GOVERNMENT OF WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 10545/1
Permit Holder:	Shire of Serpentine Jarrahdale
Duration of Permit:	From 18 October 2024 to 18 October 2035

ADVICE NOTE

Monetary contribution to the Offsets Fund

The monetary contribution to the Offsets Fund referred to in condition 8 of this permit is intended to contribute towards the purchase and conservation, in perpetuity of *native vegetation* that provides high quality foraging habitat for forest red-tailed black cockatoo *(Calyptorhynchus banksii naso*).

Rehabilitation offset

The *rehabilitation* offset referred to in condition 9 of this permit is intended to facilitate the *rehabilitation* of a total of 0.57 hectares of *native vegetation* within Lot 427 on Deposited Plan 202731, Oldbury, to provide 0.57 hectares of significant foraging habitat for forest red-tailed black cockatoo *(Calyptorhynchus banksii naso*), 0.56 hectares of significant foraging habitat for Carnaby's cockatoo (*Zanda latirostris*), 0.56 hectares of native vegetation that is broadly representative of the *Beermullah Vegetation Complex*, 0.28 hectares of significant foraging habitat for Baudin's cockatoo (*Zanda baudinii*), and 0.09 hectares of *native vegetation* that is broadly representative of the *Corymbia calophylla – Xanthorrhoea preissii* woodlands and shrublands (*Corymbia* Woodlands) Threatened Ecological Community (TEC) on the Swan Coastal Plain.

The permit holder is authorised to clear *native vegetation* subject to the following conditions of this permit.

PART I – CLEARING AUTHORISED

1. Clearing authorised (purpose)

The permit holder is authorised to clear *native vegetation* for the purpose of road upgrades.

2. Land on which clearing is to be done

Orton Road reserve (PIN 11614497), Oldbury
Orton Road reserve (PIN 11614499), Oakford
Orton Road reserve (PIN 11753954), Oakford
Orton Road reserve (PIN 11753955), Cardup

Kowin Road reserve (PIN 1281806), Cardup

3. Clearing authorised

The permit holder must not clear more than 1.7 hectares of *native vegetation* within the area cross-hatched yellow in Figures 1 and 2 of Schedule 1.

4. Period during which clearing is authorised

The permit holder must not clear any *native vegetation* after 18 October 2029.

PART II – MANAGEMENT CONDITIONS

5. 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.

6. 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.

7. Directional clearing

The permit holder must:

(a) conduct *clearing* activities in a slow, progressive manner towards adjacent *native vegetation*; and

(b) allow a reasonable time for fauna present within the area being cleared to move into adjacent *native vegetation* ahead of the *clearing* activity.

8. Offset- monetary contributions to the Offsets Fund

Prior to undertaking any clearing authorised under this permit, and no later than 18 October 2026, the permit holder must provide documentary evidence to the *CEO* that funding of $133,879.20 has been transferred to the Department of Water and Environmental Regulation for the purpose of acquisition, establishing or maintaining *native vegetation* as an environmental offset for the *clearing* activities authorised under this permit.

9. Offset - rehabilitation

(a) Within 24 months of the commencement of clearing authorised under this permit and no later than 18 October 2030, the permit holder must *rehabilitate* 0.57 hectares of *native vegetation* within the area cross-hatched red in Figure 3 of Schedule 2.

(b) The *rehabilitation* required under condition 9(a) of this permit, must be undertaken to achieve the Completion Criteria set out under Table 3 of Schedule 3, including but not limited to the following:

(i) undertake *direct seeding* and *planting* at an *optimal time*, using species representative of the *Corymbia calophylla woodlands TEC*;

(ii) ensure only *local provenance* seeds and propagating material are used to *rehabilitate*;

(iii) implement hygiene protocols by cleaning earth-moving machinery of soil and vegetation prior to entering and leaving the *rehabilitation* area;

(iv) establish at least four 10 x 10 metre quadrat monitoring sites within the *rehabilitation* area;

(v) undertake *weed* control activities bi-annually until the Completion Criteria as per Table 3 of Schedule 3 has been met;

(vi) monitor quadrats specified in condition 9(b)(iv) annually until the Completion Criteria as per Table 3 of Schedule 3 has been met and maintained for a minimum of three years;

(vii) undertake remedial actions for the *rehabilitation* area where monitoring required under condition 9(b)(vii) indicates the Completion Criteria, outlined in Table 3 of Schedule 3, has not been met, including:

i. deliberately *planting* and/or *direct seeding native vegetation* that will result in the minimum targets specified in Table 3 of Schedule 3 (Completion Criteria);

ii. undertake further *weed* control activities; and

iii. continue monitoring of the *rehabilitated* area by an *environmental specialist*, until the Completion Criteria, outlined in Table 3 of Schedule 3 has been met.

(viii) where an *environmental specialist* has determined that the Completion Criteria, outlined in Table 3 of Schedule 3 has been met, that report is to be provided to the *CEO* within three months of the determination being made by the *environmental specialist;* and

(ix) where the *CEO* does not agree with the determination made under condition 9(ix), the *CEO* may require the permit holder to undertake remedial actions in accordance with the requirements under condition 9(viii) and repeat the actions under condition 9(ix).

10. Offset - conservation covenant

In respect to the area cross-hatched red in Figure 3 of Schedule 2, the permit holder must, no later than 24 months after commencing clearing under this permit, and no later than 18 October 2030, give a conservation covenant under section 30B of the *Soil and Land Conservation Act 1945* for the protection and management of vegetation in perpetuity, in accordance with the following conditions;

(a) *native vegetation* in the area subject to the conservation covenant must not be cleared, other than for clearing required under the *Bush Fires Act 1954*;

(b) the conservation covenant is to apply in perpetuity and be registered on the title of the property; and

(c) within one month of executing and returning the conservation covenant to the Commissioner of Soil and Land Conservation the permit holder shall notify the *CEO* in writing that the conservation covenant has been executed.

PART III - RECORD KEEPING AND REPORTING

11. Records that must be kept

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

Table 1: 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) direction of clearing; (e) the size of the area cleared (in hectares); (f) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 5; and (g) actions taken to minimise the risk of the introduction and spread of *weeds* and *dieback* in accordance with condition 6.
2.	In relation to the rehabilitation pursuant to condition 9	(a) a description of the *rehabilitation* activities undertaken, including *planted* species composition and density, and actions taken to implement watering and *weed* control; (b) the size of the area *rehabilitated*; (c) the date/s on which the *rehabilitation* was undertaken; (d) the boundaries of the area *rehabilitated*, recorded digitally as a shapefile; (e) a description of any remediation works undertaken, in accordance with condition 9(b)(viii), and the reasons why they were required to be undertaken; (f) at least two photographs of the areas *rehabilitated* recorded annually; (g) results of annual monitoring against the completion criteria;

No.	Relevant matter	Specifications
		(h) the date completion criteria were considered to have been met (i) a copy of the *environmental specialist's* monitoring report and determination in accordance with condition 9(b)(ix).

12. Reporting

(a) The permit holder must provide to the *CEO* on or before 30 June of each calendar year, a written report containing:

(i) the records required under condition 11 of this permit; and

(ii) records of activities done by the permit holder under this permit between 1 January and 31 December of the preceding calendar year.

(b) If no clearing authorised under this permit has been undertaken, a written report confirming that no clearing under this permit has been carried out, must be provided to the *CEO* on or before 31 December of each calendar year.

(c) The permit holder must provide to the *CEO*, no later than 90 calendar days prior to the expiry date of this permit, a written report of records required under condition 11, where these records have not already been provided under condition 12(a).

DEFINITIONS

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

Table 2: Definitions

Term	Definition
Beermullah vegetation complex	means a mixture of low open forest of *Casuarina obesa* (swamp sheoak) and open woodland of *Corymbia calophylla* (marri) - Eucalyptus wandoo (wandoo) - Eucalyptus marginata (jarrah). Minor components include closed scrub of *Melaleuca* species and occurrences of *Actinostrobus pyramidalis* (swamp cypress).
black cockatoo species	means one or more of the following species: (a) *Zanda lateriosis* (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 *Environmental Protection Act 1986*.
clearing	has the meaning given under section 3(1) of the EP Act.
condition	a condition to which this clearing permit is subject under section 51H of the EP Act.
Corymbia calophylla woodlands TEC	means the federally listed *Corymbia calophylla – Xanthorrhoea preissii* woodlands and shrublands (*Corymbia* Woodlands) Threatened Ecological Community (TEC) on the Swan Coastal Plain. This TEC includes the following dominant species - *Corymbia calophylla*, and occasionally *Eucalyptus wandoo*; the shrubs *Xanthorrhoea preissii*, *Acacia pulchella*, *Banksia nivea*, *Gompholobium marginatum*, and *Hypocalymma angustifolia*; and the herbs *Burchardia umbellata*,

Term	Definition
	Cyathochaeta avenacea and *Neurachne allopecuroidea*.
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
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.
environmental specialist	means a person who holds a tertiary qualification in environmental science or equivalent, and has a minimum of two (2) years work experience relevant to the type of environmental advice that an environmental specialist is required to provide under this permit, or who is approved by the *CEO* as a suitable environmental specialist
EP Act	*Environmental Protection Act 1986* (WA)
fill	means material used to increase the ground level, or to fill a depression.
local provenance	local provenance means native vegetation seeds and propagating material from natural sources within 50 kilometres and the same IBRA subregion of the area cleared.
mulch	means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation.
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
optimal time	means the period from April to July for undertaking *planting* and *direct seeding*
planting	means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of the desired species
rehabilitate/ed/ion	means actively managing an area containing native vegetation in order to improve the ecological function of 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

Ray Carvalho
A/MANAGER
NATIVE VEGETATION REGULATION

Officer delegated under Section 20
of the Environmental Protection Act 1986

24 September 2024

Schedule 1

The boundary of the area authorised to be cleared is shown in the maps below (Figures 1 and 2).

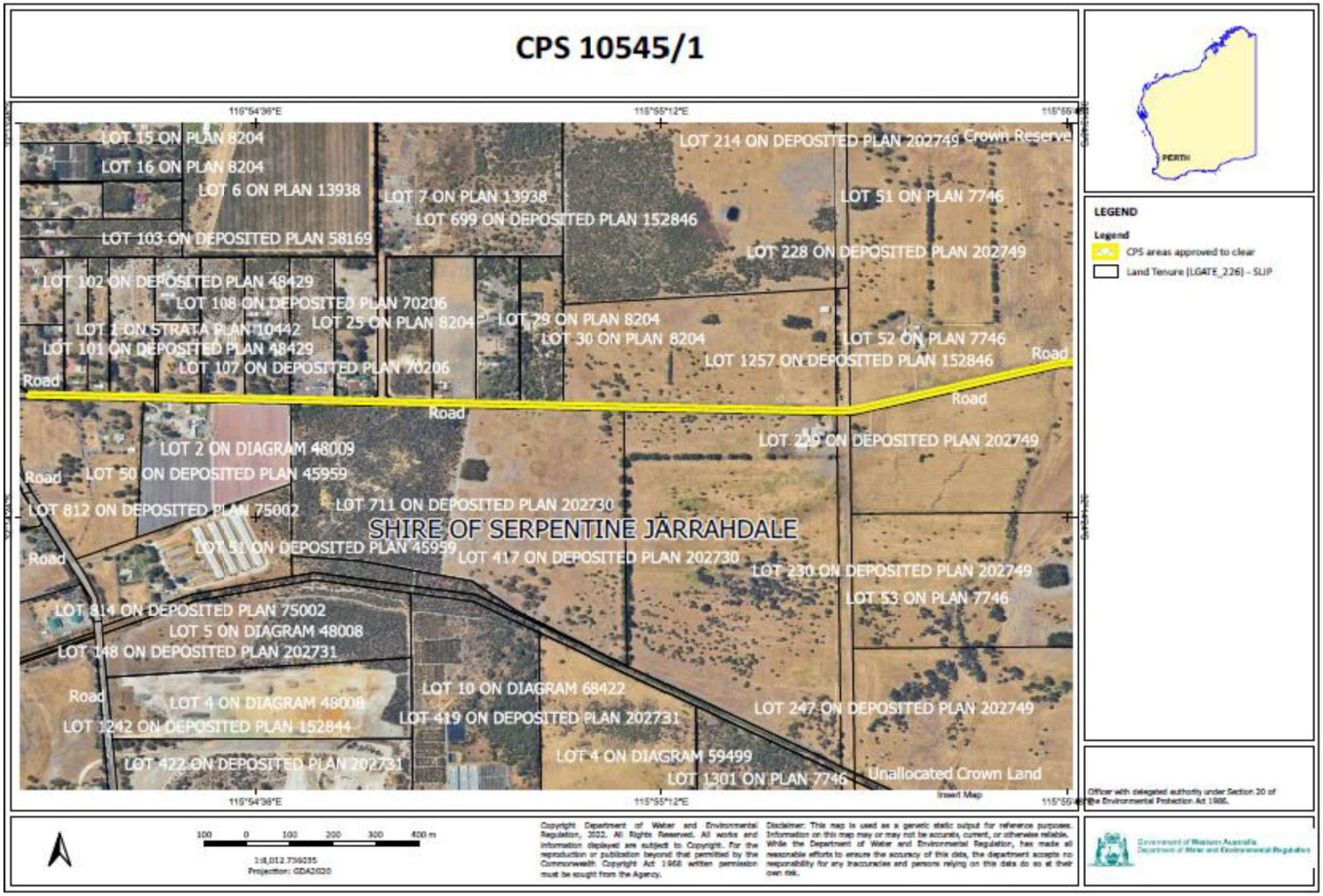

Figure 1: Map of the boundary of the area within which clearing may occur

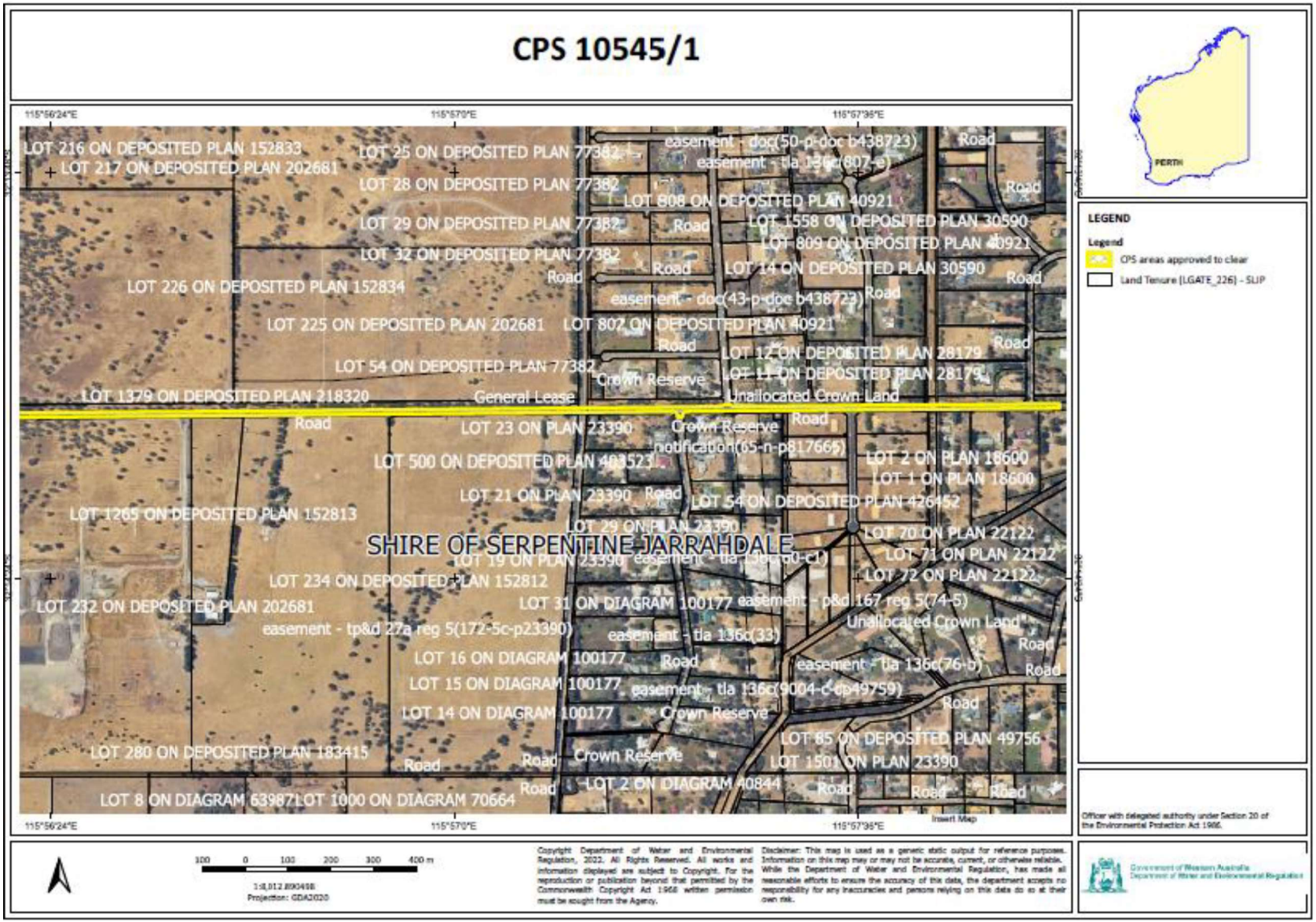

Figure 2: Map of the boundary of the area within which clearing may occur

Schedule 2

The boundary of the area designated as an offset site is shown in the map below (Figure 3).

