GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

PERMIT DETAILS

Area Permit Number: CPS 9989/1

File Number: DWERVT11549

Duration of Permit: From 12 May 2024 to 12 May 2031

ADVICE NOTE

Allocation of offset site

In relation to condition 8 of this permit, a total area of 7.06 hectares of Lot 124 on Diagram 59932, Parkfield, will be attributed to the *offset* for conservation in perpetuity for the *native vegetation* clearing authorised under this permit. The nominated area consists of:

a) conservation of 3.76 hectares of established *native vegetation* in very good condition (Keighery, 1994) that provides high-quality foraging and potential breeding habitat for *black cockatoo species*, and moderate-quality habitat for western ringtail possum and the brush-tailed phascogale; and

b) *revegetation* of at least 1.5 hectares of bare ground within a 3.3-hectare *revegetation* area.

PERMIT HOLDER

Mr Keith Sanders and Ms Tanuja Sanders

LAND ON WHICH CLEARING IS TO BE DONE

Lot 124 on Diagram 59932, Parkfield

AUTHORISED ACTIVITY

The permit holder must not clear more than 2.62 hectares of *native vegetation* within the area cross-hatched yellow in Figure 1 of Schedule 1.

CONDITIONS

1. Period during which clearing is authorised

The permit holder must not clear any *native vegetation* after 12 May 2026.

2. 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.

3. 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.

4. Directional clearing

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

5. Land degradation – Wind erosion

The permit holder must begin the activities associated with the olive farm development within three (3) months of the cessation of clearing being undertaken to reduce the risk of land degradation by minimising the exposure time of soils prior to the activities.

6. Fauna management – western ringtail possums and south-western brush-tailed phascogale

(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, wambenger (*Phascogale tapoatafa wambenger*);

(b) Clearing activities must cease in any area where fauna referred to in condition 6(a) are identified until either:

(i) the western ringtail possum(s) and/or south-western brush-tailed phascogale, wambenger(s) individuals have moved on from that area to adjoining *suitable habitat*; or

(ii) the western ringtail possum(s) and/or south-western brush-tailed phascogale, wambenger(s) individuals has been removed by a *fauna specialist*.

(c) Where fauna is identified under condition 6(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 *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.

7. Fauna management – black cockatoos (avoidance of trees)

The permit holder must not clear the two (2) *black cockatoo habitat trees* identified red in Figure 1 of Schedule 1 and listed in Table 1 below.

Table 1: *Black cockatoo habitat trees* to be retained.

ID	Species	Easting	Northing
4212	*Corymbia calophylla*	380953	6329509
4211	*Eucalyptus gomphocephala*	380873	6329505

8. Offset – Conservation covenant

Within 12 months of undertaking clearing authorised under this permit, and no later than 12 May 2025, the permit holder must provide to the *CEO* a copy of a conservation covenant under section 30B of the *Soil and Land Conservation Act 1945*, for the protection and management of vegetation in perpetuity over the areas cross-hatched red in Figure 2 of Schedule 1.

9. Offset – Revegetation

Within 24 months of undertaking clearing authorised under this permit, and no later than 12 May 2026, for the *revegetation area*, the permit holder must:

(a) undertake the *planting* of a minimum of 150 trees consisting of 60 individual *Eucalyptus marginata* (jarrah), 60 individual *Corymbia calophylla* (marri) and 30 individual *Eucalyptus patens* (blackbutt) species within the *revegetation area*;

(b) ensure only *local provenance* species and propagating material are used to *revegetate* the *revegetation area*;

(c) ensure *planting* is undertaken at the *optimal time*;

(d) undertake *weed* control, infill *planting* and watering of *plantings* on an 'as needs' basis to ensure the success of *revegetation*;

(e) within 36 months of *planting* the trees in accordance with condition 9(a) of this permit:

(i) engage an *environmental specialist* to make a determination at the *appropriate time* that a minimum of 60 individual *Eucalyptus marginata* (jarrah), 60 individual *Corymbia calophylla* (marri) and 30 individual *Eucalyptus patens* (blackbutt) planted under condition 9(a) will survive;

(ii) if the *environmental specialist* is unable to make a determination that a minimum of 60 individual *Eucalyptus marginata* (jarrah), 60 individual *Corymbia calophylla* (marri) and 30 individual *Eucalyptus patens* (blackbutt) planted under condition 9(a) will survive, the permit holder must repeat the activities required by condition 9(e)(i) at the next *appropriate time;*

(iii) if the determination made by the *environmental specialist* under condition 9(e)(i) is that a minimum of 60 individual *Eucalyptus marginata* (jarrah), 60 individual *Corymbia calophylla* (marri) and 30 individual *Eucalyptus patens* (blackbutt) planted under condition 9(a) will not survive, the permit holder must plant additional *Eucalyptus marginata* (jarrah), *Corymbia calophylla* (marri) and/or *Eucalyptus patens* (blackbutt) species that will result in a minimum of 60 individual *Eucalyptus marginata* (jarrah), 60 individual *Corymbia calophylla* (marri) and 30 individual *Eucalyptus patens* (blackbutt) species persisting within the *revegetation area*; and

(f) where additional *planting* of *Eucalyptus marginata* (jarrah), *Corymbia calophylla* (marri) and *Eucalyptus patens* (blackbutt) species is undertaken in accordance with condition 9(e)(iii), the permit holder must repeat the activities required by condition 9(b), 9(c) and 9(d) of this permit.

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 2.

Table 2: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	(a) the species composition, structure, and density of the cleared area; (b) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to 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) the direction the clearing was undertaken (f) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 2; and (g) actions taken to minimise the risk of the introduction and spread of *weeds* and *dieback* in accordance with condition 3.
2.	In relation to *offset* management, pursuant to conditions 8.	(a) the location and boundaries of the allocated 7.06 hectares offset area within Lot 124 on Diagram 59932, Parkfield (recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020, expressing the geographical coordinates in Eastings and Northings); and (b) a copy of the relevant conservation covenant under section 30B of the *Soil and Land Conservation Act 1945* in accordance with condition 8.
3.	In relation to *revegetation offset* management, pursuant to conditions 9.	(a) the date *revegetation* activities commenced; (b) the number of *Eucalyptus marginata* (jarrah), *Corymbia calophylla* (marri) and *Eucalyptus patens* (blackbutt) individuals planted; (c) actions taken to undertake *planting* of 150 trees consisting of 60 individual *Eucalyptus marginata* (jarrah), 60 individual *Corymbia calophylla* (marri) and 30 individual *Eucalyptus patens* (blackbutt) species; (d) *weed* control, watering and infill *planting* activities undertaken; (e) determination by an *environmental specialist* that the trees planted under condition 9(a) will survive; and (f) the date of any remedial actions undertaken where additional *planting* was required.

11. Reporting

(a) The permit holder must provide to the *CEO*, on or before 31 December 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 July of the preceding calendar year and 30 June of the current 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 31 December of each calendar year.

(c) The permit holder must provide to the *CEO*, no later than 90 calendar days prior to the expiry date of 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 3 have the meanings defined.

Table 3: Definitions

Term	Definition
appropriate time	means the time close to the peak flowering period for the planted species in the *revegetation area.*
black cockatoo habitat trees	means trees that have a diameter, measured at 130 centimetres from the base of the tree, of 50 centimetres or greater (or 30 centimetres or greater for *Eucalyptus salmonophloia* or *Eucalyptus wandoo*)
black cockatoo species	means one or more of the following species: (a) *Zanda latirostris* (Carnaby's cockatoo); (b) *Zanda Calyptorhynchus* (Baudin's cockatoo) (c) *Calyptorhynchus banksia naso* (red-tailed black-cockatoo)
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*.
clearing	has the meaning given under section 3(1) of the EP Act.
condition	a condition to which this clearing permit is subject under section 51H of the EP Act.
dieback	means the effect of *Phytophthora* species on native vegetation.
department	means the department established under section 35 of the *Public Sector Management Act 1994* (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
EP Act	*Environmental Protection Act 1986* (WA)
evidence	means showing chew marks or scratching on the habitat tree representative of the species being surveyed, the presence of the species entering or leaving the habitat tree, and/or the presence of chicks/young.
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 *CEO* as a suitable fauna specialist for the bioregion, and who holds a valid fauna licence issued under the *Biodiversity Conservation Act 2016*.
fill	means material used to increase the ground level, or to fill a depression.
local provenance	means native vegetation seeds and propagating material from natural sources within 50 kilometres and the same IBRA subregion of the area cleared.
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, *WA Environmental Offsets Policy, September 2011*.
optimal time	means the period from April to June.
planting	means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of the desired species.

Term	Definition
revegetate/ed/ion	means the re-establishment of a cover of local provenance native vegetation in an area using methods such as natural regeneration, direct seeding and/or planting, so that the species composition, structure and density is similar to pre-clearing vegetation types in that area
revegetation area	means the 1.5-hectare area devoid of *native vegetation* within the area cross hatched green in Figure 3 of Schedule 1.
suitable habitat (south-western brush-tailed phascogale)	means habitat known to support south-western brush-tailed phascogale 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 (*Pseudocheirus occidentalis*) 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 (*Agonis flexuosa*) dominated woodlands, jarrah (*Eucalyptus marginata*) and marri (*Corymbia calophylla*) forests, riparian vegetation with a canopy of Bullich (*Eucalyptus megacarpa*) or flooded gum (*Eucalyptus rudis*), karri (*Eucalyptus diversicolor*) forests, sheoak (*Allocasuarina fraseriana*) 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 *Biosecurity and Agriculture Management Act 2007*; or (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or (c) not indigenous to the area concerned.

END OF CONDITIONS

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Juraj Galba
A/MANAGER
NATIVE VEGETATION REGULATION

Officer delegated under Section 20
of the Environmental Protection Act 1986

19 April 2024

SCHEDULE 1

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

Figure 1: Map of the boundary of the area within which clearing may occur and specific condition applies.

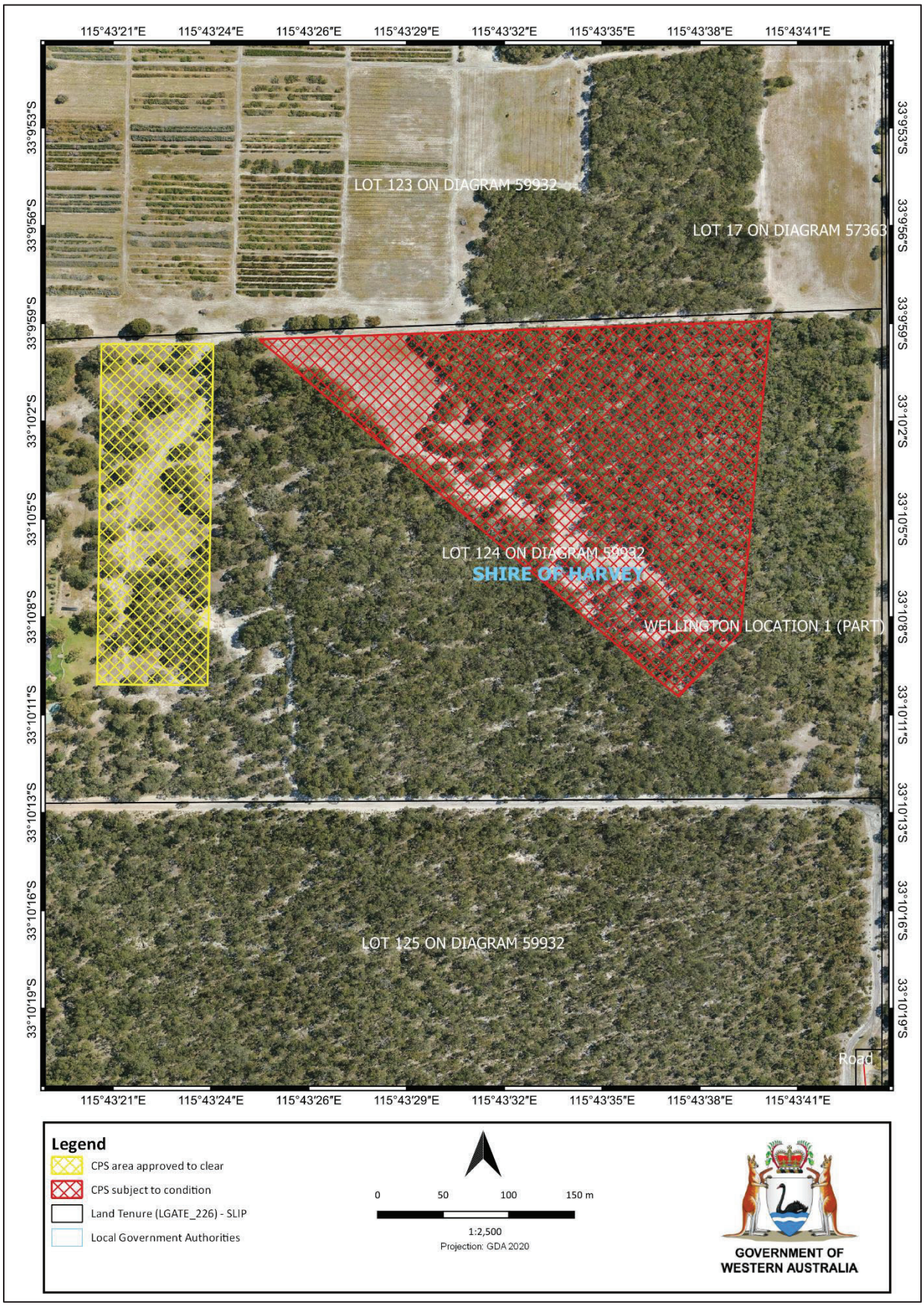


Figure 2: Map of the boundary within which offset conditions (conservation covenant) apply.

