



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

PERMIT DETAILS

Area Permit Number: CPS 8919/1
File Number: DWERVT5821
Duration of Permit: From 11 September 2020 to 11 September 2022

PERMIT HOLDER

Shire of Serpentine-Jarrahdale

LAND ON WHICH CLEARING IS TO BE DONE

Anketell Road reserve (PIN 11756223), Oakford

AUTHORISED ACTIVITY

The Permit Holder shall not clear more than 0.2267 hectares of native vegetation within the areas cross-hatched yellow on attached Plan 8919/1a, Plan 8919/1b, Plan 8919/1c, Plan 8919/1d, Plan 8919/1e and Plan 8919/1f.

CONDITIONS

1. Avoid, minimise and reduce the impacts and extent of clearing

In determining the amount of native vegetation to be cleared authorised under this Permit, the Permit Holder must have regard to the following principles, set out in order of preference:

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

2. Dieback and weed control

When undertaking any clearing or other activity authorised under this Permit, the Permit Holder must take the following steps to minimise the risk of the introduction and spread of *weeds* and *dieback*:

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

3. Directional of clearing

The Permit Holder shall conduct clearing in a slow progressive manner from one direction to the other (e.g. east to west) to allow fauna to move into adjacent native vegetation ahead of the clearing activity.

4. Records to be kept

The Permit Holder must maintain the following records in relation to the clearing of native vegetation authorised under this Permit:

- (a) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
- (b) the date(s) that the area was cleared;
- (c) the size of the area cleared (in hectares);

- (d) direction of clearing;
- (e) actions taken to avoid, minimise and reduce the impacts and extent of clearing in accordance with condition 1 of this Permit; and
- (f) actions taken to minimise the risk of the introduction and spread of *weeds* and *dieback* in accordance with condition 2 of this Permit.

5. Reporting

The Permit Holder must produce the records required under condition 4 of this Permit when required by the *CEO*.

Definitions

The following meanings are given to terms used in this Permit:

CEO means the Chief Executive Officer of the Department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*;

dieback means the effect of *Phytophthora* species on native vegetation;

fill means material used to increase the ground level, or fill a hollow;

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;

weed/s 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 Regional Weed Rankings Summary, regardless of ranking; or
- (c) not indigenous to the area concerned.



Mathew Gannaway
MANAGER
NATIVE VEGETATION REGULATION

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


19 August 2020

Plan 8919/1a




Legend

CPS layers

 CPS areas approved to clear


base layers

 Road Centrelines

 Cadastre - LGATE 218

Local Government Authority (LGA) Boundaries (LGATE-233)




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Officer delegated under section 20 of the Environmental Protection Act 1986



GOVERNMENT OF WESTERN AUSTRALIA

Plan 8919/1b






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Plan 8919/1c



Legend

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 CPS areas approved to clear


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 Road Centrelines
 Cadastre - LGATE 218

Local Government Authority (LGA) Boundaries (LGATE-233)

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Officer delegated under section 20 of the Environmental Protection Act 1986



GOVERNMENT OF WESTERN AUSTRALIA

Plan 8919/1d

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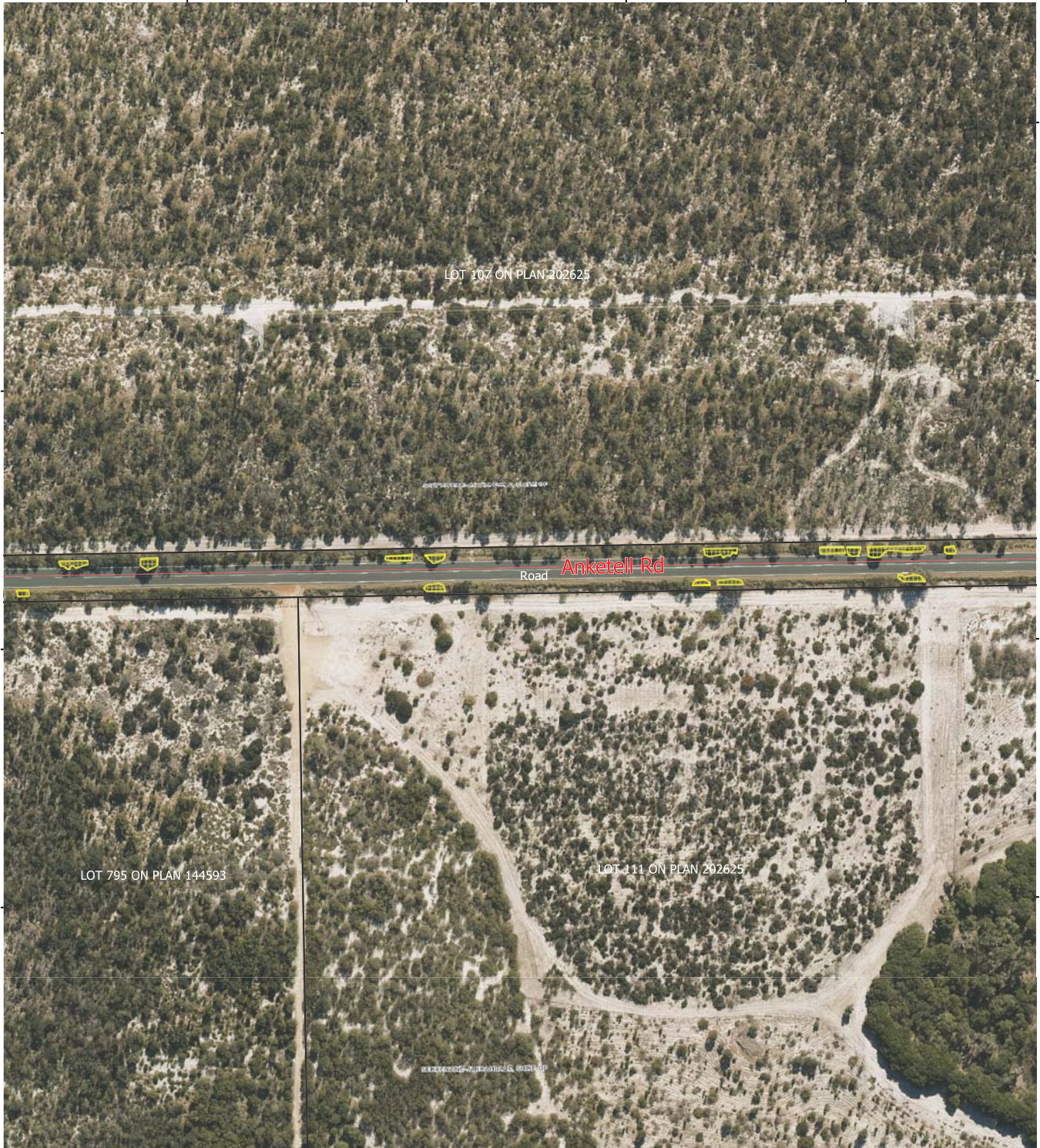
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
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 Road Centrelines

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Local Government Authority (LGA) Boundaries (LGATE-233)



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GOVERNMENT OF
WESTERN AUSTRALIA

Plan 8919/1e

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
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Environmental Protection Act 1986



GOVERNMENT OF
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Plan 8919/1f

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
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
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Legend

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 CPS areas approved to clear

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 Road Centrelines

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Local Government Authority (LGA) Boundaries (LGATE-233)



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Environmental Protection Act 1986



GOVERNMENT OF
WESTERN AUSTRALIA



1. Application details and outcome

1.1 Permit application details

Permit number:	CPS 8919/1
Permit type:	Area permit
Applicant name:	Shire of Serpentine-Jarrahdale
Application received:	22 May 2020
Proposed clearing:	0.2267 hectares (ha) of native vegetation (as revised from 0.722 ha – see Figures 1 and 2, Section 1.5)
Purpose of clearing:	Road upgrades
Method of clearing:	Mechanical removal
Property:	Anketell Road reserve (PIN 11756223)
Location (LGA area/s):	Shire of Serpentine-Jarrahdale
Localities (suburb/s):	Oakford

1.2 Description of clearing activities

The application area comprises selected trees and shrubs adjacent to an existing road formation, within a broader road reserve that has a part in maintaining connectivity between remnants in the local area¹. The application form states that the total area of clearing is 0.5933 ha of native vegetation for the purpose of road upgrades and widening to make the road safer, with the final land use being road corridor and maintenance area. On digitising, this was amended to 0.722 ha of proposed clearing. In response to DWER's request for further information on how environmental impacts could be minimised, the applicant reduced this to 0.2267 ha (see Appendix A). The extent of the proposed clearing (as revised) is indicated in Figure 1 (see Section 1.5).

1.3 Decision on application

Decision:	Granted
Decision date:	19 August 2020
Decision area:	0.2267 ha of native vegetation (see Figure 2, Section 1.5)

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 application was advertised for 21 days and no public submissions were received.

In undertaking the assessment, the Delegated Officer had regard for the site characteristics (see Appendix B), relevant datasets (see Appendix F), the findings of a site inspection (see Appendix E), the clearing principles set out in Schedule 5 of the EP Act (see Appendix C), and any other matters considered relevant to the assessment (see Section 3). The assessment identified that the proposed clearing will result in the loss of vegetation that:

- is part of a broader remnant within the road reserve that comprises 'high quality' (but not significant) foraging habitat for three threatened black cockatoo species
- is in an extensively cleared area
- may be utilised by fauna to move through the landscape
- is growing in association with a mapped 'resource enhancement' wetland (dampland)
- is part of a broader remnant within the road reserve that may be representative of and may be necessary for the maintenance a priority ecological community (PEC) which has been mapped within adjacent vegetation, and in this context may be biologically diverse compared with other road reserves in the local area
- may be necessary for the maintenance of the environmental values of adjacent conservation areas.

¹ For this application, the local area is defined as a 10-kilometre radius from the perimeter of the application area.

The proposed clearing also has the potential to result in the introduction and spread of weeds and dieback into adjacent vegetation, which could impact on its habitat quality and connectivity.

