



Our ref: CPS 8958/1
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MINISTER FOR ENVIRONMENT DETERMINATION OF APPEALS AGAINST THE GRANT OF CLEARING PERMIT CPS 8958/1

On 30 April 2024, the Minister for Environment (Minister) determined the appeal against the Department of Water and Environmental Regulation's decision to grant Clearing Permit CPS 8958/1 granted to Warwick Glen Grazing Pty Ltd and Molita Grove Grazing Pty Ltd. A link to the Minister's Decision and the Appeals Convenors report is at the link below: <https://www.appealsconvenor.wa.gov.au/Appeal?id=31816>.

The Minister decided that the appeal should be upheld in full and the clearing permit should not be granted. The decision to grant the clearing permit ceases to have effect and Clearing Permit CPS 8958/1 is no longer valid.

The following Clearing Permit, Plans and Decision Report are to be used as reference only.

If you have any queries regarding the matters above, please contact the Native Vegetation Regulation Branch on 6364 7098 or info@dwer.wa.gov.au.



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

PERMIT DETAILS

Area Permit Number: CPS 8958/1
File Number: DWERVT6017
Duration of Permit: From 1 October 2022 to 1 October 2032

PERMIT HOLDER

Warwick Glen Grazing Pty Ltd and Molita Grove Grazing Pty Ltd

LAND ON WHICH CLEARING IS TO BE DONE

Lot 230 on Deposited Plan 232802, Elgin

AUTHORISED ACTIVITY

The permit holder must not *clear* more than 5.44 hectares of *native vegetation* within the area cross-hatched yellow in Figure 1 of Schedule 1.

CONDITIONS

1. 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.

2. 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*.

3. Period during which clearing is authorised

The permit holder must not *clear* any native vegetation after 1 October 2027.

4. Fauna management - directional clearing

The permit holder must:

- a) conduct *clearing* activities authorised under this Permit in one direction towards adjacent *native vegetation*; and
- b) allow a reasonable time for fauna present within the area being *cleared* to move into that adjacent *native vegetation* ahead of the *clearing* activity.

5. Fauna management – western ringtail possum

The permit holder must not *clear* more than 2.86 hectares of *native vegetation* which provides habitat for western ringtail possum (*Pseudocheirus occidentalis*), as identified by Harewood (2020).

6. Fauna management – western ringtail possums

- (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*).
- (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) individual has moved on from that area to adjoining *suitable habitat*; or
 - (ii) the western ringtail possum(s) individual has been removed by a *western ringtail possum specialist*.
- (c) Any western ringtail possum(s) individual removed in accordance with condition 6(b)(ii) must be relocated by a *western ringtail possum specialist* to a *suitable habitat* as approved by the *CEO*.
- (d) 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 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
 - (iv) the number of individuals removed and relocated;
 - (v) the relevant qualifications of the *western ringtail possum specialist* 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 GDA94, 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 cockatoo habitat

The permit holder must not clear more than three (3) hectares of *native vegetation* which provides habitat for black cockatoos, as identified by Harewood (2020).

8. Wind erosion management

The permit holder must ensure that extractive industry activities commence within three (3) months of the authorised clearing being undertaken to reduce the risk of soil erosion by minimising the exposure time of soils prior to construction.

9. Offset – revegetation

Within 12 months of the cessation of the extractive industry activities in areas that are no longer required for the purpose for which they were *cleared*, and no later than 1 October 2028, the permit holder must implement and adhere to the *revegetation plan*. This includes, but is not limited to the following actions:

- (a) Retain the vegetative material and topsoil removed by *clearing* authorised under this permit and stockpile the vegetative material and topsoil in an area that has already been *cleared*;
- (b) Commence *revegetation* within the *offset site* by:
 - (i) establishing the final landform contours in accordance with section 6.2.1 of the *revegetation plan*
 - (ii) ripping the *offset site* to remove any areas of compaction or other obstruction that could prevent root penetration of seedlings
 - (iii) laying the vegetative material and topsoil retained under Condition 9(a) of this permit on the *cleared* area in accordance with section 3.3 of the *revegetation plan*
 - (iv) deliberately *planting native vegetation* in accordance with the *revegetation plan*; and
 - (v) ensuring only *local provenance* seeds and propagating material are used to *revegetate* the *offset site*.
- (c) Return and spread logs and larger branches retained during *clearing* activities across the *offset site*
- (d) Fence the *offset site* in accordance with section 6.2.5 of the *revegetation plan*
- (e) Undertake weed control in accordance with Section 6.2.6 of the *revegetation plan*
- (f) Install and maintain a trafficable firebreak around the interior perimeter fence of the *offset sites* that complies with the Shire of Capel requirements
- (g) Establish twelve permanent (12) and twelve (12) random 10 x 10 metre *quadrat* monitoring sites across the *offset site*
- (h) Remove rubbish from the *offset sites*
- (i) Achieve the following *completion criteria* no later than within a 5-year monitoring period for areas *revegetated* under this Permit and for the vegetation to be maintained for a period of two years from the date of the *completion criteria* having been met:

Table 1 Completion criteria related to vegetation at the *offset site*

Item	Criterion	Completion goals	Completion criteria	Monitoring
1a	Species richness	Return a minimum of four (4) overstorey species in the <i>offset site</i> .	For each target revegetation type, the revegetation needs to support the following species: <ul style="list-style-type: none"> • <i>Acacia saligna</i> • <i>Agonis flexuosa</i> • <i>Corymbia calophylla</i>; and • <i>Taxandria linearifolia</i>. 	Annually in spring by an <i>environmental specialist</i> until completion criterion has been met and maintained for two years (i.e.; three successive monitoring events).
1b	Species richness	Minimum of 60 per cent of native species returned, based on the <i>revegetation plan</i>	For each target revegetation type, the revegetation needs to support a minimum of 25 locally occurring native species, as detailed in the <i>revegetation plan</i>	Annually in spring by an <i>environmental specialist</i> until completion criterion has been met and maintained for two years (i.e.; three successive monitoring events).
2a	Cover and density	Minimum of 60 per cent of stems/ha for dominant overstorey species returned based on the <i>revegetation plan</i> .	For each target revegetation type, the revegetation needs to support a minimum of 600 stems/ha of the following overstorey species combined: <ul style="list-style-type: none"> • <i>Acacia saligna</i> • <i>Agonis flexuosa</i> • <i>Corymbia calophylla</i>; and • <i>Taxandria linearifolia</i> 	Annually by an <i>environmental specialist</i> until completion criterion has been met and maintained for two years (i.e.; three successive monitoring events).
2b	Cover and density	Minimum of 60 per cent of plants /ha in each structural layer returned, based on the <i>revegetation plan</i> .	For each target revegetation type, the revegetation needs to achieve a minimum density of: <ul style="list-style-type: none"> • 1,800 native shrubs /ha • 1,200 native herbs/grasses/climbers/ha 	Annually by an <i>environmental specialist</i> until completion criterion has been met and maintained for two years (i.e.; three successive monitoring events).
2c	<i>Black cockatoos</i> foraging species cover and density	The <i>offset site</i> must be fully revegetated to contain a minimum of 75% cover using native plants for <i>black cockatoos</i> and high to medium priority food species	For each target revegetation type, the revegetation needs to support a minimum of 1,500 stems/ha of the following species combined: <ul style="list-style-type: none"> • <i>Acacia saligna</i> • <i>Agonis flexuosa</i> • <i>Corymbia calophylla</i> • <i>Hakea prostrata</i> • <i>Hakea varia</i> • <i>Jacksonia furcellata</i> 	Annually by an <i>environmental specialist</i> until completion criterion has been met and maintained for two years (i.e.; three successive monitoring events).
3a	Weeds	Weed cover is no greater than 20 per cent at the <i>offset site</i>	The <i>offset site</i> should have a maximum of 20 per cent weed cover.	Annually in winter/spring by an <i>environmental specialist</i> until completion criterion has been met and maintained for

Item	Criterion	Completion goals	Completion criteria	Monitoring
3b	Weeds	No declared pest plants, weeds of national significance or DBCA priority alert weeds present. Managed as required by the <i>Biosecurity and Agriculture Management Regulations 2013</i>	The <i>offset site</i> does not contain any declared pest plants, weeds of national significance or DBCA priority alert weeds	Annually in winter/spring by an <i>environmental specialist</i> until completion criterion has been met and maintained for two years (i.e.; three successive monitoring events).
4	Bare ground	The maximum patch size of bare ground is 30 m ²	The <i>offset sites</i> has no bare patches of ground more than 30 m ² in size.	Annually in summer by an <i>environmental specialist</i> until completion criterion has been met and maintained for two years (i.e.; three successive monitoring events).
5	Gates and boundary fence	Gates and boundary fence to be in good condition with no obvious damage that will enable the entry of <i>pest animals</i> into the <i>vegetation</i> area.	N/A	Annually by an <i>environmental specialist</i> until <i>completion criteria</i> 1 – 4 has been met.

- (j) Undertake remedial action for areas within the *offset site* where monitoring indicated that revegetation has not met the *completion criteria*, outlined in condition 9(i) of this Permit, including:
 - (i) revegetate the area by deliberately *planting* and/or *direct seeding native vegetation* that will result in the minimum target set out in condition 9(i) of this Permit and ensuring only *local provenance* seeds and propagating material are used;
 - (ii) undertake further weed and/or *pest animal* control activities;
 - (iii) undertake further fence maintenance;
 - (iv) undertake further erosion control; and
 - (v) annual monitoring of the *offset site* by an *environmental specialist* until the *completion criteria* outline in condition 9(i) of this Permit are met.

10. Offset – conservation covenant

By 1 October 2023, the Permit Holder shall:

- (a) give a conservation covenant under section 30B of the *Soil and Land Conservation Act 1945* setting aside the *offset site* for the protection and management of vegetation in perpetuity; and
- (b) provide to the *CEO* a copy of the executed conservation covenant.

11. 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 <i>clearing</i> activities generally	<ul style="list-style-type: none"> (a) the species composition, structure, and density of the <i>cleared</i> area; (b) the location where the <i>clearing</i> occurred, recorded using a GPS unit set to GDA94, expressing the geographical coordinates in Eastings and Northings; (c) the date that the area was <i>cleared</i>; (d) the size of the area <i>cleared</i> (in hectares); (e) actions taken to avoid, minimise, and reduce the impacts and extent of <i>clearing</i> in accordance with condition 1 of this permit; (f) actions taken to minimise the risk of the introduction and spread of weeds and dieback in accordance with condition 2 of this permit (g) direction of <i>clearing</i> in accordance with condition 4 of this permit (h) extent of western ringtail possum habitat cleared in accordance with condition 5 of this permit (i) extent of <i>black cockatoo</i> habitat cleared in accordance with condition 7 of this permit; and

No.	Relevant matter	Specifications
		(j) action taken in accordance with condition 8 of this permit to mitigate the risk of wind erosion.
2.	In relation to the <i>revegetation</i> areas pursuant to condition 9 of this Permit	(a) the location of the areas <i>revegetated</i> , recorded using a GPS unit set to GDA94, expressing the geographical coordinates in Eastings and Northings or decimal degrees; (b) the date the fence and firebreak were installed and evidence of maintenance; (c) the date rubbish was removed from the <i>offset site</i> ; (d) <i>pest animal</i> and weed control measures undertaken; (e) a description of the <i>revegetation</i> activities undertaken; (f) the size of the area <i>revegetated</i> (in hectares); (g) the species composition, structure and density of <i>revegetation</i> ; (h) the number of plants and species installed (i) the assessment of the <i>revegetation</i> against <i>completion criteria</i> outlined in condition 9(i); (j) any remedial actions undertaken in accordance with condition 9(j); and (k) a copy of the <i>environmental specialist's</i> report.

12. Reporting

- (a) The Permit Holder must provide to the *CEO* on or before 30 June of each year, a written report:
 - (i) of records required under condition 11 of this Permit; and
 - (ii) concerning activities done by the Permit Holder under this Permit between 1 January and 31 December of the preceding calendar year.
- (b) If no *clearing* authorised under this Permit was undertaken between 1 January to 31 December of the preceding calendar year, a written report confirming that no *clearing* under this Permit has been carried out, must be provided to the *CEO* on or before 30 June of each year.
- (c) Prior to 1 July 2032, the Permit holder must provide to the *CEO* a written report of records required under condition 11 of this Permit, where these records have not already been provided under condition 12(a) of this Permit.

DEFINITIONS

In this permit, the terms in Table 3 have the meanings defined.

Table 3: Definitions


Term	Definition
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the <i>Environmental Protection Act 1986</i> .
clear, clearing	has the meaning given under section 3(1) of the EP Act.
completion criteria	means a measurable outcome used to determine revegetation success
completion goals	means the changes and intermediate outcomes needed to attain the revegetation objectives as detailed in section 4.2 of the <i>revegetation plan</i> .
condition	a condition to which this clearing permit is subject under section 51H of the EP Act.
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994 (WA)</i> and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
dieback	means the effect of <i>Phytophthora</i> species on native vegetation.
direct seeding	means a method of re-establishing vegetation through establishment of a seed bed and the introduction of seeds of the desired plant species.
environmental specialist	means a person who holds a tertiary qualification in environmental science or equivalent and has experience relevant to the type of environmental advice that an environmental specialist is required to provide under this Permit, or who is approved by the CEO as a suitable environmental specialist.
EP Act	<i>Environmental Protection Act 1986 (WA)</i>
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 <i>Biodiversity Conservation Act 2016</i> .
fill	means material used to increase the ground level, or to fill a depression.
local provenance	means <i>native vegetation</i> seeds and propagating material from natural sources within 100 kilometres and the same Interim Biogeographic Regionalisation for Australia (IBRA) subregion of the area <i>cleared</i> .