Figure 3: Map of the boundary within which revegetation offset conditions apply.

Government of Western Australia
Department of Water and Environmental Regulation

Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 9989/1
Permit type:	Area permit
Applicant name:	Mr Keith Sanders and Ms Tanuja Sanders
Application received:	30 November 2022
Application area:	2.62 hectares of native vegetation (revised)
Purpose of clearing:	Horticulture (expansion of an olive farm)
Method of clearing:	Mechanical
Property:	Lot 124 on Diagram 59932
Location (LGA area/s):	Shire of Harvey
Localities (suburb/s):	Parkfield

1.2. Description of clearing activities

The application area consists of a 2.62-hectare rectangular area (see Figure 1, Section 1.5). The clearing is required for the expansion of an existing olive farm on the property (Sanders. T & Sanders. K, 2022).

The application area was reduced from 3.01 hectares during the assessment of this application (refer to Section 3.1 for further details). The vegetation within the application area indicates signs of previous grazing by the absence or sparse middle and understorey vegetation. The application area consists of regrowth mature native trees in the overstorey (Ecology Matters, 2023). Although the application area is 2.62 hectares, it includes areas devoid of native vegetation. The actual area of canopy cover within the application area is approximately 1.21 hectares as illustrated in Figure 1, Section 1.5.

1.3. Decision on application

Decision:	Granted
Decision date:	19 April 2024
Decision area:	2.62 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 (the department) advertised the application for 21 days and received two submissions. Consideration of matters raised in the public submissions are summarised in Appendix B.

In making this decision, the Delegated Officer had regard for:

- avoidance and minimisation actions implemented by the applicant to reduce the extent of the application area (see Section 3.1 of this report)
- a detailed assessment of the clearing impacts on environmental values (see Section 3.2)
- other matters considered relevant to the assessment (see Section 3.3). This included:

    - advice from the department's Southwest Region that the applicant holds a valid water licence for taking of water (DWER, 2023b); and
    - development approval issued by the Shire of Harvey for the proposed olive farm expansion (Shire of Harvey, 2023).
- the additional information obtained during the assessment (Appendix A). Including the findings of:
    - a fauna survey that incorporates a habitat tree assessment (Ecology Matters, 2023)
    - a threatened ecological community assessment (Ecoedge, 2023)
    - photographs of the application area (Sanders. T & Sanders. K, 2022); and
    - a site inspection undertaken by the department (DWER, 2023a)
- expert advice received from the Commissioner of Soil and Land Conservation (CSLC) based on the findings of Department of Primary Industries and Regional Development's (DPIRD) site inspection (CSLC, 2023)
- public concerns raised during the submission period (Appendix B)
- the site characteristics and analysis of flora, fauna and ecological communities recorded/mapped within the local area (a 10-kilometre buffer from the application area) (see Appendix C)
- the 10 Clearing Principles set out in Schedule 5 of the EP Act (see Appendix D); and
- available datasets at the time of the assessment (see Appendix H).

After consideration of the above information, as well as the avoidance, minimisation and mitigation actions taken by the applicant, the Delegated Officer determined that the clearing would result in the following significant residual impacts:

- 1.21 hectares of high quality foraging habitat for all three black cockatoo species (*Zanda latirostris* (Carnaby's cockatoo), *Z. baudinii* (Baudin's cockatoo) and *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo)); and
- 1.21 hectares of moderate quality habitat for the *Pseudocheirus occidentalis* (western ringtail possum).

To address the above significant residual impacts and applying the WA environmental offsets metric (the offsets metric) along with the environmental offsets metric guideline, and consistent with the *WA Environmental Offsets Policy* (2011) (the Offsets Policy) and *Western Australia's Environmental Offsets Guidelines* (2014) (the Offsets Guidelines), the Delegated Officer determined that the following offset would address 100 per cent of the significant residual impacts of the clearing on black cockatoos and more than 100 per cent on WRP:

- Revegetation of 1.5 hectares of bare ground within a 3.3-hectare area of Lot 124 on Diagram 59932 (hereafter referred to as the revegetation area), through the planting of a minimum of 150 native trees consisting of 60 individuals of *Eucalyptus marginata* (jarrah), 60 individuals of *Corymbia calophylla* (marri) and 30 individuals of *Eucalyptus patens* (blackbutt). The revegetation area will be conserved in perpetuity under a conservation covenant.
- Conservation of a further 3.76 hectares of native vegetation in very good condition (Keighery, 1994) located within Lot 124 on Diagram 59932.

The Delegated Officer also determined that the proposed clearing will result in:

- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values
- increased likelihood of mortality of fauna utilising the application area at the time of clearing; and
- potential land degradation in the form of wind erosion.

On this basis, the Delegated Officer decided to grant a clearing permit subject to the following conditions imposed on the clearing permit:

- avoid, minimise to reduce the impacts and extent of clearing
- take hygiene steps to minimise the risk of the introduction and spread of weeds
- commencement of activities associated with the olive plantation within three months of the cessation of clearing to minimise the risk of wind erosion
- avoid the clearing of two habitat trees within the application area (ID: 4212 and 4211)
- revegetation of 1.5 hectares of bare ground within the revegetation area through the planting a minimum of 150 native trees (to be a mixture of 60 individual marri, 60 individual jarrah and 30 individual blackbutt) with management measures to ensure the long-term survival of the 150 trees. The revegetation area is to be conserved in perpetuity under a conservation covenant; and
- conservation of 3.76 hectares of native vegetation in very good (Keighery, 1994) condition that provides high quality forging habitat for black cockatoo cockatoos, and moderate habitat for western ringtail possum.

Noting the applicant's requirements under the permit conditions to provide an offset to counterbalance the significant residual impacts by 100 per cent, the Delegated Officer considered that the impacts of the proposed clearing are

unlikely to have any long-term adverse impacts on the environmental values in the local area and that the abovementioned management practices will adequately counterbalance any potential impacts.

In addition to the above, the Delegated Officer also took into consideration the following when making the decision to grant the clearing permit application.

- the purpose of the clearing is consistent with the planning framework and has been granted a Development Approval by the Shire of Harvey
- the proposed offsets are immediately adjacent to the impact area
- the 1.5 hectares of revegetation offset will deliver a net gain in native vegetation (1.5 ha of revegetation compared to the 1.21 ha of vegetation to be cleared)
- as the current condition of the application area is 'parkland cleared' vegetation and the proposed offset locations are adjacent to the application area, the offset outcome would be highly 'like for like' if not better
- In the long-term, the current fragmentation nature of the property will be improved by the revegetation conditions implemented on the clearing permit
- following the delivery of the offsets, an additional 7.06 hectares of foraging habitat in a known black cockatoo migration corridor will be protected in perpetuity; and
- according to the calculations, the offsets will counterbalance 111 per cent of the significant residual impacts for the loss of WRP impacts, that is 11 per cent more than the minimum required.

1.5. Site map

Figure 1: Map of the application area. The area crosshatched yellow indicates the area authorised to be cleared under the granted clearing permit.

2 Legislative context

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

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

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

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Rights in Water and Irrigation Act 1914* (WA) (RIWI Act)
- *Aboriginal Heritage Act 1972* (WA)
- *Soil and Land Conservation Act 1945* (WA)

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

Applicant (Sanders. T & Sanders. K, 2023b) advised that the aim of the project is to create a sustainable agricultural landscape that supports local wildlife while ensuring the economic viability of the olive plantation and of the region. Prior to applying for a clearing permit, the applicant considered two other options that did not involve clearing of native vegetation. The options were compared against number of factors that relates to the business operated by the applicant. A comparison of benefits between the options are shown in the table below.

Table 1: Development options considered by the applicant (Sanders. T & Sanders. K, 2023b).

-	Option 0	Option 1	Option 2	Comments
Total Olive Trees	7,500	14,000	20,000	
Total Production in litres per annum	11,000 to 14,000	18,000 to 22,000	26,000 to 32,000	
Reduction in Carbon footprint in tons of CO2 reduction per month	450	840	1,200	Carbon credits will be our future currency as we head towards Net-Zero
Employment Offering		2 FTE	3 FTE	
Investment		$550K	$900K	
Potential for Export/Annum	$100K	$250K	$400K	
Total Solar Energy Generation	22kW	22kW	40kW	
No. of Carbon offsets with solar energy harnessing	25 - 75 trees	25 - 75 trees	50 - 135 trees	Winter to Summer months
CO2 reduction per month	1.5 - 4.5 tons	1.5 - 4.5 tons	3.0 - 8.0 tons	Winter to Summer months through solar energy harvesting
Clearing of Native Trees under the Permit	Nil	Nil	< 50	
Impact per month on Carbon footprint due to clearing			<3.0 tons	
Increase in foraging habitat		Good	Substantial	Birds love Olives and each year we lose 30 - 40% fruit to the birds
Bushfire Management	High Risk	High Risk	Low Risk	As 3 hectares of land between the forest and housing / highway will be irrigated and weed controlled through plantation management
Profit per Annum	$23K	$75K	$150K	
Tourism Attraction		Increased	Increased	
Support to Local Businesses		Increased	Increased	
Asset Value		Appreciated	Appreciated	

Considering the above, the applicant has determined that the most cost-effective option for their business is to expand the olive into an additional area. An area with the least amount of vegetation clearing was selected for the purpose of expanding the olive farm (Sanders. T & Sanders. K, 2022).

The following avoidance measures were further applied by the applicant throughout the assessment process:

- based on the findings of the black cockatoo habitat assessment (Ecology Matters, 2023), the applicant reduced the application area by 0.39 hectares, which is the western portion of the initial application area, to avoid clearing as many black cockatoo habitat trees as possible.
- the applicant has also proposed to retain two habitat trees with no observed hollows near the northern boundary of the application area.

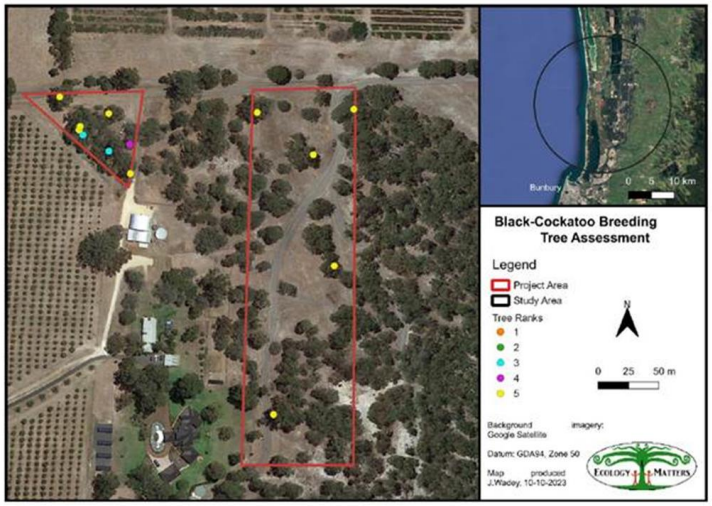


Figure 2: A map representing the habitat trees identified within the initial application area.