The Delegated Officer considered the impacts of the proposed clearing are unlikely to have any long-term adverse impacts on the hydrological and ecological values of the wetland, that weed and dieback management practices will mitigate any potential impacts to adjacent vegetation.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures, the Delegated Officer determined that the impacts of the proposed clearing could be minimised and managed to be environmentally acceptable. The Delegated Officer decided to grant a clearing permit subject to conditions to:

- avoid, minimise and reduce the impacts and extent of clearing
- conducting clearing in a slow, progressive manner towards the areas of adjacent remnant vegetation will minimise impacts to fauna individuals that may be present at the time of clearing
- take steps to minimise the risk of the introduction and spread of weeds and dieback.

1.5 Site map

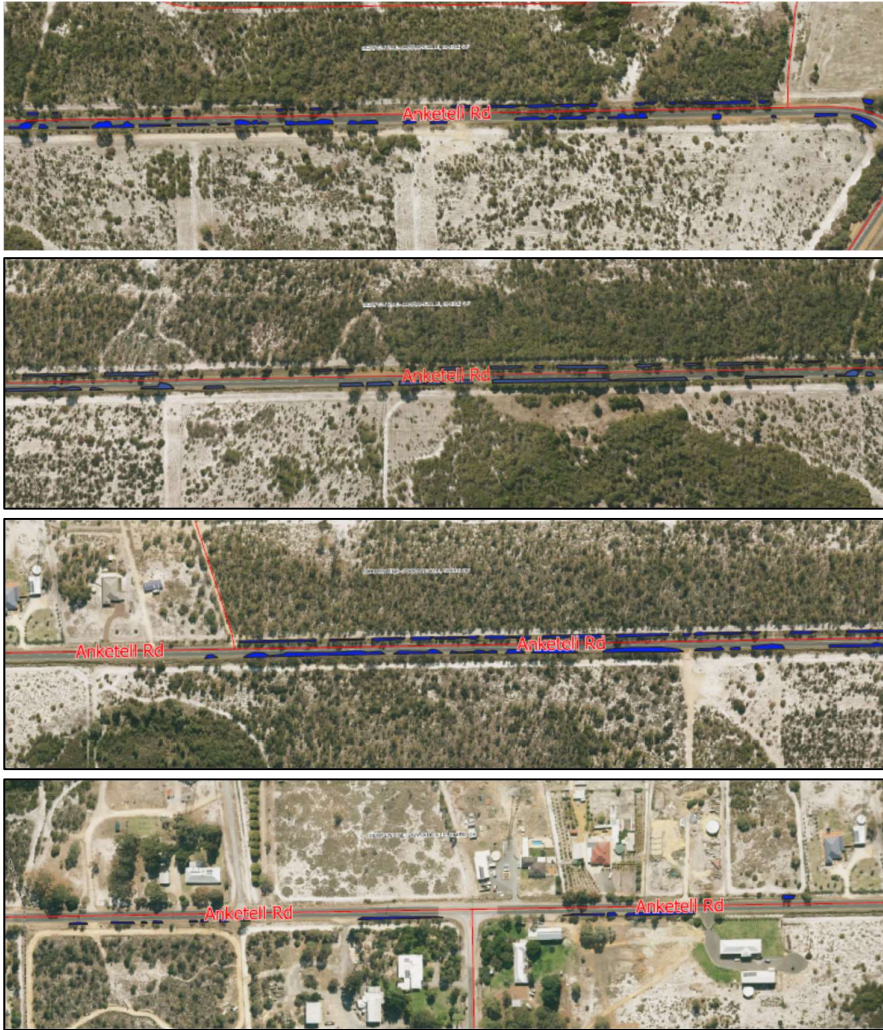


Figure 1: Map of original application area. The area shaded blue indicates the original extent of proposed clearing (0.722 ha). Images east (top) to west.



Figure 2: Map of revised application area. The area shaded yellow indicates the extent of clearing authorised (0.2267 ha). Images east (top) to west.

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 1.3), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

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

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA)
- *Conservation and Land Management Act 1984* (WA)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth)
- *Rights in Water and Irrigation Act 1914*.

Relevant policies considered during the assessment were:

- *WA Environmental Offsets Policy* (2011)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DWER, December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019).

3. Detailed assessment of application

3.1 Avoidance and mitigation measures

The application form states that only those plants that are too close to the road works will be removed, that the applicant will prioritise pruning to removal when possible, and that kerbing and crash barriers will be installed to reduce the amount of clearing where possible.

In response to DWER's request for further information on how environmental impacts could be minimised, the applicant reduced the proposed clearing to 0.2267 ha, representing a 68.6 per cent reduction (see Appendix A).

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

3.2 Assessment of environmental impacts

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix B), and considered the extent to which the impacts of the proposed clearing (as revised) present a risk to environmental values and whether these can be managed to be environmentally acceptable. The assessment against the clearing principles is contained in Appendix C.

This assessment identified that the impacts of the proposed clearing (as revised) present a risk to fauna habitat (including for threatened fauna), adjacent vegetation which includes a priority ecological community (PEC), vegetation considered to be significant as a remnant in an extensively cleared area, and wetland habitat. 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 Fauna

Assessment

A site inspection undertaken by DWER and photographs provided by the applicant indicate that the original application area contains candle banksia (*Banksia attenuata*), sheoak (*Allocasuarina fraseriana*), spearwood (*Kunzea glabrescens*), woollybush (*Adenanthos cygnorum*), grasstree (*Xanthorrhoea preissii*), WA Christmas tree (*Nuytsia floribunda*), zamia (*Macrozamia* sp.), moonah (*Melaleuca preissiana*) and/or swamp paperbark (*Melaleuca raphiophylla*) and blueboy (*Stirlingia latifolia*), with emergent firewood banksia (*Banksia menziesii*) (unconfirmed), holly-leaf banksia (*Banksia illicifolia*) and wattle (*Acacia* sp.), with occasional non-local *Acacia* and *Eucalyptus* species, over unidentified Myrtaceae and other shrubs and a ground layer dominated by grassy weeds.

The applicant advised that the proposed clearing (as revised) is limited to individual trees and shrubs, including 30 x *Banksia* and 26 x sheoak trees (see Appendix A).

Mapping undertaken by the Roadside Conservation Committee in September 2005 identified that the vegetation within the Anketell Road reserve had mainly 'high' conservation value (including approximately 96 per cent of the application area), and that the balance had 'medium-high' conservation value (including the balance of the application area). This mapping took into account the condition of the vegetation at that time based on structure, composition, floristic diversity and weed cover (Roadside Conservation Committee, 2006). Since then the vegetation condition has declined, and currently ranges from good to degraded to completely degraded condition.

Available aerial imagery and spatial datasets indicate that the vegetation within the Anketell Road reserve (including that proposed to be cleared) is contiguous with adjacent large patches of remnant vegetation contained in Crown freehold lands managed by the Department of Biodiversity, Conservation and Attractions (DBCA) (see Section 3.2.5). No mapped ecological linkages occur in the local area, although it is acknowledged that the vegetation within the broader road reserve has a part in providing a buffer to and maintaining connectivity between adjacent and nearby remnants.

Twelve threatened, 13 priority, one 'conservation dependent' and one 'other specially protected' fauna, and 19 fauna protected under an international agreement, have been recorded in the local area. In forming a view on the likelihood of these species occurring within the application area, the preferred habitat types and typical home ranges of these species and their recorded proximity to the application area were considered, along with the type and condition of the vegetation within the application area.

Five threatened, four priority, one 'conservation dependent' and one 'other specially protected' fauna have been recorded within or in close proximity to the application area, within an adjacent remnant (noting that the vegetation is contiguous) and/or from similar vegetation/habitat as found within the application area:

- Forest red-tailed black cockatoo (*Calyptorhynchus banksii* subsp. *naso*; Vulnerable), Carnaby's black cockatoo (*Calyptorhynchus latirostris*; Endangered) and Baudin's black cockatoo (*Calyptorhynchus baudinii*; Endangered): Published literature sets out the habitat preferences of these species, which includes *Banksia* and sheoak for foraging (Department of Environment and Conservation, 2008; Department of Parks and Wildlife, 2013; Department of Sustainability, Environment, Water, Population and Communities, 2012; Department of the Environment and Energy, 2017; Department of the Environment, Water, Heritage and the Arts, 2009; Environmental Protection Authority, 2019; Johnstone et al., 2011; Shah, 2006; Valentine and Stock, 2008). The forest red-tailed black cockatoo has been recorded adjacent to (approximately 3 m from) the application area, and Carnaby's black cockatoo and Baudin's black cockatoo have been recorded approximately 530 m and 5.7 km from the application area respectively. In relation to Carnaby's black cockatoo, the application area is approximately 470 m from the nearest confirmed roosting site, within 10 km of unconfirmed breeding sites, and approximately 19 km from a confirmed breeding site. The vegetation within the application area has value as foraging habitat for these species; this foraging habitat is considered to be of 'high quality' based on Commonwealth guidance, that is, the vegetation proposed to be cleared comprises woodland dominated by Proteaceous species (Department of the Environment and Energy, 2017). The applicant advised that the revised application area (reduced by 68.6 per cent from 0.722 ha to 0.2267 ha) contains 30 x *Banksia* and 26 x sheoak, which are estimated to account for approximately two-thirds of the proposed clearing (approximately 0.15 ha). With regard for this and the presence of adjacent large patches of remnant vegetation (totalling approximately 900 ha in size), the impacts of the proposed clearing on foraging habitat for black cockatoo species is unlikely to be significant. The species proposed to be cleared does not contain suitable breeding or roosting habitat for black cockatoos.
- Chuditch/western quoll (*Dasyurus geoffroii*; Vulnerable): Chuditch use a range of habitats including forest, mallee shrublands, woodland and desert. The most dense populations have been found in riparian jarrah forest. Chuditch require adequate numbers of suitable den and refuge sites (horizontal hollow logs or earth burrows) and sufficient prey biomass (large invertebrates, reptiles and small mammals) to survive. They are capable of travelling long distances and have large home ranges, and even at their most abundant, chuditch are generally present in low numbers. For this reason they require habitats that are of a suitable size and not excessively fragmented (Department of Environment and Conservation, 2012a). The nearest record is approximately 650 m from the application area, recorded in 2009. Photographs provided by the applicant and available aerial photograph indicate that the application area may be utilised as a corridor for movement of this species.
- Numbat (*Myrmecobius fasciatus*; Endangered): Numbats have historically been present in a large variety of habitat types, including eucalypt forest, eucalypt woodland, *Acacia* woodland and *Triodia* grassland. Numbats need large areas of natural woodland vegetation because of their relatively large home ranges and limited food resources. Habitat that allows for natural expansion of the species distribution and habitat linking existing subpopulations are also considered critical (Department of Parks and Wildlife, 2017). The nearest record is approximately 5.5 km from the application area. Photographs provided by the applicant and available aerial photography indicate that the application area may be utilised as a corridor for movement of this species.

