



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

ADVICE NOTE

Allocation of offset site

In relation to condition 9 of this Permit, a total of 20 hectares of Lot 5 on Deposited Plan 5888, Wellesley, will be conserved in perpetuity to *offset* the impacts of clearing authorised under this Permit. The nominated areas contain 20 hectares of high-quality foraging and potential breeding habitat for *black cockatoo species* and 19.5 hectares of high-quality habitat for the western ringtail possum in addition to other environmental values.

Purpose Permit number:	CPS 8561/1
Permit Holder:	Carbone Bros. Pty Ltd
Duration of Permit:	From 7 December 2024 to 7 December 2034

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 sand extraction.

2. Land on which clearing is to be done

Lot 5 on Deposited Plan 5888, Wellesley

3. Clearing authorised

The permit holder must not clear more than 2.33 hectares of *native vegetation* within the area cross-hatched yellow in Figure 1 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 west to east to allow fauna to move into adjacent *native vegetation* ahead of the clearing activity.

7. Wind erosion management

The permit holder must commence sand extraction activities no later than two (2) months after undertaking the authorised clearing activities to reduce the potential for wind erosion.

8. Fauna management – Western ringtail possums and South-western brush-tailed phascogales

- (a) In relation to the area cross-hatched yellow in Figure 1 of Schedule 1, the permit holder must engage a *fauna specialist* to inspect that area immediately prior to, and for the duration of clearing activities, for the presence of western ringtail possum(s) (*Pseudocheirus occidentalis*) and south-western brush-tailed phascogale(s) (*Phascogale tapoatafa wambenger*).
- (b) Clearing activities must cease in any area where fauna referred to in condition 8(a) are identified until either:
 - (i) the western ringtail possum and/or south-western brush-tailed phascogale individual(s) has moved on from that area to adjoining *suitable habitat*; or
 - (ii) the western ringtail possum individual(s) has been removed by a *western ringtail possum specialist* and/or the south-western brush-tailed phascogale individual(s) has been removed by a *fauna specialist*.
- (c) Any western ringtail possum individual(s) removed in accordance with condition 8(b)(ii) must be relocated by a *western ringtail possum specialist* to adjoining *suitable habitat*.
- (d) Any south-western brush-tailed phascogale individual(s) removed in accordance with condition 8(b)(ii) must be relocated by a *fauna specialist* to adjoining *suitable habitat*.
- (e) Where fauna is identified under condition 8(a), the permit holder must within 14 calendar days provide the following records to the *CEO*:
 - (i) the number of individuals identified;
 - (ii) the date each individual was identified;

- (iii) the location where each individual was identified recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020 (GDA2020), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
- (iv) the number of individuals removed and relocated;
- (v) the relevant qualifications of the *western ringtail possum specialist* and/or *fauna specialist* undertaking removal and relocation;
- (vi) the date each individual was removed;
- (vii) the method of removal;
- (viii) the date each individual was relocated;
- (ix) the location where each individual was relocated to, recorded using a GPS unit set to GDA2020, expressing the geographical coordinates in Eastings and Northings or decimal degrees; and
- (x) details pertaining to the circumstances of any death of, or injury sustained by, an individual.

9. Offset – Conservation covenant

In respect to the areas cross-hatched red on Figure 2 of Schedule 1, the Permit Holder must within 12 months of the commencement of clearing authorised under this Permit and no later than 7 December 2026:

- (a) give a conservation covenant under section 21A of the *National Trust of Australia (WA) Act 1964* for the protection and management of vegetation in perpetuity; and
- (b) within 1 month of executing the conservation covenant, provide a copy of the executed conservation covenant to the *CEO*.

PART III - RECORD KEEPING AND REPORTING

10. 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	<ul style="list-style-type: none"> (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 GDA2020, 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; (f) actions taken to minimise the risk of the introduction and spread of <i>weeds</i> and <i>dieback</i> in accordance with condition 5;

No.	Relevant matter	Specifications
		<p>(g) actions taken to manage and mitigate impacts to western ringtail possums and south-western brush-tailed phascogales in accordance with condition 8; and</p> <p>(h) actions taken to conserve the areas cross-hatched red in Figure 2 of Schedule 1 of this permit in accordance with condition 9.</p>

11. Reporting

- (a) The permit holder must provide to the *CEO*, on or before 30 June of each calendar year, a written report containing:
- (i) the records required to be kept under condition 10; and
 - (ii) records of activities done by the permit holder under this permit between 1 January and 31 December of the preceding calendar year.
- (b) If no clearing authorised under this permit has been undertaken, a written report confirming that no clearing under this permit has been undertaken, must be provided to the *CEO* on or before 30 June of each calendar year.
- (c) The permit holder must provide to the *CEO*, no later than 90 calendar days prior to the expiry date of the permit, a written report of records required under condition 10, where these records have not already been provided under condition 11(a).

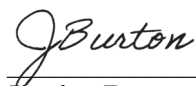
DEFINITIONS

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

Table 2: Definitions

Term	Definition
black cockatoo species	means one or more of the following species: (d) <i>Zanda latirostris</i> (Carnaby's cockatoo); (e) <i>Zanda baudinii</i> (Baudin's cockatoo); and (f) <i>Calyptorhynchus banksii naso</i> (forest red-tailed black cockatoo).
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the <i>Environmental Protection Act 1986</i> .
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.
dieback	means the effect of <i>Phytophthora</i> species on native vegetation.
department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
EP Act	<i>Environmental Protection Act 1986</i> (WA)
fauna specialist	means a person who holds a tertiary qualification specialising in environmental science or equivalent, and has a minimum of 2 years work experience in fauna identification and surveys of fauna native to the region being inspected or surveyed, or who is approved by the <i>CEO</i> as a suitable fauna specialist for the bioregion, and who holds a valid fauna licence issued under the <i>Biodiversity Conservation Act 2016</i> .

Term	Definition
fill	means material used to increase the ground level, or to fill a depression.
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.
offset	means a direct offset as described in the Government of Western Australia, <i>WA Environmental Offsets Policy, September 2011</i> .
suitable habitat (south-western brush-tailed phascogale)	means habitat known to support south-western brush-tailed phascogale (<i>Phascogale tapoatafa wambenger</i>) within the known current distribution of the species. This often includes dry sclerophyll forests and open woodlands, with hollow-bearing trees (usually eucalypts) and sparse understorey.
suitable habitat (western ringtail possum)	means habitat known to support western ringtail possums (<i>Pseudocheirus occidentalis</i>) within the known current distribution of the species, typically characterised by abundant foliage, presence of suitable nesting structures such as tree hollows, as well as high canopy cover and continuity. Known habitat includes peppermint (<i>Agonis flexuosa</i>) dominated woodlands, jarrah (<i>Eucalyptus marginata</i>) and marri (<i>Corymbia calophylla</i>) forests, riparian vegetation with a canopy of Bullich (<i>Eucalyptus megacarpa</i>) or flooded gum (<i>Eucalyptus rudis</i>), karri (<i>Eucalyptus diversicolor</i>) forests, sheoak (<i>Allocasuarina fraseriana</i>) dominated woodlands, and other stands of myrtaceous trees growing near swamps, watercourses or floodplains.
weeds	means any plant – (a) that is a declared pest under section 22 of the <i>Biosecurity and Agriculture Management Act 2007</i> ; or (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or (c) not indigenous to the area concerned.
western ringtail possum specialist	means a <i>fauna specialist</i> who holds a tertiary qualification specialising in environmental science or equivalent, has a minimum of two years of work experience in western ringtail possum (<i>Pseudocheirus occidentalis</i>) identification, surveys of western ringtail possums and capture and handling of western ringtail possums, and holds a valid fauna licence issued under the <i>Biodiversity Conservation Act 2016</i> .

END OF CONDITIONS


 Jessica Burton

MANAGER

NATIVE VEGETATION REGULATION

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

14 November 2024

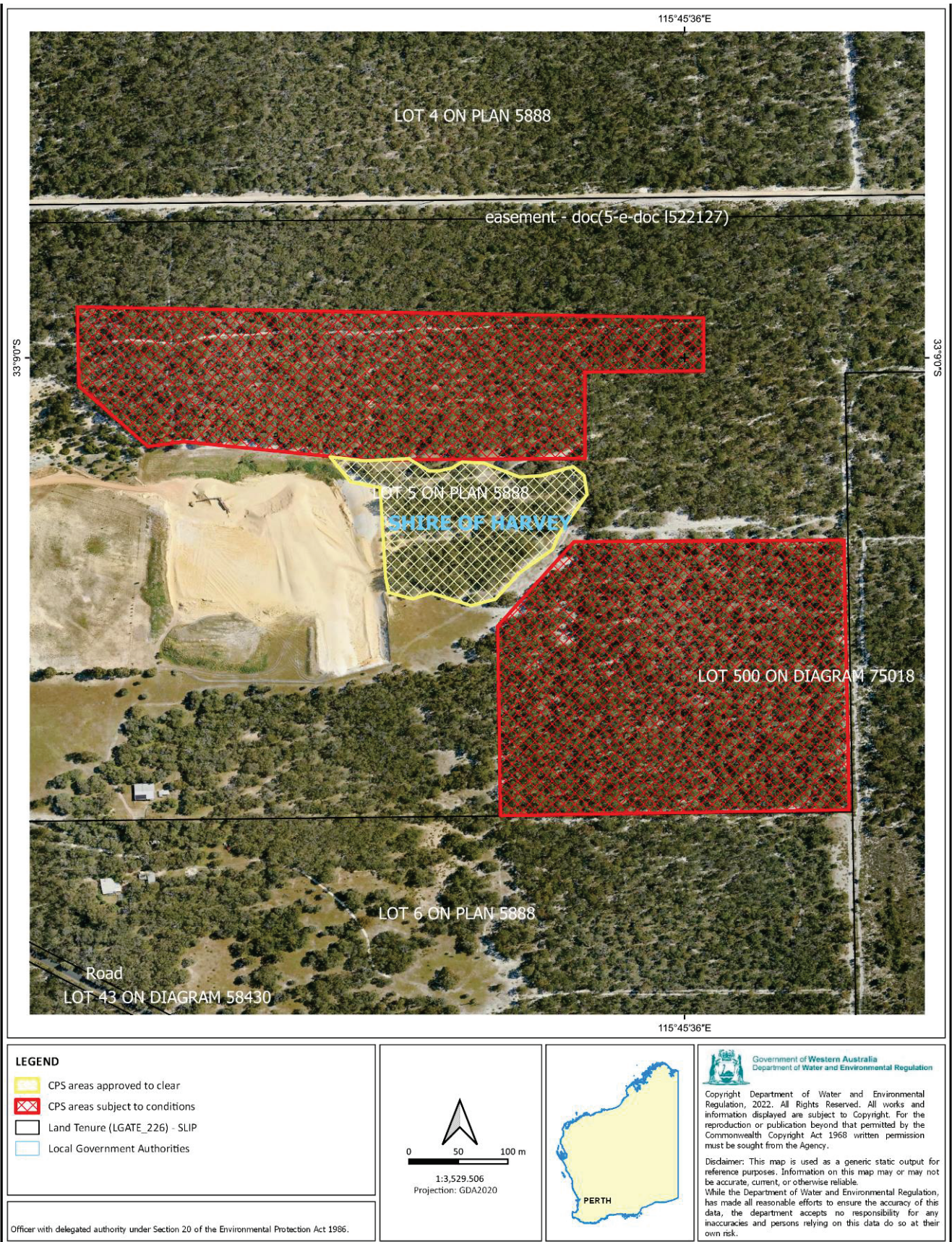
Schedule 1

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



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Figure 1: Map of the boundary of the area within which clearing may occur (area cross hatched yellow)



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Figure 2: Map of the boundary of the area within which condition 9 of this permit applies (area cross-hatched red).



Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 8561/1
Permit type:	Purpose permit
Applicant name:	Carbone Bros. Pty Ltd
Application received:	21 June 2019
Application area:	2.33 hectares of native vegetation (as revised)
Purpose of clearing:	Sand Extraction
Method of clearing:	Mechanical Clearing
Property:	Lot 5 on Deposited Plan 5888
Location (LGA area/s):	Shire of Harvey
Localities (suburb/s):	Wellesley

1.2. Description of clearing activities

The vegetation applied to be cleared is part of a single area located at Lot 5 on Deposited Plan 5888, Wellesley (see Figure 1, Section 1.3) for the purpose of sand extraction. The proposed clearing area is part of a larger corridor of remnant vegetation to the north and east on the property and is adjacent to existing cleared areas already being utilised for sand extraction to the west.

The application was revised during the assessment process and reduced from 6 hectares to 2.33 hectares of clearing to avoid several significant environmental values identified in the preliminary assessment.

1.3. Decision on application

Decision:	Granted
Decision date:	14 November 2024
Decision area:	2.33 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 B),
- relevant datasets (see Appendix G.1),
- the findings of a flora and vegetation survey (Plantecology, 2020) (see Appendix F),
- the findings of fauna surveys (Harewood, 2018 & 2022) (see Appendix F),
- the clearing principles set out in Schedule 5 of the EP Act (see Appendix C),
- relevant planning instruments and any other matters considered relevant to the assessment (see Section 3).

The assessment identified that the proposed clearing will result in:

- the loss of 2.33 hectares suitable foraging habitat for Carnaby's cockatoo, Baudin's cockatoo and forest red-tailed black cockatoo
- the loss of 2.33 hectares western ringtail possum habitat
- the loss of 2.33 hectares of native vegetation that forms part of a formal regional ecological linkage,
- the loss of 27 potential future breeding trees, 10 with small hollows and 17 with no hollows,
- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values; and
- potential land degradation in the form of wind erosion.

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 will result in the following significant residual impacts:

- the loss of 2.33 hectares of native vegetation that provides moderate foraging habitat for Carnaby's cockatoo, Baudin's cockatoo and forest red-tailed black cockatoo, and
- the loss of 2.33 hectares of native vegetation that is suitable habitat for western ringtail possums.

In accordance with the Government of Western Australia's Environmental Offsets Policy and Environmental Offsets Guidelines, the Delegated Officer determined that the conservation in perpetuity of 20 hectares of native vegetation that provides suitable foraging habitat for black cockatoos and western ringtail possum, within Lot 5 on Deposited Plan 5888, Wellesley, is required to counterbalance the above significant residual impacts.

The Delegated Officer determined that the above offset was sufficient to counterbalance the significant residual impacts associated with the proposed clearing. Further information on the suitability of the offset provided is summarised in Section 4.

