



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 10600/1
Permit Holder:	Shire of Serpentine Jarrahdale
Duration of Permit:	From 18 October 2024 to 18 October 2029

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 significant foraging habitat for forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*) and native vegetation that is representative of significant remnant vegetation in an extensively cleared area.

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

Abernethy Road reserve (PIN 11614507 and PIN 11756240), Oakford

Bishop Road reserve (PIN 11610737), Cardup, Mundijong

Elwood Loop road reserve (PIN 12016446), Oakford

Gossage Road reserve (PIN 11610399, PIN 11610405 and PIN 11698924), Cardup, Oldbury

Kargotich Road reserve (PIN 11610400, PIN 11610404, PIN 11610735, PIN 11614455, PIN 11614453, PIN 11614454 and PIN 11753959), Cardup, Oldbury

Kargotich Road reserve (PIN 117556996 and PIN 12079976), Oakford

Lucca Lane road reserve (PIN 12080038), Oakford

Mckenna Drive road reserve (PIN 1353571), Cardup

Orton Road reserve (PIN 11753954, PIN 11753955 and PIN 1282238), Oldbury, Oakford and Cardup

3. Clearing authorised

The permit holder must not clear more than 3.31 hectares of *native vegetation* within the areas cross-hatched yellow in Figures 1 and 2 of Schedule 1.

PART II – MANAGEMENT CONDITIONS

4. 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.

5. 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.

6. 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.

7. 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 \$399,614.70 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.

PART III - RECORD KEEPING AND REPORTING

8. Records that must be kept

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

Table 1: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	<ul style="list-style-type: none"> (a) the species composition, structure, and density of the cleared area; (b) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to GDA2020, expressing the geographical coordinates in Eastings and Northings; (c) the date that the area was cleared; (d) the size of the area cleared (in hectares); (e) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 4; and (f) actions taken to minimise the risk of the introduction and spread of <i>weeds</i> and <i>dieback</i> in accordance with condition 5.

9. Reporting

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

DEFINITIONS


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

Table 2: Definitions

Term	Definition
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the <i>Environmental Protection Act 1986</i> .
clearing	has the meaning given under section 3(1) of the EP Act.
condition	a condition to which this clearing permit is subject under section 51H of the EP Act.
fill	means material used to increase the ground level, or to fill a depression.
dieback	means the effect of <i>Phytophthora</i> species on native vegetation.
department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
EP Act	<i>Environmental Protection Act 1986</i> (WA)

Term	Definition
mulch	means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation.
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
weeds	means any plant – <ul style="list-style-type: none"> <li data-bbox="539 376 1353 450">(a) that is a declared pest under section 22 of the <i>Biosecurity and Agriculture Management Act 2007</i>; or <li data-bbox="539 454 1353 566">(b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or <li data-bbox="539 571 1066 609">(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).