- Short-tongued bee (*Leioproctus contrarius*; Priority 3): Known or likely to occur in the Commonwealth-listed 'Banksia Woodlands of the Swan Coastal Plain' threatened ecological community (TEC) (Threatened Species Scientific Committee, 2016). Noting that the application area is adjacent to occurrences of this Commonwealth-listed TEC (see Section 3.2.2) and includes *Banksia* species, this species may utilise the application area.
- South-western brown bandicoot/quenda (*Isoodon fusciventer*, Priority 4): This species typically prefers dense understorey (Department of Biodiversity, Conservation and Attractions, 2017; Department of Environment and Conservation, 2012c). The nearest record is approximately 170 m from the application area. Photographs provided by the applicant and available aerial photography indicate that the application area may be utilised as a corridor for movement of this species.
- Western brush wallaby (*Notamacropus irma*; Priority 4): Optimum habitat is open forest or woodland, particularly favouring open, seasonally-wet flats with low grasses and open scrubby thickets. It is also found in some areas of mallee and heath-land, and is uncommon in karri forest (Department of Environment and Conservation, 2012d). The nearest record is approximately 3.2 km from the application area. Photographs provided by the applicant and available aerial photography indicate that the application area may be utilised as a corridor for movement of this species.
- Graceful sun-moth (*Synemon gratiosa*; Priority 4): Sun-moths are most common in sedgeland, heathlands, woodlands and sometimes in open parts of the forest where their 'foodplants' (various grasses, sedges and mat-rushes) are found. Most sun-moths only breed on one or two plant species - their caterpillars are adapted to feed only on these particular plants. The graceful sun-moth breeds on two species of *Lomandra* mat-rushes (*L. maritima* and *L. hermaphrodita*) (Department of Environment and Conservation, 2011). The nearest record is approximately 115 m from the application area. Given the close proximity, the application area may be utilised by this species.
- South-western brush-tailed phascogale/wambenger (*Phascogale tapoatafa* subsp. *wambenger*; Conservation Dependent): In the south-west, this species is typically found in jarrah forest, and has been observed in dry sclerophyll forests and open woodlands that contain hollow-bearing trees (Department of Environment and Conservation, 2012a). The nearest record is approximately 5.7 km from the application area. Photographs provided by the applicant and available aerial photography indicate that the application area may be utilised as a corridor for movement of this species.
- Peregrine falcon (*Falco peregrinus*; Other Specially Protected): The Australian Museum website states that this species 'is found in most habitats, from rainforests to the arid zone, and at most altitudes, from the coast to alpine areas. It requires abundant prey and secure nest sites, and prefers coastal and inland cliffs or open woodlands near water, and may even be found nesting on high city buildings' (Australian Museum, 2020). The nearest record is approximately 5.4 km from the application area. This species is widespread and highly mobile, and is found in various habitats, and may utilise the application area.

Significant habitat refers to the resources (breeding, resting and feeding), connectivity or habitat area for a species or community that is critical for its survival. Noting the narrow, linear shape of the application area and with regard to adjacent large patches of remnant vegetation, the application area is unlikely to be significant for the survival of indigenous fauna or be necessary for the maintenance of significant habitat.

As discussed above, the application area may be utilised by fauna to move through the landscape. However noting the adjacent remnant vegetation and that vegetation will remain within the road reserve, this linkage will not be severed.

The adjacent large patches of remnant vegetation may comprise significant habitat for indigenous fauna, and there is potential that the proposed clearing activities could result in the introduction or spread of weeds and dieback into this adjacent vegetation which could impact on its habitat quality.

Conclusion

From the above, the application area comprises suitable habitat for indigenous fauna, including species of conservation significance, however is unlikely to comprise significant habitat for these species.

It is considered that potential impacts to adjacent vegetation can be managed to be environmentally acceptable by requiring the applicant to take steps to minimise the risk of the introduction and spread of weeds and dieback. This will be required as a condition on the clearing permit.

Conducting clearing in a slow, progressive manner towards the areas of adjacent remnant vegetation will minimise impacts to fauna individuals that may be present at the time of clearing.

3.2.2 Flora and vegetation

Assessment

Conservation-significant flora

Eleven threatened and 29 priority flora have been recorded in the local area. In forming a view on the likelihood of these species occurring within the application area, the preferred habitat types of these species and their recorded proximity to the application area were considered, along with the vegetation/soil types and landforms within the application area.

Seven threatened and 12 priority flora are unlikely to occur within the application area due to a combination of proximity and differences in the vegetation/soil types and landforms in which they occur compared to those within the application area. Fourteen priority flora have been recorded from a soil and/or vegetation type mapped within the application area, however are associated with a habitat form (e.g. swamp, winter-wet depression, clay flat, limestone, dense scrub) that does not occur within the application area. Based on similar habitat qualities and/or close proximity, the application area might contain suitable habitat for four threatened and three priority flora, and these are considered in further detail.

- *Diuris purdiei* (Threatened): The Florabase website (Western Australian Herbarium, 1998-) indicates that this species is known from 24 recorded populations (some records may overlap) from the local government areas of Armadale, Canning, Murray and Serpentine-Jarrahdale, typically associated with grey-black sand and moist soils in winter-wet swamps (Western Australian Herbarium, 1998-). There are several records of this species in the local area from soil types mapped within the application area; the nearest is approximately 0.7 km from the application area and is associated with *Melaleuca preissiana* and *Leptospermum ellipticum*. Noting that the ground layer within the application area is dominated by grassy weeds which would typically out-compete native herbs, this species is unlikely to be present.
- *Caladenia huegelii* (Threatened): The Florabase website indicates that this species is known from 41 recorded populations (some records may overlap) ranging from the City of Perth to the City of Busselton, typically associated with grey or brown sand and clay loam. There are several records of this species in the local area from soil types mapped within the application area; the nearest is approximately 1.2 km from the application area and is associated with *Banksia* spp. woodland.
- *Drakaea elastica* (Threatened): The Florabase website indicates that this species is known from 19 recorded populations (some records may overlap) ranging from the Shire of Dandaragan to the City of Busselton, typically associated with white or grey sand in low-lying areas adjoining winter-wet swamps. There are several records of this species in the local area from soil types mapped within the application area; the nearest is approximately 1.9 km from the application area and is associated with *Banksia* spp. woodland.
- *Drakaea micrantha* (Threatened): The Florabase website indicates that this species is known from 49 recorded populations (some records may overlap) ranging from the City of Canning to the City of Busselton and the City of Albany, typically associated with white-grey sand. The nearest record is approximately 4 km from the application area from a soil type mapped within the application area; other records from a different mapped soil type.
- *Stylidium paludicola* (Priority 3): The Florabase website indicates that this species is known from 34 recorded populations (some records may overlap) ranging from the City of Joondalup to the Shire of Capel, typically associated with peaty sand over clay in winter-wet habitats with marri and *Melaleuca* spp. woodland and shrubland. The nearest approximately 1.1 km from the application area from a different mapped soil type; other records from a soil type mapped within the application area.
- *Jacksonia gracillima* (Priority 3): The Florabase website indicates that this species is known from 30 recorded populations (some records may overlap) ranging from the City of Wanneroo to the City of Busselton. Florabase describes this species as a prostrate, spreading or scrambling shrub. The nearest record is approximately 1.6 km from the application area from a soil type mapped within the application area and associated with *Banksia* spp. woodland; some other records from a different mapped soil type.
- *Amanita preissii* (Priority 3): The Florabase website indicates that this species is known from 26 recorded populations (some records may overlap) from the Perth Metropolitan Region, Shire of Cuballing and City of Albany, typically associated with vegetation including *Eucalyptus* species. There is one record in the local area, located approximately 1.7 km from the application area from a soil type mapped within the application area, and is associated with *Banksia* spp./*Eucalyptus* spp. woodland with *Kunzea* species.

Noting the condition of the vegetation proposed to be cleared, in particular that the ground layer within the application area is dominated by grassy weeds, it is considered that the above conservation-significant flora species are unlikely to be present.

Conservation-significant ecological communities

Nine TECs and three PECs have been recorded in the local area. In forming a view on the likelihood of these ecological communities occurring within the application area, the composition and habitat types of these ecological communities and their recorded proximity to the application area were considered, along with the vegetation/soil types and landforms within the application area.

The vegetation within the application area is unlikely to be representative of most of the TECs and PECs recorded within the local area. However, the application area is adjacent to mapped occurrences of the 'Banksia Dominated Woodlands of the Swan Coastal Plain IBRA region' PEC (Priority 3) which occur on the same soil types as mapped within the application area. Noting the composition of the vegetation proposed to be cleared, the vegetation within the application area might be representative of or be necessary for the maintenance of this PEC.

This PEC is a component of the Commonwealth-listed 'Banksia Woodlands of the Swan Coastal Plain' TEC under the *Environment Protection and Biodiversity Conservation Act 1999*. The Approved Conservation Advice for the Commonwealth-listed TEC discusses the different values and functional attributes of an ecological community and their thresholds to be considered representative of the TEC, including the principle features of an upper layer of low trees typically dominated by one or more specified *Banksia* species (Threatened Species Scientific Committee, 2016). One of the thresholds to be considered is minimum patch size of vegetation meeting the key diagnostic criteria of this TEC, including that vegetation in good condition should have a minimum patch size of 2 ha.

