GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

PERMIT DETAILS

Area Permit Number: CPS 9597/1

File Number: DWERVT9580

Duration of Permit: From 9 November 2023 to 9 November 2036

PERMIT HOLDER

Mr Graeme Yukich

LAND ON WHICH CLEARING IS TO BE DONE

Lot 104 on Deposited Plan 416801, Middle Swan

AUTHORISED ACTIVITY

The permit holder must not clear more than 1.19 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 9 November 2025.

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 from south to north to allow fauna to move into adjacent *native vegetation* ahead of the clearing activity.

5. Offset - Revegetation and rehabilitation

(a) The permit holder must undertake *revegetation* and *rehabilitation* within the combined areas cross-hatched red in Figure 2 and Figure 3 of Schedule 1 of this permit, of which 3.69 hectares is to provide suitable foraging habitat for *black cockatoo species* and at least 2.06 hectares is to be representative of the *Guildford Vegetation Complex*.

(b) Within 12 months of the commencement of clearing authorised under this permit, and no later than 9 November 2026, the permit holder must *revegetate* and r*ehabilitate* the combined areas cross-hatched red in Figure 2 and Figure 3 of Schedule 1 by implementing and adhering to the document 'Revegetation Management Plan – 148 Dale road, Middle Swan' dated 1 September 2023 (by JBS & G Australia Pty Ltd), including but not limited to the following actions:

(i) retain the vegetative material removed by *clearing* authorised under this permit and stockpile the vegetative material in an area that has already been cleared;

(ii) laying the vegetative material retained under condition 5(b)(i);

(iii) laying topsoil to an appropriate depth to enable species establishment;

(iv) deliberately *planting* tube stock and undertaking *direct seeding* at an *optimal time*, using species listed in Schedule 2 (target species);

(v) ensuring only *local provenance* seeds and propagating material are used to *revegetate* and *rehabilitate* the area;

(vi) establish a minimum of four 10 metre x 10 metre quadrat monitoring sites;

(vii) water planted vegetation between November and March for the first two years post *planting,* as required;

(viii) undertake *weed* control activities to achieve the completion criteria as listed in Table 1; and

(ix) achieve the following completion criteria listed in Table 1 within the five-year monitoring period for areas *revegetated* and *rehabilitated* under condition 5 of this permit;

Table 1: Completion criteria

Aspect	Completion targets	Completion criteria	Monitoring
1) Species richness – within revegetation areas required to be representative of the Guildford complex	Species richness of each 10 m x 10 m monitoring site at least 70 per cent of that within the *reference site 1* (20 species).	Species richness of each 10 m x 10 m monitoring site is at least 14 species	The species and number of plants per 10 m x 10 m monitoring site in the rehabilitation area will be counted annually for five years.
2) Species density/composition– within revegetation areas required to provide habitat for *black cockatoo* species	Total native species stem density of potential foraging species for *black cockatoos* equal to or greater than *reference site 1*	Total native species stem density of potential foraging species for *black cockatoos* exceeds or equals *reference site 1*	Stem density and species to be assessed annually for five years
3) Survival rate	If after planting a survival rate of at least 50 per cent is not achieved, infill planting must occur.	The rehabilitation area needs to ensure a survival rate of at least 50 per cent of the density planted is achieved after five years.	The number of surviving plants in the revegetation areas will be monitored annually for five years.
4) Weeds	<10% weed cover, no declared pests or Weeds of National Significance (WoNS)	<10% weed cover, no declared pests or WoNS	Annually during spring for five years

(c) The permit holder must undertake remedial actions for areas *revegetated* and *rehabilitated* where monitoring indicates that *revegetation* has not met the completion criteria outlined in Table 1, including:

(i) *revegetate* the area by deliberately *planting native vegetation* that will result in the minimum targets specified in Table 1 and ensuring only *local provenance* seeds and propagating material are used;

(ii) undertake further *weed* control activities;

(iii) undertake further watering activities;

(iv) annual monitoring of each *revegetated* and *rehabilitated* site, until the completion criteria outlined in Table 1 are met.

6. Offset – Conservation covenant

Twelve (12) months after commencing the *revegetation* and *rehabilitation* activities required under condition 5(b), and by no later than 9 November 2027, the Permit Holder shall:

(a) give a conservation covenant under section 30B of the *Soil and Land Conservation Act* 1945, setting aside the combined areas cross-hatched red on Figure 2 and Figure 3 of Schedule 1, for the protection and management of vegetation in perpetuity; and

(b) provide to the *CEO* a copy of the executed conservation covenant.

7. Records that must be kept

The permit holder must maintain records relating to the listed relevant matters in accordance with the specifications detailed in Table 2.

Table 2: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	(a) the species composition, structure, and density of the cleared area; (b) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to GDA2020, expressing the geographical coordinates in Eastings and Northings; (c) the date that the area was cleared; (d) the size of the area cleared (in hectares); (e) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 2; and (f) actions taken to minimise the risk of the introduction and spread of *weeds* and *dieback* in accordance with condition 3.
2.	In relation to the *revegetation* and *rehabilitation* of areas pursuant to condition 5	(a) the size of the area *revegetated* and *rehabilitated*; (b) the date(s) on which the area *revegetation* and *rehabilitation* was undertaken; (c) the boundaries of the area *revegetated* and *rehabilitated* (recorded digitally as a shapefile); (d) description of the *revegetation* and *rehabilitation* activities undertaken, including actions taken to implement hygiene protocols and weed control; and (e) description of any remedial actions undertaken in accordance with condition 5(c).

8. Reporting

The permit holder must provide to the *CEO* the records required under condition 7 of this permit when requested by the *CEO*.

DEFINITIONS

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

Table 3: Definitions

Term	Definition
black cockatoo species	means one or more of the following species: *(a) Zanda latirostris* (Carnaby's cockatoo); *(b) Zanda baudinii* (Baudin's cockatoo); and/or *(c) Calyptorhynchus banksii naso* (forest red-tailed black cockatoo).
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the EP Act.
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.
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
fauna specialist	means a person who holds a tertiary qualification specialising in environmental science or equivalent, and has a minimum of 2 years work experience in fauna identification and surveys of fauna native to the region being inspected or surveyed, or who is approved by the *CEO* as a suitable fauna specialist for the bioregion, and who holds a valid fauna licence issued under the *Biodiversity Conservation Act 2016*.
fill	means material used to increase the ground level, or to fill a depression.
dieback	means the effect of *Phytophthora* species on native vegetation.
department	means the department established under section 35 of the *Public Sector Management Act 1994* (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
EP Act	*Environmental Protection Act 1986* (WA)
Guildford Vegetation Complex	means the vegetation complex as described and mapped by Heddle, E. M., Loneragan, O. W., and Havel, J. J. (1980). *Vegetation Complexes of the Darling System, Western Australia*. In Department of Conservation and Environment, Atlas of Natural Resources, Darling System, Western Australia.
local provenance	means native vegetation seeds and propagating material from natural sources within 50 kilometres and the same IBRA subregion of the area cleared.
optimal time	means the period from April to June for undertaking planting and seeding.
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.
planting	means the re-establishment of vegetation by creating soil conditions and planting seedlings of the desired species.
reference site 1	Quadrat No 2 from *Flora and Fauna Survey, 148 Dale Road, Middle Swan* (Natural Area Consulting Management Services, 2021) with the

Term	Definition
	following coordinates: Latitude: -31.85207690 Longitude: 116.00868176)
rehabilitate / rehabilitated / rehabilitation	means actively managing an area containing native vegetation in order to improve the ecological function of that area.
revegetate / vegetated / revegetation	means the re-establishment of a cover of local provenance native vegetation in an area using methods such as natural regeneration, direct seeding and/or planting, so that the species composition, structure and density is similar to pre-clearing vegetation types in that area.
weeds	means any plant – (a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*; or (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or (c) not indigenous to the area concerned.

END OF CONDITIONS

JBurton

Jessica Burton
A/MANAGER
NATIVE VEGETATION REGULATION

Officer delegated under Section 20
of the Environmental Protection Act 1986

16 October 2023

SCHEDULE 1

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

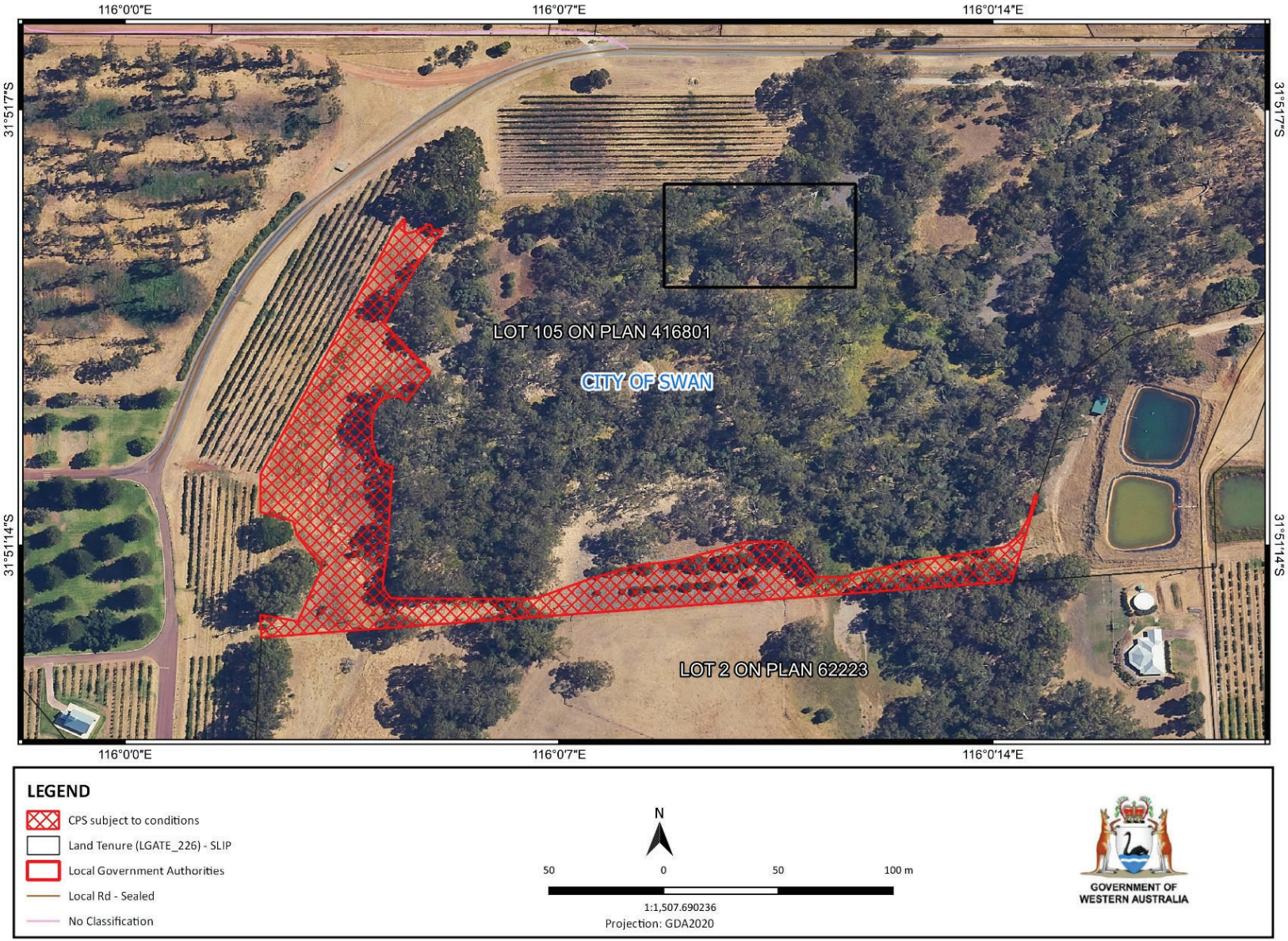

Figure 2: Map of the boundary of the area within which conditions apply.

