GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 9104/1
Permit Holder:	Natural Area Holdings Pty Ltd T/A Natural Area Consulting Management Services
Duration of Permit:	From 7 August 2021 to 7 August 2026

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 fence line installation.

2. Land on which clearing is to be done

Lot 203 on Deposited Plan 21513, Two Rocks

3. Clearing authorised

The permit holder must not clear more than 0.6 hectares of native vegetation within the area cross-hatched yellow in Figures 1-3 of Schedule 1.

PART II – MANAGEMENT CONDITIONS

4. Avoid, minimise, and reduce 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.

5. 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; and

(c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

6. Directional clearing

The permit holder must conduct clearing activities in a slow, progressive manner from in one direction, i.e. from north to south, to allow fauna to move into adjacent native vegetation ahead of the clearing activity.

7. Flora management – *Acacia benthamii*

(a) The permit holder shall demarcate all *Acacia benthamii* individuals located within the area cross-hatched yellow on Figures 1-3 of Schedule 1, as identified by the biological survey titled 'Department of Lands, Planning and Heritage Breakwater Flora, Vegetation and Black Cockatoo Assessment (Natural Area Holdings Pty Ltd, 2021)'.

(b) The permit holder shall ensure that no clearing of *Acacia benthamii* occurs.

8. Fauna management – black cockatoo habitat

The permit holder must not clear the 11 *black cockatoo habitat trees* found within the area/s cross-hatched yellow in Figures 1-3 of Schedule 1, as identified in the table below:

Latitude	Longitude	Tree #	Species
-31.4913	115.64701	1	*Eucalyptus gomocephala*
-31.46836	115.63991	2	*Eucalyptus gomocephala*
-31.47246	115.63992	3	*Eucalyptus gomocephala*
-31.47265	115.63993	4	*Eucalyptus gomocephala*
-31.47343	115.63968	5	*Eucalyptus gomocephala*
-31.473	115.63977	6	*Eucalyptus gomocephala*
-31.47378	115.63963	7	*Eucalyptus gomocephala*
-31.47411	115.63954	8	*Eucalyptus gomocephala*
-31.47387	115.63959	9	*Eucalyptus gomocephala*
-31.46317	115.63945	10	*Eucalyptus gomocephala*
-31.47937	115.63924	11	*Eucalyptus gomocephala*

PART III - RECORD KEEPING AND REPORTING

9. 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 clearing activities generally	(a) the species composition, structure, and density of the cleared area; (b) the location where the clearing 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) the size of the area cleared (in hectares); (e) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 4; and (f) actions taken to minimise the risk of the introduction and spread of weeds and dieback in accordance with condition 5; (g) actions taken to undertake directional clearing in accordance with condition 6; and (h) actions take to avoid *black cockatoo habitat trees* in accordance with condition 8.
2.	In relation to flora management pursuant to condition 7	(a) the name and location of each individual *Acacia benthamii*, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings; (b) actions taken to demarcate each individual *Acacia benthamii* recorded; and (c) actions taken to avoid the clearing of *Acacia benthamii*.

10. Reporting

The permit holder must provide to the *CEO*, the records required under condition 9 of this permit when requested by the *CEO*.

DEFINITIONS

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

Table 2: Definitions

Term	Definition
black cockatoo habitat trees	means trees that have a diameter, measured at 150 centimetres from the base of the tree, of 50 centimetres or greater (or 30 centimetres or greater for *Eucalyptus salmonophloia* or *Eucalyptus wandoo*) that contain hollows suitable for breeding by *black cockatoo species*.
black cockatoo species	means one or more of the following species: (a) *Calyptorhynchus lateriosis* (Carnaby's cockatoo); (b) *Calyptorhynchus baudinii* (Baudin's cockatoo); and/or (c) *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo).
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*.
clearing	has the meaning given under section 3(1) of the EP Act.
condition	a condition to which this clearing permit is subject under section 51H of the EP Act.
fill	means material used to increase the ground level, or to fill a depression.
dieback	means the effect of *Phytophthora* species on native vegetation.
department	means the department established under section 35 of the *Public Sector Management Act 1994* (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
EP Act	*Environmental Protection Act 1986* (WA)
mulch	means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation.
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
weeds	means any plant – (a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*; 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

Meenu Vitarana
A/MANAGER
NATIVE VEGETATION REGULATION

Officer delegated under Section 20
of the Environmental Protection Act 1986

14 July 2021

Schedule 1

The boundary of the area authorised to be cleared is shown in the maps below (Figures 1-3).