From available aerial imagery and spatial datasets, noting that the vegetation within the Anketell Road reserve is contiguous with adjacent large patches of remnant vegetation mapped as the PEC, and with regard for the findings of the site inspection, the vegetation within the broader Anketell Road reserve may meet the minimum size and condition criteria outlined above to be representative of the Commonwealth-listed TEC. Given this, the vegetation within the application area may be representative of the PEC/TEC, and may be necessary for the maintenance of adjacent occurrences of this PEC/TEC by providing a buffer between it and the existing road.

Conclusion

From the above, the vegetation within the application area is part of a broader remnant within the road reserve that may be representative of and may be necessary for the maintenance of a PEC/TEC which has been mapped in adjacent vegetation, and in this context may be biologically diverse compared with other road reserves in the local area. There is potential that the proposed clearing activities could result in the introduction or spread of weeds and dieback into adjacent vegetation, which could impact on the adjacent PEC/TEC.

As set out under Section 3.2.1, it is considered that impacts to adjacent vegetation can be managed to be environmentally acceptable by requiring the applicant to take steps to minimise the risk of the introduction and spread of weeds and dieback. This will be required as a condition on the clearing permit.

3.2.3 Significance as a remnant

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). The Environmental Protection Authority (EPA) recommends a minimum 10 per cent representation threshold for ecological communities in constrained areas (EPA, 2008).

The application area is located within the Perth Metropolitan Region Scheme boundary, which the EPA recognises to be a constrained area within which a minimum 10 per cent representation threshold for ecological communities is recommended (EPA, 2008).

The mapped Vegetation Complex has less than 30 per cent of its pre-European extent remaining (at 26.87 per cent), and is considered to be extensively cleared. The local area retains approximately 21.72 per cent of its pre-European native vegetation cover, and is also considered to be extensively cleared.

The application area does not include a significant ecological linkage, is unlikely to be required to maintain ecosystem services (such as hydrological processes) or compensate for a high degree of fragmentation, and with regard for the composition and condition of the vegetation, is adjacent to large area of remnant vegetation managed for conservation and is unlikely to be biologically diverse. On this basis, the application area is not considered to be significant as a remnant in an extensively cleared area.

Conclusion

For the reasons set out above, it is considered that the application area is significant as a remnant in an extensively cleared area. Noting the extent of the proposed clearing, in particular that it involves individual trees and shrubs along an existing road which is adjacent to large area of remnant vegetation managed for conservation, and with regard for the applicant's avoidance and minimisation measures, it is considered that the impact of the proposed clearing is unlikely to constitute a significant residual impact. No clearing permit conditions are necessary in relation to this matter.

3.2.4 Land and water resources

Assessment

A portion of the application area is located within a wetland (dampland) that has a 'resource enhancement' management category. The application area is approximately 9 m from a wetland (dampland) that has a 'conservation' management category, and is within the broader Jandakot consanguineous wetland suite. The potential for an increase in surface water run-off has the potential to lead to sedimentation of these wetlands.

By way of context, the existing road formation is constructed to be higher in the landscape than the surrounding land; it is understood that this is to reduce the risk of inundation. The application area is along the edges of the road formation. Noting this, and the extent and purpose of the proposed clearing, impacts to the wetlands and surface water quality are expected to be minimal and limited to the duration of the proposed clearing activities.

Conclusion

For the reasons set out above, it is considered the impacts of the proposed clearing are unlikely to have any long-term adverse impacts on the hydrological and ecological values of the wetlands. No clearing permit conditions are necessary in relation to this matter.

3.2.5 Conservation areas

Assessment

A number of nature reserves, conservation parks, and Crown freehold lands managed by the Department of Biodiversity, Conservation and Attractions occur within the local area. The nearest of these are Crown freehold lands (also Bush Forever areas) comprising part of the Jandakot Regional Park located adjacent to the Anketell Road reserve (including the application area).

Conclusion

From the above, the application area is adjacent to conservation areas. There is potential that the proposed clearing activities could result in the introduction or spread of weeds and dieback into adjacent vegetation, which could impact on the environmental values of these conservation areas.

As set out under Section 3.2.1, it is considered that impacts to adjacent vegetation can be managed by requiring the applicant to take steps to minimise the risk of the introduction and spread of weeds and dieback. This will be required as a condition on the clearing permit.

3.3 Relevant planning instruments and other matters

No registered Aboriginal sites of significance have been mapped within the application area. The nearest registered site is an Aboriginal Heritage Place known as 'Mandogalup Swamp/Spectacles', located approximately 2 km from the application area. Given the separation distance, the proposed clearing is unlikely to impact on this site. In any event, 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.

The applicant has an additional clearing application under assessment and five recently granted clearing permits at the time of this decision, also for the purpose of road upgrades:

- Clearing Permit CPS 8895/1 to clear 0.31472 ha of marri, flooded gum (*Eucalyptus rudis*), moonah, WA Christmas tree (*Nuytsia floribunda*) and stinkwood (*Jacksonia* sp.) in the Punrak Road reserve (granted on 29 June 2020)
- Clearing Permit CPS 8896/1 to clear 0.189 ha of swamp sheoak (*Casuarina obesa*) and robin redbreast bush (*Melaleuca lateritia*) in the Kargotich Road reserve (granted on 30 June 2020)
- Clearing Permit CPS 8903/1 to clear 0.188 ha of marri, moonah, flooded gum and swamp cypress (*Callitris pyramidalis*) in the Hopkinson Road reserve (granted on 3 July 2020)
- Application CPS 8908/1 to clear 0.51 ha (as revised) of marri, swamp sheoak and moonah in the Mundijong Road reserve
- Clearing Permit CPS 8918/1 to clear 0.78 ha of native vegetation in the Nettleton Road reserve (granted 10 August 2020)

- Clearing Permit CPS 8920/1 to clear 0.217 ha of marri, flooded gum, moonah, swamp sheoak and orange wattle (*Acacia saligna*) in the Keirnan Street reserve (granted 10 August 2020).

The combined extent of clearing proposed by the current and above applications is approximately 2.42 ha, of which approximately half comprises individual trees and shrubs. In each case the applicant advised that only those plants that are too close to the road works will be removed, and that pruning will be prioritised over removal when possible. The applicant also advised that installation of kerbing and crash barriers will be considered to reduce clearing in the Mundijong Road, Nettleton Road, Anketell Road and Keirnan Street reserves.

Appendix A – Additional information provided by applicant

During assessment of the original application, DWER identified that the proposed clearing would result in the loss of 0.722 hectares (ha) of native vegetation that is considered to be significant as a remnant of native vegetation in an extensively cleared area because it comprises habitat for threatened fauna and is below the national target and objective for biodiversity conservation.

DWER invited the applicant to provide further information in relation to this matter, including to consider whether there is scope to refine the extent of the proposed clearing. In response, the applicant reduced the extent of the proposed clearing to 0.2267 ha.

The applicant's response, and the Department's consideration of this, are summarised below.

Summary of comments	Consideration of comment
<p>The applicant advised that a more detailed assessment of the clearing required for the upgrade of this road was conducted, and that it was found that it will be possible to prune overhanging stems instead of removing whole plants. The applicant advised that on this basis, the extent of the proposed clearing was able to be reduced to 0.2267 ha.</p> <p>The applicant advised that the revised extent of proposed clearing impacts on the following:</p> <ul style="list-style-type: none"> • 30 x <i>Banksia</i> species • 26 x swamp sheoak (<i>Casuarina obesa</i>) • 20 plus x <i>Melaleuca</i> species • 2 x WA Christmas tree (<i>Nuytsia floribunda</i>) • 2 x woollybush (<i>Adenanthos cygnorum</i>) • multiple grasstree (<i>Xanthorrhoea preissii</i>) • multiple spearwood (<i>Kunzea ericifolia</i>) • 4 x <i>Acacia</i> species • 1 x flooded gum (<i>Eucalyptus rudis</i>) • 2 x peppermint (<i>Agonis flexuosa</i>). 	<p>The reduction in the extent of the proposed clearing has been taken into account by DWER in the assessment of the environmental impacts of the proposed clearing, as set out in Sections 1 and 3.</p> <p>The reduced extent of the proposed clearing (0.2267 ha) represents a 68.6 per cent reduction from the extent originally assessed (0.722 ha), and avoids and minimises the impacts identified during assessment of the original application.</p> <p>In relation to impacts to black cockatoo foraging habitat, the revised application area includes 30 x <i>Banksia</i> and 26 x sheoak trees, which are estimated to account for approximately two-thirds of the proposed clearing (approximately 0.15 ha). With regard for this and the presence of adjacent large patches of remnant vegetation, the impacts of the proposed clearing on black cockatoos is unlikely to be significant.</p> <p>With regard for the applicant's proposed avoidance and mitigation measures (see Section 3.1), the findings from the assessment of the revised application (see Section 3.2), and the presence of adjacent large patches of remnant vegetation, DWER concluded that the proposed clearing is unlikely to result in any significant residual impacts.</p> <p>It is taken that the applicant's references to swamp sheoak (<i>Casuarina obesa</i>) and spearwood (<i>Kunzea ericifolia</i>) are the same species identified by DWER's site inspection as sheoak (<i>Allocasuarina fraseriana</i>) and spearwood (<i>Kunzea glabrescens</i>) respectively.</p>

Appendix B – Site characteristics

The information below are the findings of a desktop assessment based on the best information available to the Department of Water and Environment Regulation (DWER) at the time of this assessment, and described the key characteristics of the application area. This information was used to inform the assessment of the clearing against the clearing principles (see Appendix C).