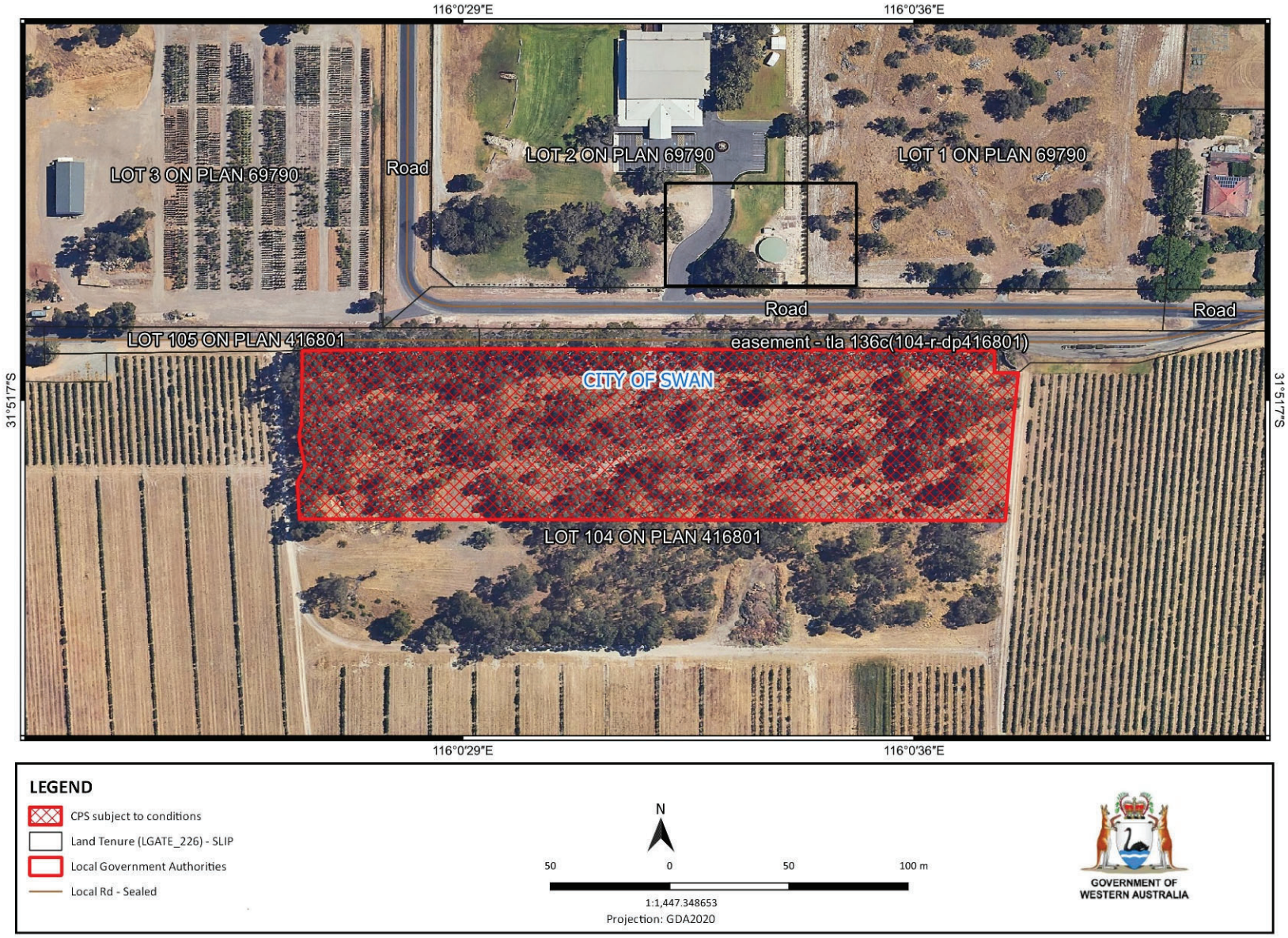

Figure 3: Map of the boundary of the area within which conditions apply.

SCHEDULE 2

Target Species for Revegetation

Species name	Common name
Acacia saligna	Coojong, Orange Wattle
Allocasuarina fraseriana	Common Sheoak
Allocasuarina humilis	Dwarf Sheoak
Banksia attenuata	Slender Banksia, Candlestick Banksia
Banksis grandis	Bull Banksia
Banksia littoralis	Swamp Banksia
Banksia menziesii	Firewood Banksia
Corymbia calophylla	Marri
Eucalyptus marginata	Jarrah
Eucalyptus rudis	Flooded Gum
Eucalyptus wandoo	Wandoo
Hakea lissocarpha	Honey Bush
Hakea ruscifolia	Candle Hakea
Hakea prostrata	Harsh Hakea
Hakea trifurcata	Two-leaf Hakea
Hakea varia	Variable-leaved Hakea
Jacksonia furcellata	Grey Stinkwood
Xanthorrhoea preissii	Grass Tree

Government of Western Australia
Department of Water and Environmental Regulation

Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 9597/1
Permit type:	Area permit
Applicant name:	Graeme Yukich
Application received:	9 February 2022
Application area:	1.19 hectares of native vegetation
Purpose of clearing:	Viticulture
Method of clearing:	Mechanical
Property:	Lot 104 on Deposited Plan 416801
Location (LGA area/s):	City of Swan
Localities (suburb/s):	Middle Swan

1.2. Description of clearing activities

The vegetation proposed to be cleared is contained within a single contiguous area (see Figure 1, Section 1.5). The clearing is required to support the establishment of additional grapevines on the property.

The application area was reduced from 2.63 hectares to 1.19 hectares during the assessment process (refer to Section 3.1 for further details).

1.3. Decision on application

Decision:	Granted
Decision date:	16 October 2023
Decision area:	1.19 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 two submissions were received. Consideration of matters raised in the public submissions 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 fauna survey (see Appendix G), 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 the loss of 1.19 hectares of native vegetation that consist of significant foraging and potential breeding habitat for black cockatoo species and is significant as a remnant of native vegetation in an area that has been extensively cleared.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures and an offset proposal provided by the applicant (see Section 3.1 and 4), the Delegated Officer determined that the offset

provided sufficiently counterbalances the impacts to the above impacts (see Section 4), that otherwise the proposed clearing is unlikely to result in significant impacts to environmental values, and the applicant has suitably demonstrated avoidance and minimisation measures.

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

- avoid, minimise to reduce the impacts and extent of clearing
- take hygiene steps to minimise the risk of the introduction and spread of weeds
- undertake slow, progressive one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity.

1.5. Site map

Figure 1. Map area authorised to be cleared under the granted clearing permit (cross-hatched yellow).

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)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Planning and Development Act 2005* (WA) (P&D Act)

Relevant policies considered during the assessment include:

- *Environmental Offsets Policy* (2011)

The key guidance documents which inform this assessment are:

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

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

The following avoidance and minimisation measures (relevant to the original 2.63 hectare application area in Figure 2 below) were submitted by the applicant within the application form:

- A 25 metre setback from the existing fence-line in the northern section of the site will not be cleared. The setback from the existing fencing will see the retention of approximately 0.8 hectares of remnant bushland and 16 potential cockatoo habitat trees, including 10 *Corymbia callophylla* and six *Allocasuarina fraseriana.*
- The contraction of the proposed clearing area, to retain vegetation including potential black cockatoo habitat trees, and areas of good (Keighery, 1994) condition vegetation, may help mitigate some of the impacts associated with land clearing.

Figure 2. Original 2.63 hectare application area (blue hatched area).

The assessment of the original application area identified that the proposed clearing of 2.63 hectares was likely to have significant impacts on black cockatoo habitat and the vegetation proposed to be cleared was significant as a remnant within a highly cleared landscape. As such, further consideration of avoidance and mitigation measures and/or offsets was requested from the applicant.

In response to this, the applicant reduced the application area to 1.19 hectares (as per Figure 1), and proposed the offset outlined in Section 4. The revised area avoided all vegetation in good (Keighery, 1994) condition, avoided 1.44 hectares of foraging habitat for black cockatoos and avoided a further 19 potential breeding trees.

Subsequently the Delegated Officer was satisfied that the applicant has made a reasonable effort to avoid and minimise potential impacts of the proposed clearing on environmental values.