Term	Definition
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	means vegetation as defined under section 3(1) and section 51A of the EP Act.
offset site	means the 6.69-hectare area cross-hatched green in Figure 2 of Schedule of this permit
pest animal	animals that are known to impact the survival of revegetation/rehabilitation i.e., livestock, rabbits and/or kangaroos.
planting	means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of the desired species.
quadrat	means a sample plot established for the purpose of data collection and monitoring vegetation characteristics, for example species composition, structure, density and condition
regeneration	means revegetation that can be established from in situ seed banks contained either within the topsoil or seed-bearing mulch.
rehabilitate/ed/ion/ing	means actively managing an area containing <i>native vegetation</i> in order to improve the ecological function of that area using methods such as natural <i>regeneration</i> , <i>direct seeding</i> and/or <i>planting</i> , so that the species composition, structure and density is similar to pre-clearing vegetation types in that area.
revegetate/ed/ion	means the re-establishment of a cover of local provenance <i>native vegetation</i> in an area using methods such as natural <i>regeneration</i> , <i>direct seeding</i> and/or planting.
revegetation plan	means the plan prepared by MBS Environmental (2022) to support the revegetation of the offset site in accordance with condition 10 of this permit.
weeds	means any plant – <ul style="list-style-type: none"> (a) that is a declared pest under section 22 of the <i>Biosecurity and Agriculture Management Act 2007</i>; or (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or (c) not indigenous to the area concerned.
western ringtail possum specialist	means a fauna specialist who holds a tertiary qualification specialising in environmental science or equivalent, has a minimum of two years of work experience in western ringtail possum (<i>Pseudocheirus occidentalis</i>) identification, surveys of western ringtail possums and capture and handling of western ringtail possums, and holds a valid fauna licence issued under the <i>Biodiversity Conservation Act 2016</i> .

REFERENCES

- Harewood, G. (2020). *Fauna Assessment Lot 230 Elgin Road Elgin*. Report for MBS Environmental prepared by Greg Harewood, June 2020. DWER ref: A1918057.
- MBS Environmental. (2022). *Revegetation plan. Sand Extraction on Lot 230 Elgin Road, Elgin*. Revegetation plan prepared to support clearing permit application CPS 8958/1. Received on: 1 June 2022. DWER ref: DWERDT612568.

END OF CONDITIONS

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Ryan Mincham
MANAGER
NATIVE VEGETATION REGULATION

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

8 September 2022

Schedule 1

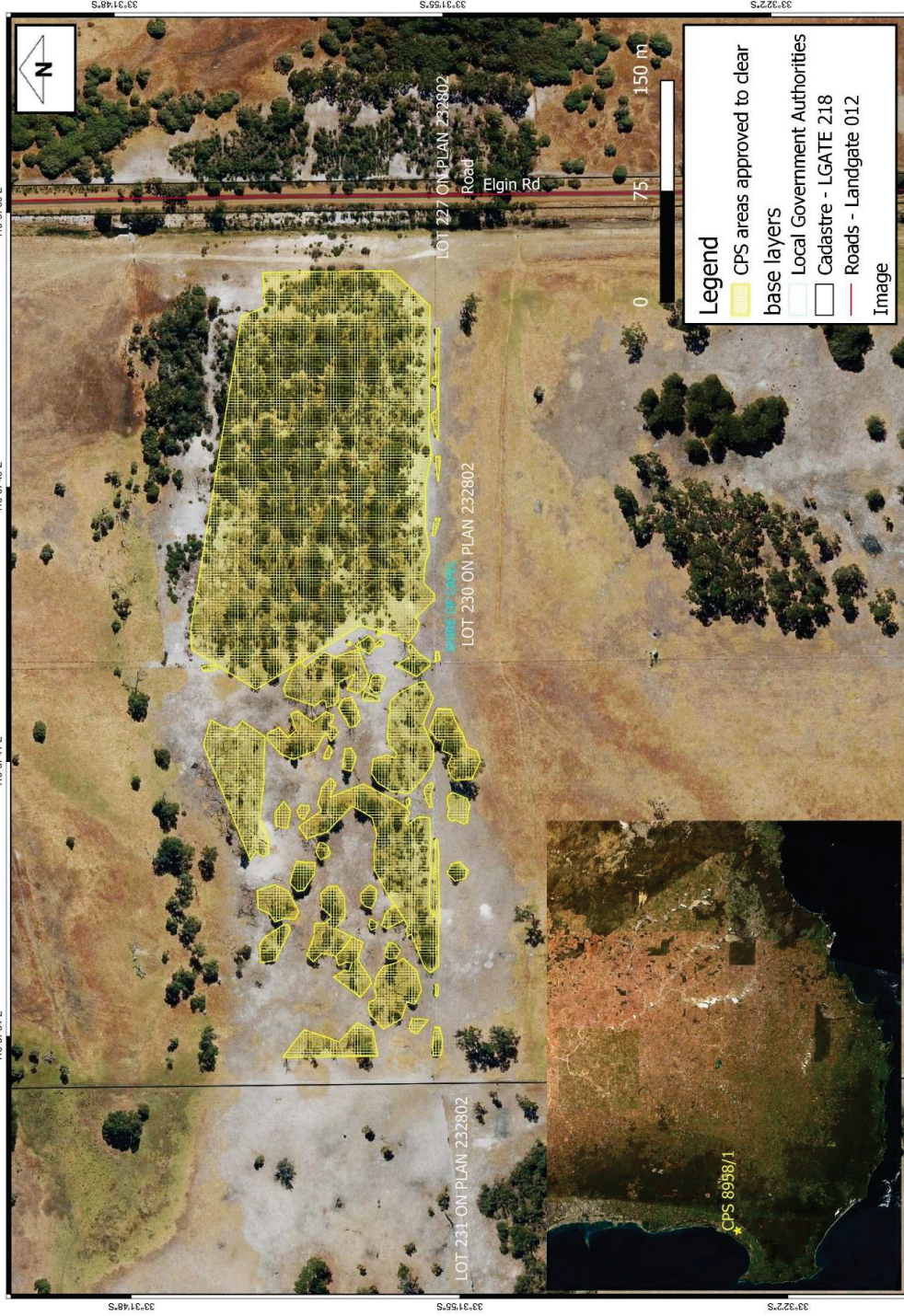


Figure 1: Map of the boundary of the area within which clearing may occur

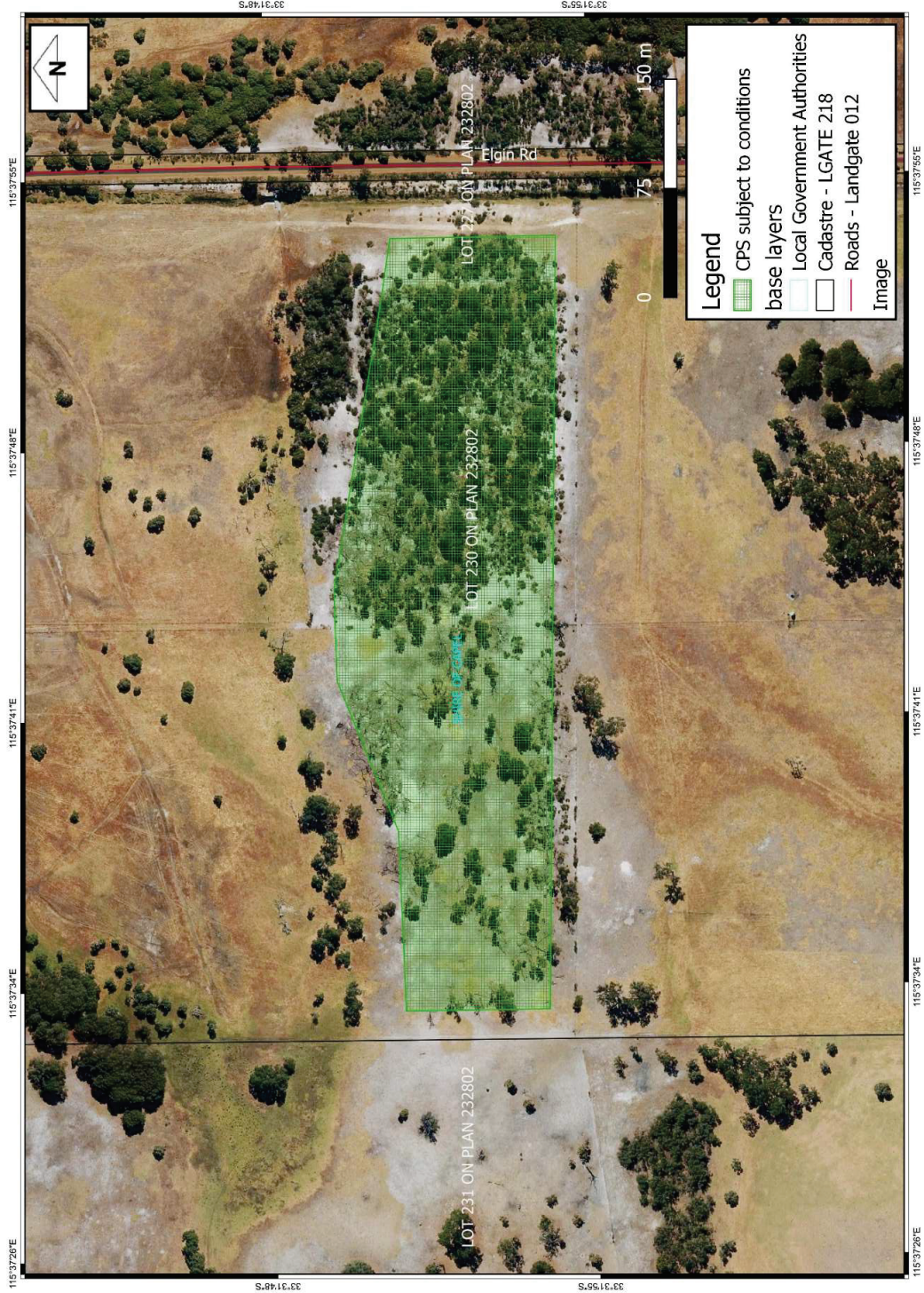


Figure 2: Map of the boundary of the area cross-hatched green which will be revegetated in accordance with the offset condition of this permit
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Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 8958/1
Permit type:	Area permitArea permit
Applicant name:	Warwick Glen Grazing Pty Ltd and Molita Grove Grazing Pty Ltd
Application received:	1 July 2020
Application area:	5.44 hectares of native vegetation
Purpose of clearing:	Extractive industry
Method of clearing:	Mechanical
Property:	Lot 230 on Deposited Plan 232802
Location (LGA area):	Shire of Capel
Localities (suburb):	Elgin

1.2. Description of clearing activities

The vegetation proposed to be cleared is mostly within a single continuous area, with the vegetation becoming more sparser towards the western end of the application area (see Figure 1, Section 1.5).

On 7 September 2020, the Department of Water and Environmental Regulation (DWER) sent correspondence to the applicant which outlined the environmental impacts identified during the assessment of the proposed clearing. The applicant subsequently:

- commissioned MBS Environmental to undertake a flora survey which targeted species identified by DWER as potentially occurring within the application area; and
- avoided clearing of two large trees to the south of the application area. This reduced the amount of clearing by approximately 2.6 per cent, that being, from 5.58 hectares to 5.44 hectares.

1.3. Decision on application

Decision:	Grant
Decision date:	8 September 2022
Decision area:	5.44 hectares of native vegetation, as depicted in Section 1.5, below.

1.4. Reasons for decision

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

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

- advice from the DWER's Planning Advice, South West Region branch (2020; 2022) on the permitted depths to groundwater with regards to the proposed extractive industry activities and suitability of the soil substrate post-extraction for the required revegetation activities
- applicant's provision of additional information during the assessment (see Appendix A)
- the public concerns raised in submissions and during the assessment (see Appendix B)
- the application area site characteristics and analysis of flora, fauna and ecological communities recorded/mapped within the local area and determined by DWER as 'likely to occur' within the local area (a 10-kilometre radius from the perimeter of the application area) (see Appendix C)
- the 10 Clearing Principles set out in Schedule 5 of the *Environmental Protection Act 1986* (EP Act) (see Appendix D)
- the results of offset calculations using the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Offsets Assessment Guide (Commonwealth Offsets Calculator) (see Appendix F)
- the findings of (Appendix G):
 - a fauna survey (Harewood, 2020);
 - a site inspection (MBS Environmental, 2020a); and
 - a targeted flora survey (MBS Environmental, 2021a); and
- relevant datasets available at the time of the assessment (see Appendix H).

This clearing permit application was submitted, accepted, assessed and determined in accordance with sections 51E and 51O of the EP Act. DWER advertised the application for 21 days and one submission was received. Consideration of matters raised in the submission is summarised in Appendix B.

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 will result in the following significant residual impacts (SRI):

- the loss of 5.44 hectares of native vegetation that supports fauna movement across the landscape which has been extensively cleared;
- the loss of approximately three hectares of native vegetation that provides significant foraging habitat for Carnaby's cockatoo (*Calyptorhynchus latirostris*), forest red-tailed black cockatoo (*Calyptorhynchus banksia* subsp. *naso*) and Baudin's cockatoo (*Calyptorhynchus baudinii*) (collectively referred to as 'black cockatoos' herein this report); and
- the loss of approximately 2.86 hectares of native vegetation that provides critical habitat for western ringtail possum (WRP) (*Pseudocheirus occidentalis*).

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

- the potential introduction and spread of weeds and dieback into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values; and
- potential land degradation in the form of wind erosion.

To address the above SRIs and applying the Commonwealth Offsets Calculator, the Delegated Officer determined that the following revegetation offset is required:

- revegetation of 6.69 hectares of Lot 230 on Deposited Plan 232802, Elgin (hereafter referred to as the offset site).