Figure 3: Offset area required to be rehabilitated and placed under a conservation covenant, in accordance with conditions 9 and 10 of this permit, respectively.

Schedule 3

Table 3: Completion criteria for the *rehabilitation* with the areas cross hatched red in Figure 3 of Schedule 2.

Aspect	Completion Criteria	Monitoring
Survival rate to be achieved	The *rehabilitation* site must ensure a survival rate of at least 70 per cent of the seedlings initially planted.	The species in the *rehabilitation* area, will be counted annually by an *environmental specialist* in spring for a minimum of three years after the last year plants were established.
Vegetation Structure	Vegetation in the *rehabilitation* area must include native vegetation that is broadly representative of the *Corymbia calophylla* woodlands TEC, by establishing understorey and midstorey species and providing conditions suitable for expanding remnant understory species across the site.	The structure is to be assessed annually by an *environmental specialist* in spring for a minimum of three years after the last year plants were established.
Black cockatoo	Vegetation in the *rehabilitation* site must contain native foraging species for *black cockatoo species.*	Assessed annually by an *environmental specialist* in spring for a minimum of three years after the last year plants were established.
Percentage of *weeds* present	Weed coverage within the *rehabilitation* site to have no more than 15 per cent *weed* coverage. No Weeds of National Significance (WoNS) within the *rehabilitation* site.	Monitor the *rehabilitation* site for *weeds* by quadrates annually in spring for a minimum of three years after the last year plants were established.
Patch size of bare ground	The *rehabilitation* area has no more than 5 per cent of bare ground.	The patch size of bare ground is to be assessed annually by an *environmental specialist* in spring for a minimum of three years after the last year plants were established.
Declared weeds	No Declared Weeds under the *Biosecurity and Agricultural Management Act 2007* present	Monitor the *rehabilitation* site for Declared weeds by quadrates biannually in autumn and spring for a minimum of three years after the last year plants were established.
Boundary Fence	Gates and boundary fence of *rehabilitation* area must be in good condition with no clear damage that will enable access by the general public, kangaroos or livestock.	Annually until completion criteria has been met.

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 10545/1
Permit type:	Purpose permit
Applicant name:	Shire of Serpentine Jarrahdale
Application received:	5 March 2024
Application area:	1.7 hectares of native vegetation
Purpose of clearing:	Upgrades to Orton Road
Method of clearing:	Mechanical clearing
Property:	Orton road reserve (PINs 11614497, 11614499, 11753954 and 11753955) Kowin Court road reserve (PIN 1281806)
Location (LGA area/s):	Shire of Serpentine Jarrahdale
Localities (suburb/s):	Oakford, Oldbury, Cardup

1.2. Description of clearing activities

The Shire of Serpentine Jarrahdale (the Shire) is proposing to undertake the clearing of native vegetation within Orton road reserve (PINs 11614497, 11614499, 11753954 and 11753955) and Kowin Court road reserve (PIN 1281806), in the localities of Oakford, Oldbury, and Cardup. The clearing is proposed to facilitate upgrades to Orton road to address increased demand of the road (see Figure 1, Section 1.5).

Specifically, the Shire notes that Orton Road is currently a single carriageway (dual lane) local road, with a 90 kilometre per hour speed limit. The Shire notes that increased traffic and safety concerns have prompted the requirement for Orton Road to be upgraded and widened to support current and future traffic loads.

1.3. Decision on application

Decision:	Granted
Decision date:	24 September 2024
Decision area:	1.7 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 A.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix B), relevant datasets (see Appendix G), the findings of biological surveys (see Appendix F), the clearing principles set out in Schedule 5 of the EP Act (see Appendix C), relevant planning instruments and any other matters considered

relevant to the assessment (see Section 3). The Delegated Officer also took into consideration that the proposed works form part of a state government funded project to improve road safety and allow for current and future traffic volumes along this section of Orton road.

The assessment identified that the proposed clearing will result in:

- the loss of 0.051 hectares of native vegetation in degraded (Keighery, 1994) condition that is broadly representative of the *Corymbia calophylla – Xanthorrhoea preissii* woodlands and shrublands of the Swan Coastal Plain (*Corymbia calophylla* woodlands) Threatened Ecological Community (TEC) (Endangered),
- the loss of 1.08 hectares of native vegetation that provides significant foraging habitat forest red-tailed black cockatoo,
- the loss of 0.22 hectares of native vegetation that provides significant foraging habitat for Carnaby's cockatoo,
- the loss of 0.11 hectares of native vegetation that provides significant foraging habitat for Baudin's cockatoo,
- the loss of 0.009 hectares of native vegetation that is representative of the *Banksia* Woodlands of the Swan Coastal Plain (*Banksia* Woodlands) federally listed TEC and state listed Priority Ecological Community (PEC),
- the loss of native vegetation that is significant as a remnant of native vegetation in an area that has been extensively cleared,
- potential fauna strike, should any fauna be using the application area at the time of clearing
- the potential introduction and spread of weeds and dieback into adjacent vegetation, which could impact on the quality of adjacent vegetation and its habitat values, and
- potential land degradation.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined that some of the potential impacts of the proposed clearing, including fauna strike, land degradation, and the potential spread of weeds and dieback, can be minimised and managed to be unlikely to lead to an unacceptable risk to environmental values through appropriate conditions on the clearing permit. However, impacts to native vegetation that is representative of the *Corymbia calophylla* woodlands TEC, significant remnant vegetation in an extensively cleared landscape, and significant foraging habitat for Carnaby's cockatoo, Baudin's cockatoo, and forest red-tailed black cockatoo, remained significant even after the application of minimisation and mitigation measures, and constitutes a significant residual impact.

Having considered the environmental impacts outlined above, the applicant's implementation of the mitigation hierarchy and planning and other matters (including the consistency of the proposal with the planning framework and the public benefit of road safety), the Delegated Officer determined that, on balance, it was appropriate to grant the clearing permit subject to an adequate environmental offset. The applicant has provided an adequate environmental offset, consistent with the Government of Western Australia's *Environmental Offsets Policy* (2011) and the *Environmental Offsets Guidelines* (2014), to counterbalance the significant residual impacts to native vegetation that is representative of the *Corymbia calophylla* woodlands TEC, significant remnant vegetation in an extensively cleared landscape, and significant foraging habitat for Carnaby's cockatoo, Baudin's cockatoo, and forest red-tailed black cockatoo (see Section 4).

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

- avoid, minimise and reduce the impacts and extent of clearing,
- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback,
- undertake slow, progressive one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity,
- rehabilitate 0.57 hectares of native vegetation within Lot 427 on Plan 202731, Oldbury, to provide significant foraging habitat for black cockatoo species, vegetation representative of the *Corymbia calophylla* woodlands TEC, and vegetation significant as a remnant within an area that has been extensively cleared,
- provide a monetary contribution to the Part V Offsets Fund to fund the purchase of at least 7.28 hectares of high quality foraging habitat for forest red-tailed black cockatoo.

1.5. Site maps

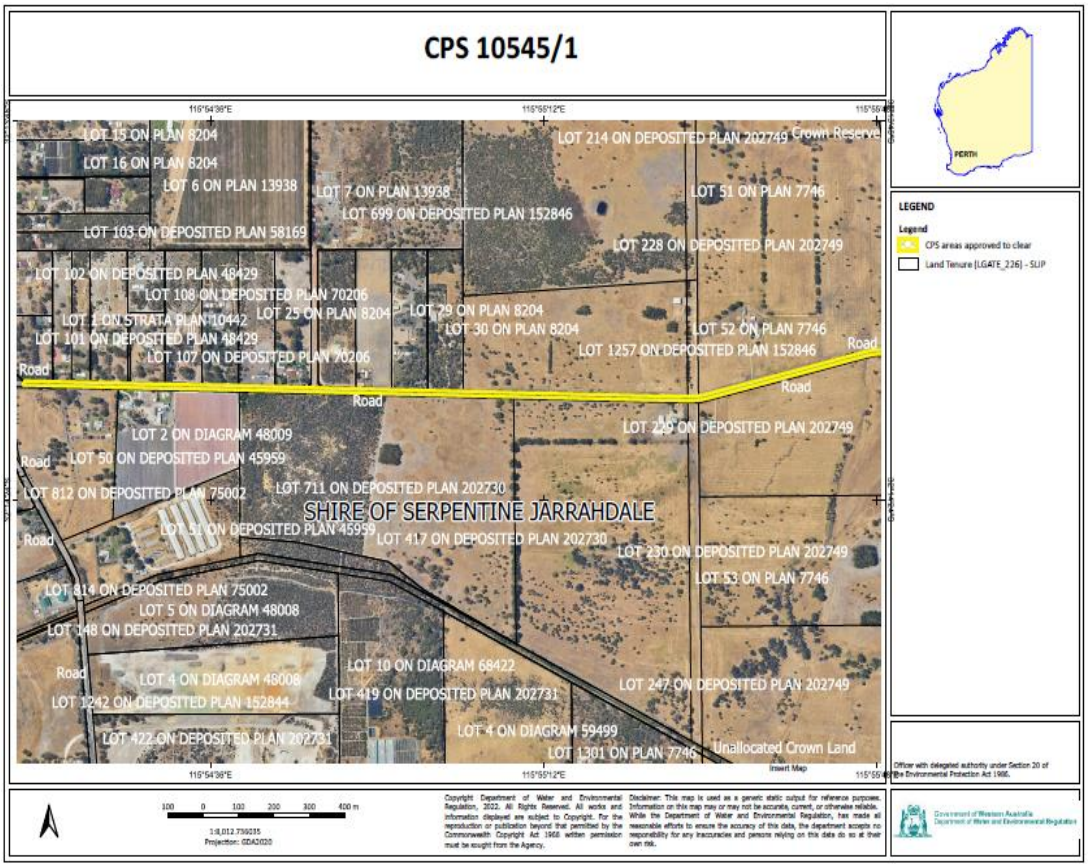

Figure 1. Map of the application area. The area crosshatched yellow indicates the area authorised to be cleared under the granted clearing permit.

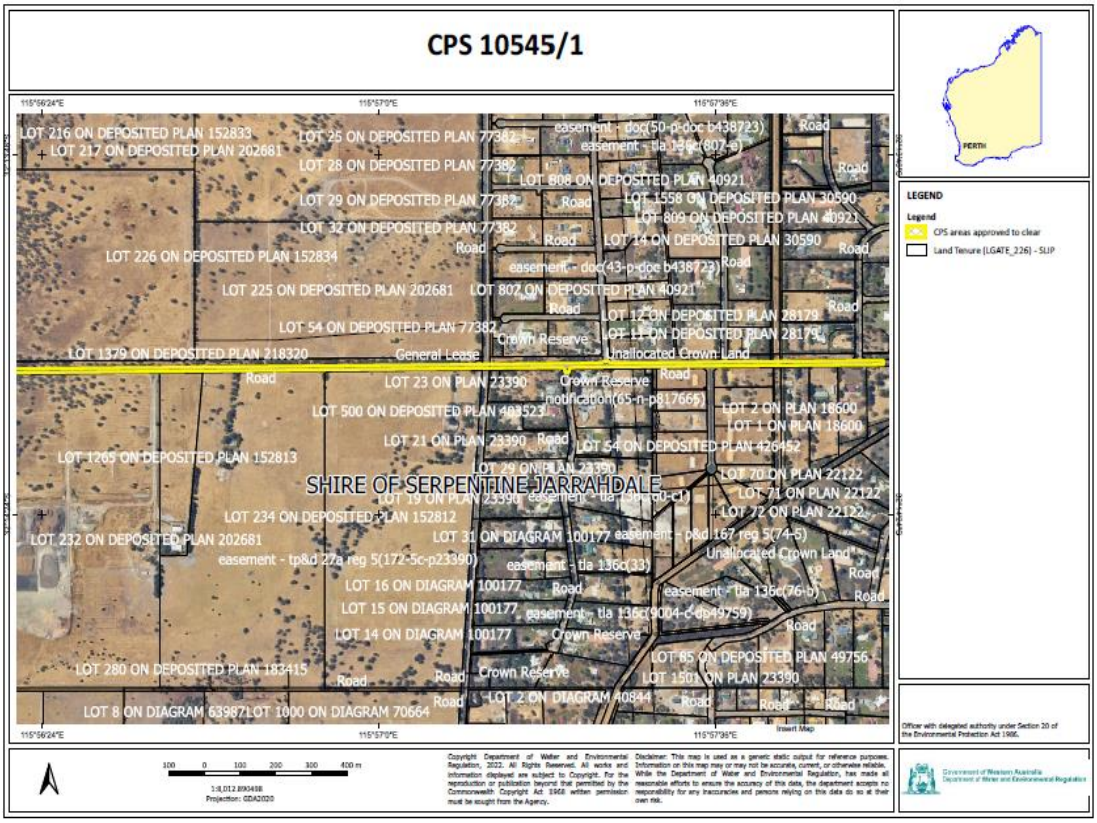

Figure 2. Map of the application area. The area crosshatched yellow indicates the area authorised to be cleared under the granted clearing permit.

2 Legislative context

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

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

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

Other legislation of relevance for this assessment include:

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

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)
- *Environmental offsets metric: Quantifying environmental offsets in Western Australia*
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2016)
- Western Australian Environmental Offsets Metric

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

The proponent has endeavoured to minimise the extent of clearing necessitated by the proposed upgrades and has committed to the retention of significant trees within the project area where construction activities permit. The implementation of management measures to minimise dust emissions, water runoff and topsoil disturbance will ensure that potential indirect impacts will be appropriately minimised (Coterra, 2023).

The Shire notes that it has considered the avoidance and minimisation of clearing, and sought to reduce the extent of impact to environmental values through the following actions (Coterra, 2023):

- the Shire has strategically designed the project to ensure that all trees identified to have hollows suitable for breeding by black cockatoos will be completely avoided,
- the Shire has largely avoided occurrences of the Banksia Woodland on the Swan Coastal Plain ecological community (TEC)
- the Shire has designed the project to preferentially include highly modified areas with the least environmental values, including utilising bare areas where possible, hence the application area includes vegetation mostly in a degraded to completely degraded (Keighery, 1994) condition,
- the Shire has committed to limiting the timing of works to the drier months of late spring and summer, to reduce the potential for interference with surface water flows, complications with topsoil disturbance (erosion and sedimentation) and the introduction and spread of water borne pathogens.

The Shire has also noted that, with specific regard to the retention of native vegetation, the Shire has committed to protecting, retaining and enhancing a minimum area of each vegetation type found in the Shire, equating to a total area of approximately 1,690 hectares, in accordance with its Local Biodiversity Strategy (2019).

After considering the above avoidance, minimisation and mitigation measures, the Delegated Officer determined that offsets to counterbalance the following significant residual impacts are required:

- loss of 0.051 hectares of native vegetation considered broadly representative of the *Corymbia calophylla* woodlands TEC,

- loss of 0.22 hectares of native vegetation that provides significant foraging habitat for Carnaby's cockatoo,
- loss of 0.11 hectares of native vegetation that provides significant foraging habitat for Baudin's cockatoo,
- loss of 1.08 hectares of native vegetation that provides significant foraging habitat forest red-tailed black cockatoo, and
- loss of 0.36 hectares of native vegetation that is significant as a remnant of native vegetation in an area that has been extensively cleared.