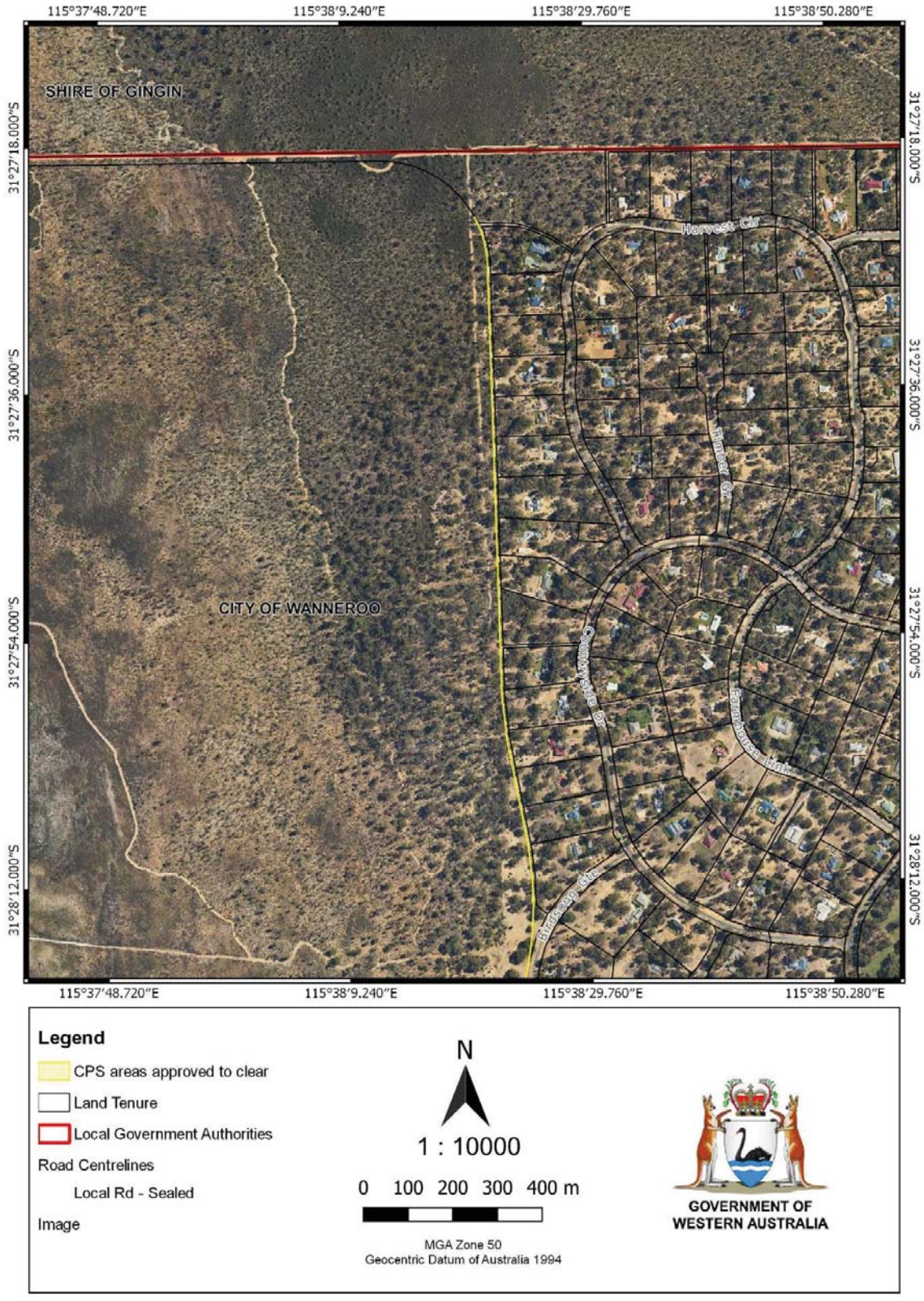


Figure 1: Map of the boundary of the area within which clearing may occur

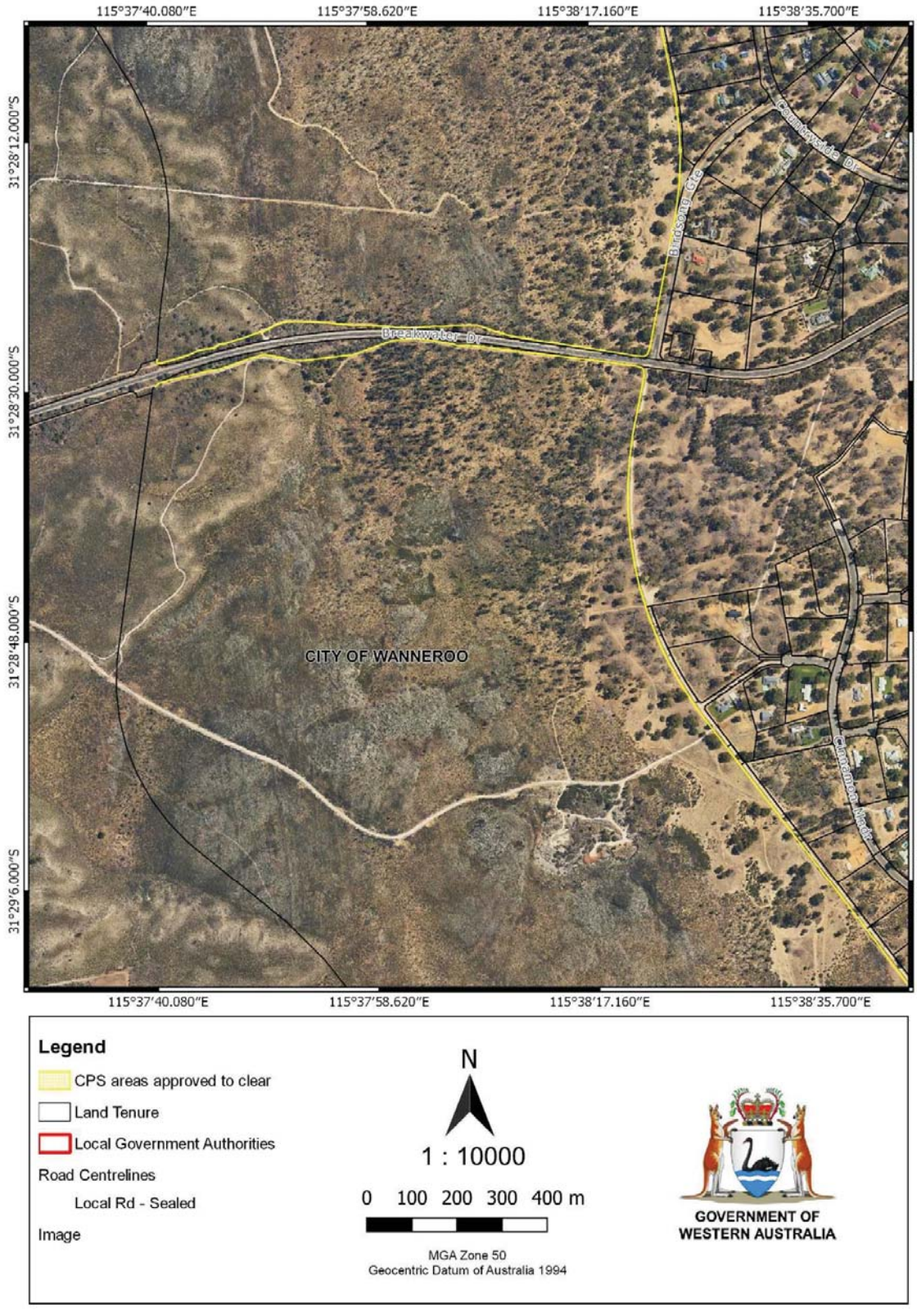


Figure 2: Map of the boundary of the area within which clearing may occur

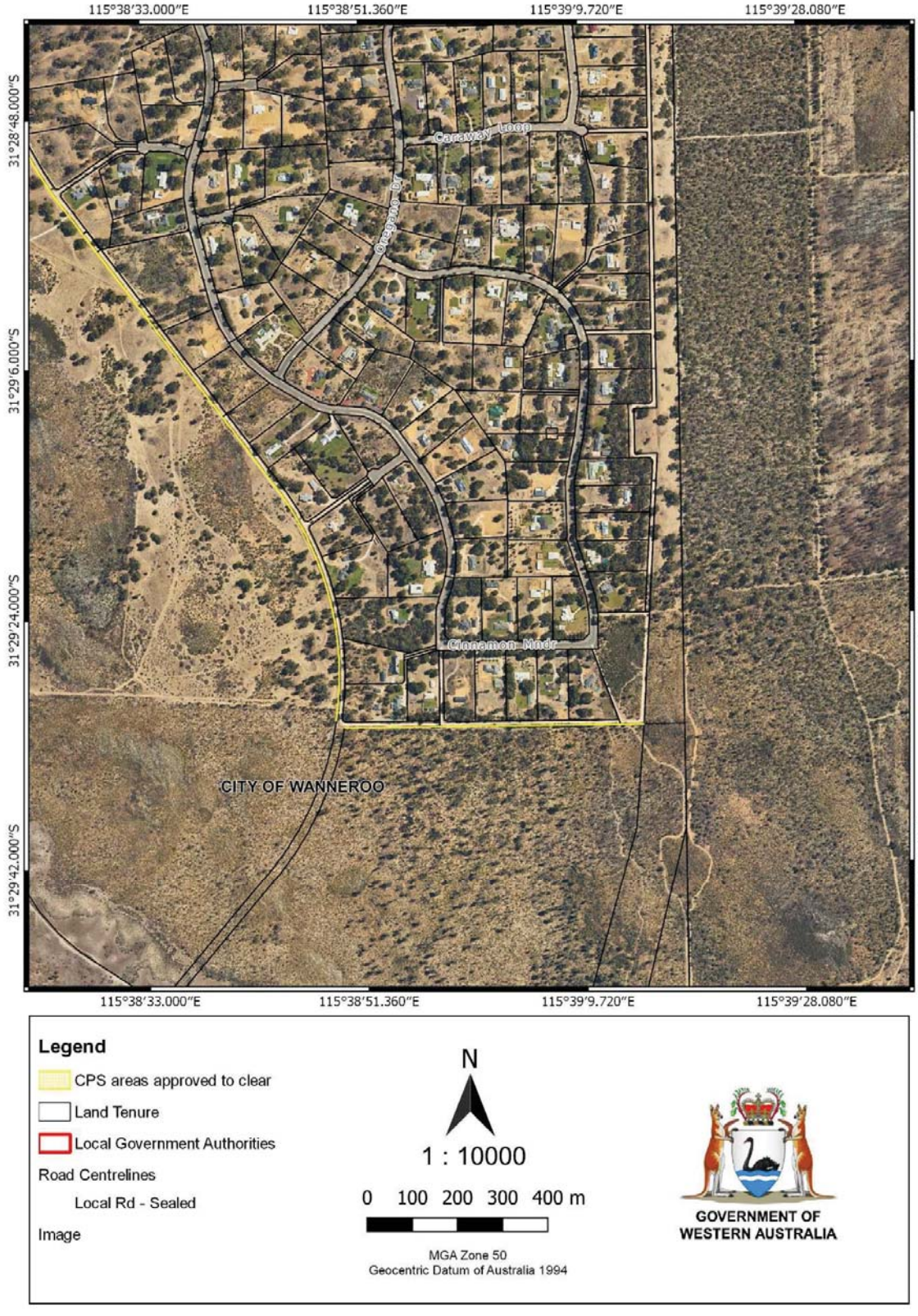


Figure 3: Map of the boundary of the area within which clearing may occur

Government of Western Australia
Department of Water and Environmental Regulation

Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 9104/1
Permit type:	Purpose permit
Applicant name:	Natural Area Holdings Pty Ltd T/A Natural Area Consulting Management Services
Application received:	10 November 2020
Application area:	0.6 hectares of native vegetation
Purpose of clearing:	Fence line installation
Method of clearing:	Mechanical
Property:	Lot 203 on Deposited Plan 21513
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 distributed across three separate areas along the border of Bush Forever Site 284 (see Figure 1, Section 1.5). The application is to selectively clear shrubs and understorey within one metre (0.5 metres each side) of a proposed fence line, which is required to keep third parties from entering the Bush Forever Site and to assist in the preservation of its environmental values.

1.3. Decision on application

Decision:	Granted
Decision date:	14 July 2021
Decision area:	0.6 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 no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix A), relevant datasets (see Appendix E.1), the findings of a biological survey (Natural Area, 2021), the clearing principles set out in Schedule 5 of the EP Act (see Appendix B), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3). The Delegated Officer also took into consideration that the purpose of the clearing is to assist in the preservation of the environmental values of Bush Forever Site 284, through the exclusion of third parties.

The assessment identified that the proposed clearing has the potential to result in the introduction and spread of weeds and dieback into adjacent vegetation within Bush Forever Site 284, which could impact on the quality of the adjacent vegetation and its habitat values. The assessment also identified that the application area may include vegetation representative of a significant ecological community and may provide suitable habitat for conservation

significant flora and fauna species. However, given the extent of the proposed clearing, the condition of the vegetation, the abundance of adjacent suitable habitat within Bush Forever Site 284 and the applicant's avoidance and minimisation measures, the proposed clearing was not considered likely to constitute a significant residual impact to the adjacent vegetation or any other biological, conservation, or land and water resource values.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing is unlikely to have long-term adverse impacts on the environmental values of adjacent or nearby conservation areas or on conservation significant flora, fauna or ecological communities. The Delegated Officer considered that the impacts of the proposed clearing can be minimised and managed to be unlikely to lead to an unacceptable risk to the environment.

The Delegated Officer decided to grant a clearing permit subject to conditions to:

- avoid, minimise and reduce the impacts and extent of clearing,
- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback,
- undertake slow, progressive one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity,
- ensure no clearing of individual *Acacia benthamii* identified within the permit area occurs, and
- retain all potential habitat trees for Carnaby's cockatoo (*Calyptorhynchus latirostris*) identified within the permit area.