To maximise the revegetation success, the applicant commissioned MBS Environmental to prepare a comprehensive revegetation plan in accordance with the DWER's *Guide to Preparing Revegetation Plan for Clearing Permits*. DWER deemed the revegetation plan (MBS Environmental, 2021c) adequate due to the following:

- the identified species list was considered appropriate given MBS Environmental had selected locally occurring flora species which are suitable for the changed depth to groundwater level and soil profile post-extraction and simultaneously address the SRIs of the proposed clearing
- SMART (Specific, Measurable, Achievable, Realistic, and Time-bound) completion criteria were developed with the aim to establish self-sustaining, dieback resistant vegetation suitable for the post-extraction soil substrate which provides long-term habitat for black cockatoos and WRP
- the completion criteria considered the offset site characteristics, such as the soil type, landscape position and site history
- appropriate revegetation techniques were proposed; and
- appropriate monitoring and contingency actions were developed.

The Delegated Officer considered that the revegetation offset is consistent with the WA Environmental Offsets Policy (2011) and Western Australia's Environmental Offsets Guidelines (2014), will address 100 per cent of the SRI impacts of the proposed clearing and result in:

- a net increase of vegetation in the locality of the application
- improved habitat for black cockatoos and WRP; and
- improved ecological linkage values due to the enhanced connectivity of vegetation within the offset site.

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
- weed and dieback management to minimise the risk of introduction and spread of weeds and dieback
- WRP and black cockatoo management to ensure that the proposed clearing will not adversely impact these species or individuals present at the time of clearing
- undertake slow, progressive one-directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity
- begin extractive industry activities within three months of the cessation of clearing to minimise the risk of wind erosion
- revegetation of the offset site to account for the loss of
 - significant remnant vegetation and ecological linkage values; and
 - WRP and black cockatoo habitat.

Noting the applicant's requirements under the permit conditions to revegetate the application area post-extraction, 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 mitigate any potential impacts.

1.5. Site map

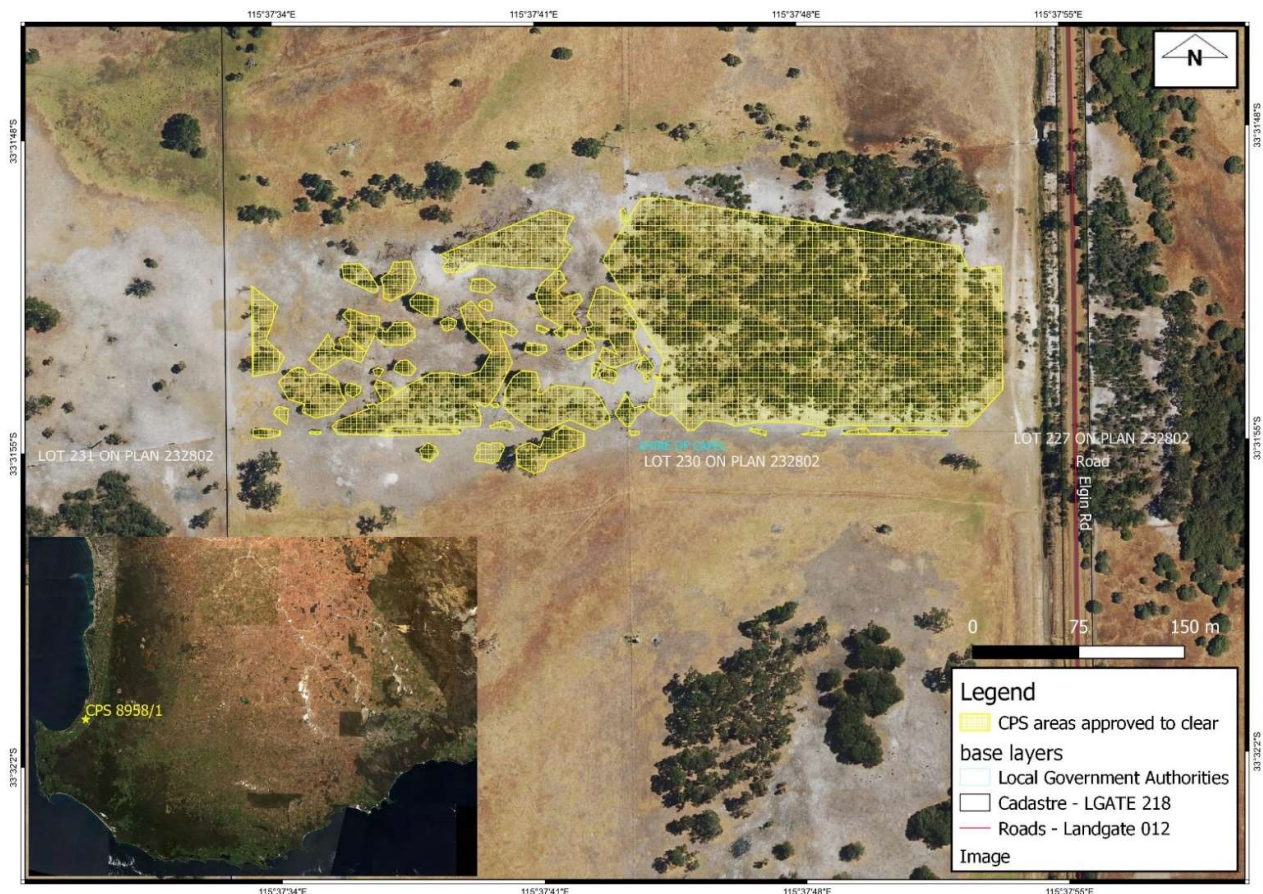


Figure 1 Map of the application area. The areas cross-hatched yellow indicate the areas authorised to be cleared under the granted clearing permit.

2 Legislative context

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

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

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

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- EPBC Act
- *Planning and Development Act 2005* (WA) (P&D Act)
- *Soil and Land Conservation Act 1945* (WA); and
- *Rights in Water and Irrigation Act 1914* (RIWI Act).

Relevant policies considered during the assessment include:

- Environmental Offsets Policy (2011)

The key guidance documents which inform this assessment are:

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

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

The applicant determined to retain a patch of native vegetation to the north of the application area during the design phase to avoid two dreys that were recorded (MBS Environmental, 2021a). During the assessment, the applicant further reduced the application area from 5.58 hectares to 5.44 hectares to remove two large trees to the south of the application area.

The applicant is proposing to revegetate 6.69 hectares of the disturbed area post-extraction. The applicant has advised that revegetation will include local dieback resistant species, such as marri, which would provide potential habitat for black cockatoo species (MBS Environmental, 2021a).

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

- critical habitat for WRP
- significant habitat for black cockatoos
- native vegetation considered significant in an area that has been extensively cleared.

In accordance with the Government of WA Environmental Offsets Policy (2011) and Environmental Offsets Guidelines (2014), 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 has had regard for the site characteristics (see Appendix C) and the extent to which the impacts of the proposed clearing present a risk to biological, 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, including fauna, flora, adjacent vegetation, significant remnant

vegetation, and land and water resources. The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

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

Assessment outcomes:

The proposed clearing may impact adjacent native vegetation through an increase of weeds and dieback.

Conditions:

The Delegated Officer imposed a weed and dieback management condition on the clearing permit to minimise the risk of introduction and spread of weeds and dieback.

Assessment:

Site information:

MBS Environmental inspected the area proposed to be cleared to describe the existing vegetation and other key environmental features. MBS Environmental (2020) identified that:

- the majority of the vegetation within the project envelope comprised open woodland of *Eucalyptus marginata*, *Banksia attenuata*, *Banksia ilicifolia*, *Xylomelum occidentale* and *Nuytsia floribunda* over patches of *Kunzea glabrescens* over bare ground and weeds
- in the lower lying areas in the southern portion, there were isolated *Corymbia calophylla* and *Agonis flexuosa* over pasture
- the condition of the vegetation within the project envelope was completely degraded (Keighery, 1994)
- the vegetation in the application area showed signs of multiple historical disturbances including selective logging, clearing for pasture, draining, grazing and fire
- native understorey had been lost and replaced by introduced weed species. Upper storey density was low
- much of the native vegetation that remained was either dead or in poor health, likely due to dieback, but also potentially due to water stress as the deep drain would have resulted in reduction in groundwater levels
- the occurrence of dieback (*Phytophthora cinnamomi*) was suspected due to gradual deaths of susceptible species (e.g. banksia spp. and jarrah)
- considering the degraded nature of the site and the lack of native understorey, the likelihood of any significant flora is considered low.

Flora

According to the Department of Biodiversity, Conservation and Attractions (DBCA) (2022a), a total of 10 flora species listed as threatened under the BC Act and 44 priority listed flora by DBCA have been recorded within the local area (DBCA 2022a). Based on the similarities shared between the soil and vegetation types in habitats for these flora taxa and within the application area, DWER considered that two threatened and 20 priority flora may occur within the application area.

To confirm the presence/absence of these species within the application area, the applicant commissioned MBS Environmental to undertake a flora survey of the application area targeting the species considered as potentially occurring in the application area. MBS Environmental undertook the survey on 23 September and 21 October 2020 which are considered appropriate months for vegetation surveys in South-West and Interzone Botanical Provenance (EPA, 2016). MBS Environmental (2021a) identified that the native understorey within the application area had been nearly completely replaced by introduced species with only a few native understory species remaining. The survey did not identify any conservation significant species.

The timing of the targeted survey was not adequate for *Verticordia attenuata* (P3) and *Caustis* sp. Boyanup (P3). *V. attenuata* is a small woody shrub known from 19 populations in total with a known range of approximately 30 kilometres east - west and 55 kilometres north – south in the Swan Coastal Plain IBRA bioregion (DBCA, 2022a). The species flowers in December or between January and May (WA Herbarium, 1998-). *C. sp. Boyanup* is a rhizomatous, clumped perennial grass-like or herb up to one metre high (WA Herbarium, 1998-). The known spatial distribution of this species is approximately 250 kilometres east-west and 275 kilometres north-south in the Avon Wheatbelt, Esperance Plains, Jarrah Forest, Swan Coastal Plain and Warren IBRA bioregions (DBCA, 2022a).

A further assessment identified that the application area is unlikely to provide suitable habitat for *Verticordia attenuata* and *Caustis* sp. Boyanup. The survey was undertaken by personnel with appropriate training and experience in conducting ecological surveys and experience with previous targeted flora surveys in the south west region of WA (MBS Environmental, 2021a). *C. sp. Boyanup* is a perennial species identifiable and detectable at any time of year. *V. attenuata* is an up to one metre high, conspicuous shrub which is unlikely to be overlooked in an

environment where only limited native understory flora remain. Noting this, the targeted survey would likely have identified individuals of these species if they occurred within the application area.

DWER has also considered the potential impacts of the proposed clearing on three flora taxa identified within public permissions as likely to occur within the application area. Donkey Orchids (*Diuris corymbosa*) is a tuberous, perennial herb flowering from September and October which tends to occur on sandy, granite and gravel soils. *Synaphea hians* is a prostrate or decumbent shrub approximately 0.6 metre high and one metre wide which flowers in July or September to November and occupies sandy soils (WA Herbarium, 1998-). MBS Environmental (2021a) surveyed the application area during the flowering times of these species and did not identify any individuals of either species. Noting this and that the application area is highly degraded (MBS Environmental, 2021a), the application area is unlikely to provide suitable habitat for *Diuris corymbosa* and *Synaphea hians*.

Slipper Orchids (*Cryptostylis ovata*) is tuberous, perennial herb typically flowering between November and December or January to April. In the absence of an adequate survey for *C. ovata*, DWER has conducted a detailed risk-based assessment to determine the potential impacts of the proposed clearing on this species. The likelihood of occurrence of *C. ovata* within the application area was considered low given the degraded condition of vegetation within the application area where the majority of native species is absent (MBS Environmental, 2021a). The severity of any potential impact on this species was deemed minor on the basis that *C. ovata* is known from a number of records spread across Perth, Northern Jarrah Forest, Southern Jarrah Forest, Fitzgerald and Warren. Taking this information into consideration, DWER concluded that the clearing is unlikely to cause significant impacts on *C. ovata*.

Noting the survey efforts, survey timing and flowering periods of the species considered as potentially occurring within the application area, DWER considered that the application area is unlikely to provide habitat for conservation significant flora known to occur within the local area.

Priority and Threatened Ecological Communities:

According to available datasets, the majority of the application area (approximately 75.72 per cent) is located within two mapped occurrences of the Commonwealth listed 'Banksia Dominated Woodlands of the Swan Coastal Plain' threatened ecological community (TEC). This TEC is listed as 'Endangered' under the Commonwealth EPBC Act and a 'Priority 3' priority ecological community (PEC) at a state level.

The approved conservation advice for this community states that "ground-truthing (e.g., an on-ground survey) is required to verify if a particular site meets the required key diagnostic characteristics and minimum condition thresholds to be the described ecological community" (Threatened Species Scientific Committee (TSSC), 2016).

The Approved Conservation Advice states that to be considered representative of the TEC:

- a remnant in the Swan Coastal Plain bioregion must include at least one of four Banksia species being *Banksia attenuata* (candlestick banksia), *Banksia menziesii* (firewood banksia), *Banksia prionotes* (acorn banksia) and/or *Banksia ilicifolia* (holly-leaved banksia)
- must include an emergent tree layer often including marri, jarrah, or tuart, and other medium trees including *Eucalyptus tottiana* (pricklybark), *Nuytsia floribunda* (WA Christmas tree), western sheoak, *Callitris arenaria* (sandplain cypress), *Callitris pyramidalis* (swamp cypress) or *Xylomelum occidentale* (woody pear); and
- must include an often highly species-rich understorey (TSSC, 2016).