The applicant acknowledged the impacts of the clearing and proposed the following mitigation measures:

- place a conservation covenant over three hectares of dense forest along the eastern boundary of the property as illustrated in the figure below; and

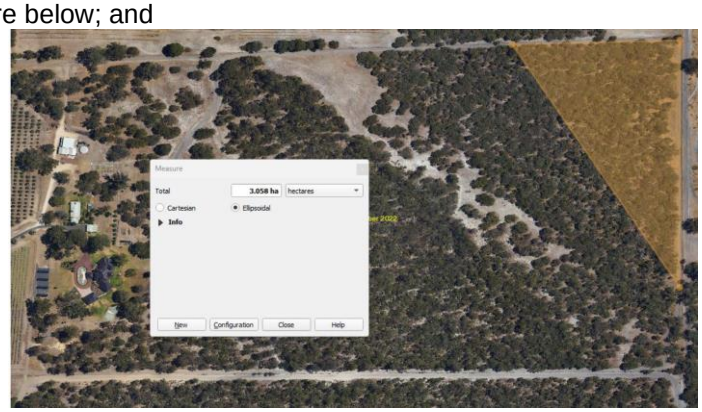


Figure 3: Area proposed by the applicant for a conservation covenant.

- plant 100 native trees (marri, jarrah, blackbutt or tuart) in the area shown in the image below.

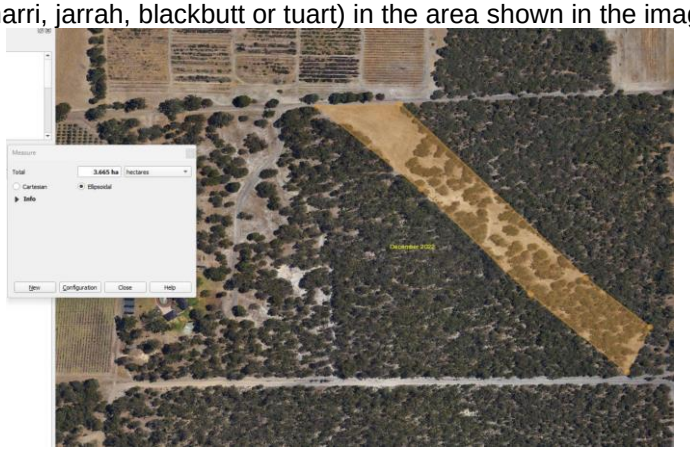


Figure 4: Area proposed for the planting of 100 native trees.

After consideration of avoidance and mitigation measures, the department has determined that an offset was necessary to account for the significant residual impacts of the proposed clearing:

- the loss of moderate quality habitat for western ringtail possum; and
- the loss of significant foraging habitat for (*Zanda latirostris* (Carnaby's cockatoo), *Zanda baudinii* (Baudin's cockatoo) and *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo)).

In accordance with the Offsets Policy and the Offsets Guidelines, the above significant residual impacts have been addressed through the conditioning of environmental offset requirements on the permit. The nature and suitability of the offset provided are summarised in Section 4.

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer had regard for the site characteristics (see Appendix C) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

The assessment against the clearing principles (see Appendix D) identified that the impacts of the proposed clearing present a risk to biological values 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 (flora and ecological community) - Clearing Principles (a) (d)

Assessment

The proposed application area is located within the Swan Coastal Plain Interim Biogeographic Regionalisation for Australia (IBRA) region of Western Australia. According to available databases, the broadscale vegetation mapped within the application area is the Yoongarillup Complex, which is described as woodland to tall woodland of *Eucalyptus gomphocephala* (tuart) with *Agonis flexuosa* (peppermint) in the second storey, less consistently an open forest of *E. gomphocephala* (tuart) - *Eucalyptus marginata* (jarrah) and *Corymbia. calophylla* (marri) with south of Bunbury characterized by *Eucalyptus rudis* (flooded Gum) - *Melaleuca* species open forests. (Government of Western Australia, 2019a).

According to the findings of the department's site inspection (DWER, 2023a), the vegetation within the application area comprised of *Corymbia calophylla* (marri), *Eucalyptus marginata* (jarrah), *Eucalyptus gomphocephala* (tuart) and *Agonis flexuosa* (peppermint trees) species.

According to the information available to the department through the supporting information provided by Ecology Matters (2023), the application area contains mature trees of peppermint and tuart, with mature trees of marri, regrowth *Eucalyptus patens* (Blackbutt), scattered acacia shrubs and isolated grass trees and zamia palms (Ecology Matters, 2023).

Based on the information available to the department, the application was identified to be previously grazed given the absence of middle and understorey vegetation, with majority of the area being open and cleared. It was determined that the condition of the application area ranged from degraded (Keighery, 1994) to completely degraded (Keighery, 1994) (DWER, 2023; Ecoedge, 2023).

Flora

According to the desktop assessment, 24 conservation significant flora species were identified within the local area, which consist of seven threatened flora species and 17 priority flora species. In forming a view on the likelihood of these species occurring within the application area, the preferred habitat types of these species and their recorded proximity to the application area were considered, along with the vegetation/soil types and landforms within the application area.

Vegetation proposed to be cleared is in a degraded to completely degraded condition utilising the vegetation condition scale of Keighery (1994). The structure of the vegetation is no longer intact and is 'parkland cleared' with little to no native understorey. Due predominantly to the lack of understorey, the species richness of the vegetation present is very low when compared to analogous areas of native vegetation in better condition. Therefore, the likelihood of flora species of conservation significance occurring within the application area is very low.

Ecological Community

A portion of the application area is mapped within a 'Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain' (the Tuart Woodlands) community which is listed as a Priority three (3) Priority Ecological Community (PEC) under the BC Act and Critically Endangered Threatened Ecological Community (TEC) under the

EPBC Act. This community is described as a woodland, forest, or other structural forms where the primary feature is the presence of *E. gomphocephala* in the upper most canopy, often with a sub-canopy of *Agonis flexuosa* (peppermint), with a relatively open understorey (DoEE, 2019a). The Tuart Woodlands and Forests are considered to be significant due to their capacity to support threatened fauna, such as *Pseudocheirus occidentalis* (western ringtail possum) and black cockatoos, and a number of threatened and priority flora species (DoEE, 2019b).

Ecoedge (2023) undertook a threatened ecological community assessment 6 October 2023 to identify whether the application area comprised of the Tuart Woodland TEC. The assessment considered the following criteria to assess the presence of the PEC/TEC within the application area (Ecoedge, 2023).

- patches occur in the Swan Coastal Plain bioregion
- location on the Spearwood and Quindalup dune systems but can also occur on the Bassendean dunes and Pinjarra Plain. It can also occur on the banks of rivers and wetlands
- the presence of at least two living established *Eucalyptus gomphocephala* (tuart) trees in the uppermost canopy layer, although they may co-occur with trees of other species; and
- a gap of no more than 60 metres between the outer edges of the canopies of adjacent tuart trees.

Ecoedge (2023) identified four patches meeting the key diagnostics characteristics of the Tuart Woodlands TEC (patch 1, patch 2, patch 3 and patch 4) within the survey area. Only patches 1, 2 and 4 were intersecting the application area (Ecoedge, 2023).

- Patch one (1) (3.69 ha) had less than 50 per cent native understorey species, greater than 70 per cent weed cover and three or less native species per assessment site. Patch 1 vegetation was classified as completely degraded (Keighery, 1994) and 'Poor' according to the condition scale in the Tuart Woodlands conservation advice.
- Patch two (2) (1.8 ha) was rated as almost 98 per cent completely degraded or degraded (Keighery, 1994) with less than 50 per cent native species and between 30-70 per cent weed cover. Only a small portion of the patch was rated as Good (Keighery, 1994) and had twelve native understorey species.
- Patch four (4) (0.31 ha) had two tuart trees, with the 30-metre buffer just within the survey area and was in a completely degraded (Keighery, 1994) vegetation condition.

Based on the above findings, Ecoedge (2023) concluded that the vegetation within the application area does not represent the Tuart Woodlands TEC.

Conclusion

Based on the above assessment, the proposed clearing is not likely to result in significant impact to conservation significant flora species or conservation significant ecological communities.

Weeds have the potential to out-compete native flora and reduce the biodiversity of an area. Potential impacts to biodiversity as a result of the introduction and spread of weeds may be minimised by the implementation of a weed management condition.

Conditions

To address the above impacts, the following management measures will be conditioned on the clearing permit:

- avoid and minimise clearing, to minimise the direct impacts to native vegetation.
- weed and dieback management, to minimise the risk of the introduction and spread of weeds and dieback into adjacent vegetation.

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

Assessment

The department's desktop assessment identified 25 conservation significant fauna species in the local area, which included 15 species of bird, one species of invertebrate, eight species of mammal, and one species of reptile. The majority of records in the local area are associated with *Zanda latirostris* (Carnaby's cockatoo) followed by *Calyptorhynchus sp.* (white-tailed black cockatoo) and *Pseudocheirus occidentalis* (western ringtail possum). A likelihood assessment was undertaken for these species, and it was determined that based on the mapped vegetation and information provided by the proponent, the proposed clearing may contain habitat suitable for these species.

- Black cockatoo species
  - *Zanda baudinii)* (Baudin's cockatoo) - Endangered
  - *Zanda latirostris* (Carnaby's cockatoo) - Endangered
  - *Calyptorhynchus banksii naso*) (Forest red-tailed black cockatoo) - Vulnerable
- *Pseudocheirus occidentalis* (Western ringtail possum (WRP)) – Critically Endangered; and
- *Phascogale tapoatafa wambenger* (South-western brush-tailed phascogale) – Conservation Dependent

Black cockatoos

The application area is mapped within the known distribution zones of the endangered Baudin's cockatoo, Carnaby's cockatoo and the vulnerable forest red-tailed black cockatoo, collectively referred to as 'black cockatoos' hereafter. Baudin's cockatoo is more commonly associated with the forests of the Jarrah Forest Bioregion, with Carnaby's cockatoo more commonly associated with the Swan Coastal Plain (Department of Agriculture, Water and the Environment (DAWE), 2022). The forest red-tailed black cockatoo has become more commonly sighted on the Swan Coastal Plain in recent decades.

The application area is not mapped as a roost site for black cockatoos, nor is it mapped as foraging habitat. However, it is directly adjacent to areas mapped as possible feeding habitat, and the site is partially mapped as remnant vegetation.

The department's inspection noted the following (DWER, 2023a):

- The trees in the application area comprise of very good to excellent quality foraging habitat for black cockatoos
- Foraging evidence by black cockatoos were observed throughout the entire application area
- Two flocks of red-tailed black cockatoos (between 5 – 10 birds in each flock) were seen foraging on site
- A flock of three white-tailed cockatoos (most likely Carnaby's) were foraging on site; and
- Black cockatoo calls were heard during the time spent on site.

The seasonal movements of black cockatoos mean they require large areas of habitat for breeding, night roosting and foraging, as well as connectivity between these habitats to assist their movement through the landscape (Commonwealth of Australia, 2012). The assessment has considered the potential impacts of the proposed clearing on all types of black cockatoo habitat.

Breeding habitat

Breeding habitat for black cockatoos includes trees that either have a suitable nest hollow or are of a suitable diameter at breast height (DBH) to develop a nest hollow. Suitable DBH for nest hollows is 500 millimetres for most tree species (Commonwealth of Australia, 2012; DAWE, 2022) however, is reduced to 300 millimetres for wandoo and salmon gum (Commonwealth of Australia, 2012).