1.5. Site maps

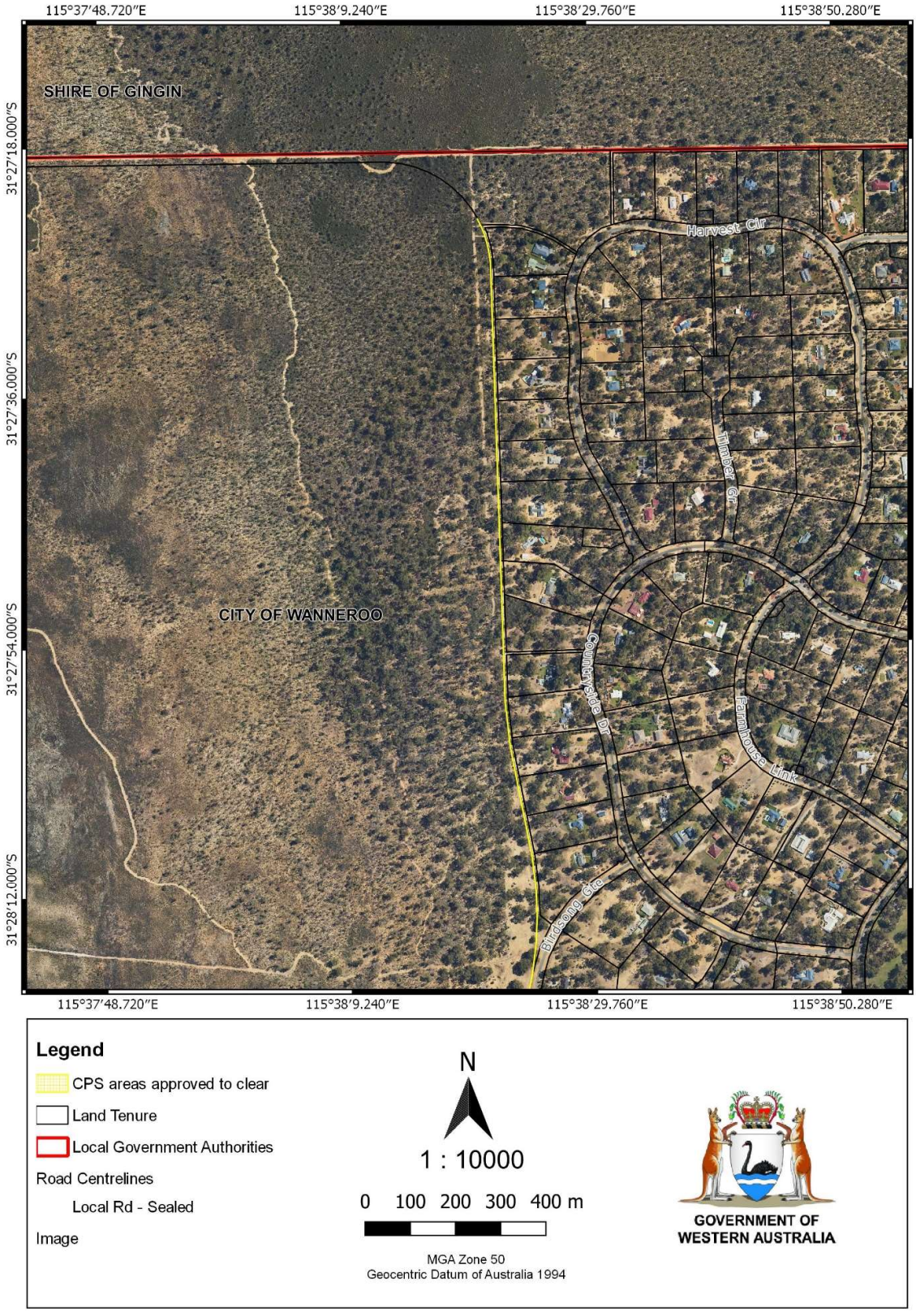


Figure 1 The areas crosshatched yellow indicate the areas authorised to be cleared under the granted clearing permit.

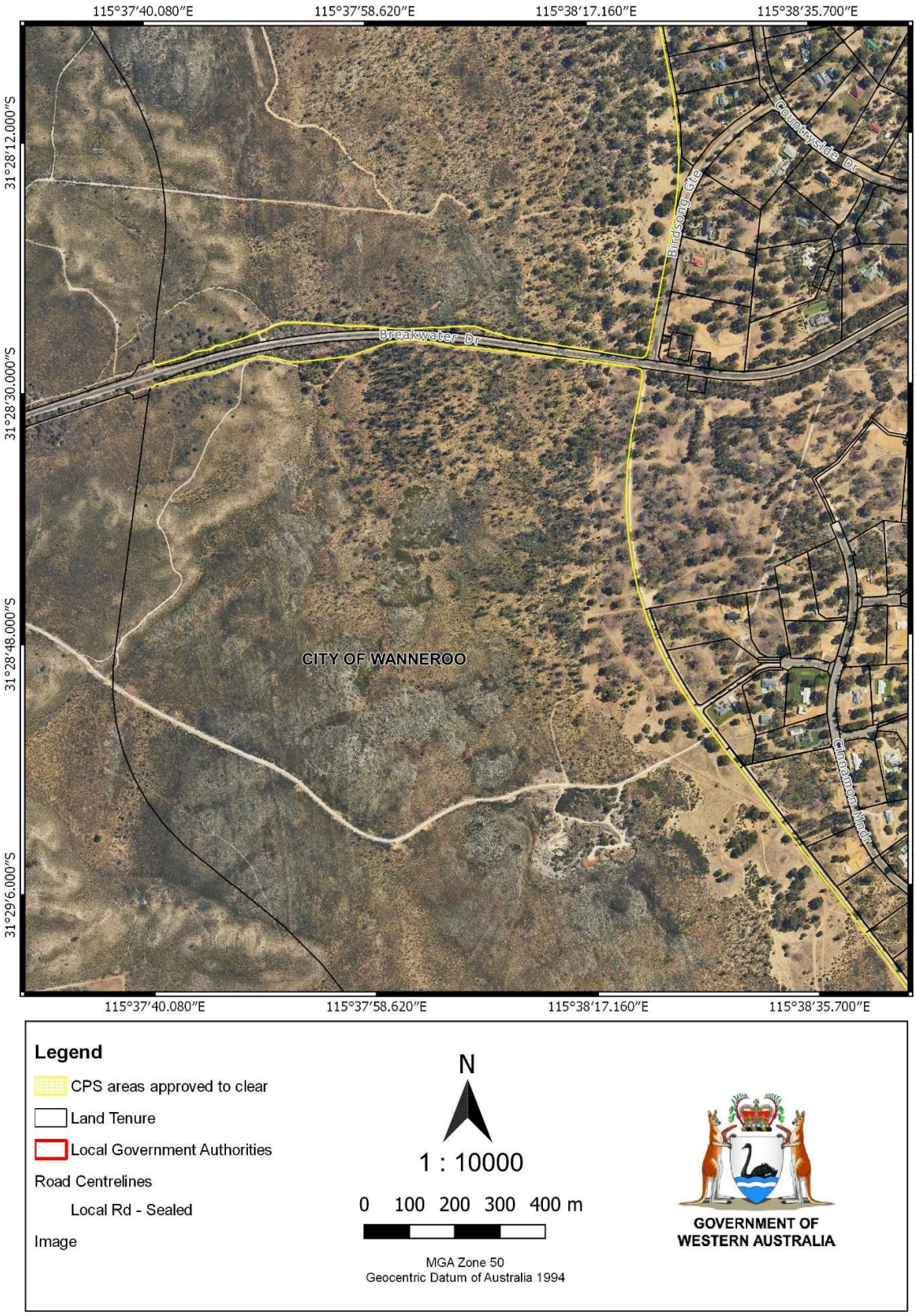


Figure 2 The areas crosshatched yellow indicate the areas authorised to be cleared under the granted clearing permit.

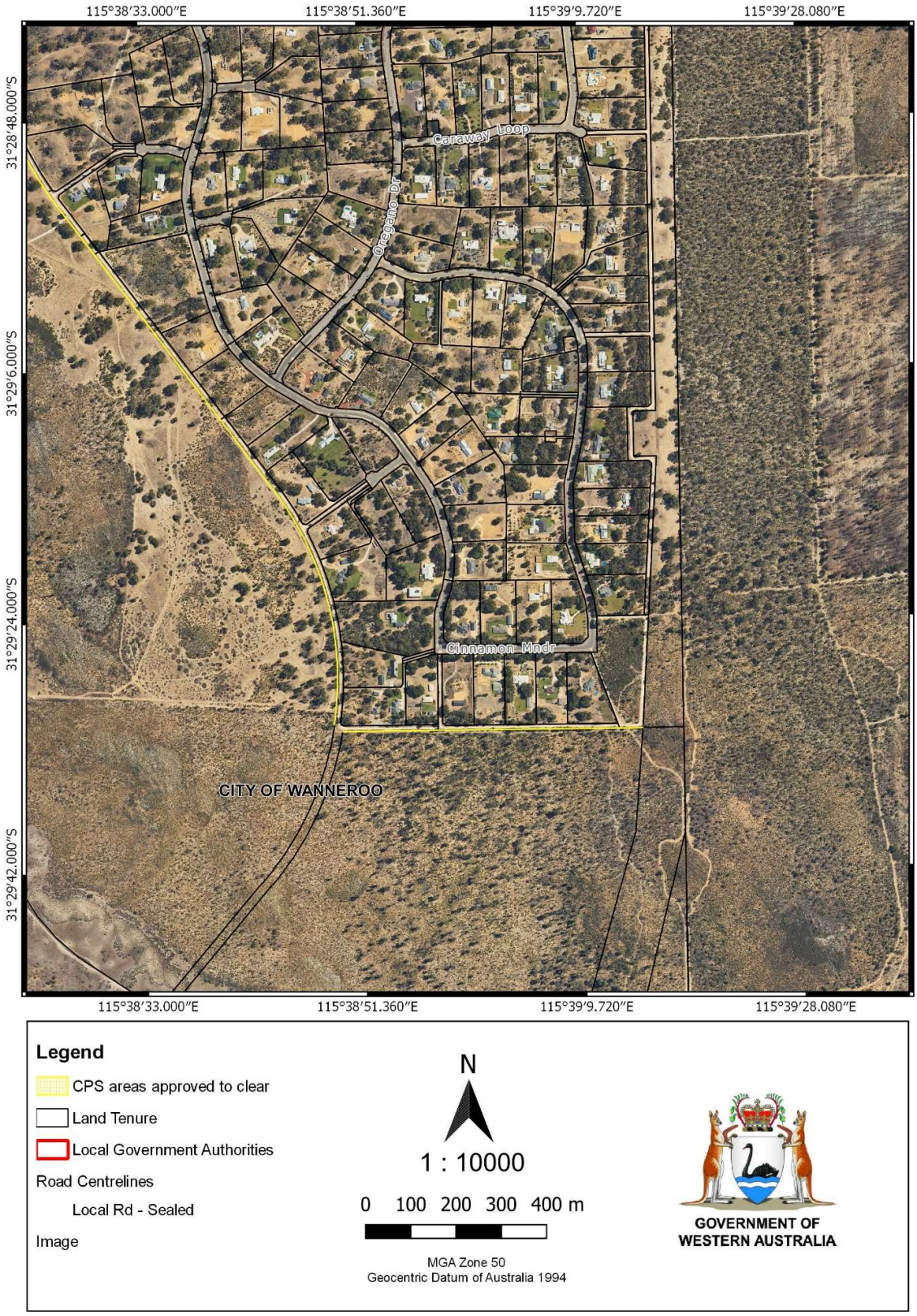


Figure 3 The areas crosshatched yellow indicate the areas authorised to be cleared under the granted clearing permit.