The Approved Conservation Advice for the TEC states that the patch of vegetation must meet the minimum patch size and condition thresholds criteria to be representative of the TEC. The approved advice states that a single patch of the TEC must be in at least a good (Keighery, 1994) condition to meet the condition threshold requirements of the TEC. The minimum patch size for a patch considered to be in a good (Keighery, 1994) condition is two hectares (TSSC, 2016).

A review of representative photographs taken during a site inspection by MBS Environmental (2020b) indicates that the application area contains key species of this TEC, namely a canopy comprising of *Banksia attenuata* and *Banksia ilicifolia* species, and an emergent tree layer of *Eucalyptus marginata*, *Nuytsia floribunda* and *Xylomelum occidentale* species. However, noting the completely degraded (Keighery, 1994) condition, the vegetation proposed to be cleared does not meet the condition threshold requirements of the TEC and therefore is not considered to be representative of this TEC.

According to available databases, there are nine other conservation significant ecological communities mapped within the local area. The closest communities are *Corymbia calophylla* - *Xanthorrhoea preissii* woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in Gibson et al. (1994)) and the Herb rich shrublands in clay pans (floristic community type 8 as originally described in Gibson et al. (1994)),

both located approximately 6.4 kilometres from the application area. Noting the vegetation type and the degraded to completely degraded (Keighery, 1994) condition of the vegetation under application, the vegetation proposed to be cleared is not considered to be representative of these, or any other, conservation significant ecological communities mapped in the local area.

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

Assessment outcomes:

The assessment has identified that the proposed clearing will result in the following SRIs:

- loss of approximately 2.86 hectares of critical WRP habitat
- loss of approximately three hectares of significant black cockatoo foraging habitat that supports breeding and roosting
- loss of 5.44 hectares of native vegetation that supports fauna movement across the landscape which retains only 23.19 per cent of its original vegetation extent.

Taking into account the applicant's avoidance, minimisation and mitigation measures, the Delegated Officer determined that the above impacts can be addressed through an adequate offset strategy (as conditioned on the clearing permit permit). Section 4 of this report provides further information on the offset provided.

The Delegated Officer acknowledged that although the vegetation in the application area is not likely to provide significant habitat for masked owl, south-western brush-tailed phascogale, peregrine falcon and ground dwelling fauna, it may be occasionally foraged upon by these species and/or used by other fauna for dispersal.

Conditions:

In addition to the offset, the Delegated Officer determined that the following management conditions on the clearing permit will adequately mitigate the potential impacts of the proposed clearing on the above environmental values:

- pre-clearance survey for the presence of WRP to ensure that individuals are not harmed at the time of clearing
- limitation of the extent of WRP and black cockatoo habitat authorised to be cleared
- fauna management condition to provide fauna an opportunity to move into adjacent native vegetation ahead of the clearing activity; and
- weed and dieback hygiene measures to mitigate the risk of impacts to adjacent fauna habitat.

Assessment:

According to available databases, a total of 27 conservation significant fauna species have been recorded within the local area (DBCA, 2022b). Noting there are no watercourses being impacted by the proposed clearing, the proposed clearing will not impact on any aquatic fauna. Taking into consideration the habitat requirements of the recorded species, their distribution, the mapped vegetation type (MBS Environmental, 2020), the condition of the vegetation within the application area, and the findings of the fauna survey (Harewood, 2020), the application area is likely to comprise suitable habitat for:

- forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*)
- Baudin's cockatoo (*Calyptorhynchus baudinii*)
- Carnaby's cockatoo (*Calyptorhynchus latirostris*)
- masked owl (southwest) (*Tyto novaehollandiae novaehollandiae*)
- peregrine Falcon (*Falco peregrinus*)
- south-western brush-tailed phascogale, wambenger (*Phascogale tapoatafa wambenger*); and
- western ringtail possum, ngwayir (*Pseudocheirus occidentalis*).

Fauna survey

To obtain a thorough understanding of the fauna values within the application area, MBS Environmental, on behalf of the applicant, engaged Greg Harewood to conduct a level 1 fauna survey of the application area. The survey also comprised targeted searches for black cockatoo habitat and WRP habitat (Harewood, 2020). The main fauna habitat type present within the proposed clearing area consists of an open woodland containing jarrah (*Eucalyptus marginata*), marri (*Corymbia calophylla*), candlestick banksia (*Banksia attenuata*), holly-leaved banksia (*Banksia ilicifolia*), woody pear (*Xylomelum occidentale*), Christmas tree (*Nuytsia floribunda*) and peppermint (*Agonis flexuosa*) in various densities over small areas of spearwood (*Kunzea glabrescens*) on a low sandy hill (Harewood, 2020).

Harewood (2020) described the overall fauna habitat quality within the application as very low due to its completely degraded (Keighery, 1994) condition, and in particular, the almost complete lack of any native ground cover. The fauna assemblage present was lacking in number and diversity, with particular regard to ground dwelling reptile and mammal species. The application area isolated due to clearing of surrounding areas and being within a fragmented landscape with limited connectivity (Harewood, 2020).

Black cockatoos

The application area falls within the modelled distribution of all three black cockatoo species. Black cockatoos are classified as threatened under the BC Act. Under the EPBC Act, the Carnaby's and Baudin's cockatoo are listed as Endangered and the forest red-tailed black cockatoo is listed as Vulnerable. 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.

The application area does not provide suitable breeding habitat for black cockatoos. Suitable breeding habitat for these species includes trees which 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, however, is reduced to 300 millimetres for wandoo and salmon gum (Commonwealth of Australia, 2012). Carnaby's cockatoo typically nests in eucalypt woodlands, primarily in the hollows of wandoo (*Eucalyptus wandoo*), salmon gum (*E. salmonophloia*) and marri (*Corymbia calophylla*) (Groom, 2015). The most important breeding trees for forest red-tailed black cockatoos throughout their range are large, mature marri trees, approximately 120-150 years in age with a mean overall height of 20.24 metres (Johnston, Kirkby and Sarti, 2013). According to Saunders, Mawson and Dawson (2014), black cockatoos show strong nest site fidelity as approximately 43 per cent of female black cockatoos bred in the same hollow over consecutive years, 13 per cent bred within 100 metres of their previous hollows, 32 per cent bred in a hollow between 101-1000 metres from their previous hollow and only 12 per cent bred more than one kilometre from their previous hollow.

Harewood (2020) identified 47 breeding habitat trees within the survey area, of which 37 occur within the application area. Of these, 24 habitat trees did not contain hollows of any size and 13 were assessed as having hollows potentially suitable for breeding, but of a likely size or orientation that was deemed unsuitable for black cockatoo to utilise. Identified hollows were examined using binoculars for evidence of actual use by black cockatoos, that being chewing around the hollow entrance, scarring and scratch marks on trunks and branches. Where possible, the survey author used a drone to photograph hollows suspected of being possibly suitable for black cockatoos. Noting this, the size and orientation of the identified hollows, Harewood (2020) concluded that the hollows were unlikely suitable for black cockatoo breeding.

Noting typical food resources for black cockatoos, approximately three hectares of the application area contains foraging habitat for these species (Harewood, 2020). The remaining application area contains dead trees and Kunzea regrowth (MBS Environmental, 2021a). Forest red-tailed black cockatoo forages within jarrah and marri woodlands and forest, and edges of karri forests including wandoo and blackbutt, within the range of the subspecies. The species largely feeds on seeds of marri and jarrah, as well as other Eucalyptus species and Allocasuarina cones (Commonwealth of Australia, 2012). Baudin's cockatoo prefers foraging within Eucalypt woodlands and forest, and proteaceous woodland and heath. During the breeding season (October to late January/early February) this species prefers marri seeds. Outside the breeding season the species may feed in fruit orchards and tips of Pinus spp. (Commonwealth of Australia, 2012). Carnaby's cockatoo feeds on the seeds, nuts and flowers of a large variety of plants including Proteaceous species (Banksia, Hakea and Grevillea), as well as Allocasuarina and Eucalyptus species, *Corymbia calophylla* and a range of introduced species (Valentine and Stock, 2008). The application area contains jarrah, marri and banksia species in various concentrations which are a primary food source for all three species of black cockatoo. Evidence of black cockatoo foraging was observed during the field survey in the form of chewed marri fruits. Harewood attributed this evidence to forest red-tailed black cockatoo based on the nature of bite marks (Harewood, 2020).

The local area comprises approximately 7,224.41 hectares of native vegetation which is mapped as Carnaby's cockatoo foraging habitat. The application area represents approximately 0.075 per cent of this extent. Approximately 38 per cent (or 2,710 hectares) of the vegetation in the local area occurs within conservation areas (Figure 2).

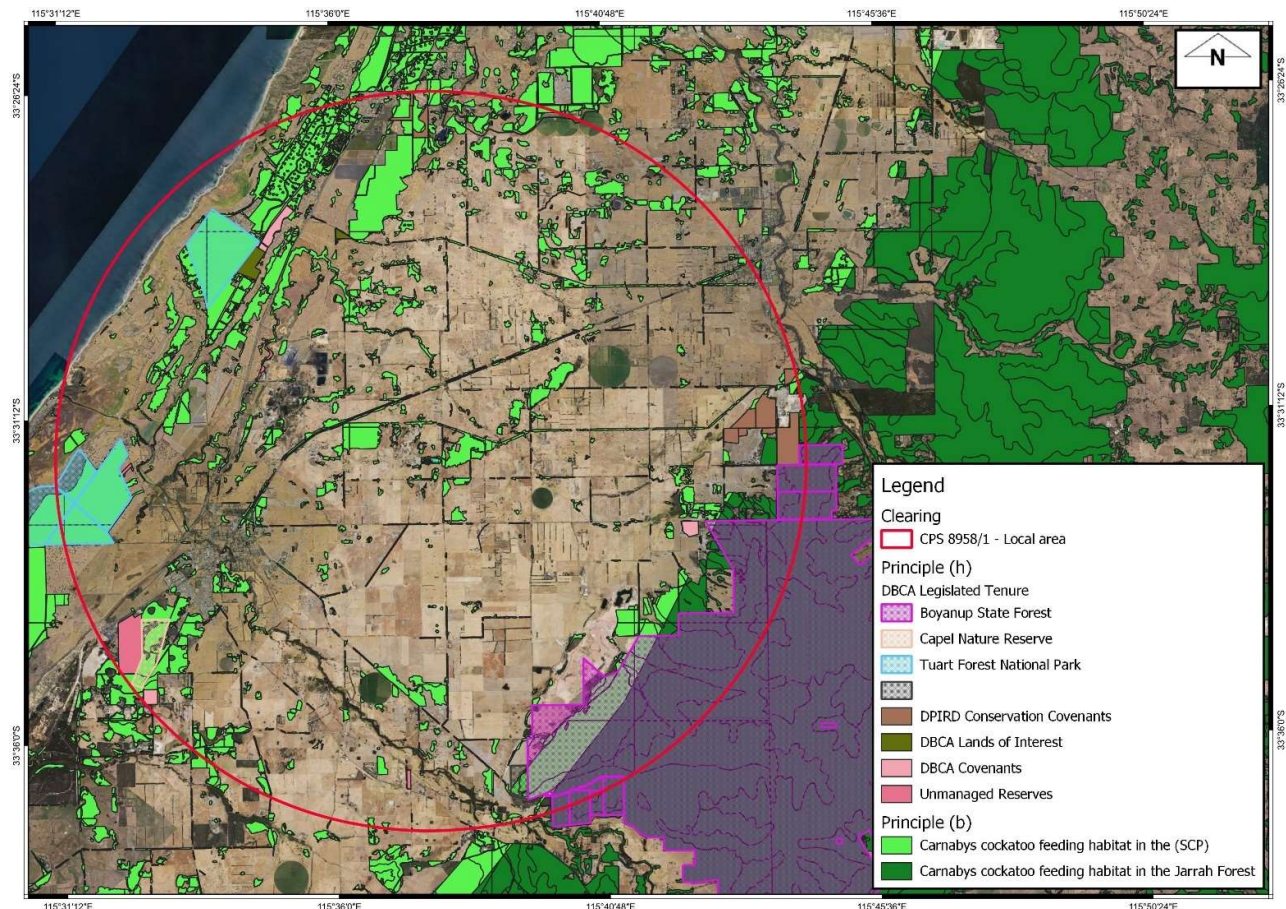


Figure 2 Map of Carnaby's cockatoo foraging habitat within the local area

The vegetation within the application area contains black cockatoo foraging habitat which supports breeding. While breeding, black cockatoos will generally forage within a 6–12 kilometre radius of their nesting sites (Commonwealth of Australia, 2012). According to available databases, a natural confirmed black cockatoo breeding point is mapped approximately 6.3 kilometres southeast of the application area.

The assessment further identified that the application area provides foraging habitat that supports black cockatoo roosting. Roosting habitat is defined as a suitable tree (generally the tallest) or group of tall trees, native or introduced, usually close to an important water source, within an area of quality foraging habitat within the range of each black cockatoo species which provide black cockatoos with shelter during the heat of the day and safe resting places at night (Department of the Environment and Energy, 2017). Individual night roosting sites need suitable foraging habitat and water within six kilometres (EPA, 2019). Overlapping foraging ranges within 12 kilometres also support roosting sites and maintain habitat connectivity and movement across the landscape (EPA, 2019). There is one confirmed black cockatoo roosting site mapped within the local area. The site occurs near Capel Nature Forest approximately 8.4 kilometres southwest of the application area. An additional three confirmed black cockatoo roosting sites are mapped within a 12-kilometre buffer of the application area within Boyanup State Forest.