Breeding habitat for species of black cockatoos is described as the following (DAWE, 2020):

- Baudin's cockatoo - Generally in woodland or forest but may also breed in former woodland or forest now present as isolated trees. Nest in hollows in live or dead trees of *Eucalyptus diversicolor* (karri), *Corymbia calophylla* (marri), *Eucalyptus wandoo* (wandoo) and tuart *Eucalyptus gomphocephala* (tuart).

- Carnaby's cockatoo - Generally in woodland or forest, but also breeds in former woodland or forest now present as isolated trees. Nest in hollows in live or dead trees of salmon gum *Eucalyptus Salmonophloia* (salmon gum), wandoo, tuart, jarrah, *Eucalyptus* rudis (flooded gum), *Eucalyptus loxophleba* subsp. *Loxophleba* (york gum), *Eucalyptus accedens* (powder bark), karri and marri.

- FRTBC - Generally in woodland or forest but may also breed in former woodland or forest now present as isolated trees. Nest in hollows in live or dead trees of marri, karri, wandoo, *Eucalyptus megacarpa* (bullish), *Eucalyptus patens* (blackbutt), tuart and jarrah.

Ecology Matters (2023) identified 13 habitat trees within the original application area. Of these, eight trees were excluded from the application area. The applicant has further committed to retaining two habitat trees within the northern portion of the application area. Therefore, the application area includes three habitat trees with no hollows. Given the absence of suitable breeding hollows, the proposed clearing is unlikely to impact black cockatoo breeding habitat.

Roosting

Night-roosts are usually located in the tallest trees of an area, and in close proximity to both a food supply and a water source (DAWE, 2022).

The closest confirmed roost site is located approximately 3.60 kilometres from the application area. The photographs (DWER, 2023a) and the results of the fauna survey (Ecology Matters, 2023) indicate that the marri trees located within the application area are of a suitable height to provide roosting habitat. None of these trees were identified as a known, confirmed roost site. Ecology Matters (2023) did not identify any habitat trees with hollows which could be used for roosting by black cockatoos. Given this, the proposed clearing is unlikely to impact black cockatoo roosting.

Foraging

The application area is located in the Swan Coastal Plain which is an extensively cleared area and an area used by black cockatoos primarily for foraging resources. A key focus for this region is the ongoing viability of foraging resources for black cockatoos, particularly the Carnaby's cockatoos (DAWE, 2022).

The preferred foraging habitat for each of the species is described below:

- Carnaby's cockatoo – native shrubland, kwongan heathland and woodland dominated by proteaceous plant species such as banksia spp, hakea spp. and grevillea spp, as well as allocasuarina and eucalyptus species, marri and a range of introduced species (Valentine and Stock, 2008).
- Forest red-tailed black cockatoo – jarrah and marri woodlands and forest, edges of karri forests including wandoo and blackbutt within the range of the species (DAWE, 2022).
- Baudin's cockatoo – eucalypt woodlands and forest, proteaceous woodland, and heath. Primarily feeding on marri during the breeding season and non-native species outside of the breeding season (DAWE, 2022). During the breeding season (October to late January/early February), Baudin's has a preference for marri seeds (Commonwealth of Australia, 2012).

Food resources within the range of breeding sites and roost sites are important to sustain black cockatoo populations. Foraging resources are therefore, viewed in the context of known breeding and night roosting sites. It is considered that foraging habitat within 6 to 12 kilometres of an application area are a significant food source (DAWE, 2022). According to the available databases, seven known black cockatoo roosting sites are mapped within the 12 kilometres of the application area. The closest mapped breeding site is located nine kilometres north of application area (recorded through another clearing permit application). The application area is also within the migration corridor for the Carnaby's black cockatoos.

The application area contains jarrah, marri and tuart species which are known as primary foraging habitat for all three species of black cockatoos. Individuals of blackbutt species which are also a foraging resource for two species of black cockatoos are also within the application area. Evidence of black cockatoo foraging was observed during the fauna survey (Ecology Matters, 2023) and the department's site inspection (DWER, 2023a) in the form of chewed marri and blackbutt nuts. The evidence of foraging within the application area was attributed to forest red-tailed black cockatoos (Ecology Matters, 2023).

Based on the above, it is likely that the vegetation within the application area comprises of significant foraging habitat that supports both breeding and roosting of the black cockatoos.

The local area comprises approximately 10,235.43 hectares of native vegetation, which is also mapped as black cockatoo feeding habitat within the Swan Coastal Plain. The application represents approximately 0.012 per cent of this extent (see Figure 5).

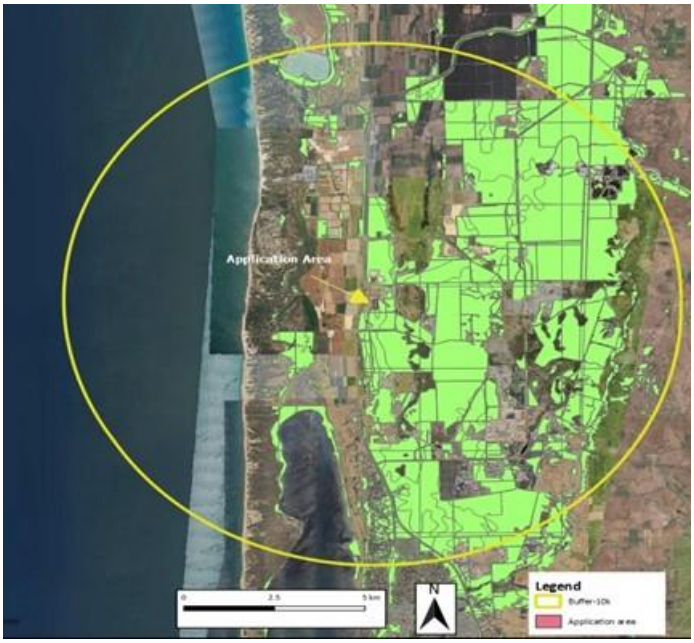


Figure 5: Extent of black cockatoo foraging habitat within the local area of clearing permit application CPS 9989/1.

Although the local area comprises of vegetation that can provide foraging resources to black cockatoos, the department considers that cumulative impact of clearing black cockatoo foraging habitat within the Swan Coastal Plain is resulting in an ongoing decline in foraging resources available to the black cockatoo birds. Based on this, the proposed clearing is likely to have a significant impact on the black cockatoo foraging. In particular, suitable vegetation for foraging in this region is considered to be significant for Carnaby's cockatoo, as this area is part of an important migration corridor for this species.

***Pseudocheirus occidentalis* (Western ringtail possum)**

The application area is mapped within the Swan Coastal Plain Management zone for the western ringtail possum (WRP) (DPAW, 2017a). Populations of WRP in the Swan Coastal Plain Management zone are associated with stands of myrtaceous trees (usually *Agonis flexuosa* trees (peppermint)) growing near swamps, water courses or floodplains, and at topographic low points which provide cooler and often more fertile conditions (DPaW, 2017). Habitat critical to survival comprises long unburnt mature remnant peppermint woodlands with high canopy continuity and high nutrient foliage with minimal periods of summer moisture stress, and habitat connecting patches of remnants (Jones et al. 1994)

WRP resting sites include constructed dreys and tree hollows, with dreys constructed in the canopy when hollows are not available (Jones et al, 1994). The department's site inspection (DWER, 2023a) and the fauna survey (Ecology Matters, 2023) did not identify evidence of WRP individuals within the application area. The large trees that were identified within the application did not contain hollows of any size that could be used by WRP for nesting.

While the application area is not mapped as suitable habitat, it is directly adjacent to areas that are, and photographs supplied by the applicant (Sanders. T & Sanders. K, 2023a) and the results of the fauna survey (Ecology Matters, 2023) note the presence of peppermint trees within the site. However, no evidence of the application area being used by the WRP were identified.

The WRP recovery plan notes that any habitat where possum individuals occur naturally are considered critical and worthy of protection. The plan further states that habitat critical to survival for WRP is not well understood and is therefore, based on the habitat variables observed where WRP are most commonly recorded (DPaW, 2017).

Given the peppermint trees identified within the application area, the presence of remnant vegetation connectivity immediately adjacent to the application area and the proximity to the nearby records (187 records in the local area), it is considered that the application area is likely to provide habitat for the WRP species and WRP individuals may be transecting the application area.

***Phascogale tapoatafa wambenger* (South-western brush-tailed phascogale)**

The preferred habitat for phascogale species in Western Australia is within dry sclerophyll forests and open woodlands that contain hollow bearing trees. The species almost exclusively forages among the tree canopy (Department of Environment and Conservation, 2012). According to the fauna survey, the application area does not contain trees with hollows to provide refuge for this species (Ecology Mattes, 2023). Although the surrounding vegetation is connected, the application area alone consists of scattered trees throughout the application area, increasing the chance of predation.

Based on the above, it is not likely that this species would prefer using the application area and there is abundance of better condition vegetation located adjacent to the application area that would more likely provide habitat for the phascogale. The fauna survey did not record any evidence of this species utilising the application area (Ecology Matters, 2023). However, this species could use the application area for dispersal.

Ecological Linkage

The application area does not intersect the mapped ecological linkages but occurs approximately 1.2 kilometres south and approximately 1.5 kilometres west of the South West Regional Ecological Linkages mapped by Molloy et. al., (2009). Given the separation distance between this linkage and the application area, the proposed clearing is unlikely to impact on the SWREL linkage. The application area is adjacent to a larger remnant of native vegetation. Therefore, it may be part of an ecological linkage which supports fauna movement across the local landscape. However, noting the extent of the proposed clearing and lack of a continuous tree canopy, the proposed clearing is unlikely to decrease the effectiveness of local linkages.

The required offset will enhance the ecological linkage by connecting two patches of remnant vegetation and improving their canopy connectivity.

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

- the loss of 1.21 hectares of significant foraging habitat for black cockatoos
- the loss of 1.21 hectares of vegetation that would provide suitable habitat for WRP; and
- increased risk of mortality on WRP and south-western brush-tailed phascogale individuals, should they be present in the application area at the time of the clearing activities.

The potential direct impact to fauna resulting from the proposed clearing can be managed through directional clearing and fauna management conditions.

However, the impacts of the proposed clearing to significant foraging habitat for black cockatoos and habitat for WRP constitutes a significant residual impact.

The applicant may have notification responsibilities under the EPBC Act for impacts to black cockatoo and its habitat, as set out in the EPBC Act referral guidelines for these species.

Conditions
The following management measures will be required as conditions on the clearing permit:

- avoid and minimise clearing, to minimise the direct impacts to native vegetation
- directional clearing, which requires slow, progressive, one directional clearing to allow terrestrial fauna to disperse ahead of the clearing activity should they occur on site at the time of clearing
- fauna management (WRP and South -western brush-tailed phascogale) – to ensure that a fauna specialist is present on site while the proposed clearing occurs
- offset – revegetation of 1.5 hectares of the Revegetation Area using *Eucalyptus marginata* (jarrah), *Corymbia calophylla* (marri) and *Eucalyptus patens* (blackbutt); and
- offset – conservation of 7.06 hectares of vegetation in perpetuity under section 30B of the *Soil and Land Conservation Act 1945.*

3.2.3. Land and water resources (wind erosion) - Clearing Principles (g)

Assessment
According to the available databases, the application area is mapped within two soil landscape mapping systems:

- spearwood S1b phase, described as dune ridges with deep siliceous yellow brown sands or pale sands with yellow-brown subsoil and slopes up to 15 per cent. The soil in this landform is identified as deep siliceous yellow brown sands or pale sands with yellow-brown subsoil; and
- spearwood S2c phase, described as dominated by lower slopes (1-5%) of dune ridge which usually occurs on the eastern edge of the Spearwood dunes. The soil in this landform is identified as bleached or pale sands with a yellow-brown or pale brown subsoil.

To accurately assess the potential land degradation issues resulting from the proposed clearing the department sought expert advice from the CSLC. DPIRD undertook a site inspection on 16 February 2023 to assess the impacts of the proposed clearing on the degradation of the land. The assessment identified that the site is dominated by gentle slopes with very deep, pale, and yellow sands (CSLC, 2023). An assessment of land degradation risks from the proposed clearing is summarised below (CSLC, 2023).

