



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

PERMIT DETAILS

Area Permit Number: CPS 9713/1

File Number: DWERVT10068

Duration of Permit: From 27 December 2022 to 27 December 2025

ADVICE NOTE:

In relation to condition 7 of this Permit, it is noted that 21.51 hectares of Lot 42 on Plan 58430, Wellesley, will be attributed to the offset for this project. The nominated 21.51 hectare area contains foraging habitat for *black cockatoo species*, in addition to other environmental values.

PERMIT HOLDER

Albemarle Lithium Pty Ltd

LAND ON WHICH CLEARING IS TO BE DONE

Lot 254 on Deposited Plan 416516, Wellesley

AUTHORISED ACTIVITY

The permit holder must not clear more than 51.61 hectares of *native vegetation* within the area cross-hatched yellow in Figure 1 of Schedule 1.

CONDITIONS

1. Period during which clearing is authorised

The permit holder must not clear any *native vegetation* after 27 December 2024.

2. Avoid, minimise, and reduce impacts and extent of clearing

In determining the *native vegetation* authorised to be cleared under this permit, the permit holder must apply the following principles, set out in descending order of preference:

- (a) avoid the clearing of *native vegetation*;
- (b) minimise the amount of *native vegetation* to be cleared; and
- (c) reduce the impact of clearing on any environmental value.

3. Weed and dieback management

When undertaking any clearing authorised under this permit, the permit holder must take the following measures to minimise the risk of introduction and spread of *weeds* and *dieback*:

- (a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
- (b) ensure that no known *dieback* or *weed*-affected soil, *mulch*, *fill*, or other material is brought into the area to be cleared; and
- (c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

4. Directional clearing

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

5. 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 *western ringtail possum 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 5(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 5(b)(ii) must be relocated by a *western ringtail possum specialist* to a *suitable habitat*.
- (d) Where western ringtail possum(s) are identified under condition 5(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 1994/2020 (GDA94/2020), 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 fauna specialist* undertaking removal and relocation;
- (vi) the date each individual was removed;
- (vii) the method of removal;
- (viii) the date each individual was relocated;
- (ix) the location where each individual was relocated to, recorded using a GPS unit set to GDA94/2020, 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.

6. Wind erosion management

The permit holder must commence construction of the laydown area no later than three (3) months after undertaking the authorised *clearing* activities to reduce the potential for wind erosion.

7. Offset – Land acquisition

Within 24 months of the commencement of *clearing* authorized under this permit and no later than 27 December 2025, the permit holder must fund the purchase of *native vegetation* within the area cross-hatched red in Figure 2 of Schedule 2 (Lot 42 on Plan 58430, Wellesley) for inclusion of *native vegetation* into conservation estate managed by the Department of Biodiversity, Conservation and Attractions.

8. Records that must be kept

The permit holder must maintain records relating to the listed relevant matters in accordance with the specifications detailed in Table 1.

Table 1: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	<ul style="list-style-type: none"> (a) the species composition, structure, and density of the cleared area; (b) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994/2020 (GDA94/2020), expressing the geographical coordinates in Eastings and Northings; (c) the date that the area was cleared; (d) the size of the area cleared (in hectares); (e) actions taken to avoid, minimise, and reduce the

No.	Relevant matter	Specifications
		<p>impacts and extent of clearing in accordance with condition 2;</p> <p>(f) actions taken to minimise the risk of the introduction and spread of <i>weeds</i> and <i>dieback</i> in accordance with condition 3;</p> <p>(g) actions undertaken in accordance with condition 4;</p> <p>(h) actions taken to manage and mitigate impacts to western ringtail possums in accordance with condition 5;</p> <p>(i) actions undertaken in regards in wind erosion management in accordance with condition 6; and</p> <p>(j) actions taken to acquire and conserve the area cross-hatched red in Figure 2 of Schedule 2 of this permit in accordance with condition 7 of this permit.</p>

9. Reporting

The permit holder must provide to the *CEO* the records required under condition 8 of this permit when requested by the *CEO*.

DEFINITIONS

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

Table 2: 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> .
clearing	has the meaning given under section 3(1) of the EP Act.
condition	a condition to which this clearing permit is subject under section 51H of the EP Act.
fauna specialist	means a person who holds a tertiary qualification specialising in environmental science or equivalent, and has a minimum of 2 years work experience in fauna identification and surveys of fauna native to the region being inspected or surveyed, or who is approved by the <i>CEO</i> as a suitable fauna specialist for the bioregion, and who holds a valid fauna licence issued under the <i>Biodiversity Conservation Act 2016</i> .
fill	means material used to increase the ground level, or to fill a depression.

Term	Definition
dieback	means the effect of <i>Phytophthora</i> species on native vegetation.
department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
EP Act	<i>Environmental Protection Act 1986</i> (WA)
mulch	means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation.
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
suitable habitat (western ringtail possum)	means habitat known to support western ringtail possums (<i>Pseudocheirus occidentalis</i>) within the known current distribution of the species, typically characterised by abundant foliage, presence of suitable nesting structures such as tree hollows, as well as high canopy cover and continuity. Known habitat includes peppermint (<i>Agonis flexuosa</i>) dominated woodlands, jarrah (<i>Eucalyptus marginata</i>) and marri (<i>Corymbia calophylla</i>) forests, riparian vegetation with a canopy of Bullich (<i>Eucalyptus megacarpa</i>) or flooded gum (<i>Eucalyptus rudis</i>), karri (<i>Eucalyptus diversicolor</i>) forests, sheoak (<i>Allocasuarina fraseriana</i>) dominated woodlands, and other stands of myrtaceous trees growing near swamps, watercourses or floodplains.
weeds	means any plant – <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 fauna specialist	means a <i>fauna specialist</i> who holds a tertiary qualification specialising in environmental science or equivalent, has a minimum of two years of work experience in western ringtail possum (<i>Pseudocheirus occidentalis</i>) identification, surveys of western ringtail possums and capture and handling of western ringtail possums, and holds a valid fauna licence issued under the <i>Biodiversity Conservation Act 2016</i> .