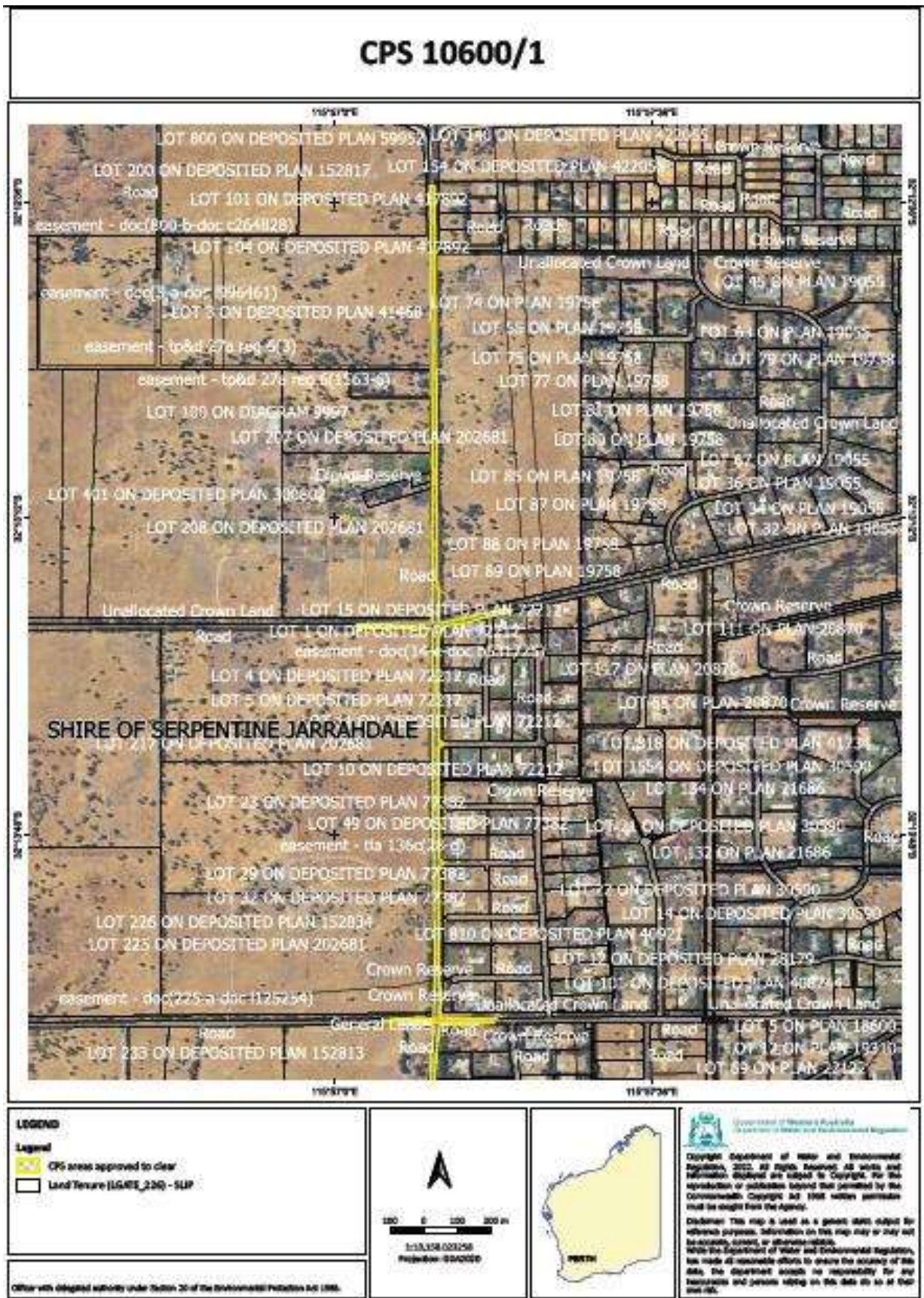


Figure 1: Map of the boundary of the area within which clearing may occur

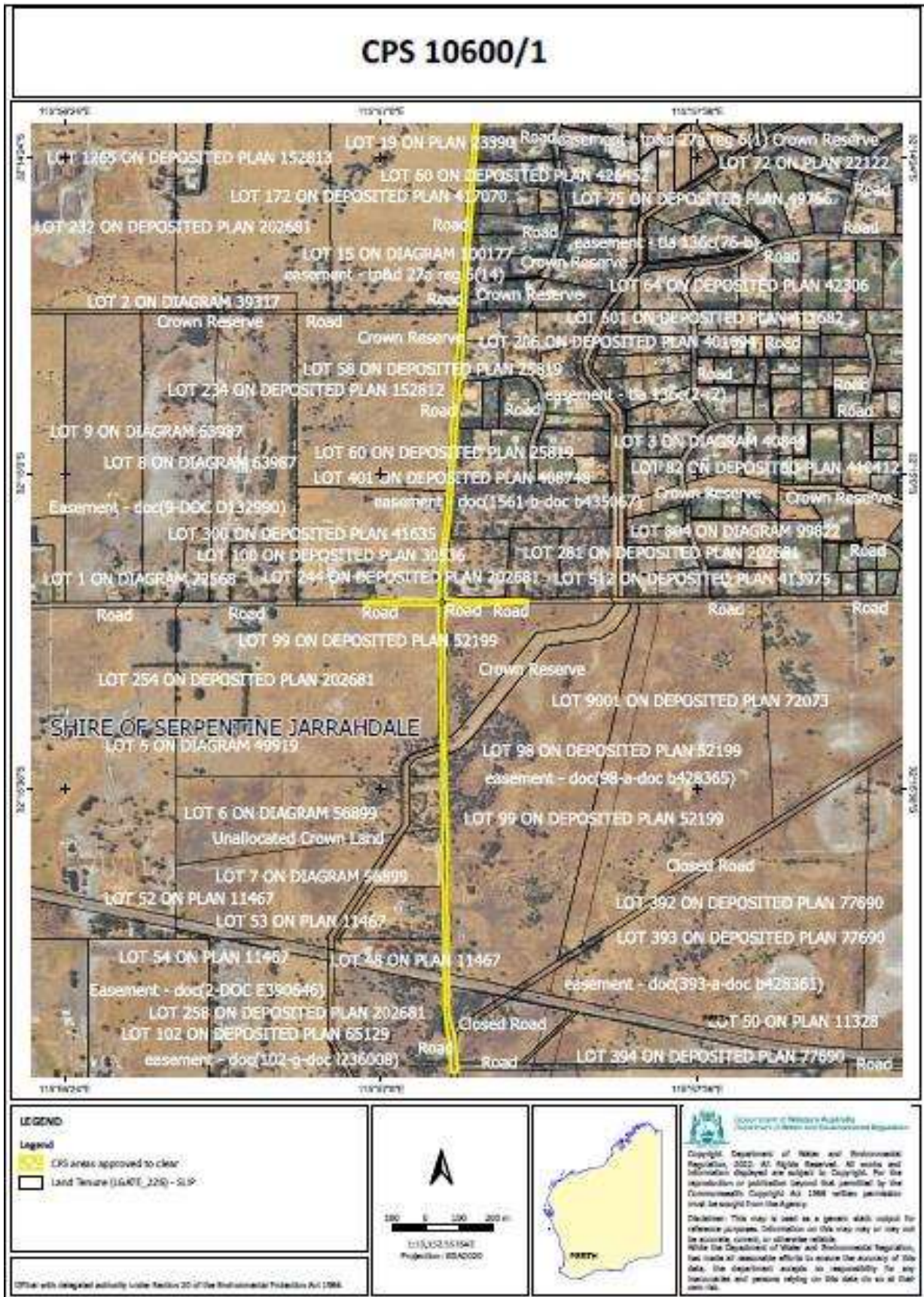


Figure 2: Map of the boundary of the area within which clearing may occur



Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 10600/1
Permit type:	Purpose permit
Applicant name:	Shire of Serpentine- Jarrahdale
Application received:	30 April 2024
Application area:	3.31 hectares of native vegetation
Purpose of clearing:	Road upgrades
Method of clearing:	Mechanical
Properties:	Abernethy Road reserve (PIN 11614507 and PIN 11756240) Bishop Road reserve (PIN 11610737) Elwood Road reserve (PIN 12016446) Gossage Road reserve (PIN 11610399, PIN 11610405 and PIN 11698924) Kargotich Road reserve (PIN 11610400, PIN 11610404, PIN 11610735, PIN 11614455, PIN 11614453, PIN 11614454, PIN 11753959, PIN 11756996 and PIN 12079976) Lucca Lane Road reserve (PIN 12080038) Mckenna Drive Road reserve (PIN 1353571) Orton Road reserve (PIN11753954, PIN 11753955 and PIN 1282238)
Location (LGA area/s):	Shire of Serpentine-Jarrahdale
Localities (suburb/s):	Oakford, Cardup, Mundijong and Oldbury

1.2. Description of clearing activities

The Shire of Serpentine Jarrahdale (the Shire) is proposing to undertake the clearing of native vegetation within multiple road reserves, in the localities of Oakford, Oldbury, Mundijong and Cardup (see Figure 1, Section 1.5). The clearing is proposed to facilitate road upgrades to Kargotich road.

The applicant notes that Kargotich road is currently a single carriageway (dual lane) local road, and increased traffic and safety concerns have prompted the requirement to upgrade the road to safely support current and future traffic loads (Coterra, 2023).

The applicant notes that the road upgrade works will involve the clearing of existing vegetation, installation of subbase, road base (limestone and crushed rock) and asphalt within a defined corridor of approximately 6.6 km in length. Design of the proposed upgrades have been undertaken to minimise the extent of clearing required, such that clearing is proposed to be undertaken within 3 metres of the edge of the travel line (Coterra, 2023).