Considering the extent of the application area and native vegetation within adjacent properties, the proposed clearing is not likely to restrict the ability of black cockatoos to move across the landscape but does represent habitat supporting the persistence of black cockatoos in the local area.

WRP

WRP is listed as critically endangered under the BC Act and the EPBC Act. The species generally occurs within coastal or near coastal forest that includes peppermint trees (*Agonis flexuosa*) as a major component. Habitat critical to survival for WRP is not well understood but commonly contains high nutrient foliage availability food, suitable structure for protection/nesting and canopy continuity to avoid/escape predation and other threats (Department of Parks and Wildlife (DPaW), 2017). The application area falls within one of three management zones, that being along the west coast (from Bunbury to Augusta) on the Swan Coastal Plain zone. The highest

densities of WRP within this management zones were recorded in the areas of mature peppermint trees (*Agonis flexuosa*) where large, dense and overlapping canopies have been retained (Shedley and Williams, 2014).

In 2009, the then Department of the Environment, Water, Heritage and the Arts developed policy guidelines for the protection and enhancement of WRP habitat and habitat connections on the southern Swan Coastal Plain in which criteria for significant impacts were defined. The document recognised and mapped three habitat categories, namely core habitat, primary corridors and supporting habitat from Bunbury to Dunsborough (Shedley and Williams, 2014). The application area is mapped within the areas of WRP supporting habitat.

According to available databases, three records of WRP have been recorded within one kilometre of the application area (DBCA, 2022b). Harewood (2020) identified a total of three WRP dreys during the daytime fauna survey, one of which occurs within the application area. The other two dreys are located approximately 20 metres and 25 metres north of the application area. Harewood (2020) noted that WRP use not only dreys, but also forks in trees, subtle cavities in tree trunks, fallen hollow logs, rabbit burrows and dense ground cover for daytime refuge. On this basis, observations of dreys only provide a guide to WRP habitat use/quality as other opportunities for daytime refuge may exist. Near the drey within the application area, Harewood (2020) observed two individual WRP.

Based on the survey findings, Harewood (2020) concluded that approximately 3.22 hectares of the vegetation within the survey area represents WRP habitat in the form of refuge, foraging or dispersal type (Figure 3). Approximately 2.86 hectares is proposed to be cleared. The quality of the habitat was considered low given the relatively sparse vegetation density and poor canopy connectivity in many areas. Individuals of WRP appeared to be absent from the western portion of the application area where only scattered trees were present (Harewood, 2020).

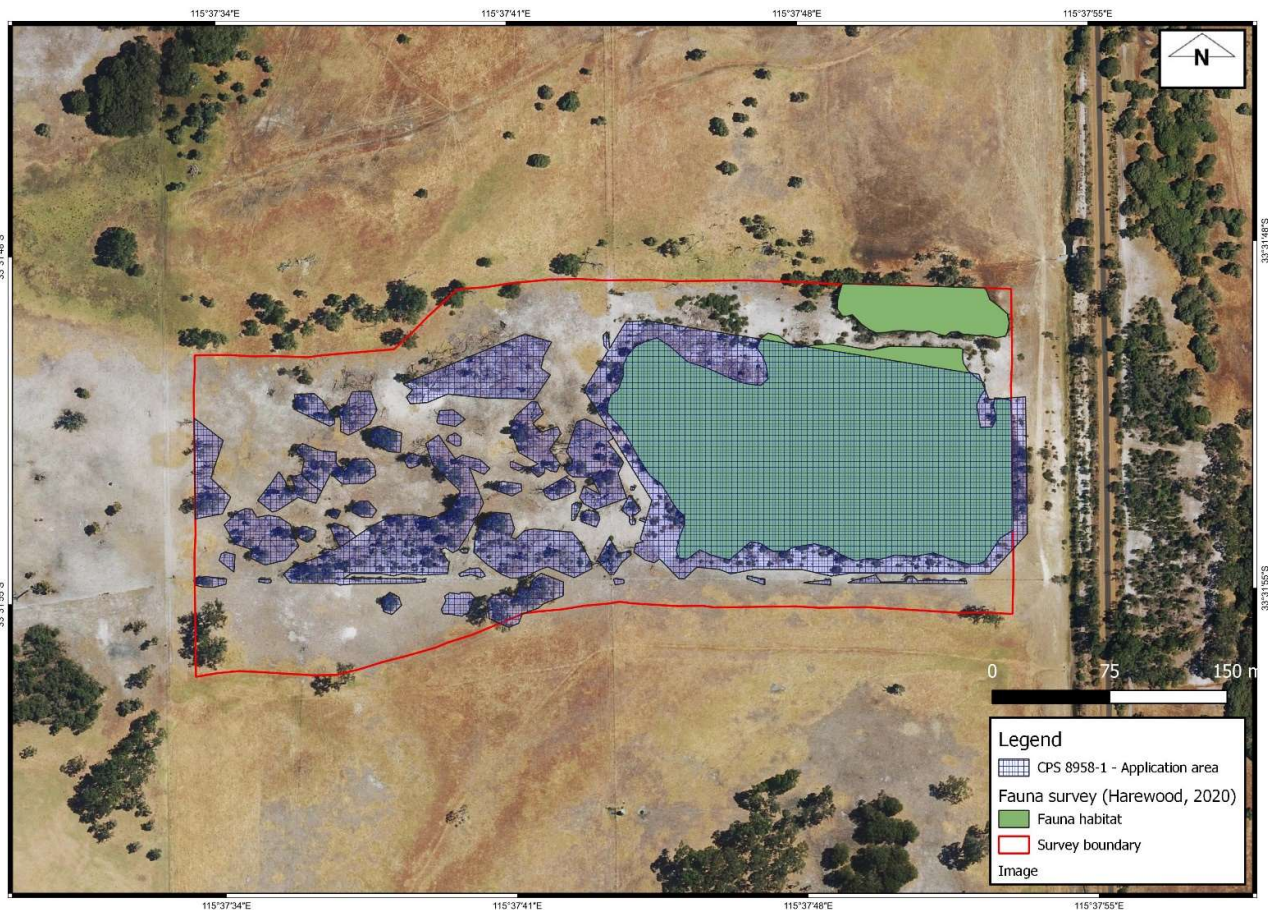


Figure 3 WRP habitat mapped within the application and survey area (Harewood, 2020)

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. These appear to vary between key management zones (DPaW, 2017). The application area occurs outside the WRP core habitat of the Swan Coastal Plan key management zone (Shedley and Williams, 2014). Noting this, and that the quality of the WRP habitat within the application area is low (Harewood, 2020), the application area does not provide habitat which is imperative for the conservation of WRP. Despite this, for the purposes of the assessment, the application area is considered to represent critical habitat in accordance with the WRP recovery plan on the basis that WRP individuals have been recorded within the application area.

South-western brush-tailed phascogale, wambenger

In south Western Australia, brush-tailed phascogale have been observed in dry sclerophyll forests and open woodland that contain hollow-bearing trees. The species almost exclusively forages among the tree canopy (Department of Environment and Conservation, 2012). Noting the historical disturbance of the site, lack of a continuous tree canopy linking nearby remnants which would assist this species in avoiding predators, the application area is unlikely to provide suitable habitat for this species. Harewood (2020) did not observe any evidence of south-western brush-tailed phascogale within the application area.

Masked owl (southwest)

Masked owl, listed as Priority 3 by DBCA, inhabits forests, woodlands, timbered waterways and open country on the fringe of these areas and usually roosts in vertical hollows in large trees. The main requirements are tall trees with suitable hollows for nesting and roosting and adjacent areas for foraging (Birdlife Australia, 2020). Given Harewood (2020) did not identify any hollows of suitable size for this species, the application area does not provide significant habitat for masked owl.

Peregrine Falcon

The species is found in most habitats, from rainforests to the arid zone and at most altitudes, from the coast to alpine areas. It requires abundant prey and secure nest sites and prefers coastal and inland cliffs or open woodlands near water and may even be found nesting on high city buildings (Australian Museum, 2020). This species is widespread, highly mobile and is found in various habitats. The application area may comprise suitable habitat for this species, however, noting habitat preferences and the small extent of the proposed clearing, the application area is unlikely to comprise a significant habitat for this species.

Other fauna

Noting the completely degraded (Keighery, 1994) condition of the vegetation, with almost no native groundcover, the application area is of low habitat value for any ground dwelling fauna species. Quenda (*Isoodon fusciventer*; Priority 4) requires a dense understorey for cover and suitable contiguous dense understorey habitat is not present within the application area (van Dyck and Strahan, 2008). Chuditch (*Dasyurus geoffroi*; vulnerable) and western brush wallaby (*Notamacropus Irma*; Priority 4) are wide-ranging with large home ranges requiring large contiguous areas of woodland habitat. The local records of quokka (*Setonix brachyurus*; vulnerable) are historical, and this species has largely disappeared from the mainland. The vegetation in the application is therefore unlikely to provide significant habitat for quenda, chuditch, quokka or other ground-dwelling fauna. Rakali (*Hydromys chrysogaster*; Priority 4) inhabits wetland or estuarine habitats that are not present in the application area. Western false pipistrelle (*Falsistrellus mackenziei*; Priority 4) (a bat) may potentially overfly the application area, but its range has contracted to old growth forest and higher rainfall eucalypt woodlands (Richards et al., 2012).

Ecological linkage

The application area occurs approximately 1.7 kilometres south of a mapped South West Regional Ecological Linkage axis. An ecological linkage is defined as a series of (both contiguous and non-contiguous) patches, which by, virtue of their proximity to each other, act as stepping-stones of habitat which facilitate the maintenance of ecological processes and the movement of organisms within, and across a landscape (Molloy et al., 2009).

The application area is part of a contiguous strip of vegetation which runs parallel to the mapped linkage. Noting that the local area has been extensively cleared, the native vegetation within the application area is likely to facilitate the movement of fauna and ecological processes across the landscape. In addition, the application area is located east of an approximately 50-hectare patch of native vegetation and may therefore be used by fauna for dispersal.

A revegetation offset condition imposed on the clearing permit will adequately address the potential impact on ecological linkages. The revegetation will result in a net gain of vegetation within the locality of the application area.

3.2.3. Significant remnant vegetation - Clearing Principles (e)

Outcome

The proposed clearing will result in the loss of 5.44 hectares of native vegetation which is considered significant as a remnant of native vegetation in an area that is in an extensively cleared landscape.

Taking into account the applicant's avoidance, minimisation and mitigation measures, the Delegated Officer determined that the above SRI can be accounted for through an adequate offset (as conditioned on the clearing permit). Section 4 of this report provides further information on the offset provided.

Conditions

In addition to the offset, the Delegated Officer determined that the following management conditions on the clearing permit will adequately mitigate the potential impacts of the proposed clearing on the above environmental values:

- Weed and dieback hygiene measures to mitigate the risk of the introduction and spread of weeds and dieback into adjacent native vegetation.

Assessment

The aim of this clearing principle is to maintain sufficient native vegetation in the landscape for the maintenance of ecological values. It also recognises the need to protect ecological communities that have been extensively cleared and to retain a representation of each ecological community in local areas throughout its pre-European settlement range. Cumulative impacts of clearing within the local area are also considered (Department of Environment Regulation, 2013).

As detailed under Clearing Principle (b), the application area provides significant habitat for black cockatoos and critical habitat for WRP. Given this, the vegetation proposed to be cleared is considered significant as a remnant of native vegetation.

The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001). The extent of native vegetation within the local area is inconsistent with these thresholds as it retains approximately 23.19 per cent vegetation cover (approximately 7,588.54 hectares) (refer to Table 1 below). The application represents approximately 0.072 per cent of the remaining vegetation within the local area and the proposed clearing will reduce the extent of native vegetation within the local area to 7,583.10 hectares. Given this, the application area is located within an extensively cleared landscape.

The application area is located within the 'Swan Coastal Plain' (SCP) Interim Biogeographic Regionalisation for Australia (IBRA) which retains approximately 38.6 per cent of its pre-European vegetation extent (Government of Western Australia, 2019).

The SCP Southern River vegetation complex mapped within the application area retains approximately 18.4 per cent of its original vegetation extent. MBS Environmental (2020) and Harewood (2020) described the condition of vegetation proposed to be cleared as completely degraded (Keighery, 1994). On this basis, an assessment of vegetation in the application area concluded that the vegetation in the application area does not represent the mapped vegetation community (MBS Environmental, 2020).

Although the native vegetation within the application area does not represent the extensively cleared Southern River vegetation complex, it occurs within the local area which retains less than 30 per cent of its original extent. In addition, it provides habitat for conservation significant fauna and contributes to ecological linkage function. On this basis, the vegetation proposed to be cleared is considered significant as a remnant in an area which has been extensively cleared.

Table 1 - Vegetation statistics (Government of Western Australia 2019a and 2019b)

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
IBRA bioregion*					
Swan Coastal Plain	1,501,221.93	579,813.47	38.62	222,916.97	14.85
Vegetation complex					
Southern River Complex	58,781.48	10,832.18	18.43	940.36	1.60

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
Local area					
10 kilometre radius	32,717.70	7,588.54	23.19	-	-

*Government of Western Australia (2019a)

**Government of Western Australia (2019b)

3.2.4. Environmental value: water resources - Clearing Principles (f)

Outcome:

The proposed clearing will not significantly impact on this environmental value.

Conditions:

No clearing permit conditions are necessary in relation to this matter.

Assessment:

The application area does not intersect any mapped watercourses but is mapped within an unknown multiple use wetland (unique feature identifier 15809). DPaW (2014) describes multiple use wetlands as wetlands with few remaining important attributes and functions. It therefore recommends that use, development and management should be considered in the context of ecologically sustainable development and best management practice catchment planning through landcare.