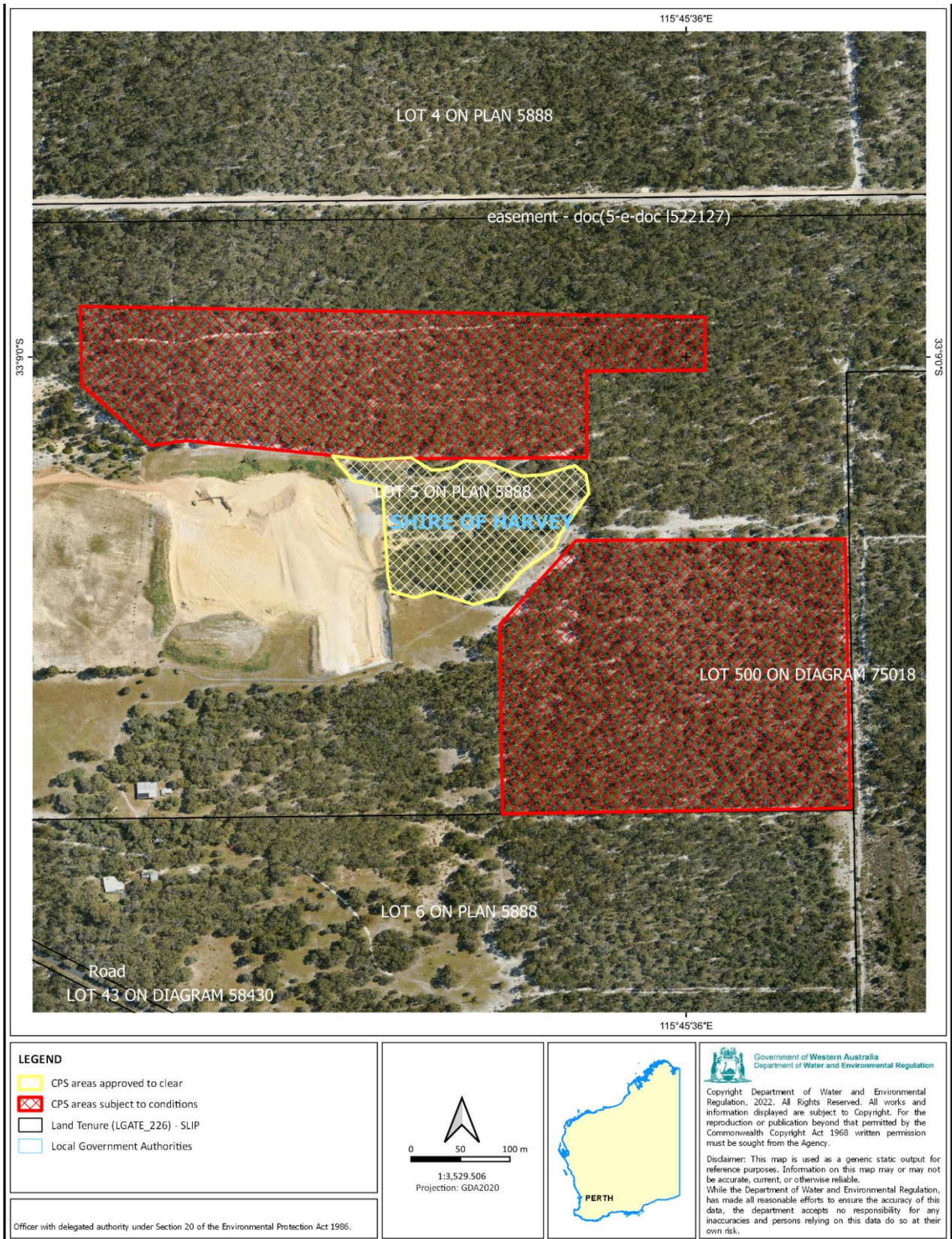
In addition to the above, the Delegated Officer also took into consideration the following:

- the proposed clearing area is located within a mapped Significant Geological Supply for sand under State Planning Policy 2.4 Planning for basic raw materials,
- the purpose of the clearing is consistent with the planning framework and has been granted a Development Approval and Extractive Industries Licence by the Shire of Harvey, and
- following the delivery of offsets, 20 hectares of native vegetation within a known black cockatoo migration corridor which is subject to significant development pressures, will be protected in perpetuity.

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

- avoid, minimise to 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,
- commence sand extraction activities within two (2) months of clearing to minimise wind erosion.
- undertake pre-clearance surveys for western ringtail possums and southwestern brush-tailed phascogales, and
- the provision of an offset through the conservation of 20 hectares of significant foraging habitat for black cockatoos and significant habitat for western ringtail possums within Lot 5 on Deposited Plan 5888, Wellesley.

1.5. Site map



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Figure 1. Map of the application area The area crosshatched yellow indicates the area authorised to be cleared under the granted clearing permit. The areas cross-hatched red indicates areas within which specific conditions apply.

2 Legislative context

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

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

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

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Planning and Development Act 2005* (WA) (P&D Act)

Relevant policies considered during the assessment include:

- *Environmental Offsets Policy* (2011)

The key guidance documents which inform this assessment are:

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

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

The original application was to clear six (6) hectares of native vegetation and no alternatives that would avoid or minimise the need for clearing were proposed (Lundstrom, 2019).

During the assessment, the applicant consulted with the department and subsequently reduced the applied clearing footprint from 6 hectares to 5.18 hectares (Figure 2) in July 2020 (Lundstrom, 2020b). This aimed to reduce the impacts to the threatened Western Ringtail Possum (*Pseudocheirus occidentalis*), black cockatoo foraging habitat, black cockatoo breeding habitat trees, and a state-listed Priority 3 Ecological Community (PEC) and commonwealth-listed Threatened Ecological Community (TEC), the '*Banksia Woodlands of the Swan Coastal Plain IBRA Bioregion*'.

The Shire of Harvey (the Shire) initially refused a Development Application for the 5.18-hectare footprint (Shire of Harvey, 2022). The applicant subsequently revised the application area further in April 2022 to 2.33 hectares (Lundstrom, 2022) (see Figure 1, Section 1.3 above and Figure 2, below) which avoids several significant environmental values including:

- all recorded black cockatoo habitat trees with suitable hollows for breeding,
- further minimises impacts to black cockatoo foraging habitat,
- avoids all vegetation that is representative of the '*Banksia woodlands of the Swan Coastal Plain*' threatened ecological community (TEC) including a 20 m buffer, and
- avoids all recorded locations of the Priority 3 flora taxa *Lasiopetalum membranaceum*.

Several additional actions to mitigate and manage potential impacts of the clearing have been proposed by the applicant including (Lundstrom, 2024):

- preparation and implementation of management plans as required under the Shire's Development Application, including:
 - Environmental management Plan
 - Fauna management plan
 - Weed and dieback management plan
 - Dust management plan
 - Water management plan
- a pre-clearing site assessment conducted by a qualified fauna specialist to determine best options for relocation and treatment of injuries if required during activities,
- a pre-clearance fauna survey to check for any fauna that may be present within the application area and relocate, if necessary,

- demarcation of areas to be cleared and ensuring that contractors are aware of the site plans and clearing limits, and
- clearing to occur between April and August to avoid the black cockatoo breeding season.

After consideration of avoidance and minimisation measures provided, it was determined that an offset to counterbalance the significant residual impacts to 2.33 hectares of Western Ringtail Possum and black cockatoo habitat was necessary. In accordance with the Government of Western Australia’s *Environmental Offsets Policy* and *Environmental Offsets Guidelines*, these significant residual impacts have been addressed through the conditioning of environmental offset requirements on the permit. The nature and suitability of the offset provided is summarised in Section 4.

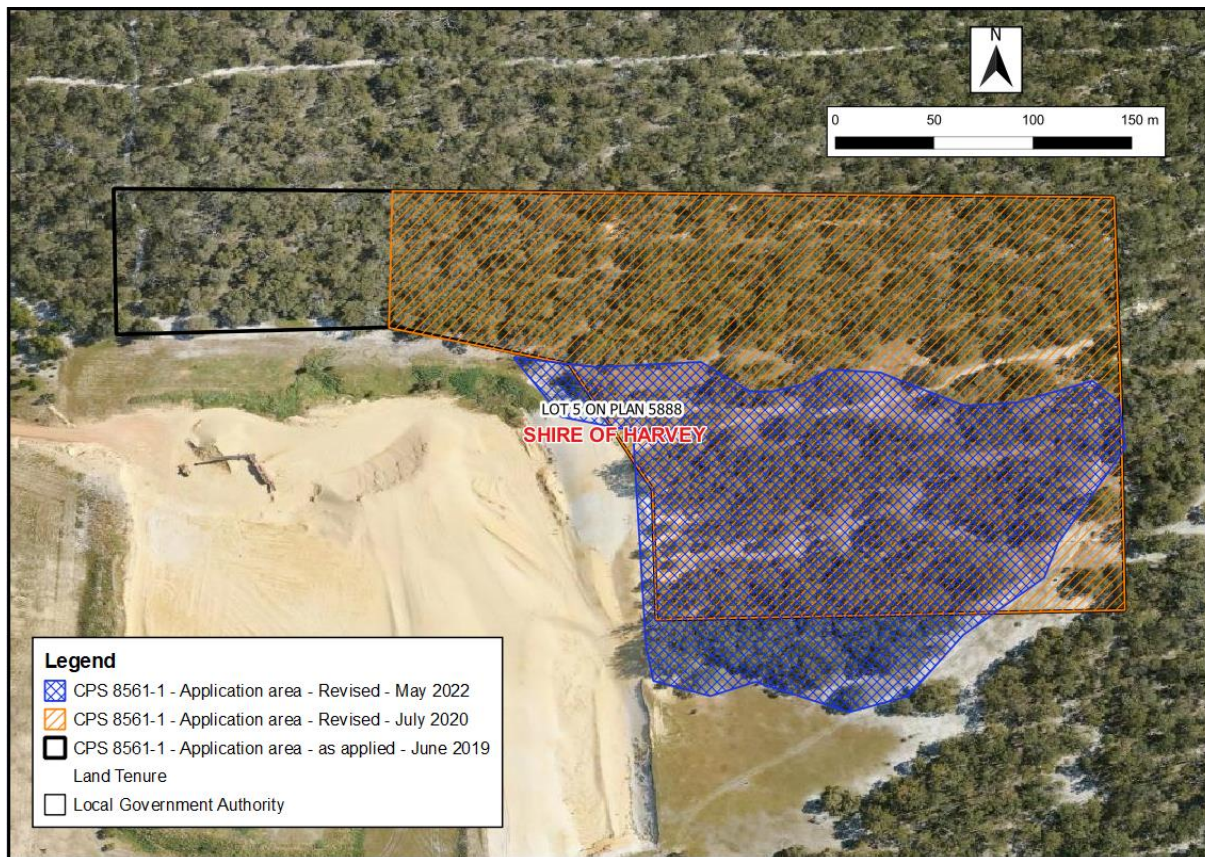


Figure 2: Revisions to the application area.

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix B) 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 C) identified that the impacts of the proposed clearing present a risk to biological values (fauna, adjacent flora and vegetation), and land and water resources. The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

3.2.1. Biological values (ecological communities and flora) - Clearing Principles (a), (c) and (d)

Assessment

The desktop assessment identified that the proposed clearing area is mapped as the “Banksia Woodlands of the Swan Coastal Plain ecological community” (Banksia Woodlands) which is listed as a Priority 3 ecological community (PEC) in Western Australia and as an Endangered threatened ecological community (TEC) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Additionally, the mapped vegetation and soil types indicate that the proposed clearing contains suitable habitat for both priority and threatened flora species.

Banksia Woodlands

The Banksia Woodlands PEC/TEC is characterised by a prominent layer of Banksia species with other trees such as eucalypts either amongst or emerging above the Banksia canopy and a rich understorey (DoEE, 2016). This

community is considered significant due to its capacity to support a diverse range of fauna and flora species (DoEE, 2016).

The flora and vegetation survey of Plantecology (2020) over a larger survey area identified two vegetation units:

- *Eucalyptus marginata*–*Banksia attenuata* woodland: Open Woodland of *Eucalyptus marginata* and *Banksia attenuata* with *Agonis flexuosa* over *Banksia grandis* and a shrubland of *Xanthorrhoea gracilis* and *Hibbertia hypericoides* over a herbland of *Dasypogon bromeliifolius*, *Anarthria prolifera* and *Desmocladius fasciculatus* on grey sands, and
- *Agonis flexuosa* woodland: Woodland of *Agonis flexuosa* with *Eucalyptus marginata* over open shrubland of *Xanthorrhoea gracilis*, *Macrozamia riedlei* and *Hibbertia hypericoides* over a herbland of *Dasypogon bromeliifolius* in grey sands.

As part of the survey (Plantecology, 2020) a Floristic Community Type analysis (FCT) was conducted that indicated that the *E. marginata* – *B. attenuata* woodland is representative of FCT 21a 'Central *Banksia attenuata*–*Eucalyptus marginata* woodlands', which is part of the Banksia Woodlands PEC/TEC.

Based on the final revised application area (See Figure 2), the proposed clearing will not result in the direct loss of the Banksia Woodlands PEC/TEC, however, may result in the introduction and spread of weeds and dieback into the community.

***Lasiopetalum membranaceum* (P3)**

The flora and vegetation survey identified seven individuals of *Lasiopetalum membranaceum* across the broader survey area, none of which occur within the proposed clearing area, however, do occur near the application (approximately 0.21 km) (Plantecology, 2020). According to available databases, this species has previously been identified within the property and in the local area five times, with the nearest record being 0.21 km from the proposed clearing.

L. membranaceum is a low multi-stemmed shrub with pink-blue-purple flowers, growing up to one metre in height found in sand over limestone and has been recorded between Busselton and Yanchep. According to the flora and vegetation survey, this species was only recorded within the *E. marginata*–*B. attenuata* woodland (see Appendix F) (Plantecology, 2020), which has been avoided, and therefore the proposed clearing is not likely to impact on individuals of *L. membranaceum*.

According to the Western Australian Herbarium records (Florabase, 1998-), *L. membranaceum* is primarily found in Tuart (*Eucalyptus gomphocephala*) and Jarrah (*Eucalyptus marginata*) woodland with peppermint (*Agonis flexuosa*), meaning that the proposed clearing area contains suitable habitat for the species. Given the degraded (Keighery, 1994) condition of the vegetation and that no individuals were recorded within the application area, the proposed clearing is not likely to comprise significant habitat for *L. membranaceum*. However, may introduce and spread weeds and dieback into the adjacent vegetation and may impact the species indirectly.

Threatened flora

The proposed clearing was identified to contain suitable habitat for two threatened flora species, *Drakaea elastica* (glossy-leaved hammer orchid) and *Drakaea micrantha* (dwarf hammer orchid). Both species have previously been recorded near the application and have been recorded several times in the local area.

D. elastica grows within bare patches of sand within otherwise dense vegetation alongside winter-wet swamps composed of banksia woodlands or spearwood thicket vegetation (DEC, 2009). It is likely that the orchid requires shady canopy for survival (DEC, 2009). The recovery plan for this species characterises critical habitat for the species as their existing areas of occupancy and similar habitat surrounding existing populations (DEC, 2009). Based on the habitat preferences of this species, the proposed clearing area is not likely to contain suitable habitat for *D. elastica*, since there are no watercourses or swamps within the application.