END OF CONDITIONS



Meenu Vitarana

MANAGER

NATIVE VEGETATION REGULATION

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

2 December 2022

SCHEDULE 1

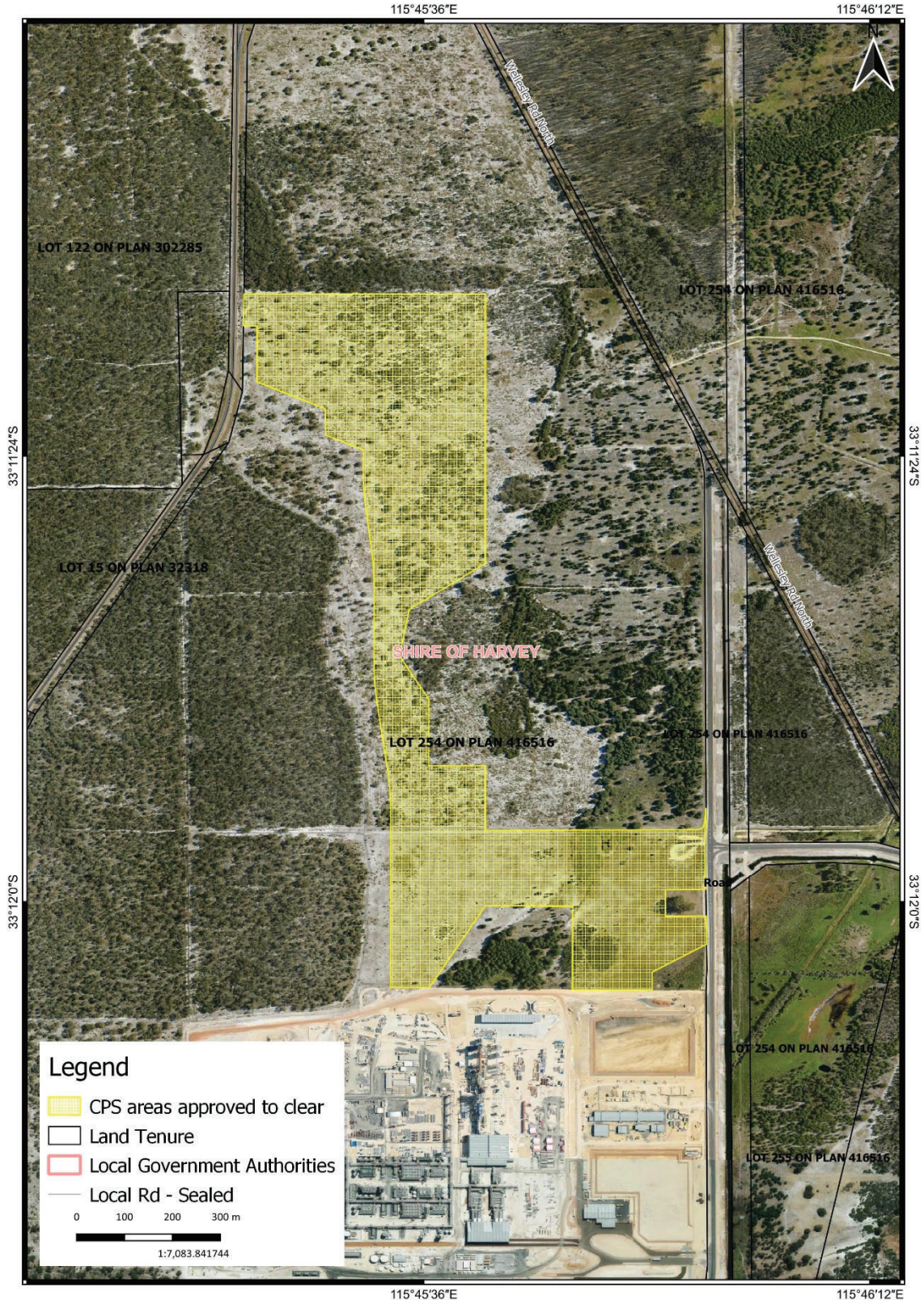


Figure 1: Map of the boundary of the area within which clearing may occur

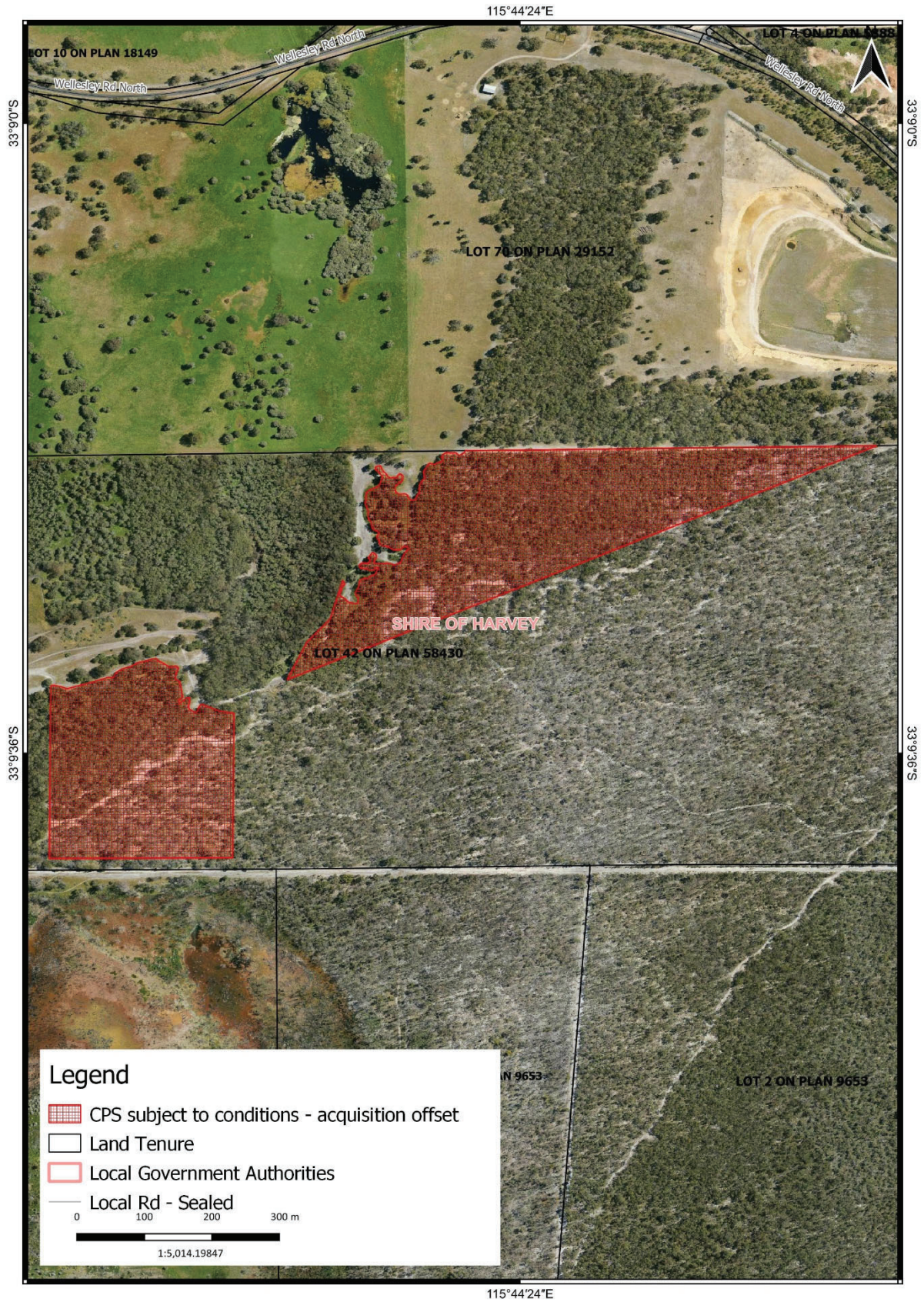


Figure 2: Map of the boundary of the area (red hatched area) that land acquisition must occur in accordance with condition 7



Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 9713/1
Permit type:	Area permit
Applicant name:	Albemarle Lithium Pty Ltd
Application received:	26 April 2022
Application area:	51.61 hectares of native vegetation
Purpose of clearing:	Establishing a construction laydown area
Method of clearing:	Mechanical
Property:	Lot 254 on Deposited Plan 416516
Location (LGA area/s):	Shire of Harvey
Localities (suburb/s):	Wellesley

1.2. Description of clearing activities

The vegetation proposed to be cleared is contained within a 51.61 hectare single contiguous area (see Figure 1, Section 1.5). This purpose of the clearing is to develop the site to provide a temporary laydown area and administration buildings to support the construction of Trains 3 and 4 (K3 and K4) at the Albemarle Kemerton lithium processing plant (Albemarle, 2022a). Although the laydown area is temporary, it is understood that the application area is intended to be utilised as part of an industrial area in the future (Western Australian Land Authority, 2018) and therefore the proposed clearing will remain permanent.

The applicant reduced the application area from an original area of 60.4 hectares (see Figure 2, Section 1.5) during the assessment process in response to a request to consider avoiding impacts to environmental values in the original application area (refer to Section 3.1 for further details).

1.3. Decision on application

Decision:	Granted
Decision date:	2 December 2022
Decision area:	51.61 hectares of native vegetation as depicted in Section 1.5 below

1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). The Department of Water and Environmental Regulation (DWER) advertised the application for 21 days and one submission was received. Consideration of matters raised in the public submission is summarised in Appendix B.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix C), relevant datasets (see Appendix H.1), the findings of a flora and vegetation survey (Ecoedge, 2022) and fauna habitat assessments (Harewood, 2022 and GHD, 2022b), other information provided by the applicant (refer to Appendix A),

the clearing principles set out in Schedule 5 of the EP Act (see Appendix D), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3).

The assessment identified that the proposed clearing will result in:

- clearing of 8.1 hectares of moderate quality foraging habitat for black cockatoo species;
- clearing of vegetation that is unlikely to contain significant habitat for western ringtail possums, although there is a chance individuals may be present during the time of the clearing;
- clearing of habitat for Coastal Plains skink, Swan Coastal Plain shield-backed trapdoor spider, Perth slider, quenda, Western brush wallaby, South-western brush-tailed phascogale, Peregrine falcon, although impacts to habitat for these species are unlikely to be significant;
- removal of 26 individuals of *Acacia semitrullata*, listed as a Priority 4 flora species under the *Biodiversity Conservation Act 2016*, however is unlikely to cause detriment to the overall conservation status of this species in the larger area;
- removal of vegetation associated with multiple use wetlands, however the clearing is unlikely to result in significant impacts to wetland areas; and
- an increased risk of land degradation resulting from wind erosion.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing can be managed and offset such that an unacceptable risk to environmental values is unlikely. The applicant has suitably demonstrated avoidance and minimisation measures and the offset provided counterbalances the significant residual impacts to black cockatoo foraging habitat (see Section 4).

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

- avoid and minimise to reduce the impacts and extent of clearing
- take hygiene steps to minimise the risk of the introduction and spread of weeds to conservation significant adjacent vegetation;
- undertake clearing in a slow, progressive one directional manner to allow terrestrial fauna to disperse ahead of the clearing activity should they occur on site at the time of clearing;
- inspect areas prior to clearing for WRPs and prohibit clearing in areas where WRPs are present until individuals have left the area or have been removed by a western ringtail possum specialist, to minimise impacts to any WRPs present within the application area;
- commence the construction of the laydown area no later than three months after undertaking the clearing to reduce the potential for wind erosion to occur; and
- implement the land acquisition offset detailed in Section 4 to offset impacts to black cockatoo foraging habitat.

1.5. Site maps

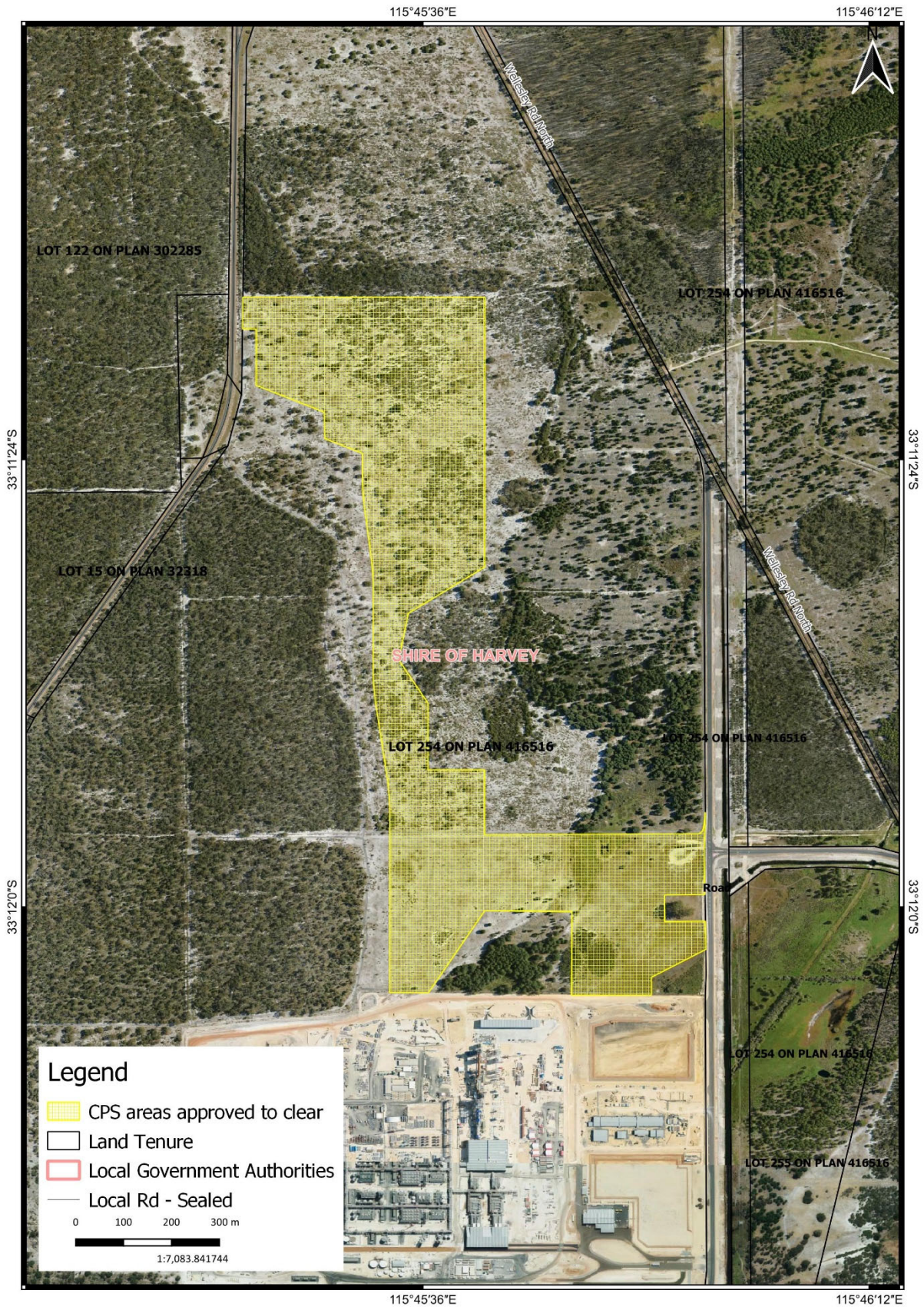


Figure 1. Map of the application area. The area crosshatched yellow indicates the area authorised to be cleared under the granted clearing permit.