In accordance with the *WA Environmental Offsets Policy* and *WA Environmental Offsets Guidelines*, these significant residual impacts have been addressed through the conditioning of environmental offset requirements on the clearing permit. The nature and adequacy 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 B), a detailed and targeted flora and vegetation survey (Ecoedge, 2023; Coterra, 2023), a black cockatoo assessment (Bamford Consulting Ecologists (Bamford), 2023) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

The assessment against the clearing principles (see Appendix C) identified that the impacts of the proposed clearing present a risk to biological values (fauna and vegetation communities), significant remnant vegetation and conservation areas, and water resources. The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

3.2.1. Biological values (fauna) - Clearing Principles (a) and (b)

Assessment

Noting the findings of the Black Cockatoo Assessment (Bamford, 2023), flora survey (Ecoedge, 2023), the site characteristics (Appendix B), and the habitat preferences of the conservation significant fauna species recorded in the local area (10-kilometre radius), the application area is considered to contain suitable habitat for the following conservation listed fauna species:

- *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo) (VU)
- *Falco peregrinus* (peregrine falcon) (OS)
- *Isoodon fusciventer* (quenda) (P4)
- *Lerista lineata* (Perth slider, lined skink) (P3)
- *Zanda baudinii* (Baudin's cockatoo) (EN)
- *Zanda latirostris* (Carnaby's cockatoo) (EN)

Black cockatoos

Collectively known as black cockatoo species, the forest red-tailed black-cockatoo, Baudin's cockatoo and Carnaby's cockatoo are known to nest in hollows of live and dead trees, including marri (*Corymbia calophylla)*, jarrah (*Eucalyptus marginata*), karri (*Eucalyptus diversicolor*), wandoo (*Eucalyptus wandoo*), tuart (*Eucalyptus gomphocephala*), flooded gum (*Eucalyptus rudis*), and other *Eucalyptus* spp. (DAWE, 2022). The application area is within the known distribution of all three black cockatoo species.

'Breeding habitat' for black cockatoos includes trees of these species that either have a suitable nest hollow or are of a suitable diameter at breast height (DBH) to develop a nest hollow, where the required DBH to develop a nest hollow is 500 millimetres for most tree species (DAWE, 2022). While breeding, black cockatoos generally forage within a six to 12-kilometre radius of their nesting site (DAWE, 2022). According to available datasets, mapped potential black cockatoo feeding habitat is recorded within 12 kilometres of the application area, making it a suitable location for breeding if appropriate hollows are present.

The Black Cockatoo Assessment (Bamford, 2023) identified:

- a flock of approximately 10 Carnaby's cockatoos within the broader survey area. During the survey, individuals were foraging on *Banksia menziesii* in the remnant *Banksia* woodland on the south side of Orton Road.
- a total of 44 trees with a DBH of greater than 500 millimetres within the survey area. These trees comprised 28 marri, two flooded gums, one swamp paperbark (*Melaleuca ericifolia*) and 13 planted

Eucalypts. Of these, nine trees contained hollows suitable for breeding, none with evidence of use. Of the potential breeding trees identified, 10 are located within the application area, none of which contain suitably sized breeding hollows.

- feeding residue of marri and sheoak nuts, which indicate foraging use by forest red-tailed black cockatoos.

The applicant has avoided all significant trees (DBH of greater than 500 millimetres) with hollows that may provide breeding habitat for black cockatoos, therefore significant impacts to breeding from the proposed clearing is not expected to occur. The larger trees may provide roosting opportunities for black cockatoos; however no evidence of roosting was identified (Bamford, 2023). Noting that the applicant has avoided more than 75 per cent of the trees with a DBH of greater than 500 millimetres recorded in the broader survey area (Bamford, 2023), the proposed clearing is unlikely to significantly impact on roosting habitat.

Black cockatoos forage on a range of plant species, predominantly the seeds and flowers of marri, jarrah and proteaceous species (e.g., *Banksia* spp., *Hakea* spp. and *Grevillea* spp.) (DAWE, 2022). The application area contains *Banksia*, marri and *Eucalyptus* spp. and provides suitable foraging habitat for black cockatoos. Specifically, eight Vegetation and Substrate Associations (VSAs) were identified within the survey area (Bamford, 2023) (see Appendix F, Figures 6 and 7) of which four were considered to provide foraging habitat for at least one black cockatoo species. The breakdown of the suitability of these habitat types for black cockatoo foraging, and the proposed impact to each is shown below:

- VSA 1, 2 and 3 represented Carnaby's cockatoo foraging habitat (0.22 hectares)
- VSAs 2 and 3 represented Baudin's cockatoo foraging habitat (0.11 hectares)
- VSAs 1, 2, 3 and 4 represented forest red-tailed black cockatoo foraging habitat (1.08 hectares).

The Black Cockatoo Assessment (Bamford, 2023) examined the quality of foraging habitat within the application area, with strong reference to the Commonwealth of Australia's black cockatoo referral guidelines (DAWE, 2022). This included consideration of vegetation composition, condition and structure, the context of the site, and species density (with consideration of foraging evidence) (Bamford, 2023). Bamford (2023) identified that the VSAs with the highest foraging value for black cockatoos were:

- Banksia woodland (VSA 1 – high value for Carnaby's cockatoo)
- Marri woodland (VSA 2 – high value for Baudin's and forest red-tailed black cockatoo)
- Mixed woodland of marri and flooded gum (VSA 3 – moderate value for all black cockatoos)
- Sheoak stands (VSA 4 - moderate to high value for forest red-tailed black cockatoo).

The importance of foraging habitat for black cockatoos increases when it occurs within foraging distance of nesting sites (around 12 km) as it supports breeding effort (DPAW 2013; EPA 2019). Food resources within the range of roost sites are also important to sustain populations of black cockatoos (EPA 2019). There are two potential nesting sites for Carnaby's cockatoo, and two for forest red-tailed black cockatoo, within 12 km of the application area, and known numerous roosting sites for both species within 6 km of the application area (the closest being 0.64 kilometres away). This indicates the foraging habitat present within the application area may support breeding effort and roosting birds.

Given the quality of the vegetation attributed to portions of the application area by the Black Cockatoo Assessment, the proximity of the application area to known black cockatoo roost sites and potential breeding sites, evidence of foraging within the application area, and the cumulative loss of black cockatoo foraging habitat on the Swan Coastal Plain, the foraging habitat proposed for clearing is considered significant. Therefore, the proposed clearing constitutes a significant residual impact to black cockatoo foraging habitat.

Peregrine falcon

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

Quenda

Quenda inhabit areas of dense vegetation including wetland fringes and heathlands. Quenda rarely venture from cover and will feed by digging in leaf litter and soil to find food (DEC, 2012). Given the extent and linearity of the application area and largely degraded to completely degraded (Keighery, 1994) condition of the vegetation with a lack of preferred dense vegetation, it is unlikely that the application area comprises significant habitat for the species. Quenda may however occur within the application area while moving through the landscape, and there is therefore a risk of injury to any such individuals during clearing. The implementation of slow, directional clearing measures will allow any individuals present during clearing to move ahead of the clearing and into adjacent suitable habitat.

Perth lined skink

The presence of Perth lined skink in the application area and surround is possible. The Perth lined skink is known to inhabit landscaped gardens and may persist in degraded areas post development (TSSC, 2020). As such, the application area may provide habitat for this species. Given the extent of proposed clearing, and the species ability to thrive in degraded environments, the proposed clearing is unlikely to pose a significant threat to this species habitat. The proposed clearing should be undertaken in a slow one directional manner to allow any individuals present during clearing to disperse into adjacent remnant vegetation.

Ecological linkages

Four ecological linkages intersect the application area, being linkage numbers 60, 61, 67 and 68 of the mapped Perth Regional Ecological Linkages dataset. Most of these linkages run perpendicular to Orton Road. Noting the extensively cleared local area, the application area may contribute to the ecological function of these linkages by providing dispersal habitat between larger remnants in the local area. However, the application area is in a degraded to completely degraded (Keighery, 1994) condition and has limited understorey and heavily compromised canopy connectivity both within each remnant and between other areas of native vegetation in the local area. Therefore, the proposed clearing is unlikely to significantly impact on the abovementioned linkages or result in significant impacts to fauna dispersal through the local area.

Conclusion

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

- the loss of 0.22 hectares of significant foraging habitat for Carnaby's cockatoo;
- the loss of 0.11 hectares of significant foraging habitat for Baudin's cockatoo;
- the loss of 1.08 hectares of significant foraging habitat for forest red-tailed black cockatoo;
- the loss of suitable habitat for quenda, peregrine falcon and Perth lined skink, although impacts to these species habitat is unlikely to be significant; and
- an increased risk of fauna strike to any fauna using the application area at the time of clearing.

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

Conditions

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

- Offset - which requires the rehabilitation of 0.57 hectares to provide significant foraging habitat for black cockatoo species within Lot 427 on Plan 202731, Oldbury
- Offset - monetary contribution to the Part V Offsets Fund to fund the purchase of at least 7.28 hectares of high quality foraging habitat for forest red-tailed black cockatoo, and
- Directional clearing - which requires slow progressive, one directional clearing to allow terrestrial fauna to disperse ahead of the clearing activity should they occur on site at the time of clearing.

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

Assessment

A review of the site characteristics and habitat preferences of the conservation significant flora species recorded in the local area (See Appendix B) identified that the application area may provide suitable habitat for the following species:

- *Diuris purdiei* (T)
- *Verticordia lindleyi subsp. lindleyi* (P4)

A Detailed and Targeted Flora and Vegetation Survey (the flora survey) (Ecoedge, 2023) was conducted on 5 and 6 September, and 20 October 2023. A total of 163 taxa were identified within the survey area, of which 68 were identified as introduced species. No threatened or priority flora were found in the survey area (Ecoedge, 2023). *Diuris purdiei* and *Verticordia lindleyi subsp. lindleyi* are known to flower within the survey period and should have been identifiable at the time of survey, if present. Noting this, and the limited understorey within the application area, it is unlikely that any individuals of these species will be impacted from the proposed clearing.

Six vegetation units were mapped within the application area, of which 98 per cent was recorded in a Degraded to Completely Degraded (Keighery, 1994) condition (Ecoedge, 2023) (see Appendix B for full vegetation unit descriptions).

The flora survey identified two federally listed TECs within the application area; the *Corymbia calophylla* woodlands TEC (FCT 3c) and the *Banksia* Woodlands TEC (Ecoedge, 2023). The *Corymbia calophylla* woodlands TEC is also a state listed TEC, known as '*Corymbia calophylla — Xanthorrhoea preissii* woodlands and shrublands, Swan Coastal Plain (floristic community type (FCT) 3c as originally described in Gibson et al. 1994)'. However, the survey identified that, based on previous advice from DBCA, FCT 3c only qualifies for the state listed occurrence of the community if it is in good (Keighery, 1994) or better condition (Ecoedge, 2023), which in this instance is not the case given the community was recorded in a degraded (Keighery, 1994) condition (Ecoedge, 2023).

***Corymbia calophylla* woodlands TEC (FCT 3c)**

This TEC is located on heavy soils of the eastern side of the Swan Coastal Plain between Bullsbrook and Stratham and is a heavily restricted community. Dominant species in the TEC are marri and grasstree (*Xanthorrhoea preissii*), and occasionally wandoo (*Eucalyptus wandoo*), typically over *Gompholobium marginatum*, white myrtle (*Hypocalymma angustifolium)* and couch honeypot (*Banksia dallanneyi*), over *Burchardia congesta, Cyathochaeta avenacea*, foxtail mulga grass (*Neurachne alopecuroidea*), and several other native herb, grass and sedge species (DoEE, 2017).

The flora survey identified that the majority of Vegetation Unit (VU5) 5, described as mid woodland of *Corymbia calophylla* and *Eucalyptus rudis* over isolated tall shrubs of *Acacia saligna* and *Xanthorrhoea preissii* over mid grassland of **Ehrharta* calycina and **Eragrostis curvula* on orange-brown sandy clay-loam, was possibly an occurrence of FCT 3c (Ecoedge, 2023). VU5 was recorded in a degraded to completely degraded (Keighery, 1994) condition. The flora survey noted that the classification of degraded vegetation into floristic community types (and FCT 3c) is difficult, and classification of completely degraded vegetation is not plausible (Ecoedge, 2023). The extent of the degraded (Keighery, 1994) portion of VU5 within the application area is 0.051 hectares.

The flora survey noted that while only good (Keighery, 1994) or better occurrences of FCT 3c are recognised as the state listed TEC, no condition thresholds exist for the federally listed TEC. The lack of condition thresholds set for the federal occurrence of the TEC is due to its highly restricted distribution. The approved conservation advice for this TEC notes that that all areas meeting the description of the TEC are areas critical to its survival (DoEE, 2017).

Given the above, it is considered that the proposed clearing of 0.051 hectares of vegetation representative of FCT 3c constitutes a significant residual impact. In accordance with the *WA Environmental Offsets Policy* (2011) and *WA Environmental Offsets Guidelines* (2014) this significant residual impact has been addressed through the conditioning of an environmental offset requirement on the clearing permit (refer to Section 4 for further detail).

***Banksia* Woodlands PEC/TEC**

According to the approved conservation advice for the *Banksia* Woodlands TEC, the key diagnostic criteria for the TEC includes the presence of at least one of the four diagnostic *Banksia* species, and distinct low woodland to forest structure comprising a canopy co-dominated by *Banksia attenuata* or *Banksia menziesii*, where the emergent tree layer often includes marri, jarrah, or tuart, over a diverse shrub or herbaceous understorey (DoEE, 2016). The community typically occurs on well drained, low nutrient soils on sandplain landforms, particularly deep Bassendean and Spearwood sands and occasionally on Quindalup sands and is also common on sandy colluvium and aeolian sands of the Ridge Hill Shelf, Whicher Scarp and Dandaragan Plateau (DoEE, 2016).

The thresholds for patch size and condition for the Banksia Woodlands TEC (set out in the approved conservation advice for this community) state that a patch should meet at least Good (Keighery, 1994) condition to be considered part of the listed community, and minimum patch size is dependent on vegetation condition and its

overall contribution to beta diversity, connectivity, and function of the ecological community across the landscape (DoEE, 2016). Based on these thresholds, and the flora survey findings (Ecoedge, 2023), the application area includes 0.009 hectares of this community.

Given the very small extent of clearing proposed to this community, which has been historically disturbed, relative to the extent of the community mapped in the local area, including that mapped adjacent on the south side of Orton road (15 hectares) and within the nearby Modong Nature Reserve (600 metres west) (150 hectares), the proposed clearing is not likely to constitute a significant residual impact to this community.

Conclusion

Based on the avoidance and minimisation measures proposed by the applicant, it is considered that the indirect impacts of the proposed clearing on *Banksia* Woodlands TEC and adjacent vegetation generally, can be managed through implementing appropriate weed and dieback control measures.

However, based on the above assessment, the proposed clearing will result in the loss of 0.051 hectares of native vegetation that is broadly representative of the *Corymbia calophylla* woodlands TEC. For the reasons set out above, it is considered that the impacts of the proposed clearing on the *Corymbia calophylla* woodlands TEC constitutes a significant residual impact that requires an environmental offset (see section 4 for additional information).

Conditions

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

- Offset - which requires the rehabilitation of 0.09 hectares of native vegetation within Lot 427 on Plan 202731, Oldbury, to provide vegetation that is representative of the *Corymbia calophylla* woodlands TEC, and
- Dieback and weed control - which ensures protocols are put in place to limit the introduction and transportation of dieback and weed-affected materials.

3.2.3. Significant remnant vegetation - Clearing Principle (e)

Assessment

The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001). Noting that the current vegetation extent for the mapped vegetation complexes within the application area (Bassendean Complex – Central and South, Guildford Complex and Beermullah Complex), and vegetation extent within the local area, are below the 30 per cent threshold (see Appendix B), the application area is considered to occur within an extensively cleared landscape.

However, the Environmental Protection Authority (EPA) recognises the Perth Metropolitan Region as a constrained area, within which a minimum 10 per cent representation threshold for ecological communities is recommended (EPA, 2008). The current vegetation extent for the Swan Coastal Plain IBRA Bioregion, Bassendean Complex – Central and South and the local area are all above the 10 per cent threshold. However, the current vegetation extent for the Beermullah and Guildford Complex are below the threshold (see Appendix B).

The flora survey of the application area noted that the vegetation units described for the survey area are a reasonable match for the three abovementioned vegetation complexes mapped over the application area (Ecoedge, 2023).

The eastern portion of the application area within the mapped Guildford Complex is largely cleared or completely degraded, and this portion of the application area is not considered representative of this complex. The central portion of the application area mapped as the Beermullah Complex is in a degraded to completely degraded (Keighery, 1994) condition. Some of the vegetation types recorded along this portion of the application area contain tree species commonly associated with this vegetation complex, including *Corymbia calophylla, Casuarina obesa* and *Melaleuca* sp., and therefore the vegetation within this portion is considered, at a broad level, to be representative of the Beermullah Complex.