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix 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 (flora and fauna) and significant remnant vegetation required further consideration. 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 (fauna) - Clearing Principles (a) and (b)

Assessment

Of the conservation significant fauna recorded within the local area, the following species were considered likely or possible to occur within the application area based on the vegetation and habitat types present:

- Likely:
  - *Zanda latirostris* (Carnaby's cockatoo) (Endangered)
  - *Zanda baudinii* (Baudin's cockatoo) (Endangered)
  - *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo) (Vulnerable)
- Possible:
  - *Neelaps calonotos* (Black-striped snake, black-striped burrowing snake) (Priority 3)
  - *Ctenotus delli* (Dell's skink, Darling Range Southwest Ctenotus) (Priority 4)
  - *Isoodon fusciventer* (quenda, southwestern brown bandicoot) (Priority 4)
  - *Falco peregrinus* (peregrine falcon) (Other specially protected)

Black cockatoos

A flora survey of the application area identified that the vegetation is dominated by an open *Corymbia calophylla* (marri) woodland in a predominantly degraded (Keighery, 1994) condition (Natural Area Holdings, 2021). Marri is a preferred foraging resource for Carnaby's cockatoo, Baudin's cockatoo and forest red-tailed black cockatoo (hereafter collectively referred to as “black cockatoo species”). Other plants, that some or all black cockatoo species are known to forage upon, such as *Banksia attenuata, Banksia menziesii, Eucalyptus marginata* (jarrah) *Allocasuarina fraseriana* (sheoak) and *Xanthorrhoea preissii* and smaller proteaceous shrubs, were also recorded within the wider surveyed area, although it is noted that these species are likely of greater density in the better quality vegetation to the north of the application area (Natural Area Holdings, 2021). The application area is thus considered to provide very good quality foraging habitat for all three black cockatoo species.

Black cockatoos will forage within an approximately 6 kilometre range from a roost site (Le Roux, 2017) and 12 kilometres from a breeding site (DAWE, 2022). Given that there are 11 known black cockatoo roost sites within 6 kilometres of the application area, 14 known white tailed black cockatoo breeding sites within 12 kilometres of the application area and that several lakes/dams likely to provide a suitable water source suitable for black cockatoos are present within 500 metres of the application area, it is considered that the application area contains significant foraging habitat for black cockatoo species. Noting that the application area is within the Swan Coastal Plain, a critical foraging area for Carnaby’s cockatoo where foraging resources are becoming scarce, the impact of this loss of habitat to Carnaby’s cockatoo, in the local area, is considered significant. An offset for black cockatoo foraging habitat,

requiring the applicant to revegetate and place areas of suitable foraging habitat under conservation covenant, in close proximity to the application area, is conditioned on this permit to mitigate this impact (refer to Section 4).

Black cockatoo species breed within hollows that develop within suitable trees species, which includes marri trees and certain *Eucalyptus* species such as jarrah (DAWE, 2022). For most of these species, including marri and jarrah, suitable nest hollows are generally found in live trees with a diameter at breast height (DBH) of at least 500 mm (DAWE, 2022). A total of 25 potential habitat trees (i.e. trees with a DBH greater than 500 mm but with no suitable nesting hollows), 24 marri and one jarrah, were recorded within the application area (Natural Area Holdings, 2021). None of these trees had suitable hollows to support black cockatoo breeding, although one tree contained a small hollow (Natural Area Holdings, 2021). While there are no suitable breeding trees within the application area, the loss of potential nesting trees will reduce the number of trees suitable for black cockatoo breeding in the future. It is considered that the offset required on the permit (refer to Section 4) will ensure the protection of black cockatoo breeding habitat into the future through the conservation of 19 existing potential habitat trees mapped within the site (Natural Area Consulting, 2021) and creation of new breeding habitat in planted eucalypt and marri trees.

Black cockatoo species roost in large trees, including marri and jarrah trees (DAWE, 2022) such as those present within the application area. The loss of potential roosting habitat associated with the proposed clearing is not considered likely to have a significant impact on black cockatoo species, noting that other potential roosting trees are available in adjacent bushland. Additionally, it is considered that the offset required on the permit (refer to Section 4) will help to ensure black cockatoo roosting habitat is conserved and created.

Other species

Vegetation within the application area may provide habitat for the following species, noting their habitat requirements and known distributions:

- **Quenda** inhabit dense scrubby, often swampy, vegetation with dense cover and adjacent forest and woodland (DEC, 2012).
- The **black-striped snake** lives in Banksia woodlands and sandy areas of the Perth region (Western Australian Museum, 2017).
- **Dell's skink** inhabits jarrah and marri forest on lateritic, clay and sandy soils (Wilson and Swan 2013).
- The **peregrine falcon** typically nests on rocky ledges in tall, vertical cliff faces and gorges, or in tall trees associated with drainage lines, and can hunt in a range of habitat types including timbered watercourses, riverine environments, wetlands, plains, open woodlands, and pylons and spires of buildings (Australian Museum, 2021).

Although a basic fauna survey (Natural Area Consulting, 2021) did not record the presence of these species, it is still considered possible that they may be present, particularly noting that invertebrate species are less likely to be found during a basic fauna survey. While 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:

- Vegetation within the application area is not likely to be significant habitat for these species, noting its degraded (Keighery, 1994) condition;
- The relatively large distributions of the quenda and peregrine falcon relative to the extent of the application area;
- Vegetation immediately north of the application area will be retained, and a permit condition requiring directional clearing will allow individuals to move into this adjacent habitat;
- A permit condition requiring the applicant to revegetate and place areas under conservation covenant will create and preserve habitat for these species in the future.

Conclusion

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

- Removal of 1.19 hectares of very good quality black cockatoo foraging habitat and potential breeding habitat;
- Removal of 1.19 hectares of potential habitat for quenda, black-striped snake, Dell's skink and peregrine falcon

For the reasons set out above, it is considered that the impacts to quenda, black-striped snake, Dell's skink and peregrine falcon are not likely to be significant and can be further managed though the conditions described below. Impacts of the proposed clearing on black cockatoo habitat cannot be managed to be environmentally acceptable through conditions alone, and as such the applicant has agreed to offset these impacts, as described in Section 4.

Conditions

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

- Slow directional clearing to allow fauna to move into adjacent vegetation ahead of the clearing activity will minimise impact to individuals
- Offset for black cockatoo foraging and potential breeding habitat (refer to Section 4).

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

Assessment

Flora

Of the conservation significant flora recorded within the local area, based on the vegetation, soil type and habitat types present within the application area the following species required further consideration;

- *Caladenia huegelii* (Threatened)
- *Thysanotus brachiatus* (Priority 2)
- *Thysanotus anceps* (Priority 3)
- *Amanita preissii* (Priority 3)
- *Amanita carneiphylla* (Priority 3)
- *Amanita fibrillopes* (Priority 3)
- *Isopogon autumnalis* (Priority 3)
- *Anigozanthos humilis* subsp. *chrysanthus* (Priority 4)
- *Jacksonia sericea* (Priority 4)
- *Thysanotus glaucus* (Priority 4)

Caladenia huegelii occurs in areas of mixed woodland of jarrah, banksia species with scattered sheoak and marri, tending to favour areas of dense undergrowth (Department of Environment and Conservation, 2009). It has been recorded from just north of Perth to the Busselton area, usually within 20 kilometres of the coast and within deep grey-white sand usually associated with the Bassendean or Spearwood soil systems (Department of Environment and Conservation, 2009). Soil and vegetation types present within the application area may be suitable for this species, although given the application area is approximately 25 kilometres from the coast, and although grey sands are present, the application area is mapped within the Pinjarra soil system which reduces the likelihood of this species being present.

Given that *Caladenia huegelii* is an annual orchid species that flowers in September to October, it is unlikely to have be flowering at that time that the on-ground component of this survey was conducted (May 2021) and therefore may not have been detected if it were present. However, it is considered that the likelihood of this species actually occurring within the application area is low, noting the degraded (Keighery, 1994) condition of the vegetation and relatively sparse native understorey layer that is dominated by the grassy weed *Ehrharta calycina* and that the understorey vegetation within the application area has previously been cleared (DWER, 2023).

The three *Amanita* species listed above are mushroom species that have been recorded within marri, *Eucalyptus* or *Banksia* woodlands in various soil types throughout the southwest region of Western Australia (Western Australian Herbarium, 1998-). These species were not searched for during the flora survey (Natural Area Consulting, 2021). While it is possible that these species may be present, noting the variety of vegetation types and soil types they have been found to inhabit, should they be present within the application area the proposed clearing is unlikely to have a significant impact upon the conservation status of these species.

The rest of the species listed above were searched for during a flora survey (Natural Area Consulting, 2021) and were not found. These species were considered likely to have been detected during the survey if they were to be present.

Ecological Communities

Of the conservation significant ecological communities recorded within the local area, based on the vegetation, soil type and habitat present within the application area the following ecological communities required further consideration;

- Shrublands and woodlands of the eastern side of the Swan Coastal Plain (floristic community type 20c as originally described in in Gibson et al. (1994)) (Critically Endangered)
- *Corymbia calophylla - Xanthorrhoea preissii* woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in in Gibson et al. (1994)) (Critically Endangered)

- *Banksia attenuata* woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. (1994)) (Endangered)
- *Banksia attenuata* and/or *Eucalyptus marginata* woodlands of the eastern side of the Swan Coastal Plain (floristic community type 20b as originally described in Gibson et al. (1994)) (Endangered)

A flora survey conducted within the application area (Natural Area Consulting, 2021) did not explicitly state whether the presence of the above ecological communities had been ruled out within the application area. Additional information provided (Natural Area Consulting, 2022) stated that "a floristic community type statistical analysis (Bray-Curtis similarity) against weed and native flora quadrat data (Keighery et al, 2012) found low similarities between quadrats on site with published flora datasets. Highest similarity was 39.2% between Quadrat 1 and the floristic community type 21a- Central *Banksia attenuata- Eucalyptus marginata* Woodlands. This floristic community type is currently not listed as threatened or priority in Western Australia." This indicates that the above ecological communities associated with other floristic community types are unlikely to be present within the application area.

Conclusion
No conservation significant flora or ecological communities are likely to be present within the application area.

Conditions
No flora management conditions required.

3.2.3. Significant remnant vegetation - Clearing Principle (e)

Assessment

The National Objectives and Targets for Biodiversity Conservation 2001-2005 include a target to have clearing controls in place that prevent clearance of ecological communities with an extent below 30 per cent of that present pre-1750 (i.e., pre-European settlement) (Commonwealth of Australia, 2001). This is the threshold level below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001). The Environmental Protection Authority (EPA) recognises the Perth Metropolitan Region to be a constrained area, within which a minimum 10 per cent representation threshold for ecological communities is recommended (EPA, 2008).

The application area is located within the Swan Coastal Plain IBRA Bioregion which retains approximately 38.62 per cent of its pre-European vegetation extent (Government of Western Australia, 2019) and approximately 26.9 per cent of remnant vegetation remains within the local area. However, the application area is mapped within the Guildford complex vegetation unit (Heddle et al., 1980), which retains only approximately 5.09 per cent of its pre-European vegetation extent and therefore falls below the 10 per cent threshold for constrained areas. While it is noted that the vegetation within the application area is in a degraded to completely degraded (Keighery, 1994) condition, the vegetation is still considered to be representative of this vegetation unit.