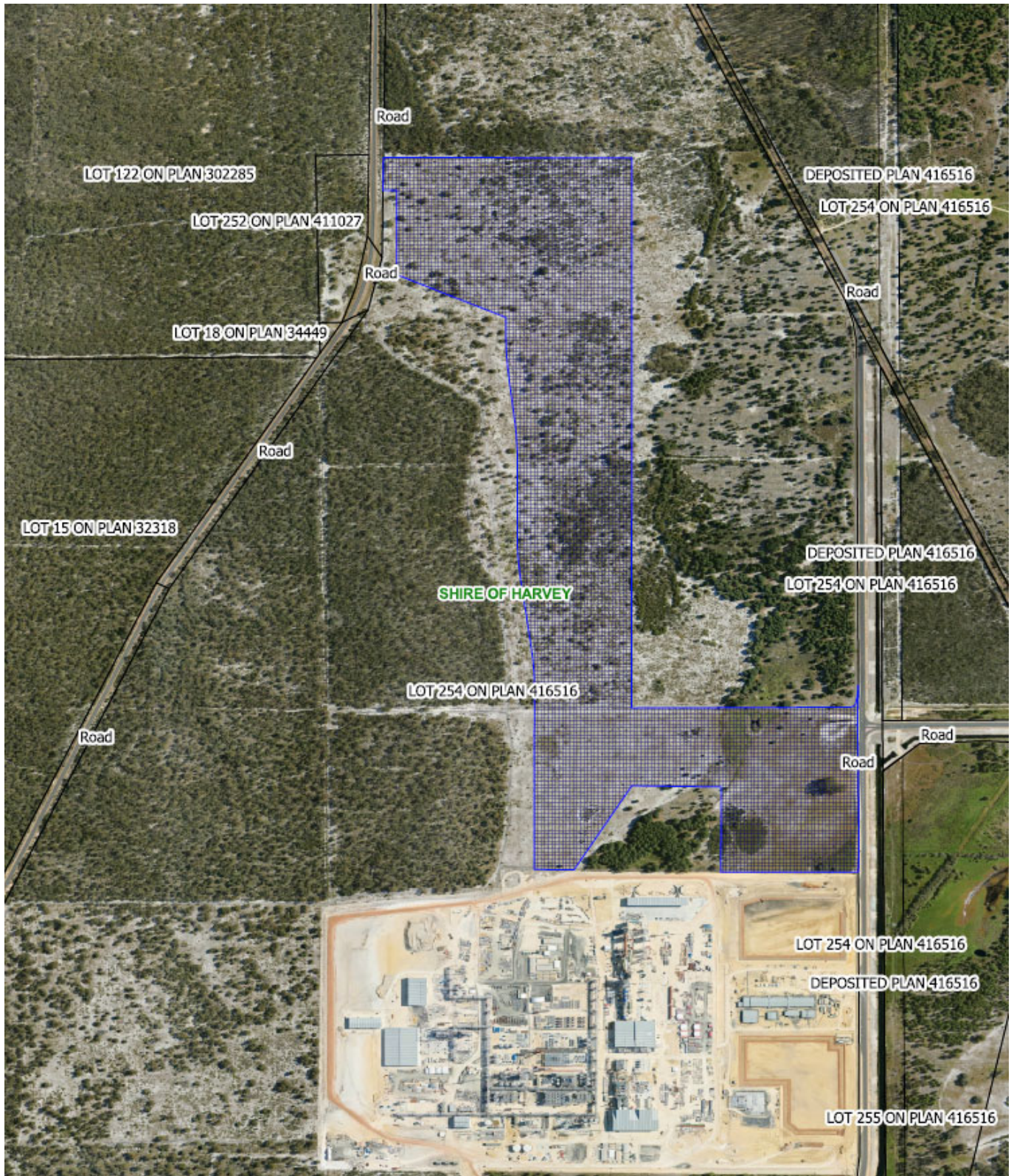


Figure 2. Map of the original 60.4 hectare application area. The area crosshatched blue indicates the area originally applied to clear.

2 Legislative context

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

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

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

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)

Relevant policies considered during the assessment include:

- *Environmental Offsets Policy* (2011)

The key guidance documents which inform this assessment are:

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

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

The applicant submitted the following information to demonstrate evidence of avoidance and mitigation considerations with regard to their original 60.4 hectare application area (Albemarle, 2022b):

- Avoidance of native vegetation clearing was a key consideration in the preparation and planning of the proposal;
- The application area was designed to exclude, and retain a 50 metre buffer from, an area of Banksia woodland priority ecological community and quality black cockatoo foraging habitat to the west;
- One black cockatoo habitat tree (without hollows) mapped within the application area, as well as a 25 metre buffer of vegetation surrounding this tree, would be retained;
- The following management plans will be developed for the proposed construction:
 - Environmental Management Plan;
 - Waste Management Plan;
 - Bushfire Management Plan; and
 - Waste Management Plan.

The applicant was asked if further avoidance and mitigation measures could be applied to their proposed clearing to reduce impacts to black cockatoo foraging habitat and Priority 4 flora species *Acacia semitrullata*. In response to this (Albemarle, 2022c), the applicant reduced the application area from 60.4 hectares to 51.61 hectares, which resulted in the following:

- Clearing of *Acacia semitrullata* will be reduced from 36 to 26 individuals;
- A 0.5 hectare area of Very Good quality vegetation present within the original application area will no longer be cleared, such that no Very Good condition vegetation will be cleared;
- The area of Good quality vegetation to be cleared will be reduced from 4.7 hectares to 0.77 hectares. The majority of the application area is in Degraded, Completely Degraded or cleared condition;
- 5.4 ha of EmXbMW (including Good to Very Good condition) has been retained;
- Most of the paperbark woodland vegetation present within the original application area has been retained;
- The avoidance of Good to Very Good condition EmXbMW vegetation will reduce impacts to black cockatoo foraging habitat and western ringtail possum habitat, and reduces the likelihood of occurrence of *Drakaea elastica*; and
- One potential black cockatoo habitat tree within the original application area (a planted non-endemic tree within the southwestern portion) has been excluded in the revised application area.

The applicant also provided an Environmental Management Plan (GHD, 2022a) which includes the following proposed measures to mitigate impacts of the clearing:

- A site induction will include information on significant fauna which may be encountered within the Site. Information will include descriptions of the fauna, specific management measures to protect them, responsibilities for reporting sightings and incidents involving conservation significant fauna.
- A suitably qualified environmental professional (fauna spotter) will be present during all land clearing activities. The person will hold a permit to handle and move significant fauna under Regulation 28 of the BC Act and have access to a care facility which can be used to rehabilitate injured or sick fauna;
- Clearing will be progressed in a direction that provides native fauna the opportunity to re-locate to the adjacent 'Excellent' condition Banksia TEC along the western boundary;
- All native vegetation and fauna habitats to be retained will be demarcated prior to clearing, including identification and pegging of habitat trees, so that "Development Exclusion" zones are clearly delineated and site induction for construction workers, and any accidental loss of vegetation is avoided.
- All clearing boundaries to be clearly marked and checked prior to commencement, during and post clearing activities.
- Vehicles shall avoid driving over, or parking on native vegetation as far as practicable.
- Designated access roads will be established to prevent unauthorised disturbance
- all vehicles are to be restricted to approved clearing areas and designated access tracks.
- Clearing will be undertaken in stages and limited to the extent required for construction of infrastructure.
- A post-clearing survey to be undertaken to confirm the extent of clearing, confirm that clearing remained within the permitted boundaries.
- Dust suppression measures will be regularly implemented on the site.
- Erosion and sediment control measures will be applied to prevent erosion of exposed areas and sediment discharge to adjacent areas, where practicable.
- Clearing will be undertaken progressively to minimise the extent of soil exposed.
- Measures to prevent dieback and weeds.

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

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, conservation, or land and water resource values. The assessment against the clearing principles (see Appendix D) identified that the risk of impacts of the proposed clearing to biological values (fauna, flora and ecological communities), water resources and land degradation required further consideration. The consideration of these risks, 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 (fauna) - Clearing Principles (a) and (b)

Assessment

Noting the habitat requirements, distribution of the recorded species and vegetation type and condition present within the application area, it was considered that the application area is likely to comprise suitable habitat for the following conservation significant fauna species:

- *Pseudocheirus occidentalis* (Western ringtail possum, ngwayir) (Critically endangered);
- *Zanda* (formerly *Calyptorhynchus*) *baudinii* (Baudin's cockatoo) (Endangered);
- *Zanda* (formerly *Calyptorhynchus*) *latirostris* (Carnaby's cockatoo) (Endangered);
- *Calyptorhynchus banksii naso* (Forest red-tailed black cockatoo) (Vulnerable);
- *Ctenotus ora* (Coastal Plains skink) (Priority 3);
- *Lerista lineata* (Perth slider, lined skink) (Priority 3);
- *Isoodon fusciventer* (Quenda, southwestern brown bandicoot) (Priority 4);
- *Notamacropus irma* (Western brush wallaby) (Priority 4);
- *Phascogale tapoatafa wambenger* (South-western brush-tailed phascogale, wambenger) (Conservation Dependent); and
- *Falco peregrinus* (Peregrine falcon) (Other specially protected).

Western Ringtail Possums

The application area is within the Swan Coastal Plain Management zone for the western ringtail possum (WRP) (DPAW, 2017a). Populations of WRP in the Swan Coastal Plain Management zone are associated with stands of myrtaceous trees (usually peppermint trees (*Agonis flexuosa*)) growing near swamps, water courses or floodplains, and at topographic low points which provide cooler and often more fertile conditions (Jones 2001, de Tores et al. 2004). Habitat critical to survival comprises long unburnt mature remnant peppermint woodlands with high canopy continuity and high nutrient foliage with minimal periods of summer moisture stress, and habitat connecting patches of remnants (Jones et al. 1994b, Jones et al. 2004, Wayne et al. 2006).

Noting the above, vegetation within the application area the application area does not provide ideal WRP habitat within its context within the Swan Coastal Plain, particularly considering the poor quality and low canopy continuity of trees within the majority of the application area. As such, the proposed clearing is unlikely to have a significant impact upon western ringtail possums. However, WRP have previously been recorded within the vicinity of the application area, and their presence within the application area is plausible (DBCA, 2022a).

The following conditions placed on the permit will mitigate impacts to WRP individuals, should they be present:

- Clearing is to be undertaken in a slow, progressive one directional manner. This will allow terrestrial fauna to disperse ahead of the clearing activity should they occur on site at the time of clearing
- A fauna specialist is required to inspect areas prior to clearing for WRPs and clearing cannot take place in areas where WRPs are present until individuals have left the area or have been removed by a western ringtail possum specialist.

Black cockatoos

The application area is within the range of Baudin's cockatoo, Carnaby's cockatoo and forest red-tailed black cockatoo (hereafter referred to as black cockatoo species) and within the known breeding range of Carnaby's cockatoo and possible breeding range of Baudin's cockatoo and forest red-tailed black cockatoo (DAWE, 2022). All of these species nest in hollows of live or dead Eucalypt trees, including marri, jarrah and blackbutt (red-tailed black cockatoos) (Department of Agriculture, Water and Environment (DAWE), 2022). For most species of trees, including jarrah and marri, suitable nest hollows are only found in live trees with a diameter at breast height (DBH) of at least 50 centimetres, with a DBH of 30 centimetres or greater considered suitable to develop a nest hollow in the future (DAWE, 2022). No trees with a DBH of 50 centimetres or greater were found within the application area (Harewood, 2022a). As such, no current black cockatoo breeding habitat will be impacted by the proposed clearing. It is possible that future black cockatoo breeding habitat may be impacted, as the presence of trees with a DBH of 30-50 centimetres within the application area has not been ruled out. However, noting the relative sparsity of trees within the application area, this potential future breeding habitat is not considered to be significant.

While black cockatoo species roost in jarrah and marri trees, noting that larger eucalypt trees are preferred for roosting, the application area is unlikely to contain significant roosting habitat for black cockatoo species.