Site characteristics

Site characteristic	Details
Local context	<p>The application area comprises native vegetation adjacent to an existing road formation, within a broader road reserve that has a part in maintaining connectivity between remnants in the local area.</p> <p>The local area considered in the assessment of this application is defined as a 10-kilometre (km) radius from the perimeter of the application area, and retains approximately 21.72 per cent of native vegetation cover.</p>
Vegetation description	<p>The application area is mapped as Bassendean Complex - Central and South vegetation complex, which described as ranging from woodland of jarrah (<i>Eucalyptus marginata</i>) - sheoak (<i>Allocasuarina fraseriana</i>) - <i>Banksia</i> species to low woodland of <i>Melaleuca</i> species, and sedgelands on the moister sites; this area includes the transition of jarrah to pricklybark (<i>Eucalyptus tottiana</i>) in the vicinity of Perth.</p> <p>Vegetation composition was determined from supporting information (photographs) provided by the applicant and the findings of a site inspection undertaken by DWER.</p> <p>The original application area contains candle banksia (<i>Banksia attenuata</i>), sheoak (<i>Allocasuarina fraseriana</i>), spearwood (<i>Kunzea glabrescens</i>), woollybush (<i>Adenanthos cygnorum</i>), grasstree (<i>Xanthorrhoea preissii</i>), WA Christmas tree (<i>Nuytsia floribunda</i>), zamia (<i>Macrozamia</i> sp.), moonah (<i>Melaleuca preissiana</i>) and/or swamp paperbark (<i>Melaleuca rhamniphylla</i>) and blueboy (<i>Stirlingia latifolia</i>), with emergent firewood banksia (<i>Banksia rhenziesii</i>) (unconfirmed), holly-leaf banksia (<i>Banksia illicifolia</i>) and wattle (<i>Acacia</i> sp.), with occasional non-local <i>Acacia</i> and <i>Eucalyptus</i> species, over unidentified Myrtaceae and other shrubs and a ground layer dominated by grassy weeds.</p> <p>The applicant advised that the proposed clearing (as revised) is limited to individual trees and shrubs, and includes 30 x <i>Banksia</i> species, 26 x swamp sheoak (<i>Casuarina obesa</i>), 20 plus x <i>Melaleuca</i> species, 2 x WA Christmas tree (<i>Nuytsia floribunda</i>), 2 x woollybush, multiple grasstree, multiple spearwood (<i>Kunzea ericifolia</i>), 4 x <i>Acacia</i> species, 1 x flooded gum (<i>Eucalyptus rudis</i>), and 2 x peppermint (<i>Agonis flexuosa</i>).</p>
Vegetation condition	<p>Vegetation condition was determined from available aerial imagery, photographs provided by the applicant, and the findings of the site inspection. The vegetation within the application area ranges from good to degraded to completely degraded condition on the scale described by Keighery (1994) (see Appendix D).</p>
Soil description	<p>The application area is mapped as:</p> <ul style="list-style-type: none"> • Bassendean B2 Phase (212Bs_B2) described as: Flat to very gently undulating sandplain with well to moderately well drained deep bleached grey sands with a pale yellow B horizon or a weak iron organic hardpan at 1-2 metres (m) (mapped across approximately 64.1 per cent of the application area) • Bassendean B1 Phase (213Bs_B1) described as: Extremely low to very low relief dunes, undulating sandplain and discrete sand rises with deep bleached grey sands sometimes with pale yellow B horizon or a weak iron-organic hardpan at depths generally greater than 2 m; <i>Banksia</i> dominant (mapped across approximately 32.6 per cent of the application area) • Bassendean B4 Phase (212Bs_B4) described as: Broad poorly drained sandplain with deep grey siliceous sands or bleached sands underlain at depths generally greater than 1.5 m by clay or less frequently a strong iron-organic pan (mapped across approximately 2.2 per cent of the application area) • Bassendean B3 Phase (212Bs_B3) described as: Closed depressions and poorly defined stream channels with moderately deep, poorly to very poorly drained bleached sands with

Site characteristic	Details																												
	an iron-organic pan, or clay at generally less than 1 m depth; surfaces are dark grey sand or sandy loam (mapped across approximately 1 per cent of the application area).																												
Land degradation risk	Mapped land degradation risk factors (as percentage of map unit)																												
	Risk categories	212Bs_B2	212Bs_B1	212Bs_B4	212Bs_B3																								
	Wind erosion	>70% has a high to extreme risk	>70% has a high to extreme risk	10-30% has a high to extreme risk	3-10% has a high to extreme risk																								
	Water erosion	<3% has a high to extreme risk	3-10% has a high to extreme risk	<3% has a high to extreme risk	30-50% has a high to extreme risk																								
	Salinity	30-50% has a moderate to high risk	30-50% has a moderate to high risk	30-50% has a moderate to high risk	30-50% has a moderate to high risk																								
	Subsurface Acidification	<3% has a high risk	<3% has a high risk	<3% has a high risk	<3% has a high risk																								
	Flood risk	<3% has a moderate to high risk	<3% has a moderate to high risk	<3% has a moderate to high risk	30-50% has a moderate to high risk																								
	Waterlogging	3-10% has a moderate to very high risk	3-10% has a moderate to very high risk	>70% has a moderate to very high risk	>70% has a moderate to very high risk																								
	Phosphorus export risk	>70% has a high to extreme risk	>70% has a high to extreme risk	>70% has a high to extreme risk	>70% has a high to extreme risk																								
Waterbodies	<p>The application area is located within the broader Jandakot consanguineous wetland suite. A man-made drain is located approximately 385 m from the application area, and the nearest natural watercourse (non-perennial minor river) is approximately 655 m from the application area.</p> <p>A further 48 mapped lakes, wetlands, rivers and other water bodies occur within the local area. Those within two km of the application area are outlined below.</p>																												
	<table border="1"> <thead> <tr> <th data-bbox="383 1255 846 1325">Type of inland water</th> <th data-bbox="846 1255 1287 1325">Description</th> <th data-bbox="1287 1255 1435 1325">Proximity (m)²</th> </tr> </thead> <tbody> <tr> <td data-bbox="383 1325 846 1394">Geomorphic Wetlands (Classification), Swan Coastal Plain</td> <td data-bbox="846 1325 1287 1394">Resource Enhancement - Dampland</td> <td data-bbox="1287 1325 1435 1394">0</td> </tr> <tr> <td data-bbox="383 1394 846 1463">Geomorphic Wetlands (Classification), Swan Coastal Plain</td> <td data-bbox="846 1394 1287 1463">Conservation - Dampland</td> <td data-bbox="1287 1394 1435 1463">9</td> </tr> <tr> <td data-bbox="383 1463 846 1533">Geomorphic Wetlands (Classification), Swan Coastal Plain</td> <td data-bbox="846 1463 1287 1533">Multiple Use - Dampland</td> <td data-bbox="1287 1463 1435 1533">29</td> </tr> <tr> <td data-bbox="383 1533 846 1602">Geomorphic Wetlands (Classification), Swan Coastal Plain</td> <td data-bbox="846 1533 1287 1602">Conservation - Sumpland</td> <td data-bbox="1287 1533 1435 1602">123</td> </tr> <tr> <td data-bbox="383 1602 846 1671">Geomorphic Wetlands (Classification), Swan Coastal Plain</td> <td data-bbox="846 1602 1287 1671">Resource Enhancement - Sumpland</td> <td data-bbox="1287 1602 1435 1671">254</td> </tr> <tr> <td data-bbox="383 1671 846 1740">Geodata, Lakes</td> <td data-bbox="846 1671 1287 1740">sub_to_inund</td> <td data-bbox="1287 1671 1435 1740">272</td> </tr> <tr> <td data-bbox="383 1740 846 1808">Hydrography, Lakes (medium scale 250k GA)</td> <td data-bbox="846 1740 1287 1808">sub_to_inund</td> <td data-bbox="1287 1740 1435 1808">272</td> </tr> </tbody> </table>					Type of inland water	Description	Proximity (m) ²	Geomorphic Wetlands (Classification), Swan Coastal Plain	Resource Enhancement - Dampland	0	Geomorphic Wetlands (Classification), Swan Coastal Plain	Conservation - Dampland	9	Geomorphic Wetlands (Classification), Swan Coastal Plain	Multiple Use - Dampland	29	Geomorphic Wetlands (Classification), Swan Coastal Plain	Conservation - Sumpland	123	Geomorphic Wetlands (Classification), Swan Coastal Plain	Resource Enhancement - Sumpland	254	Geodata, Lakes	sub_to_inund	272	Hydrography, Lakes (medium scale 250k GA)	sub_to_inund	272
Type of inland water	Description	Proximity (m) ²																											
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² Measured as the distance from the original application area; may vary slightly for the revised/reduced application area.