- Wind erosion - The likelihood of wind erosion is unlikely to increase with the proposed clearing of the native vegetation given suitable groundcover is established.
- Water erosion - The likelihood of water erosion in this location is considered low.
- Salinity - The risk of salinity causing land degradation is low; no salinity is occurring on the property; no offsite salinity was observed.
- Waterlogging - The likelihood of waterlogging in this location is low.
- Phosphorus export - The likelihood of phosphorus export in this location is low. Good management of crop once established will further reduce this risk.

Conclusion
Based on the above assessment, the proposed clearing is likely to increase the risk of wind erosion. However, with adequate land management practices, this risk can be managed.

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

- commence the proposed land use activities within three months of cessation of the clearing activities.

3.3. Relevant planning instruments and other matters

The Shire of Harvey (2023) (the Shire) advised that the applicant requires local government approvals under the *Planning and Development Act 2005.* The Shire did not have any objections to the proposed clearing subject to the department implementing an offset condition on the clearing permit, with appropriate species and a maintenance program to ensure the establishment of the planting. On 13 April 2023, the Shire granted a Development Approval (DA) to the applicant for the purpose of olive orchard expansion (Shire of Harvey, 2023).

The application area is mapped within the northwestern section of the Kemerton industry buffer. The buffer is to ensure that the impact of the Kemerton industry do not adversely impact the public beyond the buffer area. Advice received from the Shire states that the proposed clearing will have minimal impact on the intent of the Kemerton buffer. It is noted that the DA includes an advice note that the department will require a condition for an offset management plan or mitigation actions in its clearing permit issued to the applicant (Shire of Harvey, 2023).

The subject property is located within the South West Coastal Groundwater area as proclaimed under the RIWI Act. Any groundwater abstraction in this proclaimed area is subject to licensing by the department, other than supply from the shallow watertable (superficial aquifer) for domestic and non-intensive stock watering purposes (DWER, 2023c). The applicant has indicated that the proposed extension will be irrigated utilising the current water licences issued to the property.

The applicant holds two licences under section 5C of the RIWI Act. Groundwater licences GWL171325(3) and GWL168999(2), which authorise the take of groundwater for horticulture and the irrigation of lawns and gardens. The available water allocation appears to be sufficient for the proposed olive grove expansion (DWER, 2023c).

GWL171325(3) authorises the take of groundwater from the superficial aquifer for horticultural purposes and the irrigation of up to 0.5 hectares of lawns and gardens. The annual water entitlement is 50,000 Kilolitres. An increase in the entitlement was approved on 13 December 2022 from 5,000 Kilolitres to 50,000kL/a. There is currently one superficial bore on the property. GWL168999(2) authorises the take of groundwater from the Leederville aquifer for horticultural purposes and the irrigation of up to 0.4 hectares of lawns and gardens. The annual water entitlement is 50,700 Kilolitres, with water taken across two bores (DWER, 2023c)

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* (WA) and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

4 Suitability of offsets

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

- 1.21 hectares of high quality foraging habitat for all three black cockatoo species; and
- 1.21 hectares of moderate quality habitat for the western ringtail possum.

The applicant proposed an environmental offset consisting of:

- planting of 100 trees (marri, jarrah, blackbutt or tuart) within a 3.66 hectare revegetation area; and
- placing a conservation covenant over 3.06 hectare of vegetated land.

The department has undertaken an assessment of the proposed offset using the offsets metric and in accordance with the *WA Environmental Offset Policy* (2011) and Offset Guidelines (2014), determined that the proposed offset is not sufficient to counterbalance 100 per cent of the significant residual impacts.

The department has undertaken a revised offset calculation and determined that the following offset is required to fully counterbalance the proposed clearing.

- Revegetation of 1.5 hectares of bare ground within a 3.3 hectares revegetation area through the planting of 150 native trees (to be a mixture of marri, jarrah and blackbutt) with management measures to ensure the long term survival of the trees which include: ongoing infill planting, weeding, watering and monitoring by an environmental specialist. This revegetation area (3.3 hectares) is to be conserved in perpetuity under a conservation covenant; and
- Conservation of a further 3.76 ha of native vegetation in very good condition that provides high quality forging habitat for black cockatoo cockatoos, and moderate habitat for western ringtail possum.

Table 2: Summary of the offset strategy

	3.30 ha 'revegetation area'		3.76 ha adjacent area (covenant only)
	1.50 ha (revegetation and covenant)	1.80 ha (covenant only)	
Black cockatoos	48.1%	51.9%	
WRPs	42.2%	68.8%	

To achieve the best possible environmental outcomes, the department required the applicant to connect the revegetation offset (3.3-hectare area) with the area secured under the conservation covenant (3.76-hectare area) to reduce edge effects, and therefore, maximise the value of native vegetation at the property as a remnant. The Figure 6 below illustrates the location of the revegetation area and conservation covenant as proposed by the department. The objective of the revegetation is to ensure a long-term successful revegetation outcome with ongoing management measures to maximise the success of the revegetation. Conditions were implemented on the clearing permit to reflect this.

Figure 6: A map representing the location of the conservation covenant and the revegetation area.

The justification for the values used in the offset calculation is provided in Appendix F.

End

Appendix A. Additional information provided by applicant

Information	Description of the information
Photographs of the application area	The applicant (Sanders. T & Sanders. K, 2023a) submitted photographs of the application area on 17 February 2023 to support the department's assessment.
A threatened ecological community assessment (Ecoedge, 2023)	The applicant commissioned Ecoedge Environmental services (2023) to undertake a threatened ecological community assessment of the proposed clearing area. The assessment was conducted on 4 September 2023 in accordance with the Department of Climate Change, Energy, the Environment and Water (DCCEEW) "Approved Conservation Advice (incorporating listing advice) for the Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain ecological community".
Targeted fauna assessment (Ecology Matters, 2023)	The department requested the application to provide a fauna survey, including a habitat tree assessment. The applicant commissioned Ecological Matters to undertake the fauna survey. The fauna survey was conducted on 28 September 2023 targeting the following species: • Carnaby's black cockatoo (*Zanda latirostris*) • Forest red-tailed black cockatoo (*Calyptorhynchus banksia naso*) • Baudin's black cockatoo (*Zanda baudinii*) • Western ringtail possum (*Pseudocheirus occidentalis*);and • Western brush-tailed phascogale (*Phascogale tapoatafa wambenger*).
Photographs of the proposed offset area	To support the offset proposal and to determine the type of vegetation and vegetation condition (Keighery, 1994) within the revegetation and offset area, the department requested the applicant to provide photographs of the proposed offset areas. In response, the applicant has submitted a range of photographs of the offset area to the department (Sanders. T & Sanders. K, 2023c).

Appendix B. Details of public submissions

During the public submission period, the department has received two public submissions. A summary of the submissions are detailed in the table below (submission, 2023a; submission, 2023b).

Summary of comments	Consideration of comment
The photographs supplied in the application were not optimal for the assessment as they focused more fire effects	See Appendix G for photographs provided by the applicant during the assessment process and for photographs received through the surveys and expert advice.
Possible black cockatoo breeding habitat	See section 3.2.2 for further details on the departments assessment on black cockatoo breeding habitat.
Farming on previously cleared land over clearing native vegetation should be considered	The applicant has demonstrated avoidance and mitigation measures during the assessment process. See section 3.1.
Black cockatoo habitat assessment should occur for foraging, roosting, and breeding	A habitat assessment for black cockatoos was undertaken by Ecological Matters on 28 September 2028.
Part of a Carnaby's cockatoo migration corridor: increasing the importance of foraging and day roost habitat in this area.	See section 3.2.2 for further assessment explanation.
Importance of retaining current and future breeding habitat for the black cockatoo species.	The applicant has removed a 0.39 hectares area from the initial application area which resulted in eight black cockatoo habitat trees being retained. The applicant has further agreed to retain two more habitat trees located within the application area.
Importance of considering the cumulative impacts	Discussed under section 3.2.2 and considered in determining an appropriate offset to counterbalance the significant residual impacts. The revegetation offsets would deliver a net gain in native vegetation in the long-term (1.5 ha of revegetation compared to the 1.21 ha of vegetation to be cleared)
If black cockatoo habitat is present, and clearing is approved, the applicant should have to offset with revegetation commitments.	See section 4 that explain the offset conditioned on the clearing permit.

Appendix C. Site characteristics

C.1. Site characteristics

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

Characteristic	Details
Local context	The area proposed to be cleared is part of an expansive tract of native vegetation, albeit separated by tracks, roads and firebreaks, in the intensive land use zone of Western Australia. It is surrounded by scattered remnant vegetation and buildings to the west, native vegetation to the south and the east, and horticultural land to the north. Spatial data indicates the local area retains approximately 46.77 per cent of the original native vegetation cover.
Ecological linkage	The application area is approximately 1.5 km west of an axis line (47) mapped within the South West Regional Ecological Linkages, and is contiguous with remanent vegetation associated with this axis line. Vegetation within the application area links remnant native vegetation to its east and west.
Conservation areas	The application is not within a mapped conservation area. There are two conservation areas within one kilometre of the proposed clearing: • DPIRD Conservation Covenant – approximately 200 m southeast; and • Section 34A freehold land of DBCA interest – approximately 600 m east.
Vegetation description	A site inspection (DWER, 2023a), fauna assessment (Ecology Matters, 2023) and TEC assessment (Ecoedge, 2023) indicates vegetation within the application area consists of woodland to open-forest of *Eucalyptus gomphocephala* (Tuart), *Agonis flexuosa, Corymbia calophylla* (Marri), *Eucalyptus marginata* (Jarrah) and *Eucalyptus todtiana* (blackbutt), with understorey species including *Acacia* species shrubs, grass trees and *Macrozamia riedlei* (zamia palm) and a groundcover of mainly exotic species. This is largely consistent with the mapped vegetation type (Heddle et al., 1980): • Yoongarillup Complex - described as Woodland to tall woodland of *Eucalyptus gomphocephala* (Tuart) with *Agonis flexuosa* in the second storey. Less consistently an open forest of Eucalyptus gomphocephala (Tuart) - *Eucalyptus marginata* (Jarrah) - *Corymbia calophylla* (Marri). South of Bunbury is characterized by *Eucalyptus rudis* (Flooded Gum)-*Melaleuca* species open forests. (Government of Western Australia, 2019b). The mapped vegetation type retains approximately 35.81 per cent of the original extent (Government of Western Australia, 2019b).
Vegetation condition	A site inspection (DWER, 2023a), fauna assessment (Ecology Matters, 2023) and TEC assessment (Ecoedge, 2023) indicates vegetation within the application area is in Completely Degraded (northern portion) to Degraded (southern portion) (Keighery, 1994) condition. The full Keighery (1994) condition rating scale is provided in Appendix E. Representative photos are available in Appendix G.
Climate and topography	The proposed clearing is located in an area considered to have a mild climate with average maximum temperature of 23.7 degrees Celsius, and minimum average temperature of 11.4 degrees Celsius. The average rainfall is 865.6 mm. Elevation within the application area ranges from 10 m Australian Height Datum (AHD) in the south-eastern corner to 15 m AHD along the western boundary.
Soil description	Two soil types are mapped within the proposed clearing area, both are within the Spearwood system (211Sp):

Characteristic	Details
	• Spearwood S1b Phase - Dune ridges with deep siliceous yellow brown sands or pale sands with yellow-brown subsoil and slopes up to 15 per cent. • Spearwood S2c Phase - Lower slopes (1-5 per cent) of dune ridge with bleached or pale sands with a yellow-brown or pale brown subsoil (like S1c). Usually occurs on the eastern edge of the Spearwood Dunes.
Land degradation risk	The mapped soil types are associated with a high risk of wind erosion, moderate risk of phosphorus export and subsurface acidification, and low risk of other land degradation impacts (refer to Table C.5). Following a DPIRD's inspection of the property, CSLC (2023) identified that there is a land degradation risk from wind erosion. With appropriate management measures this risk can be mitigated.
Waterbodies	The application area does not intersect any wetlands or watercourses. The nearest waterbody to the application area is a conservation category sumpland approximately 0.6 km east.
Hydrogeography	The application is within the South West Coastal Groundwater Area proclaimed under the RIWI Act. Hydrogeology: Surficial Sediments - Shallow Aquifers (sand, gravel lithology) Groundwater salinity: 500-1000 mg/L TDS
Flora	There are records of 24 conservation significant flora within the local area, the closest of which to the application area is *Diuris drimmondii* approximately 0.9 km away.
Ecological communities	There are records of two threatened and four priority ecological communities within the local area. An occurrence of the Tuart Woodlands TEC intersects the northeastern corner of the application area. A TEC assessment (Ecoedge, 2023) found that while several tuart trees were present within the application area, patches of tuart vegetation did not meet the condition and size thresholds to be considered the Tuart Woodlands TEC.
Fauna	A total of 15 threatened, seven priority, three conservation dependent, six migratory and one other specially protected fauna species have been recorded within in the local area. Of these, the closest record to the application area is *Zanda latirostris* (Carnaby's cockatoo) recoded approximately 0.5 km away. There are seven known black cockatoo roost sites within a 12 km radius of the application area, the closest of which are 3.6 km away (no recorded roosts since 2017). (white tailed black cockatoo have been observed roosting). DWER is aware that a known white-tailed black cockatoo breeding site not included in the databases is present nine km north of the application area.