D. micrantha is found in bare sandy areas, however, this species is identified as preferring disturbed areas where competition from plants has been removed (DEWHA, 2008). The dwarf hammer orchid is usually found in grey infertile sands within banksia, jarrah and sheoak woodland or forest, often under thickets of spearwood (DEWHA, 2008). While the proposed clearing area has been subject to disturbance, the vegetation is not composed of species preferred by *D. micrantha* and therefore is not likely to be suitable habitat for the species.

A targeted search during the flora and vegetation survey did not identify any individuals of threatened flora within the proposed clearing area (Plantecology, 2020). Targeted searches for threatened orchids within the proposed clearing area occurred as part of the applicant's referral under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) which also did not identify any individuals and concluded that the application area did not contain suitable habitat for threatened orchids (Lundstrom, 2024). Therefore, it is considered that the proposed clearing is not likely to result in the loss of individuals of or critical habitat for threatened flora.

Conclusion

Based on the above assessment, the proposed clearing is not likely to have a significant impact to ecological communities, threatened or priority flora. The proposed clearing may facilitate the introduction and spread of weed species and or dieback disease that may compromise the condition of adjacent native that is representative of the Banksia woodlands PEC/TEC and contains individuals of Priority flora species *L. membranaceum*.

Conditions

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

- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback into adjacent native vegetation.

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

Assessment

The preliminary assessment identified 549 records across 37 species of conservation significant fauna in the local area composed of 22 birds, one fish, one invertebrate, ten mammals and three reptiles.

A fauna survey (Harewood, 2018 & 2022) identified one habitat type within the proposed clearing area composed of Open woodland of *Eucalyptus marginata* with very occasional *Corymbia calophylla* over a low woodland dominated by *Agonis flexuosa* with very occasional *Banksia attenuata* and *B. grandis* over a low open shrubland or very open grassland of introduced species or bare sand on dune crest with grey to light grey/white sands (grading to yellow at depth).

The fauna survey found no evidence of threatened or priority fauna within the application area, however, determined that the proposed clearing contains suitable habitat for several fauna species (Harewood, 2018 & 2022). Based on a likelihood of occurrence assessment and the results of the fauna survey, the following species may have suitable habitat within the proposed clearing area:

- Baudin's cockatoo (*Zanda baudinii*) (EN)
- Carnaby's cockatoo (*Zanda latirostris*) (EN)
- Forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*) (VU)
- South-western brush-tailed phascogale (*Phascogale tapoatafa wambenger*) (CD)
- Western ringtail possum (*Pseudocheirus occidentalis*) (CR)
- Western brush wallaby (*Macropus irma*) (P4)
- Western false pipistrelle (*Falsistrellus mackenziei*) (P4)

Black cockatoos

According to available mapping, the application area is located within the known breeding distribution for Carnaby's cockatoo, within the core distribution for the forest red-tailed black cockatoo and within the known distribution for Baudin's cockatoo. While habitat requirements for the three species of black cockatoos differ, the requirements in general can be categorised as breeding habitat, foraging habitat and night roosting habitat. In the context of the application area, all three species have been recorded within one kilometre of the proposed clearing, the nearest being the Carnaby's cockatoo approximately 0.47 km away.

Breeding habitat

Suitable breeding habitat for black cockatoos includes trees which either have a suitable nest hollow or are of a suitable diameter at breast height (DBH) to develop a nest hollow (DAWE, 2022). All three species prefer to breed in woodland or forest but have been known to breed in partially cleared areas including isolated trees (DAWE, 2022). According to available databases there are no recorded breeding sites in the local area.

Habitat trees considered potentially suitable for Black Cockatoo breeding generally have a DBH greater than 500 millimetres. The proposed clearing includes the removal of 26 trees (21 jarrah, four marri, one tuart) that have a suitable DBH (Harewood, 2018 & 2022), 17 of which do not currently have hollows and nine which have hollows not suitable for use by black cockatoos. As no suitable breeding hollows have been identified within the application area, significant impacts to breeding habitat for black cockatoos is not expected to occur.

Foraging habitat

Black cockatoo species are noted to forage on a range of plant species, with the primary foraging resources varying between species (DAWE, 2022). Food resources within the range of roosting and breeding sites are important to sustain populations of black cockatoos, and foraging resources should therefore be viewed in the context of the proximity to the known night roosting and breeding sites to the application area. Black cockatoos will generally forage up to 12 km from an active breeding site. Following breeding, they will flock in search of food, usually within six kilometres of a night roost (DAWE, 2022).

Available databases note that there are five recorded roosts within the local area but no recorded breeding sites, however, the fauna survey and offset proposal note that there are several trees with suitable black cockatoo hollows

(no evidence of use) within the property (Harewood, 2018 & Lundstrom, 2024). Therefore, the vegetation within the application area may support foraging by both roosting and breeding populations. The fauna survey did not identify any evidence of foraging within the proposed clearing area and noted that it was difficult to quantify the extent of foraging habitat since the density of foraging species was so low (Harewood, 2018).

A key focus for the Swan Coastal Plain is the ongoing viability of foraging resources for black cockatoos, particularly Carnaby's cockatoo (DAWE, 2022). While there is no evidence of foraging within the site currently, this does not mean the trees will not be utilised in the future and given that the foraging habitat is within the range of known roosting locations and potential breeding locations, the application contains foraging habitat which may be utilised by local black cockatoo populations.

Roosting habitat

Black cockatoo night roosts are usually located in the tallest trees of an area, and near both a food supply and surface water (DAWE, 2022). Available databases note that there are five recorded roosts within the local area, the nearest being 1.94 km from the proposed clearing area.

Black cockatoos rely upon the availability of night roosting habitat in proximity to foraging resources and rely on access to watering points in selecting night roost sites, with roost sites usually within two kilometres of a watering point. The fauna survey did not identify any evidence of roosting within the proposed clearing area (Harewood, 2018) and given the limited availability of roosting species within the application area, the proposed clearing is not likely to support significant roosting habitat for black cockatoos.

Western ringtail possum

Based on available datasets there are 169 records of the western ringtail possum (WRP) (*Pseudocheirus occidentalis*) in the local area, the nearest being 2.79 km from the proposed clearing.

Habitat critical for the WRP is generally long unburnt vegetation with high canopy connectivity and habitat connecting patches of remnants (DPAW, 2017). According to the 'Western ringtail possum recovery plan', the proposed clearing is located within the Swan Coastal Plain management zone (DPaW, 2017) which characterises vegetation communities critical to the species as long unburnt mature remnants of *Agonis flexuosa* (peppermint) woodlands with high canopy continuity and high foliage nutrients; *Eucalyptus marginata* (jarrah)/ *Corymbia calophylla* (marri) forests and woodlands with limited anthropogenic disturbance (unlogged or lightly logged, and a low intensity and low frequency fire history), that are intensively fox-baited and have low indices of fragmentation. Any habitat where WRPs occur naturally are considered critical and worthy of protection (DPaW, 2017).

The fauna survey notes that the proposed clearing area contains suitable habitat for western ringtail possums due to the dominance of peppermint, however, no evidence of the species was recorded and concluded that the species would either not be present, or only be present in low densities (Harewood, 2018). A survey of other vegetation on the property (Lundstrom, 2024) identified numerous possum scats on the property, with some being attributable to western ringtail possums.

Although WRP presence was not recorded, the report determined that all vegetation within the clearing area likely comprises habitat suitable for the WRP (Harewood 2018). Based on the identified habitat and number of records in the local area, the proposed clearing is likely to impact on significant habitat for the WRP.

Other fauna

The south-western brush-tailed phascogale (*Phascogale tapoatafa wambenger*) occurs in dry sclerophyll forests and open woodlands that contain hollow-bearing trees (DEC, 2012a). According to available databases there are 33 records of the south-western brush-tailed phascogale in the local area, the nearest being 0.56 km from the proposed clearing.

Optimum habitat for the western brush wallaby (*Notamacropus irma*) is open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets (DEC, 2012b). According to available databases there are three records in the local area, the nearest being 0.80 km from the proposed clearing.

The western false pipistrelle (*Falsistrellus mackenziei*) is found in wet sclerophyll forest dominated by karri and in high rainfall zones of the jarrah and marri forest (Woinarski et al., 2014). It prefers tall mature forest but has also been recorded from Banksia woodland on the Swan Coastal Plain (Armstrong et al. 2017). According to available databases, there are three records of the western false pipistrelle in the local area, the nearest being 2.46 km from the proposed clearing.

The fauna survey did not identify any individuals of the abovementioned species within the proposed clearing area, however, noted that they all may have suitable habitat and could occur (Harewood, 2018). Given the condition of the vegetation within the proposed clearing, in addition to the history of disturbance, the proposed clearing is not likely to impact on critical habitat for the south-western brush-tailed phascogale, western brush wallaby and western false pipistrelle. The proximity to better quality and large remnants of native vegetation may mean the site is used to support dispersal throughout the landscape and the proposed clearing may result in injury or mortality of individuals

that may be moving through the area at the time. Small hollows identified in the fauna survey (Harewood, 2018 & 2022) may be utilised by the south-western brush-tailed phascogale from time to time.

Ecological linkage

The vegetation in the application area is mapped within 300 metres of a regionally significant ecological linkage. This linkage is identified under two datasets, the *McLarty/Kemerton/TwinRivers/Preston River/Gwindinup Ecological Linkage* (ID 47) in the Greater Bunbury Region Scheme and South West Regional Ecological Linkages dataset (EPA, 2003 & Molloy et. al, 2009).

Aerial imagery indicates the vegetation applied to clear is part of a strip of remnant vegetation running parallel to the coastline, extending from Kooljerrenup Nature Reserve to the north to the Leschenault and Australind Townsite to the south (approximately 50 kilometres). This broader ecological linkage includes vegetation from the Myalup State Forest, Yalgorup National Park, Crampton Nature Reserve and Kooljerrenup Nature Reserve.

The proposed clearing is not likely to significantly impact on the function of the ecological linkage given that there is still an expansive tract of native vegetation surrounding the application, however, may introduce and spread weeds and dieback into the adjacent vegetation that may impact on the quality of said vegetation. Furthermore, given the location of the application, the vegetation, while in degraded (Keighery, 1994) condition, may still facilitate the movement of fauna through the landscape and the proposed clearing may result in the injury or death of fauna.

Conclusion

Based on the above assessment the proposed clearing will result in the loss of significant habitat for the Western Ringtail Possum and moderate foraging habitat for Threatened black cockatoo species. The proposed clearing may facilitate the introduction or spread of weed species and/or dieback disease that may compromise the condition of adjacent fauna habitat and ecological linkage values.

Conditions

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

- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback into adjacent habitat;
- slow directional clearing to allow fauna to move into adjacent vegetation ahead of the clearing activity will minimise impact to individuals;
- inspection of the application area by a fauna specialist immediately prior to and during clearing activities for the presence of Western Ringtail Possums and south-western brush-tailed phascogales with any individuals relocated to a suitable habitat; and
- the provision of an offset to counterbalance the significant residual impacts to 2.33 hectares of *Agonis flexuosa* woodland in Degraded condition that provides habitat for the Western Ringtail Possum and moderate-quality foraging habitat for threatened black cockatoo species

3.2.3. Land and water resources (land degradation) - Clearing Principle (g)

Assessment

The soil within the application area is mapped as being highly susceptible to land degradation from wind erosion. The proposed clearing may cause land degradation if soils are left exposed for extended periods post-clearing. It is also noted that the landowner intends to sue the site for grazing pasture following extraction.

Noting that sand extraction is already occurring on the property, the vegetation within the application area is in degraded (Keighery, 1994) condition and that the landowner intends to use the site for grazing pasture following extraction, the proposed clearing is not likely to cause an appreciable or long-term risk to land degradation from wind erosion.

Conclusion

For the reasons set out above, it is considered that the impacts of the proposed clearing on wind erosion can be managed by minimising the time land is left bare between clearing and post-clearing activities.

Conditions

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

- commence sand extraction activities no later than two (2) months after undertaking the authorised clearing activities to reduce the potential for wind erosion.

3.3. Relevant planning instruments and other matters

The applicant has advised that the purpose of the clearing is to allow sand extraction of a sand resource which is in very high demand and is essential for a number of site significant projects including the Bunbury Outer Ring Road.

The applicant intends to extract sand from the proposed extension to the existing extraction area on the property (Stage 10) over a period of 5 years. The proposed new extraction area will be rehabilitated with pasture grasses at the completion of extraction and returned to the landowner for grazing stock. An Offset Management Plan (OMP) has been prepared to demonstrate the actions and responsibilities of both the applicant and landowner at Lot 5 Wellesley Road to effectively preserve the habitat values and maintain the offset areas within the property.

Shire of Harvey

Other relevant authorisations required for the proposed land use include a development approval under the *Planning and Development Act 2005* and an Extractive Industry Licence issued by the Shire of Harvey.

An associated development application based on the original 5.18 hectares was refused by the Shire of Harvey (Shire of Harvey, 2022a). The reason for the refusal was that the proposal was contrary to provisions of Clause 67(2) of the *Planning and Development (Local Planning Schemes) Regulations 2015*, in part due to the impacts to Banksia Woodlands of the Swan Coastal Plain TEC, black cockatoo habitat and Western Ringtail Possum Habitat (Shire of Harvey, 2022a).

In response, and in consultation with the Shire, the applicant reduced the application further in April 2022 to an area of 2.33 hectares, avoiding all recorded black cockatoo breeding habitat trees with suitable hollows, minimising impacts to black cockatoo foraging habitat, avoiding a commonwealth listed TEC, and avoiding all recorded locations of a Priority 3 flora taxa.

A Development Approval (DA) for the proposed land use was issued by the Shire of Harvey on 5 July 2022 based on the reduced clearing footprint (Shire of Harvey, 2022b) and was subsequently amended on 4 December 2023 to extend the duration of the DA as the applicant has not yet achieved all the conditions required to issue an Extractive Industries Licence (EIL) (Shire of Harvey, 2024a).

An EIL was granted by the Shire of Harvey on 31 October 2024, which is valid for five years, expiring on 31 October 2029 (Shire of Harvey, 2024b).

State Planning Policy 2.4

The revised application area is mapped within a Significant Geological Supplies (SGS) area under State Planning Policy 2.4 Planning for basic raw materials. SGSs are Basic Raw Material areas identified by the Department of Energy, Mines, Industry, Regulation and Safety (DEMIRS) as having State significance due to the size of the resource, relative scarcity, demand and/or location near growth areas and transport routes.

EPBC Act Referral

A proposal based upon the revised 5.18-hectare application area of CPS 8561/1 was referred by the applicant to the Department of Agriculture, Water and the Environment (DAWE) (now the Department of Climate Change, Energy, the Environment and Water) with an invitation for public comments on 5th October 2021 (EPBC Ref: 2021/9034).

The DAWE deemed the proposal to be a Controlled Action on 4 November 2021. That is, an action that will have or likely have a significant impact on one or more protected matters and therefore requires assessment and approval under the EPBC Act.