Site characteristic	Details																																						
	Geomorphic Wetlands (Classification), Swan Coastal Plain	Multiple Use - Sumpland	396																																				
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	Geodata, Lakes	swamp	1203																																				
	Hydrography, Lakes (medium scale 250k GA)	swamp	1203																																				
	Rivers	Birriga Main Drain : Minor River	1328																																				
	Geomorphic Wetlands (Classification), Swan Coastal Plain	Resource Enhancement - Not Assessed	1359																																				
	Geomorphic Wetlands (Classification), Swan Coastal Plain	Not Applicable - Dryland	1705																																				
	Geomorphic Wetlands (Classification), Swan Coastal Plain	Multiple Use - Not Assessed	1757																																				
Conservation areas	There are 88 records of conservation areas within the local area, comprising of lands managed by the Department of Biodiversity, Conservation and Attractions (DBCA), privately-managed conservation areas, and Bush Forever sites/nominated sites (some of these overlap). Those within two km of the application area are outlined below.																																						
	<table border="1"> <thead> <tr> <th data-bbox="375 867 756 947">Theme</th> <th data-bbox="756 867 1289 947">Description</th> <th data-bbox="1289 867 1435 947">Proximity (m)³</th> </tr> </thead> <tbody> <tr> <td data-bbox="375 947 756 993">DBCA Managed Lands</td> <td data-bbox="756 947 1289 993"></td> <td data-bbox="1289 947 1435 993">1</td> </tr> <tr> <td data-bbox="375 993 756 1039">Bushforever</td> <td data-bbox="756 993 1289 1039">347</td> <td data-bbox="1289 993 1435 1039">1</td> </tr> <tr> <td data-bbox="375 1039 756 1085">Bushforever</td> <td data-bbox="756 1039 1289 1085">348</td> <td data-bbox="1289 1039 1435 1085">2</td> </tr> <tr> <td data-bbox="375 1085 756 1131">DBCA Land for Wildlife Sites</td> <td data-bbox="756 1085 1289 1131">1308</td> <td data-bbox="1289 1085 1435 1131">826</td> </tr> <tr> <td data-bbox="375 1131 756 1178">DBCA Land for Wildlife Sites</td> <td data-bbox="756 1131 1289 1178">1814</td> <td data-bbox="1289 1131 1435 1178">1013</td> </tr> <tr> <td data-bbox="375 1178 756 1224">DBCA Land for Wildlife Sites</td> <td data-bbox="756 1178 1289 1224">1806</td> <td data-bbox="1289 1178 1435 1224">1057</td> </tr> <tr> <td data-bbox="375 1224 756 1297">DBCA Managed Lands</td> <td data-bbox="756 1224 1289 1297">Modong Nature Reserve; onservation Commission Of WA</td> <td data-bbox="1289 1224 1435 1297">1082</td> </tr> <tr> <td data-bbox="375 1297 756 1344">DBCA Land for Wildlife Sites</td> <td data-bbox="756 1297 1289 1344">2219</td> <td data-bbox="1289 1297 1435 1344">1103</td> </tr> <tr> <td data-bbox="375 1344 756 1417">DBCA Managed Lands</td> <td data-bbox="756 1344 1289 1417">Wandi Nature Reserve; Conservation Commission Of WA</td> <td data-bbox="1289 1344 1435 1417">1127</td> </tr> <tr> <td data-bbox="375 1417 756 1463">DBCA Land for Wildlife Sites</td> <td data-bbox="756 1417 1289 1463">691</td> <td data-bbox="1289 1417 1435 1463">1663</td> </tr> <tr> <td data-bbox="375 1463 756 1497">Bushforever</td> <td data-bbox="756 1463 1289 1497">270</td> <td data-bbox="1289 1463 1435 1497">1705</td> </tr> </tbody> </table>	Theme	Description	Proximity (m) ³	DBCA Managed Lands		1	Bushforever	347	1	Bushforever	348	2	DBCA Land for Wildlife Sites	1308	826	DBCA Land for Wildlife Sites	1814	1013	DBCA Land for Wildlife Sites	1806	1057	DBCA Managed Lands	Modong Nature Reserve; onservation Commission Of WA	1082	DBCA Land for Wildlife Sites	2219	1103	DBCA Managed Lands	Wandi Nature Reserve; Conservation Commission Of WA	1127	DBCA Land for Wildlife Sites	691	1663	Bushforever	270	1705		
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Climate and landform	Rainfall: 900 Evapotranspiration: 800 Geology: Alluvial, shoreline, and aeolian deposits Acid Sulfate Soil Risk: Moderate to low risk Groundwater Salinity (Total Dissolved Solids): <500 mg/L and 500-1,000 mg/L The application area is on a broad flat. Topography is between 20-30 m above sea level (Department of Primary Industries and Regional Development, 2017).																																						

³ Measured as the distance from the original application area; may vary slightly for the revised/reduced application area.

Site characteristic	Details
Hydrology and hydrogeology	The application area is within the 'Coastal Plain' Hydrological Zone, and the 'Peel Estuary – Serpentine River' Hydrographic Catchment. The application area is also within the mapped 'Serpentine' Groundwater Area under the <i>Rights in Water and Irrigation Act 1914</i> .

Flora, fauna and ecosystem analysis

Ecological Linkages: No ecological linkages are mapped within the local area.⁴

Roadside Conservation Committee roadside conservation values: High, Medium, High (September 2005).

The following conservation-significant species and ecological communities have been recorded from the local area. With consideration for the site characteristics set out above, relevant datasets (see Appendix F), and photographs provided by the applicant (see Appendix E), the likelihood of their occurrences within the application area has been assessed.

Species / Ecological Community	Distance to nearest record (km) ⁵	Suitable soil type?	Suitable vegetation type?	Suitable habitat features?	Surveys adequate to identify?
Fauna					
Forest red-tailed black cockatoo (<i>Calyptorhynchus banksii</i> subsp. <i>naso</i> ; Vulnerable)	Adjacent (approximately 0.003 km)		Y	Y	N/A
Graceful sun-moth (<i>Synemon gratiosa</i> ; Priority 4)	Approximately 0.12 km			Y	N/A
South-western brown bandicoot/quenda (<i>Isodon fusciventer</i> ; Priority 4)	Approximately 0.17 km			Y	N/A
Carnaby's black cockatoo (<i>Calyptorhynchus latirostris</i> ; Endangered)	Approximately 0.53 km		Y	Y	N/A
Chuditch/western quoll (<i>Dasyurus geoffroii</i> ; Vulnerable)	Approximately 0.65 km			Y	N/A
Perth slider/lined skink (<i>Lerista lineata</i> ; Priority 3)	Approximately 1.6 km			N	N/A
Carter's freshwater mussel (<i>Westralunio carteri</i> ; Vulnerable)	Approximately 1.9 km			N	N/A
Western brush wallaby (<i>Notamacropus irma</i> ; Priority 4)	Approximately 3.2 km			Y	N/A
Sharp-tailed sandpiper (<i>Calidris acuminata</i> ; International Agreement)	Approximately 4.3 km			N	N/A
Curlew sandpiper (<i>Calidris ferruginea</i> ; Critically Endangered)	Approximately 4.3 km			N	N/A
Curlew sandpiper (<i>Calidris ruficollis</i> ; International Agreement)	Approximately 4.3 km			N	N/A
Marsh sandpiper/little greenshank (<i>Tringa nebularia</i> ; International Agreement)	Approximately 4.3 km			N	N/A

⁴ As described in: Molloy, S., Wood, J., Hall, S., Wallrodt, S. and Whisson, G. (2009) *South West Regional Ecological Linkages Technical Report*. Western Australian Local Government Association (WALGA) and Department of Environment and Conservation (DEC), Perth.

⁵ Measured as the distance from the original application area; may vary slightly for the revised/reduced application area.

Species / Ecological Community	Distance to nearest record (km) ⁵	Suitable soil type?	Suitable vegetation type?	Suitable habitat features?	Surveys adequate to identify?
Common sandpiper (<i>Actitis hypoleucos</i> ; International Agreement)	Approximately 4.4 km			N	N/A
Blue-billed duck (<i>Oxyura australis</i> ; Priority 4)	Approximately 4.4 km			N	N/A
Glossy ibis (<i>Plegadis falcinellus</i> ; International Agreement)	Approximately 4.5 km			N	N/A
Long-tailed jaeger/long-tailed skua (<i>Stercorarius longicaudus</i> ; International Agreement)	Approximately 4.8 km			N	N/A
Long-toed stint (<i>Calidris subminuta</i> ; International Agreement)	Approximately 4.9 km			N	N/A
Pacific golden plover (<i>Pluvialis fulva</i> ; International Agreement)	Approximately 5.1 km			N	N/A
Australasian bittern (<i>Botaurus poiciloptilus</i> ; Threatened)	Approximately 5.2 km			N	N/A
Black-striped burrowing snake (<i>Neelaps calonotus</i> ; Priority 3)	Approximately 5.2 km			N	N/A
Peregrine Falcon (<i>Falco peregrinus</i> ; Other Specially Protected)	Approximately 5.4 km			Y	N/A
Numbat (<i>Myrmecobius fasciatus</i> ; Endangered)	Approximately 5.5 km			Y	N/A
South-western brush-tailed phascogale/wambenger (<i>Phascogale tapoatafa</i> subsp. <i>wambenger</i> ; Conservation Dependent)	Approximately 5.7 km			Y	N/A
Fork-tailed swift/Pacific swift (<i>Apus pacificus</i> ; International Agreement)	Approximately 5.8 km			N	N/A
Ruddy turnstone (<i>Arenaria interpres</i> ; International Agreement)	Approximately 5.8 km			N	N/A
Pectoral sandpiper (<i>Calidris melanotos</i> ; International Agreement)	Approximately 5.8 km			N	N/A
Greater sand plover/large sand plover (<i>Charadrius leschenaultii</i> ; Vulnerable)	Approximately 5.8 km			N	N/A
Black-tailed godwit (<i>Limosa limosa</i> ; International Agreement)	Approximately 5.8 km			N	N/A
Wood sandpiper (<i>Tringa glareola</i> ; International Agreement)	Approximately 5.8 km			N	N/A
Marsh sandpiper/little greenshank (<i>Tringa stagnatilis</i> ; International Agreement)	Approximately 5.8 km			N	N/A
Grey plover (<i>Pluvialis squatarola</i> ; International Agreement)	Approximately 5.9 km			N	N/A
Short-tongued bee (<i>Leioproctus douglasiellus</i> ; Endangered)	Approximately 6.1 km			N	N/A