1.3. Decision on application

Decision:	Granted
Decision date:	24 September 2024
Decision area:	3.31 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 no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix A), relevant datasets (see Appendix F), the findings of biological surveys (see Appendix E), the clearing principles set out in Schedule 5 of the EP Act (see Appendix B), and 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 Kargotich road.

The assessment identified that the proposed clearing will result in:

- the loss of native vegetation that is significant foraging habitat for forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*) and 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 the adjacent vegetation and its habitat values, and
- potential land degradation.

After consideration of the available information, as well as the applicant's avoidance, 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 provides significant foraging habitat for forest red-tailed black cockatoo within an extensively cleared landscape, is considered a significant residual impact even after the application of minimisation and mitigation measures.

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 a clearing permit subject to an adequate environmental offset being provided. 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, as described above. The required offset is detailed under 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,
- provide a monetary contribution to the Part V Offsets Fund to fund the purchase of at least 21.73 hectares of high-quality foraging habitat for forest red-tailed black cockatoo and that provides significant native vegetation within an extensively cleared area.

1.5. Site maps

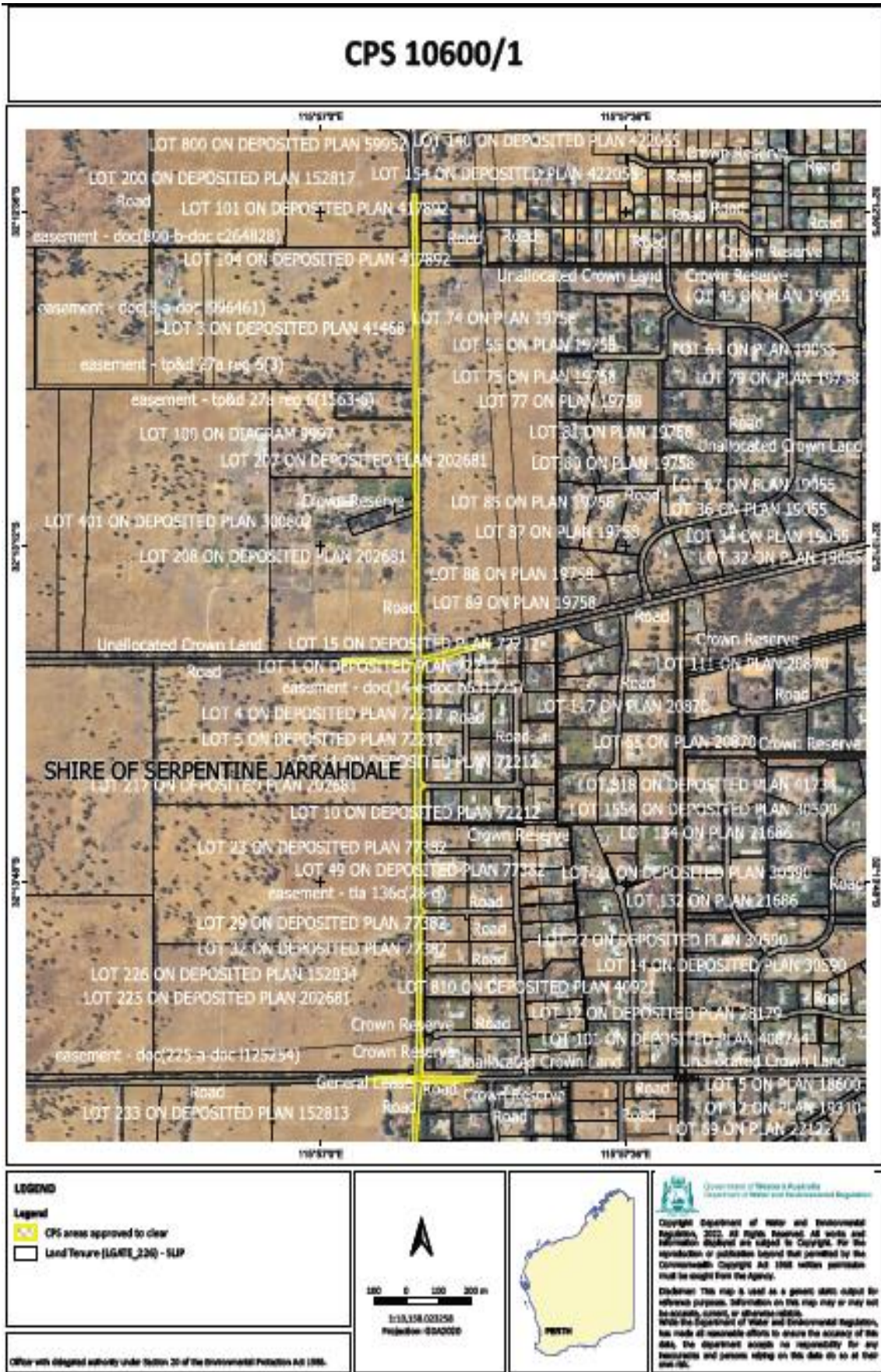


Figure 1 Map of the application area. The area cross-hatched yellow indicates the area authorised to be cleared under the granted clearing permit.