On 25 August 2022 the DAWE accepted an amendment to the disturbance footprint from 5.18 hectares of native vegetation to 3.4 hectares within which 2.6 hectares of native vegetation is proposed to be cleared, based upon the revised 2.33-hectare application area of CPS 8561/1. An EPBC Act determination is yet to be made.

Aboriginal Heritage

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

4 Suitability of offsets

As per the Western Australian *Environmental Offsets Policy* (EPA, 2011), environmental offsets are used as a tool to address environmental impacts that remain after on-site avoidance and mitigation measures have been undertaken. Environmental offsets will not be considered in the absence of proposed strategies to avoid and mitigate environmental impacts.

As discussed under section 3.1, the applicant has reduced the applied clearing footprint from six (6) hectares to 2.33 hectares and avoided significant environmental factors. The revised area:

- excludes areas of Banksia Woodland TEC, with a buffer area of approximately 20 metres incorporated,
- excludes all trees with suitable hollows for black cockatoo breeding opportunities,
- excludes the Priority 3 flora species *Lasiopetalum membranaceum*,
- consists entirely of Peppermint (*Agonis flexuosa*) Woodland, and
- consists entirely of vegetation in a degraded (Keighery, 1994) condition.

Areas of vegetation in Good to Very Good condition that provide quality Western Ringtail Possum habitat and hollows with the potential to provide black cockatoo breeding opportunities occur immediately to the north of the revised area (Figures 5 & 6).

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

- 2.33 hectares suitable moderate quality foraging habitat for Carnaby's, Baudin's black cockatoo and forest red-tailed black cockatoo, and
- 2.33 hectares western ringtail possum habitat. – no evidence of use was found but may use application area sparingly - evidence of use in surrounding adjacent vegetation.

In determining the appropriateness of an offset, the Delegated Officer took into consideration the applicant's implementation of the mitigation hierarchy and the public benefit of the proposed clearing (see Section 3.1). The Delegated Officer noted that the proposed sand extraction is mapped as a significant geological supply for basic raw materials under State Planning Policy 2.4 and that the resource will be used to facilitate a number of developments in the South West region. In considering these matters, the Delegated Officer determined that it was appropriate to grant the clearing permit in relation to the significant residual impacts, on the basis that a suitable environmental offset was implemented to counterbalance the impacts.

The applicant has proposed an environmental offset consisting of placing remnant native vegetation within Lot 5 on Deposited Plan 5888 under a Conservation Covenant, securing a conservation status in perpetuity (Figure 3). The Applicant has advised that the landowner is supportive of placing a covenant over the existing vegetation and does not support revegetation following extraction due to scepticism at the level of success that can be achieved restoring bushland on the site given the presence of sandy soils and large distance between the surface and groundwater level, in addition to also being able to use the area as grazing pasture following extraction (Lundstrom, 2023).

The applicant conducted a survey of 28 hectares of native vegetation within Lot 5 to determine the environmental values of potential offset areas (Lundstrom, 2020c). The entire 28 hectare area assessed consisted of *Eucalyptus marginata*–*Banksia attenuata* woodland with mature *Banksia attenuata* typically co-dominant with *Eucalyptus marginata*, making the vegetation representative of the Banksia Woodlands PEC/TEC. However, variations were noted in relation to the percentage of *Agonis flexuosa* present as part of the overstory and/or midstory mix (Figure 4). Vegetation condition was assessed as Good or better (Figure 4) and the entire area was considered high quality foraging habitat for black cockatoo species, due to the presence of *Eucalyptus marginata*, *Banksia attenuata* and *Banksia grandis*. No dieback (*Phytophthora* sp.) affected areas were recorded.

Based on the varying abundance of peppermint trees, a total of 19.5 hectares of suitable habitat for Western Ringtail Possums was identified between three areas (Figure 4) with both common brushtail possum (*Trichosurus vulpecula*) and potential western ringtail possum scats recorded (Figure 6). A total of 82 habitat trees with a variety of hollow sizes were recorded in the field survey which have the potential to be utilised by Western Ringtail Possums for refuge sites including 53 with large hollows greater than 10 centimetres potentially suitable for breeding purposes by black cockatoo species (Figure 6).

A restrictive conservation covenant of approximately 13.6 hectares currently exists in the north west portion of Lot 5 (Figure 3). The covenant has been placed on the property by the landholder under Section 21A of the *National Trust of Australia (WA) Act 1964*. Placement of an additional conservation covenant on the property over the proposed offset site (Figure 3) has been agreed to by the landowner (Lundstrom, 2021).

Based on the results of the offset survey (Lundstrom, 2020c), the applicant has proposed a 20 hectare offset that incorporates (Lundstrom 2024):

- a mid-story of *Agonis flexuosa* with an overstory of eucalypts providing high quality habitat with a continuous canopy for the Western Ringtail Possum (Figure 5),
- native vegetation in Good to Excellent condition (Keighery, 1994) (Figure 4) composed of vegetation representative of the Banksia Woodlands PEC/TEC,
- 53 trees with hollows suitable for breeding by black cockatoos, 15 trees with small hollows and 17 trees with no hollows (figure 6),

- high quality foraging habitat for black cockatoos composed of Jarrah-Banksia woodland in good to excellent (Keighery, 1994) condition, and
- records of the Priority 3 flora species *Lasiopetalum membranaceum* (figure 6).

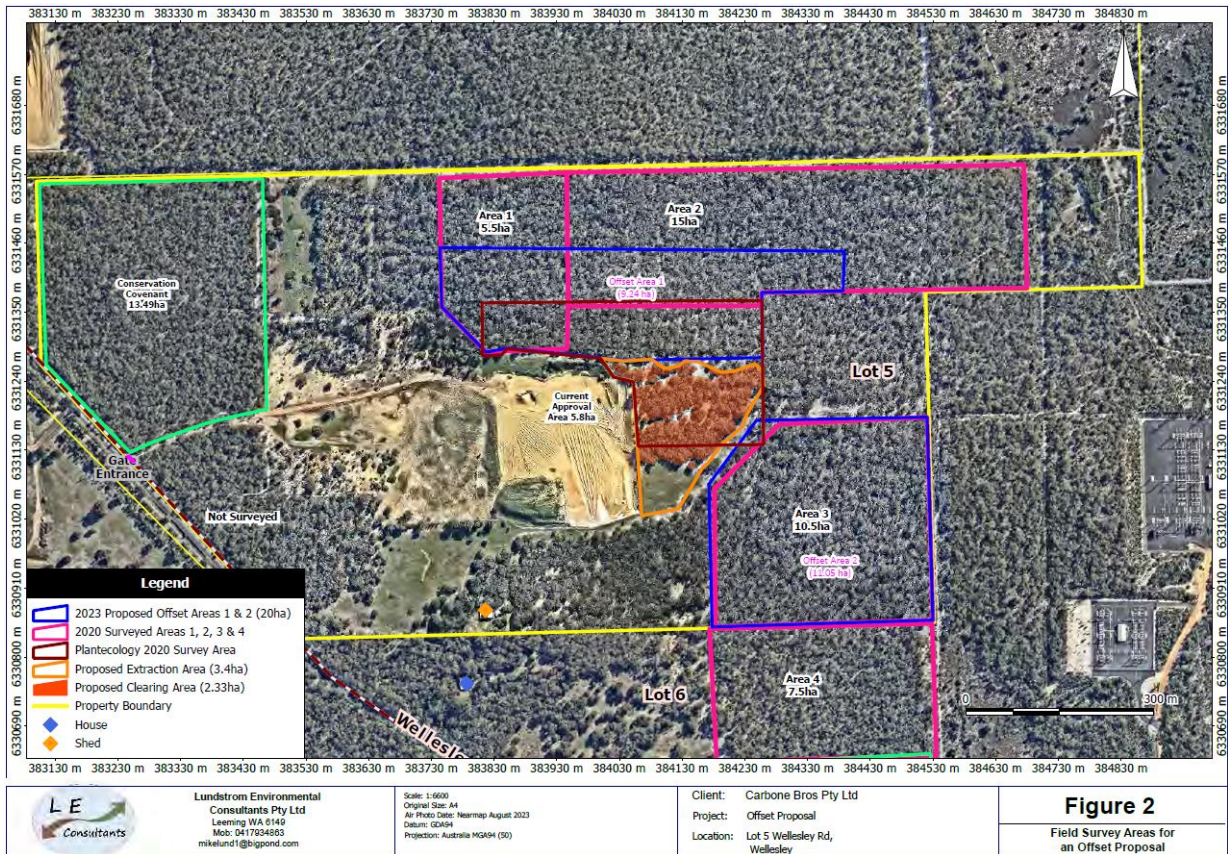


Figure 3. Locations of the proposed offsets (Lundstrom, 2020c).

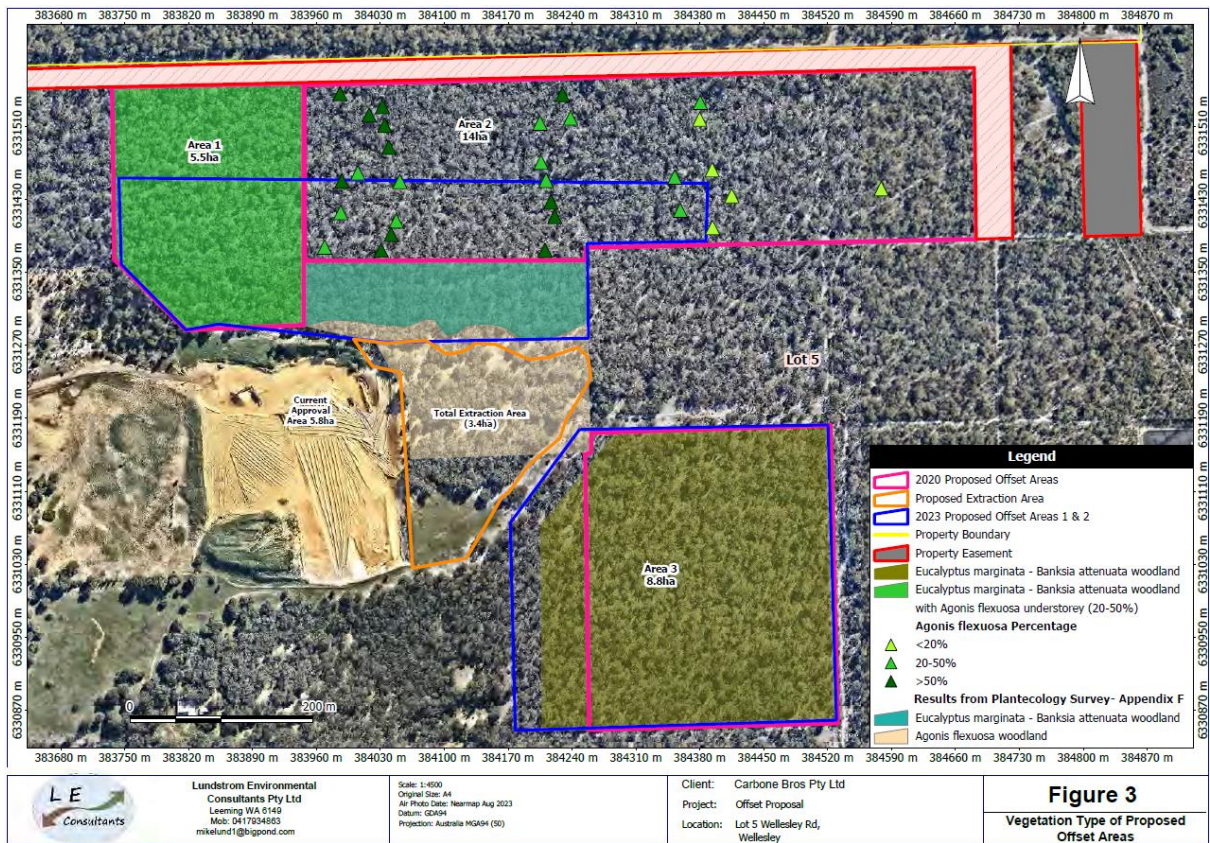


Figure 4. Vegetation types within the proposed offset areas (Lundstrom, 2020c).

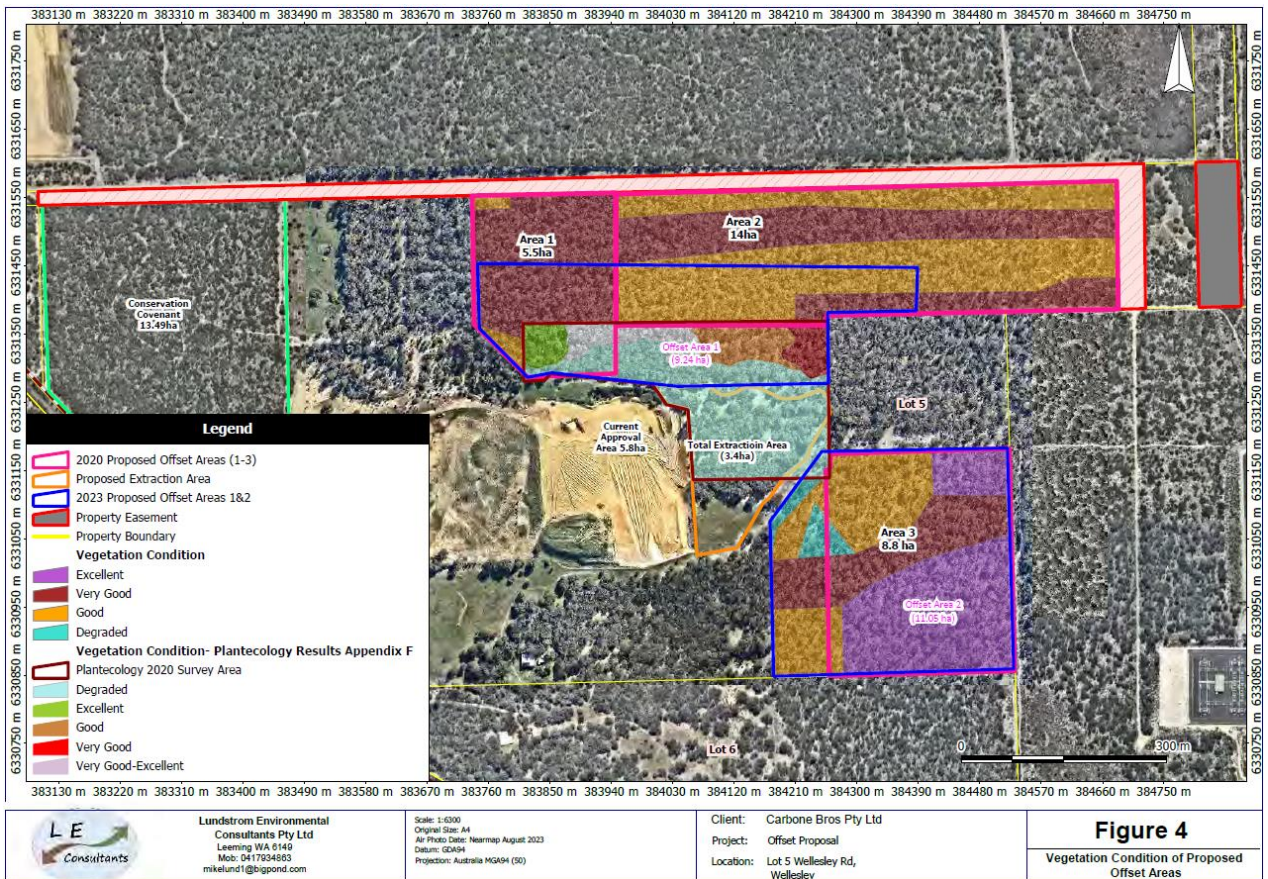


Figure 5. Vegetation quality within the proposed offset areas (Lundstrom, 2020c).