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 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)

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)
- 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 applicant has advised that the installation of a fence line is required to prevent third parties from entering Bush Forever Site 284 and impacting on its environmental values (Natural Area, 2020). The clearing proposed is only to the extent necessary for access, construction and maintenance of the proposed fence line, being 0.5 metres on either side of the fence (Natural Area, 2020).

The applicant has also advised that the proposed fence line has been aligned with existing firebreaks where possible, as opposed to aligning with the cadastral boundary of the Bush Forever Site, to reduce the total clearing required (Natural Area, 2020). The applicant indicated that the alignment of the proposed fence has been designed to accommodate the retention of significant environmental values identified during biological surveys, including mature trees and priority flora species (Natural Area, 2020).

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.

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix A) 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 Appendix B) identified that the impacts of the proposed clearing present a risk to biological values (fauna, flora and ecological communities) and conservation areas. 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 (ecological communities) - Clearing Principle (a)

Assessment

According to available databases and with consideration of the site characteristics of the proposed clearing area (see Appendix A), two state-listed priority ecological communities (PECs) are considered likely to occur within the application area; the “Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain” (Tuart Woodlands) PEC and the “Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region” (Banksia WL SCP) PEC. It should be noted that both communities are federally listed threatened ecological communities (TECs) under the EPBC Act.

Tuart Woodlands TEC/PEC
The approved conservation advice for the federally listed Tuart Woodlands TEC, notes that the defining characteristic of this community is the presence of at least two living tuart trees in the uppermost canopy layer, with a gap of no more than 60 metres between the outer edges of the canopy of adjacent tuart trees (DoEE, 2019). Further, the patch boundary for an occurrence of the Tuart Woodlands is defined as 30 metres beyond the outer canopy of the established tuart trees (≥15 cm diameter at breast height (DBH)), including dead tuart trees (DoEE, 2019). The key diagnostic criteria for the Tuart Woodlands also includes thresholds for patch size and condition, where a patch smaller than 0.5 hectares that meets the defining characteristics is not part of the nationally listed community, a patch greater than 5 hectares that meets the defining characteristics in any condition is part of the nationally listed community, and a patch between 0.5 and 5 hectares that meets the defining characteristics may be part of the listed community, dependent on condition (DoEE, 2019). The descriptions, area and condition thresholds that apply to the federally listed TEC also apply to the Tuart Woodlands PEC (DBCA, 2021).

A biological survey undertaken in accordance with the *Technical guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016a)* conducted by Natural Area (2021) in January 2021 identified that, while the application area itself is unlikely to be representative of any conservation significant ecological community, the greater patch of vegetation beyond the application area is likely to be representative of the Tuart Woodlands TEC/PEC (Natural Area, 2021). Noting that the application area includes woodland with an overstorey of tuart and that the greater vegetation within Bush Forever Site 284 is likely to represent the ecological community, it is considered that the proposed clearing may result in the removal of mid- and understorey species within a patch of the Tuart Woodlands TEC/PEC. However, as discussed in Section 3.2.1, the applicant has advised that the proposed fence line alignment has been designed to avoid all mature tuart trees and to align with the existing cleared firebreak, limiting the proposed clearing to a maximum of 0.6 hectares of mid- and understorey vegetation in Good to Completely Degraded (Keighery, 1994) condition (Natural Area, 2021; Natural Area, 2020). Further, the intent of the proposed fence line is to protect the environmental values of Bush Forever Site 284, including the patch of Tuart Woodlands TEC/PEC, from the impacts of third parties accessing the site without authorisation (Natural Area, 2020). Given the above, the extent of the proposed clearing, and that no clearing of mature tuart trees will occur, impacts to the Tuart Woodlands PEC/TEC resulting from the proposed clearing are not considered to be significant.

However, it is acknowledged that the proposed clearing has the potential to facilitate the spread of weeds and dieback into adjacent vegetation that is representative of the Tuart Woodlands TEC/PEC, by exposing an area of Bush Forever Site 284 to edge effects. Noting the extent of the proposed clearing along a long, linear footprint, a weed and dieback management condition is considered sufficient to minimise this risk.

Banksia WL SCP TEC/PEC
With respect to the Banksia WL SCP state-listed PEC and federally listed TEC, the key diagnostic criteria for the community includes the presence of at least one of the four diagnostic *Banksia* species, and distinct low woodland to forest structure comprising a canopy co-dominated by *Banksia attenuata* or *Banksia menziesii*, where the emergent tree layer often includes marri, jarrah or tuart, over a diverse shrub or herbaceous understorey (TSSC, 2016). The community typically occurs on well drained, low nutrient soils on sandplain landforms, particularly deep Bassendean and Spearwood sands and occasionally on Quindalup sands, and is also common on sandy colluvium and aeolian sands of the Ridge Hill Shelf, Whicher Scarp and Dandaragan Plateau (TSSC, 2016). The thresholds for patch size and condition for the Banksia WL SCP TEC state that a patch should meet at least Good (Keighery, 1994) condition to be considered part of the listed community, and minimum patch size is dependent on vegetation condition and its overall contribution to beta diversity, connectivity, and function of the ecological community across the landscape (TSSC, 2016). The descriptions, area and condition thresholds that apply to the federally listed TEC also apply to the Banksia WL SCP PEC (DBCA, 2021).

The flora survey identified a small area of *Banksia attenuata* woodland within the northern alignment of the clearing envelope (Natural Area, 2021). This area is predominantly in Degraded to Completely Degraded (Keighery, 1994) condition and includes only a 0.02-hectare area of Good (Keighery, 1994) condition vegetation (Natural Area, 2021), which is below the minimum patch size to be considered part of the Banksia WL SCP TEC/PEC. Given the above, the vegetation within the application area is not considered to be representative of the Banksia WL SCP TEC/PEC and no clearing within this ecological community is expected to result from the proposal.

Conclusion
Based on the above assessment, the proposed clearing may result in the loss of mid- and understorey species within a patch of the Tuart Woodlands State-listed PEC and federally listed TEC and may facilitate the spread of weeds and dieback into the adjacent patch of the Tuart Woodlands TEC/PEC. However, given the condition of the vegetation and the extent of the proposed clearing, it is not considered likely that the proposed clearing will result in significant impacts to the greater patch of the Tuart Woodlands TEC/PEC or any other conservation significant ecological community.

For the reasons set out above, it is considered that the impacts of the proposed clearing to conservation significant ecological communities can be managed to be environmentally acceptable by taking steps to minimise the risk of the introduction and spread of weeds and dieback and does not constitute a significant residual impact.

Conditions
To address the above impacts, the following management measure will be required as a condition on the clearing permit:

- Dieback and weed control, which ensures protocols are put in place to limit the introduction and transportation of dieback- and weed-affected materials.

3.2.2. Biological values (flora) - Clearing Principles (a) and (c)

Assessment
A review of available databases indicates that a total of 28 conservation significant flora species have been recorded within the local area (see Appendix A). These species were listed under the state BC Act and/or Commonwealth EPBC Act, or as Priority (P) species by the Department of Biodiversity Conservation and Attractions (DBCA).

A targeted flora survey undertaken in accordance with the *Technical guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016a) conducted by Natural Area (2021) in January 2021 did not identify any state or federally listed threatened flora species within the application area (Natural Area, 2021). However, one priority flora species, *Acacia benthamii* (P2), was recorded within the northern alignment of the clearing envelope (Natural Area 2021).

Acacia benthamii is a spindly shrub with yellow flowers occurring between August and September and is typically associated with sandy soils over limestone in woodland or low shrubland (Western Australian Herbarium, 1998-). The flora survey identified a population of 20 individual plants within the vicinity of the northern alignment of the clearing envelope, with one individual located within the application area (Natural Area, 2021). However, the applicant has advised that the fence will be constructed around the individual, where spacing and alignment between the fence posts in this area can accommodate the shrub without sacrificing its function or causing damage (Natural Area, 2021). A condition requiring the retention of any *Acacia benthamii* identified with the application area will be applied to the clearing permit, to ensure no direct impacts to individuals occur. Given no individuals are proposed to be cleared and that the greater population is outside of the alignment of the proposed fence line, it is not considered likely that the proposed clearing will result in significant impacts to the local population of *Acacia benthamii* or that the application area is necessary for the continued existence of the species.

The flora survey was undertaken by an experienced botanist and included targeted searches for threatened and priority flora along the entire clearing footprint (Natural Area, 2021). While it is noted that the survey was undertaken outside of the peak flowering period for most of the flora species in the Swan Coastal Plain bioregion, it is acknowledged that the majority of the 28 conservation significant flora species recorded in the local area are perennial trees, shrubs, herbs or fungi, with the exception of *Haloragis luminosa* (P1) and *Calandrinia oraria* (P3) (Western Australian Herbarium, 1998-). Noting this and that the application area is degraded and sparsely vegetated, it is considered likely that the survey would have identified perennial threatened and priority flora species, should they have occurred within the application area.

Regarding annual species, *Haloragis luminosa* is an annual herb that persists between September and February and is typically associated with sandy soils in shrubland dominated by *Melaleuca* spp. and *Banksia* spp. (Western Australian Herbarium, 1998-). While the coastal shrubland and Banksia woodland vegetation types within the application area are likely to provide suitable habitat for the species, it is likely that the timing of the flora survey would have been adequate to identify *Haloragis luminosa*, should individuals have been present within the application area. *Calandrinia oraria* an annual herb that persists between August and October and is associated with coastal shrublands in sandy dune systems (Western Australian Herbarium, 1998-). The coastal shrubland within the application area is likely to provide suitable habitat for this species and it is unlikely that the January 2021 survey would have been adequately timed to identify individuals. However, *Calandrinia oraria* is a Priority 3 species known from 11 records from Coorow to Mandurah and is typically found in more coastal areas to west of the application area (Western Australia Herbarium, 1998-). The total area of suitable habitat for *Calandrinia oraria* contained within the clearing envelope is approximately 0.1 hectares (Natural Area, 2021). Further, the coastal shrubland vegetation within the application area is in Degraded to Completely Degraded (Keighery, 1994) condition and comprises sparse vegetation adjacent to an existing firebreak and road infrastructure (Natural Area, 2021). Noting the above and that suitable habitat for *Calandrinia oraria* is likely to be present within the adjacent 590-hectare Bush Forever Site 284, it is not considered likely that the application area represents significant habitat or is critical for the continuation of the species.