Species / Ecological Community	Distance to nearest record (km) ⁵	Suitable soil type?	Suitable vegetation type?	Suitable habitat features?	Surveys adequate to identify?
Short-tongued bee (<i>Neopasiphae simplicior</i> ; Endangered)	Approximately 6.1 km			N	N/A
Swan Coastal Plain shield-backed trapdoor spider (<i>Idiosoma sigillatum</i> ; Priority 3)	Approximately 6.2 km			N	N/A
Short-tongued bee (<i>Leioproctus contrarius</i> ; Priority 3)	Approximately 6.7 km		Y	Y	N/A
Tammar wallaby (<i>Notamacropus eugenii</i> subsp. <i>derbianus</i> ; Priority 4)	Approximately 6.7 km			N	N/A
Osprey (<i>Pandion cristatus</i> ; International Agreement)	Approximately 6.7 km			N	N/A
Western false pipistrelle (<i>Falsistrellus mackenziei</i> ; Priority 4)	Approximately 6.9 km			N	N/A
Baudin's black cockatoo (<i>Calyptorhynchus baudinii</i> ; Endangered)	Approximately 7.9 km		Y	Y	N/A
Quokka (<i>Setonix brachyurus</i> ; Vulnerable)	Approximately 7.9 km			N	N/A
Water-rat/rakali (<i>Hydromys chrysogaster</i> ; Priority 4)	Approximately 7.9 km			N	N/A
Southern death adder (<i>Acanthophis antarticus</i> ; Priority 3)	Approximately 8 km	N		N	N/A
Dell's skink/Darling Range southwest ctenotus (<i>Ctenotus delli</i> ; Priority 4)	Approximately 8 km			N	N/A
White-winged black tern/white-winged tern (<i>Chlidonias leucopterus</i> ; International Agreement)	Approximately 8.4 km			N	N/A
Red-tailed tropicbird (<i>Phaethon rubricauda</i> ; International Agreement)	Approximately 8.4 km			N	N/A
Caspian tern (<i>Hydroprogne caspia</i> ; International Agreement)	Approximately 8.5 km			N	N/A
Flora					
<i>Diuris purdiei</i> (Threatened)	Approximately 0.7 km	Y	Y		N/A
<i>Stylidium paludicola</i> (Priority 3)	Approximately 1.1 km	Y	Y		N/A
<i>Caladenia huegelii</i> (Threatened)	Approximately 1.2 km	Y	Y		N/A
<i>Jacksonia gracillima</i> (Priority 3)	Approximately 1.6 km	Y			N/A
<i>Amanita preissii</i> (Priority 3)	Approximately 1.7 km	Y	Y		N/A
<i>Drakaea elastica</i> (Threatened)	Approximately 1.9 km	Y	Y		N/A
<i>Cyathochaeta teretifolia</i> (Priority 3)	Approximately 2.6 km	Y		N	N/A

Species / Ecological Community	Distance to nearest record (km) ⁵	Suitable soil type?	Suitable vegetation type?	Suitable habitat features?	Surveys adequate to identify?
<i>Drakaea micrantha</i> (Threatened)	Approximately 4 km	Y			N/A
<i>Dodonaea hackettiana</i> (Priority 4)	Approximately 4 km	Y		N	N/A
<i>Synaphea</i> sp. Serpentine (G.R. Brand 103) (Threatened)	Approximately 4.7 km	N		N	N/A
<i>Verticordia lindleyi</i> subsp. <i>lindleyi</i> (Priority 4)	Approximately 4.7 km	Y		N	N/A
<i>Diuris micrantha</i> (Threatened)	Approximately 4.8 km	N		N	N/A
<i>Tetraparia</i> sp. chandala (G.J. Keighery 17055) (Priority 2)	Approximately 4.9 km	Y	Y	N	N/A
<i>Aponogeton hexatepalus</i> (Priority 4)	Approximately 5 km	Y		N	N/A
<i>Babingtonia urbana</i> (Priority 3)	Approximately 5.6 km	N			N/A
<i>Drosera occidentalis</i> (Priority 4)	Approximately 5.9 km	N			N/A
<i>Lepidosperma rostratum</i> (Threatened)	Approximately 6 km	N		N	N/A
<i>Meionectes tenuifolia</i> (Priority 3)	Approximately 6 km	N		N	N/A
<i>Kennedia beckxiana</i> (Priority 4)	Approximately 6 km	N		N	N/A
<i>Ornduffia submersa</i> (Priority 4)	Approximately 6 km	Y		N	N/A
<i>Tripterococcus</i> sp. <i>Brachylobus</i> (A.S. George 14234) (Priority 4)	Approximately 6.2 km	Y		N	N/A
<i>Boronia juncea</i> subsp. <i>juncea</i> (Priority 1)	Approximately 6.5 km	Y		N	N/A
<i>Stylidium ireneae</i> (Priority 4)	Approximately 6.6 km	N		N	N/A
<i>Pimelea calcicola</i> (Priority 3)	Approximately 6.7 km	N		N	N/A
<i>Stylidium longitubum</i> (Priority 4)	Approximately 6.7 km	Y		N	N/A
<i>Acacia lasiocarpa</i> var. <i>bracteolata</i> long peduncle variant (G.J. Keighery 5026) (Priority 1)	Approximately 7.3 km	N		N	N/A
<i>Jacksonia sericea</i> (Priority 4)	Approximately 7.7 km	Y		N	N/A
<i>Amanita wadulawitu</i> (Priority 3)	Approximately 7.8 km	N		N	N/A
<i>Johnsonia pubescens</i> subsp. <i>cygnorum</i> (Priority 2)	Approximately 7.9 km	N		N	N/A

Species / Ecological Community	Distance to nearest record (km) ⁵	Suitable soil type?	Suitable vegetation type?	Suitable habitat features?	Surveys adequate to identify?
<i>Schoenus pennisetis</i> (Priority 3)	Approximately 8.2 km	Y		N	N/A
<i>Acacia oncinophylla</i> subsp. <i>patulifolia</i> (Priority 4)	Approximately 8.3 km	N		N	N/A
<i>Banksia kippistiana</i> var. <i>paenepeccata</i> (Priority 3)	Approximately 8.4 km	N		N	N/A
<i>Byblis gigantea</i> (Priority 3)	Approximately 8.5 km	Y		N	N/A
<i>Stylidium aceratum</i> (Priority 3)	Approximately 8.5 km	Y		N	N/A
<i>Diurus drummondii</i> (Threatened)	Approximately 9.2 km	N		N	N/A
<i>Eucalyptus x balanites</i> (Threatened)	Approximately 9.4 km	N		N	N/A
<i>Synaphea</i> sp. Pinjarra Plain (A.S. George 17182) (Threatened)	Approximately 9.5 km	N		N	N/A
<i>Tetraria australiensis</i> (Threatened)	Approximately 9.5 km	N		N	N/A
<i>Thysanotus glaucus</i> (Priority 4)	Approximately 9.6 km	N	Y		N/A
<i>Austrostipa mundula</i> (Priority 3)	Approximately 9.9 km	N		N	N/A
Ecological communities					
Banksia Dominated Woodlands of the Swan Coastal Plain IBRA region (Priority 3)	Adjacent	Y	Y		N/A
Communities of Tumulus Springs (Organic Mound Springs, Swan Coastal Plain) (Threatened)	Approximately 2.4 km	N	N		N/A
Tuart (<i>Eucalyptus gomphocephala</i>) woodlands and forests of the Swan Coastal Plain (Priority 3)	Approximately 3.6 km	N	N		N/A
<i>Corymbia calophylla</i> – <i>Kingia australis</i> woodlands on heavy soils, Swan Coastal Plain (floristic community type ⁶ (FCT) 3a) (Threatened)	Approximately 4.7 km	N	N No <i>Kingia</i>		N/A
Herb rich shrublands in clay pans (FCT 8) (Threatened)	Approximately 5 km	N	N		N/A
Shrublands on dry clay flats (FCT 10a) (Threatened)	Approximately 6.6 km	Y	N		N/A

⁶ Floristic community types as described in: Gibson, N., Keighery, B.J., Keighery, G.J., Burbidge, A.H. and Lyons, M.N. (1994) *A Floristic Survey of the Southern Swan Coastal Plain*. Department of Conservation and Land Management and Conservation Council of Western Australia, Perth, Western Australia.

Species / Ecological Community	Distance to nearest record (km) ⁵	Suitable soil type?	Suitable vegetation type?	Suitable habitat features?	Surveys adequate to identify?
<i>Melaleuca huegelii</i> - <i>Melaleuca systema</i> shrublands on limestone ridges (FCT 26a) (Threatened)	Approximately 6.8 km	N	N		N/A
<i>Corymbia calophylla</i> – <i>Eucalyptus marginata</i> woodlands on sandy clay soils of the southern Swan Coastal Plain (FCT 3b) (Threatened)	Approximately 7.3 km	Y	Y	N	N/A
<i>Banksia attenuata</i> and/or <i>Eucalyptus marginata</i> woodlands of the eastern side of the Swan Coastal Plain (FCT 20b) (Threatened)	Approximately 7.7 km	Y	Y	N	N/A
Northern Spearwood shrublands and woodlands (FCT 24) (Priority 3)	Approximately 8.2 km	Y	N		N/A
Dense shrublands on clay flats (floristic community type 9) (Threatened)	Approximately 8.4 km	N	N		N/A
<i>Corymbia calophylla</i> – <i>Xanthorrhoea preissii</i> woodlands and shublands, Swan Coastal Plain (FCT 3c) (Threatened)	Approximately 8.8 km	N	Y		N/A

Vegetation extent

	Pre-European (ha)	Current extent (ha)	Current extent (%)	Current extent (ha) in DBCA ⁷ -managed lands	Current extent (%) in DBCA-managed lands
IBRA⁸ bioregion (as at March 2019)⁹					
Swan Coastal Plain	1,501,221.93	579,813.47	38.62	269,964.76	17.98
Vegetation Complex (as at March 2019)¹⁰					
Bassendean - Central and South	87,476.26	23,508.66	26.87	7,614.25	5.00
Local area					
10-kilometre radius	37,389.21	8,121.09	21.72	N/a	N/a

⁷ Current extent as proportion of pre-European extent within DBCA-managed lands.

⁸ Interim Biogeographic Regionalisation for Australia.