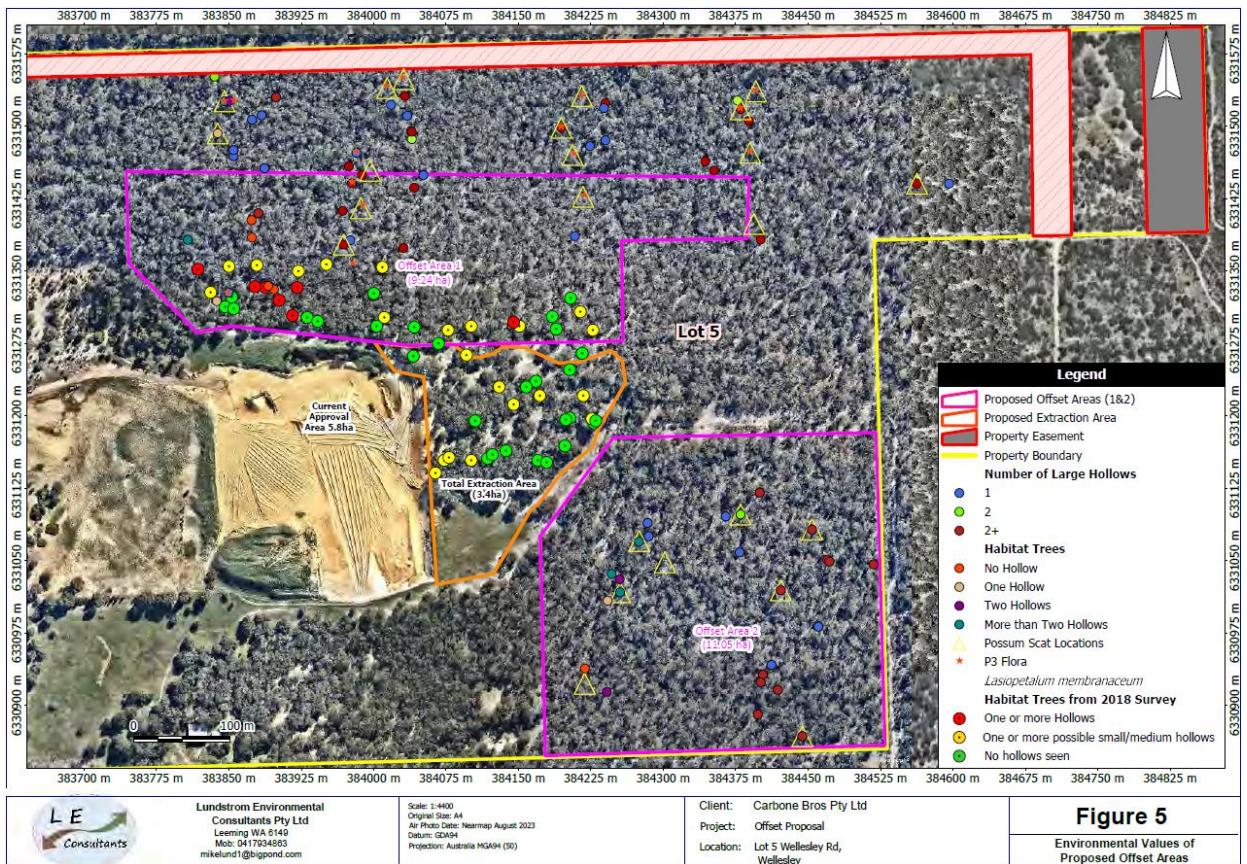


Figure 6. Environmental values identified within the proposed offset areas (Lundstrom, 2020c).

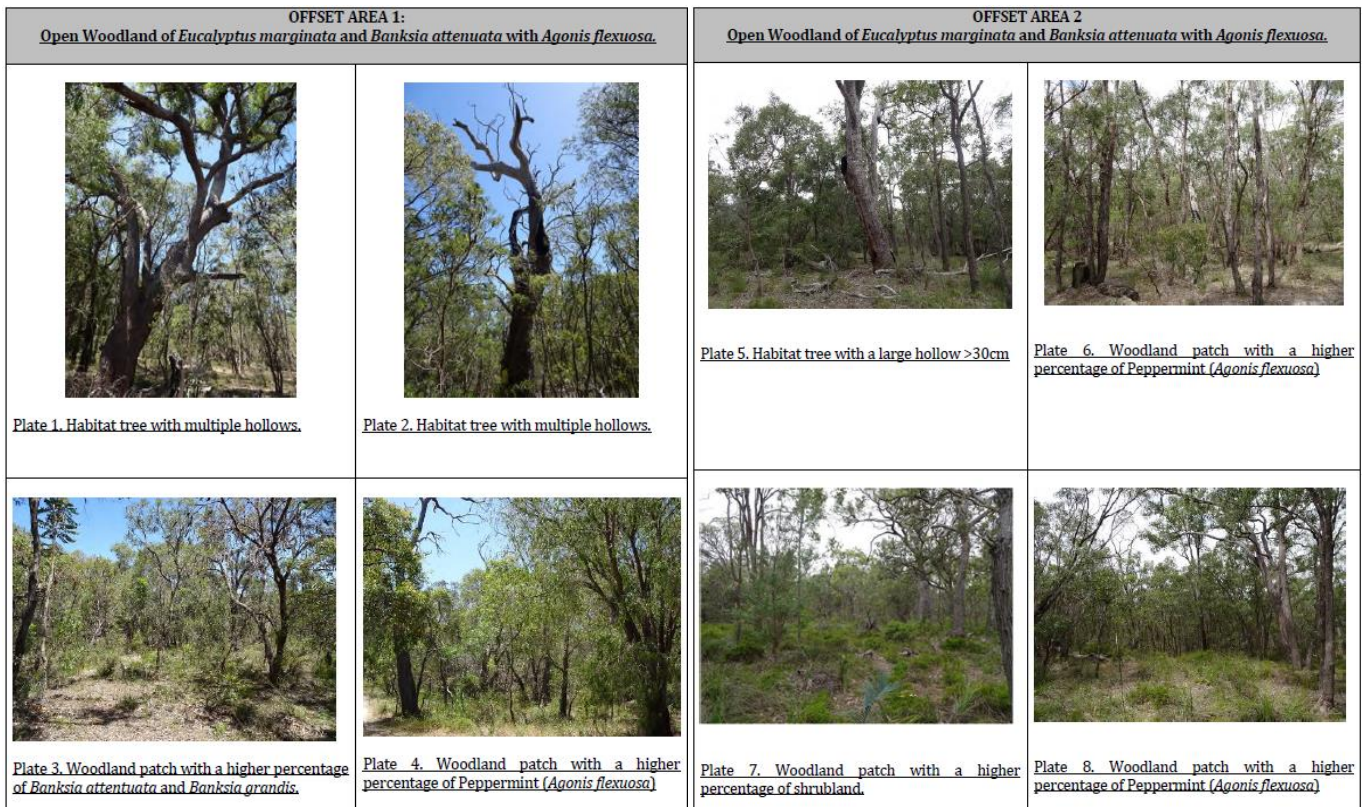


Figure 7. Photographs of the proposed offset areas (Lundstrom, 2020c).

An Offset Management Plan (OMP) has been prepared by the applicant to demonstrate the actions and responsibilities of both the applicant and landowner at Lot 5 Wellesley Road to effectively preserve the habitat values and maintain the offset areas within the property. The offset sites will be protected under a restrictive conservation covenant with the National Trust under Section 21A of the *National Trust of Australia (WA) Act 1964*. The OMP outlines management actions proposed by the applicant to manage the offset sites. These includes fencing of the offset site (ensuring fence allows fauna movement), gating of any access tracts and monitoring for weeds and dieback.

The offset proposal has been assessed against the WA Environmental Offsets Policy (2011) and WA Environmental Offsets Guidelines (August 2014), and informed by guidance quantifying environmental offsets in Western Australia (DWER, 2021), and the draft procedure for environmental offset metric inputs and associated DWER WA environmental offsets calculator (DWER, 2022). The justification for the values used in the offset calculation is provided in Appendix E. Based on the calculations, the proposed offset counterbalances:

- 203.6 per cent of the significant residual impacts to black cockatoos, and
- 156.7 per cent of the significant residual impacts to western ringtail possums.

The Delegated Officer considers that this adequately counterbalances the significant residual impacts listed above. The justification for the values used in the offset calculation is provided in Appendix E.

End

Appendix A. Additional information provided by applicant

Information provided	Reference
A flora and vegetation survey provided to support the application.	Plantecology (2020)
Fauna habitat assessment provided to support the application.	Harewood (2018)
Additional fauna habitat assessment over a component of the revised application.	Harewood (2022)
Revised draft offset proposal, based on a six hectare application area.	Lundstrom (2020a)
Revised draft offset proposal, based on a six hectare application area.	Lundstrom (2020b)
Field survey of environmental values over proposed offset sites.	Lundstrom (2020c)
Revised draft offset proposal, based on a revised 5.18 hectare application area.	Lundstrom (2021)
Revised draft offset proposal, based on a revised 2.33 hectare application area.	Lundstrom (2022)
Revised draft offset proposal, based on a revised 2.33 hectare application area.	Lundstrom (2024)
Granted Extractive Industries Licence from the Shire of Harvey.	Shire of Harvey (2024b)

Appendix B. Site characteristics

B.1. Site characteristics

Characteristic	Details
Local context	<p>The proposed clearing area is part of an expansive tract of native vegetation within the intensive land use zone of Western Australia. It is mostly surrounded by remnant native vegetation and is adjacent to an existing extractive industry operation.</p> <p>Spatial data indicates the local area (10 kilometre radius from the proposed clearing area) retains approximately 35.1 per cent of the original native vegetation cover.</p>
Ecological linkage	The proposed clearing is mapped approximately 0.3 km from the axis line of a mapped ecological linkage associated with the South West Regional Ecological Linkages (SWREL) dataset.
Conservation areas	<p>The nearest conservation area is Gwalia Nature Reserve (R 53149) which is located approximately 0.66 km east from the proposed clearing.</p> <p>Lot 5 on Deposited Plan 5888 also has an existing conservation covenant under the <i>National Trust of Australia (WA) Act 1964</i>, located approximately 0.5 km north-west of the proposed clearing.</p>
Vegetation description	<p>The flora and vegetation survey Plantecology (2020) indicates that the vegetation within the proposed clearing area consists of woodland of <i>Agonis flexuosa</i> with <i>Eucalyptus marginata</i> over open shrubland of <i>Xanthorrhoea gracilis</i>, <i>Macrozamia riedlei</i> and <i>Hibbertia hypericoides</i> over a herbland of <i>Dasypogon bromeliifolius</i> on grey sands.</p> <p>The full survey descriptions and maps are available in Appendix F.</p> <p>This is inconsistent with the mapped vegetation type(s):</p> <ul style="list-style-type: none"> Bassendean complex – Central and South, which is described as vegetation ranging from woodland of <i>Eucalyptus marginata</i> (Jarrah) - <i>Allocasuarina fraseriana</i> (Sheoak) - <i>Banksia</i> species to low woodland of <i>Melaleuca</i> species, and sedgelands on the moister sites. This area includes the transition of <i>Eucalyptus marginata</i> (Jarrah) to <i>Eucalyptus tottiana</i> (Pricklybark) in the vicinity of Perth. <p>The mapped vegetation type retains approximately 26.9 per cent of the original extent (Government of Western Australia, 2019).</p>
Vegetation condition	<p>The vegetation survey (Plantecology, 2020) indicates the vegetation within the proposed clearing area is Degraded (Keighery, 1994) condition.</p> <p>The full Keighery (1994) condition rating scale is provided in Appendix D.</p> <p>The full survey descriptions and mapping are available in Appendix F.</p>
Climate and landform	The proposed clearing is located within the South West region of Western Australia which has a temperate climate characterised by warm summers and cold winters. The nearest major town to the proposed clearing is Bunbury, which has an average maximum temperature of 23.2 degrees Celsius and an average annual rainfall of 734 mm.