Conclusion
Based on the above assessment, the application area is not considered likely to represent significant habitat for any threatened or priority flora species or to be critical for the continuation of these species. However, the proposed clearing has the potential to directly impact individual *Acacia benthamii* located within the clearing envelope.

For the reasons set out above, it is considered that the impacts of the proposed clearing on *Acacia benthamii* can be mitigated through the applicant's avoidance and minimisation strategies and managed through the implementation of a flora management condition requiring the avoidance of all individuals. Therefore, the impact of the proposed clearing does not constitute a significant residual impact with respect to *Acacia benthamii*.

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

- Flora management – *Acacia benthamii*, which ensures no clearing of individual *Acacia benthamii* occurs.

3.2.3. Biological values (fauna) - Clearing Principles (a) and (b)

Assessment
A review of available databases indicates that a total of 39 conservation significant fauna species have been recorded within the local area (see Appendix A). These species were listed under the state BC Act and/or Commonwealth EPBC Act, as Priority species by DBCA, or are migratory species listed under International Agreements.

Of the conservation significant fauna species recorded within the local area, the following have the potential to be found within the application area based on habitat preferences (see Appendix A.4):

- *Calyptorhynchus latirostris* (Carnaby's cockatoo)
- *Idiosoma sigillatum* (Swan Coastal Plain shield-backed trapdoor spider)
- *Isoodon fusciventer* (Quenda)
- *Neelaps calonotos* (Black-striped burrowing snake)
- *Synemon gratiosa* (Graceful sunmoth)

Carnaby's cockatoo
Carnaby's cockatoos are known to nest in hollows of live and dead trees, including salmon gum (*Eucalyptus salmonophloia*), wandoo (*Eucalyptus wandoo*), tuart, jarrah (*Eucalyptus marginata*), flooded gum (*Eucalyptus rudis*), York gum (*Eucalyptus loxophleba subsp. loxophleba*), powderbark (*Eucalyptus accedens*), karri (*Eucalyptus diversicolor*) and marri (*Corymbia calophylla*) (Commonwealth of Australia, 2012). 'Breeding habitat' for Carnaby's cockatoos includes trees of these species that either have a suitable nest hollow or are of a suitable diameter at breast height (DBH) to develop a nest hollow, where suitable DBH for nest hollows is 500 millimetres for most tree species (Commonwealth of Australia, 2012). While breeding, Carnaby's cockatoos also generally forage within a 6 to 12 km radius of their nesting site (Commonwealth of Australia, 2012). According to available datasets, mapped potential feeding habitat is recorded within a 12-kilometre radius of the application area, including within the application area itself, making it a suitable location for breeding if appropriate hollows are present.

A targeted black cockatoo habitat assessment undertaken in accordance with the *Technical guidance – Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2016b) and the referral guidelines for three threatened black cockatoo species (Commonwealth of Australia, 2012) was undertaken across the entire application area by Natural Area in January 2021 (Natural Area, 2021). The black cockatoo habitat assessment identified that 11 habitat trees of suitable DBH to provide breeding habitat were present within the application area, of which three trees were identified to contain hollows (Natural Area, 2021). The assessment identified that two trees of the three trees within the application area contained hollows, one per tree, of suitable size for use as breeding habitat by Carnaby's cockatoo (Natural Area, 2021). However, the applicant has advised that the alignment of the proposed fence line has been designed to ensure the retention of all potential breeding trees for Carnaby's cockatoo and that clearing will be limited to mid- and understorey species only (Natural Area, 2021). A condition will be applied to the clearing permit to ensure the applicant's proposed avoidance measure is implemented and that all potential breeding trees identified during the black cockatoo habitat assessment are retained. Therefore, the proposed clearing is not considered likely to impact significant breeding habitat for Carnaby's cockatoo.

It is acknowledged that the potential breeding trees within the application area may also represent suitable roosting habitat for black cockatoo species. According to available databases, the application area also occurs within 250 metres of a confirmed roost site (DBCA, 2007-). As no clearing of the mature trees within the application area is proposed and the retention of potential breeding trees will be conditioned on the clearing permit, it is not considered likely that significant roosting habitat will be impacted by the proposed clearing.

Carnaby's cockatoos forage on the seeds, nuts and flowers of a variety of plants, including Proteaceous species (*Banksia*, *Hakea* and *Grevillea*), as well as *Allocasuarina* and *Eucalyptus* species, marri and a range of introduced species (Valentine and Stock, 2008). On the Swan Coastal Plain, it is noted that *Banksia* species (predominantly *Banksia attenuata*, *Banksia menziesii* and *Banksia sessilis*) are the most important natural food source for Carnaby's cockatoo, followed by marri (Groom, et al., 2014). As the application area contains *Banksia* and *Eucalyptus* species on the Swan Coastal Plain, is mapped within 12 kilometres of known breeding sites and within 6 kilometres of known roost sites, it is likely to provide suitable foraging habitat for Carnaby's cockatoo. However, it should be noted that *Banksia* species are sparsely distributed through the application area and primary foraging species for Carnaby's cockatoo within the application area is likely to be limited to approximately 16 individual Banksia trees within the 0.6-hectare footprint (Natural Area, 2020). The local area is also extensively vegetated, with extensive tracts of suitable foraging habitat available in local conservation estate, including the greater Bush Forever Site 284 and Gnangara-Moore River State Forest. According to available databases, approximately 21,000 hectares of foraging habitat for Carnaby's cockatoo remains within the local area, of which the application area comprises approximately 0.003 per cent. Given the extent of the proposed clearing and that mature *Eucalyptus* trees within the application area will be retained, it is not considered likely that the application area comprises significant foraging habitat for Carnaby's cockatoo or that the proposed clearing will significantly reduce foraging habitat for Carnaby's cockatoos in the local area.

It should be noted that the application area is located outside of the modelled occurrence range for both Baudin's black cockatoo (*Calyptorhynchus baudinii*) and the forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*). Therefore, impacts to these species were not considered likely to result from the proposed clearing.

Invertebrates

The Swan Coastal Plain shield-backed trapdoor spider is associated with Banksia woodland and heathland in sandy soils on the Swan Coastal Plain and is largely restricted to bushland remnants in the Greater Perth region (Rix et al., 2018). Given the application area includes remnant woodland on the Swan Coastal Plain and occurs on sandy soils, it is possible that the application area provides suitable habitat for the Swan Coastal Plain shield-backed trapdoor spider. However, the application area comprises primarily tuart woodland and coastal heath with a small patch of *Banksia attenuata* woodland (Natural Area, 2021), and is unlikely to represent the preferred habitat of the Swan Coastal Plain shield-backed trapdoor spider. It is also likely that larger remnants of higher quality vegetation would provide more favourable habitat for this species in the local area, such as adjacent vegetation within the greater Bush Forever Site 284. Further, the application area is highly disturbed from adjacent land uses, is in predominantly Degraded to Completely Degraded (Keighery, 1994) condition with a small patch of Good (Keighery, 1994) condition vegetation at the northern extent of the application area, and is likely to be too poor in condition to support a significant population of the Swan Coastal Plain shield-backed trapdoor spider. Noting the above, the application area is unlikely to constitute significant habitat for the Swan Coastal Plain shield-backed trapdoor spider.

The graceful sun moth is a medium-sized diurnal moth, associated Banksia woodland that comprises the suitable host species *Lomandra hermaphrodita* or coastal heath comprising *Lomandra maritima* (TSSC, 2013). The flora survey identified that the application area includes a small patch of *Banksia attenuata* woodland as well as coastal heath that comprises *Lomandra maritima* (Natural Area, 2021). Noting the above, it is likely that the application area provides suitable habitat for the graceful sun moth. The graceful sun moth was listed as Endangered under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) in 1997, however was delisted to a Priority 4 conservation significant fauna species in 2012 after extensive survey efforts identified new subpopulations located in coastal heathland (TSSC, 2013). The dispersal of this species is also thought to be very limited, with dispersal across unsuitable habitat extremely uncommon (TSSC, 2013). Therefore, it is likely that larger remnants of higher quality vegetation would provide more favourable habitat for this species in the local area, including adjacent vegetation within the greater Bush Forever Site 284. Given the above, the extent of suitable habitat in the local area, and that the application area is directly adjacent to an existing firebreak and is highly disturbed from adjacent land uses, the proposed clearing is not likely to impact significant habitat for the graceful sun moth.

Ground-dwelling fauna

Quenda are ground-dwelling marsupials, typically associated with forest or woodlands near watercourses, where understorey consists of dense scrub and leaf litter is abundant (DEC, 2012). Given the application area contains remnant woodland, it is likely to contain suitable habitat for quenda. However, it is acknowledged that the application area comprises 0.6 hectares of degraded vegetation across a long, linear footprint and that native understorey is sparse and highly disturbed throughout the application area. It is therefore unlikely that the application area would provide sufficient understorey cover and leaf litter to comprise preferred habitat for the species. Further, the application area is adjacent to larger remnants of suitable habitat for quenda including adjacent vegetation within the greater Bush Forever Site 284, and it is expected that individuals will be able to disperse into this vegetation at the time of clearing, given the application of slow, progressive directional clearing. Given the extent of the proposed

clearing, the condition of the vegetation and the proximity of the application area to suitable habitat, the application area is not considered likely to comprise significant habitat for quenda.

The black-striped burrowing snake is associated with deep sandy soils in Banksia and jarrah woodland on the Swan Coastal Plain (ALA, 2021). Therefore, it is considered that the small patch of Banksia woodland may provide suitable habitat for this species within the application area. However, the biological survey identified that the Banksia woodland present is in predominantly Good to Degraded (Keighery, 1994) condition, with sparsely distributed native understorey and has been highly disturbed from adjacent land uses (Natural Area, 2021). Further, the application area is adjacent to larger remnants of vegetation including the greater Bush Forever Site 284, which are likely to provide more suitable habitat for the species. Given the above, the application area is unlikely to constitute significant habitat for the black-striped burrowing snake.