Taking into consideration the extent and condition of native vegetation in the application area which grows within the area of a mapped wetland, the proposed clearing is unlikely have significant impacts on riparian vegetation or environmental values of the wetland. The wetland is mapped across approximately 42,321.9 hectares. The application area contains approximately 0.23 hectares of vegetation growing in, or in association with the wetland in a completely degraded (Keighery, 1994) condition. The proposed clearing may result in sedimentation/turbidity and other water quality impacts. However, noting that the clearing will impact only approximately 0.00054 per cent of the mapped wetland, the impacts will likely be only minimal and temporary and no long-term impacts on the ecological functions of the wetland are anticipated.

3.2.5. Environmental value: land resources - Clearing Principles (g)

Outcome:

The proposed clearing may result in appreciable land degradation in the form of wind erosion, should the soils within the application area remain exposed for an extended period post-clearing.

Conditions:

The Delegated Officer determined that to adequately mitigate the potential long-term impacts of the proposed clearing on the above environmental value, under the conditions of the clearing permit, the applicant will be required to:

- undertake sand extraction activities within three months of the cessation of clearing to reduce the exposure time of sandy soils; and
- commence revegetation activities in the cleared areas within 12 months of the cessation of sand extraction to prevent any potential for long-term land degradation impacts.

Assessment:

According to DPIRD's land degradation risk mapping, the soils mapped in the application area generally present a low risk of water erosion, water logging, flooding and salinity and a moderate risk of wind erosion. Noting that the mapped landforms are largely light sandy substrate (given the minimum of wetland habitat within the application area), there is a risk of wind erosion.

3.3. Relevant planning instruments and other matters

According to available databases, the application area is zoned rural under the town planning scheme.

On 16 September 2021, Shire of Capel granted the applicant Development Approval for 'Industry-Extractive' of Lot 230 on Deposited Plan 232802, Elgin, in accordance with clause 68(2)(b) of the deemed provisions of the *Planning and Development (Local Planning Schemes) Regulations 2015*.

On 31 May 2022, Shire of Capel granted the applicant an Extractive Industry Licence for the extraction of sand on Lot 230 on Deposited Plan 232802, Elgin, in accordance with *Extractive Industry Local Law 2016*.

DWER's Planning Advice, South West Region (2020) branch has advised that proponents are required to maintain an adequate vertical separation distance between the base of extraction and the highest groundwater level (HGL), in accordance with Water Quality Protection Note 15 'Basic raw materials extraction, July 2019'. DWER supports a minimum of 0.5 metres vertical separation between the HGL and final ground level post-extraction, where the site is being rehabilitated to pasture.

DWER noted that the Shire of Capel's Development Approval requires the applicant to maintain a minimum separation distance of one metre between the bottom of the extraction pit and HGL. To ensure that the proposed clearing would not adversely impact the groundwater resources, the Delegated Officer sought additional advice from the Planning Advice, South West Region branch on suitability of this separation distance.

Planning Advice, South West Region (2022) provided updated advice that a separation distance of one metre is sufficient to avoid any impacts to groundwater during extraction activities. This advice was exclusively provided with the regards to the proposed extraction activities.

DWER notes that to minimise the impacts on groundwater during the extraction, the applicant has committed to connecting all sand extraction machinery to the site survey and pit design specifications through a machine control system (MBS Environmental, 2021b). According to the applicant, this will ensure that the extraction does not reduce the separation distance between the extraction pit and groundwater level.

During the assessment of the revegetation plan, DWER considered the reduced separation distance from the base of the proposed pit to the highest groundwater level and whether this adequately supports the offset revegetation activities. DWER noted that the dominant plant species proposed to be used for revegetation have vast feeder roots at the surface and smaller tap roots able to survive in wetter environments compared to other native species. For example, *Corymbia calophylla* is known to occur in a variety of habitats, including along watercourses and wetlands, particularly in heavier soils (WA Herbarium, 1998-). On this basis, DWER concluded that the maximum separation distance to groundwater level remaining post-extraction will support the nominated replanting flora species and the revegetation will result in a self-sustaining, resilient patch of native vegetation.

The applicant may have notification responsibilities under the EPBC Act for impacts to black cockatoos, WRP and their habitats, as set out in the relevant EPBC Act referral guidelines for these species. The applicant has been advised to contact the federal Department of Water, Agriculture and the Environment (DAWE) to discuss EPBC Act referral requirements.

There are no Aboriginal Sites of Significance 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 SRIs remain after the application of the avoidance and mitigation measures summarised in Section 3.1:

- loss of 5.44 hectares of native vegetation that supports fauna movement across the landscape which retains only 23.19 per cent of its original vegetation extent
- loss of approximately three hectares of significant black cockatoo foraging habitat which supports breeding and roosting
- loss of approximately 2.86 hectares of critical habitat for WRP.

To address the above residual impacts, the applicant has submitted an environmental offset that involves revegetation of approximately 6.69 hectares of the offset site, which includes the application area post-extraction and immediately adjacent areas which are devoid of vegetation (Figure 4).

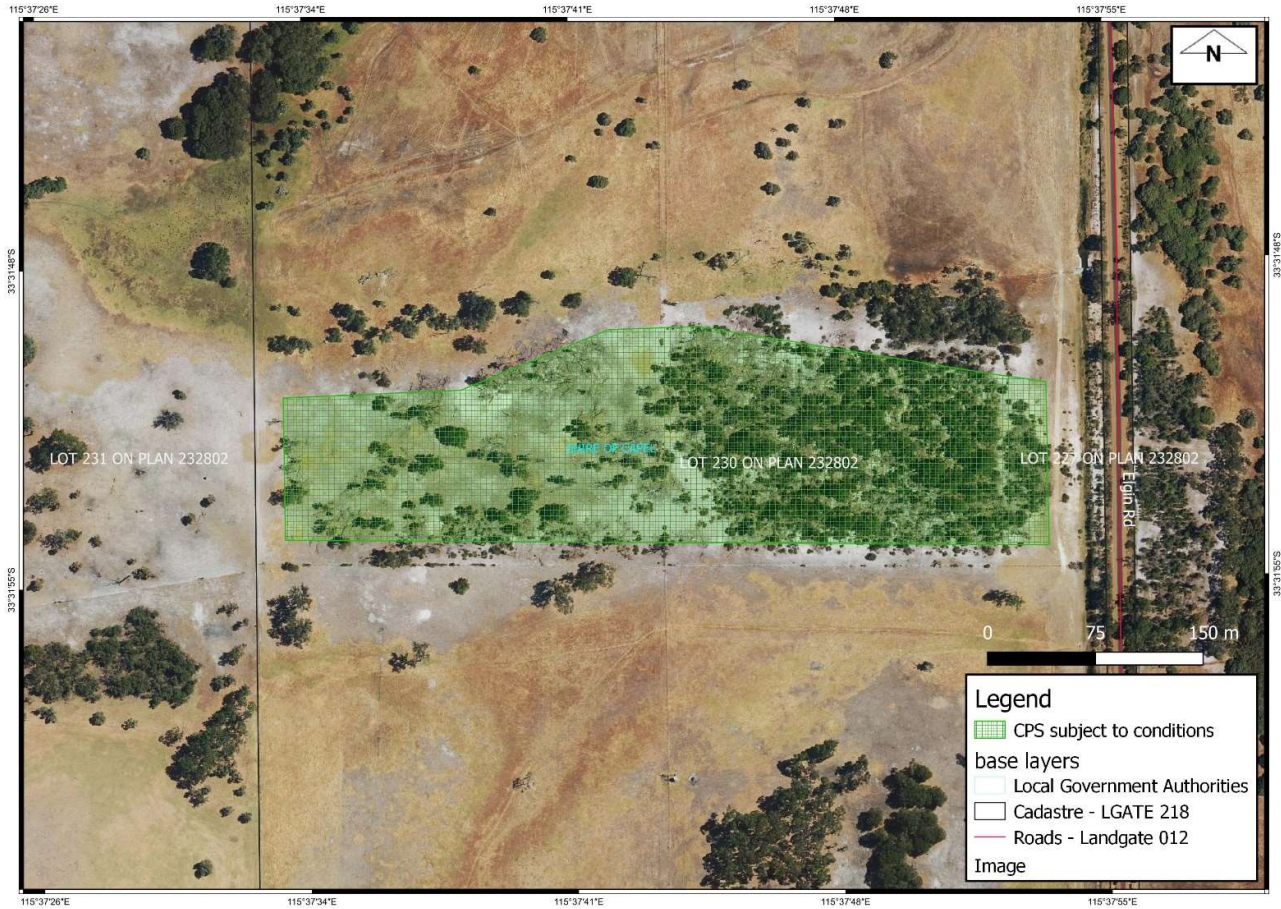


Figure 4 Offset revegetation area

In assessing whether the proposed offset is adequately proportionate to account for the significant residual impacts of the proposal, DWER undertook a calculation using the Commonwealth Offsets Calculator. The calculator indicated that the above offset would address 100 per cent of the SRI of the proposed clearing and is consistent with the WA Environmental Offsets Policy (2011). Appendix F provides the justification for the values used in the offset calculation.

The Delegated Officer noted that the revegetation offset will result in a restoration of fauna habitat and vegetation considered significant in an area that has been extensively cleared in better quality than that currently present in the application area. On this basis, the Delegated Officer determined that the implementation of the above offset strategy will adequately account for the SRIs of the proposed clearing.

End

Appendix A. Additional information provided by applicant

Table 2 - Summary of additional information provided by applicant

ID	Information	Consideration of additional information
1	Clearing Permit Application Supporting Documentation (MBS Environmental, 2020a). This document contained: <ul style="list-style-type: none"> ○ project background information ○ a summary of the proposed clearing ○ assessment against 10 clearing principles conducted by MBS Environmental ○ site inspection memorandum summarising the findings of an inspection of the application area ○ Fauna Survey Report prepared by Harewood (2020a). 	DWER considered this information in the preliminary assessment of the proposed clearing. Based on this information, review of biological databases available at the time of the assessment and application area site characteristics, DWER determined that there was a reasonable probability that several conservation significant flora species recorded within the local area could occur in the application area. On this basis, DWER requested the applicant to conduct a flora survey targeting the flora species identified as likely to occur within the application area (Appendix C below).
2	Representative photographs of the vegetation proposed to be cleared (2020b)	
3	Targeted flora survey report (MBS Environmental, 2021a)	This information allowed DWER to accurately assess the impacts of the proposed clearing on conservation significant flora (section 3.2.1 above).
4	Summary of measures to avoid and mitigate the impacts of the clearing, including undertaking on-site revegetation activities over approximately 7 hectares of the extraction site (MBS Environmental, 2021a).	DWER considered this information in the assessment of environmental impacts (section 3.1 and 3.2 above), as well as the suitability of the proposed offset (section 4 above).
5	Development Approval issued by Shire of Capel (MBS Environmental, 2021b)	DWER noted this information in accordance with section 51O(4) of the EP Act.
6	Offset and Revegetation plan (MBS Environmental, 2021c)	DWER considered this document in the development of the revegetation offset condition, including revegetation completion criteria, imposed on the clearing permit to adequately address the significant residual impacts of the proposed clearing.

Appendix B. Details of public submissions

Table 3 - Summary of public submissions (Submitter, 2020)

Summary of comments	Consideration of comment
The public submission raised concerns that the proposed clearing may impact WRP and black cockatoos.	Section 3.2.2 of this report details the assessment of impacts of the proposed clearing on these species. To offset these impacts, under the conditions of the clearing permit, the permit holder will be required to restore 6.69 hectares of habitat for these species.
<p>A visual inspection of the proposed clearing area from the adjacent road verge indicated that approximately 66 per cent of the eastern portion of the application area was in good condition. The remaining portion of the application area was degraded by livestock. The understory vegetation appeared to be degraded.</p> <p>The road verge vegetation, which was also in degraded condition, indicated a presence of Slipper Orchids (<i>Cryptostylis ovata</i>), Donkey Orchids (<i>Diuris corymbosa</i>) <i>Synaphea hians</i>. The submitter noted the <i>Verticordia attenuata</i> is also known to occur within road verges. This indicates that, if fenced off, natural regeneration of this species could occur within the application area.</p>	<p>MBS Environmental (2020a and 2021a) inspected the application area and identified that:</p> <ul style="list-style-type: none"> the condition of the vegetation was completely degraded (Keighery, 1994) the vegetation showed signs of multiple disturbances native understorey had been lost and replaced by introduced weed species. Upper storey density was low much of the native vegetation that remained was either dead or in poor health, the occurrence of dieback (<i>Phytophthora cinnamomi</i>) was suspected; and the application area does not provide habitat for conservation significant flora. <p>On this basis, DWER determined that the proposed clearing will unlikely impact conservation significant flora. Refer to Section 3.2.1 above for more information.</p>
According to the Submitter, an application to clear native vegetation east of the application area, across Elgin Road, has been submitted. Loss of this vegetation, together with the vegetation within the application area, could have significant adverse impacts on the environmental values within the local area.	<p>DWER presumes the Submitter referred to clearing permit application CPS 7973/1. This application has been withdrawn.</p> <p>DWER considered cumulative impacts of clearing within the local area under Clearing Principle (e).</p>
The sand ridge where the extraction is proposed, appears to be very low in elevation and a significant amount of clearing would be required for a small amount of material.	This matter is outside of the scope of this environmental impact assessment. Activities relating to the sand extraction are regulated by the Local Government Authority.
The applicant may have issues receiving approvals from Shire of Capel to utilise Elgin Road as a heavy duty haulage route.	This matter is outside of the scope of this environmental impact assessment. Activities relating to the sand extraction are regulated by the Local Government Authority.

During the assessment of the application, the Submitter provided additional comments on the proposed clearing. These comments are summarised in Table 4.