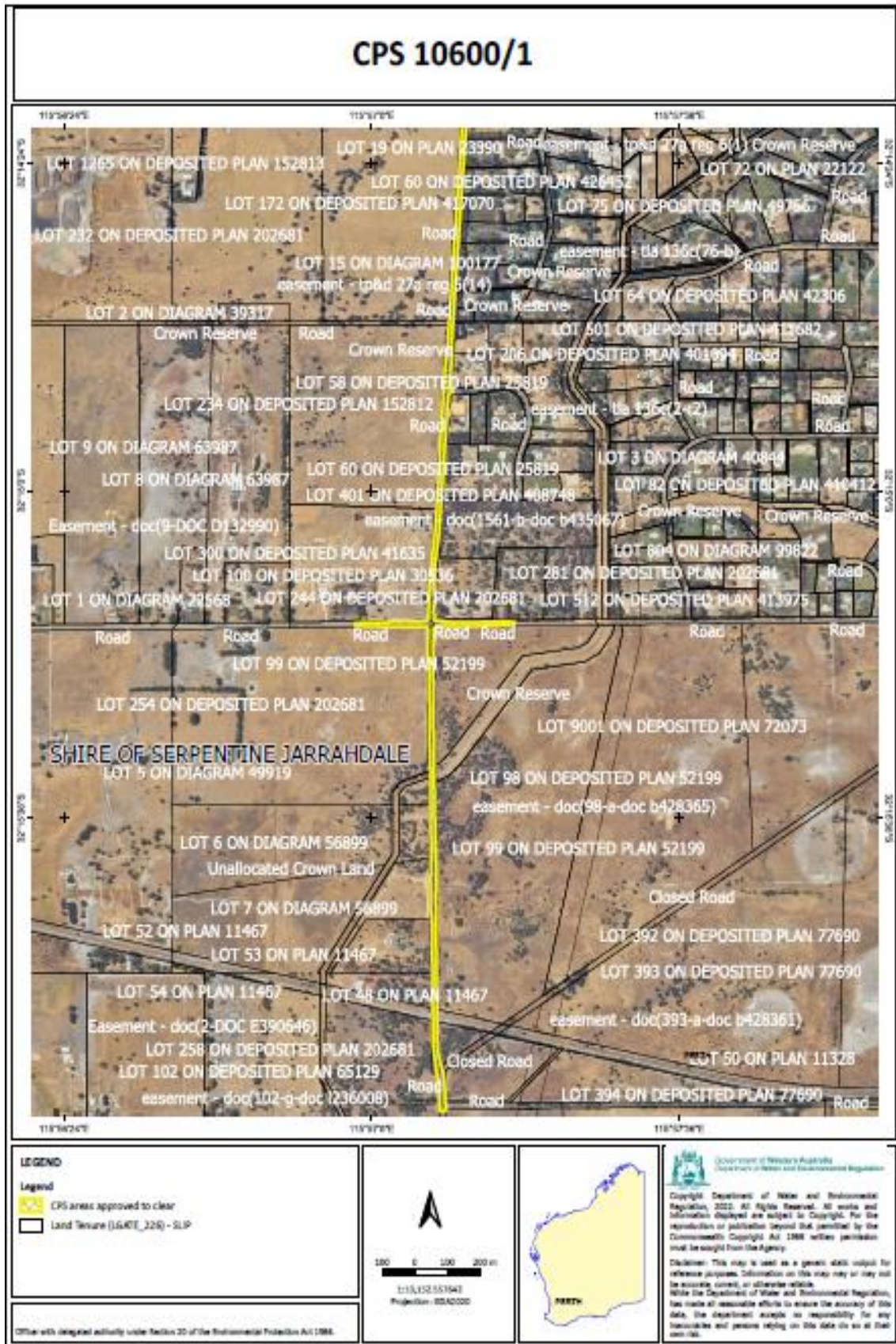


Figure 2 Map of the application area. The area cross-hatched yellow indicates the area authorised to be cleared under the granted clearing permit.

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)
- 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 endeavoured to reduce the total extent of the clearing, and has limited the extent of impact to forest red-tailed black cockatoo foraging habitat to 2.88 hectares, of the 12.5 hectares of foraging habitat identified within the broader survey area,
- 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 entirely in a degraded to completely degraded (Keighery, 1994) condition,
- The Shire has ensured that the project avoids trees with hollows that may provide breeding habitat for black cockatoos, and
- 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:

- The loss of 2.88 hectares of native vegetation that provides significant foraging habitat forest red-tailed black cockatoo, and

- The loss of 3.31 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 Government of Western Australia's *Environmental Offsets Policy* and *Environmental Offsets Guidelines*, these significant residual impacts have been addressed through the conditioning of environmental offsets on the clearing permit. The nature and suitability of the offsets provided are summarised in Section 4.

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix A), biological surveys and site information, 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 B) identified that the impacts of the proposed clearing present a risk to biological values (fauna), significant remnant vegetation and land and 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 Consulting Ecologists (Bamford), 2023), the site characteristics (Appendix A), and the habitat preferences of the conservation significant fauna species recorded in the local area (10-kilometre radius), the application area was considered to contain suitable habitat for the following fauna species:

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

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. 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.

There were 30 trees identified within the survey area with a DBH of greater than 500 millimetres (Bamford, 2023). These trees were either introduced *Eucalypts* or Flooded Gums (*Eucalyptus rudis*) and lacked hollows which could be suitable for current breeding by black cockatoos (Bamford, 2023). Of these trees, 15 occur within the application area. Noting an absence of suitable hollows for breeding within any of the trees within the application area, the proposed clearing is not likely to impact on currently suitable breeding habitat. The trees may provide roosting opportunities for black cockatoos, however no evidence of roosting was identified (Bamford, 2023).

Black cockatoo species 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). Forest red-tailed black cockatoo also commonly forages on *Allocasuarina* cones (DAWE, 2022).

Regarding the forest red-tailed black cockatoo, critical habitat for this species is defined as all marri, karri and jarrah forests, woodlands and remnants in the south-west of Western Australia receiving more than 600 millimetres of annual average rainfall (DEC, 2008). The application area has a mean annual rainfall of approximately 880-890 millimetres (BoM, 2024). While the application area is not a remnant of marri, karri, or jarrah forest, it contains 2.88 hectares of primary foraging habitat for this species in the form closed dense stands of sheoak (*Allocasuarina fraseriana*) (Bamford, 2023).

Evidence of forest red-tailed black cockatoo foraging in the form of chewed sheoak nuts was identified within the application area, as well as a flock of approximately six individuals foraging in trees within 200 metres of the application area (Bamford, 2023). The Black Cockatoo Assessment noted that the quality of the foraging habitat to forest red-tailed black cockatoo was moderate, which considered the vegetation composition, condition and structure, the context of the site, and species density (with consideration of foraging evidence) (Bamford, 2023).

Noting the above, the vegetation within the application area is considered to represent significant foraging habitat for forest red-tailed black cockatoo. This is also noting that the application area occurs within 12 kilometres of two potential forest red-tailed black cockatoo breeding sites, and multiple roost sites, and the foraging habitat present may support roosting birds and breeding effort.

The application area provides low value foraging habitat for Carnaby's cockatoo and Baudin's cockatoo due to the low number of primary foraging plants present for both species (Bamford, 2023). This is noting these species do not as readily forage on sheoak cones. Therefore, the application area is not considered to provide significant foraging habitat for these species.