Given the above, the application area is considered to be a significant remnant within a highly cleared landscape. To mitigate the impacts of the loss of Guildford complex vegetation, as a condition of this permit the applicant will be required to revegetate an area of least 2.08 hectares with species representative of the Guildford complex and place these areas of vegetation under conservation covenant (refer to Section 4).

Conclusion

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

- Removal of 1.19 hectares of vegetation in degraded (Keighery, 1994) condition that is representative of the highly cleared Guildford complex.

It is considered that the impacts to the Guildford Complex cannot be managed to be environmentally acceptable through conditions alone, and as such the applicant has agreed to offset these impacts as described in Section 4.

Conditions

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

- Offset for Guildford complex vegetation (refer to Section 4).

3.3. Relevant planning instruments and other matters

The City of Swan advised DWER that Lot 104 (and 105) are not within the jurisdiction of the City of Swan for planning matters and is administered by Department of Planning Lands and Heritage (DPLH) covered by Swan Valley Planning Scheme No.1. (City of Swan, 2022).

The purpose of the proposed clearing (expansion of viticulture on site) is in line with the *Swan Valley Planning Act 1995* and the *City of Swan Local Planning Scheme No. 17*.

It is noted the application area is one of the properties included under a water licence (GWL105698) for the authorisation of taking water from artesian bores for vineyard irrigation (DWER, 2022).

The proposed clearing was referred to The Department of Agriculture, Water and the Environment (EPBC 2021/9099) with the decision made on 28 January 2022 that the proposed clearing was not a controlled action.

A small portion of a large mapped Aboriginal site of significance has been mapped over the application area, which occurs along the site's northern boundary, a registered site (Jane Brook, place ID 3759). The permit holder is required to comply with any obligations under the *Aboriginal Heritage Act 1972* (WA) in relation to this Aboriginal Site of Significance.

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:

- Removal of 1.19 hectares of very good quality black cockatoo foraging habitat and potential breeding habitat;
- Removal of 1.19 hectares of vegetation in Degraded condition that is representative of the highly cleared Guildford complex.

The applicant proposed an environmental offset consisting of revegetation and placement of a conservation covenant over two areas within the applicant's property:

- Western area – a 1.21 hectare cleared area. Part of this area is within a Bush Forever site (Site 302).
- Eastern area – a 2.48 hectare area immediately north of the application area containing Open *Corymbia calophylla* Woodland vegetation in Degraded to Good (Kiegheyr, 1994) condition.

Plantings will include species that provide foraging and future breeding habitat for black cockatoos as well as including at least 2.06 hectares of vegetation being representative of the Guildford complex.

The Delegated Officer considers the proposed offset is consistent with the *WA Environmental Offsets Policy* (2011) and the *WA Environmental Offsets Guidelines* (2014), and that adequately counterbalances 100 per cent of the significant residual listed above. The justification for the values used in the offset calculation is provided in Appendix F.

End

Appendix A. Additional information provided by applicant

In response to a request for further information, the applicant provided the following information relevant to this assessment.

Summary of comments	Consideration of comment
Applicant provided further information regarding potential for conservation significant flora to be present within the application area (Natural Area Consulting, 2022)	Considered in Table C.3 and in Section 3.2.2
Applicant provided further information regarding potential for conservation significant ecological communities to be present within the application area (Natural Area Consulting, 2022)	Considered in Table C.5 and in Section 3.2.2

Appendix B. Details of public submissions

Two public submissions were received regarding this clearing permit application, as summarised below.

Summary of comments	Consideration of comment
Importance of retaining habitat trees which represent potential breeding trees in the near future	This has been considered in Section 3.2.1. Only one tree with a small hollow (currently unsuitable for black cockatoo nesting) will be removed. While it is acknowledged that this tree and other potential habitat trees may provide suitable breeding habitat in the future, it is considered that the revegetation offset required on this permit will provide some future breeding habitat (in the long term) and that 19 other existing potential habitat trees will be retained and protected through the placement of a conservation covenant.
Consideration of federal level referral requirements	Discussed in Section 3.4 - the Department of Agriculture, Water and the Environment deemed that the proposed clearing was not a controlled action
Cumulative impacts to be considered	Cumulative impacts have been considered through Principle (e) (discussed in Section 3.2.3). Through this assessment, the proportion of native remnant vegetation remaining in the IBRA region, local area and vegetation complex is considered. Although it is considered that this clearing is taking place within a highly cleared landscape, the offsets conditioned on the permit are considered to mitigate the loss of this vegetation.
Importance of ensuring offsets / mitigation measures adequately mitigate any habitat loss - loss of habitat can only be mitigated effectively by providing sufficient replacement habitat in the range-area of affected flocks	Discussed in Section 4 – a revegetation offset required on the permit to mitigate the loss of black cockatoo foraging habitat permit requires revegetation within the same property and is considered sufficient to mitigate the loss of this habitat.
The proposed clearing will remove a food source for Carnaby's cockatoo	This has been considered in Section 3.2.1. It is acknowledged that the application area provides a foraging resource for black cockatoo species, however the offsets conditioned on the permit are considered to mitigate the loss of this vegetation.
Close proximity of the application area to several known black cockatoo roost sites	This has been considered in Section 3.2.1 and was a factor in DWER's consideration that the application area provides significant habitat for black cockatoo species, and has accordingly required a sufficient offset.

Summary of comments	Consideration of comment
Submission concerned that the decision-making process will not allocate any value to this native vegetation	It is acknowledged that the vegetation within the application contains environmental values, as discussed in Sections 3.2.1 and 3.2.3. Offsets have been conditioned on the permit to mitigate the loss of this vegetation accordingly.
Submission concerned that offsite, cryptic, and secondary impacts will be ignored, underestimated or inadequately managed	DWER has considered offsite impacts relevant to concerns as per the following: • water quality (Principle (f)) • nearby conservation areas (Principle (h)) • vegetation's function as an ecological corridor (Section 3.2.3) • conditions to undertake weed and dieback control will limit spread of weeds and dieback offsite It is acknowledged that it is possible the clearing may have cryptic or secondary impacts that have not been considered in this assessment. DWER considers that the most potentially significant impacts of the clearing have been considered in this assessment, and that the level of assessment of this clearing is reasonable and commensurate with the extent and nature of the vegetation to be cleared.
Submission concerned that decision-makers are susceptible to the "shifting-baseline syndrome": knowledge about the state of the natural world is lost over time because people don't perceive changes that are actually taking place	DWER acknowledges that changes are taking place within the Western Australian landscape, and in its assessment of this and other clearing permit applications, considers the most up-to-date information available of relevance. An example of this is DWER's consideration of impacts of clearing to black cockatoos.
The proposed clearing is unnecessary as suitable cleared land already exists in the Swan Valley region	While cleared land is present elsewhere within the Swan Valley region, it is considered that the benefits to the applicant of using this particular portion of land for vineyard expansion are significant, and that using land elsewhere is unlikely to be practical.

Appendix C. Site characteristics

C.1. Site characteristics

Characteristic	Details
Local context	The area proposed to be cleared is part of a 3.5-hectare isolated patch of native vegetation in the intensive land use zone of Western Australia. It is surrounded by other viticultural and residential properties. The proposed clearing area is a small, isolated remnant in a highly cleared landscape. Spatial data indicates the local area (10-kilometre radius from the centre of the area proposed to be cleared) retains approximately 26.9 per cent of the original native vegetation cover.
Ecological linkage	The application area is not within any mapped linkages but is located within approximately 250 meters from the mapped Gnangara Mound Ecological Linkages and the Perth Regional Ecological linkages. The application area is not considered to be part of a local ecological linkage.

Characteristic	Details
Conservation areas	There are no conservation areas within or adjacent to the application area, the closest conservation area is a Bushforever Site (302) which is located approximately 165 meters from the application area. This site is in association with the Swan River.
Vegetation description	A flora and vegetation survey (Natural Area Holdings, 2021) indicates the vegetation within the proposed clearing area consists of a single vegetation type: Open *Corymbia calophylla* Woodland which is comprised of *Corymbia calophylla* (Marri) over a middle storey of *Xanthorrhoea preissii* and an under storey of *Ehrharta calycina* (Perennial Veldt) and other introduced herbs. The full survey descriptions and maps are available in Appendix G. This is consistent with the mapped vegetation type(s): • Guildford Complex: which is described as A mixture of open forest to tall open forest of *Corymbia calophylla* (Marri) - *Eucalyptus wandoo* (Wandoo) - *Eucalyptus marginata* (Jarrah) and woodland of *Eucalyptus wandoo* (Wandoo) (with rare occurrences of *Eucalyptus lane-poolei* (Salmon White Gum)). Minor components include *Eucalyptus rudis* (Flooded Gum) - *Melaleuca rhaphiophylla* (Swamp Paperbark). The mapped vegetation type retains approximately five per cent of the original extent (Government of Western Australia, 2019).
Vegetation condition	Vegetation survey (Natural Area Holdings, 2021) indicate the vegetation within the proposed clearing area is in degraded to completely degraded (Keighery, 1994) condition, described as: • Degraded: Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. • Completely degraded: The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. The full Keighery (1994) condition rating scale is provided in Appendix E. The full survey descriptions and mapping are available in Appendix G.
Climate and landform	The application area is within a mostly flat landscape which drains toward the Swan River. The annual average rainfall (for Perth) is 736.8 millimetres.
Soil description	The application area lies within two mapped soil types: • Majority of the application area - Ksg - Karrakatta grey sand (Pinjarra) - Moderately deep light grey sand over yellow sand (sand dune). • Western portion of the application area - Hs - Herne sand (Pinjarra) - Grey to greyish-brown sand with nil to few gravels over mottled clay. The majority of the application area is within the Karrakatta grey sand soil type.
Land degradation risk	The mapped soil types have high risks of phosphorus export and subsoil acidification, moderate (Hs) or high (Ksg) risks of wind erosion and moderate (Hs only) risks of waterlogging. The Commissioner of Soil and Land Conservation (CSLC, 2022), following an inspection and desktop assessment of the area, advised that: • The risk of eutrophication causing land degradation is low; • The risk of wind erosion causing land degradation is low, and significant change in wind erosion is unlikely if vines are established on the property; • The risk of water erosion causing land degradation is low; • The risk of waterlogging causing land degradation is low; • The risk of acidification causing land degradation is low; and • The risk of flooding causing land degradation is low.