Table 4 - Summary of additional comments on the application

Item	Summary of comments	Consideration of comment
1	Extraction to only one metre above HGL, instead of two metres, may cause potential impacts on groundwater.	<p>DWER assesses clearing permit applications in accordance with Part V, Division 2 of the EP Act. The decision to allow extraction to one (1) above the HGL was made by Shire of Capel under the <i>Planning and Development (Local Planning Schemes) Regulations 2015</i>. DWER recommends the Submitter to contact Shire of Capel in relation to approvals under its jurisdiction.</p> <p>DWER has considered potential impacts on groundwater under Clearing Principle (i). Planning Advice, South West Region (2022) advised that a separation distance of one metre is sufficient to avoid any impacts to groundwater during extraction activities.</p>
2	The Shire of Capel's decision to grant Development Approval will create a precedent for future approvals	This matter is outside of the scope of this environmental impact assessment. Activities relating to the sand extraction are regulated by the Local Government Authority.
3	Cleared areas should be revegetated with similar native species than those being cleared	As detailed in section 4 of this report, the permit holder will be required to revegetate the offset site to offset the significant residual impacts of the proposed clearing. The successful revegetation will result in a net increase of vegetation in the local area, as well as improved fauna habitat and ecological linkage values. As per the revegetation plan approved by DWER, the permit holder is required to revegetate the offset site using locally occurring species, a number of which, such <i>Corymbia calophylla</i> , <i>Agonis flexuosa</i> or <i>Kunzea glabrescens</i> , currently grow within the

		application area. The species proposed to be planted were selected following the consideration of the soil landform remaining within the offset site following the sand extraction.
4	Risk of wind erosion	As detailed in section 3.2.5 of this report, DWER has identified that the proposed clearing may result in an increased risk of wind erosion. Given this, it imposed two management conditions on the clearing permit which will adequately mitigate any potential long-term impacts to the environment.
5	Minutes of Shire of Capel's ordinary council meeting on 25 August 2021	DWER reviewed the supplied meeting minutes which detailed Shire of Capel's Council decision to allow the proposed sand extraction at Lot 230 Elgin Road and the concerns raised by the Shire of Capel's personnel. DWER considered the concerns related to groundwater resources and impacts from the clearing of native vegetation during the assessment of the proposed clearing.

Appendix C. Site characteristics

C.1. Site characteristics

Characteristic	Details
Local context	<p>The property on which the clearing is proposed is mostly cleared, with scattered trees and sporadic patches of remnant vegetation remaining. The area proposed to be cleared comprises the largest intact patch of remnant vegetation remaining on the property. The proposed clearing is located within the intensive land use zone of Western Australia, and is surrounded by freehold properties that are also mostly devoid of native vegetation. The neighbouring property located east of the application area has a large area of intact native vegetation. The area proposed to be cleared is likely to link with this neighbouring property in providing habitat for fauna.</p> <p>Spatial data indicates the local area (10 kilometre radius from the perimeter of the application area which is equal to approximately 32,717.70 hectares) retains approximately 23.19 per cent (approximately 7,588.54 hectares) of the pre-European native vegetation cover.</p>
Ecological linkage	<p>No mapped ecological linkages intersect the application area.</p> <p>The closest ecological linkage is South West Regional Ecological Linkage (SWREL) mapped approximately 1.7 kilometres north-west of the application area. The application area occurs east of an approximately 50-hectare area of native vegetation.</p>
Conservation areas	<p>The application area is not located within, or adjacent to, any conservation areas.</p> <p>The nearest conservation area is the Boyanup State Forest, which occurs approximately 6.6 kilometres east of the application area.</p>
Vegetation description	<p>The vegetation within the application area intersects Heddle vegetation Southern River Complex, described as open woodland of <i>Corymbia calophylla</i> (Marri) - <i>Eucalyptus marginata</i> (Jarrah) - <i>Banksia</i> species with fringing woodland of <i>Eucalyptus rudis</i> (Flooded Gum) - <i>Melaleuca raphiophylla</i> (Swamp Paperbark) along creek beds (Heddle et al., 1980).</p> <p>MBS Environmental inspected the application area on 11 May 2020 and 17 June 2020 to describe the vegetation types within the application area. MBS Environmental (2020a) identified the following two vegetation types:</p> <ul style="list-style-type: none"> • Open woodland of <i>Eucalyptus marginata</i>, <i>Banksia attenuata</i>, <i>Banksia ilicifolia</i>, <i>Xylomelum occidentale</i> and <i>Nutsia floribunda</i> over patches of <i>Kunzea glabrescens</i> over bare ground and weeds; and • Isolated <i>Corymbia calophylla</i> and <i>Agonis flexuosa</i> over pasture.
Vegetation condition	<p>The environmental site inspection indicates the vegetation within the application area is in completely degraded (Keighery, 1994) condition (MBS Environmental, 2020a).</p> <p>MBS Environmental (2020) further advised that the application area showed signs of multiple historical disturbances including selective logging, clearing for pasture, draining, grazing and fire. Native understorey had been lost and replaced by introduced weed species. Upper storey density was low. Much of the native vegetation that remained was either dead or in poor health, likely due to dieback but also</p>

Characteristic	Details
	<p>potentially due to water stress as the deep drain at the eastern boundary of the property would have resulted in reduction in groundwater levels. The occurrence of dieback (<i>Phytophthora cinnamomi</i>) was suspected due to gradual deaths of susceptible species (Banksia sp. and jarrah).</p> <p>The full Keighery (1994) condition rating scale is provided in Appendix E. Representative photos are available in Appendix G.</p>
Climate and landform	The application area is located on a low, east-west aligned sand hill. Ground surface level peaks at approximately 29 metres Australian Height Datum (AHD) at the top of the hill (MBS Environmental, 2020).
Soil description	<p>Department of Primary Industries and Regional Development (DPIRD) (2022) mapped the majority of the application area (over 99 per cent) as Pinjarra, B1a Phase, described as extremely low to very low relief dunes, undulating sandplain and discrete sand rises with deep bleached grey sands with an intensely coloured yellow B horizon occurring within 1 metre of the surface; marri and jarrah dominant (Schoknecht et al., 2004).</p> <p>The remaining one per cent of the application area occurs within mapped Pinjarra P7a Phase which is described as seasonally inundated swamps and depressions with very poorly drained variable acidic mottled yellow and gley duplex soils becoming alkaline with depth (Schoknecht et al., 2004).</p>
Land degradation risk	<p>Pinjarra, B1a Phase has a high risk of acidification, water repellence and moderate risk of subsurface compaction and wind erosion (DPIRD, 2022).</p> <p>Pinjarra P7a Phase has a high risk of acidification, site drainage, waterlogging, microbial purification and phosphorus loss and moderate risk of sub surface compact and excavation ease (DPIRD, 2022).</p> <p>The land degradation risks across the above soil subsystems in the form of water erosion and salinity were low.</p>
Waterbodies	<p>There are no watercourses within or immediately adjacent to the application area. There is a deep man-made drain running north-south along the eastern property boundary. This drain flows north and connects to the Gynudup Brook located approximately 1.7 kilometres north-east from the application area.</p> <p>A small portion of the southern boundary of the application area (approximately 0.23 hectares) has been mapped within a large occurrence of a multiple-use wetland (UFI 15809) that comprises of a total area of approximately 42,000 hectares.</p>
Hydrogeography	<p>According to available databases, the application area:</p> <ul style="list-style-type: none"> • occurs within 'Capel River System' surface water area, as proclaimed under the RIWI Act • falls within Busselton-Capel groundwater area proclaimed under the RIWI Act; and • does not occur within public drinking water source areas or their protection zones.
Flora	<p>A total of 10 flora species listed as threatened under the BC Act and 44 priority listed flora by DBCA have been recorded within the local area (DBCA 2022a). Based on the similarities shared between the soil and vegetation types in habitats for these flora taxa and within the application area, two threatened and 20 priority flora may occur within the application area.</p> <p>MBS Environmental (2021) conducted a flora survey which targeted the species considered as likely to occur within the application area. The survey did not identify any conservation significant species.</p>
Ecological communities	<p>According to available databases:</p> <ul style="list-style-type: none"> • seven TECs listed under the EPBC Act • one TEC listed under the BC Act; and

Characteristic	Details
	<ul style="list-style-type: none"> two PECs listed by DBCA; are mapped within the local area. <p>The application area occurs within a mapped occurrence of Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region.</p> <p>Having assessed the vegetation in the application area, MBS Environmental (2020) concluded that the vegetation proposed to be cleared does not represent any TECs or PECs.</p>
Fauna	<p>According to available databases, a total of 27 conservation significant fauna species have been recorded within the local area (DBCA, 2022b). Noting the habitat requirements, distribution of the recorded species, the mapped vegetation type (MBS Environmental, 2020), the condition of the vegetation within the application area, and the findings of the fauna survey (Harewood, 2020), the application area is likely to comprise suitable habitat for:</p> <ul style="list-style-type: none"> forest red-tailed black cockatoo (<i>Calyptorhynchus banksii naso</i>) Baudin's cockatoo (<i>Calyptorhynchus baudinii</i>) Carnaby's cockatoo (<i>Calyptorhynchus latirostris</i>) masked owl (southwest) (<i>Tyto novaehollandiae novaehollandiae</i>) peregrine Falcon (<i>Falco peregrinus</i>) south-western brush-tailed phascogale, wambenger (<i>Phascogale tapoatafa wambenger</i>); and western ringtail possum, ngwayir (<i>Pseudocheirus occidentalis</i>).

C.2. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix H), the flora survey (MBS Environmental, 2021a) and fauna survey (Harewood, 2020), impacts to the following conservation significant flora required further consideration.

Species name	Conservation status	Suitable vegetation type?	Suitable soil type?	Closest record to application area (km)	Number of known records in local area	Are surveys adequate to identify?
<i>Acacia flagelliformis</i>	P4	Yes	Yes	3.8	3	Yes
<i>Acacia semitrullata</i>	P4	Yes	Yes	0.25	11	Yes
<i>Amperea micrantha</i>	P2	Yes	Yes	8.9	2	Yes
<i>Boronia capitata</i> subsp. <i>gracilis</i>	P3	Yes	Yes	9.5	1	Yes
<i>Caladenia speciosa</i>	P4	Yes	Yes	5.2	11	Yes
<i>Caustis</i> sp. Boyanup (G.S. McCutcheon 1706)	P3	Yes	Yes	7.1	2	No (refer to Section 3.2.1 above)
<i>Daviesia elongata</i>	T	Yes	Yes	8.0	3	Yes
<i>Franklandia triaristata</i>	P4	Yes	Yes	5.8	9	Yes
<i>Isopogon formosus</i> subsp. <i>dasylepis</i>	P3	Yes	Yes	1.0	7	Yes
<i>Jacksonia gracillima</i>	P3	Yes	Yes	1.7	8	Yes
<i>Lasiopetalum membranaceum</i>	P3	Yes	Yes	7.3	1	Yes
<i>Loxocarya magna</i>	P3	Yes	Yes	7.7	1	Yes
<i>Orianthera wendyae</i>	P1	Yes	Yes	7.2	2	Yes
<i>Platytheca anasima</i>	P2	Yes	Yes	7.3	13	Yes
<i>Pultenaea skinneri</i>	P4	Yes	Yes	9.8	1	Yes
<i>Stenanthemum sublineare</i>	P2	Yes	Yes	7.3	1	Yes

<i>Synaphea hians</i>	P3	Yes	Yes	0.3	9	Yes
<i>Synaphea petiolaris</i> subsp. <i>simplex</i>	P3	Yes	Yes	0.0	8	Yes
<i>Synaphea</i> sp. Argyle (R. Butcher RB 1323)	P1	Yes	Yes	9.5	1	Yes
<i>Synaphea stenoloba</i>	T	Yes	Yes	2.7	3	Yes
<i>Thelymitra variegata</i>	P2	Yes	Yes	6.6	1	Yes
<i>Verticordia attenuata</i>	P3	Yes	Yes	0.2	13	No (refer to Section 3.2.1 above)

C.3. Fauna analysis table

Species name	Conservation status	Suitable habitat features?	Distance of closest record to application area (m)	Adequate surveys available? [Y, N, N/A]
Baudin's cockatoo	EN	Yes	6,260	Yes
Carnaby's cockatoo	EN	Yes	2,259	Yes
Forest red-tailed black cockatoo	VU	Yes	7,690	Yes
Masked owl (southwest)	P3	Yes	7,321	No
Peregrine falcon	OS	Yes	7,891	No
South-western brush-tailed phascogale, wambenger	CD	Yes	2,987	No
Western ringtail possum, ngwayir	CR	Yes	274	Yes

Appendix D. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
<p><u>Principle (a):</u> <i>“Native vegetation should not be cleared if it comprises a high level of biodiversity.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared does not contain locally or regionally significant flora or assemblages of plants. The application area (MBS Environmental, 2021a):</p> <ul style="list-style-type: none"> • contains native understory in completely degraded condition (Keighery, 1994) which has been nearly completely replaced by introduced species with only a few native understory species remaining • does not resemble habitat for threatened or priority flora • does not contain native vegetation which represents a TEC or PEC. <p>The impacts to conservation significant fauna are addressed under Clearing Principle (b) below.</p>	Not likely to be at variance	No <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (b):</u> <i>“Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna.”</i></p> <p><u>Assessment:</u></p> <p>The application area contains significant habitat for black cockatoos and critical habitat for WRP. Ground dwelling and avian fauna may use the application area for foraging or dispersal. The clearing will reduce the ability of fauna to move across the landscape which has been extensively cleared.</p>	At variance	Yes <i>Refer to Section 3.2.2, above.</i>
<p><u>Principle (c):</u> <i>“Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</i></p> <p><u>Assessment:</u></p> <p>The application area does not contain flora species listed as threatened under the BC Act (MBS Environmental, 2021a).</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (d):</u> <i>“Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community.”</i></p> <p><u>Assessment:</u></p> <p>The proposed clearing area does not contain species composition indicative of a TEC listed under the BC Act or EPBC Act (MBS Environmental, 2021a).</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
Environmental value: significant remnant vegetation and conservation areas		
<p><u>Principle (e):</u> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u></p> <p>The extent of the native vegetation in the local area is inconsistent with the national objectives and targets for biodiversity conservation in Australia. The vegetation proposed to be cleared is considered to be part of an ecological linkage in the local area.</p>	At variance	Yes <i>Refer to Section 3.2.3, above.</i>