Ecological linkage
While the application area may provide some linkage values for fauna moving through the local area, it is acknowledged that the application area is on the border of an expansive tract of remnant vegetation within Bush Forever Site 284. Given the proposed clearing will not sever any linkages to Bush Forever Site 284 and will not significantly alter vegetation connectivity in the landscape, it is not considered likely that the application area acts as a significant ecological linkage for fauna moving through the local area.

Conclusion
Based on the above assessment, the area proposed to be cleared is not considered likely to represent significant habitat for any conservation significant fauna species or to be critical for the continuation of these species.

For the reasons set out above, it is considered that the impacts of the proposed clearing on conservation significant fauna can be managed by slow directional clearing to allow fauna to move into adjacent vegetation and the retention of all potential habitat trees for Carnaby's cockatoo. The impacts of the proposed clearing can be managed to be environmentally acceptable and do not constitute a significant residual impact.

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

- Directional clearing, which requires slow, directional clearing to allow fauna to move into adjacent vegetation ahead of the clearing activity, and
- Fauna management (Carnaby's cockatoo habitat trees), which requires the retention of all black cockatoo habitat trees identified within the clearing area.

3.2.4. Conservation areas - Clearing Principle (h)

Assessment
As the application area is located within Bush Forever Site 284, the proposed clearing may have an impact on the environmental values of a conservation area through the direct removal of vegetation. However, it is acknowledged that the proposed clearing will result in the removal of 0.6 hectares of degraded vegetation across a long, linear footprint adjacent to an existing firebreak, road reserves and residential properties on the eastern edge of the Bush Forever Site. As discussed in the sections above, it is also noted that the application area is unlikely to comprise locally or regionally significant flora, fauna or ecological communities and that significant habitat resources such a potential breeding trees for Carnaby's cockatoo will be retained. Further, it is acknowledged that the intention of the proposed fence line is to assist in the preservation of the environmental values of Bush Forever Site 284, by reducing access and damage to the site caused by third parties (Natural Area, 2020). The application area is also not expected to add to the ecological linkage values of Bush Forever Site 284, noting its location on the eastern border of the site. Given the extent of the propose clearing, the applicant's avoidance and minimisation measures, and the purpose of the proposed clearing, it is not considered likely that the proposed clearing will significantly impact the environmental values contained within Bush Forever Site 284 or significantly reduce the capacity of the site to act as a conservation reserve.

It is acknowledged that the proposed clearing it to install a fence line to prevent third parties from entering Bush Forever Site 284 and impacting on its environmental values in the long term. However, it is considered that the proposed clearing activities has the potential to facilitate the spread of weeds and dieback to the adjacent Bush Forever Site 284 and other retained remnant vegetation in the local area, by exposing an area of Bush Forever Site 284 to edge effects. A weed and dieback management condition is considered to minimise this risk.

Conclusion

Based on the above assessment, the proposed clearing may facilitate the spread of weeds and dieback into adjacent retained vegetation in the local area, including an adjacent conservation area. For the reasons set out above, it is considered that the impacts of the proposed clearing can be managed to be environmentally acceptable by taking steps to minimise the risk of the introduction and spread of weeds and dieback and does not constitute a significant residual impact.

Conditions

To address the above impacts, the following management measure will be required as a condition on the clearing permit:

- Dieback and weed control, which ensures protocols are put in place to limit the introduction and transportation of dieback- and weed-affected materials.

3.3. Relevant planning instruments and other matters

The clearing permit application was advertised on the Department of Water and Environmental Regulation's website on 26 March 2021, inviting submissions from the public within a 21-day period. No submissions were received in relation to this application.

The City of Wanneroo (the City) advised DWER that local government approvals are not required as the area proposed to be cleared is located on land reserved as 'Parks and Recreation' under the Metropolitan Region Scheme, and any approvals would need to be determined through the Western Australian Planning Commission and Department of Planning, Lands and Heritage (DPLH) (City of Wanneroo, 2021). The City recommended that DPLH be contacted for comment as to whether a development application was required (City of Wanneroo, 2021). Noting that the applicant has been commissioned by DPLH to undertake the proposed clearing, the Delegated Officer considered that additional advice was not required. The City also noted that the Quindalup Complex was a high priority for further protection according to the City's *Local Biodiversity Strategy 2011-16*, as the complex has close to 11.3 per cent of its original extent currently protected within the City (City of Wanneroo, 2021). The Delegated Officer considered that the current extent of the Quindalup Complex is consistent with the national objectives and targets for biodiversity conservation in Australia (see Appendix C.2.) and, given the extent of the proposed clearing, further consideration of impacts to the Quindalup Complex was not required.

DWER's Water Source Protection Planning branch (Water Source Protection) advised that it had no concerns relating to the impacts of the proposed clearing on the Perth Coastal and Gwelup Underground Water Pollution Control Area, noting that the land is managed in perpetuity by DPLH and that the ongoing land use is conservation (DWER, 2021). Water Source Protection advised that the application area did not occur within 1.5 kilometres of any Wellhead Protection Zones (WHPZs) and given the extent of the proposed clearing and retention of all mature trees, no water quality impacts were expected from the proposed works (DWER, 2021).

No Aboriginal sites of significance have been mapped within the application area. However, the application area is located adjacent to the Emu Cave mythological site. 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.

End

Appendix A. Site characteristics

A.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 bordered by Bush Forever Site 284 to the north, south and west and is adjacent to various road reserves and residential properties to the east. The proposed clearing area aligns with an existing firebreak and intersects numerous patches of remnant native vegetation within Bush Forever Site 284, which vary in size from approximately 108 to over 5000 hectares. Spatial data indicates the local area (10-kilometre radius from the centre of the area proposed to be cleared) retains approximately 76.3 per cent of the original native vegetation cover.
Ecological linkage	The application area is mapped within a Conceptual Linkage defined by the Gnangara Sustainability Strategy (2009). However, noting that the application area is on the border of an expansive tract of remnant vegetation within Bush Forever Site 284 and is adjacent to an existing firebreak, road reserves and residential properties, it is not expected that the application area significantly contributes to the functionality of this conceptual linkage or acts as a significant ecological linkage in the local area.
Conservation areas	The application area is located within Bush Forever Site 284 designated under *State Planning Policy 2.8 – Bushland Policy for the Perth Metropolitan Region* (SPP 2.8). The next closest conservation area is the Gnangara-Moore River State Forest, located approximately 150 metres north of the application area, separated by existing cleared firebreaks.
Vegetation description	A vegetation survey undertaken by Natural Area in January 2021 indicates the vegetation within the proposed clearing area consists of the following three vegetation types: • **Tuart Woodland**, described as an open woodland of *Eucalyptus gomphocephala* (tuart) trees over sparse shrubs and an understorey of introduced grasses and herbs • **Coastal Shrubland**, described as shrubland of mixed coastal shrubs over a weedy understorey of introduced grasses and herbs, and • **Banksia Woodland**, described as a woodland of *Banksia attenuata* over *Hibbertia hypericoides* and mixed shrubs, over an understorey of mixed native and introduced sedges and herbs (Natural Area, 2021). Representative photographs and the full survey mapping are available in Appendix D. This is inconsistent with the mapped Swan Coastal Plain vegetation types: • Cottesloe Complex – North, which is described as predominantly low open forest and low woodland of *Banksia attenuata* (slender Banksia), *Banksia menziesii* (firewood Banksia) or *Eucalyptus todtiana* (pricklybark), with closed heath on limestone outcrops, and • Quindalup Complex, 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, with local variations (Heddle et al., 1980).
Vegetation condition	A vegetation survey undertaken by Natural Area in January 2021 indicates the vegetation within the proposed clearing area is in Good to Completely Degraded (Keighery, 1994) condition (Natural Area, 2021), described as:

Characteristic	Details
	• Good: Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it, and • Completely Degraded: The structure of the vegetation is no longer intact, and the area is completely or almost completely without native species (Keighery, 1994) The full Keighery (1994) condition rating scale is provided in Appendix C. Representative photos and the full survey mapping are available in Appendix D.
Climate and landform	The application area is located within a Mediterranean climate and has a mean annual maximum temperature of 25.6°C and a mean annual minimum temperature of 11.0°C. The mean annual rainfall is 800 millimetres, and the annual evapotranspiration rate is 700 millimetres. Topography of the site ranges from 16 Australian Height Datum (AHD) in the south and rises to 46 AHD to the north, with undulations (14 - 42 AHD) along Breakwater Drive (Natural Area, 2021).
Soil description and land degradation risk	The soil is mapped within the following systems: • Karrakatta shallow soils Phase (211Sp__Kls), described as low hills and ridge with bare limestone or shallow siliceous or calcareous sand over limestone and characterised by dense low shrub dominated by *Dryandra sessilis*, *Melaleuca huegellii* and species of *Grevillea*, • Karrakatta Sand Yellow Phase (211Sp__Ky), described as low hilly to gently undulating terrain with yellow sand over limestone at 1-2 metres and characterised by *Banksia* spp. woodland with scattered emergent *Eucalyptus gomphocephala* and *Eucalyptus marginata* and a dense shrub layer, • Spearwood Sand Phase (211Sp__Sp), described as irregular banks of karst depressions with some limestone outcrop and shallow brown sands, characterised by *Banksia* spp. woodland with emergent *Eucalyptus gomphocephala* and *Eucalyptus* marginata and a dense shrub layer. • Quindalup South shallow sand flat Phase (211Qu__Qs), described as undulating landscapes with shallow calcareous sands over limestone and much rock outcrop, and • Quindalup South oldest dune Phase (211Qu__Q1), described as the oldest phase, consisting of dunes or remnants with low relief where calcareous sands have organic staining to about 30 cm, overlying pale brown sand with definite cementation below 1 metre (DPIRD, 2021). The land degradation risks relating to the mapped soil types are provided in Appendix A.6.
Waterbodies and hydrogeography	The desktop assessment and aerial imagery indicated that the application area does not transect any watercourses or wetlands. The closest watercourse is a perennial lake which occurs approximately 4.3 kilometres south-west of the application area, separated by road infrastructure. The closest wetland is an unnamed dampland (seasonally inundated basin), occurring approximately 2.3 kilometres east of the application area, separated by road infrastructure and residential properties. Biological survey information also did not identify any remnants representative of riparian vegetation or any wetland indicator species within the survey area (Natural Area, 2021). The application area is mapped within the Yanchep Groundwater Area, proclaimed under the *Rights in Water and Irrigation Act 1914* (the RIWI Act), and the Perth Coastal and Gwelup Underground Water Pollution Control Area, a Priority 3 Public Drinking Water Source Area (PDWSA) proclaimed under the *Metropolitan Water Supply Sewerage and Drainage Act 1909*.