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 and may even be found nesting on high city buildings (Australian Museum, 2020). This species is widespread, highly mobile and is found in various habitats. The application area may comprise suitable habitat for this species, however, noting the broad habitat preference of the species and the extent of proposed linear 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 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 linkage

Two ecological linkages intersect the application area, being linkage numbers 67 and 68 of the mapped Perth Regional Ecological Linkages dataset. These linkages run perpendicular to Kargotich 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 2.88 hectares of native vegetation that provides significant foraging habitat for forest red-tailed black cockatoo, and
- the loss of suitable habitat for quenda, peregrine falcon and Perth slider, although impacts to these species habitat is unlikely to be significant,
- 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 to forest red-tailed black cockatoo foraging habitat constitutes a significant residual impact that requires an environmental offset (refer to Section 4 for further details). It is considered that impacts to other fauna species referenced 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 - monetary contribution to the Part V Offsets Fund to fund the purchase of at least 21.73 hectares of high-quality foraging habitat for forest red-tailed black cockatoo (see section 4 for additional information), 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. 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 complex, the Beermullah Complex, and vegetation extent within the local area fall below the 30 per cent threshold (see Appendix A.2), the application area represents native vegetation 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 and the local area are both above the 10 per cent threshold for constrained areas (see Appendix A.2). However, the current vegetation extent for the Beermullah Complex is below this threshold (see Appendix A.2).

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 forest red-tailed black cockatoo, it is considered a significant remnant within an extensively cleared area.

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 3.31 hectares of native vegetation, which is considered significant as a remnant in an area that has been extensively cleared. The proposed clearing may also facilitate the spread of weeds and dieback into adjacent remnant vegetation.

As outlined above, it is considered that the risk of weed and dieback spread to nearby remnant vegetation can be managed by taking steps to minimise the risk of the introduction and spread of weeds and dieback and does not constitute a significant residual impact.

For the reasons set out above, it is considered that the impacts of the proposed clearing to significant remnant vegetation within an extensively cleared area 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 – specific actions to be undertaken to limit the introduction and transportation of dieback and weed affected materials.
- Offset - monetary offset to the Part V Offsets Fund to fund the purchase of at least 20.7 hectares of native vegetation that comprises significant native vegetation within an extensively cleared area of the Swan Coastal Plain (see section 4 for additional information).

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

Assessment

The application area is located within two subsystems (B1 and B4 phases) of the Bassendean soil system, and six 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 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 dampland area that intersects 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 this clearing permit application, the Delegated Officer had regard to the necessity of clearing, noting it is related to a public benefit through improving road safety, and appropriately supporting current and future traffic loads along this section of Kargotich road. 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 road upgrade works, 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 Lower Serpentine Surface Water Resource which is not proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act). The application area is however 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.

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 8 July 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 2.88 hectares of native vegetation that provides significant foraging habitat for forest red-tailed black cockatoo; and
- the loss 3.31 hectares of native vegetation that is a significant remnant within an extensively cleared landscape.

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

Financial offset (monetary contribution)

The applicant has proposed a monetary contribution to the Part V Offsets Fund, to adequately counterbalance the significant residual impacts of the proposed clearing.

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 in this instance. The Shire noted that it is limited in the rehabilitation opportunities that exist within its reserves and has exhausted any such options in trying to appease DWER's offset requirements.
- the magnitude of the significant residual impact to forest red-tailed black cockatoo foraging habitat, being 2.28 hectares.
- ongoing searches for other suitable and preferred offsets will delay the progress of 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 significant residual impact to forest red-tailed black cockatoo foraging habitat and native vegetation that is a significant remnant within an extensively cleared landscape. Specifically, DWER has identified that a monetary contribution to fund the purchase of 21.73 hectares of native vegetation that provides high quality foraging habitat for forest red-tailed black cockatoo, and 20.7 hectares of native vegetation that represents significant native vegetation in an extensively cleared landscape, 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 required is 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 prospects of acquiring land containing similar or better quality foraging habitat via the Part V Offsets Fund and determined that a per-hectare land value, in this instance, is appropriate and 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 \$399,614.70 will be required to fund the acquisition of 21.73 hectares of vegetation of high-quality foraging value for forest red-tailed black cockatoo, and 20.7 hectares of native vegetation that represents significant native vegetation in an extensively cleared landscape.

Conclusion

The Delegated Officer considers the offset proposed adequately counterbalances the significant residual impacts listed above and is 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 D.

End

Appendix A. Site characteristics

A.1. Site characteristics

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

Characteristic	Details
Local context	<p>The area proposed to be cleared comprises 3.31 hectares of roadside 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.</p> <p>Spatial data indicates the local area (10-kilometre radius from the centre of the area proposed to be cleared) retains approximately 26.71 per cent of the original native vegetation cover.</p>
Ecological linkage	The application area intersects Perth Regional Linkages 67, 68.
Conservation areas	The nearest conservation area is Jandakot Regional Park which is located approximately 208 metres west of the application area.
Vegetation description	<p>Six vegetation and substrate associations were recorded within the application area during a vegetation survey (Coterra, 2023). The full survey descriptions and maps area available in Appendix E.</p> <ul style="list-style-type: none"> • VSA 1: Sheoak stands. Closed dense stands of Sheoak (<i>Allocasuarina fraseriana</i>) with no midstorey and understorey consisting of invasive grasses and weeds. • VSA 2: Melaleuca dampland. Closed dampland of <i>Melaleuca raphiophylla</i> with midstorey of scattered <i>Kunzea</i> and understorey of invasive weeds and grasses on dark grey sand. Appears to be seasonally inundated. • VSA 3: Flooded gum stands. Closed dense stands of Flooded Gum (<i>Eucalyptus rudis</i>) with no midstorey and understorey consisting of invasive grasses and weeds. • VSA 4: Planted Eucalypts. Open woodland of scattered planted mature trees such as <i>Eucalyptus camaldulensis</i> over grassy understorey on grey-white sand. • VSA 5: Xanthorrhoea shrubland. Consisting of moderate density <i>Xanthorrhoea pressii</i> with introduced grasses scattered with disturbance species of plants and weeds with occasional <i>Acacia saligna</i> on grey-white sand. • VSA 6: Open areas. Disturbed open areas ranging from introduced grasses scattered with disturbance species of plants and weeds with occasional <i>Acacia saligna</i> on grey-white sand. <p>The broadscale vegetation complex mapped over the application area is:</p> <ul style="list-style-type: none"> • Beermullah Complex: Mixture of low open forest of <i>Casuarina obesa</i> (Swamp Sheoak) and open woodland of <i>Corymbia calophylla</i> (Marri) - <i>Eucalyptus wandoo</i> (Wandoo) - <i>Eucalyptus marginata</i> (Jarrah). Minor components include closed scrub of <i>Melaleuca</i> species and occurrence of <i>Actinostrobus pyramidalis</i> (Swamp Cypress). (Hedde et al, 1980). This complex retains approximately 6.67 per cent of the original extent (Government of Western Australia, 2019).
Vegetation condition	<p>The flora and vegetation survey indicates the vegetation within the proposed clearing area is in a degraded to completely degraded (Keighery, 1994) condition (Coterra, 2023). The full Keighery (1994) condition rating scale is provided in Appendix C. Representative photos and the full survey descriptions and mapping are available in Appendix E.</p>
Climate and landform	The region experiences a Mediterranean climate with cool winters and hot summers with a mean annual rainfall of 850-900 mm.