C.2. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	proportion (%) of current extent in all DBCA managed land
IBRA bioregion*					
Swan Coastal Plain	1,501,221.93	579,813.47	38.62	222,916.97	38.45
Vegetation complex					
Yoongarillup Complex*	27,977.93	10,018.14	35.81	5,151.57	18.41
Local area					
10 km radius	21,883.64	10,235.43	46.77	-	-

*Government of Western Australia (2019a)

C.3. Fauna analysis table

Significant fauna identified from the local area that required further consideration.

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
Calyptorhynchus banksii naso (*Forest red-tailed black cockatoo*)	VU	Y	Y	5.44	25	Y
Calyptorhynchus sp. 'white-tailed black cockatoo' (white-tailed black cockatoo)	EN	Y	Y	9.10	726	Y
Zanda Calyptorhynchus (Baudin's cockatoo)	EN	Y	Y	5.03	1	Y
Zanda latirostris (Carnaby's cockatoo)	EN	Y	Y	0.57	3555	Y
Phascogale tapoatafa wambenger (south-western brush-tailed phascogale, wambenger)	CD	Y	Y	2.75	19	Y
Pseudocheirus occidentalis (western ringtail possum, ngwayir)	CR	Y	Y	1.42	187	Y

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

C.4. Ecological community analysis table

Ecological Communities identified from the local area that required further consideration.

Community name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain	Priority 3	Y	Y	Y	0	113	N/A

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

C.5. Land degradation risk table

Risk categories	***Spearwood S1b Phase and Spearwood S2c Phase***
Wind erosion	H2: >70% of map unit has a high to extreme wind erosion risk
Water erosion	L1: <3% of map unit has a high to extreme water erosion risk
Salinity	<3% of map unit has a moderate to high salinity risk or is presently saline
Subsurface Acidification	M1: 10-30% of map unit has a high subsurface acidification risk or is presently acid
Flood risk	L1: <3% of the map unit has a moderate to high flood risk
Water logging	L1: <3% of map unit has a moderate to very high waterlogging risk
Phosphorus export risk	M1: 10-30% of map unit has a high to extreme phosphorus export risk

Appendix D. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment: The application area contains habitat for conservation significant fauna species. However, given the degraded to completely degraded condition of the vegetation (Keighery, 1994) and the nature of the application along with the result of a threatened ecological assessment, the application area is unlikely to contain conservation significant flora species or ecological communities.	Not likely to be at variance	Yes *Refer to Sections 3.2.1 and 3.2.2 above.*
Principle (b): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna."* Assessment: The area proposed to be cleared contains significant foraging habitat and potential roosting and breeding habitat for black cockatoos. The vegetation within the application area also contains suitable habitat for western ringtail possum.	At variance	Yes *Refer to Section 3.2.2, above.*
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: The application area proposed to be cleared is unlikely to contain habitat for flora species listed under the BC Act, noting it has previously been cleared of understorey species.	Not likely to be at variance	No
Principle (d): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community."* Assessment: A TEC assessment (Ecoedge, 2023) found that while several tuart trees were present within the application area, patches of tuart vegetation did not meet the condition and size thresholds to be considered the Tuart PEC/TEC.	Not likely to be at variance	Yes *Refer to Section 3.2.1, above.*
Environmental value: significant remnant vegetation and conservation areas		
Principle (e): *"Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared."* Assessment: The extent of the mapped vegetation type is consistent with the national objectives and targets for biodiversity conservation in Australia. Although the application area is contiguous with vegetation mapped within an axis line of the South West Regional Ecological Linkages, noting it is on the western edge of this linkage and that it contains relatively poor quality and patchy vegetation compared to vegetation to the east, it is not considered to play an integral role in this linkage. Although the application area may provide a local linkage between vegetation to its east and west, given that it contains relatively poor quality and patchy vegetation and better-quality vegetation will remain to the south which can also provide this local linkage, it value as a linkage is not considered to be significant.	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
Principle (h): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area."* Assessment: Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of nearby conservation areas.	Not likely to be at variance	No
Environmental value: land and water resources		
Principle (f): *"Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."* Assessment: Vegetation within the application area is not growing in association with a watercourse or wetland, and is not indicative of riparian vegetation.	Not likely to be at variance	No
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: The mapped soils are highly susceptible to wind erosion. However, according to the advice received from CSLC, impacts from wind erosion can be managed through good land management practices (CSLC, 2023). Therefore, the proposed clearing is not likely to result in an appreciable land degradation.	May be at variance	Yes *Refer to Section 3.2.3 above.*
Principle (i): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water."* Assessment: According to specialist advice received regarding groundwater quality under the RIWI Act, the proposal is unlikely to have a significant impact to groundwater quality. As stated in Principle (f), it is unlikely the proposal would have significant impacts on the nearby wetland. There are no watercourses or wetlands are mapped in close proximity to the application area. No impact to surface water from the proposed clearing is likely to occur.	Not likely to be at variance	No
Principle (j): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding."* Assessment: The mapped soils and topographic contours in the surrounding area do not indicate the proposed clearing is likely to contribute to increased incidence or intensity of flooding. The advice received from CSLC is that the risk of flooding due to the proposed clearing is low (CSLC, 2023).	Not likely to be at variance	No

Appendix E. Vegetation condition rating scale

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

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

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

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

Appendix F. Offset calculator value justification

Calculation 1: Revegetation offset for black cockatoos.

Field Name	Description	Justification for value used
Area of impact (habitat/community) or Quantum of impact (features/individuals)	The area of habitat/community impacted or number of features/individuals impacted	1.21 hectares of native vegetation that comprises of peppermint, tuart, marri, jarrah, blackbutt, scattered acacia shrubs and isolated grass trees.
Quality of impacted area (habitat/community)	The quality score for area of habitat/community being impacted - a measure of how well a particular site supports a particular threatened species or ecological community and contributes to its ongoing viability	7 – The vegetation proposed for clearing are primary foraging habitat for the black cockatoos. known black cockatoo roost and breeding sites in the local area and within a Carnaby's cockatoo migration corridor. Black cockatoos have been observed foraging here with evidence of foraging identified throughout the entire application area.
Time over which loss is averted (habitat/community)	This describes the timeframe over which changes in the level of risk to the proposed offset site can be considered and quantified	20 - The offset site will be conserved in perpetuity under a conservation covenant. 20 years is the maximum value associated with this field.
Time until ecological benefit (habitat/community) or Time horizon (features/individuals)	This describes the estimated time (in years) that it will take for the main benefit of the quality (habitat/community) or value (features/individuals) improvement of the proposed offset to be realised	17 – Noting the site characteristics of the revegetation offset area, and the applicant's commitment to plant tree species comprising marri, jarrah, and blackbutt, it is assumed that the benefits of revegetation of Carnaby's cockatoo foraging habitat will be available after 15 years. This is a conservative measure based on available literature (e.g., Lee et al. (2013) who identified evidence of foraging on marri and Banksia in rehabilitated mine pit areas, ranging from 8-14 years of age) and the understanding that marri and other large tree species may take longer to mature and provide calorific benefit. An extra two years have been allowed to account for the delay in commencement of the revegetation (assumed to commence within 2 years of permit start date).
Start area (habitat/community) or Start value (features/individuals)	The area of habitat/community or number of features/individuals proposed to offset the impacts	1.5 hectares – Area available for revegetation on the property and proposed by the applicant.
Start quality (habitat/community)	The quality score for the area of habitat/community proposed as an offset - a measure of how well a particular site supports a particular threatened species or ecological community and contributes to its ongoing viability	1 – revegetation proposed within a cleared area. Current quality is set higher than zero to account for site context, as per Draft procedure for environmental offsets metric inputs (2022)
Future quality without offset (habitat/community) or Future value without offset (features/individuals)	The predicted future quality score (habitat/community) or value (features/individuals) of the proposed offset site without the offset	1- no significant change expected
Future quality with offset (habitat/community) or Future value with offset (features/individuals)	The predicted future quality score (habitat/community) or value (features/individuals) of the proposed offset site with the offset	5 - would expect moderate quality foraging habitat to establish within 17 years.
Risk of loss (%) without offset (habitat/community)	This describes the chance that the habitat/community on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter of concern) over the foreseeable future without an offset	15% - The offset area is located within a rural property, and this is consistent with other decision making by the department.
Risk of loss (%) with offset (habitat/community)	This describes the chance that the habitat/community on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter of concern) over the foreseeable future with an offset	5% - The risk of loss will reduce with the conservation covenant placed over the property.
Confidence in result (%)	The capacity of measures to mitigate risk of loss of the proposed offset site	80% - no revegetation plan is in place, but strict revegetation conditions are implemented on the clearing permit to ensure the success of the revegetation.
% of impact offset	% of the significant residual impact that would be offset by the proposed offset (note: the offset calculations combined should equate to 100% for each residual impact)	48.1% - Obtained through the input of variables explained above.

Calculation 2: Land acquisition offset for black cockatoos.

Field Name	Description	Justification for value used
Area of impact (habitat/community) or Quantum of impact (features/individuals)	The area of habitat/community impacted or number of features/individuals impacted	1.21 hectares of native vegetation that comprises of peppermint, tuart, marri, jarrah, blackbutt, scattered acacia shrubs and isolated grass trees.
Quality of impacted area (habitat/community)	The quality score for area of habitat/community being impacted - a measure of how well a particular site supports a particular threatened species or ecological community and contributes to its ongoing viability	7 – the vegetation proposed for clearing are primary foraging habitat for the black cockatoos. known black cockatoo roost and breeding sites in the local area and within a Carnaby's cockatoo migration corridor. Black cockatoos have been observed foraging here with evidence of foraging identified throughout the entire application area.
Time over which loss is averted (habitat/community)	This describes the timeframe over which changes in the level of risk to the proposed offset site can be considered and quantified	20 - the offset site will be conserved in perpetuity under a conservation covenant. 20 years is the maximum value associated with this field.
Time until ecological benefit (habitat/community) or Time horizon (features/individuals)	This describes the estimated time (in years) that it will take for the main benefit of the quality (habitat/community) or value (features/individuals) improvement of the proposed offset to be realised	1 – one year to obtain security of area under covenant.
Start area (habitat/community) or Start value (features/individuals)	The area of habitat/community or number of features/individuals proposed to offset the impacts	5.56 hectares – after considering the revegetation offset credit, an area of 5.56 is required to counterbalance the significant residual by 100 per cent.
Start quality (habitat/community)	The quality score for the area of habitat/community proposed as an offset - a measure of how well a particular site supports a particular threatened species or ecological community and contributes to its ongoing viability	8 – According to the photographs provided to the department, the offset area appears to contain primary foraging habitat for black cockatoos and in with the site context, the offset site is identified to be a high quality site for black cockatoo species.
Future quality without offset (habitat/community) or Future value without offset (features/individuals)	The predicted future quality score (habitat/community) or value (features/individuals) of the proposed offset site without the offset	8- no significant change expected
Future quality with offset (habitat/community) or Future value with offset (features/individuals)	The predicted future quality score (habitat/community) or value (features/individuals) of the proposed offset site with the offset	8 - no significant change expected.
Risk of loss (%) without offset (habitat/community)	This describes the chance that the habitat/community on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter of concern) over the foreseeable future without an offset	15% - the offset area is located within a rural property, and this is consistent with other decision making by the department.
Risk of loss (%) with offset (habitat/community)	This describes the chance that the habitat/community on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter of concern) over the foreseeable future with an offset	5% - the risk of loss will reduce with the conservation covenant placed over the property.
Confidence in result (%)	The capacity of measures to mitigate risk of loss of the proposed offset site	90% - there is a high confidence in conservation covenants.
% of impact offset	% of the significant residual impact that would be offset by the proposed offset (note: the offset calculations combined should equate to 100% for each residual impact)	51.9% - Obtained through the input of variables explained above. In combination with the revegetation offset detailed above, 100% of the significant residual impacts of the clearing on black cockatoos will be offset.