⁹ Government of Western Australia (2019b)

¹⁰ Government of Western Australia (2019a)

Appendix C – Assessment against the Clearing Principles

Assessment against the Clearing Principles	Variance level	Is further consideration required?
<p><u>Principle (a):</u> “Native vegetation should not be cleared if it comprises a high level of biodiversity.”¹¹</p> <p><u>Assessment:</u> The application area is adjacent to mapped occurrences of a PEC which occurs on the same soil types as mapped within the application area, and the vegetation proposed to be cleared may be representative of and/or necessary for the maintenance of this PEC. The application area is adjacent to large patches of remnant vegetation managed for conservation purposes, and is unlikely to comprise significant habitat for fauna or contain threatened or priority flora.</p>	May be at variance	Yes Sections 3.2.1, 3.2.2 and 3.2.5
<p><u>Principle (b):</u> “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.”</p> <p><u>Assessment:</u> From the composition and condition of the vegetation within the road reserve and its linkage with other remnants in the local area, the application area contains suitable habitat for indigenous fauna, including species of conservation significance. Noting the narrow, linear shape of the application area and with regard for adjacent large patches of remnant vegetation, the application area is unlikely to be significant for the survival of indigenous fauna or be necessary for the maintenance of significant habitat.</p>	Not likely to be at variance	Yes Section 3.2.1
<p><u>Principle (c):</u> “Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</p> <p><u>Assessment:</u> Eleven threatened flora have been recorded in the local area, however are unlikely to occur within the application area. Noting the type and condition of the vegetation, the application area is unlikely to be necessary for the continued existence of threatened flora.</p>	Not likely to be at variance	Yes Section 3.2.2
<p><u>Principle (d):</u> “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.”¹²</p> <p><u>Assessment:</u> Nine TEC’s have been recorded in the local area. Noting the composition and condition of the vegetation within the application area, the application area is unlikely to be representative of, or be necessary for the maintenance of a TEC.</p>	Not likely to be at variance	No
<p><u>Principle (e):</u> “Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</p> <p><u>Assessment:</u> The application area includes vegetation that comprises habitat for threatened fauna and has less than 30 per cent of its pre-European extent remaining. On this basis the vegetation proposed to be cleared is considered to be within an extensively cleared area.</p>	Is at variance	Yes Section 3.2.3
<p><u>Principle (f):</u> “Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</p> <p><u>Assessment:</u> The application area is located within a wetland (dampland) and is in close proximity to another wetland (dampland). The vegetation within the application area is growing in association with these wetlands.</p>	Is at variance	Yes Section 3.2.4

¹¹ The *Biodiversity Conservation Act 2016* defines ‘biodiversity’ as ‘the variability among living organisms and the ecosystems of which those organisms are a part and includes the following – (a) diversity within native species and between native species; (b) diversity of ecosystems; (c) diversity of other biodiversity components’.

¹² The *Biodiversity Conservation Act 2016* defines ‘threatened ecological community’ as ‘an ecological community that – (a) is listed as a threatened ecological community under section 27(1); or (b) is to be regarded as a threatened ecological community under section 33’. Section 27(1) refers to TECs listed by the WA Minister for Environment; section 33 refers to the listing and de-listing of collapsed TECs.

Assessment against the Clearing Principles	Variance level	Is further consideration required?
<p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u> The main land degradation risks associated with the soil types mapped across the application area are high to extreme risks of phosphorus export and wind erosion (affecting 100 per cent and approximately 96.8 per cent of the application area respectively), and moderate to high risk of salinity (affecting 100 per cent of the application area). Noting the extent and purpose of the proposed clearing and its location adjacent to an existing road, the proposed clearing is unlikely to cause appreciable land degradation.</p>	Not likely to be at variance	No
<p><u>Principle (h):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.”</i></p> <p><u>Assessment:</u> Crown freehold lands (also Bush Forever sites) comprising part of the Jandakot Regional Park are located adjacent to the road reserve within which the application area is located. There is potential that the proposed clearing activities could result in the introduction or spread of weeds and dieback into these adjacent conservation areas, which could impact on their environmental values.</p>	May be at variance	Yes Section 3.2.5
<p><u>Principle (i):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.”</i></p> <p><u>Assessment:</u> The potential for an increase in surface water run-off has the potential to lead to sedimentation of the wetland (palusplain) within which the application area is located. Noting the extent and purpose of the proposed clearing and its location adjacent to an existing road, impacts to surface water quality are expected to be minimal and limited to the duration of the proposed clearing activities. Taking into account the topography and the underlying groundwater salinity, the proposed clearing is unlikely to cause deterioration in underground water quality.</p>	Not likely to be at variance	Yes Section 3.2.4
<p><u>Principle (j):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</i></p> <p><u>Assessment:</u> The soil types mapped across approximately 99 per cent of the application area have a low flood risk.</p>	Not likely to be 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.

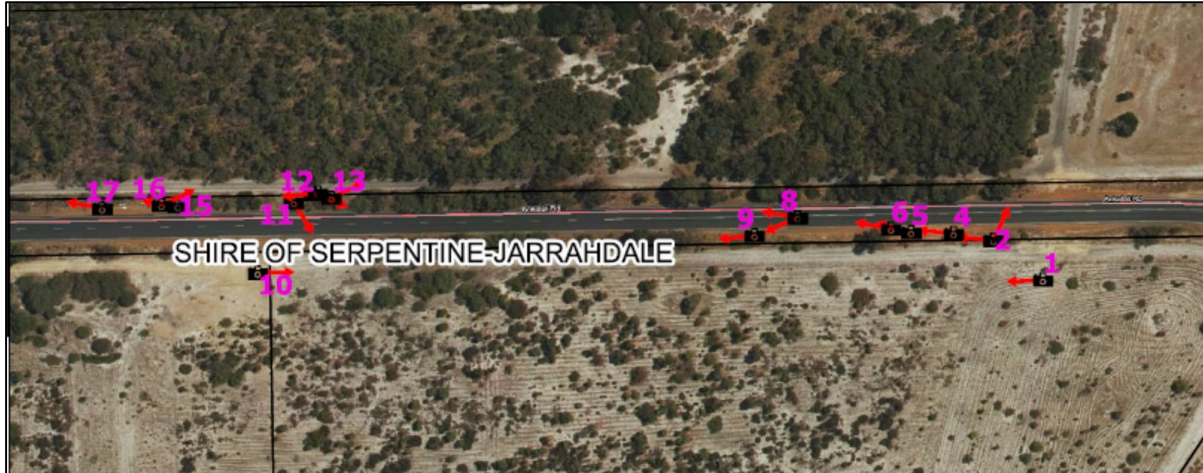
Measuring Vegetation Condition for the South West and Interzone Botanical Province (Keighery, 1994)

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

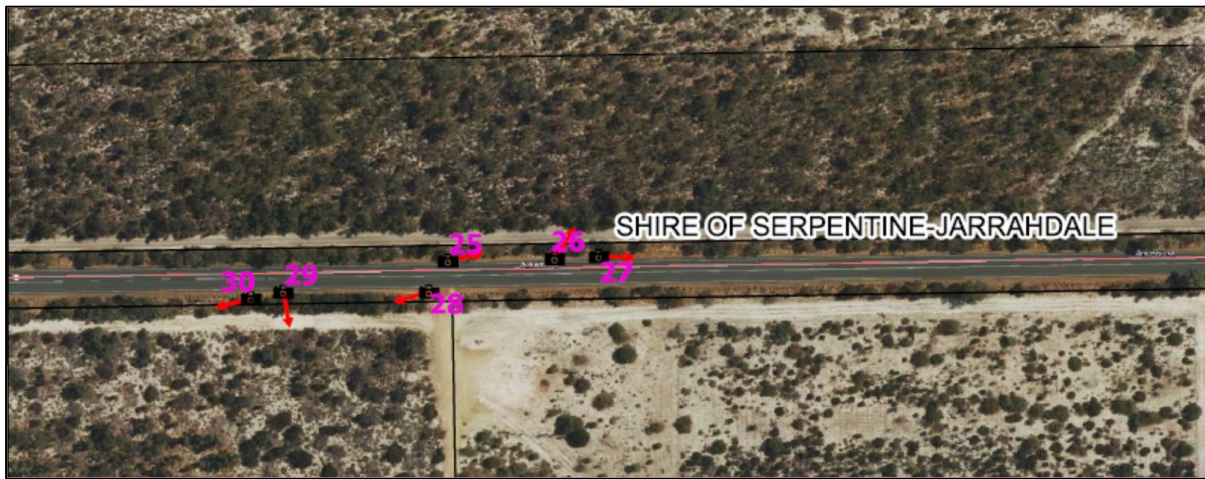
Appendix E – Photographs of the vegetation

Site inspection

Photographs (and map of photograph locations) from the report of a site inspection undertaken within the application area by DWER on 2 July 2020.¹³ The site inspection focussed on the portions of the application area that are adjacent to conservation areas.



¹³ Department of Water and Environmental Regulation (2020) *Site Inspection Report – Native Vegetation Regulation – CPS 8919/1*. Report of a site inspection undertaken on 2 July 2020.



Maps indicating location of photographs from DWER site inspection. Images east (top) to west.



Photo 1: candle banksia (*Banksia attenuata*) and woollybush (*Adenanthos cygnorum*) over a weedy understorey including soursob (*Oxalis* sp.) and fountain grass (*Cenchrus setaceus*) (southern side of road reserve at eastern end)



Photo 2: Isolated sheoak (*Allocasuarina fraseriana*) (southern side of road reserve at eastern end)



Photo 3: Sheoak, candle banksia and woollybush over a weedy understorey (southern side of road reserve at eastern end)



Photo 4: Candle banksia over a weedy understorey (northern side of road reserve at western end)



Photo 5: Candle banksia over a weedy understorey (northern side of road reserve at western end)



Photo 6: Vegetation (excluding grassy edge) in good to degraded condition, some native understorey species including blueboy (*Stirlingia latifolia*) (northern side of road reserve at western end)

Appendix F – References and databases

GIS datasets

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)
- Consanguineous Wetlands Suites (DBCA-020)
- 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)
- Geomorphic Wetlands, Swan Coastal Plain (DBCA-019)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Imagery
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Offsets Register – Offsets (DWER-078)
- Pre-European Vegetation Statistics
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- Remnant Vegetation, All Areas
- Soil Landscape Mapping – Best Available
- Soil Landscape Mapping – Systems
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- RIWI Act, Groundwater Areas (DWER-034)

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

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