Vegetation units XbEcOS, EmXbMW and KgJhXbTOS (see Appendix C.1 for descriptions) contain jarrah trees that are a preferred foraging species for forest red-tailed black cockatoo, and a less preferred foraging species for Carnaby's cockatoo and Baudin's cockatoo (DAWE, 2022, Valentine and Stock, 2008). An additional black cockatoo foraging assessment undertaken over the application area recorded evidence of black cockatoo foraging within these three vegetation types within the application area (GHD, 2022b). Black cockatoos are known to forage within 20 kilometres of night roost sites (DAWE, 2022), and the application area is within 20 kilometres of twenty known black cockatoo roost sites for white and/or red tailed black cockatoos, the closest of which to the application area is 640 metres to the north. Black cockatoos will also forage in areas up to 12 km from their nest during the breeding season, and while no known breeding trees are recorded within this radius of the application area, noting the relative absence of black cockatoo habitat information in the south-west region of Western Australia, the presence of unrecorded breeding trees within the vicinity of the application area cannot be ruled out. Suitable breeding habitat was recorded in vegetation adjacent to the application area (Harewood, 2022). It is also noted that waterbodies able to be used for drinking are within one kilometre of the application area, further increasing the likelihood that vegetation within the application area would comprise suitable foraging habitat for black cockatoo species (DAWE, 2022).

Although vegetation units XbEcOS, EmXbMW and KgJhXbTOS all contain foraging habitat, foraging plants are only sparsely present within XbEcOS and KgJhXbTOS. Aerial mapping indicates that the canopy cover of foraging habitat trees within these vegetation types comprises approximately 0.8 ha (GHD, 2022c). Together with the 7.3 hectares of foraging habitat present within vegetation type EmXbMW, it is considered that the application area includes a total of 8.1 hectares of foraging habitat for all three black cockatoo species.

This foraging habitat is considered to be of moderate quality for black cockatoo species, noting the following:

- A confirmed roost site is present within one kilometre of the application area, and 19 other roost sites are within a 20 kilometre radius;

- Trees providing potential breeding habitat are present within adjacent vegetation, although no confirmed breeding trees have been recorded within 12 kilometres of the application area;
- Water sources are present within one kilometre of the application area;
- Foraging habitat is comprised mainly of jarrah, which is less preferred foraging species (i.e. when compared to marri or proteaceous species), particularly for Carnaby's and Baudin's cockatoo;
- Trees in the application area are relatively small, with no trees with a DBH of greater than 50 centimetres present;
- Vegetation is largely in Degraded condition (only 0.8 is in Good condition);
- Foraging species are relatively sparse within EmXbMW vegetation unit compared to surrounding vegetation in better quality, including within *Banksia* vegetation immediately west of the application area (Ecoedge, 2022).

Notwithstanding the above, it is considered that the clearing of 8.1 hectares of moderate quality foraging habitat for black cockatoo species is likely to have a significant impact on black cockatoos, and therefore an offset was required (refer to Section 4 for further information).

Other possible conservation significant fauna species

Vegetation within the application area is also considered likely to provide habitat for the Coastal Plains skink, Perth slider, quenda, Western brush wallaby, South-western brush-tailed phascogale, Peregrine falcon, noting the habitat requirements and distributions of these species:

- **Coastal Plains skink** is locally restricted to the sandy regions of the Swan Coastal Plain south of Perth. It inhabits open eucalypt woodland over *Banksia*, as well as sandy coastal plain and coastal dunes between Pinjarra and Yallingup Brook (Wilson & Swan 2013)
- **Perth slider** occurs on the coastal plain with *Banksia* and/or *Eucalyptus* and shelters in the upper layers of loose soil beneath leaf litter, logs, at the base of shrubs (Maryan et al. 2015).
- **Quenda** inhabit dense scrubby, often swampy, vegetation with dense cover and adjacent forest and woodland (DPAW, 2012b).
- **Western brush wallaby** inhabit open forest or woodland, particularly favouring open, seasonally-wet flats with low grasses and open scrubby thickets, also found in some areas of mallee and heath-land, and is uncommon in karri forest (DEC, 2012d).
- **Southwestern brush-tailed phascogale** inhabit dry sclerophyll forests and open woodlands that contain hollow bearing trees but a sparse groundcover. In the south-west, this species is typically found in jarrah forest (DEC, 2012e).
- **Peregrine falcon** are 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.

Although the application area contains suitable habitat for the above species, the proposed clearing is not likely to result in significant impacts to habitat for these species, noting the following:

- The small extent (0.8 hectares) of Good quality vegetation that is most likely to provide habitat for these species, particularly when compared to surrounding areas of native vegetation;
- The abundance of native vegetation to the west of the application area within lands managed by DBCA for conservation, which is likely to be in better condition than vegetation within the application area and therefore more likely to provide better quality habitat;
- These species are mobile and likely to be able to find new habitat in adjacent vegetation, should they currently be inhabiting vegetation within the clearing area; and
- No trees with hollows were found within the application area, reducing the likelihood that the area would be utilised by brush-tailed phascogale.

The following condition placed on the permit will further mitigate impacts to the above fauna species:

- Clearing is to be undertaken in a slow, progressive one directional manner. This will allow terrestrial fauna to disperse to adjacent vegetation ahead of the clearing activity should they occur on site at the time of clearing

Conclusion

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

- clearing of 8.1 hectares of moderate quality foraging habitat for black cockatoo species;
- clearing of vegetation that is unlikely to contain significant habitat for western ringtail possums, however there is a possibility for individuals to be present (transient habitat) during the time of the clearing; and

- clearing of habitat for Coastal Plains skink, Swan Coastal Plain shield-backed trapdoor spider, Perth slider, quenda, Western brush wallaby, South-western brush-tailed phascogale, Peregrine falcon, although impacts to habitat for these species are unlikely to be significant.

For the reasons set out above, it is considered that the impacts of the proposed clearing on black cockatoos constitutes a significant residual impact that requires an offset (refer to Section 4 for further details). Impacts to other fauna species identified above can be managed by permit conditions, as identified below.

The applicant may have notification responsibilities under the EPBC Act for impacts to Baudin's black cockatoo, Carnaby's cockatoo, and forest red-tailed black cockatoo and their habitats, as set out in the EPBC Act *Referral guideline for 3 WA threatened black cockatoo species* (DAWE, 2022). The applicant has been advised to contact the federal Department of Water, Agriculture and the Environment (DAWE) to discuss EPBC Act referral requirements.

Conditions

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

- Clearing is to be undertaken in a slow, progressive one directional manner . This will allow terrestrial fauna to disperse to adjacent vegetation ahead of the clearing activity should they occur on site at the time of clearing
- A fauna specialist is required to inspect areas prior to clearing for WRPs and clearing cannot take place in areas where WRPs are present until individuals have left the area or have been removed by a western ringtail possum specialist.

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

Assessment

Conservation significant flora

Noting the habitat requirements, distribution of the recorded species, mapped soil type and vegetation type and condition present within the application area, it was considered that the application area may comprise suitable habitat for the following conservation significant flora species:

- Austrostipa bronweniae* (Threatened)
- Caladenia huegelii* (Threatened)
- Diuris drummondii* (Threatened)
- Drakaea elastica* (Threatened)
- Drakaea micrantha* (Threatened)
- Boronia juncea subsp. juncea* (Priority 1)
- Boronia capitata subsp. gracilis* (Priority 3)
- Carex tereticaulis* (Priority 3)
- Cyathochaeta teretifolia* (Priority 3)
- Dillwynia dillwynioides* (Priority 3)
- Verticordia attenuate* (Priority 3)
- Acacia flagelliformis* (Priority 4)
- Acacia semitrullata* (Priority 4)
- Caladenia speciosa* (Priority 4)
- Pultenaea skinneri* (Priority 4)
- Tripterococcus sp. Brachylobus* (A.S. George 14234) (Priority 4)

A reconnaissance and targeted flora and vegetation survey (Ecoedge, 2022) did not record the above species within the application area, except for *Acacia semitrullata*. Survey methodology was considered adequate to establish the presence or absence of the above species, except for Threatened species *Drakaea elastica*, recorded 330 metres west of the application area (Western Australian Herbarium, 1998-). Although surveys may have been conducted slightly early to rule out the absence of *Drakaea elastica*, given the application area had been previously cleared and the habitat for this species modified, it was considered that the overall risk to this species was low (DBCA, 2022b). A previous survey conducted in August 2019 of a wider area, including the application area, which included a targeted survey for *Drakaea elastica*, found the species within the wider survey area but not the application area (GHD, 2022d), further demonstrating the risk of this species being present within the application area is low.

27 individuals of Priority 4 species *Acacia semitrullata* were recorded within the application area and a further 17 individuals were recorded within 50 metres of the application area. However, DBCA (2022a) noted that the impact of the clearing is unlikely to cause detriment to the overall conservation status of this species in the larger area.

Conditions on the permit requiring the applicant to undertake weed and dieback management will reduce the risks of spread of weeds and dieback impacting individuals of *Acacia semitrullata* remaining within vegetation surrounding the application area.

Ecological communities

The Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region Priority 3 listed ecological community (Banksia PEC) was not recorded within the application area, however was recorded 50 metres west of the application area (Ecoedge, 2022). Noting that the applicant has retained a 50 metre buffer of vegetation between the application area and this ecological community, the proposed clearing is unlikely to significantly impact this area of Banksia PEC. Conditions on the permit requiring the applicant to undertake weed and dieback management will reduce the risks of spread of weeds and dieback impacting this area of Banksia PEC.

Conclusion

Based on the above assessment, the proposed clearing will result in removal of 26 individuals of *Acacia semitrullata*, however other conservation significant flora species or ecological communities are unlikely to be impacted.

For the reasons set out above, it is considered that the impacts of the proposed clearing on *Acacia semitrullata*, does not constitute a significant residual impact, and impacts to *Acacia semitrullata* individuals and the Banksia PEC within surrounding remnant vegetation can be managed through a condition on the permit to manage weeds and dieback.

Conditions

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

- Weed and dieback management conditions.

3.2.3. Water resources - Clearing Principles (f) and (i)

Assessment

Multiple use sumpland and dampland areas are mapped in the south-eastern corner of the application area, including vegetation mapped as *Juncus pallidus* closed rushland/open rushland and *Kunzea glabrescens* and *Jacksonia horrida* tall open shrubland (Ecoedge, 2022). This vegetation is in Degraded condition, and aerial imagery indicates this vegetation has previously been cleared. Noting this, it is unlikely that the proposed clearing would impact the values of this wetland. The elevation throughout the entirety of the mapped wetland is reasonably flat, with a small low point within the application area, the only portion of the wetland appearing to hold permanent water. Noting this, it is unlikely that the proposed clearing would result in significant impacts to water quality within the remnant northern portion of this wetland.

A small multiple use dampland area is mapped within the application area along the western boundary, associated with 0.01 hectares of *Melaleuca preissiana* (*Pinus* sp.) very open/open low woodland vegetation. Noting the small extent of vegetation to be cleared within this wetland, and that it is surrounded by Degraded and cleared vegetation, impacts from the proposed clearing to this wetland are not likely to be significant.

While a manmade drainage line within the Collie River catchment is located approximately 200 metres south-east of the application area, noting that the south-eastern corner of the application area is already largely cleared of native vegetation, the proposed clearing is unlikely to impact this drainage line.