Characteristic	Details																		
Soil description	<p>The soil within the application area is mapped as the following subsystems (DPIRD, 2024):</p> <table border="1" data-bbox="432 241 1461 1641"> <thead> <tr> <th data-bbox="432 241 951 282">Subsystem</th> <th data-bbox="951 241 1461 282">Description</th> </tr> </thead> <tbody> <tr> <td data-bbox="432 282 951 472">212Bs_B4</td> <td data-bbox="951 282 1461 472">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 data-bbox="432 472 951 685">213Pj_B1</td> <td data-bbox="951 472 1461 685">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 data-bbox="432 685 951 875">213Pj_P1d</td> <td data-bbox="951 685 1461 875">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.</td> </tr> <tr> <td data-bbox="432 875 951 1077">213Pj_P2a</td> <td data-bbox="951 875 1461 1077">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.</td> </tr> <tr> <td data-bbox="432 1077 951 1211">213Pj_P5</td> <td data-bbox="951 1077 1461 1211">Poorly drained flats, commonly with gilgai microrelief and with deep black grey to olive-brown cracking clays with subsoils becoming alkaline.</td> </tr> <tr> <td data-bbox="432 1211 951 1335">213Pj_P7</td> <td data-bbox="951 1211 1461 1335">Seasonally inundated swamps and depressions with very poorly drained variable acidic mottled yellow and grey sandy duplex and effective duplex soils.</td> </tr> <tr> <td data-bbox="432 1335 951 1514">213Pj_P8</td> <td data-bbox="951 1335 1461 1514">Broad poorly drained flats and poorly defined stream channels with moderately deep to deep sands over mottled clays; acidic or less commonly alkaline grey and yellow duplex soils to uniform bleached or pale brown sands over clay.</td> </tr> <tr> <td data-bbox="432 1514 951 1641">213Pj_P11</td> <td data-bbox="951 1514 1461 1641">Shallow brown loamy soils or less commonly, very shallow sands over ironstone pavement which is a clear barrier to drainage.</td> </tr> </tbody> </table>	Subsystem	Description	212Bs_B4	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.	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_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_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_P5	Poorly drained flats, commonly with gilgai microrelief and with deep black grey to olive-brown cracking clays with subsoils becoming alkaline.	213Pj_P7	Seasonally inundated swamps and depressions with very poorly drained variable acidic mottled yellow and grey sandy duplex and effective duplex soils.	213Pj_P8	Broad poorly drained flats and poorly defined stream channels with moderately deep to deep sands over mottled clays; acidic or less commonly alkaline grey and yellow duplex soils to uniform bleached or pale brown sands over clay.	213Pj_P11	Shallow brown loamy soils or less commonly, very shallow sands over ironstone pavement which is a clear barrier to drainage.
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213Pj_P11	Shallow brown loamy soils or less commonly, very shallow sands over ironstone pavement which is a clear barrier to drainage.																		
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	<p>The application area lies within two MUW's, these being the Armadale Paluspain (UFI 15797) and an unnamed Palusplain (UFI 16021). The application area also intersects one artificial drain, being the Cardup Brook Drain and multiple other minor drains to serve to remove water for local agricultural land.</p> <p>The application area is located within the Serpentine Groundwater Area which is proclaimed under the <i>Rights in Water and Irrigation Act 1914</i> (RIWI Act).</p> <p>Groundwater salinity within the application area is mapped at 500 – 1000 milligrams</p>																		

Characteristic	Details
	per litre total dissolved solids.
Flora	<p>The desktop assessment identified that a total of 58 conservation significant flora species have been recorded within the local area, comprising of 15 threatened flora species and 43 priority flora species (Western Australian Herbarium, 1998-).</p> <p>None of these existing records occur within the application area, with the closest record being an occurrence of <i>Babingtonia urbana</i> (P3), approximately 60 metres from the application area. No threatened or priority flora species were recorded during a spring site inspection of the application area, undertaken by Coterra in 2023.</p>
Ecological communities	<p>The desktop assessment identified that there are no conservation significant ecological communities within the application area. The closest mapped Threatened Ecological Community (TEC) is the <i>Corymbia calophylla Kingia australis</i> woodlands on heavy soils (floristic community type 3a as originally described in Gibson et al. 1994) which is located 0.8 kilometres east of the application area. The application area is not considered representative of any TECs or PECs.</p>
Fauna	<p>The desktop assessment identified that a total of 45 conservation significant fauna species have been recorded within the local area including 14 threatened species, 14 priority species, 16 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 <i>Isoodon fusciventer</i> approximately 100 metres from the application area. Forest red-tailed black cockatoo was identified foraging within the application area.</p>

A.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					
Beermullah Complex *	6707.27	447.21	6.67	142.62	2.13
Local area					
10km radius	44331.55	11840.10	26.71	-	-

*Government of Western Australia (2019)

A.3. Fauna analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix F.1), 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]	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Calyptorhynchus banksii naso</i> (forest red-tailed black cockatoo)	VU	Y	Y	221	Y
<i>Zanda latirostris</i> (Carnaby's cockatoo)	EN	Y	N	1014	Y
<i>Zanda baudinii</i> (Baudin's cockatoo)	EN	Y	N	121	Y
<i>Falco peregrinus</i> (peregrine falcon)	OS	Y	Y	36	Y
<i>Isodon fusciventer</i> (quenda)	P4	Y	Y	1104	Y
<i>Lerista lineata</i> (Perth slider, lined skink)	P3	Y	Y	39	Y