The Shire notes that via its Local Biodiversity Strategy (2019), it has committed to the protection of 20 ha of the Beermullah Vegetation Complex within its local parks and reserves (Coterra, 2023).

Noting that the application area includes vegetation that comprises significant foraging habitat for black cockatoos, and vegetation representative of the *Corymbia calophylla* woodlands TEC, the application area comprises significant remnant vegetation, in an extensively cleared landscape.

The application area has a high degree of weed cover and that the proposed clearing has the potential to facilitate the spread of weeds and dieback into significant native vegetation in the local area. Weed and dieback management measures will assist to minimise this risk.

Conclusion

Based on the above assessment, the proposed clearing will result in the loss of up to 0.36 hectares of significant native vegetation that is broadly representative of the extensively cleared Beermullah Complex. The proposed clearing may also facilitate the spread of weeds and dieback into adjacent remnant vegetation.

It is considered that the risk of weed and dieback spread to nearby remnant vegetation can be managed by taking actions to manage this risk such that it does not constitute a significant residual impact.

For the reasons set out above, it is considered that the impacts of the proposed clearing to the Beermullah Complex constitutes a significant residual impact that requires an environmental offset (see section 4 for additional information).

Conditions

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

- Dieback and weed control - which ensures protocols are put in place to limit the introduction and transportation of dieback and weed affected materials, and
- Offsets - which requires the rehabilitation of 0.56 hectares to provide species that are broadly representative of the Beermullah Complex within Lot 427 on Plan 202731, Oldbury.

3.2.4. Land and water resources (wetland) - Clearing Principles (h), (f) and (i)

Assessment

Most of the application area lies within the mapped extent of two Multiple Use Wetlands (MUW). These wetlands, which include the Armadale Palusplain (Unique Feature Id (UFI): 15797) and an unnamed dampland (UFI: 14704) extend across approximately 7,266 hectares and 277 hectares respectively, comprising cleared and vegetated land.

One Conservation Category Wetland (CCW) is located 30 metres from the western portion of the application area. This CCW (UFI: 14873) is an un-named palusplain wetland, covering approximately 2.39 hectares of cleared and vegetated land (Coterra, 2023). The vegetation within the application area is separated from the mapped occurrence of the CCW by existing access tracks.

DWER considers that the application area and local area have been heavily modified through historical clearing for road infrastructure and agriculture. It is therefore unlikely that the vegetation within the application area is contributing significantly to the function of the broader mapped wetlands, or to riparian communities in the local area.

Given the extent of proposed clearing, and surrounding land uses, the proposed clearing is not likely to result in any significant or long-term impacts to the ecological values of the riparian communities associated with the mapped wetlands within and nearby the application area. Similarly, the proposed clearing is not likely to significantly impact on the CCW subject to measures to control the spread of weeds and dieback into adjacent vegetation. The proposed clearing is also not likely to result in any significant impacts to surface water quality should any of these wetland areas hold water during winter months, noting that the applicant has committed to undertaking clearing during spring and summer months, when the mapped wetland areas are expected to be dry, reducing the potential risk of sedimentation.

Conclusion

Based on the above assessment, the proposed clearing is unlikely to result in significant impacts to the ecological values of riparian communities associated with the mapped multiple use wetlands that intersect the application

area, or the nearby CCW. It is considered that the impacts of the proposed clearing will be minimal, localised and short-term and that the impacts of the proposed clearing on riparian communities can be managed by taking steps to minimise the risk of the introduction and spread of weeds into adjacent remnant vegetation.

Conditions

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

- Dieback and weed control - which ensures protocols are put in place to limit the introduction and transportation of dieback and weed affected materials.

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

Assessment

The application area is located within three subsystems (B1, B3, and B6 phases) of the Bassendean soil system, and eight subsystems of the Pinjarra soil system (which is generally made up of well-bleached white-grey sands (DPIRD, 2023). Based on available risk mapping, all subsystems have a high risk of land degradation resulting from subsurface acidification and phosphorous export.

Noting that no dewatering or drainage works are proposed, and that the clearing activities will be limited to the surface (within three meters of the surface) where acidification is unlikely to occur, the proposed clearing is unlikely to result in land degradation due to acidification (Coterra, 2023). The Shire has advised that there will be no use of fertilisers, or any other actions that would increase the risk of phosphorus export (Coterra, 2023).

The Shire has also committed to undertake clearing in spring and summer, which will reduce the risk of water erosion associated with the mapped multiple use wetlands that intersect the application area.

Conclusion

Based on the above assessment, it is considered that the potential land degradation impacts of the proposed clearing can be appropriately addressed through the applicant's construction management measures, and without the requirement for any further clearing permit conditions. Therefore, the proposed clearing is not likely to result in appreciable land degradation.

3.3. Relevant planning instruments and other matters

In addition to CPS 10600/1, the Shire has five concurrent clearing permit applications with (or recently determined by) DWER: CPS 9019/1, CPS 10192/1, CPS 10264/1, CPS 10597/1 and CPS 10545/1. The cumulative impact of the clearing proposed under these applications has been considered by DWER during the assessment of CPS 10600/1 and was a consideration in requiring offsets for this application.

In considering the clearing permit application, the Delegated Officer had regard to the necessity of clearing, noting the clearing is related to public benefit through improving road safety, and appropriately supporting current and future traffic loads along this section. DWER notes that the Shire has received state funding to undertake the required upgrades.

The Shire advised DWER that local government approvals are not required for the proposed road upgrades, and that the proposed clearing is consistent with the Shire's Local Planning Scheme.

The Delegated Officer noted that at a statutory level, the Shire's *Local Planning Policy 4.16: Landscape and Vegetation Policy* guides the development of land within the Shire in accordance with the Shire's Local Planning Scheme No. 3.

The application area is located within the Serpentine Groundwater Area which is proclaimed under the RIWI Act. The applicant is not proposing to take any groundwater for this project and therefore licences under the RIWI Act are unlikely to be required in this instance.

The application area also intersects a Priority 2 area of the Jandakot Underground Water Pollution Control Area, a Public Drinking Water Source Area (PDWSA) proclaimed under the *Metropolitan Water Supply Sewerage and Drainage Act 1909*. Advice received from the DWER Water Source Protection branch indicated that the road upgrade of Orton Road, in the Shire of Serpentine-Jarrahdale, is compatible with condition number 37 in Priority 2

(P2) areas of Public drinking water source areas (PDWSAs). DWERs Water Source Protection branch recommends best practice be applied for this project, including (DWER, 2024):

- no use of recycled drainage rock in PDWSAs
- no use of recycled road base in P1 areas
- undertake works in accordance Water Quality Protection Notes (WQPN) 10, 28, 29, 44, 56, 83 and 84.

Potential impacts on Matters of National Environmental Significance (MNES) associated with the proposed clearing were referred to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) under the EPBC Act. The proposed action was deemed 'Not a Controlled Action' by DCCEEW on 16 February 2024.

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:

- the loss of 0.051 hectares of native vegetation that is broadly representative of the *Corymbia calophylla* woodlands TEC,
- the loss of 0.22 hectares of native vegetation that provides significant foraging habitat for Carnaby's cockatoo,
- the loss of 0.11 hectares of native vegetation that provides significant foraging habitat for Baudin's cockatoo,
- the loss of 1.08 hectares of native vegetation that provides significant foraging habitat forest red-tailed black cockatoo, and
- the loss of 0.36 hectares of native vegetation broadly representative of the highly cleared Beermullah Complex.

The applicant has proposed an environmental offset to address the above impacts, as detailed below.

Rehabilitation

The applicant has provided a rehabilitation offset as part of its offset proposal, located within Lot 427 on Plan 202731, Oldbury, 2.5 km south of the application area. The applicant has proposed to rehabilitate 0.57 hectares of Lot 427 to provide the following environmental values:

- 0.57 hectares of significant foraging habitat for the forest red-tailed black cockatoo;
- 0.56 hectares of significant foraging habitat for Carnaby's cockatoo;
- 0.28 hectares of significant foraging habitat for Baudin's cockatoo;
- 0.56 hectares of native vegetation that is broadly representative of the Beermullah Complex; and
- 0.09 hectares of native vegetation that is broadly representative of the *Corymbia calophylla – Xanthorrhoea preissii* woodlands and shrublands TEC

Lot 427 is currently zoned as public open space. The area of rehabilitation will be conserved in perpetuity through the application of a conservation covenant under section 30B the *Soil and Land Conservation Act 1945.*

Lot 427 is in a completely degraded (Keighery) condition (Plantecology, 2024) and consists of modified *Corymbia calophylla* and *Xanthorrhoea* woodland (Plantecology, 2024). Noting the presence of some overstorey species commonly associated with the *Corymbia calophylla* woodlands TEC, Beermullah Complex and black cockatoo foraging habitat (albeit of limited density), DWER considers that the proposed offset site represents an appropriate site for rehabilitation to counterbalance the abovementioned significant residual impacts.

The rehabilitation offset is considered to adequately counterbalance the proposed impact to Baudin's cockatoo foraging habitat, Carnaby's cockatoo foraging habitat, the Beermullah Complex and the *Corymbia calophylla* woodlands TEC. A portion of the significant residual impact to forest red-tailed black cockatoo remains post consideration of the rehabilitation offset and therefore additoinal offset measures are required.

Financial offset (monetary contribution)

In addition to the above rehabilitation offset, the applicant has proposed a monetary contribution to the Part V Offsets Fund, to adequatley countrerbalance the remaining significant residual impact to forest red-tailed black cockatoo foraging habitat.

In considering the suitability of an offset, DWER will require an applicant to demonstrate that they have followed a hierarchy of preferred offset outcomes when proposing offsets. Of the preferred offset outcomes, a monetary contribution to the Part V Offsets Fund is the least preferred option in most situations. In considering whether a monetary offset is appropriate, DWER will take into account the following:

- the applicant's efforts to follow the hierarchy of offset types which include the use of existing strategic offset programs, local or regional rehabilitation and land acquisition and conservation in perpetuity
- local or regional rehabilitation and rehabilitation, and land acquisition with conservation tenure
- the necessity of clearing
- the magnitude of the significant residual impact
- the ability to find suitable land for offsets and any associated constraints i.e. land tenure.

In this instance, the Delegated Officer noted:

- the Shire's efforts to date to try and identify suitable offset sites within its managed lands that could be used to offset the significant residual impacts to forest red-tailed black cockatoo habitat. The Shire noted that it is limited in the rehabilitation oppurtunities that exist within its reserves and has exhausted any such options in trying to appease DWERs offset requirements.
- the Shire has proposed a local rehabilitation offset to counterbalance all other significant residual impacts (as described above)
- the magnitude of the significant residual impact remaining to forest red-tailed black cockatoo foraging habitat (0.82 hectares, after consideration of the rehabilitation offset above)
- ongoing searches for other suitable and more preferred offsets will delay approvals for this project (and risk the loss of funding) which is of strategic importance within the Shire.

Given the above, the Delegated Officer considers that a monetary contribution to the Part V Offset Fund is acceptable to counterbalance the remaining significant residual impact to forest red-tailed black cockatoo foraging habitat. Specifically, DWER has identified that a monetary contribution to fund the purchase of 7.28 hectares of native vegetation that provides high quality foraging habitat for forest red-tailed black cockatoo is required.

The size of the offset required was determined using the Western Australia Environmental Offsets Assessment Guide and the WA Offset Calculator. The monetary contribution amount is calculated based on the 'rate per hectare' value selected from a table of land values in different local government authorities, provided to DWER by Landgate. In the assessment of the proposed offset, the Delegated Officer considered the prospect of acquiring land containing similar or better quality foraging vegetation via the Part V Offsets Fund and determined that a per-hectare land value, in this instance, is appropriate and is consistent with the WA Environmental Offsets Policy (2011).

Given the uncertainty surrounding the site for acquisition, the Delegated Officer determined that the unimproved land value in the Shire of Murray was appropriate for use in determining a suitable monetary contribution. Based on unimproved land values for the Shire of Murray, a 20-hectare parcel has a market value of $18,390 per hectare. Therefore, a monetary contribution of $133,879.20 will be required to fund the acquisition of 7.28 hectares of vegetation of high-quality foraging value for forest red-tailed black cockatoo.

While it is acknowledged that a 20-hectare parcel is not required for acquisition to satisfy this offset requirement (7.28 hectares required), the Delegated Officer has considered that this application is being determined concurrently with a separate Shire application (being CPS 10600/1) that also has the requirement for a monetary offset contribution. Collectively, the monetary offsets from both applications will require the purchase of a 29.01-hectare parcel of land (with the required environmental values). Hence, DWER considered it appropriate to use the per hectare value of a 20-hectare land parcel with the Shire of Murray to determine the required monetary offset in this instance.

Conclusion

The Delegated Officer considers the offsets proposed adequately counterbalances the significant residual impacts listed above and are consistent with the Government of Western Australia's *Environmental Offsets Policy* (2011) and the *WA Environmental Offsets Guidelines* (2014). The justification for the values used in the offset calculations are provided in Appendix E.

Figure 5. Location of the rehabilitation offset area within Lot 427 on Plan 202731, Oldbury, approximately 2.5 kilometres south of CPS 10545/1.

End

Appendix A. Details of public submissions

One submission was received raising four grounds in total, with supporting information provided as comments under each ground of submission.

Summary of comments	Consideration of comment
Clarification of area proposed to be cleared- 1.7ha within a 7.4 footprint	The applicant has applied for a purpose permit in which the Shire is proposing to clear 1.7 hectares within a 7.4-hectare footprint. A total of 2.64 hectares of vegetation was recorded in the application area at the time of survey, of this vegetation within the application area 1.7 hectares is considered native vegetation, noting the presence of cleared areas and non-native planted Eucalypts.
An offset for young and mature trees should be 10 trees planted for every tree removed and sections of the application area that have remnant local endemic understorey should have seed harvesting done for local revegetation prior to clearing.	DWER has required the Shire to provide an offset to counterbalance the significant residual impacts of clearing. The Shire has subsequently committed to providing the offsets referred to under Section 4, which includes a rehabilitation offset. The offset suitability has been quantified using the WA Environmental Offsets Metric calculator, and DWER has deemed that the offsets are adequate to counterbalance the significant residual impacts of clearing. The requirement to undertake these offsets will be conditioned on the clearing permit, including required completion criteria for the rehabilitation offset. DWER's assessment of the suitability of offsets and associated use of the WA Environmental Offsets Metric calculator is outlined in Section 4 and *Appendix E. Offset calculator value justification*.
The Shire of Serpentine Jarrahdale should provide a carbon cost for the road building project	DWER acknowledges that the clearing of native vegetation contributes to climate change and notes that, as stated in the *Native vegetation policy for Western Australia* (2022), the unchecked cumulative impacts of clearing native vegetation will work against the *Western Australian Climate Policy* (2020) and the State's progress towards its emissions reduction goals. Notwithstanding the above, it is not considered reasonable to attribute a particular climate change impact to the proposal given the relatively small amount of clearing proposed for the project.
The DWER permit system does not acknowledge and deal with sustainable urban design to keep mature trees in the roadside.	DWER's assessment of clearing permit applications is undertaken in accordance with *A guide to the assessment of applications to clear native vegetation* (DER, 2013). DWER's assessment is risk-based and evidence-based, in accordance with the requirements of the EP Act, and considers whether a clearing permit application is likely to have a significant effect on the environment. In considering whether to grant a clearing permit, the Delegated Officer must consider not only the clearing principles, but also any planning instruments or other matters considered to be relevant. In accordance with section 51H of the EP Act, a clearing permit may be granted subject to conditions as necessary for the purposes of preventing, controlling, abating, or mitigating environmental harm or directly or

Summary of comments	Consideration of comment
	indirectly offsetting the loss of the cleared vegetation, and proportionate to the assessed potential impact on the environment. In this instance, after consideration of the Shire's efforts to avoid and mitigate the impacts of clearing, which includes the avoidance of large hollow bearing trees, DWER has required the applicant to provide an adequate environmental offset, which includes a rehabilitation offset, to counterbalance the significant residual impacts of clearing (as detailed under section 4).