Conclusion

Based on the above assessment, the proposed clearing is unlikely to result in significant impacts to wetland areas.

Conditions

No management conditions required.

3.2.4. Land degradation - Clearing Principle (g)

Assessment

Soils within the application area have a high risk of wind erosion, and as such the proposed clearing has the potential to result in land degradation impacts resulting from wind erosion. However, noting that the majority of the application area will be covered by limestone capping (and some areas will have temporary buildings installed over these areas) following the clearing (GHD, 2022a), it is unlikely that significant wind erosion of soils is likely to occur while this capping is in place. A condition requiring the application to commence the construction of the laydown area no later

than three months after undertaking the clearing will reduce the potential for wind erosion to occur. Although the laydown area is temporary, it is understood that the application area is intended to be utilised as part of an industrial area in the future (Western Australian Land Authority, 2018) and therefore it is unlikely that significant soil exposure, and therefore wind erosion, would occur in the future.

Conclusion

Based on the above assessment, the proposed clearing may result in land degradation impacts resulting from wind erosion. For the reasons set out above, it is considered that these impacts can be managed through the condition outlined below.

Conditions

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

- The permit holder must commence the construction of the laydown area no later than three months after undertaking the clearing to reduce the potential for wind erosion to occur.

3.3. Relevant planning instruments and other matters

Other relevant authorisations required for the proposed land use include:

- Development approval under the *Planning and Development Act 2005* (issued by the Shire of Harvey).

The Shire of Harvey advised DWER that local government approvals are required (Shire of Harvey, 2022a) and this approval was provided on 8 November 2022 (Shire of Harvey, 2022b). The Shire did not advise of any objections to the proposed clearing (Shire of Harvey, 2022a).

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

4 Suitability of offsets

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

- clearing of 8.1 hectares of moderate quality foraging habitat for black cockatoo species *Zanda baudinii*, *Zanda latirostris* and *Calyptorhynchus banksii naso*.

The applicant proposed an environmental offset consisting of 21.51 hectares of vegetation within Lot 42 on Plan 58430, Wellesley (Albemarle, 2022d) (see Figure 3 below) to be ceded to DBCA for inclusion within the conservation estate, containing largely Good quality vegetation of the following vegetation types:

- Open forest or Woodland of *Corymbia calophylla* over *Banksia attenuata*, *B. ilicifolia* and *Agonis flexuosa* over low shrubland and introduced grasses on grey loamy sands on lower slopes; and
- Tall woodland of *Eucalyptus gomphocephala* over *Eucalyptus marginata*, *Agonis flexuosa* and *Banksia attenuata*, with occasional *Corymbia calophylla* and *Melaleuca preissiana* on lower slopes on yellow-grey sand (Ecoedge, 2022).

The offset site is approximately 2.8 kilometres northwest of the application area. The applicant has committed to fencing the offset site, together with an adjacent offset site for another project (Albemarle, 2022d), which will reduce the risk of degradation of the vegetation by preventing public access and associated disturbance to the site.

In assessing whether the proposed offset is adequately proportionate to the significance of the environmental values being impacted, DWER undertook a calculation using the DWER WA environmental offsets calculator (the calculator). The calculator indicated that the vegetation within the proposed offset area, considered to be good quality black cockatoo foraging habitat, is adequate to counterbalance the significant residual impacts of the clearing to black cockatoo foraging habitat. The justification for the values used in the offset calculation is provided in Appendix F.

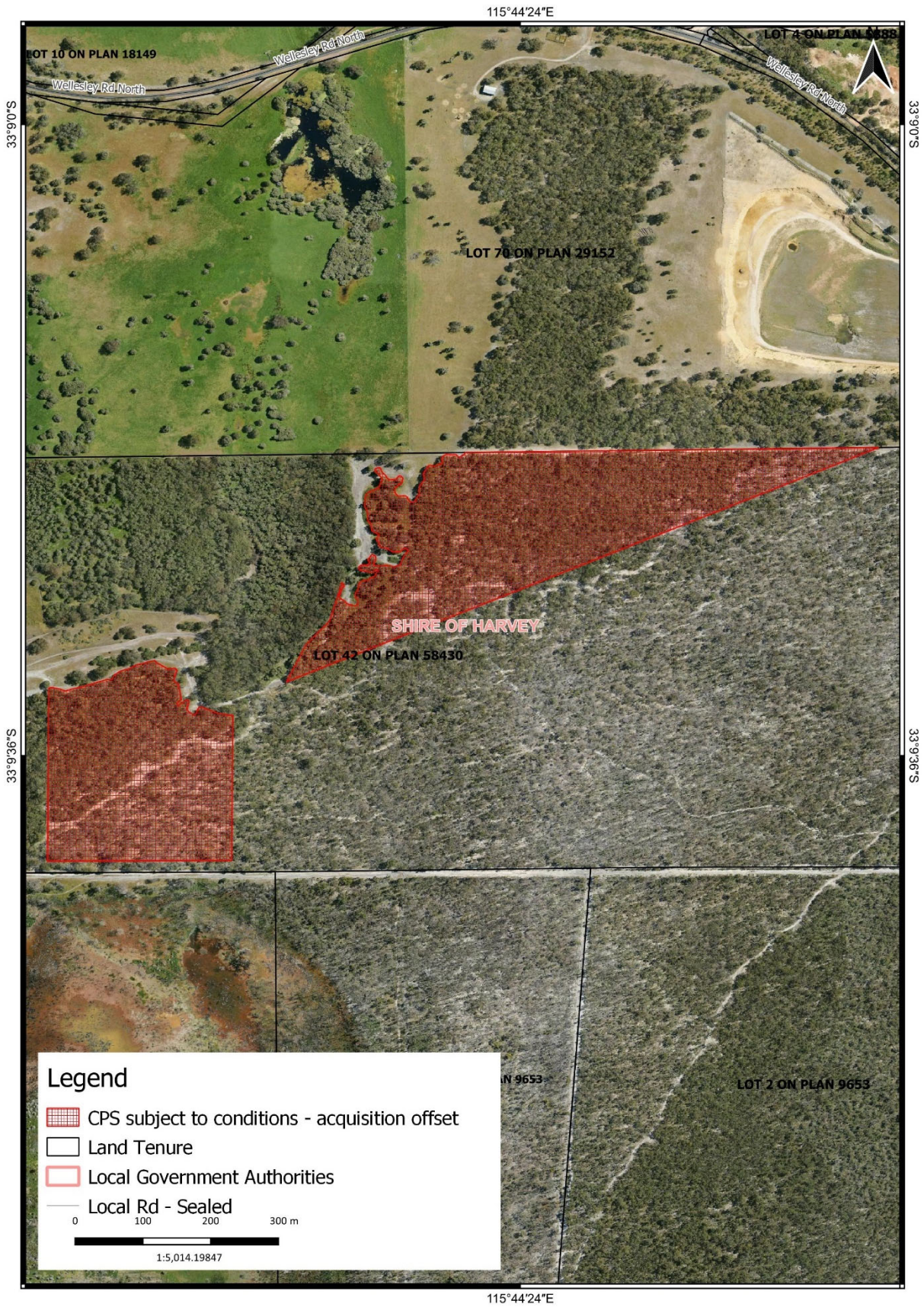


Figure 3 – Map of offset site (hatched red)

End

Appendix A. Additional information provided by applicant

Summary of comments	Consideration of comment
Response to DWER's request for further information (Albemarle, 2022c), including: <ul style="list-style-type: none"> Avoidance and mitigation measures applied to clearing proposal An Environmental Management Plan for the proposed works (GHD, 2022a) Technical memorandum pertaining to <i>Drakaea elastica</i> (GHD, 2022d) 	Refer to Section 3.1
	Refer to Section 3.1
	Refer to Section 3.2.2
Additional black cockatoo foraging assessment (GHD, 2022b)	Refer to Section 3.2.1
Further information regarding black cockatoo foraging habitat (GHD, 2022c)	Refer to Section 3.2.1
Offset information (Albemarle, 2022d)	Refer to Section 4 and Appendix F
Development approval provided (Shire of Harvey, 2022b)	Refer to Section 3.3

Appendix B. Details of public submissions

Summary of comments	Consideration of comment
Submittor appreciated the quality of the flora and faunal surveys provided with the application and for the applicant's mitigation measure to exclude the Banksia Woodland ecological community inclusive of mature trees suitable for black cockatoo and other bird species breeding	<p>No further consideration is required noting it is an appreciative note.</p> <p>Avoidance and mitigation measures are captured in Section 3.1. As discussed in Section 3.2.1 and 3.2.2, it is noted that no residual impacts to the Banksia Woodland ecological community or potential black cockatoo breeding habitat are likely to result from the proposed clearing. An offset for black cockatoo foraging habitat has been provided.</p>

Appendix C. Site characteristics

C.1. Site characteristics

Characteristic	Details
Local context	<p>The area proposed to be cleared is part of an expansive tract of native vegetation in the intensive land use zone of Western Australia. The application area has previously experienced some level of clearing, as has remnant vegetation present to the north and east of the application area, whereas remnant vegetation to the west of the application area appears to have experienced minimal disturbance. The Albemarle Kemerton lithium processing plant is south of the application area.</p> <p>Spatial data indicates the local area (10-kilometre radius from the centre of the area proposed to be cleared) retains approximately 35 per cent of the original native vegetation cover.</p>
Ecological linkage	The application area is approximately 1.8 km to the east and 2 km to the west of ecological linkages identified in the South West Regional Ecological Linkages, and is mapped within an area of vegetation with an edge touching or <500m from a natural area that has an edge touching or within 500m from a linkage (Molloy et al, 2009).
Conservation areas	The application area is approximately 40 m to the east and 1 km to the west of unnamed freehold land parcels that the Department of Biodiversity Conservation and Attractions have an interest in under Section 34A of the <i>Conservation and Land Management Act 1984</i> . Leschenault Peninsula National Park and Benger Swamp