Appendix B. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
<p><u>Principle (a):</u> <i>“Native vegetation should not be cleared if it comprises a high level of biodiversity.”</i></p> <p><u>Assessment:</u> The application area is in a degraded to completely degraded (Keighery, 1994) condition, and is unlikely to contain conservation listed flora or ecological communities, however, it contains significant foraging habitat for forest red-tailed black cockatoo.</p>	May be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (b):</u> <i>“Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna.”</i></p> <p><u>Assessment:</u> The application area contains significant foraging habitat for 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.</p>	At variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (c):</u> <i>“Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</i></p> <p><u>Assessment:</u> The application area is unlikely to contain habitat for threatened flora species, noting the degraded to completely degraded (Keighery, 1994) condition of the application area with a weed dominated understorey (Coterra, 2023) and lack of suitable habitat for threatened flora known from the local area.</p>	Not likely to be at variance	No
<p><u>Principle (d):</u> <i>“Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community.”</i></p> <p><u>Assessment:</u> The application area does not comprise of vegetation types that are representative of any known threatened ecological communities (Coterra, 2023).</p>	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		
<p><u>Principle (e):</u> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u> The extent of the mapped vegetation type and native vegetation in the local area is inconsistent with the national objectives and targets for biodiversity conservation in Australia.</p>	At variance	Yes <i>Refer to Section 3.2.2, above.</i>
<p><u>Principle (h):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.”</i></p> <p><u>Assessment:</u> Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of nearby conservation areas.</p>	Not likely to be at variance	No
Environmental value: land and water resources		
<p><u>Principle (f):</u> <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment:</u> Given that two multiple use wetlands are mapped within the application area, and riparian vegetation types were recorded within the</p>	At variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
<p>application area (VSA's 2 and 3) the proposed clearing will impact on vegetation growing in association with a wetland.</p> <p>The portions of these much larger mapped wetland occurrences that intersect the application area are highly modified, and the proposed clearing of vegetation in a degraded to completely degraded (Keighery, 1994) condition, is not expected to have a significant impact on the broader riparian habitat that occurs within these mapped wetlands.</p>		
<p>Principle (g): <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p>Assessment: The mapped soils within the application area are highly susceptible to subsurface acidification and phosphorus export. Noting the extent of proposed clearing, location of the application area, and the condition of the vegetation, the proposed clearing is not likely to result in appreciable land degradation.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.3, above.</i>
<p>Principle (i): <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.”</i></p> <p>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 (considered likely in the dampland area associated with VSA 2).</p> <p>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.</p>	Not likely to be at variance	No
<p>Principle (j): <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</i></p> <p>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.</p>	Not at variance	No

Appendix C. 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.

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

Appendix D. Offset calculator value justification

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.
Conservation significance of environmental value	Terrestrial native vegetation complex - <10% extent remaining in a constrained area.	The vegetation within the application area occurs within a local area (10-kilometre radius) that retains 26.71 per cent of its original vegetation extent. The application area is mapped as the 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) / Type of feature	3.31	The entirety of the application area is mapped as the Beermullah Complex and therefore all of the native vegetation proposed for clearing is considered a significant remnant within an extensively cleared area.

Calculation	Score (Area)	Rationale
Quality (scale) / Number	5.00	The vegetation within the application area predominantly consists of open areas, stands of sheoak, planted native vegetation, bare areas and isolated paddock trees in Completely Degraded to Degraded (Keighery, 1994) condition (Coterra, 2023). In considering the above, the site context, and the value of the vegetation as foraging habitat for forest red-tailed black cockatoo, a moderate quality score was attributed to this environmental value.
Offset		
Description	Acquisition and conservation	An offset involving the acquisition and conservation in perpetuity of an offset site that contains native vegetation that is significant as a remnant in an area that has been extensively cleared.
Proposed offset (area in hectares)	20.7	The acquisition and conservation in perpetuity of 20.7 hectares of native vegetation that comprises significant remnant native vegetation in an area that has been extensively cleared is required to counterbalance 100% of the significant residual impact to this environmental value. 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 significant remnant vegetation in a highly cleared landscape 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 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.

Forest red-tailed black cockatoo foraging habitat

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

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	2.88	The application area includes 2.88 hectares of sheoak (<i>Allocasuarina fraseriana</i>) that provides primary foraging habitat for forest red-tailed black cockatoo on the Swan Coastal Plain (Bamford, 2023).
Quality (scale) / Number	6.00	While the application area is largely in a degraded to completely degraded condition, it is located within 10 kilometres of 47 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)	21.73	The acquisition and conservation of 21.73 hectares of native vegetation that comprises significant foraging habitat for forest red-tailed black cockatoo will offset 100 per cent of the significant residual impact to this value. Note , an offset site has not yet been identified for this calculation, therefore presumptions have been made for the below values.

Calculation	Score (Area)	Rationale
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 value to forest red-tailed black cockatoos 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 for conservation purposes 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 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 in perpetuity.
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 transferred into conservation estate within 3 years of clearing.
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.

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



Figure 3 VSA 1 Sheoak stands, only one native species was identified within this VSA (Coterra, 2023)



Figure 4 VSA 1 Sheoak stands, only one native species was identified within this VSA (Coterra, 2023)

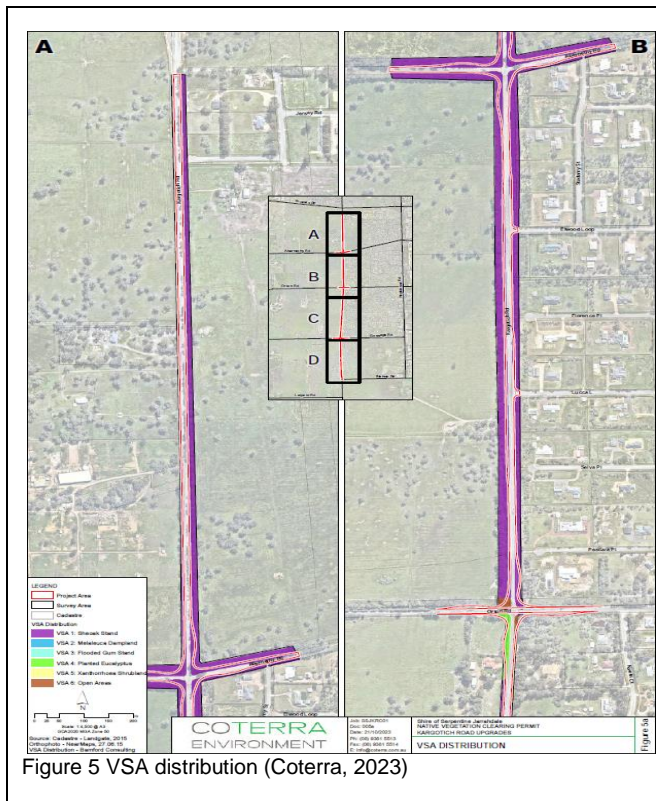


Figure 5 VSA distribution (Coterra, 2023)