Appendix B. Site characteristics

Site characteristics

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

Characteristic	Details
Local context	The area proposed to be cleared comprises 1.7 hectares of roadside remnant native vegetation in the intensive land use zone of Western Australia. It is surrounded by agricultural land, occasional patches of remnant vegetation and residential dwellings within an extensively cleared landscape. Spatial data indicates the local area (10-kilometre radius from the centre of the area proposed to be cleared) retains approximately 27.1 per cent of the original native vegetation cover.
Ecological linkage	The application area intersects Perth Regional Linkages 60, 61, 67, 68.
Conservation areas	The closest conservation area to the application area is a Conservation Category Wetland (CCW) (UFI: 14873) recorded around 30 metres from the application area. The closest conservation estate to the application area is Modong Nature Reserve located around 600 metres west.
Vegetation description	Six vegetation types were recorded within the application area during a vegetation survey (Coterra, 2023; Ecoedge, 2023; Bamford, 2023). The full descriptions and maps are available in Appendix F. • VU1: Mid woodland of *Melaleuca preissiana* with isolated *Corymbia calophylla* mid trees over **Cenchrus clandestinus*, **Ehrharta longiflora* grassland on grey sand • VU2: Low woodland of *Banksia attenuata*, *B. menziesii*, (*B. ilicifolia*) over tall open/very open shrubland of *Kunzea glabrescens* over mid open shrubland of *Adenanthos cygnorum* subsp. *cygnorum* over low open shrubland of *Bossiaea eriocarpa*, *Hibbertia hypericoides*, *Dasypogon bromeliifolius* and *Stirlingia latifolia* over low open forbland of *Conostylis aculeata, Corynotheca micrantha* and *Phlebocarya ciliata*, and grassland of **Ehrharta calycin*a on grey sand • VU3: Mid open forest of *Melaleuca preissiana* or *M. rhaphiophylla* and *Corymbia calophylla* over very open forbland of **Fumaria capreolata* and **Oxalis pes-caprae* and mid closed of grassland of **Cenchrus clandestinus* and **Ehrharta longiflora* on grey-brown clay-loam. • VU4: Mid open forest of *Casuarina obesa* over isolated tall shrubs of *Acacia saligna* and *Viminaria juncea* over patches of *Chorizandra enodis* and *Eleocharis acuta* sedgeland, and forbland of **Watsonia meriana*, **Oxalis pes-caprae*, **Trifolium dubium* and **Cenchrus clandestinus*, **Ehrharta calycina* and **Eragrostis curvula* grassland on grey-brown silty clay-loam.

<table>
<tr><th>Characteristic</th><th>Details</th></tr>
<tr><td></td><td>

VU5: Mid woodland of Corymbia calophylla and Eucalyptus rudis over isolated tall shrubs of Acacia saligna and Xanthorrhoea preissii over mid grassland of *Ehrharta calycina and *Eragrostis curvula on orange-brown sandy clay-loam.
VU6: Tall open shrubland of Acacia saligna, Melaleuca viminea, Hakea varia and Viminaria juncea over open mid grassland of *Ehrharta calycina and low grassland of *Briza maxima and *B. minor, and forbland including *Hypochaeris glabra, Ficinia marginata, Schoenus plumosus and *Watsonia meriana on grey-brown clay-loam.

This is reasonably consistent with the below mapped broad scale vegetation types (Heddle et al, 1980) over the application area:

Bassendean Complex-Central and South: vegetation ranges from woodland of Eucalyptus marginata (Jarrah) - Allocasuarina fraseriana (Sheoak) - Banksia species to low woodland of Melaleuca species, and sedgelands on the moister sites. This area includes the transition of Eucalyptus marginata (Jarrah) to Eucalyptus todtiana (Pricklybark) in the vicinity of Perth.
Beermullah Complex: mixture of low open forest of Casuarina obesa (Swamp Sheoak) and open woodland of Corymbia calophylla (Marri) - Eucalyptus wandoo (Wandoo) - Eucalyptus marginata (Jarrah). Minor components include closed scrub of Melaleuca species and occurrence of Actinostrobus pyramidalis (Swamp Cypress).
Guildford Complex: 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 types retain approximately 26.87, 6.67 and 5.09 per cent, respectively, of their pre-European extents (Government of Western Australia, 2019).
</td></tr>
<tr><td>Vegetation condition</td><td>The flora survey (Ecoedge, 2023) indicates the vegetation within the proposed clearing area is largely in a degraded to completely degraded (Keighery, 1994) condition.
The full Keighery (1994) condition rating scale is provided in Appendix D. Representative photographs of the application area and the full survey descriptions and mapping are available in Appendix F.</td></tr>
<tr><td>Climate and landform</td><td>The region experiences a Mediterranean climate with cool winters and hot summers with a mean annual rainfall of 850-900 mm.</td></tr>
<tr><td>Soil description</td><td>The soil within the application area is mapped as the following subsystems (DPIRD, 2024):
<table>
<tr><th>Subsystem</th><th>Description</th></tr>
<tr><td>212Bs_B1</td><td>Extremely low to very low relief dunes, undulating sandplain, and discrete sand rises with deep bleached grey sands, sometimes with a pale-yellow B horizon or a weak iron-organic hardpan at depths generally greater than 2 m;
banksia dominant.</td></tr>
<tr><td>212Bs_B3</td><td>Closed depressions and poorly defined stream channels with moderately deep, poorly to very poorly drained bleached sands with an iron-organic pan, or clay subsoil. Surfaces are dark grey sand or sandy loam.</td></tr>
<tr><td>212Bs_B6</td><td>Imperfectly drained sandplain and broad extremely low rises. Deep or very deep grey siliceous sands.</td></tr>
</table>
</td></tr>
</table>

Characteristic	Details	
	213Pj_B1	Extremely low to very low relief dunes, undulating sandplain and discrete sand rises with deep bleached grey sands sometimes with a pale-yellow B horizon or a weak iron-organic hardpan at depths generally greater than 2 m; banksia dominant.
	213Pj_B2	Well to moderately well drained flat to very gently undulating sandplain. Deep bleached grey sands with a pale yellow B horizon or a weak iron-organic hardpan 1-2 m.
	213Pj_P1b	Flat to very gently undulating plain. Imperfectly drained and moderately susceptible to salinity in limited areas. Deep acidic mottled yellow duplex (or 'effective duplex') soils. Moderately deep pale sand to loamy sand over clay.
	213Pj_P1d	Flat to very gently undulating plain with deep acidic mottled yellow duplex (or 'effective duplex') soils. Shallow pale sand to sandy loam over clay; imperfect to poorly drained and moderately susceptible to salinity.
	213Pj_P2	Flat to very gently undulating plain. Poor to imperfectly drained. Deep alkaline mottled yellow duplex soils which generally, consist of shallow pale sand to sandy loam over clay.
	213Pj_P2a	Flat to very gently undulating plain, poorly drained. Deep alkaline mottled yellow duplex soils which generally consist of shallow pale sand to sandy loam with a silcrete hardpan at 50-100 cm depth generally.
	213Pj_P3	Flat to very gently undulating plain with deep, imperfect to poorly drained acidic gradational yellow or grey brown earths and mottled yellow duplex soils, with loam to clay loam surface horizons.
	213Pj_P5	Poorly drained flats, commonly with gilgai microrelief and with deep black grey to olive-brown cracking clays with subsoils becoming alkaline.
Land degradation risk	The soils mapped within the application area are mapped as having a high risk of phosphorus export and subsurface acidification (DPIRD, 2024).	
Waterbodies and hydrogeography	The application area lies within two Multiple Use Wetlands (MUWs), these being the Armadale Paluspain (UFI 15797) and an unnamed dampland (UFI 14704). One CCW (UFI 14873) is located at the western end of the application area, approximately 30 metres form the proposed clearing area. The application area also intersects two artificial drains, being the Birriga Main Drain and the Beenyup Brook Drain and multiple other minor drains to serve to remove water for local agricultural land. The application area is located within the Serpentine Groundwater Area which is proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act). The application area also intersects a Priority 2 area of the Jandakot Underground Water Pollution	

Characteristic	Details
	Control Area, a PDWSA proclaimed under the *Metropolitan Water Supply Sewerage and Drainage Act 1909*. Groundwater salinity within the application area is mapped at 500 – 1000 milligrams per litre total dissolved solids.
Flora	The desktop assessment identified that 52 conservation significant flora species have been recorded within the local area, comprising 15 threatened flora species and 37 priority flora species (Western Australian Herbarium, 1998-). None of these existing records occur within the application area, with the closest record being an occurrence of *Diuris purdiei* approximately 0.2 kilometres from the application area. No threatened or priority flora were recorded within the application area during a targeted spring flora survey (Ecoedge, 2023).
Ecological communities	The desktop assessment identified that the application area is partially within a mapped occurrence of the Banksia Woodlands TEC, which is listed as Endangered under the Commonwealth EPBC Act and is considered a Priority 3 PEC by DBCA in Western Australia. The flora and vegetation survey of the application area identified that the VU5 vegetation may be an occurrence of the *Corymbia calophylla* woodlands (floristic community type 3c as originally described in Gibson et al. 1994*)* TEC and that the VU2 vegetation type is consistent with a part of Floristic Community Type 23a, which is recognised as a subcomponent of the Banksia Woodlands PEC/TEC (Ecoedge, 2023). Impacts to these communities are detailed under Section 3.2.2.
Fauna	The desktop assessment identified that 45 conservation significant fauna species have been recorded within the local area including 14 threatened species, 13 priority species, 17 migratory species and one other specially protected fauna species. None of these existing records occur within the application area, with the closest being an occurrence of *Isoodon fusciventer* approximately 30 metres south of the application area. With consideration of the site characteristics set out above, relevant datasets (see Appendix G), flora survey (Ecoedge, 2023), black cockatoo habitat assessment (Bamford, 2023) and the habitat preferences of the aforementioned species, the application area is considered to provide significant habitat for black cockatoos and impacts to these fauna species have been detailed under Section 3.2.2.

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	1501221.93	579813.47	38.62	222916.97	14.85
Vegetation complex					
Bassendean Complex- Central and South *	87476.26	25508.66	26.87	4377.36	5
Beermullah Complex*	6707.27	447.21	6.67	142.62	2.13
Guilford Complex*	90513.13	4607.91	5.09	287.49	0.32
Local area					
10km radius	42893.44	11625.10	27.10	-	-

	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

*Government of Western Australia (2019)

Flora analysis table

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

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]	Did surveys identify?
Diuris purdiei	T	Y	Y	Y	0.2	7	Y	N
Verticordia lindleyi subsp. lindleyi	P4	Y	Y	Y	0.4	5	Y	N

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

Fauna analysis table

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

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
Calyptorhynchus banksii naso (forest red-tailed black cockatoo)	VU	Y	Y	0.64	208	Y
Falco peregrinus (peregrine falcon)	OS	Y	Y	3.63	33	Y
Isoodon fusciventer (quenda)	P4	Y	Y	0.02	1223	Y
Lerista lineata (Perth slider, lined skink)	P3	Y	Y	0.76	50	Y
Zanda baudinii (Baudin's cockatoo)	EN	Y	Y	2.45	129*	Y
Zanda latirostris (Carnaby's cockatoo)	EN	Y	Y	0.08	1022*	Y
Zanda sp. 'white-tailed black cockatoo'	EN	Y	Y	0.64	46	Y

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority
* An additional 46 records of Zanda sp. 'white-tailed black cockatoo' (White-tailed black cockatoo) were recorded in the local area, which may comprise either of these species.

Ecological community analysis table

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

Community name	Conservation status (WA)	Conservation status (COMM)	Suitable habitat features [Y/N]	Suitable vegetation type? [Y/N]	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]	Did surveys identify?
Corymbia calophylla — Xanthorrhoea preissii woodlands and shrublands of the Swan Coastal Plain	EN	EN	Y	Y	5	Y	Y
Banksia Woodlands of the Swan Coastal Plain ecological community	P3	EN	Y	Y	1863	Y	Y

Appendix C. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment: The application area contains regionally significant vegetation including vegetation that is representative of the *Corymbia calophylla* woodlands TEC and significant foraging habitat for black cockatoo species.	At variance	Yes *Refer to Section 3.2.1, 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 application area contains significant foraging habitat for Carnaby's cockatoo, Baudin's cockatoo and forest red-tailed black cockatoo. An environmental offset is required to counterbalance this impact, noting the applicant has considered and actioned measures to avoid and minimise the extent of clearing.	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 application area is unlikely to contain any flora species listed under the BC Act or EPBC Act.	Not likely to be at variance	Yes *Refer to Section 3.2.1, above.*
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 contains approximately 0.051 hectares of native vegetation that is broadly representative of the *Corymbia calophylla* woodlands TEC (Endangered) and 0.009 hectares of native vegetation that is representative of the *Banksia* Woodlands TEC (Endangered).	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 native vegetation in the local area is inconsistent with the national objectives and targets for biodiversity conservation in Australia.	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: The application area is around 30 metres from a CCW, and the proposed clearing may result in the encroachment of weeds and dieback into the native vegetation that forms this CCW, if appropriate management measures are not adhered to.	May be at variance	Yes *Refer to Section 3.2.4, above.*
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: Two multiple use wetlands wetlands intersect the application area, and riparian vegetation was recorded within the application area. The portions of these much broader wetland occurrences that intersect the	At variance	Yes *Refer to Section 3.2.4, above.*

Assessment against the clearing principles	Variance level	Is further consideration required?
application area are highly modified, and the proposed clearing is not expected to impact on significant riparian habitat.		
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: The mapped soils are highly susceptible to subsurface acidification and phosphorus export. Noting the extent and location of the application area and the condition of the vegetation, the proposed clearing is not likely to result in appreciable land degradation.	Not likely to be at variance	Yes *Refer to Section 3.2.5, above.*
Principle (i): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water."* Assessment: Given the application area is within two mapped multiple use wetlands, the proposed clearing may impact on surface water quality should any lower lying areas hold water during the winter months. However, noting the application area has been highly modified and is in a degraded to completely degraded (Keighery, 1994) condition, it is unlikely the proposed linear clearing will have long term or significant impacts to surface or groundwater quality. The Shire has also committed to undertake clearing in spring and summer, which will reduce the risk of sedimentation.	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: Noting the mapped soils and topographic contours in the surrounding area, the application area is at low risk of flooding. Noting this, the extent of the proposed clearing across a long, linear footprint, and the condition of the vegetation, the proposed clearing is unlikely to contribute to increased incidence or intensity of flooding. The Shire has also committed to undertake clearing in spring and summer, which will reduce the risk of sedimentation.	Not at variance	No

Appendix D. Vegetation condition rating scale

Vegetation condition is a rating given to a defined area of vegetation to categorise and rank disturbance related to human activities. The rating refers to the degree of change in the vegetation structure, density and species present in relation to undisturbed vegetation of the same type. The degree of disturbance impacts upon the vegetation's ability to regenerate. Disturbance at a site can be a cumulative effect from a number of interacting disturbance types. Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

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

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species.
Very good	Vegetation structure altered, with obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and/or grazing.

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

Appendix E. Offset calculator value justification

Corymbia calophylla woodlands of the Swan Coastal Plain TEC

WA Environmental Offsets Calculator
Rationale for scores used in the offset calculator

Calculation	Score (Area)	Rationale
Conservation significance		
Description	*Corymbia calophylla – Xanthorrhoea preissii* woodlands and shrublands TEC	The proposed clearing will impact on 0.051 hectares of native vegetation that is broadly representative of the *Corymbia calophylla* woodlands TEC.
Conservation significance of environmental value	Threatened ecological community - endangered	The *Corymbia calophylla* woodlands TEC is listed as Endangered under the EPBC Act.
Significant impact		
Description	The clearing of native vegetation representative of the *Corymbia calophylla – Xanthorrhoea preissii* woodlands and shrublands TEC	Native vegetation that is representative of the *Corymbia calophylla* woodlands TEC is proposed to be cleared.
Significant impact (hectares) / Type of feature	0.051	Based on the information provided from the flora survey (Ecoedge, 2023), the proposed clearing includes 0.051 hectares of native vegetation considered broadly representative of the *Corymbia calophylla* woodlands TEC.
Quality (scale) / Number	5.00	The recorded occurrence of this TEC was in a degraded (Keighery, 1994) condition. Noting that, the site context and that the remaining patches of this TEC are highly fragmented, a moderate quality score was attributed to this environmental value.
Offset		
Description	Rehabilitation	An offset involving the rehabilitation and conservation in perpetuity of an offset site within Lot 427 on Deposited Plan 202731, Oldbury, as outlined in Section 4, that will provide native vegetation that is broadly representative of the *Corymbia calophylla* woodlands TEC.