Characteristic	Details
	Groundwater salinity within the application area is mapped at 500 to 1000 milligrams per litre total dissolved solids.
Flora	The desktop assessment identified that a total of 28 conservation significant flora species have been recorded within the local area, comprising four Priority 1 (P1) flora, six Priority 2 (P2) flora, 13 Priority 3 (P3) flora, three Priority 4 (P4) flora, and two threatened flora (Western Australian Herbarium, 1998-). None of these existing records occur within the application area, with the closest record being an occurrence of *Eucalyptus argutifolia* (T) approximately 0.3 kilometres from the application area. With consideration for the site characteristics set out above, relevant datasets (see Appendix E.1), the distribution and extent of existing records, the habitat preferences of the aforementioned species, and biological survey information (Natural Area, 2021), the application area may provide suitable habitat for three priority flora species and impacts to these species required further consideration (see Appendix A.3).
Ecological communities	The desktop assessment identified that the closest state-listed threatened ecological community (TEC) is an occurrence of the SCP26a; *Melaleuca huegelii - Melaleuca systena* shrublands on limestone ridges (floristic community type 26a as originally described in Gibson et al. (1994)) TEC, located approximately 2.4 kilometres north-east of the application area, separated by road infrastructure and residential properties. The desktop assessment identified that the application area intersects two mapped priority ecological communities (PECs); the Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain PEC and the Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region PEC. Both communities are federally listed threatened ecological communities under the EPBC Act. With consideration for the site characteristics set out above, relevant datasets (see Appendix E.1), and biological survey information (Natural Area, 2021), impacts to these ecological communities required further consideration (see Appendix A.5).
Fauna	The desktop assessment identified that a total of 39 threatened or priority fauna species have been recorded within the local area, including 16 threatened fauna species, 10 priority fauna species, 11 fauna species protected under international agreement, and two other specially protected fauna species (DBCA, 2007-). One of these records, a record of a Carnaby's cockatoo (*Calyptorhynchus latirostris*) occurs within the application area. With consideration for the site characteristics set out above, relevant datasets (see Appendix E.1), the habitat preferences of the aforementioned species, and biological survey information (Natural Area, 2021), the application area may provide suitable habitat for five conservation significant fauna species and impacts to these species required further consideration (see Appendix A.4).

A.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	38.62	269,964.76	14.85
Swan Coastal Plain Vegetation complex*					
Cottesloe Complex - North	43474.31	25165.42	57.89	19756.19	37.81
Quindalup Complex	54,573.87	33,011.64	60.49	6632.92	10.98
Local area					
10-kilometre radius	34,152.39	26,049.56	76.27	-	-

*Government of Western Australia (2019a)

**Government of Western Australia (2019b)

A.3. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix E.1), the distribution and extent of existing records, and biological survey information (Natural Area, 2021), impacts to the following conservation significant flora required further consideration.

Species name	Conservation status	Suitable habitat features ? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Number of known records in local area (total)	Are surveys adequate to identify? [Y, N, N/A]
Acacia benthamii	2	Y	Y	Y	1.4	5	Y
Calandrinia oraria	3	N	Y	Y	3.8	1	N
Haloragis luminosa	1	N	Y	Y	5.2	4	Y

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

A.4. Fauna analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix E.1), and biological survey information (Natural Area, 2021), impacts to the following conservation significant fauna required further consideration.

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
Calyptorhynchus latirostris (Carnaby's cockatoo)	EN	Y	Y	0.0	422	Y
Idiosoma sigillatum (Swan Coastal Plain shield-backed trapdoor spider)	P3	Y	Y	6.8	1	N
Isoodon fusciventer (Quenda)	P4	Y	Y	2.6	8	N

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
Neelaps calonotos (Black-striped burrowing snake)	P3	Y	Y	6.9	4	N
Synemon gratiosa (Graceful sunmoth)	P4	Y	Y	2.0	125	N

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

A.5. Ecological community analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix E.1), and biological survey information (Natural Area, 2021), impacts to the following conservation significant ecological communities required further consideration.

Community name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Are surveys adequate to identify? [Y, N, N/A]
Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	P	Y	N	Y	0.0	Y
Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain	P	Y	Y	Y	0.0	Y

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

A.6. Land degradation risk table

Risk categories	Karrakatta shallow soils Phase (211Sp__Kls)	Karrakatta Sand Yellow Phase (211Sp__Ky)	Spearwood Sand Phase (211Sp__Sp)	Quindalup South shallow sand flat Phase (211Qu__Qs)	Quindalup South oldest dune Phase (211Qu__Q1)
Wind erosion	50-70% of map unit has a high to extreme wind erosion risk	>70% of map unit has a high to extreme wind erosion risk	>70% of map unit has a high to extreme wind erosion risk	30-50% of map unit has a high to extreme wind erosion risk	30-50% of map unit has a high to extreme wind erosion risk
Water erosion	<3% of the map unit has a high to extreme water erosion risk	<3% of the map unit has a high to extreme water erosion risk	3-10% of map unit has a high to extreme water erosion risk	50-70% of map unit has a high to extreme water erosion risk	30-50% of map unit has a high to extreme water erosion risk
Salinity	<3% of the map unit has a moderate to high salinity risk or is presently saline	<3% of the map unit has a moderate to high salinity risk or is presently saline	<3% of the map unit has a moderate to high salinity risk or is presently saline	<3% of the map unit has a moderate to high salinity risk or is presently saline	<3% of the map unit has a moderate to high salinity risk or is presently saline
Subsurface Acidification	3-10% of map unit has a high subsurface acidification risk or is presently acid	>70% of map unit has a high subsurface acidification risk or is presently acid	50-70% of map unit has a high to extreme subsurface acidification risk	<3% of the map unit has a high subsurface acidification risk or is presently acid	<3% of the map unit has a high subsurface acidification risk or is presently acid
Flood risk	<3% of the map unit has a moderate to high flood risk	<3% of the map unit has a moderate to high flood risk	<3% of the map unit has a moderate to high flood risk	<3% of the map unit has a moderate to high flood risk	<3% of the map unit has a moderate to high flood risk
Water logging	<3% of map unit has a moderate to very high waterlogging risk	<3% of map unit has a moderate to very high waterlogging risk	<3% of map unit has a moderate to very high waterlogging risk	<3% of map unit has a moderate to very high waterlogging risk	<3% of map unit has a moderate to very high waterlogging risk
Phosphorus export risk	3-10% of map unit has a high to extreme phosphorus export risk	3-10% of map unit has a high to extreme phosphorus export risk	10-30% of map unit has a high to extreme phosphorus export risk	50-70% of map unit has a high to extreme phosphorus export risk	30-50% of map unit has a high to extreme phosphorus export risk

Appendix B. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment: The area proposed to be cleared contains suitable habitat for regionally significant flora and fauna species and includes species that can indicate a priority ecological community (PEC).	May be at variance	Yes *Refer to Sections 3.2.1 and 3.2.2, above.*
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."* Assessment: The area proposed to be cleared contains suitable foraging, roosting, and breeding habitat for conservation significant fauna.	Not likely to be at variance	Yes *Refer to Section 3.2.2, above.*
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: The area proposed to be cleared may contain suitable habitat for flora species listed under the BC Act.	Not likely to be at variance	Yes *Refer to Section 3.2.1, above.*
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."* Assessment: The area proposed to be cleared does not contain species that can indicate a threatened ecological community (TEC) listed under the BC Act. Given the distance and separation from the nearest TEC by infrastructure, the proposed clearing is not likely to impact or be necessary for the maintenance of any state-listed TEC.	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		
Principle (e): *"Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared."* Assessment: The extent of the mapped vegetation types and native vegetation in the local area is consistent with the national objectives and targets for biodiversity conservation in Australia. The vegetation proposed to be cleared is on the border of an expansive tract of remnant vegetation within Bush Forever Site 284 and is adjacent to an existing firebreak, road reserves and residential properties, and is therefore not considered to be part of a significant ecological linkage in the local area.	Not likely to be at variance	No
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."* Assessment: Given the application area occurs within Bush Forever Site 284, the proposed clearing may have an impact on the environmental values of a conservation area.	May be at variance	Yes *Refer to Section 3.2.3, above.*

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: land and water resources		
Principle (f): *"Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."* Assessment: Given no wetlands or watercourses are recorded within one kilometre of the application area and that biological surveys identified no characteristic riparian vegetation, the proposed clearing is unlikely to impact on- or off-site hydrology and water quality or the environmental values of any riparian communities.	Not likely to be at variance	No
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: The mapped soils are highly susceptible to land degradation resulting from wind erosion and subsurface acidification. However, it is noted that the proposal includes the clearing of 0.6 hectares of degraded vegetation across a 7-kilometre long, linear footprint that aligns with an existing firebreak. Noting the location of the application area and the condition of the vegetation, the proposed clearing is not considered likely to have an appreciable impact on land degradation through wind erosion and subsurface acidification.	Not likely to be at variance	No
Principle (i): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water."* Assessment: The application area is mapped within a proclaimed groundwater area and a Priority 3 PDWSA but does not transect any mapped watercourses or wetlands. Given no groundwater will be taken under the proposal, the separation from the nearest source of surface water, the extent of clearing across a long, linear clearing footprint, and the condition of the vegetation, the proposed clearing is unlikely to impact surface or ground water quality.	Not likely to be at variance	No
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."* Assessment: The mapped soils and topographic contours in the surrounding area do not indicate that the application area is susceptible to flooding or waterlogging. Noting this, the extent of the proposed clearing across a long, linear footprint, and the condition of the vegetation, the proposed clearing is unlikely to contribute to increased incidence or intensity of flooding.	Not likely to be at variance	No

Appendix C. 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.