Characteristic	Details
	Landform of the proposed clearing area is described as dune ridges with slopes up to 15 per cent.
Soil description	The soil is mapped as the Spearwood S1b phase which is described as dune ridges with deep siliceous yellow brown sands or pale sands with yellow-brown subsoil and slopes up to 15 per cent.
Land degradation risk	The mapped soil within the proposed clearing area is mapped as high risk for wind erosion, medium risk of phosphorous export and low risk of land degradation from salinity.
Waterbodies	The desktop assessment and aerial imagery indicated that no watercourses or waterbodies transect the application area. A conservation category wetland (UFI 1499) occurs approximately 525 metres to the south-east of the application area, with another (UFI 1496) approximately 600 metres to the north-east.
Hydrogeography	The proposed clearing is mapped within the South West Coastal Groundwater Area as Proclaimed under the RIWI Act and is at low risk of water erosion, water logging and flooding.
Flora	<p>A total of 104 records across 26 species of conservation significant flora are recorded within the local area (10-kilometre radius). Of these species, 20 species are listed as Priority and six are listed as Threatened.</p> <p>The flora and vegetation survey identified one priority flora species within the property, <i>Lasiopetalum membranaceum</i> (P3), none of which were recorded within the proposed clearing area (Plantecology, 2020).</p>
Ecological communities	<p>The proposed clearing is mapped as the 'Banksia woodlands of the Swan Coastal Plain' ecological community, listed as Priority 3 in Western Australia and Endangered under the EPBC Act.</p> <p>The flora and vegetation survey indicates that the proposed clearing area is not representative of this community, however, the vegetation adjacent to the proposal is representative of this community (Plantecology, 2020).</p>
Fauna	<p>A total of 549 records across 37 species of conservation significant fauna are recorded within the local area (10-kilometre radius). Six of these species were recorded within one kilometre of the proposed clearing, namely:</p> <ul style="list-style-type: none"> • chuditch (<i>Dasyurus geoffroii</i>) (VU) – 0.42 km • Carnaby's cockatoo (<i>Zanda latirostris</i>) (EN) – 0.47 km • south-western brush-tailed phascogale (<i>Phascogale tapoatafa wambenger</i>) (CD) – 0.58 km • forest red-tailed black cockatoo (<i>Calyptorhynchus banksii naso</i>) (VU) – 0.75 km • Baudin's cockatoo (<i>Zanda baudinii</i>) (EN) – 0.75 km • western brush wallaby (<i>Notamacropus irma</i>) (P4) – 0.80 km <p>According to available databases, there are five (5) black cockatoo roost sites in the local area, the nearest being approximately 1.94 km from the proposed clearing.</p>

B.2. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix G.1), and biological survey information, 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 (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Drakaea elastica</i>	CR	N	Y	Y	0.46	12	Y
<i>Drakaea micrantha</i>	EN	N	N	Y	0.46	15	Y
<i>Lasiopetalum membranaceum</i>	P3	Y	Y	Y	0.20	5	Y

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

B.3. Fauna analysis table

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]
<i>Calyptorhynchus banksii naso</i> (forest red-tailed black cockatoo)	VU	Y	Y	0.75	11	Y
<i>Falsistrellus mackenziei</i> (western false pipistrelle, western falsistrelle)	P4	Y	Y	2.46	3	Y
<i>Notamacropus irma</i> (western brush wallaby)	P4	Y	Y	0.80	3	Y
<i>Phascogale tapoatafa wambenger</i> (south-western brush-tailed phascogale, wambenger)	CD	Y	Y	0.56	33	Y
<i>Pseudocheirus occidentalis</i> (western ringtail possum, ngwayir)	CR	Y	Y	2.79	169	Y
<i>Zanda baudinii</i> (Baudin's cockatoo)	EN	Y	Y	0.75	3	Y
<i>Zanda latirostris</i> (Carnaby's cockatoo)	EN	Y	Y	0.47	86	Y
<i>Zanda</i> sp. 'white-tailed black cockatoo' (white-tailed black cockatoo)	EN	Y	Y	4.90	10	Y

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

B.4. Ecological community analysis table

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)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
Banksia Woodlands of the Swan Coastal Plain ecological community	P3 (WA) EN (EPBC Act)	N	Y	Y	0	432	Y

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

B.5. Land degradation risk table

Risk categories	Land Unit 1
Wind erosion	H2: >70% of map unit has a high to extreme wind erosion risk

Appendix C. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
<p><u>Principle (a):</u> "Native vegetation should not be cleared if it comprises a high level of biodiversity."</p> <p><u>Assessment:</u> The proposed clearing is mapped as the 'Banksia Woodlands of the Swan Coastal Plain' (Banksia Woodlands) Priority 3 Ecological Community (PEC). A flora and vegetation survey (Plantecology, 2020) identified that the vegetation within the proposed clearing area is in degraded (Keighery, 1994) condition and was not representative of the Banksia Woodlands PEC, likely due to a history of grazing and logging on the property.</p> <p>Priority flora species <i>Lasiopetalum membranaceum</i> has been recorded 205 metres to the north of the application area. The application area was reduced to eliminate impacts to this species.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1 above.</i>

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Principle (b):</u> <i>“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><u>Assessment:</u> The <i>Agonis flexuosa</i> woodland over the application area (Plantecology 2020), provides habitat for the Threatened Western Ringtail Possum (<i>Pseudocheirus occidentalis</i>), conservation dependant south-western brush-tailed phascogale (<i>Phascogale tapoatafa wambenger</i>) and Priority 4 Western Brush Wallaby (<i>Notamacropus irma</i>) and western false pipistrelle (<i>Falsistrellus mackenziei</i>).</p> <p>The eucalypts and banksia present within the woodland provide foraging habitat for three Threatened black cockatoo species.</p> <p>The vegetation in the proposed clearing area is considered to be part of the South West Regional Ecological Linkage in the local area.</p>	At variance	Yes <i>Refer to Section 3.2.2, above.</i>
<p><u>Principle (c):</u> <i>“Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</i></p> <p><u>Assessment:</u> The mapped vegetation and soil types within the proposed clearing area indicate suitable habitat for threatened flora species. The application area was surveyed (Plantecology 2020), and no threatened flora pursuant to the BC Act or the EPBC Act were recorded.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (d):</u> <i>“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><u>Assessment:</u> The proposed clearing is mapped as the ‘Banksia Woodlands of the Swan Coastal Plain’ (Banksia Woodlands) threatened ecological community (TEC) listed as Endangered under the EPBC Act. A flora and vegetation survey (Plantecology, 2020) identified that the vegetation within the proposed clearing area is in degraded (Keighery, 1994) condition and was not representative of the Banksia Woodlands TEC, likely due to a history of grazing and logging on the property.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
Environmental value: significant remnant vegetation and conservation areas		
<p><u>Principle (e):</u> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u> The proposed clearing is mapped within the Bassendean Complex Central and South which has been extensively cleared. The surveyed vegetation (Plantecology, 2020) indicates that the proposed clearing is not representative of this vegetation complex. While jarrah is found in the proposed clearing area, it lacks other key component species and dominant peppermint woodland is not characteristic of the mapped vegetation complex. Therefore, it is not likely the proposed clearing will impact on the extent of the Bassendean Complex Central and South.</p>	Not likely to be at variance	No
<p><u>Principle (h):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.”</i></p> <p><u>Assessment:</u> Given the distance to the nearest conservation area (Gwalia Nature Reserve - R 53149) is over 600 metres, the proposed clearing is not likely to have a direct impact on the environmental values of nearby conservation areas.</p>	Not likely to be at variance	No
Environmental value: land and water resources		

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Principle (f):</u> <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment:</u> Given that no water courses or wetlands are recorded within the application area, or within the vicinity of the application area, and that riparian vegetation does not occur within the application area (Plantecology 2020), the proposed clearing is unlikely to impact native vegetation growing in, or in association with, an environment associated with a watercourse or wetland.</p>	Not likely to be at variance	No
<p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u> The mapped soils are highly susceptible to wind erosion. Noting the size of the proposed clearing and the sandy soils present, the proposed clearing may cause an appreciable land degradation in the form of wind erosion.</p>	May be at variance	Yes <i>Refer to Section 3.2.3, above.</i>
<p><u>Principle (i):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.”</i></p> <p><u>Assessment:</u> The application area is located within the South West Coastal Groundwater Area proclaimed under the RIWI Act. Given that no wetlands or watercourses occur within the proposed clearing area, the proposed clearing is unlikely to impact surface or ground water quality.</p>	Not likely to be at variance	No
<p><u>Principle (j):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</i></p> <p><u>Assessment:</u> The mapped soils and topographic contours in the surrounding area indicate the proposed clearing is unlikely to contribute to increased incidence or intensity of flooding. Given no water courses or wetlands are recorded within the proposed clearing area, the clearing is unlikely to contribute to waterlogging.</p>	Not likely to be at variance	No

Appendix D. 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.

Condition	Description
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 E. Offset calculator value justification

E.1. Black cockatoo foraging habitat

**WA Environmental Offset Calculator
Rationale for scores used in the offset calculator**

Calculation/Element	Score (Area)	Rationale
Conservation significance		
Description	Black cockatoo foraging habitat	The fauna survey (Harewood, 2018) and the flora and vegetation survey (Plantecology, 2020), identified sparse black cockatoo foraging habitat within the proposed clearing area, mainly composed of jarrah with occasional marri and banksia, noting that the extent was difficult to quantify as the suitable species were largely sparsely scattered throughout the proposed clearing area (Harewood, 2018).
Type of environmental value	Species (Flora/Fauna)	Baudin's cockatoo, Carnaby's cockatoo and forest-red-tailed black cockatoo.
Conservation significance of environmental value	Rare/Threatened Species - Endangered	Carnaby's cockatoo and Baudin's cockatoo are listed as endangered fauna species under the Commonwealth EPBC Act and state BC Act and forest red-tailed black cockatoo are listed as Vulnerable. The calculations use the species with the highest listing.
Landscape-level value impacted	yes/no	No, there is still extensive vegetation on the property and state forest on the neighbouring property. While the Vegetation is part of a mapped ecological linkage and could be assigned a value of 1a according to the <i>South West Regional Ecological Linkages Report</i> (Molloy et al., 2009), the proposal will not significantly impact on the function of the linkage given the availability of vegetation in the surrounding area.
Significant impact		
Description	Black cockatoo foraging habitat	Native vegetation comprises suitable habitat for black cockatoos is proposed to be cleared for the purpose of sand extraction.
Significant impact (hectares)	2.33	One fauna habitat was identified by the fauna survey (Harewood, 2018) namely sparsely scattered <i>Eucalyptus marginata</i> with very occasional <i>Corymbia calophylla</i> over a low woodland dominated by <i>Agonis flexuosa</i> with very occasional <i>Banksia attenuata</i> and <i>B. grandis</i> over a low open shrubland or very open grassland of introduced species or bare sand on dune crest with grey to light grey/white sands (grading to yellow at depth) which was found over the whole extent of the proposed clearing area.
Quality (scale)	5.00	The flora and vegetation survey (Plantecology, 2020) noted that the proposed clearing area consists predominantly of <i>Agonis flexuosa</i> in degraded (Keighery, 1994) condition due to a history of grazing and logging activity on the property and no evidence of use by black cockatoos was identified during the fauna survey (Harewood, 2018). Despite this, the proposed clearing area does contain some suitable

		foraging species, is part of a regional ecological linkage and within the Swan Coastal Plain. Evidence of foraging was identified in adjacent better-quality vegetation (including offset sites) suggesting that the species may utilise the site on occasion for foraging.
Rehabilitation credit		
Description	N/A	The application area will be used as pasture following extraction.
Offset		
Description	Conservation covenant	Conservation of area within Lot 5 on Deposited Plan 5888 that provides suitable habitat for black cockatoos
Proposed offset (area in hectares)	20.00	The proposed clearing was determined to be a Controlled Action under the EPBC Act 1999. The proposed offset area of 20 ha is the same as what has been proposed to the Department of Climate Change, Environment, Energy and Water (DCCEE). The offset survey (Lundstrom, 2023) identified that the entire proposed offset area contains suitable foraging habitat for black cockatoos.
Current quality of offset site	8.00	Vegetation condition of the offset areas ranged between good and excellent (Keighery, 1994) condition (Lundstrom, 2023). While limited evidence of foraging was identified, the vegetation was identified to contain high quality foraging habitat composed of Jarrah - Banksia woodland and a flock of red-tailed black cockatoos was observed on the property (Lundstrom, 2023).
Future quality WITHOUT offset (scale)	8.00	Change in value is not expected, given the vegetation has remained largely resilient given the history of logging, grazing and extractive industry on the property.
Future quality WITH offset (scale)	8.00	The sites will be placed under a conservation covenant, and it is assumed that the habitat would maintain its current quality without additional management.
Time until ecological benefit (years)	1.00	It is assumed that it will take 1 year to acquire the covenant.
Confidence in offset result (%)	90.00%	There is a high level of confidence that the offset will be achieved, and that conservation of the offset site (in perpetuity) would successfully mitigate the future risk of loss of the site.
Duration of offset implementation (maximum 20 years)	20.00	The offset site will be conserved in perpetuity under a conservation covenant. Therefore, the maximum of 20 years for this field is applied.
Time until offset site secured (years)	1.00	Time until conservation covenant can be acquired.
Risk of future loss WITHOUT offset (%)	20.0%	The offset site is currently rural-zoned freehold land. The offset site is also mapped within a significant geological supply of sand, identified by the Department of Energy, Mines, Industry Regulation and Safety (DEMIRS). Therefore, there is a reasonable risk that the offset site could be developed in future without the implementation of the offset.
Risk of future loss WITH offset (%)	5.0%	The future conservation (in perpetuity) of the offset site and the adjacent revegetation area (also conserved in perpetuity) would result in a substantial increased security and substantially reduce the risk of loss. The risk of catastrophic events (fire, dieback, etc.) remain.

E.2. Western ringtail possum habitat

**WA Environmental Offset Calculator
Rationale for scores used in the offset calculator**

Calculation/Element	Score (Area)	Rationale
Conservation significance		
Description	Western ringtail possum habitat	The fauna survey (Harewood, 2018) and habitat review (Harewood, 2022) identified that the application area provides suitable habitat for WRP, however no evidence of use by WRP was observed. It is likely

		that WRP use the application area sparingly to move through the landscape. Extensive records of this species occur in the local area.
Type of environmental value	Species (Flora/Fauna)	Western ringtail possum.
Conservation significance of environmental value	Rare/Threatened Species - Critically Endangered	Western Ringtail Possum is listed as Critically Endangered under the EPBC Act and BC Act.
Landscape-level value impacted	yes/no	No, there is still extensive vegetation on the property and state forest on the neighbouring property. While the Vegetation is part of a mapped ecological linkage and could be assigned a value of 1a according to the <i>South West Regional Ecological Linkages Report</i> (Molloy et al., 2009), the proposal will not significantly impact on the function of the linkage given the availability of vegetation in the surrounding area.
Significant impact		
Description	Western ringtail possum habitat	Native vegetation that comprises suitable habitat for WRP is proposed to be cleared for the purpose of sand extraction.
Significant impact (hectares)	2.33	One fauna habitat was identified by the fauna survey (Harewood, 2018) namely Open woodland of <i>Eucalyptus marginata</i> with very occasional <i>Corymbia calophylla</i> over a low woodland dominated by <i>Agonis flexuosa</i> with very occasional <i>Banksia attenuata</i> and <i>B. grandis</i> over a low open shrubland or very open grassland of introduced species or bare sand on dune crest with grey to light grey/white sands (grading to yellow at depth) which was found over the whole extent of the proposed clearing area.
Quality (scale)	6.00	The flora and vegetation survey (Plantecology, 2020) noted that the proposed clearing area is in degraded (Keighery, 1994 condition) due to a history of grazing and logging activity on the property and no evidence of use by western ringtail possum was identified during the fauna survey (Harewood, 2018). Despite this, the proposed clearing area is dominated by peppermint woodland, part of a regional ecological linkage and within the Swan Coastal Plain Management Zone as described in the <i>Western Ringtail Possum Recovery Plan</i> (DPaW, 2017). It is likely that WRP are using the surrounding vegetation and may utilise the site as a linkage.
Rehabilitation credit		
Description	N/A	The application area will be used as pasture following extraction.
Offset		
Description	Conservation covenant	Conservation of area within Lot 5 on Deposited Plan 5888 that provides suitable habitat for western ringtail possums.
Proposed offset (area in hectares)	19.50	The proposed clearing was determined to be a Controlled Action under the EPBC Act 1999. The proposed offset area of 20 ha is the same as what has been proposed to the Department of Climate Change, Environment, Energy and Water (DCCEE). The offset survey (Lundstrom, 2023) identified that the proposed offset area contains approximately 19.50 ha of suitable WRP habitat.
Current quality of offset site	8.00	Vegetation condition of the offset areas ranged between good and excellent (Keighery, 1994) condition (Lundstrom, 2023). While no individuals of WRP or dreys were observed, several possum scats found could be attributed to WRP and 82 trees with hollows suitable for refuge are present (Lundstrom, 2023).
Future quality WITHOUT offset (scale)	8.00	Change in value is not expected, given the vegetation has remained largely resilient given the history of logging, grazing and extractive industry on the property.
Future quality WITH offset (scale)	8.00	The sites will be placed under a conservation covenant, and it is assumed that the habitat would maintain its current quality without additional management.