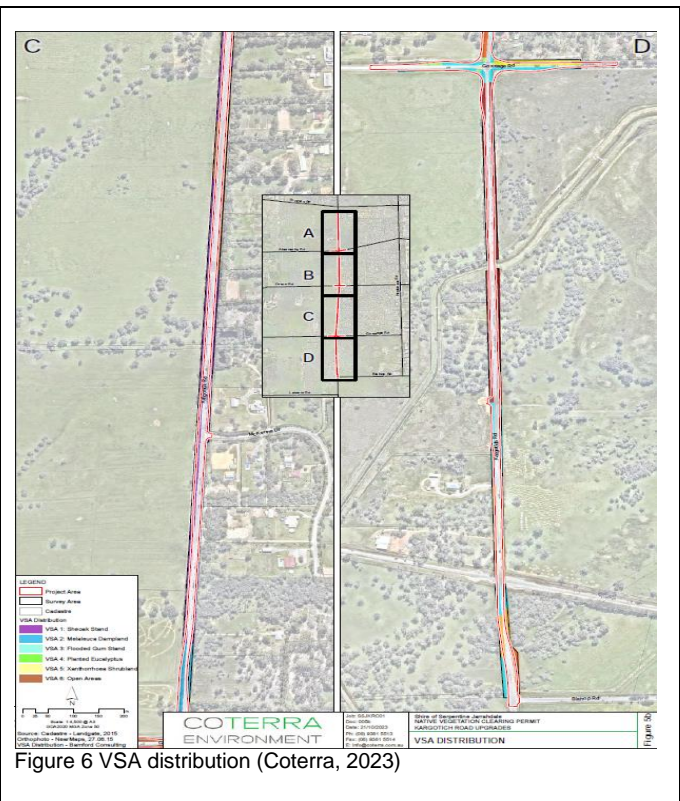


Figure 6 VSA distribution (Coterra, 2023)

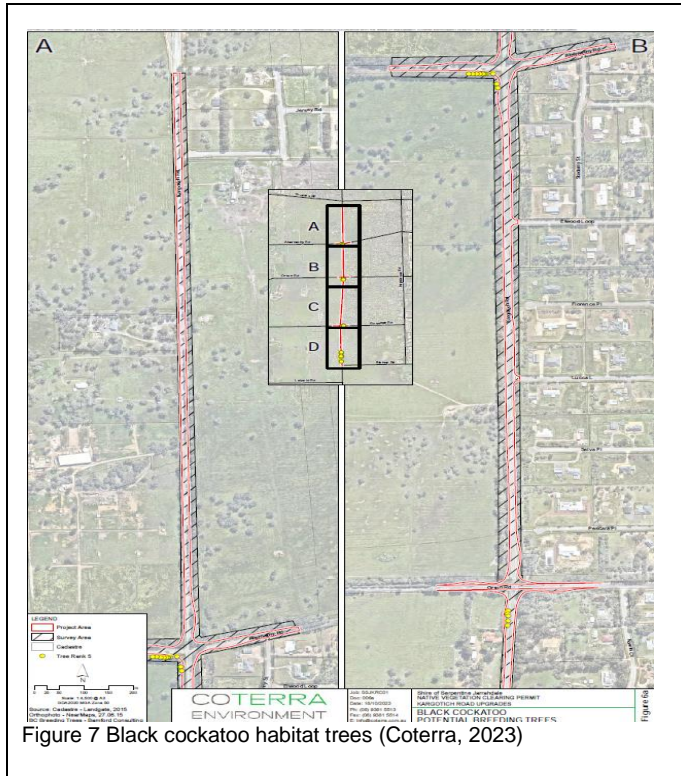


Figure 7 Black cockatoo habitat trees (Coterra, 2023)

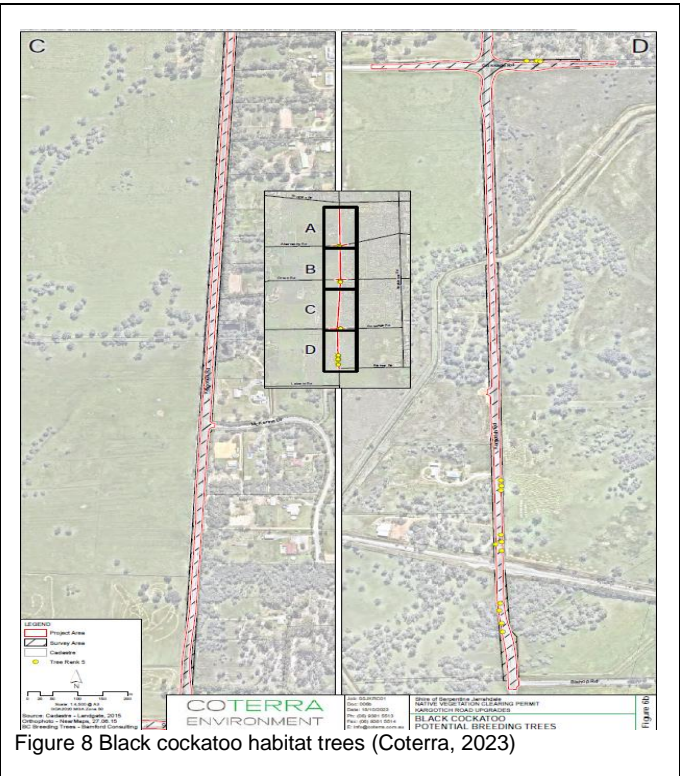


Figure 8 Black cockatoo habitat trees (Coterra, 2023)

Appendix F. Sources of information

F.1. GIS databases

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

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- 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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