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Principle (h):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.”</i></p> <p><u>Assessment:</u></p> <p>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.</p>	Not likely to be at variance	No
Environmental value: land and water resources		
<p><u>Principle (f):</u> <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment:</u></p> <p>Approximately 0.23 hectares of the vegetation in the application area is mapped within a multiple use wetland. The vegetation proposed to be cleared is therefore growing in an environment associated with a wetland.</p> <p>Noting the small amount of clearing of vegetation within the mapped wetland scattered across several smaller portions of the application area, and the extent of the mapped wetland, the clearing is unlikely to impact on an environment associated with wetlands.</p>	At variance	Yes Refer to Section 3.2.4, above.
<p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u></p> <p>The mapped soils are susceptible to wind erosion. To mitigate this risk, the applicant will be required to commence the extractive industry activities within three months of the cessation of clearing activities.</p> <p>The risks of land degradation in the form of water erosion, salinity, eutrophication and waterlogging are low.</p>	May be at variance	Yes Refer to Section 3.2.5, above.
<p><u>Principle (i):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.”</i></p> <p><u>Assessment:</u></p> <p>Noting the relatively flat landscape in the vicinity of the proposed clearing, the distance to the closest watercourse, and a small extent of wetland area mapped within the application area, the clearing is unlikely to impact surface water quality.</p> <p>The proposed clearing and subsequent mining activities are unlikely to impact groundwater resources (Planning Advice, South West Region, 2020 and 2022).</p>	Not likely to be at variance	No
<p><u>Principle (j):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</i></p> <p><u>Assessment:</u></p> <p>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.</p>	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

Table 5 - Offset calculator value justification for the loss of significant remnant residual impact

Field Name	Description	Justification for value used
IUCN Criteria	The IUCN criteria for the value being impacted	0.0% - afforded to native vegetation considered as significant remnant in an area that has been extensively cleared. The annual probability of extinction for this environmental value is 0.0%.
Area of impact (habitat/community) or Quantum of impact (features/individuals)	The area of habitat/community impacted or number of features/individuals impacted	5.44 - the application area comprises 5.44 hectares of native vegetation which is considered significant in an area which has been extensively cleared.
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	3 - the vegetation in the application area is in completely degraded (Keighery, 1994) condition, provides significant habitat for WRP, three species of black cockatoo and supports fauna movement across an extensively cleared landscape.
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	10 - It is assumed that the environmental values obtained from revegetation will not be evident until 10 years post-revegetating.
Start area (habitat/community) or Start value (features/individuals)	The area of habitat/community or number of features/individuals proposed to offset the impacts	6.69 hectares - a revegetation area of this size would be required to adequately offset the loss of native vegetation considered significant in an extensively cleared landscape
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	0 - A quality score of (0) (completely degraded) has been assigned given the offset site post extraction will not contain any biodiversity value
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	0 - without the offset revegetation, the future value of the offset site would remain 0
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	4 - the revegetation could improve the vegetation condition to a good condition
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	0% - there is no risk of loss of in situ biodiversity values as post-extraction there will be none in the offset site
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	10% - The revegetation area, with a conservation covenant over it, should reduce the risk of loss to 10%. The risk of catastrophic events (fire, dieback etc.) remain.
Confidence in result (%) – risk of loss (habitat/community)	The capacity of measures to mitigate risk of loss of the proposed offset site	90% - there is a high level of confidence that the covenant will mitigate the risk of loss.
Confidence in result (%) – Change in quality (habitat/community) or Change in value (features/individuals)	The level of certainty about the successful achievement of the proposed change in quality (habitat/community) or value (features/individuals)	70% - With a comprehensive revegetation plan, there is a relatively high level of confidence that the offset site would improve from a completely degraded to good condition.
% 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)	100% - Obtained through the input of variables explained above.
Other comments	Include here any relevant additional comments (e.g., the size of offset required to offset 100% of the residual impacts)	

Table 6 - Offset calculator value justification for the loss of black cockatoo foraging habitat residual impact

Field Name	Description	Justification for value used
IUCN Criteria	The IUCN criteria for the value being impacted	1.2% - afforded to three species of black cockatoo. Carnaby's and Baudin's are listed as Endangered under the EPBC Act and Forest red-tailed is listed as Vulnerable under the EPBC Act. Endangered has been used due to the higher value. The annual probability of extinction for this environmental value is 1.2%.
Area of impact (habitat/community) or Quantum of impact (features/individuals)	The area of habitat/community impacted or number of features/individuals impacted	3 - Harewood (2020) estimated that the application area contains approximately 3 hectares of native vegetation (jarrah, marri, banksia in various concentration) which provides foraging habitat for three species of black cockatoo.
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 foraging habitat supports black cockatoo breeding and roosting. Evidence of forest red-tailed black cockatoo foraging on marri trees was observed. No roosting trees or suitably sized hollows for black cockatoos have been identified 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	10 - It is assumed that the environmental values for black cockatoos obtained from the revegetation will not be evident until 10 years post revegetating.
Start area (habitat/community) or Start value (features/individuals)	The area of habitat/community or number of features/individuals proposed to offset the impacts	5.45 hectares - a revegetation area of this size would be required to adequately offset the loss of native vegetation which provides significant habitat for black cockatoos
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	0 - A quality score of (0) (completely degraded) has been assigned given the offset site post extraction will not contain any value for black cockatoos
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	0 - without the offset revegetation, the future value of the offset site would remain 0
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 - the revegetation could improve the quality of black cockatoo habitat at the offset site to the value '5'. The revegetated offset site will support black cockatoo breeding and roosting and be located in an extensively cleared area.
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	0% - there is no risk of loss of in situ biodiversity values as post extraction there will be none in the offset site
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	10% - The revegetation area, with a conservation covenant over it, should reduce the risk of loss to 10%. The risk of catastrophic events (fire, dieback etc.) remain.
Confidence in result (%) – risk of loss (habitat/community)	The capacity of measures to mitigate risk of loss of the proposed offset site	90% - there is a high level of confidence that the covenant will mitigate the risk of loss.
Confidence in result (%) – Change in quality (habitat/community) or Change in value (features/individuals)	The level of certainty about the successful achievement of the proposed change in quality (habitat/community) or value (features/individuals)	70% - With a comprehensive revegetation plan, there is a relatively high level of confidence that the offset site would improve from a completely degraded to good condition.
% 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)	100% - Obtained through the input of variables explained above.
Other comments	Include here any relevant additional comments (e.g., the size of offset required to offset 100% of the residual impacts)	The revegetation of approximately 6.67 hectares which is required to offset the loss of significant remnant vegetation would account for approximately 122.71 per cent of significant residuals impacts to black cockatoos. No additional offset for the loss of black cockatoo foraging habitat is required.

Table 7 - Offset calculator value justification for the loss of WRP habitat residual impact

Field Name	Description	Justification for value used
<i>IUCN Criteria</i>	The IUCN criteria for the value being impacted	6.8% - afforded to western ringtail possum habitat as this species is listed and critically endangered under the EPBC Act. The annual probability of extinction for this environmental value is 6.8%.
<i>Area of impact (habitat/community) or Quantum of impact (features/individuals)</i>	The area of habitat/community impacted or number of features/individuals impacted	2.84 - application area comprises approximately 2.84 hectares of WRP habitat
<i>Quality of impacted area (habitat/community)</i>	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	3 - According to Harewood (2020), the quality of WRP habitat in the application is relatively low given the relatively sparse vegetation density and poor canopy connectivity in many areas. Possums appeared to be absent from the western portion of the application area where only scattered trees were present.
<i>Time over which loss is averted (habitat/community)</i>	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.
<i>Time until ecological benefit (habitat/community) or Time horizon (features/individuals)</i>	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	10 - It is assumed that the environmental values obtained from revegetation will not be evident until 10 years post revegetation.
<i>Start area (habitat/community) or Start value (features/individuals)</i>	The area of habitat/community or number of features/individuals proposed to offset the impacts	5.07 hectares - a revegetation area of this size would be required to adequately offset the loss of native vegetation which provides significant habitat for WRP
<i>Start quality (habitat/community)</i>	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	0 - A quality score of (0) (completely degraded) has been assigned given the offset site post extraction will not contain any WRP value
<i>Future quality without offset (habitat/community) or Future value without offset (features/individuals)</i>	The predicted future quality score (habitat/community) or value (features/individuals) of the proposed offset site without the offset	0 - without the offset revegetation, the future value of the offset site would remain 0
<i>Future quality with offset (habitat/community) or Future value with offset (features/individuals)</i>	The predicted future quality score (habitat/community) or value (features/individuals) of the proposed offset site with the offset	5 - the successful revegetation of the offset site will result in restoration of WRP habitat with high density of suitable foraging species, canopy connectivity and safe movement across the site.
<i>Risk of loss (%) without offset (habitat/community)</i>	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	0% - there is no risk of loss of in situ biodiversity values as post extraction there will be none in the offset site
<i>Risk of loss (%) with offset (habitat/community)</i>	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	10% - The revegetation area, with a conservation covenant over it, should reduce the risk of loss to 10%. The risk of catastrophic events (fire, dieback etc.) remain.
<i>Confidence in result (%) – risk of loss (habitat/community)</i>	The capacity of measures to mitigate risk of loss of the proposed offset site	90% - there is a high level of confidence that the covenant will mitigate the risk of loss.
<i>Confidence in result (%) – Change in quality (habitat/community) or Change in value (features/individuals)</i>	The level of certainty about the successful achievement of the proposed change in quality (habitat/community) or value (features/individuals)	70% - With a comprehensive revegetation plan, there is a relatively high level of confidence that the offset site would improve from a completely degraded to good condition.
<i>% of impact offset</i>	% 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)	100% - Obtained through the input of variables explained above.
<i>Other comments</i>	Include here any relevant additional comments (e.g., the size of offset required to offset 100% of the residual impacts)	The revegetation of approximately 6.67 hectares which is required to offset the loss of significant remnant vegetation would account for approximately 131.91 per cent of significant residuals impacts to WRP. No additional offset for the loss of WRP habitat is required.

Appendix G. Biological survey information excerpts

Item	Author	Summary of information
Fauna survey	Harewood (2020)	<ul style="list-style-type: none"> • daytime field survey work conducted on 28 May 2020 • a single nocturnal survey conducted on 47 June 2020 • the main vegetation unit present consisted of an open woodland containing jarrah, marri, <i>Banksia attenuata</i>, <i>Banksia illicifolia</i>, <i>Xylomelum occidentale</i>, <i>Nuytsia floribunda</i> and <i>Agonis flexuosa</i> in various densities over small areas of <i>Kunzea glabrescens</i> • vegetated areas covered approximately 3.8 hectares of the survey area with only scattered trees of various species, many of which were dead or dying • the overall fauna habitat quality of the survey area was very low due to is completely degraded state and in particular the almost completely lack of any native ground cover • a total of 47 black cockatoo habitat trees with no evidence of suitable hollows were identified • evidence of black cockatoo foraging was observed during the field survey • no black cockatoo roosting sites were positively identified • WRP dreys and scats were located within the survey area • a total of three WRP individuals were observed during the nocturnal survey on the site
Site inspection of the application area	MBS Environmental (2020a)	<ul style="list-style-type: none"> • the majority of the vegetation within the project envelope comprised open woodland of <i>Eucalyptus marginata</i>, <i>Banksia attenuata</i>, <i>Banksia illicifolia</i>, <i>Xylomelum occidentale</i> and <i>Nuytsia floribunda</i> over patches of <i>Kunzea glabrescens</i> over bare ground and weeds • in the lower lying areas in the southern part, there were isolated <i>Corymbia calophylla</i> and <i>Agonis flexuosa</i> over pasture • the condition of the vegetation within the project envelope was completely degraded (Keighery, 1994) • the vegetation in the application area showed signs of multiple historical disturbances including selective logging, clearing for pasture, draining, grazing and fire • native understorey had been lost and replaced by introduced weed species. Upper storey density was low • much of the native vegetation that remained was either dead or in poor health, likely due to dieback but also potentially due to water stress as the deep drain would have resulted in reduction in groundwater levels • the occurrence of dieback (<i>Phytophthora cinnamomi</i>) was suspected due to gradual deaths of susceptible species (e.g. banksia spp. and jarrah) • considering the degraded nature of the site and the lack of native understorey, the occurrence of any significant flora was considered low.
Targeted flora survey	MBS Environmental (2021a)	<ul style="list-style-type: none"> • the application area was intensively surveyed • no constraints were identified as major of limiting during the survey • no conservation significant flora was identified within the application area • the location of a historic record of <i>Synaphea petiolaris</i> subs. <i>simplex</i> was extensively searched. No individuals of this species were identified • the application area has been extensively grazed and contains very few native understory species remaining



Figure 5a



Figure 5b



Figure 5c



Figure 5d



Figure 5e



Figure 5e

Figure 5a-5e Representative photos of vegetation proposed to be cleared (MBS Environmental, 2020b)

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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