Calculation 3: Revegetation offset for western ringtail possums

Field Name	Description	Justification for value used
Area of impact (habitat/community) or Quantum of impact (features/individuals)	The area of habitat/community impacted or number of features/individuals impacted	1.21 hectares of native vegetation that comprises of peppermint, tuart, marri, jarrah, blackbutt, scattered acacia shrubs and isolated grass trees.
Quality of impacted area (habitat/community)	The quality score for area of habitat/community being impacted - a measure of how well a particular site supports a particular threatened species or ecological community and contributes to its ongoing viability	5 – The vegetation proposed for clearing contains suitable habitat for the WRP. Over 100 records of WRP were identified from the local area. moderate quality habitat for WRP - no evidence of WRP present, connectivity between trees is relatively low.
Time over which loss is averted (habitat/community)	This describes the timeframe over which changes in the level of risk to the proposed offset site can be considered and quantified	20 - The offset site will be conserved in perpetuity under a conservation covenant. 20 years is the maximum value associated with this field.
Time until ecological benefit (habitat/community) or Time horizon (features/individuals)	This describes the estimated time (in years) that it will take for the main benefit of the quality (habitat/community) or value (features/individuals) improvement of the proposed offset to be realised	12 – Noting the site characteristics of the revegetation offset area, and the applicant's commitment to plant tree species comprising marri, jarrah and blackbutt, it is assumed that the benefits of revegetation of WRP habitat will be available after 10 years. An extra two years have been allowed to account for the delay in commencement of the revegetation (assumed to commence within 2 years of permit start date).
Start area (habitat/community) or Start value (features/individuals)	The area of habitat/community or number of features/individuals proposed to offset the impacts	1.5 hectares – Area available for revegetation on the property and proposed by the applicant.
Start quality (habitat/community)	The quality score for the area of habitat/community proposed as an offset - a measure of how well a particular site supports a particular threatened species or ecological community and contributes to its ongoing viability	1 – revegetation proposed within a cleared area. Current quality is set higher than zero to account for site context, as per Draft procedure for environmental offsets metric inputs (2022)
Future quality without offset (habitat/community) or Future value without offset (features/individuals)	The predicted future quality score (habitat/community) or value (features/individuals) of the proposed offset site without the offset	1- no significant change expected
Future quality with offset (habitat/community) or Future value with offset (features/individuals)	The predicted future quality score (habitat/community) or value (features/individuals) of the proposed offset site with the offset	5 - would expect moderate quality foraging habitat to establish within 12 years.
Risk of loss (%) without offset (habitat/community)	This describes the chance that the habitat/community on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter of concern) over the foreseeable future without an offset	15% - The offset area is located within a rural property, and this is consistent with other decision making by the department.
Risk of loss (%) with offset (habitat/community)	This describes the chance that the habitat/community on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter of concern) over the foreseeable future with an offset	5% - The risk of loss will reduce with the conservation covenant placed over the property.
Confidence in result (%)	The capacity of measures to mitigate risk of loss of the proposed offset site	80% - no revegetation plan is in place, but strict revegetation conditions are implemented on the clearing permit to ensure the success of the revegetation.
% of impact offset	% of the significant residual impact that would be offset by the proposed offset (note: the offset calculations combined should equate to 100% for each residual impact)	42.2% - Obtained through the input of variables explained above.

Calculation 4: Land acquisition offset for western ringtail possums.

Field Name	Description	Justification for value used
Area of impact (habitat/community) or Quantum of impact (features/individuals)	The area of habitat/community impacted or number of features/individuals impacted	1.21 hectares of native vegetation that comprises of peppermint, tuart, marri, jarrah, blackbutt, scattered acacia shrubs and isolated grass trees.
Quality of impacted area (habitat/community)	The quality score for area of habitat/community being impacted - a measure of how well a particular site supports a particular threatened species or ecological community and contributes to its ongoing viability	5 – The vegetation proposed for clearing contains suitable habitat for the WRP. Over 100 records of WRP were identified from the local area. moderate quality habitat for WRP - no evidence of WRP present, connectivity between trees is relatively low.
Time over which loss is averted (habitat/community)	This describes the timeframe over which changes in the level of risk to the proposed offset site can be considered and quantified	20 - the offset site will be conserved in perpetuity under a conservation covenant. 20 years is the maximum value associated with this field.
Time until ecological benefit (habitat/community) or Time horizon (features/individuals)	This describes the estimated time (in years) that it will take for the main benefit of the quality (habitat/community) or value (features/individuals) improvement of the proposed offset to be realised	1 – one year to obtain security of area under covenant.
Start area (habitat/community) or Start value (features/individuals)	The area of habitat/community or number of features/individuals proposed to offset the impacts	5.56 hectares – this is the area required from the black cockatoo offset calculator and this same area would be used to offset the loss of WRP habitat.
Start quality (habitat/community)	The quality score for the area of habitat/community proposed as an offset - a measure of how well a particular site supports a particular threatened species or ecological community and contributes to its ongoing viability	8 – According to the photographs provided to the department, the offset area appears to contain peppermint trees and other species of habitat for WRP.
Future quality without offset (habitat/community) or Future value without offset (features/individuals)	The predicted future quality score (habitat/community) or value (features/individuals) of the proposed offset site without the offset	8- no significant change expected
Future quality with offset (habitat/community) or Future value with offset (features/individuals)	The predicted future quality score (habitat/community) or value (features/individuals) of the proposed offset site with the offset	8 - no significant change expected.
Risk of loss (%) without offset (habitat/community)	This describes the chance that the habitat/community on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter of concern) over the foreseeable future without an offset	15% - the offset area is located within a rural property, and this is consistent with other decision making by the department.
Risk of loss (%) with offset (habitat/community)	This describes the chance that the habitat/community on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter of concern) over the foreseeable future with an offset	5% - the risk of loss will reduce with the conservation covenant placed over the property.
Confidence in result (%)	The capacity of measures to mitigate risk of loss of the proposed offset site	90% - there is a high confidence in conservation covenants.
% of impact offset	% of the significant residual impact that would be offset by the proposed offset (note: the offset calculations combined should equate to 100% for each residual impact)	68.8% - Obtained through the input of variables explained above. Note that in combination with the revegetation offset detailed above, only 57.8% is required to counterbalance 100% of significant residual impacts on WRP.

Appendix G. Biological survey information excerpts and photographs of the vegetation

Figures 7 and 8: Representative photographs of the application area (CSLC, 2023)

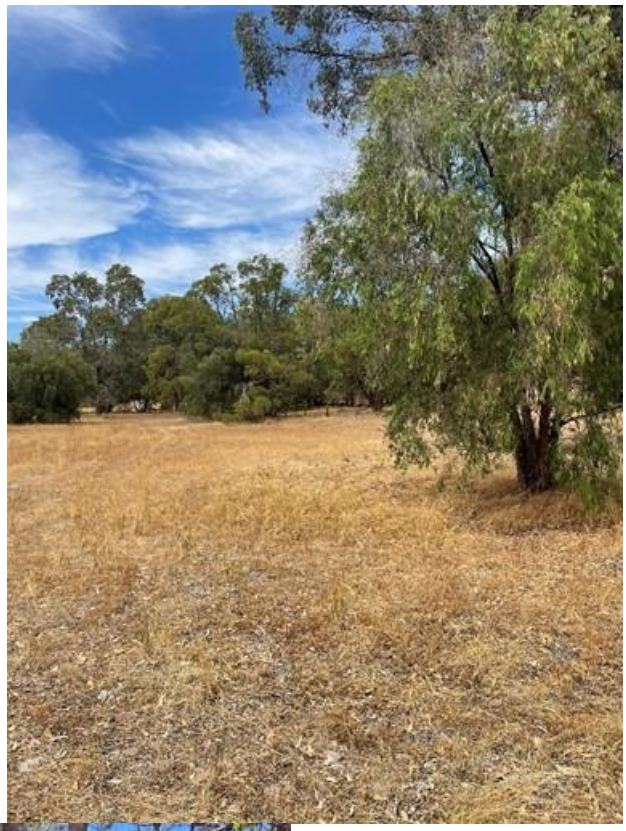
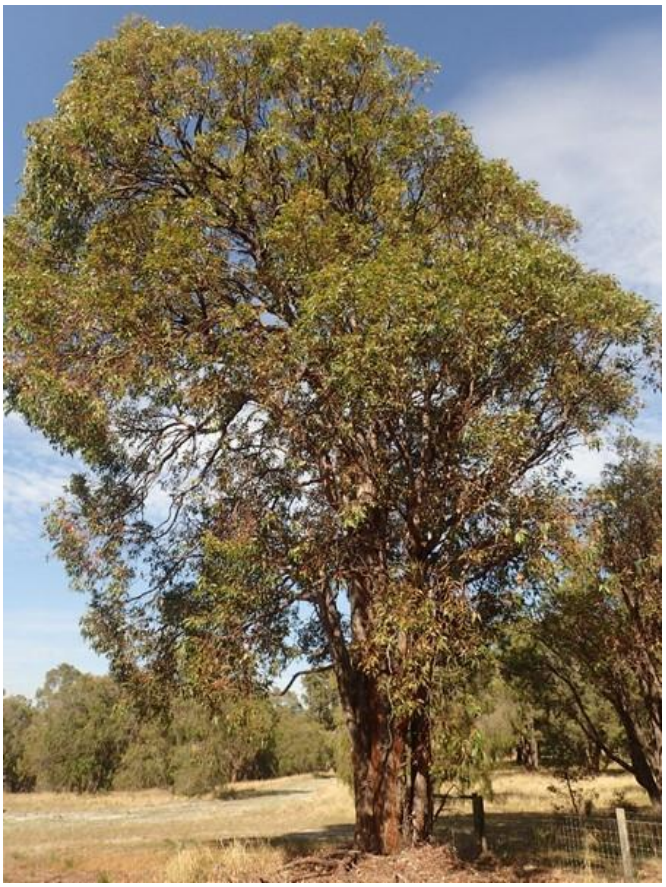


Figure 9-11: Representative photographs of the application area (Sanders. T & Sanders. K, 2023a)



Figures 11-16*:* Representative photographs of the application area (DWER, 2023a)