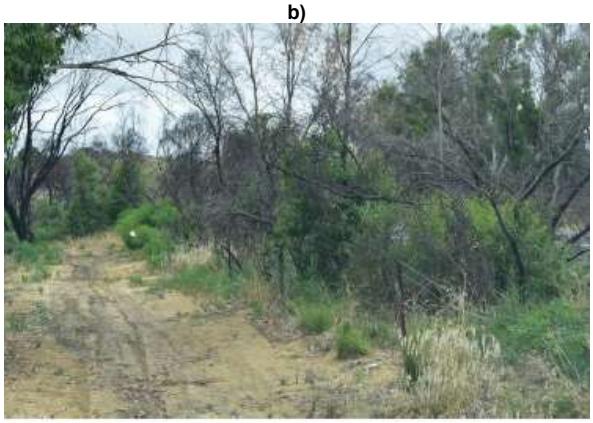
Measuring vegetation condition for the South West and Interzone Botanical Province (Keighery, 1994)

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 D. Biological survey information excerpts

a)

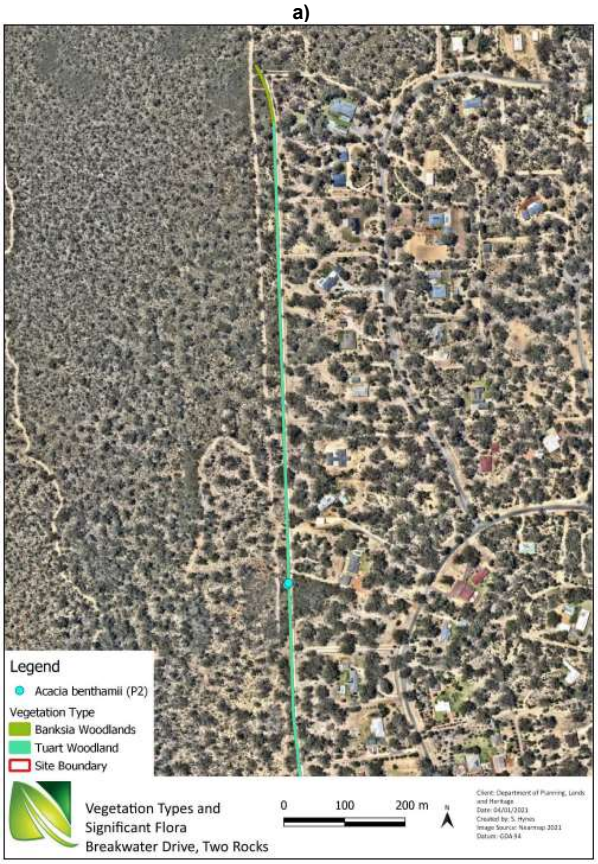
b)



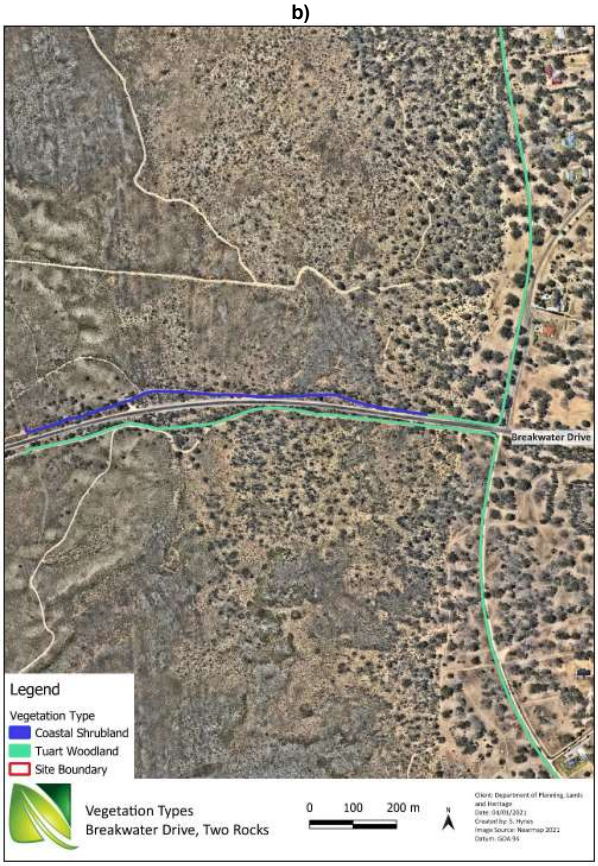
c)

Figure 4. Representative photographs of a) Tuart Woodland, b) Coastal Shrubland, and c) Banksia Woodland, vegetation types (Natural Area, 2021).

a)



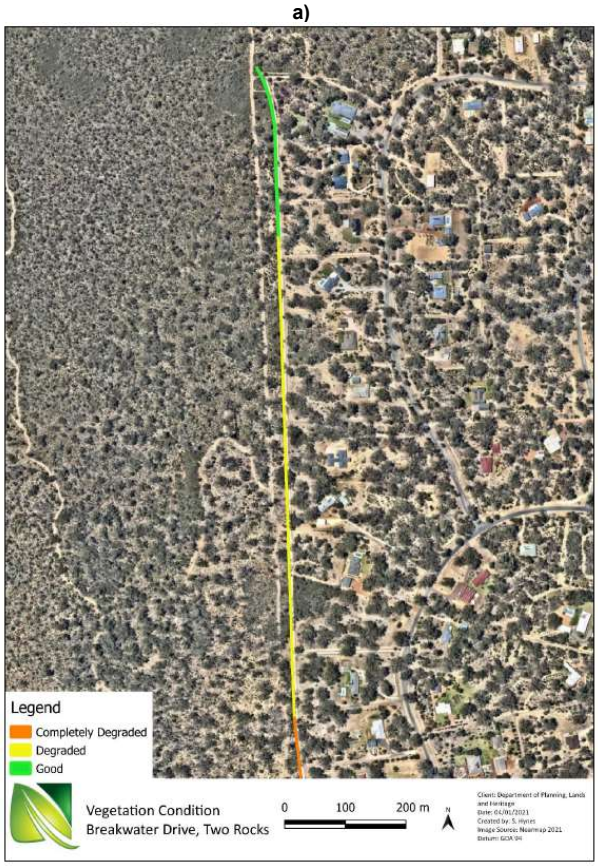
b)



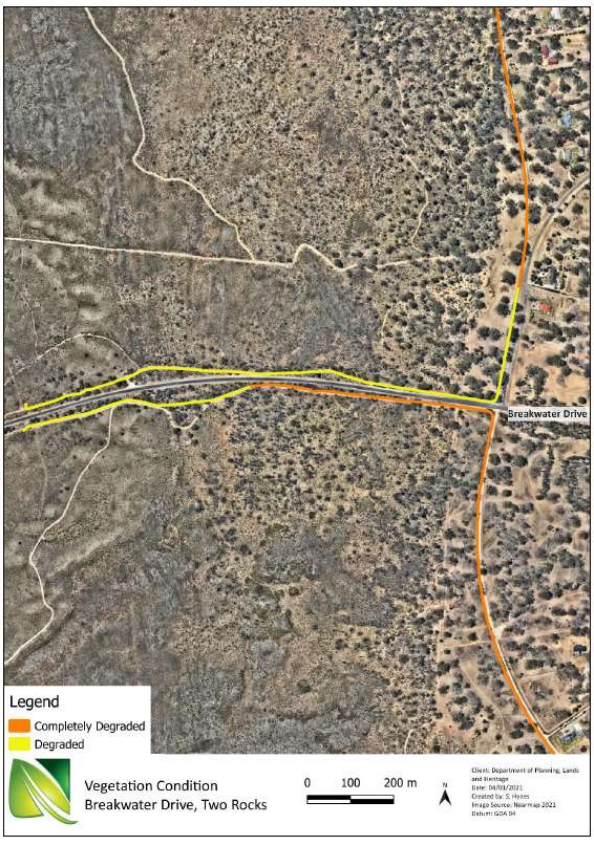
c)

Figure 5(a-c). Vegetation type mapping and locations of significant flora within the application area (Natural Area, 2021).

a)



b)



c)

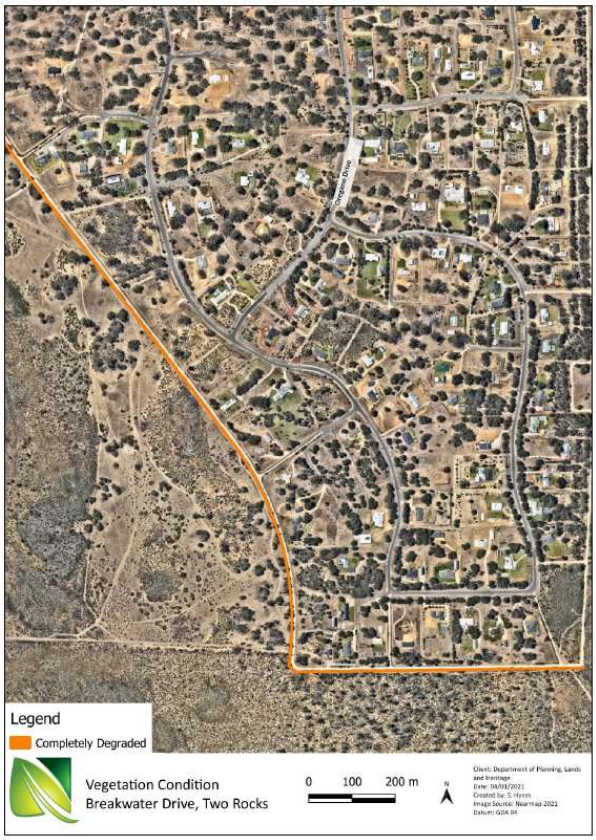


Figure 6(a-c). Vegetation condition mapping within the application area (Natural Area, 2021).

Figure 7. Location of black cockatoo habitat trees within the application area (Natural Area, 2021).

Appendix E. Sources of information

E.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)
- Bush Forever Areas 2000 (DPLH-019)
- 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
- Vegetation Complexes - Swan Coastal Plain (DBCA-046)

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)

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