Calculation	Score (Area)	Rationale
Proposed offset (area in hectares)	0.09	Rehabilitation of 0.09 hectares with species representative of the *Corymbia calophylla* woodlands TEC is required to counterbalance 100% of the significant residual impact (SRI) to this community.
Current quality of offset site / Start number (of type of feature)	1.00	The offset area has been historically disturbed and is in Completely Degraded (Keighery, 1994) condition, consisting of modified *Corymbia calophylla* and *Xanthorrhoea* woodland (Plantecology, 2024).
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	1.00	It is presumed that the offset area would remain of similar quality without specific improvement measures.
Future quality WITH offset (scale) / Future number WITH offset	5.00	Rehabilitation will be undertaken in accordance with the Completion Criteria as required by the clearing permit. It is presumed that rehabilitation efforts would substantially improve the quality of the TEC occurrence.
Time until ecological benefit (years)	16.00	It is presumed that the benefits of rehabilitation to provide an improved occurrence of the *Corymbia calophylla* woodlands TEC will be achieved within 15 years. An extra year has been added to account for the delay in commencement of the rehabilitation (presumed to commence within one year of the permit start date).
Confidence in offset result (%)	80	There is a high to moderate level of confidence that the offset will achieve the predicted result, noting the required completion criteria as conditioned on the clearing permit.
Duration of offset implementation (maximum 20 years)	20.00	The offset site will be placed under a conservation covenant following purchase and will be conserved in perpetuity. Therefore, the maximum of 20 years is applied.
Time until offset site secured (years)	3.00	It is presumed that the rehabilitation offset site will be placed under a conservation covenant within 3 years of the proposed clearing.
Risk of future loss WITHOUT offset (%)	15.0%	The rehabilitation offset site is currently zoned rural and is not subject to any existing planning approvals.
Risk of future loss WITH offset (%)	5.0%	The future conservation (in perpetuity) of the offset site would result in increased security and reduce the risk of loss.

Carnaby's cockatoo foraging habitat

WA Environmental Offsets Calculator
Rationale for scores used in the offset calculator

Calculation	Score (Area)	Rationale
Conservation significance		
Description	Carnaby's cockatoo foraging habitat	The proposed clearing will impact on significant foraging habitat for Carnaby's cockatoo.
Conservation significance of environmental value	Rare/threatened species - endangered	Carnaby's cockatoo is listed as Endangered under both the EPBC Act and BC Act.
Significant impact		

Calculation	Score (Area)	Rationale
Description	Clearing of significant foraging habitat for Carnaby's cockatoo.	Native vegetation that comprises significant foraging habitat for Carnaby's cockatoo is proposed to be cleared.
Significant impact (hectares) / Type of feature	0.22	The application area includes 0.22 hectares of marri woodland, Banksia woodland and mixed woodland, that provides primary foraging habitat for Carnaby's cockatoo on the Swan Coastal Plain.
Quality (scale) / Number	7.00	While the application area is largely in a degraded to completely degraded condition, it is located within 10 kilometres of around 44 mapped black cockatoo roost sites and two potential Carnaby's cockatoo breeding sites. The application is also located within an extensively cleared part of the species' range and available foraging habitat in the local area is limited. Foraging evidence was identified on site. Given the habitat attributes and site context of the application area, the vegetation under application is considered to provide moderate - high quality foraging habitat for this species.
Offset		
Description	Rehabilitation	Rehabilitation of native vegetation that will provide significant foraging habitat for Carnaby's cockatoo within Lot 427 on Plan 202731, Oldbury.
Proposed offset (area in hectares)	0.56	Rehabilitation of 0.56 hectares with foraging habitat for Carnaby's cockatoo is required to counterbalance 100% of the SRI to this species.
Current quality of offset site / Start number (of type of feature)	1.00	The rehabilitation area is in Completely Degraded (Keighery, 1994) condition (Plantecology, 2024) with limited foraging density.
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	1.00	It is presumed that the offset area would remain of similar quality without specific improvement measures.
Future quality WITH offset (scale) / Future number WITH offset	5.00	Rehabilitation will be undertaken in accordance with the Completion Criteria as required by the clearing permit. It is presumed that rehabilitation efforts would substantially improve the quality of the foraging habitat.
Time until ecological benefit (years)	16.00	It is presumed that the benefits of rehabilitation of Carnaby's cockatoo foraging habitat will be available after 15 years. An extra year has been added to account for the delay in commencement of the rehabilitation (presumed to commence within one year of the permit start date).
Confidence in offset result (%)	80	There is a high to moderate level of confidence that the offset will achieve the predicted result, noting the required completion criteria as conditioned on the clearing permit.

Calculation	Score (Area)	Rationale
Duration of offset implementation (maximum 20 years)	20.00	The offset site will be placed under a conservation covenant following purchase and will be conserved in perpetuity. Therefore, the maximum of 20 years is applied.
Time until offset site secured (years)	3.00	It is presumed that the rehabilitation offset site will be placed under a conservation covenant within 3 years of clearing.
Risk of future loss WITHOUT offset (%)	15.0%	The rehabilitation offset site is currently zoned rural and is not subject to any existing planning approvals.
Risk of future loss WITH offset (%)	5.0%	The future conservation (in perpetuity) of the offset site would result in a substantial increased security and substantially reduce the risk of loss.

Forest red-tailed black cockatoo foraging habitat

WA Environmental Offsets Calculator
Rationale for scores used in the offset calculator – Rehabilitation, and land acquisition and conservation (monetary offset)

Rehabilitation

Calculation	Score (Area)	Rationale
Conservation significance		
Description	Forest red-tailed black cockatoo foraging habitat	The proposed clearing will impact on significant foraging habitat for forest red-tailed black cockatoo.
Conservation significance of environmental value	Rare/threatened species - vulnerable	Forest red-tailed black cockatoo is listed as vulnerable under both the EPBC Act and BC Act.
Significant impact		
Description	Clearing of significant foraging habitat for forest red-tailed black cockatoo.	Native vegetation that comprises significant foraging habitat for forest red-tailed black cockatoo is proposed to be cleared.
Significant impact (hectares) / Type of feature	1.08	The application area includes 1.08 hectares of marri woodland, Banksia woodland, Sheoak stands, and mixed woodland that provides primary foraging habitat for forest red-tailed black cockatoo on the Swan Coastal Plain (Bamford Consulting, 2023).
Quality (scale) / Number	7.00	While the application area is largely in a degraded to completely degraded condition, it is located within 10 kilometres of 44 mapped black cockatoo roost sites and two potential forest red-tailed black cockatoo breeding sites. The application area is also located within an extensively cleared part of the species' range and available foraging habitat in the local area is limited. Foraging evidence was identified on site. Given the habitat attributes and site context, the vegetation under application is considered to provide moderate - high quality foraging habitat for this species.
Offset		
Description	Rehabilitation	Rehabilitation of native vegetation that will provide significant foraging habitat for forest red-tailed black cockatoo within Lot 427 on Plan 202731, Oldbury.

Calculation	Score (Area)	Rationale
Proposed offset (area in hectares)	0.57	Rehabilitation of 0.57 hectares with foraging habitat for forest red-tailed black cockatoo will counterbalance **23.4 per cent** of the SRI to this environmental value.
Current quality of offset site / Start number (of type of feature)	1.00	The rehabilitation area is in Completely Degraded (Keighery, 1994) condition (Plantecology, 2024) with limited foraging density.
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	1.00	It is presumed that the offset area would remain of similar quality without specific improvement measures.
Future quality WITH offset (scale) / Future number WITH offset	5.00	Rehabilitation will be undertaken in accordance with the Completion Criteria as required by the clearing permit. It is presumed that rehabilitation efforts would substantially improve the quality of the foraging habitat.
Time until ecological benefit (years)	16.00	It is presumed that the benefits of rehabilitation of foraging habitat will be available after 15 years. An extra year has been added to account for the delay in commencement of the rehabilitation (presumed to commence within one year of the permit start date).
Confidence in offset result (%)	80	There is a high to moderate level of confidence that the offset will achieve the predicted result noting the required completion criteria as conditioned on the clearing permit.
Duration of offset implementation (maximum 20 years)	20.00	The offset site will be placed under a conservation covenant following purchase and will be conserved in perpetuity. Therefore, the maximum of 20 years is applied.
Time until offset site secured (years)	3.00	It is presumed that the rehabilitation offset site will be placed under a conservation covenant within 3 years of clearing.
Risk of future loss WITHOUT offset (%)	15.0%	The rehabilitation offset site is currently zoned rural and is not subject to any existing planning approvals.
Risk of future loss WITH offset (%)	5.0%	The future conservation (in perpetuity) of the offset site would result in increased security and reduce the risk of loss.

Land acquisition and conservation (monetary offset)

Calculation	Score (Area)	Rationale
Conservation significance		
Description	Forest red-tailed black cockatoo foraging habitat	The proposed clearing will impact on significant foraging habitat for forest red-tailed black cockatoo.
Conservation significance of environmental value	Rare/threatened species - vulnerable	Forest red-tailed black cockatoo is listed as vulnerable under both the EPBC Act and BC Act.
Significant impact		

Calculation	Score (Area)	Rationale
Description	Clearing of significant foraging habitat for forest red-tailed black cockatoo.	Native vegetation that comprises significant foraging habitat for forest red-tailed black cockatoo is proposed to be cleared.
Significant impact (hectares) / Type of feature	1.08	The application area includes 1.08 hectares of marri woodland, Banksia woodland, Sheoak stands, and mixed woodland that provides primary foraging habitat for forest red-tailed black cockatoo on the Swan Coastal Plain (Bamford Consulting, 2023).
Quality (scale) / Number	7.00	While the application area is largely in a degraded to completely degraded condition, it is located within 10 kilometres of 44 mapped black cockatoo roost sites and two potential forest red-tailed black cockatoo breeding sites. The application area is also located within an extensively cleared part of the species' range and available foraging habitat in the local area is limited. Foraging evidence was identified on site. Given the habitat attributes and site context, the vegetation under application is considered to provide moderate - high quality foraging habitat for this species.
Offset		
Description	Acquisition and conservation	An offset involving the acquisition and conservation in perpetuity of an offset site that contains native vegetation that is representative of significant foraging habitat for forest red-tailed black cockatoo.
Proposed offset (area in hectares)	7.28	The acquisition and conservation of 7.28 hectares of native vegetation that comprises significant foraging habitat for forest red-tailed black cockatoo will counterbalance **76.6 per cent** of the significant residual impact to this value (equating to 100% when considering the proposed rehabilitation offset). **Note**, an offset site has not yet been identified for this calculation, therefore presumptions have been made for the below values.
Current quality of offset site / Start number (of type of feature)	8.00	It is presumed that native vegetation that provides high quality foraging habitat for forest red-tailed black cockatoo will be acquired for conservation.
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	8.00	It is presumed that the offset area would remain of similar quality without specific improvement measures.
Future quality WITH offset (scale) / Future number WITH offset	8.00	It is presumed that the offset site will be transferred into conservation estate following purchase and will be managed to maintain the quality of the existing values, in perpetuity.
Time until ecological benefit (years)	1.00	It is presumed that a site already exists (although not yet identified) and as such there is no time lag until ecological benefit is realised. Once a suitable site has been identified, it

Calculation	Score (Area)	Rationale
		is presumed that the purchase and transfer of the land to the conservation agency will take approximately 12 months.
Confidence in offset result (%)	90	There is a high level of confidence that the offset will be transferred into conservation estate following purchase and managed to maintain the quality of the existing environmental values.
Duration of offset implementation (maximum 20 years)	20.00	The offset site will be transferred into conservation estate following purchase and will be managed in perpetuity. Therefore, the maximum of 20 years is applied.
Time until offset site secured (years)	3.00	It is presumed that the offset site will be purchased and secured in conservation estate within 3 years of the proposed clearing commencing.
Risk of future loss WITHOUT offset (%)	15.0%	It is presumed that the offset site that will be purchased has no form of conservation tenure, is currently in private ownership with minimal restrictions, and is likely to be zoned rural or similar.
Risk of future loss WITH offset (%)	5.0%	Once a suitable site has been identified it will be conserved in perpetuity, on this basis the risk of loss with the offset implemented is likely to be reduced.

Baudin’s cockatoo foraging habitat

WA Environmental Offsets Calculator
Rationale for scores used in the offset calculator

Calculation	Score (Area)	Rationale
Conservation significance		
Description	Baudin’s cockatoo foraging habitat	The proposed clearing will impact on significant foraging habitat for Baudin's cockatoo.
Conservation significance of environmental value	Rare/threatened Species - endangered	Baudin's cockatoo is listed as Endangered under both the EPBC Act and BC Act.
Significant impact		
Description	Clearing of significant foraging habitat for Baudin’s cockatoo.	Native vegetation that comprises significant foraging habitat for Baudin's cockatoo is proposed to be cleared.
Significant impact (hectares) / Type of feature	0.11	The application area includes marri woodland and mixed woodland providing primary foraging habitat for Baudin’s cockatoo on the Swan Coastal Plain.
Quality (scale) / Number	7.00	While the application area is largely in a degraded to completely degraded condition, it is located within an extensively cleared part of the species' range and available foraging habitat in the local area is limited. Given the habitat attributes and site context of the application area, the vegetation under application is considered to provide moderate - high quality foraging habitat for this species.
Offset		

Calculation	Score (Area)	Rationale
Description	Rehabilitation	Rehabilitation of native vegetation that will provide significant foraging habitat for Baudin's cockatoo within Lot 427 on Plan 202731, Oldbury.
Proposed offset (area in hectares)	0.28	Rehabilitation of 0.28 hectares of native with foraging habitat for Baudin's cockatoo is required to counterbalance 100% of the SRI to this species.
Current quality of offset site / Start number (of type of feature)	1.00	The rehabilitation area is in Completely Degraded (Keighery, 1994) condition (Plantecology, 2024) with limited foraging density.
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	1.00	It is presumed that the offset area would remain of similar quality without specific improvement measures.
Future quality WITH offset (scale) / Future number WITH offset	5.00	Rehabilitation will be undertaken in accordance with the Completion Criteria as required by the clearing permit. It is presumed that rehabilitation efforts would substantially improve the quality of the foraging habitat.
Time until ecological benefit (years)	16.00	It is presumed that the benefits of rehabilitation of foraging habitat will be available after 15 years. An extra year has been added to account for the delay in commencement of the rehabilitation (presumed to commence within one year of the permit start date).
Confidence in offset result (%)	80	There is a high to moderate level of confidence that the offset will achieve the predicted result noting the required completion criteria as conditioned on the clearing permit.
Duration of offset implementation (maximum 20 years)	20.00	The offset site will be placed under a conservation covenant following purchase and will be conserved in perpetuity. Therefore, the maximum of 20 years is applied.
Time until offset site secured (years)	3.00	It is presumed that the rehabilitation offset site will be placed under a conservation covenant within 3 years of clearing.
Risk of future loss WITHOUT offset (%)	15.0%	The rehabilitation offset site is currently zoned rural and is not subject to any existing planning approvals.
Risk of future loss WITH offset (%)	5.0%	The future conservation (in perpetuity) of the offset site would result in increased security and reduce the risk of loss.

Significant remnant vegetation

WA Environmental Offsets Calculator
Rationale for scores used in the offset calculator

Calculation	Score (Area)	Rationale
Conservation significance		
Description	Significant remnant vegetation within an area that has been extensively cleared	The proposed clearing will impact on significant native vegetation within an area that has been extensively cleared.