Characteristic	Details
Waterbodies	The desktop assessment and aerial imagery indicated that the application area is within 250 meters from a minor perennial watercourse which is a tributary to the Swan River.
Hydrogeography	The application area is within the Swan Groundwater Area and the Swan River System which are proclaimed areas under the *Rights in Water and Irrigation Act 2014*. The mapped groundwater salinity within the application area is 500-1000 milligrams per litre which is considered marginal.
Flora	According to available databases, 10 Threatened and 52 Priority flora species have been recorded within the local area, some of which are within similar vegetation, soil types and/or habitats as those present within the application area. The closest of these to the application area is Priority 3 species *Meionectes tenuifolia*, recorded 0.7 km northwest. A flora survey (Natural Area Holdings Pty Ltd, 2021) did not record any conservation significant flora within the application area.
Ecological communities	According to available databases, 8 Threatened and 4 Priority ecological communities have been recorded within the local area. The application area is not mapped within a conservation significant ecological community. The closest mapped conservation significant ecological community is the Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region, listed as Priority 3 under the BC Act and Threatened under the EPBC Act (Banksia PEC/TEC) located approximately 2.3 kilometres from the application area. A flora survey (Natural Area Holdings Pty Ltd, 2021) did not consider the Banksia PEC/TEC, or the Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain ecological community to be present within the application area. Further information provided by Natural Area Holdings Pty Ltd (2022) indicates that based on a floristic community type analysis of quadrat data collected from this survey, other conservation significant ecological communities were also unlikely to be present within the application area.
Fauna	According to available databases, 14 Threatened, 12 Priority, two Conservation Dependent, nine Migratory and one other Specially Protected fauna species have been recorded within the local area. The closest of these to the application area is *Zanda latirostris* (Carnaby's cockatoo) approximately 700 m northeast of the application area. The application area is within the known range of Baudin's cockatoo, the breeding range of Carnaby's cockatoo and the core range of the forest red-tailed black cockatoo. There are 11 known black cockatoo roost sites within 6 km of the application area, the closest of which is 700 m southeast of the application area. Two of these roost sites have recorded white tailed black cockatoo roosting and two have recorded forest red-tailed black cockatoos roosting from 2010 to 2019. 14 known white tailed black cockatoo breeding sites have been recorded within 12 km; the closest of these to the application area is approximately 9.6 km to the southeast. No conservation significant fauna species were observed during a fauna survey (Natural Area Holdings Pty Ltd, 2021). 25 potential black cockatoo habitat trees (i.e. trees of suitable species with a diameter of greater than 500 mm at breast height (DAWE, 2022)), 24 marri and one jarrah, were recorded within the application area, none of which had suitable hollows to support black cockatoo breeding (Natural Area Holdings, 2021). No evidence of black cockatoo foraging was observed within the application area in this survey, although possible evidence of foraging evidence was recorded during a site inspection (DWER, 2023). Natural Area Holdings (2021) considered that the application area contained very high quality foraging habitat for all three black cockatoo species.

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					
Beard vegetation association 1009 *	18,225.88	3,004.07	16.48	107.35	0.59
Guildford complex **	90,513.13	4,607.91	5.09	287.49	0.32
Local area					
10km radius	-	-	26.9	-	-

*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 (BC Act)	Suitable habitat features? [Y/N]	Same mapped vegetation type? [Y/N]	Similar mapped soil type? [Y/N]	Distance of closest record to application area (km)	Number of records within local area	Number of Florabase records	Are surveys adequate to identify? [Y, N, N/A]
Acacia aphylla	T	N	N	N	7.4	6	47	Y
Acacia benthamii	2	N	N	N	4.8	1	36	Y
Acacia drummondii subsp. *affinis*	3	N	N	N	8.9	2	37	Y
Acacia oncinophylla subsp. *oncinophylla*	3	N	Y	Y	3.8	13	42	Y
Alyogyne sp. Great Victoria Desert (D.J. Edinger 6212)	3	N	Y	Y	5.2	1	18	Y
Amanita carneiphylla	3	possible	N	N	5.6	1	26	N
Amanita fibrillopes	3	possible	N	N	5.9	1	34	N
Amanita preissii	3	possible	N	N	9.7	1	33	N
Anigozanthos humilis subsp. *chrysanthus*	4	Y	N	N	8.9	1	64	Y
Anthocercis gracilis	T	N	N	N	5.5	11	29	Y
Beaufortia purpurea	3	N	Y	N	3.8	24	43	Y
Bolboschoenus fluviatilis	1	N	Y	N	6.7	4	5	Y
Byblis gigantea	3	N	N	Y	5.7	3	40	Y
Caladenia huegelii	T	possible	N	Y	9.2	3	43	N (considered in survey but outside flowering time)

Species name	Conservation status (BC Act)	Suitable habitat features? [Y/N]	Same mapped vegetation type? [Y/N]	Similar mapped soil type? [Y/N]	Distance of closest record to application area (km)	Number of records within local area	Number of Florabase records	Are surveys adequate to identify? [Y, N, N/A]
Calothamnus accedens	4	N	N	N	9.2	1	40	Y
Calytrix breviseta subsp. *breviseta*	T	N	N	N	5.2	3	16	Y
Carex tereticaulis	3	N	N	Y	4.9	3	18	Y
Conospermum undulatum	T	N	N	Y	7.1	17	91	Y
Cyanicula ixioides subsp. *ixioides*	4	N	N	N	9.5	1	28	N
Cyathochaeta teretifolia	3	N	Y	Y	1.6	6	40	Y
Darwinia pimelioides	4	N	N	N	1.3	34	28	Y
Diplolaena andrewsii	T	N	N	N	5.0	23	19	Y
Diuris drummondii	T	N	N	Y	6.5	1	55	Y
Drosera occidentalis	4	N	N	N	7.9	2	19	Y
Drosera patens	1	N	N	Y	9.3	1	8	Y
Drosera x sidjamesii	1	N	N	Y	9.3	1	10	N
Eryngium sp. Subdecumbens (G.J. Keighery 5390)	3	N	Y	Y	5.3	1	4	N
Grevillea manglesii subsp. *dissectifolia*	3	N	N	N	9.4	5	24	N
Halgania corymbosa	3	N	N	N	3.8	8	18	Y
Hydrocotyle lemnoides	4	N	N	Y	5.7	1	26	N
Hydrocotyle striata	1	N	N	Y	5.7	4	7	Y
Isopogon autumnalis	3	possible	N	Y	1.7	10	62	Y
Jacksonia gracillima	3	N	N	N	9.9	1	36	N
Jacksonia sericea	4	Y	N	Y	7.1	3	62	Y
Johnsonia pubescens subsp. *cygnorum*	2	N	Y	Y	8.1	5	14	N
Lasiopetalum bracteatum	4	N	N	N	7.4	11	44	N
Lasiopetalum glutinosum subsp. *glutinosum*	3	N	N	N	3.4	9	48	N
Lepyrodia curvescens	2	N	N	N	7.3	2	21	Y
Levenhookia preissii	1	N	N	Y	5.7	2	16	Y
Macarthuria keigheryi	T	N	N	N	9.7	1	33	N
Meionectes tenuifolia	3	N	Y	Y	0.7	3	27	N
Myriophyllum echinatum	3	N	N	N	5.7	2	19	N
Persoonia sulcata	4	N	Y		7.3	5	39	Y
Phyllangium palustre	2	N	Y	Y	5.3	1	7	N
Pithocarpa corymbulosa	3	N	N	N	5.3	19	22	Y
Poranthera moorokatta	2	N	N	N	9.2	1	14	N
Schoenus capillifolius	3	N		Y	7.7	1	29	Y
Schoenus griffinianus	4	N	N	N	7.3	2	42	Y
Schoenus pennisetis	3	N	N	N	9.9	1	43	N
Schoenus sp. Waroona (G.J. Keighery 12235)	3	N	N	Y	7.7	1	12	Y
Senecio leucoglossus	4	N	N	N	5.0	2	45	N
Stachystemon exilis	1	N	N	N	7.1	3	8	Y
Stylidium longitubum	4	N	N	Y	3.4	4	51	Y
Tetratheca pilifera	3	N	N	N	3.8	8	35	Y
Thelymitra dedmaniarum	T	N	Y	N	6.2	1	4	Y
Thelymitra magnifica	1	N	N	N	9.8	1	14	N
Thysanotus anceps	3	Y	N	N	5.5	3	17	Y

Species name	Conservation status (BC Act)	Suitable habitat features? [Y/N]	Same mapped vegetation type? [Y/N]	Similar mapped soil type? [Y/N]	Distance of closest record to application area (km)	Number of records within local area	Number of Florabase records	Are surveys adequate to identify? [Y, N, N/A]
Thysanotus brachiatus	2	Y	Y	Y	5.2	1	12	Y
Thysanotus glaucus	4	Y	N	N	1.6	2	29	Y
Thysanotus sp. Badgingarra (E.A. Griffin 2511)	2	N	Y	N	1.1	4	35	N
Trithuria occidentalis	T	N	Y	Y	3.4	7	15	N
Verticordia lindleyi subsp. *lindleyi*	4	N	N	Y	3.0	9	54	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, noting that species associated with coastal and/or aquatic habitats recorded within the local area have not been included within this table.