Characteristic	Details
	Nature Reserve are located 5.3 km west and 6.3 km east of the application area respectively.
Vegetation description	<p>A vegetation survey (Ecoedge, 2022) indicates the vegetation within the proposed clearing area consists of:</p> <ul style="list-style-type: none"> • Cleared (17.8 ha) • XbEcOS (17.6 ha) – <i>Eucalyptus marginata</i>, <i>Nuytsia floribunda</i> scattered medium trees over <i>Xanthorrhoea brunonis</i> (<i>Adenanthos meisneri</i>, <i>Macrozamia riedlei</i>) open/very open shrubland over <i>Austrostipa compressa</i>, <i>*Briza maxima</i>, <i>*Ehrharta calycina</i> open grassland and scattered forbs including <i>*Disa bracteata</i>, <i>*Hypochaeris glabra</i> and <i>*Ursinia anthemoides</i> on grey sand on flats • EmCcXbMW (7.3 ha) - Medium woodland of <i>Eucalyptus marginata</i>, (<i>Corymbia calophylla</i>) over <i>Jacksonia horrida</i>, <i>Kunzea glabrescens</i> tall very open shrubland over <i>Dasyopogon bromeliifolius</i>, <i>Macrozamia riedlei</i>, (<i>Hypocalymma angustifolium</i>), <i>Xanthorrhoea brunonis</i> low open shrubland over <i>*Briza maxima</i>, <i>*Ehrharta calycina</i> open grassland and open forbland including <i>*Disa bracteata</i>, <i>*Hypochaeris glabra</i> and <i>*Ursinia anthemoides</i> on grey sand on flats (occasional planted <i>Eucalypts</i>) • KgJhTOS (7.6 ha) - <i>Kunzea glabrescens</i>, <i>Jacksonia horrida</i> tall open shrubland (with scattered <i>Eucalyptus marginata</i> or <i>Corymbia calophylla</i> or <i>Melaleuca preissiana</i>) over <i>Xanthorrhoea brunonis</i> scattered medium shrubs over <i>*Briza maxima</i>, <i>*Ehrharta calycina</i> very open grassland and scattered forbs including <i>*Disa bracteata</i>, <i>*Hypochaeris glabra</i> and <i>*Ursinia anthemoides</i> on grey sand on flats • JpR (1.3 ha) - <i>Juncus pallidus</i> closed rushland/open rushland with scattered <i>Astartea scoparia</i> or <i>Kunzea glabrescens</i> tall shrubs over sparse forbland including <i>*Arctotheca calendula</i>, <i>*Hypochaeris glabra</i>, <i>Lyginia imberbis</i>, <i>*Rumex acetosella</i>, and <i>*Ursinia anthemoides</i> on grey sand in broad damplands • MpAsOLW (0.01 ha) - <i>Melaleuca preissiana</i> (<i>Pinus</i> sp.) very open/open low woodland over <i>Astartea scoparia</i> medium closed medium shrubland over <i>Adenanthos obovata</i> open low shrubland over sparse forbland including <i>*Arctotheca calendula</i>, <i>*Hypochaeris glabra</i> and <i>Lyginia imberbis</i> on grey-brown sand in broad damplands <p>Representative photos and survey maps are available in Appendix G.</p> <p>This is consistent with the mapped vegetation type:</p> <ul style="list-style-type: none"> • Bassendean Complex-Central and South, which is described as: vegetation ranges from woodland of <i>Eucalyptus marginata</i> (Jarrah) - <i>Allocasuarina fraseriana</i> (Sheoak) - <i>Banksia</i> species to low woodland of <i>Melaleuca</i> species, and sedgelands on the moister sites. This area includes the transition of <i>Eucalyptus marginata</i> (Jarrah) to <i>Eucalyptus tottiana</i> (Pricklybark) in the vicinity of Perth. (Hedde et al., 1980). <p>The mapped vegetation type retains approximately 27 per cent of the original extent (Government of Western Australia, 2019).</p>
Vegetation condition	<p>A vegetation survey (Ecoedge, 2022) indicates the vegetation within the proposed clearing area (with exception of the 17.6 ha of cleared area) is in Completely Degraded to Good (Keighery, 1994) condition, described as:</p> <ul style="list-style-type: none"> • Good (0.8 ha) - 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 (32.7 ha) - 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 (0.3 ha) - The structure of the vegetation is no longer intact and the area is completely or almost completely without native species.

Characteristic	Details
	<p>These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.</p> <p>The full Keighery (1994) condition rating scale is provided in Appendix E. Representative photos and survey mapping are available in Appendix G.</p>
Climate	<p>Rainfall: 900 mm</p> <p>Evapotranspiration: 800 mm</p>
Topography	<p>Elevation within the application area is approximately 15 m AHD. The application area is relatively flat.</p>
Soil description	<p>The soil is mapped as:</p> <ul style="list-style-type: none"> Majority of application area - Bassendean B6 Phase (212Bs_B6), described as Sandplain and broad extremely low rises with imperfectly drained deep or very deep grey siliceous sands: Northwest corner - Spearwood S1c Phase (212Sp_S1c), described as Dune ridges with deep bleached grey sands with yellow-brown subsoils, and slopes up to 15%.
Land degradation risk	<p>Soils present in the application area (Bassendean B6 Phase and Spearwood S1c Phase) are identified to have a high risk of wind erosion and phosphorus export.</p>
Surface water	<p>The application area intersects three mapped multiple use wetland areas: a small dampland along the western boundary, a small dampland area in the south-eastern corner and a large dampland/sumpland in the southeast of the application area that extends outside the application area boundary along its eastern extent. The nearest watercourse to the application area is a man-made drainage line in the Collie River catchment located approximately 200 m southeast of the application area.</p>
Hydrogeography	<p>The application area is mapped within the South West Coastal Groundwater Area proclaimed under the <i>Rights in Water and Irrigation Act 1914</i>.</p> <p>Hydrogeology: Surficial Sediments - Shallow Aquifers (Sand, gravel lithology)</p> <p>Groundwater salinity: 500-1000 mg/L TDS</p>
Flora	<p>There are records of 7 threatened and 21 priority flora species within the local area, the closest of which to the application area is threatened species <i>Drakaea elastica</i>, located approximately 330m to the west.</p> <p>A flora and vegetation survey (Ecoedge, 2022) recorded 7 occurrences (including 27 individuals) of Priority 4 species <i>Acacia semitrullata</i> within the application area and another 8 occurrences (containing 17 individuals) within 50 m of the application area.</p>
Ecological communities	<p>There are records of 3 threatened and 4 ecological communities within the local area, one of which, the Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region, is recorded within the application area.</p> <p>A flora and vegetation survey (Ecoedge, 2022) did not record any conservation significant ecological communities within the application area, however recorded areas of the Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region ecological community 30 metres west of the application area.</p>
Fauna	<p>There are records of 18 threatened, nine priority, 16 migratory, one conservation dependent and one other specially protected fauna species within the local area, one of which, threatened species <i>Calyptorhynchus latirostris</i> (Carnaby's cockatoo), has been recorded within the application area eight times. 19 of these species occur in terrestrial environments.</p> <p>A fauna assessment (Harewood, 2022), encompassing the application area and some surrounding land, recorded evidence of foraging of <i>Calyptorhynchus banksii naso</i> (forest red-tailed black cockatoo), <i>Zanda baudinii</i> (Baudin's cockatoo) and <i>Zanda latirostris</i> (Carnaby's cockatoo), mainly within Banksia vegetation to the west of the application area, but also from <i>Corymbia calophylla</i> (marri) trees. Carnaby's cockatoo individuals was also noted flying above the survey area. No foraging of <i>Eucalyptus marginata</i> (jarrah) was noted. No trees containing suitable breeding hollows for black cockatoo species were recorded within the application area, although one marri tree with a diameter at breast height of greater than 50 m was recorded. No other</p>

Characteristic	Details
	conservation significant fauna species, or evidence of such species, was recorded in the fauna assessment. A further black cockatoo foraging assessment (GHD, 2022c) recorded evidence of black cockatoo foraging from jarrah trees at multiple locations within the application area.

C.2. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
IBRA bioregion*					
Swan Coastal Plain	1,501,221.93	579,813.47	38.62	222,916.97	14.85
Vegetation complex					
Hedde vegetation complex 44**	87,476.26	23,508.66	26.87	4,377.36	5.00
Local area					
10km radius	30,860.44	10,689.87	34.64	-	-

*Government of Western Australia (2019a)

**Government of Western Australia (2019b)

C.3. Flora analysis table

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

Species name	Conservation status	Suitable habitat features ? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Number of records in local area	Are surveys adequate to identify? [Y, N, N/A]
<i>Acacia flagelliformis</i>	P4	Y	Y	Y	2.47	35	2	Y
<i>Acacia semitrullata</i>	P4	Y	Y	Y	1.11	88	9	Y
<i>Acacia</i> sp. Binningup (G. Cockerton et al. WB 37784)	P1	N	N	N	5.25	11	9	N
<i>Austrostipa bronweniae</i>	T	Y	Y	Y	6.30	11	3	Y
<i>Bolboschoenus medianus</i>	P1	N	Y	Y	5.82	4	2	N
<i>Boronia capitata</i> subsp. <i>gracilis</i>	P3	Y	Y	Y	8.29	28	2	Y
<i>Boronia juncea</i> subsp. <i>juncea</i>	P1	Y	Y	N	2.56	12	8	Y
<i>Caladenia huegelii</i>	T	Y	N	N	7.24	41	1	Y
<i>Caladenia procera</i>	T	N	Y	N	4.14	8	1	Y
<i>Caladenia speciosa</i>	P4	Y	Y	N	0.70	60	6	Y
<i>Carex tereticaulis</i>	P3	Y	Y	N	5.23	18	1	Y
<i>Chamaescilla gibsonii</i>	P3	N	N	N	8.21	28	1	Y
<i>Cyathochaeta teretifolia</i>	P3	Y	Y	Y	7.04	39	1	Y
<i>Dillwynia dillwynioides</i>	P3	Y	Y	Y	2.59	40	4	Y
<i>Diuris drummondii</i>	T	Y	Y	Y	1.88	53	4	Y

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Number of records in local area	Are surveys adequate to identify? [Y, N, N/A]
<i>Diuris micrantha</i>	T	N	Y	Y	0.97	8	1	Y
<i>Drakaea elastica</i>	T	Y	Y	Y	0.33	19	13	Y
<i>Drakaea micrantha</i>	T	Y	Y	N	1.09	49	17	Y
<i>Eucalyptus rudis</i> subsp. <i>cratyantha</i>	P4	N	N	N	9.73	18	1	N
<i>Lasiopetalum membranaceum</i>	P3	N	Y	Y	3.13	35	10	Y
<i>Myriophyllum echinatum</i>	P3	N	N	N	9.88	19	1	N
<i>Pterostylis frenchii</i>	P2	N	Y	Y	2.27	6	1	Y
<i>Puccinellia vassica</i>	P1	N	N	N	5.06	8	3	Y
<i>Pultenaea skinneri</i>	P4	Y	Y	Y	0.97	38	6	Y
<i>Schoenus</i> sp. Waroona (G.J. Keighery 12235)	P3	N	N	N	9.88	11	1	N
<i>Styphelia filifolia</i>	P3	N	Y	N	9.96	37	1	N
<i>Tripterococcus</i> sp. <i>Brachylobus</i> (A.S. George 14234)	P4	Y	Y	Y	3.68	27	1	Y
<i>Verticordia attenuata</i>	P3	Y	Y	N	3.14	35	2	Y