Calculation	Score (Area)	Rationale
Conservation significance of environmental value	Terrestrial native vegetation complex - <10% extent remaining in a constrained area.	The application area contains extensively cleared Beermullah Complex which retains 6.67 per cent of its original vegetation extent in the Swan Coastal Plain IBRA bioregion.
Significant impact		
Description	Significant remnant vegetation within an area that has been extensively cleared	Native vegetation that is significant as a remnant within an area that has been extensively cleared is proposed to be cleared.
Significant impact (hectares)	0.36	The application area intersects 0.36 hectares of the mapped Beermullah Complex, and the vegetation within this portion of the application area is broadly representative of this community. Therefore, this vegetation constitutes significant remnant vegetation in an extensively cleared landscape.
Quality (scale)	5.00	This value is based on the vegetation condition (largely degraded to completely degraded) site context, value of the vegetation as foraging habitat for black cockatoos and that the remaining patches of this vegetation complex are highly fragmented. Noting the above, it was considered appropriate to attribute a moderate quality score to this environmental value.
Offset		
Description	Rehabilitation	Rehabilitation and conservation in perpetuity of an offset site within Lot 427 on Deposited Plan 202731, Oldbury, to provide native vegetation that is significant as a remnant in an area that has been extensively cleared and broadly represents the Beermullah Complex.
Proposed offset (area in hectares)	0.56	The rehabilitation of 0.56 hectares of native vegetation species broadly consistent with the Beermullah Complex is required to counterbalance 100% of the SRI to this environmental value.
Current quality of offset site / Start number (of type of feature)	1.00	The rehabilitation area is in Completely Degraded (Keighery, 1994) condition (Plantecology, 2024) with some overstorey species representative of the Beermullah Complex.
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	1.00	It is presumed that the offset area would remain of similar quality without specific improvement measures.
Future quality WITH offset (scale) / Future number WITH offset	5.00	Rehabilitation will be undertaken in accordance with the Completion Criteria as required by the clearing permit. It is presumed that rehabilitation efforts would substantially improve the quality of native vegetation.
Time until ecological benefit (years)	11.00	It is presumed the benefits of rehabilitation will be available after 10 years. An extra year has been added to account for the delay in commencement of the rehabilitation (presumed to commence within one year of the permit start date).
Confidence in offset result (%)	80	There is a high to moderate level of confidence that the offset will achieve the predicted result noting the required completion criteria as conditioned on the clearing permit.
Duration of offset implementation (maximum 20 years)	20.00	The offset site will be placed under a conservation covenant following purchase and will be conserved in perpetuity. Therefore, the maximum of 20 years is applied.

Calculation	Score (Area)	Rationale
Time until offset site secured (years)	1.00	It is presumed that the rehabilitation offset site will be placed under a conservation covenant within 3 years of clearing.
Risk of future loss WITHOUT offset (%)	15.0%	The rehabilitation offset site is currently zoned rural and is not subject to any existing planning approvals.
Risk of future loss WITH offset (%)	5.0%	The future conservation (in perpetuity) of the offset site would result in increased security and substantially reduce the risk of loss.

Appendix F. Biological survey information excerpts and photographs of the vegetation (Coterra, 2023; Ecoedge, 2023)

Vegetation Unit	Description	Extent within survey area (ha)
VU1	Mid woodland of Melaleuca preissiana with isolated *Corymbia calophylla* mid trees over *Cenchrus clandestinus, **Ehrharta longiflora* grassland on grey sand.	0.663
VU2	Low woodland of *Banksia attenuata, B. menziesii, (B. ilicifolia)* over tall open/very open shrubland of *Kunzea glabrescens* over mid open shrubland of *Adenanthos cygnorum* subsp. *cygnorum* over low open shrubland of *Bossiaea eriocarpa, Hibbertia hypericoides, Dasypogon bromeliifolius* and *Stirlingia latifolia* over low open forbland of *Conostylis aculeata, Corynotheca micrantha* and *Phlebocarya ciliata*, and grassland of **Ehrharta calycina* on grey sand	0.31
VU3	Mid open forest of *Melaleuca preissiana* or *M. rhaphiophylla* and *Corymbia calophylla* over very open forbland of **Fumaria capreolata* and **Oxalis pes-caprae* and mid closed of grassland of **Cenchrus clandestinus* and **Ehrharta longiflora* on grey-brown clay-loam.	0.885
VU4	Mid open forest of *Casuarina obesa* over isolated tall shrubs of *Acacia saligna* and *Viminaria juncea* over patches of *Chorizandra enodis* and *Eleocharis acuta* sedgeland, and forbland of **Watsonia meriana, *Oxalis pes- caprae, *Trifolium dubium* and **Cenchrus clandestinus, *Ehrharta calycina* and **Eragrostis curvula* grassland on grey-brown silty clay-loam.	2.09
VU5	Mid woodland of *Corymbia calophylla* and *Eucalyptus rudis* over isolated tall shrubs of *Acacia saligna* and *Xanthorrhoea preissii* over mid grassland of **Ehrharta calycina* and **Eragrostis curvula* on orange-brown sandy clay-loam.	3.133
VU6	Tall open shrubland of *Acacia saligna, Melaleuca viminea*, Hakea varia and *Viminaria juncea* over open mid grassland of **Ehrharta calycina* and low grassland of **Briza maxima* and **B. minor*, and forbland including **Hypochaeris glabra, Ficinia marginata, Schoenus plumosus* and **Watsonia meriana* on grey-brown clay-loam	0.349

Figure 6. Vegetation types identified within the survey area (Coterra, 2023)

VSA	Description	Extent (ha) within survey area	Maximum extent (ha) proposed to be cleared
1	**Banksia Woodland.** Closed remnant woodland of *Banksia attenuata* and *Banksia menziesii* with scattered *Eucalyptus todtiana* over mixed midstory and understorey on grey sands. Dominant midstory species consisted of *Kunzea sp.* and Woolly Bush (*Adenanthos sp.*), with understorey dominated by introduced grasses with scattered native small shrubs on grey sand.	0.43 ha	0.11 ha
2	**Marri Woodland.** Open remnant woodland with Marri (*Corymbia calophylla*) over open midstorey of *Xanthorrhoea preissii* and understory of exotic grasses on grey sand.	0.72 ha	0.09 ha
3	**Mixed Woodland.** Open remnant woodland with a mix of Flooded Gum (*Eucalyptus rudis*) and Marri (*Corymbia calophylla*) over open midstory of *Xanthorrhoea preissii* and understory of exotic grasses on grey sand.	1.81 ha	0.02 ha
4	**Sheoak Stands.** Closed dense stands of Sheoak (*Allocasuarina fraseriana*) with no midstory and understory consisting of invasive grasses and weeds	6.08 ha	0.86 ha
5	**Melaleuca Dampland.** Closed dampland of *Melaleuca rhaphiophylla* with midstorey of scattered *Kunzea* and understory of invasive weeds and grasses on dark grey sand. Appears to be seasonally inundated.	3.04 ha	0.66 ha
6	**Planted Eucalypts.** Open woodland of scattered planted mature trees such as *Eucalyptus camaldulensis* over a grassy understory on grey to white sand.	0.23 ha	0.05 ha
7	**Revegetated Shrubland.** Open low shrubland of native vegetation consisting of *Grevillea* and other shrubs, with scattered eucalypts and a grassy understory on grey to white sand.	0.84 ha	0.4 ha
8	**Open Areas.** Disturbed open areas ranging from introduced grasses scattered with disturbance species of plants and weeds with occasional *Acacia saligna* on grey to white sand.	2.57 ha	0.45 ha
Total		**15.72 ha**	**2.64 ha**

Figure 7. Vegetation and Substrate Associations (VSA's) and their extent (Coterra, 2023)

Figure 8. Photograph of Vegetation unit VU1 (Ecoedge, 2023)

Figure 9. Photograph of Vegetation unit VU2 (Ecoedge, 2023)

Figure 10. Photograph of Vegetation unit VU3 (Ecoedge, 2023)

Figure 11. Photograph of Vegetation unit VU4 (Ecoedge, 2023)

Figure 12. Photograph of Vegetation Unit VU5 (Ecoedge, 2023)

Figure 13. Photograph of Vegetation Unit VU6 (Ecoedge, 2023)

Figure 14. Photograph of VSA 1: *Banksia* Woodland (Bamford, 2023)

Figure 15. Photograph of VSA 2: Marri Woodland (Bamford, 2023)

Figure 16. Photograph of VSA 3: Mixed Woodland (Bamford, 2023)

Figure 17. Photograph of VSA 4: *Melaleuca* Dampland (Bamford, 2023)

Figure 18. Photograph of VSA 5: Sheoak Stands (Bamford, 2023)

Figure 19. Photograph of VSA 6: Planted Eucalypts (Bamford, 2023)

Figure 20. Photograph of VSA 7: Revegetated Shrubland (Bamford, 2023)

Figure 21. Photograph of VSA 8: Open Areas (Bamford, 2023)

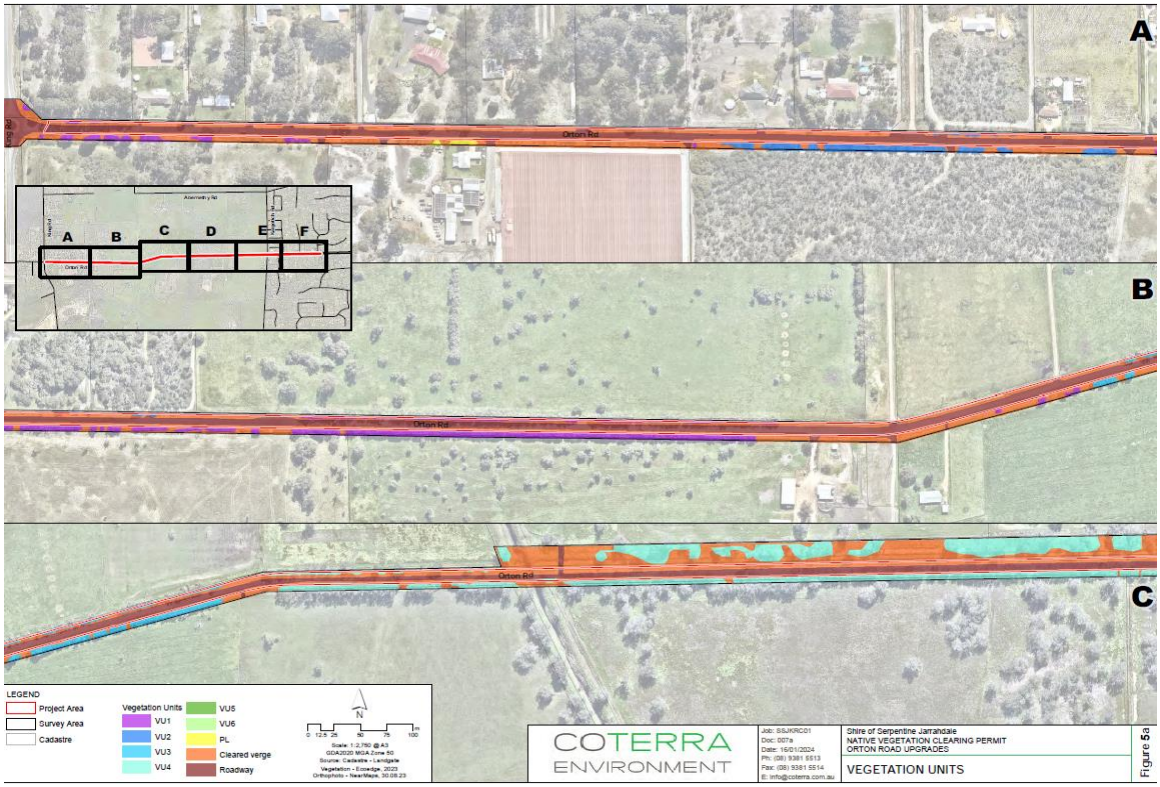

Figure 22. Vegetation units within the survey area (Coterra, 2023)

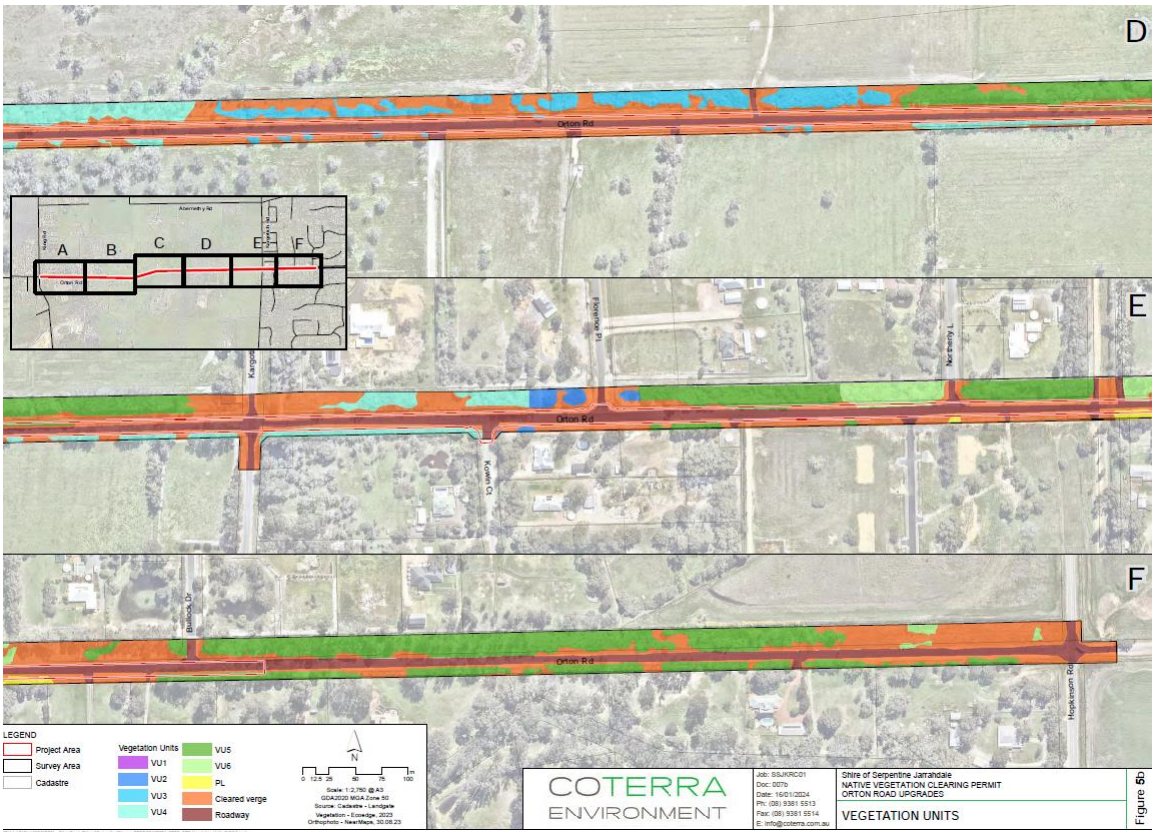

Figure 23. Vegetation units within the survey area (Coterra, 2023)

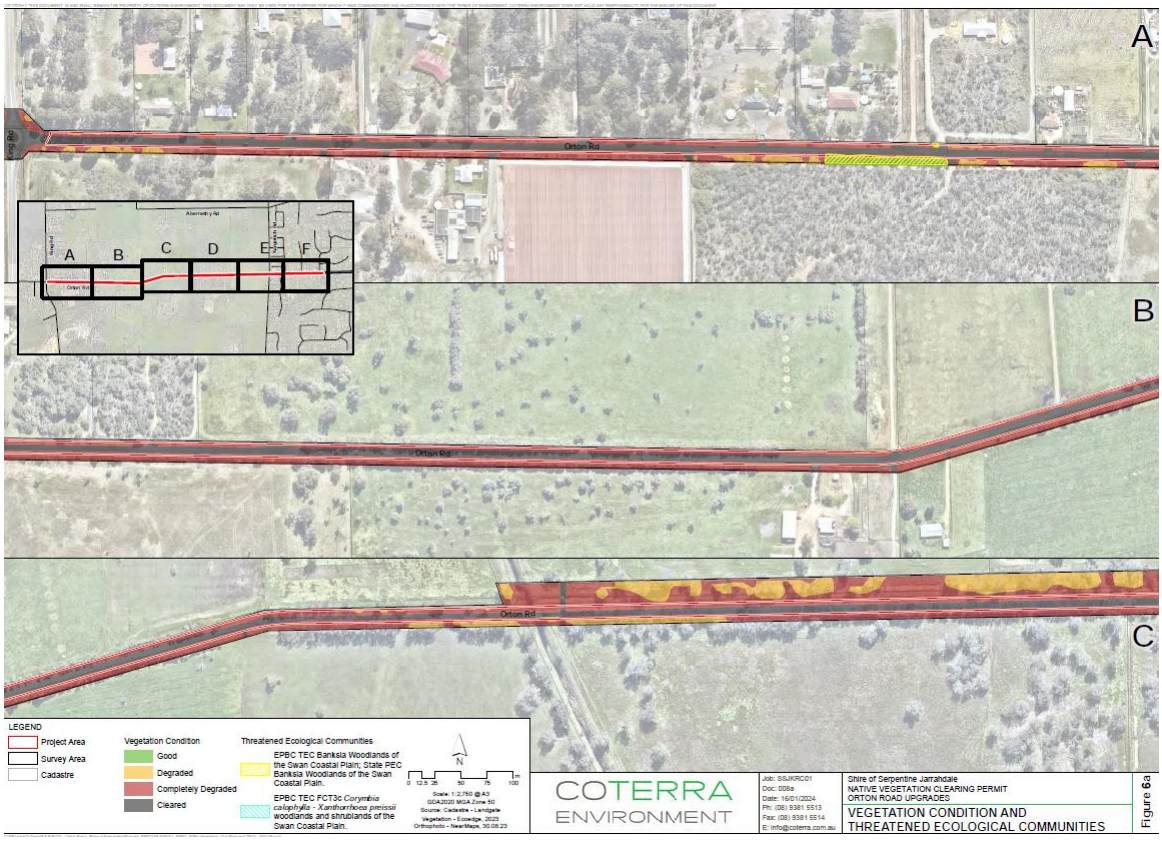

Figure 24. Vegetation condition and TEC's within the survey area (Coterra, 2023)