Species name	Conservation status (BC Act)	Suitable habitat features? [Y/N]	Most recent record within local area	Distance of closest record to application area (km)	Number of records within local area
Apus pacificus (Fork-tailed swift)	MI	unlikely	2014	9.0	3
Australotomurus morbidus (cemetery springtail, Guildford springtail)	P3	unlikely	1993	4.3	2
Bettongia penicillata ogilbyi (Woylie, brush-tailed bettong)	CR	unlikely	2018	6.0	70
Cacatua pastinator pastinator (Muir's corella)	CD	N	0	5.7	6
Calyptorhynchus banksii naso (forest red-tailed black cockatoo)	VU	Y	2019	2.9	50
Zanda baudinii (Baudin's cockatoo)	EN	Y	2015	0.8	39*
Zanda latirostris (Carnaby's cockatoo)	EN	Y	2018	0.7	1641*
Ctenotus delli (Dell's skink, Darling Range Southwest Ctenotus)	P4	possible	1985	9.7	1
Dasyurus geoffroii (chuditch, western quoll)	VU	unlikely	2017	1.6	23
Falco peregrinus (peregrine falcon)	OS	possible	2011	5.6	28
Falsistrellus mackenziei (Western false pipistrelle, western falsistrelle)	P4	unlikely	1973	2.2	1
Idiosoma sp. (an *Idiosoma* trapdoor spider) [likely referring to Idiosoma nigrum and *Idiosoma sigillatum*]	EN or P	unlikely	1993	4.0	2
Isoodon fusciventer (quenda, southwestern brown bandicoot)	P4	Y	2020	1.4	500
Macrotis lagotis (bilby, dalgyte, ninu)	VU	unlikely	1925	6.3	2
Neelaps calonotos (Black-striped snake, black-striped burrowing snake)	P3	possible	0	3.8	12
Notamacropus eugenii derbianus (Tammar wallaby)	P4	unlikely	2016	6.1	6
Notamacropus irma (Western brush wallaby)	P4	unlikely	2017	6.7	8
Phascogale tapoatafa wambenger (South-western brush-tailed phascogale, wambenger)	CD	unlikely	1992	2.2	4
Synemon gratiosa (graceful sunmoth)	P4	unlikely	2019	0.7	4

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

* An additional 138 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 (BC Act)	Suitable habitat features? [Y/N]	Same mapped soil type? [Y/N]	Same mapped vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Y	Y	Y	2.3	17930	Y
Central Northern Darling Scarp Granite Shrubland Community	Priority 4	N	N	N	4.6	8	N/A
Shrublands and woodlands of the eastern side of the Swan Coastal Plain (floristic community type 20c as originally described in in Gibson et al. (1994))	Critically Endangered	possible	Y	Y	3.3	12	N/A
Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in in Gibson et al. (1994))	Critically Endangered	N	Y	Y	2.4	34	N/A
Banksia attenuata woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. (1994))	Endangered	possible	Y	Y	6.6	75	N/A
Herb rich saline shrublands in clay pans (floristic community type 7 as originally described in Gibson et al. (1994))	Vulnerable	N	Y	Y	8	31	N/A
Banksia attenuata and/or *Eucalyptus marginata* woodlands of the eastern side of the Swan Coastal Plain (floristic community type 20b as originally described in Gibson et al. (1994))	Endangered	possible	Y	Y	3.8	42	N/A
Communities of Tumulus Springs (Organic Mound Springs, Swan Coastal Plain)	Critically Endangered	N	N	N	9.1	11	N/A
Low lying *Banksia attenuata* woodlands or shrublands	Priority 3	N	Y	Y	3.3	14	N/A
Corymbia calophylla - Kingia australis woodlands on heavy soils, Swan Coastal Plain (floristic community type 3a as originally described in Gibson et al. (1994))	Critically Endangered	N	N	Y	3.8	39	N/A
Shrublands and woodlands on Muchea Limestone of the Swan Coastal Plain	Endangered	N	N	N	9.8	16	N/A
Subtropical and Temperate Coastal Saltmarsh	Priority 3	N	Y	N	9.0	261	N/A

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

C.6. Land degradation risk table

Risk categories	***Ksg - Karrakatta grey sand (Pinjarra)***
Wind erosion	>70% of map unit has a high to extreme wind erosion risk
Water erosion	<3% of map unit has a moderate to high water erosion risk
Salinity	<3% of map unit has a moderate to high salinity risk or is presently saline
Subsurface Acidification	>70% of map unit has a high subsurface acidification risk or is presently acid
Flood risk	<3% of map unit has a moderate to high flood risk
Water logging	3-10% of map unit has a moderate to very high waterlogging risk
Phosphorus export risk	30-50% of map unit has a high to extreme phosphorus export risk

Risk categories	***Hs - Herne sand (Pinjarra)***
Wind erosion	10-30% of map unit has a high to extreme wind erosion risk
Water erosion	<3% of map unit has a moderate to high water erosion risk
Salinity	<3% of map unit has a moderate to high salinity risk or is presently saline
Subsurface Acidification	>70% of map unit has a high subsurface acidification risk or is presently acid
Flood risk	<3% of map unit has a moderate to high flood risk
Water logging	10-30% of map unit has a moderate to very high waterlogging risk
Phosphorus export risk	30-50% of map unit has a high to extreme phosphorus export risk

Appendix D. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment The application area is unlikely to contain conservation significant flora or assemblages of plant communities but contains habitat for conservation significant fauna.	May be at variance	Yes *Refer to Sections 3.2.1 and 3.2.2 above*
Principle (b): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna."* Assessment: The area proposed to be cleared contains significant foraging and breeding habitat for black cockatoo species.	At variance	Yes *Refer to Section 3.2.1, above.*
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: The area proposed to be cleared is unlikely to contain flora species listed under the BC Act.	Not likely to be at variance	Yes *Refer to Section 3.2.2, above*

Assessment against the clearing principles	Variance level	Is further consideration required?
Principle (d): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community."* Assessment: The application area is unlikely to contain species indicative of a threatened ecological community, as (a) defined in the Biodiversity Conservation Act 2016 section 5(1); or (b) any other ecological community listed, designated or declared as threatened, endangered or vulnerable under or for the purposes of a written law; or (c) a listed threatened ecological community as defined in the Commonwealth Environment Act section 528.	Not likely to be at variance	Yes *Refer to Section 3.2.2, above.*
Environmental value: significant remnant vegetation and conservation areas		
Principle (e): *"Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared."* Assessment: The extent of the mapped vegetation type is inconsistent with the national objectives and targets for biodiversity conservation in Australia. As such vegetation within the application area is considered a significant remnant in an extensively cleared area.	At variance	Yes *Refer to Section 3.2.3, above.*
Principle (h): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area."* Assessment: Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of nearby conservation areas.	Not likely to be at variance	No
Environmental value: land and water resources		
Principle (f): *"Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."* Assessment: No watercourses or wetlands are likely to be present within the application area and the application area does not contain vegetation indicative of riparian areas.	Not likely to be at variance	No
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: Advice from the Commissioner of Soil and Land Conservation indicates that the proposed clearing is unlikely to result in land degradation risks, including wind erosion, should grape vines be established within the application area.	Not likely to be at variance	No
Principle (i): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water."* Assessment: Given no water courses, wetlands or Public Drinking Water Sources Areas are recorded within 250 meters the application area, the proposed clearing is unlikely to impact surface or ground water quality.	Not likely to be at variance	No
Principle (j): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding."* Assessment: The mapped soils and topographic contours in the surrounding area do not indicate the proposed clearing is likely to contribute to increased	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
incidence or intensity of flooding. Given no watercourses or wetlands are recorded 250 meters of the application area, the proposed clearing is unlikely to contribute to waterlogging.		

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 Keighery (1994) scale below was used to measure the condition of the vegetation proposed to be cleared.

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

Offset calculations – Black cockatoo foraging habitat – western area (non Bush Forever portion)

Environmental value to be offset			
Calculation	*Score (Area)*		*Rationale*
Conservation significance			
Description	1.19 hectares of native vegetation which is foraging/breeding habitat for Carnabys cockatoo		The application are contains large trees and comprises a single vegetation unit 'Open Corymbia calophylla Woodland . This vegetation community is comprised of Corymbia calophylla (Marri) over a middle storey of Xanthorrhoea preissii and an under storey of Ehrharta calycina (Perennial Veldt) and other introduced herbs'
Type of environmental value	Species (flora/fauna)		Foraging and breeding habitat for Carnabys Cockatoo, Baudins cockatoo, forest red-tailed black cockatoo
Conservation significance of environmental value	Rare/threatened species - endangered		The conservation ranking of Carnabys and Baudins cockatoo.
Landscape-level value impacted	yes/no		Yes, this is a significant remnant
Significant impact			
Description	Open Marri Woodland providing foraging and breeding habitat for black cockatoos		The application area comprises Open Corymbia calophylla Woodland.
Significant impact (hectares) / Type of feature	1.19		This is the size of the application area
Quality (scale) / Number	7.00		A score of 6 is applied considering the Keighery scale for the vegetation (considering the Guildford complex) and the quality of the foraging and breeding habitat present (marri as a primary foraging source and Xanthorrhoea preissii as a secondary foraging source).
Rehabilitation credit			
Description	0		
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	Planting 0.93 hectares of Black Cockatoo foraging vegetation, including Marri trees in areas of degraded condition at 148 Dale Road to improve Black Cockatoo foraging habitat		Revegetation of 0.93 hectares of native vegetation
Proposed offset (area in hectares)	0.93		as per above
Current quality of offset site / Start number (of type of feature)	0.00		The degraded areas being targeted for revegetation are almost entirely devoid of vegetation and are therefore expected to currently provide no foraging value for Black cockatoo species
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	0.00		The quality of the degraded areas is unlikely to improve without the offset as no management measures are proposed
Future quality WITH offset (scale) / Future number WITH offset	6.00		The planted vegetation (largely to consist largely of marri trees) is expected to provide good quality foraging habitat for Black Cockatoos.
Time until ecological benefit (years)	11.00		The time between clearing the site and the ecological benefit is expected to be 11 years, allowing time for the vegetation to reach a sufficient size to provide foraging value plus one year for reveg to commence.
Confidence in offset result (%)	0.8		Revegetation will be undertaken by a suitably qualified revegetation contractor, with ongoing monitoring and maintenance to ensure the revegetation is successful.
Duration of offset implementation (maximum 20 years)	20.00		The maximum duration of 20 years is applied, as per DWER's Guideline for quantifying environmental offsets
Time until offset site secured (years)	2.00		It is expected that the conservation covenant will be executed within 24 months of the clearing.
Risk of future loss WITHOUT offset (%)	15.0%		The land is currently zoned 'Swan Valley Rural Zone' and there is some risk that the site could be cleared.
Risk of future loss WITH offset (%)	5.0%		As the offset site will be protected in perpetuity by a conservation covenant, the risk of loss is reduced
Offset ratio (Conservation area only)	N/A		

Offset calculations – Black cockatoo foraging habitat – western area (Bush Forever portion)