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

C.4. Fauna analysis table

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

Species name	Conservation status	Suitable habitat features? [Y/N]	Distance of closest record to application area (km)	Most recent record in local area	Number of known records in local area	Are surveys adequate to identify? [Y, N, N/A]
<i>Botaurus poiciloptilus</i> (Australasian bittern)	EN	N	5.2	2012	9	N
<i>Calyptorhynchus banksii naso</i> (forest red-tailed black cockatoo)	VU	Y	2.8	2018	13	Y
<i>Calyptorhynchus baudinii</i> (Baudin's cockatoo)	EN	Y	4.0	2010	3	Y
<i>Calyptorhynchus latirostris</i> (Carnaby's cockatoo)	EN	Y	0.0	2016	64	Y
<i>Ctenotus ora</i> (Coastal Plains skink)	P3	Y	10.0	2014	2	N
<i>Dasyurus geoffroyi</i> (Chuditch, western quoll)	VU	N	4.8	1997	3	N
<i>Falco peregrinus</i> (peregrine falcon)	OS	Y	2.4	2009	4	N
<i>Falsistrellus mackenziei</i> (Western false pipistrelle, western falsistrelle)	P4	N	4.4	2014	4	N
<i>Hydromys chrysogaster</i> (Water-rat, rakali)	P4	N	4.7	2016	5	N
<i>Idiosoma sigillatum</i> (Swan Coastal Plain shield-backed trapdoor spider)	P3	N	7.6	1999	3	N
<i>Isodon fusciventer</i> (Quenda, southwestern brown bandicoot)	P4	Y	0.8	2019	31	N
<i>Ixobrychus dubius</i> (Australian little bittern)	P4	N	7.0	2016	3	N
<i>Lerista lineata</i> (Perth slider, lined skink)	P3	Y	3.3	2009	6	N
<i>Myrmecobius fasciatus</i> (Numbat, walpurti)	EN	N	6.1	1974	3	N
<i>Notamacropus irma</i> (Western brush wallaby)	P4	Y	3.0	2009	3	N
<i>Oxyura australis</i> (Blue-billed duck)	P4	N	4.1	2011	21	N
<i>Phascogale tapoatafa wambenger</i> (South-western brush-tailed phascogale, wambenger)	CD	N	1.0	2019	25	N
<i>Plegadis falcinellus</i> (Glossy ibis)	MI	Y	5.2	2005	4	N

Species name	Conservation status	Suitable habitat features? [Y/N]	Distance of closest record to application area (km)	Most recent record in local area	Number of known records in local area	Are surveys adequate to identify? [Y, N, N/A]
<i>Pseudocheirus occidentalis</i> (Western ringtail possum, ngwayir)	CR	Y	3.8	2020	178	N

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

* A further 17 records of *Calyptorhynchus* sp. 'white-tailed black cockatoo' (White-tailed black cockatoo) have been recorded within the local area, which may comprise either of these species

C.5. Ecological community analysis table

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

Community name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Number of known records in local area	Are surveys adequate to identify? [Y, N, N/A]
Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	P3	Y	N	Y	Mapped within application area	447	Y

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

C.6. Land degradation risk table

Risk categories	<i>Bassendean B6 Phase</i>
Wind erosion	85% of map unit has a high to extreme hazard
Water erosion	0% of map unit has a very high to extreme hazard
Subsurface compaction	0% of the map unit has a high susceptibility
Salinity	0% of map unit has a moderate hazard
Subsurface Acidification	100% of map unit has a high susceptibility
Flood risk	0% of the map unit has a moderate to high hazard
Water logging	40% of map unit has a moderate to very high risk
Phosphorus export risk	90% of map unit has a high to extreme hazard

Risk categories	<i>Spearwood S1c Phase</i>
Wind erosion	100% of map unit has a high to extreme hazard
Water erosion	0% of map unit has a very high to extreme hazard
Subsurface compaction	0% of the map unit has a high susceptibility
Salinity	0% of map unit has a moderate hazard
Subsurface Acidification	55% of map unit has a high susceptibility
Flood risk	0% of the map unit has a moderate to high hazard
Water logging	0% of map unit has a moderate to very high risk
Phosphorus export risk	55% of map unit has a high to extreme hazard

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> The area proposed to be cleared contains locally significant flora species (<i>Acacia semitrullata</i>) and habitat for conservation significant fauna species (foraging habitat for black cockatoo species).</p>	At variance	Yes <i>Refer to Sections 3.2.1 and 3.2.2 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> The area proposed to be cleared contains significant foraging habitat for black cockatoo species.</p>	At variance	Yes <i>Refer to Section 3.2.2 above</i>
<p><u>Principle (c):</u> <i>“Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</i></p> <p><u>Assessment:</u> The area proposed to be cleared is unlikely to contain flora species listed under the BC Act.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.2 above</i>
<p><u>Principle (d):</u> <i>“Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community.”</i></p> <p><u>Assessment:</u> The area proposed to be cleared does not contain species indicative of a threatened ecological community.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.2 above</i>
Environmental value: significant remnant vegetation and conservation areas		
<p><u>Principle (e):</u> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u> The Environmental Protection Authority (EPA) advises that a minimum 10 per cent representation threshold for ecological communities is recommended within “constrained areas” within the Perth Metropolitan Region and the Bunbury Region (EPA, 2008), which includes areas zoned as “industrial” under the Greater Bunbury Region Scheme. As such, the extents of the mapped vegetation type and native vegetation in the local area are consistent with targets for biodiversity conservation. While the application area is mapped within an area of vegetation contiguous with an identified ecological linkage, noting that the application area is in poorer condition than vegetation immediately west and east, it is considered that the proposed clearing is unlikely to significantly impact ecological linkages.</p>	Not likely to be at variance	No
<p><u>Principle (h):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.”</i></p> <p><u>Assessment:</u> Given the distance to the nearest conservation area, 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> Three wetlands are mapped within the application area and riparian vegetation is present.</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 (g)</u>: “Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</p> <p><u>Assessment</u>: The mapped soils are highly susceptible to wind erosion, however future site use is likely to largely mitigate the risk of wind erosion.</p>	Not likely to be at variance	Yes Refer to Section 3.2.4 above
<p><u>Principle (i)</u>: “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.”</p> <p><u>Assessment</u>: Given the condition of the vegetation to be cleared within wetland areas, the conservation status of these wetlands and the site topography, the proposed clearing is unlikely to impact surface water quality. Noting the extent of the proposed clearing and lack of sensitive groundwater resources, the clearing is unlikely to have an appreciable impact upon groundwater quality.</p>	Not likely to be at variance	Yes Refer to Section 3.2.4 above
<p><u>Principle (j)</u>: “Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</p> <p><u>Assessment</u>: The mapped soils and topographic contours in the surrounding area do not indicate the proposed clearing is likely to contribute to increased incidence or intensity of flooding. The mapped soils, extent and condition of vegetation to be cleared within low-lying portions of the application area and proposed land use within the application area indicate that the proposed clearing is unlikely to contribute to waterlogging.</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 (1994).

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.

Condition	Description
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

Environmental value to be offset			
Calculation	Score (Area)		Rationale
Conservation significance			
Description	Carnaby's cockatoo, Baudin's cockatoo and forest red-tailed black cockatoo foraging habitat		A single offset involving the provision of funds to DBCA for purchase of 21.51 hectares is proposed to address the significant residual impacts to foraging habitat for all three black cockatoo species
Type of environmental value	Species (flora/fauna)		Fauna species
Conservation significance of environmental value	Rare/threatened species - endangered		Both Carnabys and Baudins cockatoo are listed as endangered under the EPBC Act 1999.
Landscape-level value impacted	yes/no		yes
Significant impact			
Description	clearing of forest containing foraging species (mainly jarrah)		Noting the context of the application area within the Swan Coastal Plain and close to known roosting sites and water sources, the clearing of any foraging habitat is considered likely to have a significant impact upon Carnaby's cockatoo and Baudin's cockatoo that requires offsetting. It is also considered that this offset would offset impacts to the forest red tailed black cockatoo as well.
Significant impact (hectares) / Type of feature	8.10		Calculated from 7.3 hectares within the proposed clearing area mapped as EmXbMW "Jarrah open woodland" in Degraded (mainly) to Good condition, plus areas of canopy cover of all large trees within XbEcOS (Scattered jarrah and Nuytsia floribunda over an open/very open shrubland) and KgJhTOS (Tall open shrubland (with scattered Jarrah and Marri) over scattered shrubs) vegetation types
Quality (scale) / Number	5.00		Considered moderate quality on the balance of the following: -Presence of confirmed roost site within 1km -Potential breeding habitat (i.e. suitable DBH trees) in adjacent veg (from survey) although no confirmed breeding trees mapped within 12km -Water sources within 1km -Predominance of jarrah i.e. less preferred foraging species (few marri and negligible proteaceae) -No trees with DBH > 50 cm present within area -Largely Degraded condition (only 0.8 is Good) and vegetation is sparse compared to surrounding vegetation in better quality, including Banksia TEC immediately west
Rehabilitation credit			
Description	0		No onsite mitigation is possible noting future land use by development W/A as part of Kemerton Industrial Area
Proposed rehabilitation (area in hectares)	0.00		
Current quality of rehabilitation site / Start number (of type of feature)	0.00		
Future quality WITHOUT rehabilitation (scale) / Future number WITHOUT rehabilitation	0.00		
Future quality WITH rehabilitation (scale) / Future number WITH rehabilitation	0.00		
Time until ecological benefit (years)	0.00		
Confidence in rehabilitation result (%)	0		
Offset			
Description	Land acquisition		Land will be provided to DBCA and managed as part of their conservation estate
Proposed offset (area in hectares)	21.51		Value required to 100% offset impacts
Current quality of offset site / Start number (of type of feature)	7.00		Vegetation provides good quality foraging habitat for black cockatoos, noting presence of foraging species (marri, jarrah, banksia, tuart), nearby water sources, roosting habitat and breeding habitat and it is in Good condition
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	7.00		The quality of the habitat would not be expected to change significantly in the absence of the offset.
Future quality WITH offset (scale) / Future number WITH offset	8.00		Fencing is expected to improve quality of habitat for black cockatoos by preventing vehicle use and therefore timber cutting, rubbish dumping and spread of dieback.
Time until ecological benefit (years)	2.00		Land acquisition is expected to occur within two years of clearing.
Confidence in offset result (%)	0.9		High confidence that the fencing will be undertaken and improve quality of vegetation and foraging habitat
Duration of offset implementation (maximum 20 years)	20.00		As the offset site will be transferred to the conservation estate, the maximum duration of 20 years is applied.
Time until offset site secured (years)	2.00		It is expected that the purchase and transfer of the land will occur within 1-2 years, noting discussions regarding the land have begun with DBCA
Risk of future loss WITHOUT offset (%)	20.0%		The land is zoned rural, and there is potential for the land to be cleared for potential mining/ quarrying activities under exploration tenement E 70/5793.
Risk of future loss WITH offset (%)	5.0%		As the offset site will be transferred to the conservation estate, the risk of loss is very low.
Offset ratio (Conservation area only)	N/A		