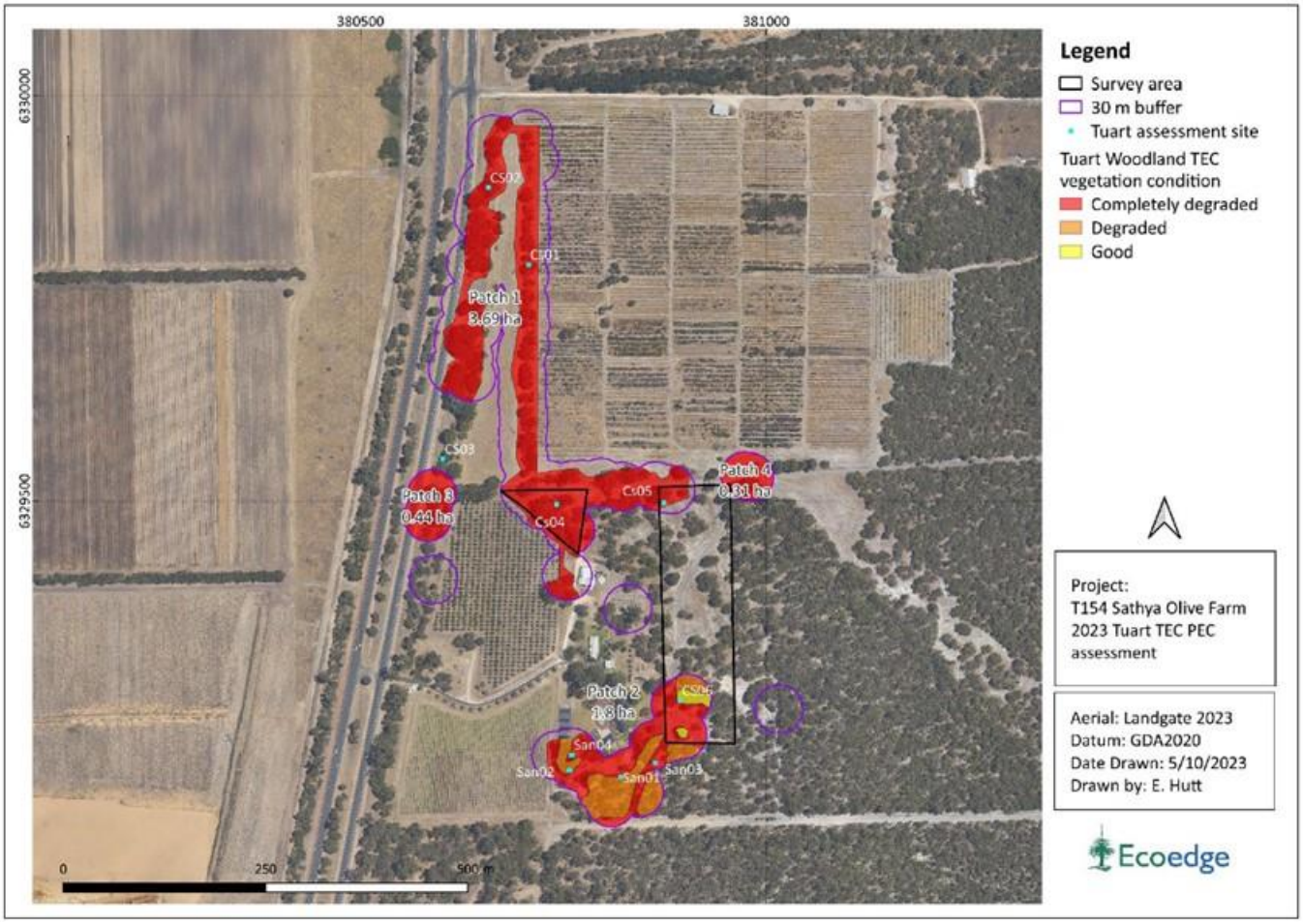


Figure 17: A map of the Tuart Woodland identified (Ecoedge, 2023)

Excerpts from the fauna survey (Ecology Matters, 2023)

Figure 3-2 Regrowth Blackbutt in the southern part of the eastern area.

Figure 3-3 Vegetation in the eastern area showing open bare areas with scattered mature Peppermint.

Table 3: Description of the tree hollows according to the allocated rank to identified habitat trees (Ecology Matters, 2023)

Rank	Description of tree and hollows/activity
1	Activity at hollow observed; adult (or immature) bird seen entering or emerging from hollow. Note that activity at a hollow does not absolutely mean that breeding is occurring unless a young bird in hollow is observed.
2	Visible hollow of suitable size, shape, vertical or near-vertical direction with chew marks around entrance indicating current/recent use.
3	Potentially suitable hollow visible but no chew marks present at entrance; or potentially suitable hollow suspected to be present - as suggested by structure of tree, such as large, vertical trunk broken off at a height of >8m; but note that hollow height is contextual. Carnaby's Black-Cockatoo will nest in hollows <5m so in a Wheatbelt breeding site a lower criterion may be more appropriate. The nest chamber is usually vertical or near-vertical, but the entrance may be horizontal.
4	Tree with large hollows or broken branches that might contain large hollows, but hollows or potential nest chamber are not vertical or near-vertical; thus a tree with or likely to have hollows of sufficient size but not to have hollows of the angle preferred by black-cockatoos.
5	Tree lacking large hollows or broken branches that might have large hollows; a tree with more or less intact branches and a spreading crown. Tree may have small hollows.

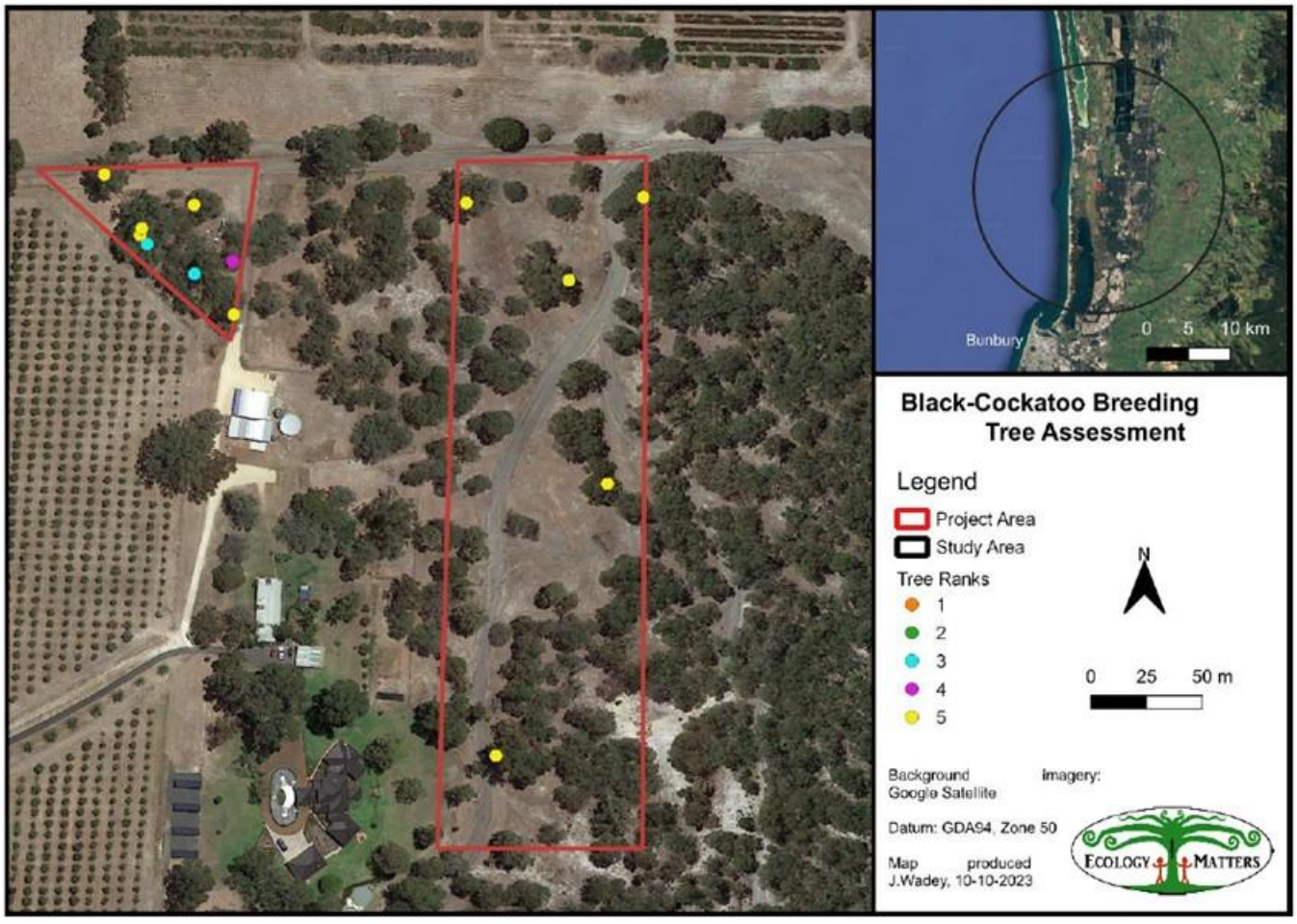


Figure 18: Locations of the black cockatoo habitat trees within the survey area (Ecology Matters, 2023).

Figure 3-7 Foraging evidence on Marri nuts (left) and Blackbutt nuts (right) by forest red-tailed black-cockatoo.

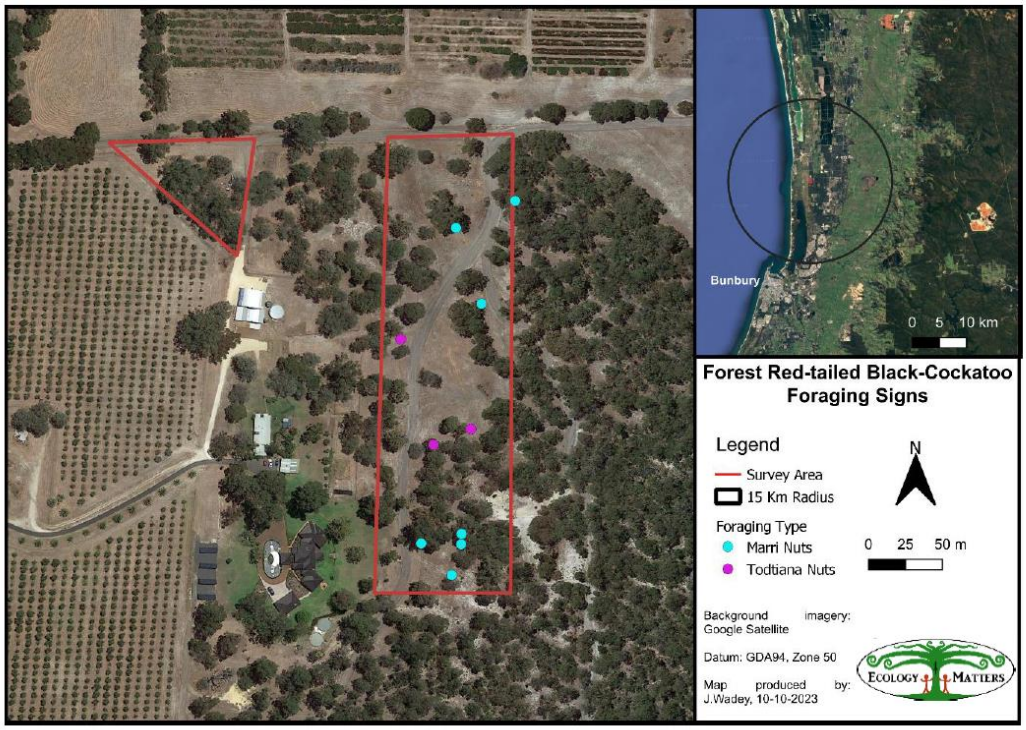


Figure 3-8 Locations of black-cockatoo foraging evidence.

Figure 19: Foraging evidence identified within the survey area and the location of the identified foraging evidence (Ecology Matters, 2023).

Table 4: Attributes of the habitat trees located within the application area.

Species	DBH	Black-cockatoo Nesting Rank	Presence of any hollows	Alive/dead	Easting	Northing
Marri	500	5	No	Alive	380920.3	6329471
Tuart	1000	5	No	Alive	380873.5	6329505
Marri	900	5	No	Alive	380953.1	6329509
Blackbutt	500	5	No	Alive	380939.1	6329380
Tuart	500	5	No	Alive	380891.2	6329257

Appendix H. Sources of information

H.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)
- 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
- Wheatbelt Wetlands Stage 1 (DBCA-021)

Restricted GIS Databases used:

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

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