Environmental value to be offset			
Calculation	*Score (Area)*		*Rationale*
Conservation significance			
Description	1.19 hectares of native vegetation which is foraging/breeding habitat for Carnabys cockatoo		The application are contains large trees and comprises a single vegetation unit 'Open Corymbia calophylla Woodland . This vegetation community is comprised of Corymbia calophylla (Marri) over a middle storey of Xanthorrhoea preissii and an under storey of Ehrharta calycina (Perennial Veldt) and other introduced herbs'
Type of environmental value	Species (flora/fauna)		Foraging and breeding habitat for Carnabys Cockatoo, Baudins cockatoo, forest red-tailed black cockatoo
Conservation significance of environmental value	Rare/threatened species - endangered		The conservation ranking of Carnabys and Baudins cockatoo.
Landscape-level value impacted	yes/no		Yes, this is a significant remnant
Significant impact			
Description	Open Marri Woodland providing foraging and breeding habitat for black cockatoos		The application area comprises Open Corymbia calophylla Woodland.
Significant impact (hectares) / Type of feature	1.19		This is the size of the application area
Quality (scale) / Number	7.00		A score of 7 is applied considering the Keighery scale for the vegetation (considering the Guildford complex) and the quality of the foraging and breeding habitat present. (marri as a primary foraging source and Xanthorrhoea preissii as a secondary foraging source).
Rehabilitation credit			
Description	0		
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	Planting 0.28 hectares of Black Cockatoo foraging vegetation, including Marri trees in areas of degraded condition wthin Bush Forever Areas at 148 Dale Road to improve Black Cockatoo foraging habitat		Revegetation of 0.28 hectares of native vegetation
Proposed offset (area in hectares)	0.28		as per above
Current quality of offset site / Start number (of type of feature)	0.00		The degraded areas being targeted for revegetation are almost entirely devoid of vegetation and are therefore expected to currently provide no foraging value for Black Cockatoo species
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	0.00		The quality of the degraded areas is unlikely to improve without the offset as no management measures are proposed
Future quality WITH offset (scale) / Future number WITH offset	6.00		The planted vegetation (to consist largely of marri trees) is expected to provide good quality foraging habitat for Black Cockatoos.
Time until ecological benefit (years)	11.00		The time between clearing the site and the ecological benefit is expected to be 11 years, allowing time for the vegetation to reach a sufficient size to provide foraging value plus one year for reveg to commence.
Confidence in offset result (%)	0.8		Revegetation will be undertaken by a suitably qualified revegetation contractor, with ongoing monitoring and maintenance to ensure the revegetation is successful.
Duration of offset implementation (maximum 20 years)	20.00		The maximum duration of 20 years is applied, as per DWER's Guideline for quantifying environmental offsets
Time until offset site secured (years)	2.00		A restrictive covenant is proposed to secure the offset site. It is expected that the restrictive covenant will be executed within 24 months of the clearing.
Risk of future loss WITHOUT offset (%)	5.0%		The land is currently within a Bush Forever Area so has some level of protection.
Risk of future loss WITH offset (%)	5.0%		As the offset site will be protected in perpetuity by a restrictive covenant, the risk of loss is reduced
Offset ratio (Conservation area only)	N/A		

Offset calculations – Black cockatoo foraging habitat – eastern area

Environmental value to be offset			
Calculation	***Score (Area)***		***Rationale***
Conservation significance			
Description	1.19 hectares of native vegetation which is foraging/breeding habitat for Carnabys cockatoo		The application are contains large trees and comprises a single vegetation unit 'Open Corymbia calophylla Woodland . This vegetation community is comprised of Corymbia calophylla (Marri) over a middle storey of Xanthorrhoea preissii and an under storey of Ehrharta calycina (Perennial Veldt) and other introduced herbs'
Type of environmental value	Species (flora/fauna)		Foraging and breeding habitat for Carnabys Cockatoo, Baudins cockatoo, forest red-tailed black cockatoo
Conservation significance of environmental value	Rare/threatened species - endangered		The conservation ranking of Carnabys and Baudins cockatoo.
Landscape-level value impacted	yes/no		Yes, this is a significant remnant
Significant impact			
Description	Open Marri Woodland providing foraging and breeding habitat for black cockatoos		The application area comprises Open Corymbia calophylla Woodland.
Significant impact (hectares) / Type of feature	1.19		This is the size of the revised clearing permit application area
Quality (scale) / Number	7.00		A score of 7 is applied considering the Keighery scale for the vegetation (considering the Guildford complex) and the quality of the foraging and breeding habitat present. (marri as a primary foraging source and Xanthorrhoea preissii as a secondary foraging source).
Rehabilitation credit			
Description	0		
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	Restrictive covenant and improvement of 2.48ha of retained bushland north of the reduced application area		Placement of a conservation covenant and improvement of 2.48ha of remnant bushland north of the reduced application area. Improvements to include weed control and infill planting to provide additional understory foraging vegetation for Black Cockatoo species.
Proposed offset (area in hectares)	2.48		as per above
Current quality of offset site / Start number (of type of feature)	7.00		Provides very good quality foraging habitat for black cokatoo species.
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	7.00		The quality of the habitat is unlikely to improve without the offset as no management measures are proposed
Future quality WITH offset (scale) / Future number WITH offset	8.00		Revegetation by a suitably qualified revegetation contractor with regular monitoring and management, plus weed control to be conducted within this area, is expected to result in a one class improvement in habitat quality over the duration of the offset, noting there are areas with no canopy cover.
Time until ecological benefit (years)	11.00		The time between clearing the site and the ecological benefit is expected to be 11 years, allowing time for the vegetation to reach a sufficient size to provide foraging value plus one year for reveg to commence.
Confidence in offset result (%)	0.9		Revegetation will be undertaken by a suitably qualified revegetation contractor, with regular ongoing monitoring and maintenance to ensure the revegetation is successful.
Duration of offset implementation (maximum 20 years)	20.00		The maximum duration of 20 years is applied, as per DWER's Guideline for quantifying environmental offsets
Time until offset site secured (years)	2.00		It is expected that the conservation covenant will be executed within 24 months of the clearing.
Risk of future loss WITHOUT offset (%)	15.0%		The land is currently zoned 'Swan Valley Rural Zone' and there is some risk that the site could be cleared.
Risk of future loss WITH offset (%)	5.0%		As the offset site will be protected in perpetuity by a conservation covenant, the risk of loss is reduced
Offset ratio (Conservation area only)	N/A		

Offset calculations – Guildford complex

Environmental value to be offset			
Calculation	*Score (Area)*		*Rationale*
Conservation significance			
Description	1.19 hectares of Guildford complex vegetation in Degraded condition		The application are contains vegetation broadly consistent with the Guildford complex (Heddle et al, 1980).
Type of environmental value	Vegetation/habitat		
Conservation significance of environmental value	Terrestrial native vegetation complex - <10% extent remaining in a constrained area		5.09% of the Guildford complex remains.
Landscape-level value impacted	yes/no		Yes, this is a significant remnant
Significant impact			
Description	Open Marri Woodland providing foraging and breeding habitat for black cockatoos		The application area comprises Open Corymbia calophylla Woodland.
Significant impact (hectares) / Type of feature	1.19		This is the size of the revised clearing permit application area
Quality (scale) / Number	2.00		A score of 2 is applied considering the Keighery scale for the vegetation (Degraded).
Rehabilitation credit			
Description	0		
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	Conservation covenant and improvement of 2.06 ha of retained bushland north of the reduced application area		Planting species representative of the Guildford complex in at an area of 2.06 hectares to result in a one score improvement in vegetation quality will offset impacts to the Guildford complex.
Proposed offset (area in hectares)	2.06		as per above
Current quality of offset site / Start number (of type of feature)	3.00		The eastern area proposed to be revegetated is currently in Degraded to Good (Keighery) condition.
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	3.00		The quality of the habitat is unlikely to improve without the offset as no management measures are proposed
Future quality WITH offset (scale) / Future number WITH offset	4.00		Revegetation by a suitably qualified revegetation contractor with regular monitoring and management, plus weed control to be conducted within this area, is expected to result in a one class improvement in vegetation quality over the duration of the offset (i.e. will increase the condition to Good quality).
Time until ecological benefit (years)	11.00		The time between clearing the site and the ecological benefit is expected to be 11 years, allowing time for the vegetation to reach a sufficient size plus one year for reveg to commence.
Confidence in offset result (%)	0.9		Revegetation will be undertaken by a suitably qualified revegetation contractor, with regular ongoing monitoring and maintenance to ensure the revegetation is successful.
Duration of offset implementation (maximum 20 years)	20.00		The maximum duration of 20 years is applied, as per DWER's Guideline for quantifying environmental offsets
Time until offset site secured (years)	2.00		It is expected that the conservation covenant will be executed within 24 months of the clearing.
Risk of future loss WITHOUT offset (%)	15.0%		The land is currently zoned 'Swan Valley Rural Zone' and there is some risk that the site could be cleared.
Risk of future loss WITH offset (%)	5.0%		As the offset site will be protected in perpetuity by a conservation covenant, the risk of loss is reduced
Offset ratio (Conservation area only)	N/A		

Appendix G. Photographs of the site inspection and survey excerpts

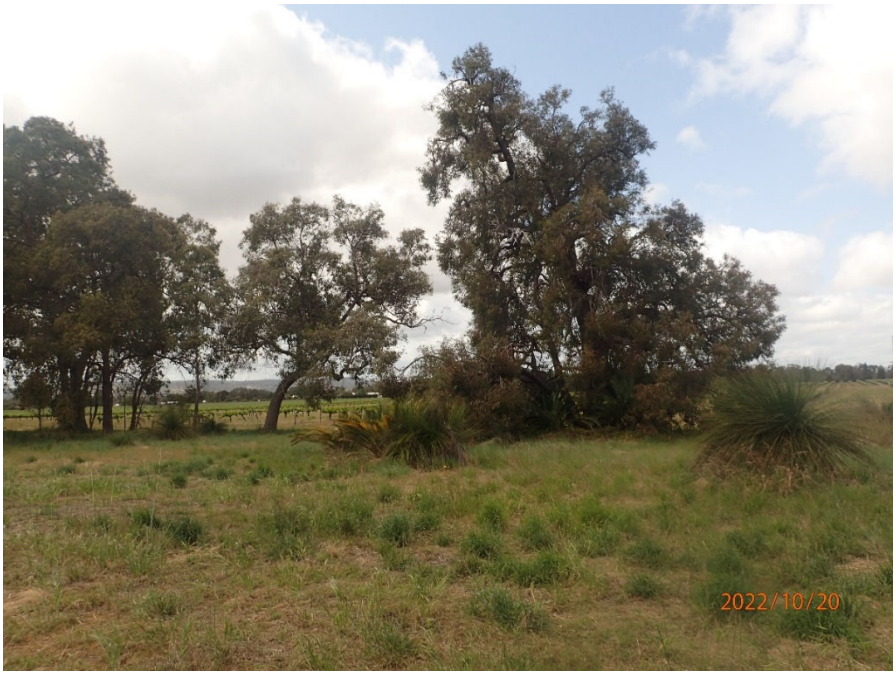

Figure G.1: Looking southwest at the southwestern corner of the application area – including *Corymbia calophylla* (marri) trees, *Xanthorrhoea preissii* (grass trees, balga), *Macrozamia* sp. and an understorey of exotic grasses.