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

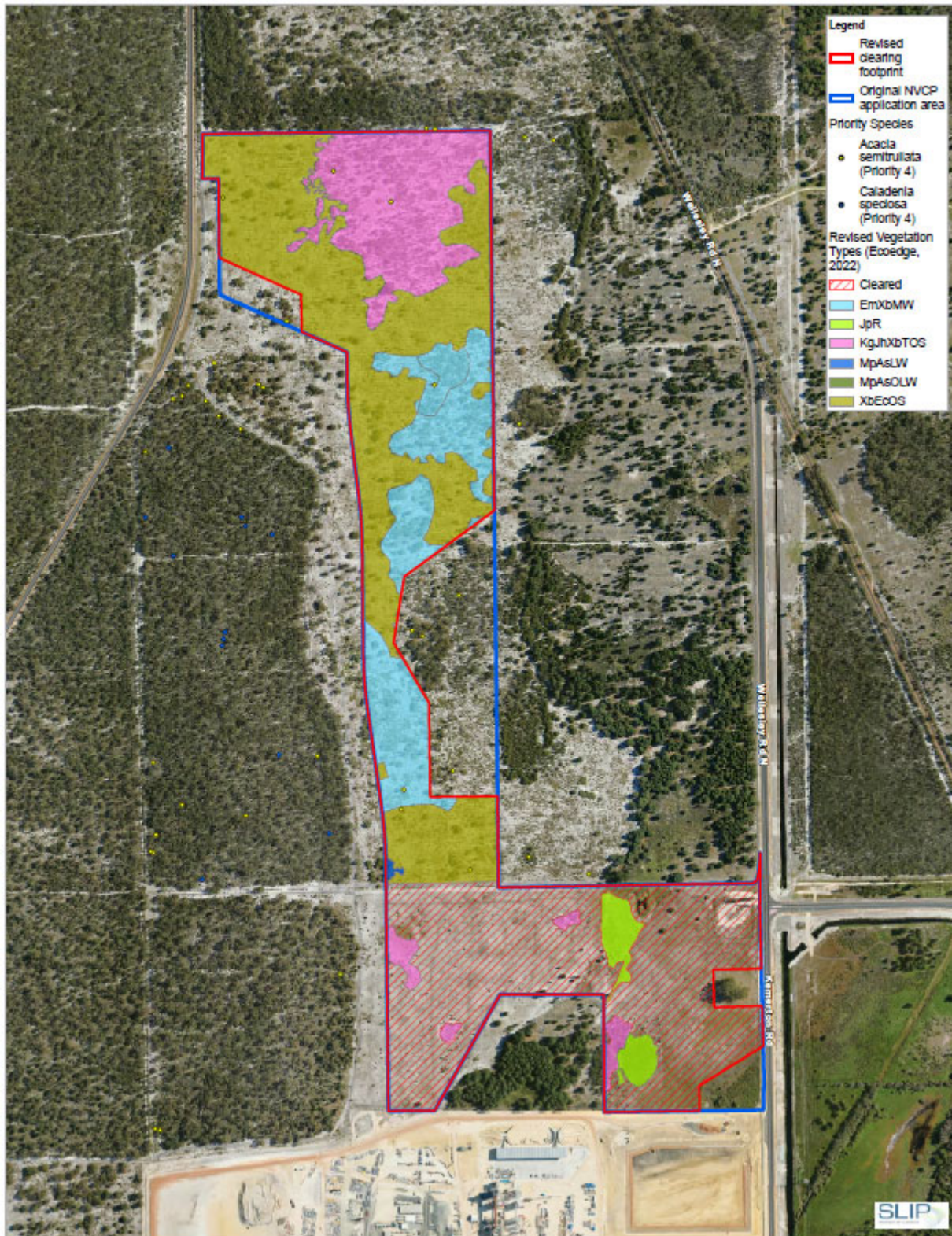


Figure G-1 - Vegetation types in application area (GHD, 2022c (based upon Ecoedge, 2022))

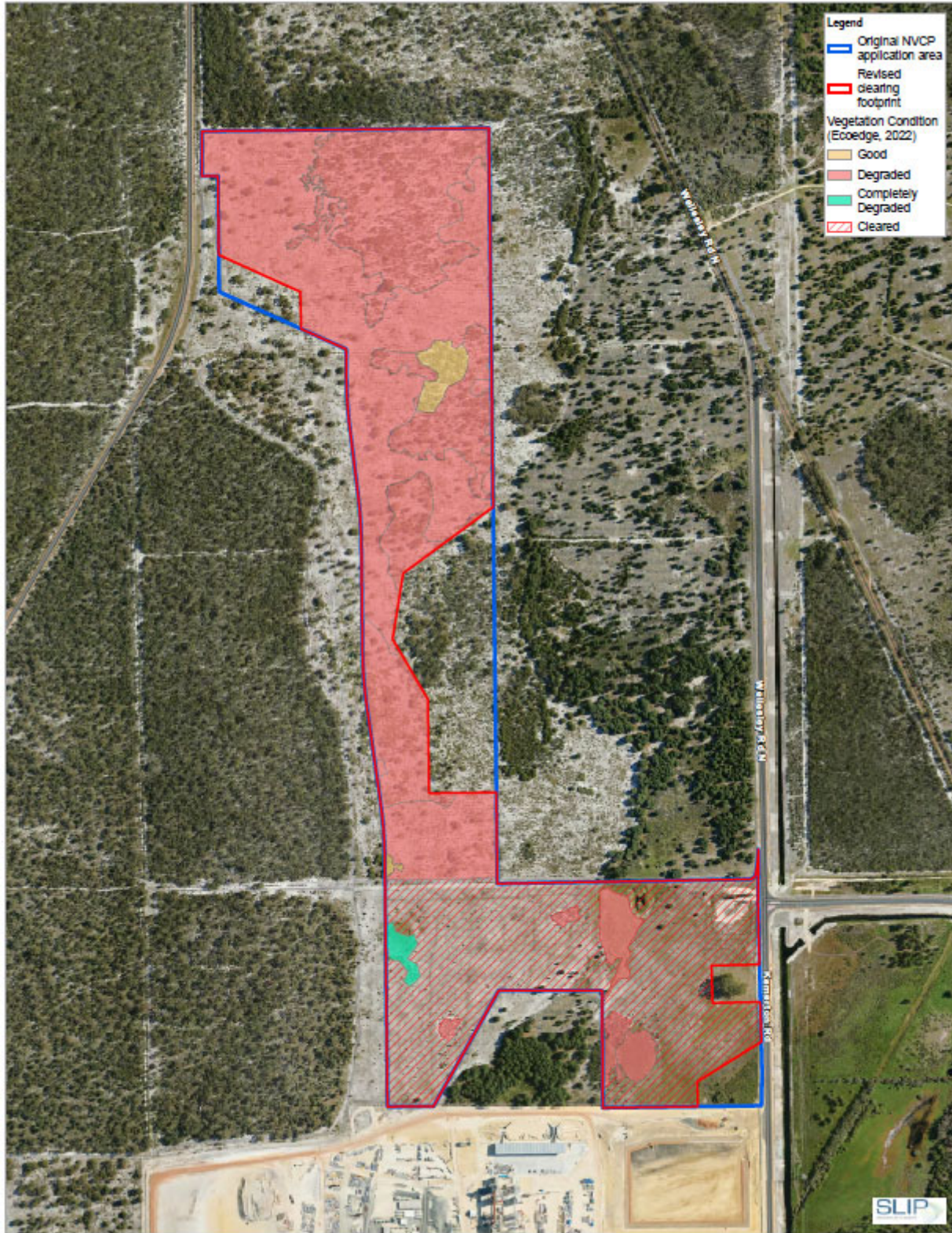


Figure G-2 - Vegetation condition in application area (GHD, 2022c (based upon Ecoedge, 2022))

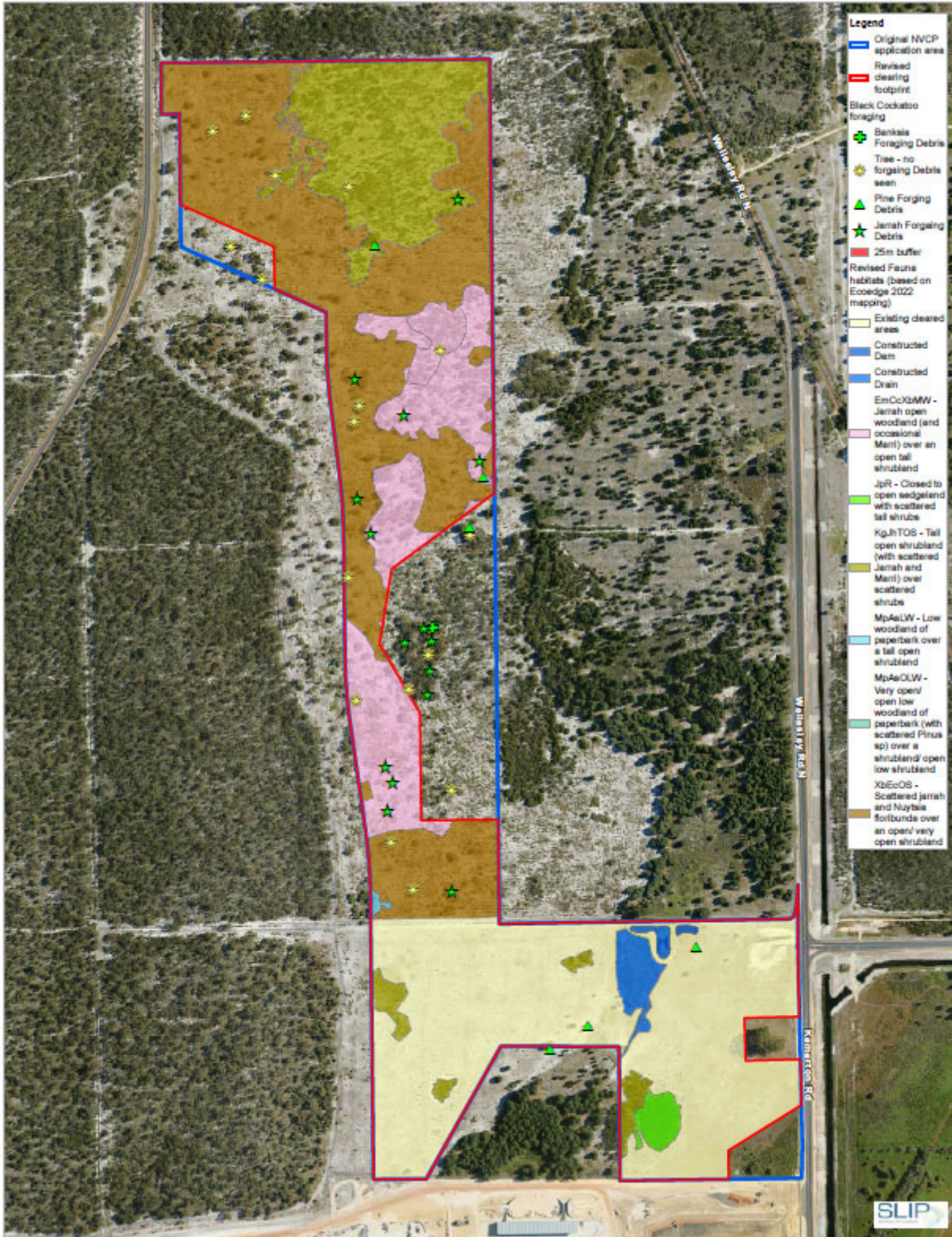


Figure G-3 – Fauna habitat/evidence in application area (GHD, 2022c (based upon Ecoedge, 2022))



Figure G-4 - *Eucalyptus marginata*, *Nuytsia floribunda* open/very open shrubland (XbEcOs vegetation immediately west of the application area (Harewood, 2022).



Figure G-5 - *Kunzea glabrescens*, *Jacksonia horrida* tall open shrubland (KgJhTOS) vegetation within the application area (Harewood, 2022).

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)
- Geomorphic wetlands, Swan Coastal Plain (DBCA-019)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Imagery
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Offsets Register – Offsets (DWER-078)
- Pre-European Vegetation Statistics
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available
- Soil Landscape Mapping – Systems

Restricted GIS Databases used:

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

H.2. References

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