Time until ecological benefit (years)	1.00	It is assumed that it will take 1 year to acquire the covenant.
Confidence in offset result (%)	90%	There is a high level of confidence that the offset will be achieved, and that conservation of the offset site (in perpetuity) would successfully mitigate the future risk of loss of the site.
Duration of offset implementation (maximum 20 years)	20.00	The offset site will be conserved in perpetuity under a conservation covenant. Therefore, the maximum of 20 years for this field is applied.
Time until offset site secured (years)	1.00	Time until conservation covenant can be acquired.
Risk of future loss WITHOUT offset (%)	20.0%	The offset site is currently rural-zoned freehold land. The offset site is also mapped within a significant geological supply of sand, identified by the Department of Energy, Mines, Industry Regulation and Safety (DMIRS). Therefore, there is a reasonable risk that the offset site could be developed in future without the implementation of the offset.
Risk of future loss WITH offset (%)	5.0%	The future conservation (in perpetuity) of the offset site and the adjacent revegetation area (also conserved in perpetuity) would result in a substantial increased security and substantially reduce the risk of loss. The risk of catastrophic events (fire, dieback, etc.) remain.

Appendix F. Biological survey information excerpts

Flora and Vegetation Survey (Plantecology, 2020)

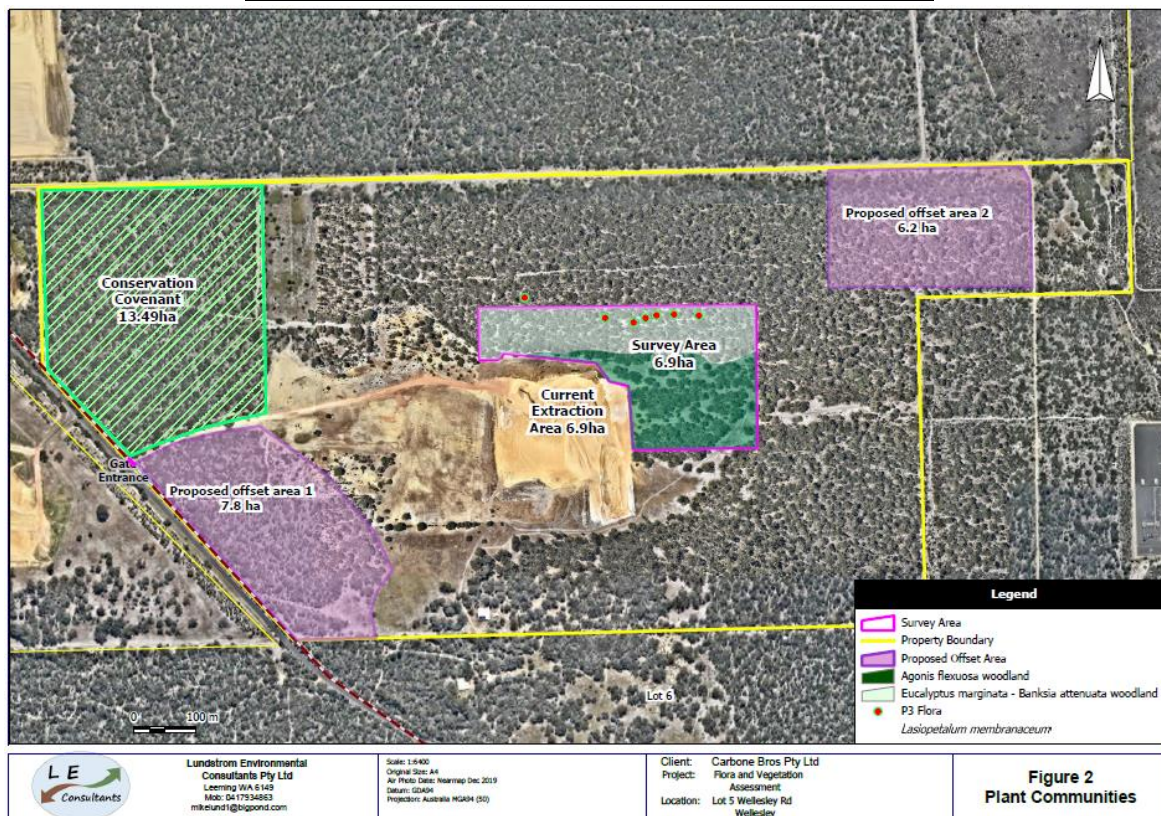


Figure 8. Vegetation types and records of *L. membranaceum* within the original application area (including previous proposed offset areas).

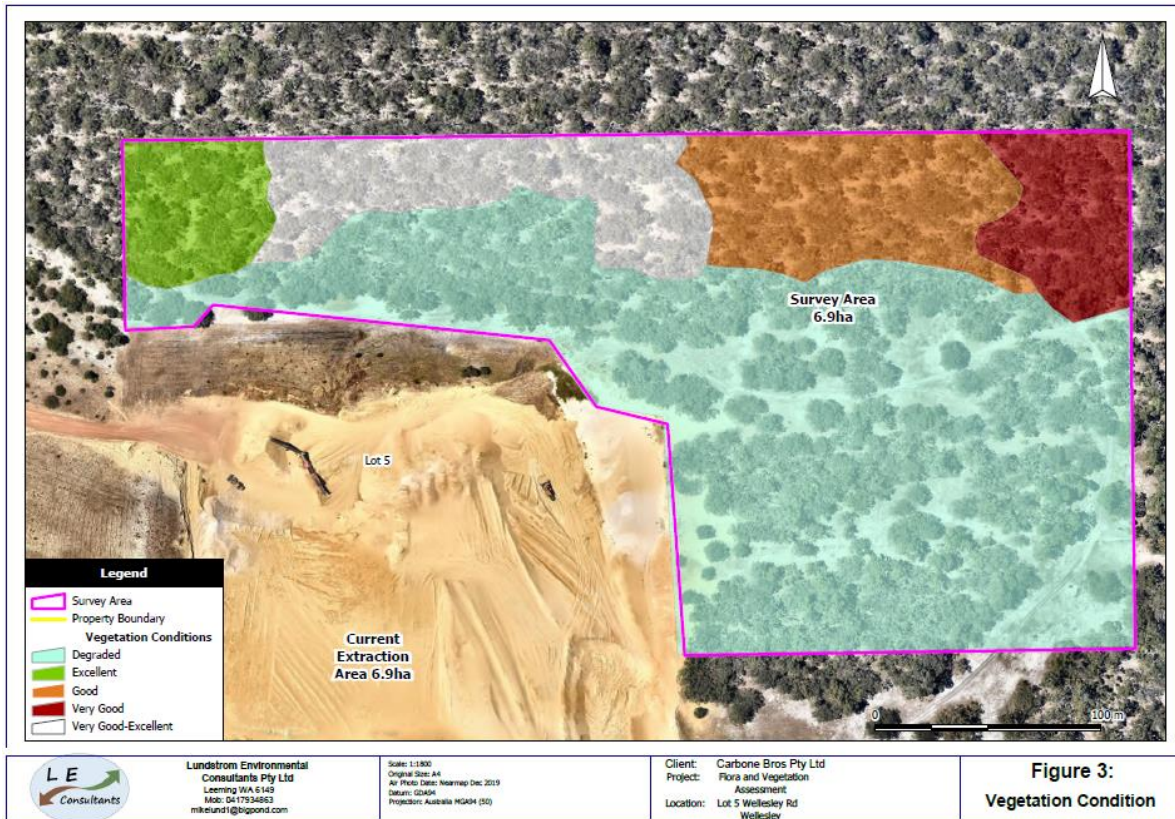


Figure 9. Mapped vegetation condition of the original application area.

Fauna Survey (Harewood, 2018)

Unit	Fauna Habitat Description	Example Images
1	Open woodland of <i>Eucalyptus marginata</i> with very occasional <i>Corymbia calophylla</i> over a low woodland dominated by <i>Agonis flexuosa</i> with very occasional <i>Banksia attenuata</i> and <i>B. grandis</i> over a low open shrubland or very open grassland of introduced species or bare sand on dune crest with grey to light grey/white sands (grading to yellow at depth).	

Figure 10. Habitat type found within the proposed clearing area.

Total Number of Habitat Trees	Number of Trees with <u>No Hollows Observed</u>	Number of Trees with Hollows Considered <u>Unsuitable</u> for Nesting Black Cockatoos	Number of Trees with Hollows Considered <u>Possibly Suitable</u> for Nesting Black Cockatoos	Tree Species			
				Jarrah	Marri	Tuart	Dead Unknown
57	28	22	7	47	3	1	6

Figure 11. Number of suitable black cockatoo trees found within the original six-hectare application area (number has since been reduced).

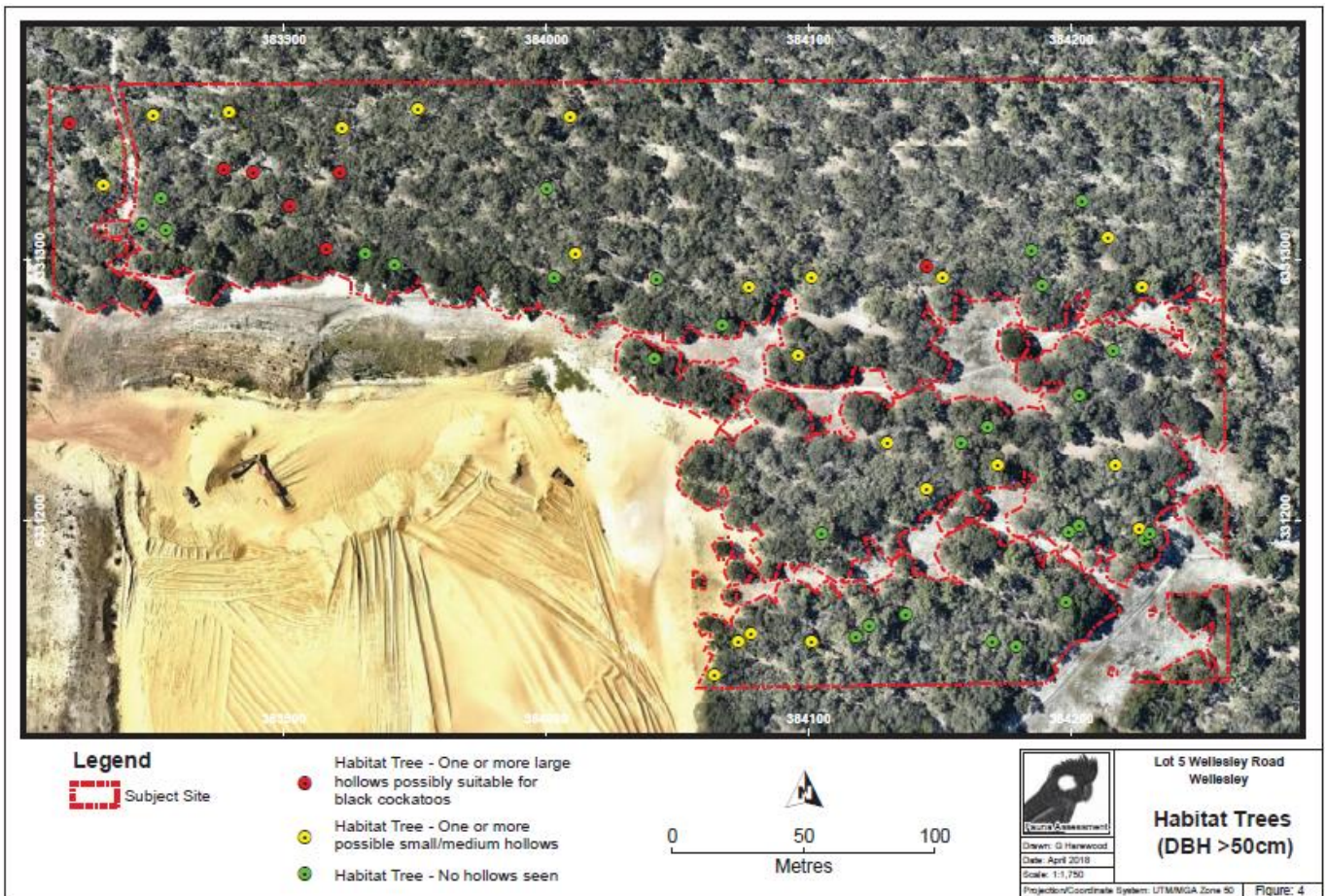


Figure 12. Black cockatoo habitat trees identified within the original proposed clearing area.

Fauna habitat review (Revised clearing area) (Harewood, 2022)

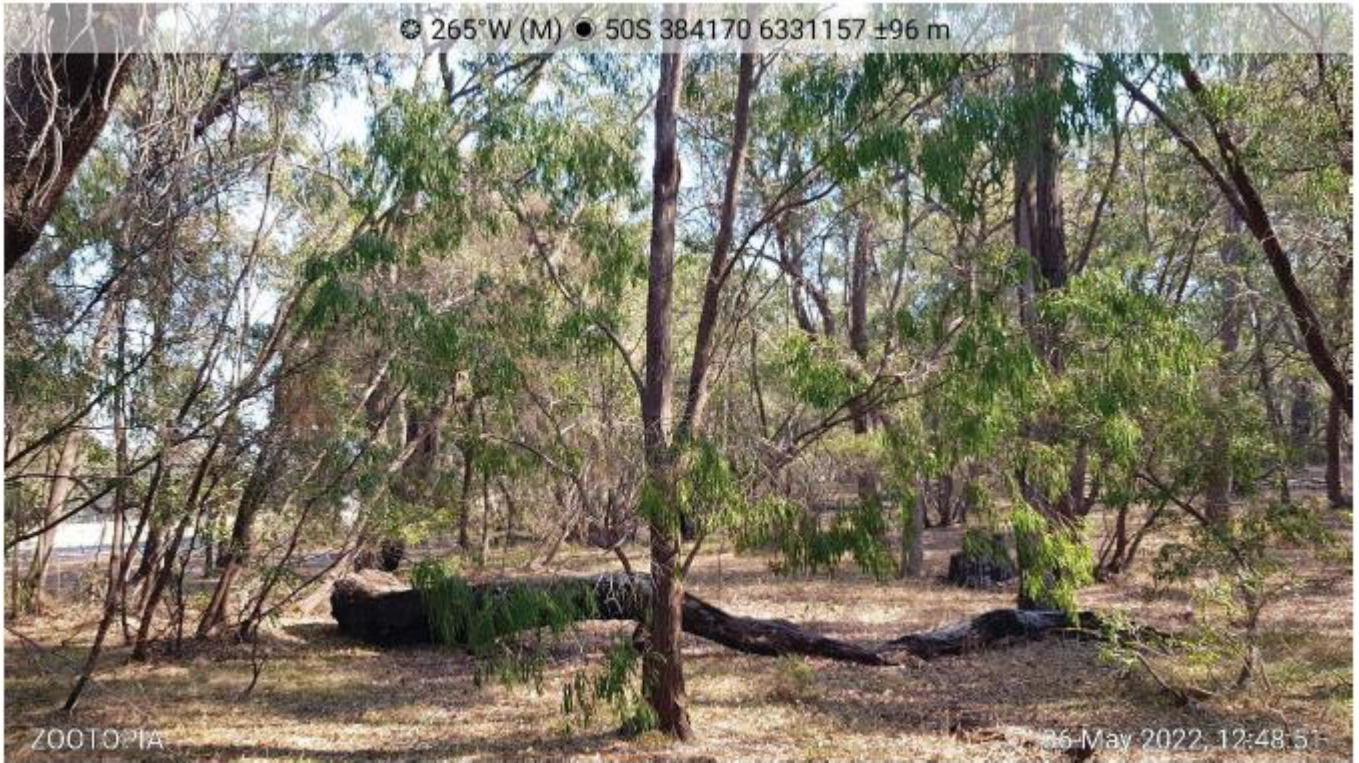


Figure 13. Photograph of the southern portion of the revised application area (this was not in the original application area).