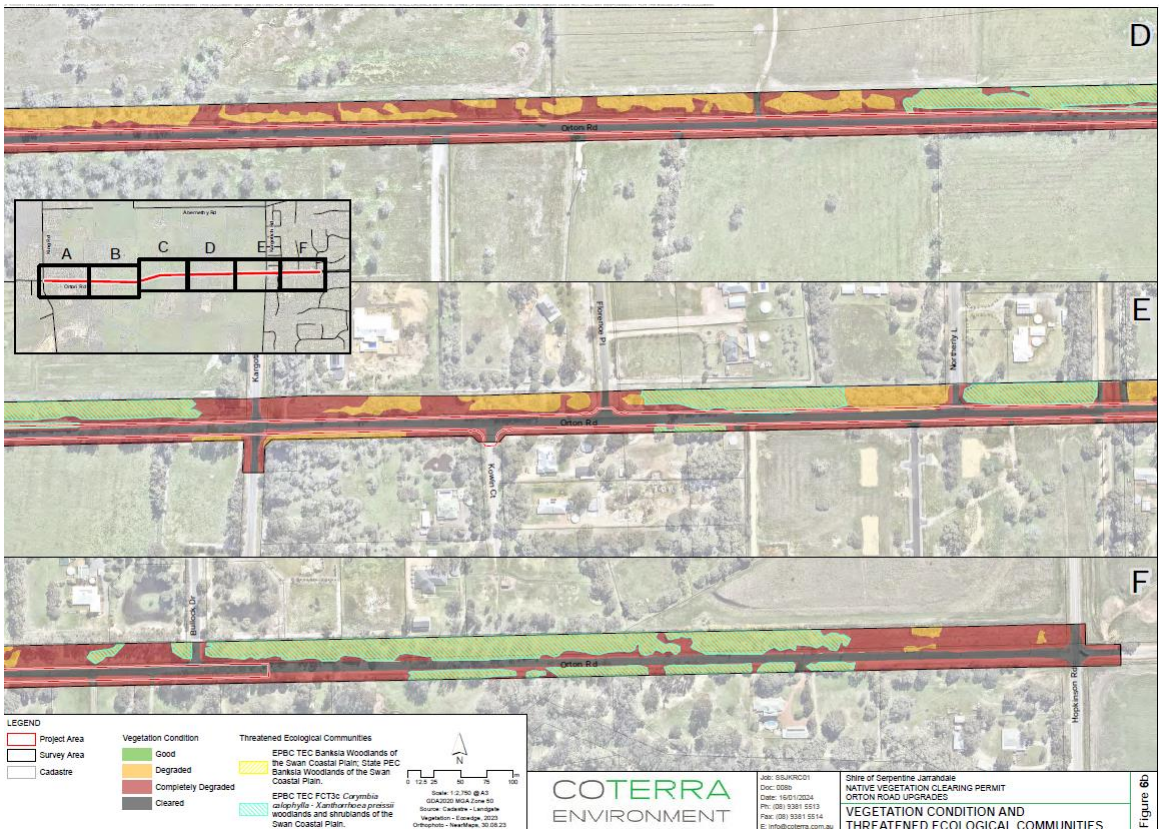

Figure 25. Vegetation condition and TEC's within the survey area (Coterra, 2023)

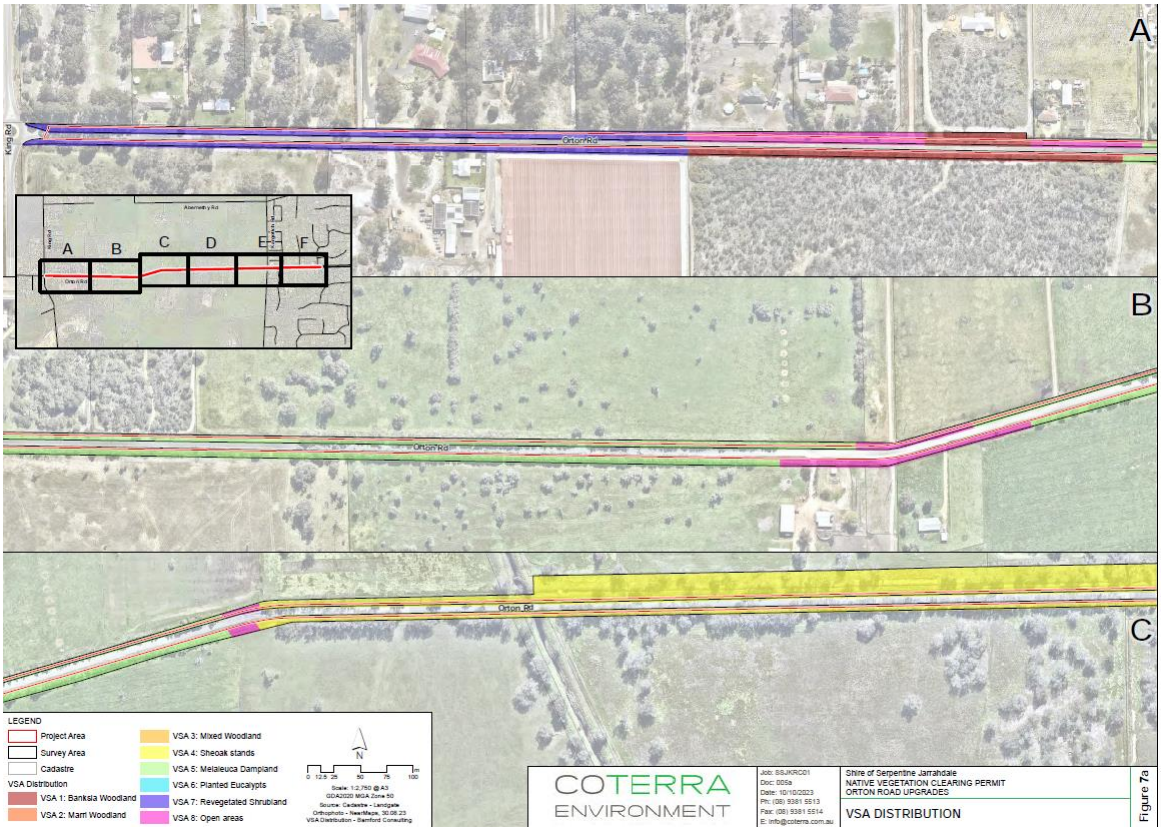

Figure 26. VSA distribution within the survey area (Coterra, 2023)

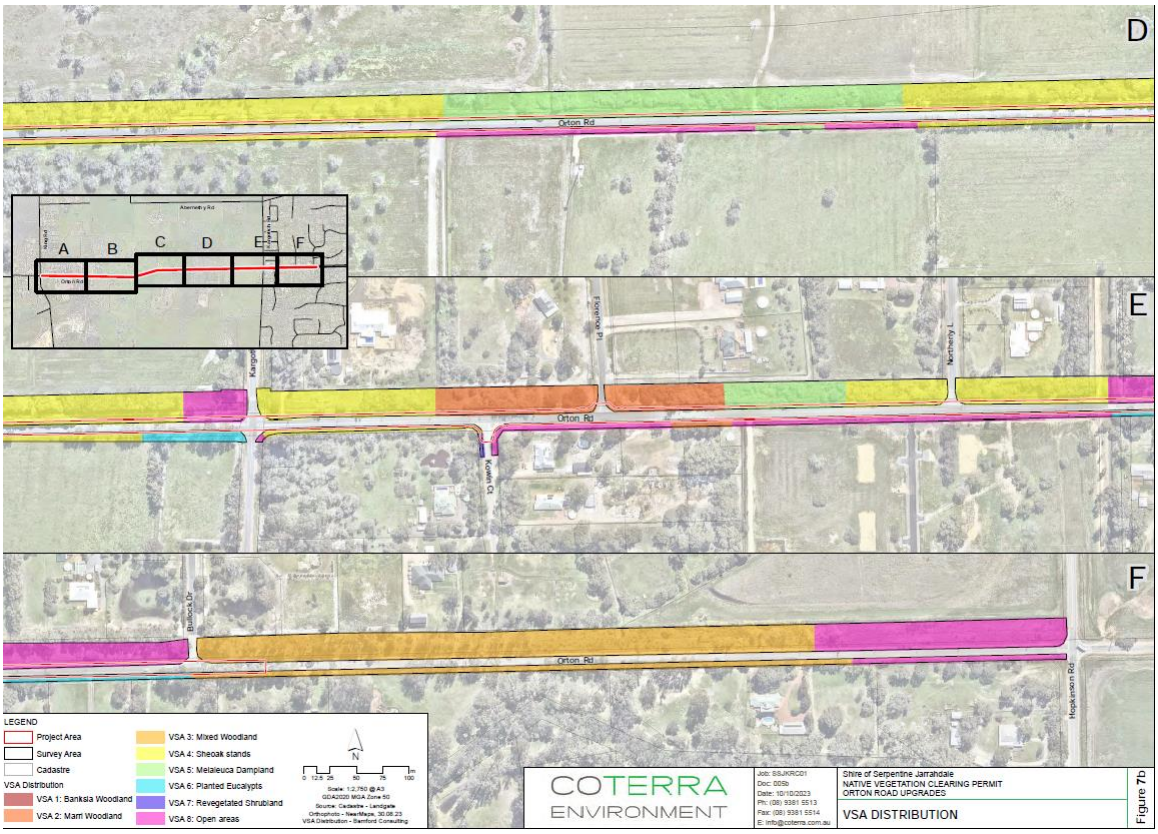

Figure 27. VSA distribution within the survey area (Coterra, 2023)

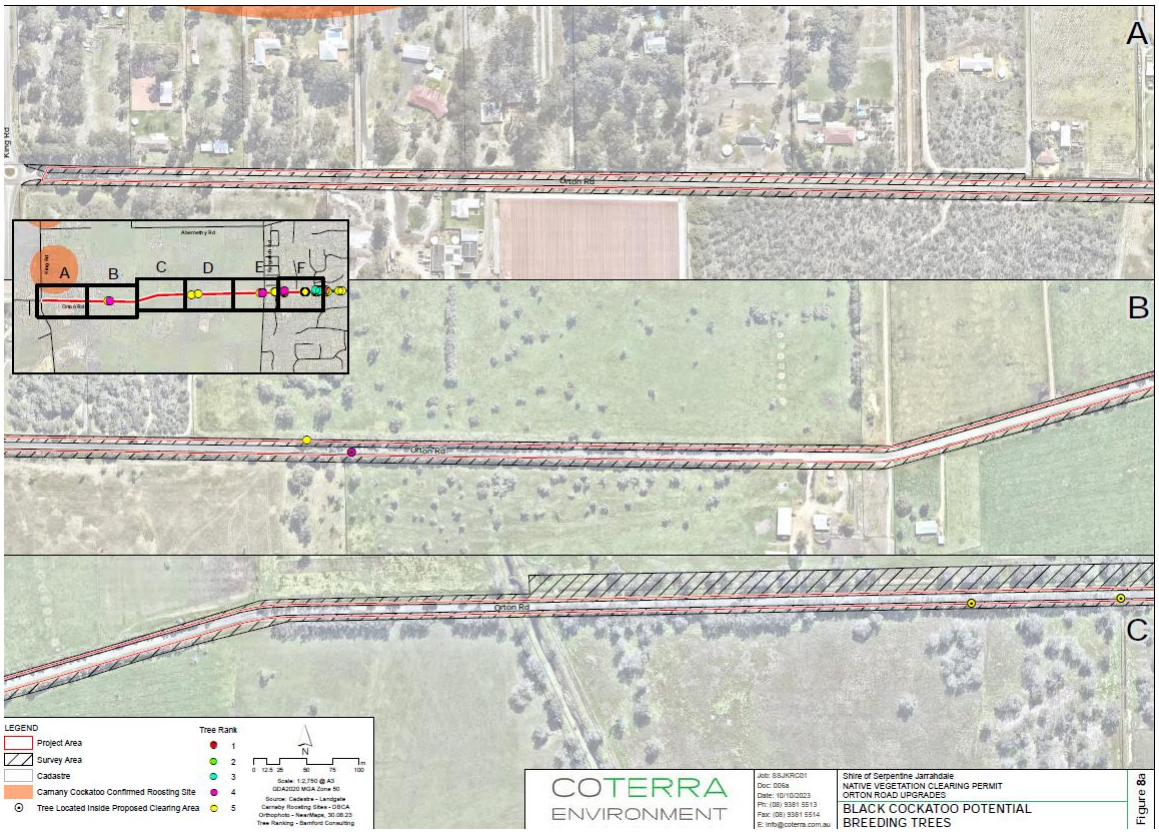

Figure 28. Black cockatoo potential breeding trees within the survey area (Coterra, 2023)

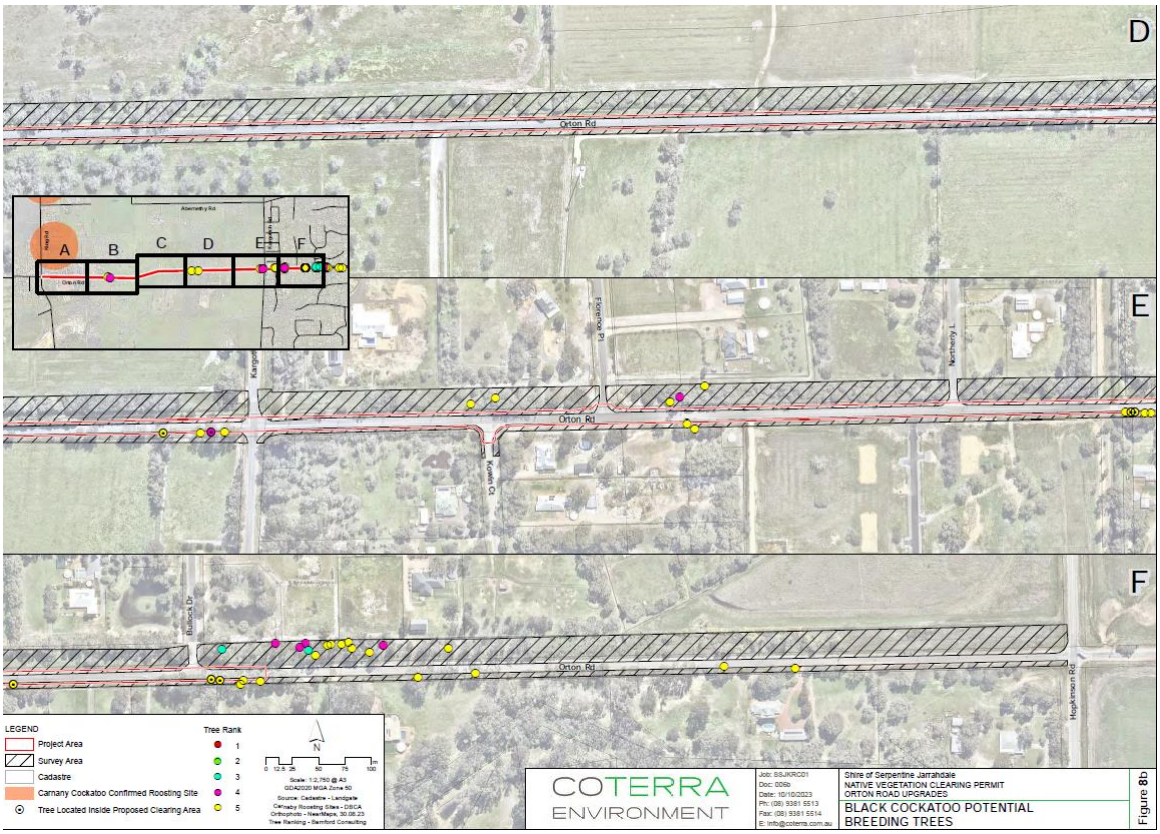

Figure 29. Black cockatoo potential breeding trees within the survey area (Coterra, 2023)

Appendix G. Sources of information

GIS databases

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

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

- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available
- Soil Landscape Mapping – Systems

Restricted GIS Databases used:

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

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