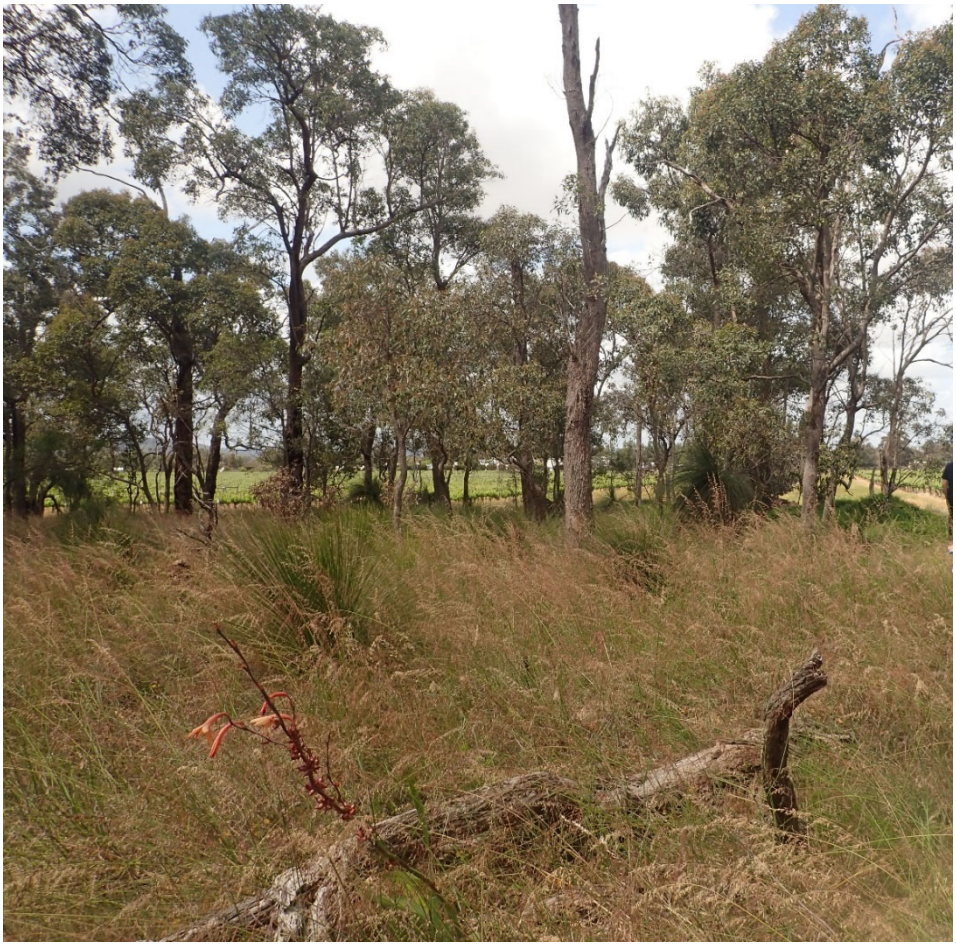

Figure G.2: Looking southeast at the southeastern corner of the application area – including *Corymbia calophylla* (marri) trees, *Xanthorrhoea preissii* (grass trees, balga) and an understorey of exotic grasses and *Watsonia meriana* var. *Bulbillifera)*.

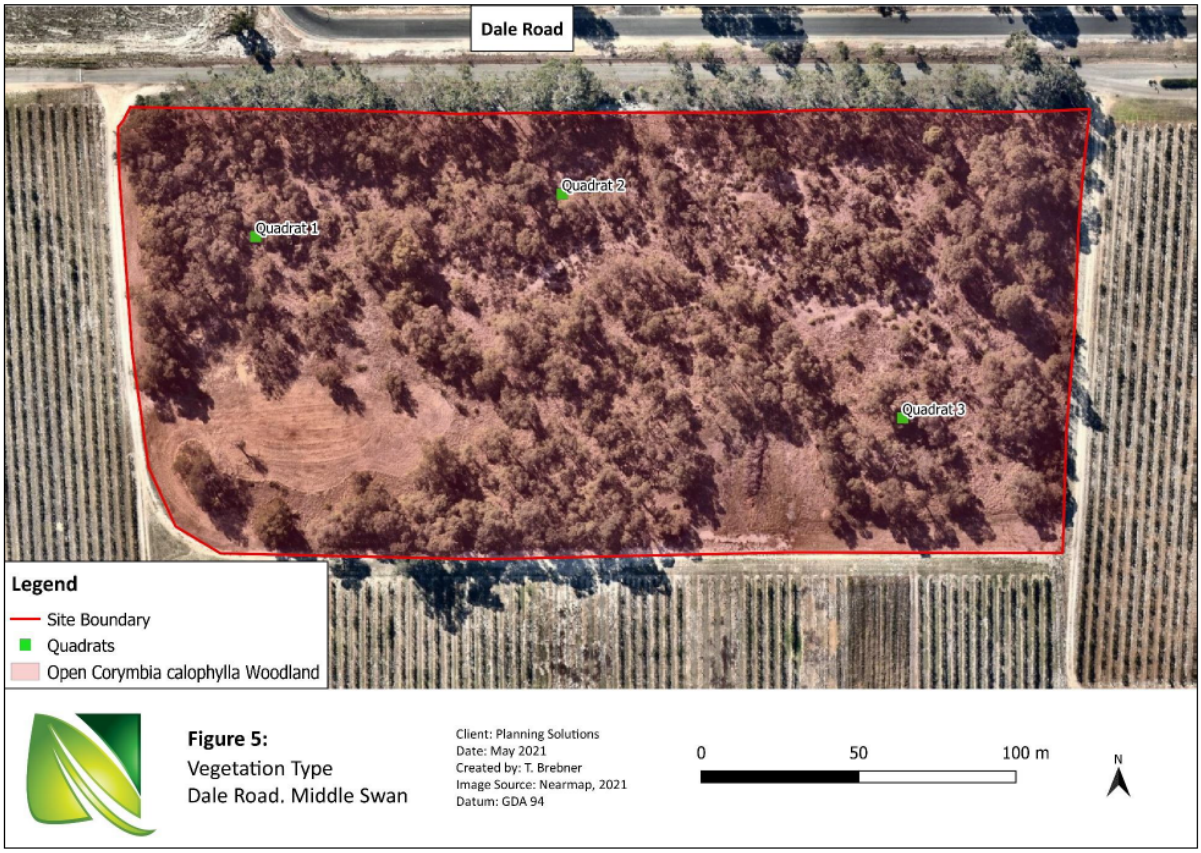

Figure G.3: Vegetation mapping within the application area (Natural Area Consulting, 2021).

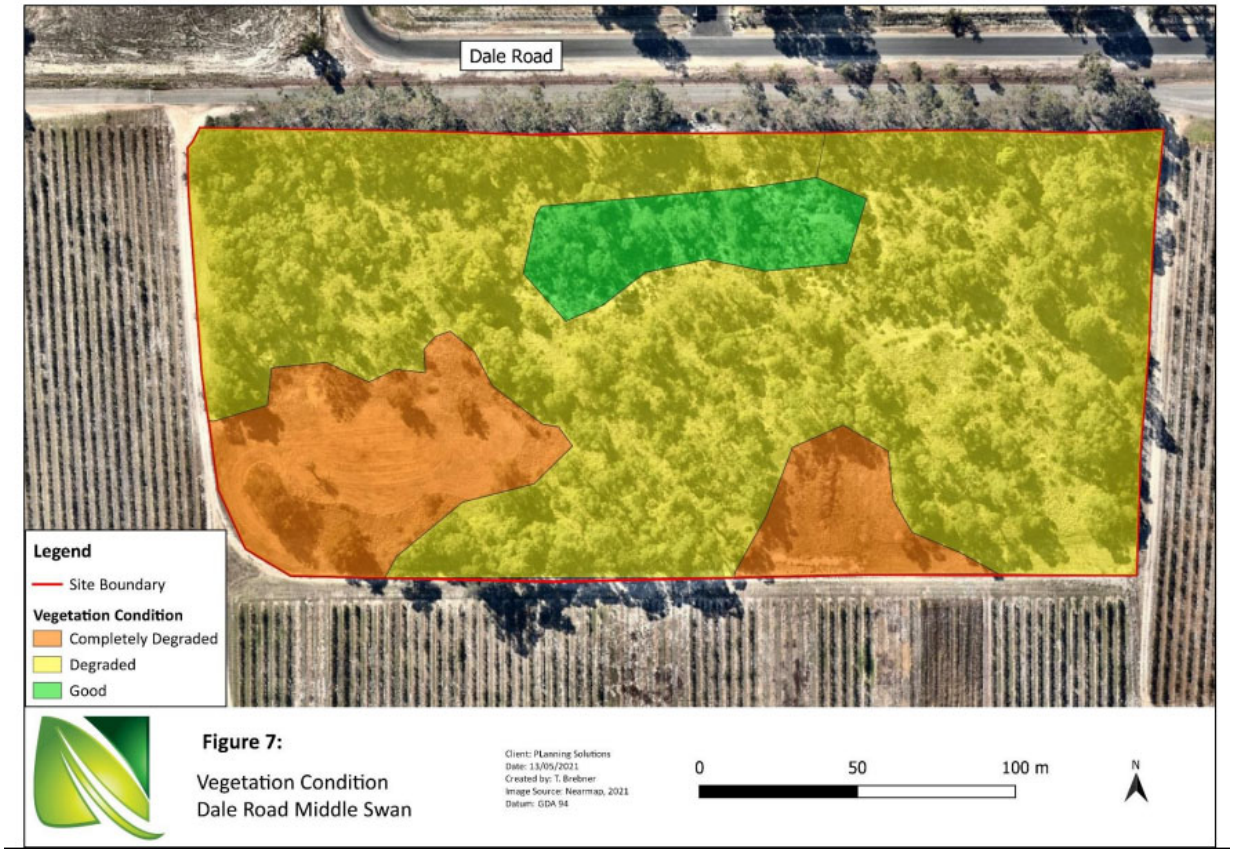

Figure G.4: Vegetation condition mapping within the application area (Natural Area Consulting, 2021).

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
- 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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