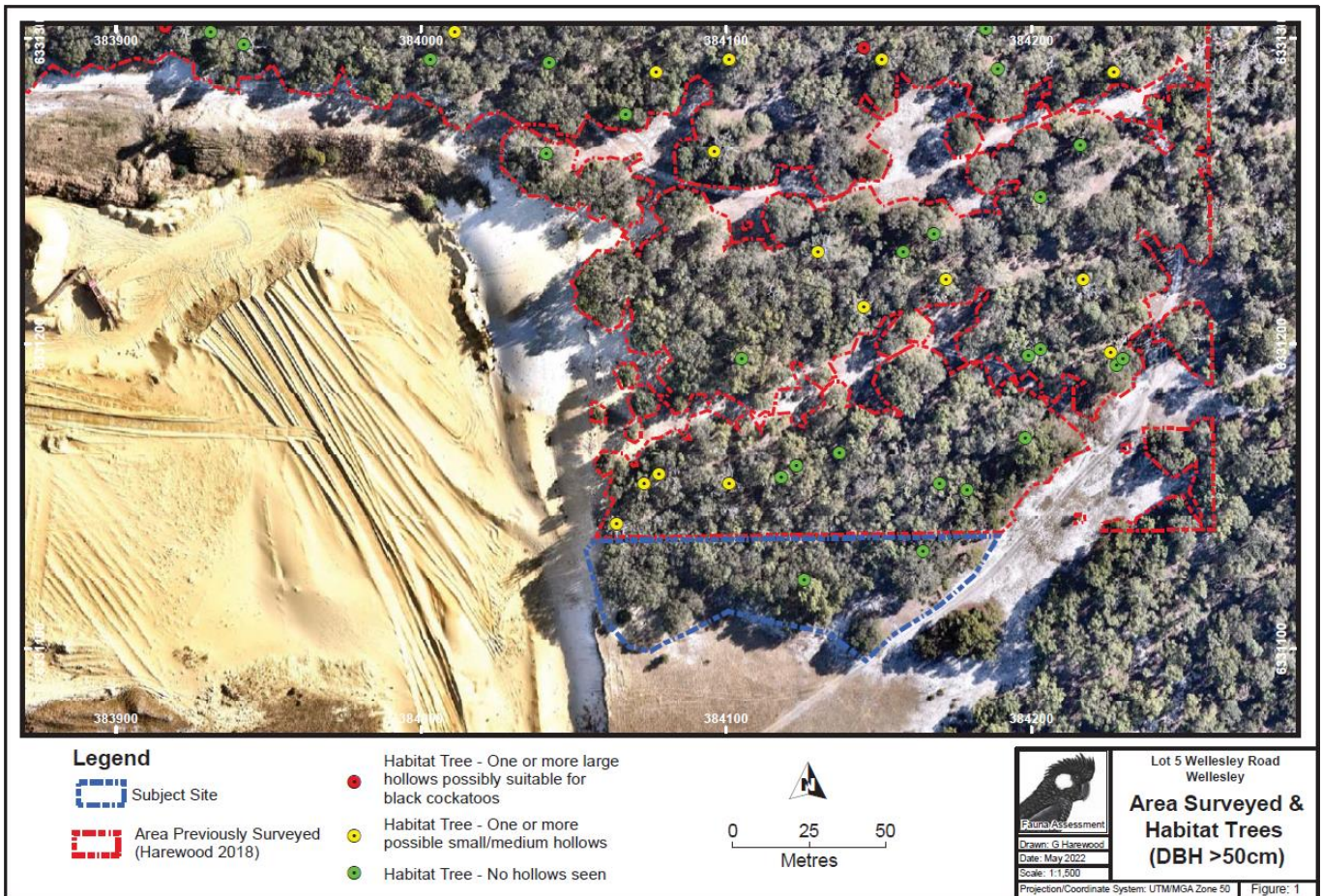


Figure 14. Map of the habitat trees including the southern portion of the revised clearing footprint.

Appendix G. Sources of information

G.1. GIS databases

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

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

Restricted GIS Databases used:

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

G.2. References

Armstrong, K., J. Woinarksi, and A. A. Burbidge (2017). *Falsistrellus mackenziei*. The IUCN Red List of Threatened Species [WWW Document]. Retrieved from <http://www.iucnredlist.org/details/17348/0>.

Commonwealth of Australia (2001) *National Objectives and Targets for Biodiversity Conservation 2001-2005*, Canberra.

Department of Agriculture, Water and the Environment (DAWE) (2022), *Referral guideline for 3 WA threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed Black-cockatoo*. Department of Agriculture, Water and the Environment, Canberra. Available from: [Referral guideline for 3 WA threatened black cockatoo species - DCCEEW](#)

- Department of Environment and Conservation (DEC) (2009). *Glossy-leafed Hammer Orchid* (*Drakaea elastica*) *Recovery Plan*. Department of Environment and Conservation, Western Australia. Available from: <http://www.environment.gov.au/biodiversity/threatened/recovery-plans/national-recovery-plan-glossy-leafed-hammer-orchid-drakaea-elastica>.
- Department of Environment and Conservation (DEC) (2012a) *Fauna profiles, Brush-tailed phascogale, Phascogale tapoatafa* (Meyer, 1793). Available from: [Home | Department of Biodiversity, Conservation and Attractions \(dbca.wa.gov.au\)](http://www.dbca.wa.gov.au)
- Department of Environment and Conservation (DEC) (2012b) *Fauna profiles, western brush wallaby, Macropus irma* (Jourdan, 1837). Available from: [Home | Department of Biodiversity, Conservation and Attractions \(dbca.wa.gov.au\)](http://www.dbca.wa.gov.au)
- Department of the Environment and Energy (DoEE) (2016). *Approved Conservation Advice (incorporating listing advice) for the Banksia Woodlands of the Swan Coastal Plain ecological community*. Canberra: Department of the Environment and Energy. Available from: <http://www.environment.gov.au/biodiversity/threatened/communities/pubs/131-conservation-advice.pdf>.
- Department of Environment Regulation (DER) (2013). *A guide to the assessment of applications to clear native vegetation*. Perth. Available from: https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Guidelines/Guide2_assessment_native_veg.pdf.
- Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008). *Approved Conservation Advice for Drakaea micrantha (Dwarf Hammer-orchid)*. Canberra: Department of the Environment, Water, Heritage and the Arts. Available from: <http://www.environment.gov.au/biodiversity/threatened/species/pubs/81853-conservation-advice.pdf>.
- Department of Parks and Wildlife (DPAW) (2017). *Western Ringtail Possum (Pseudocheirus occidentalis) Recovery Plan*. Wildlife Management Program No. 58. Department of Parks and Wildlife, Perth, WA. Available from: <http://www.environment.gov.au/biodiversity/threatened/publications/recovery/western-ringtail-possum-recovery-plan>.
- Department of Primary Industries and Regional Development (DPIRD) (2019). *NRInfo Digital Mapping. Department of Primary Industries and Regional Development*. Government of Western Australia. URL: <https://maps.agric.wa.gov.au/nrm-info/>.
- Department of Water and Environmental Regulation (DWER) (2019). *Procedure: Native vegetation clearing permits*. Joondalup. Available from: https://dwer.wa.gov.au/sites/default/files/Procedure_Native_vegetation_clearing_permits_v1.PDF.
- Environmental Protection Authority (EPA) (2003). *Appendix 4 – Greater Bunbury Region – Ecological linkages plan*. Available from: [Combined Appendix.pdf \(epa.wa.gov.au\)](http://www.epa.wa.gov.au)
- Environmental Protection Authority (EPA) (2016). *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment*. Available from: http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey_Dec13.pdf.
- Environmental Protection Authority (EPA) (2016). *Technical Guidance – Terrestrial Fauna Surveys*. Available from: https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/Tech%20guidance-%20Terrestrial%20Fauna%20Surveys-Dec-2016.pdf.
- Government of Western Australia (2019) *2018 South West Vegetation Complex Statistics. Current as of March 2019*. WA Department of Biodiversity, Conservation and Attractions, Perth, <https://catalogue.data.wa.gov.au/dataset/dbca>
- Government of Western Australia. (2019) *2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019*. WA Department of Biodiversity, Conservation and Attractions. <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics>

- Harewood, G., (2018) *Fauna assessment, Lot 5 Wellesley Road (CPS 8007/1) Wellesley*, received 25 July 2019 (DWER Ref: DWERT2996~3)
- Harewood, G., (2022) *Habitat review - Lot 5 Wellesley Road, Wellesley - CPS 8561/1 – Revised clearing area*, received 9 June 2022 (DWER Ref: DWERT616461)
- Hedde, E. M., Loneragan, O. W., and Havel, J. J. (1980) *Vegetation Complexes of the Darling System, Western Australia*. In Department of Conservation and Environment, Atlas of Natural Resources, Darling System, Western Australia.
- Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Lundstrom Environmental Consultants on behalf of Carbone Bros Pty Ltd (Lundstrom) (2019) *Clearing permit application CPS 8561/1*, received 21 June 2019 (DWER Ref: A1799004).
- Lundstrom Environmental Consultants (Lundstrom) (2020a) *Lot 5 Wellesley Rd Wellesley, offset proposal*, received 7 April 2020 (DWER Ref: A1882851).
- Lundstrom Environmental Consultants (Lundstrom) (2020b) *Revised application area received – 5.18 ha*, received 28 July 2020 (DWER Ref: A1925533).
- Lundstrom Environmental Consultants (Lundstrom) (2020c) *Field survey of environmental values for an offset proposal, Prepared for Carbone Bros Pty Ltd, Lot 5 Wellesley Road, Wellesley, Shire of Harvey*, received 9 December 2020 (DWER Ref: A1963900).
- Lundstrom Environmental Consultants (Lundstrom) (2021) *Authority to from landowner to place a conservation covenant within Lot 5 Wellesley Rd, Wellesley*, received 9 March 2021 (DWER Ref: A1993032).
- Lundstrom Environmental Consultants (Lundstrom) (2022) *Revised application area received – 2.33 ha*, received 9 May 2022 (DWER Ref: DWERT600643).
- Lundstrom Environmental Consultants (Lundstrom) (2023) *Additional supporting information for CPS 8561/1 – Reasons for not undergoing revegetation*, received 11 December 2023 (DWER Ref: DWERT881390).
- Lundstrom Environmental Consultants (Lundstrom) (2024) *Final Offset Proposal with supporting documents*, received 14 August 2024 (DWER Ref: DWERT991408).
- Mattiske, E.M. and Havel, J.J. (1998) *Vegetation Complexes of the South-west Forest Region of Western Australia*. Maps and report prepared as part of the Regional Forest Agreement, Western Australia for the Department of Conservation and Land Management and Environment Australia.
- Molloy, S., Wood, J., Hall, S., Wallrodt, S. and Whisson, G. (2009) *South West Regional Ecological Linkages Technical Report*, Western Australian Local Government Association and Department of Environment and Conservation, Perth.
- Northcote, K. H. with Beckmann G G, Bettenay E., Churchward H. M., van Dijk D. C., Dimmock G. M., Hubble G. D., Isbell R. F., McArthur W. M., Murtha G. G., Nicolls K. D., Paton T. R., Thompson C. H., Webb A. A. and Wright M. J. (1960-68) *Atlas of Australian Soils*, Sheets 1 to 10, with explanatory data. CSIRO and Melbourne University Press: Melbourne.
- Plantecology Consulting (Plantecology) (2020) *Lot 5 Wellesley Rd Wellesley, flora and vegetation survey*, received 7 May 2020 (DWER Ref: A1894735).
- Schoknecht, N., Tille, P. and Purdie, B. (2004) *Soil-landscape mapping in South-Western Australia – Overview of Methodology and outputs* Resource Management Technical Report No. 280. Department of Agriculture.
- Shah, B. (2006) *Conservation of Carnaby's Black-Cockatoo on the Swan Coastal Plain, Western Australia*. December 2006. Carnaby's Black-Cockatoo Recovery Project. Birds Australia, Western Australia.
- Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) *Native Vegetation in Western Australia, Extent, Type and Status*. Resource Management Technical Report 249. Department of Agriculture, Western Australia.

- Shire of Harvey (2022a) *Development Refusal - Extractive Industry (Sand) - Lot 5 Wellesley Road, Wellesley*, received 23 February 2022 (DWER Ref: A2086857).
- Shire of Harvey (2022b) *Development Approval - Extractive Industry (Sand) - Lot 5 Wellesley Road, Wellesley*, received 24 October 2023 (DWER Ref: DWERDT848494).
- Shire of Harvey (2024a) *Update on progress of Extractive Industries Licence for Lot 5 Wellesley Road, Wellesley*, received 6 August 2024 (DWER Ref: DWERDT987296).
- Shire of Harvey (2024b) *Extractive Industries Licence for Lot 5 Wellesley Road, Wellesley*, received 31 October 2024 (DWER Ref: DWERDT1029746).
- Trudgen, M.E. (1991) *Vegetation condition scale in National Trust (WA) 1993 Urban Bushland Policy*. National Trust of Australia (WA), Wildflower Society of WA (Inc.), and the Tree Society (Inc.), Perth.
- Valentine, L.E. and Stock, W. (2008) *Food Resources of Carnaby's Black Cockatoo (Calyptorhynchus latirostris) in the Gnangara Sustainability Strategy Study Area*. Edith Cowan University and Department of Environment and Conservation. December 2008.
- Western Australian Herbarium (1998-). *FloraBase - the Western Australian Flora*. Department of Biodiversity, Conservation and Attractions, Western Australia. <https://florabase.dpaw.wa.gov.au/>
- Woinarski, J., Burbidge, A., & Harrison, P. L. (2015) *A review of the conservation status of Australian mammals*. *Theyra*. 6(1): 155-166.