GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

PERMIT DETAILS

Area Permit Number: CPS 8920/1
File Number: DWERVT5822
Duration of Permit: From 2 September 2020 to 2 September 2022

PERMIT HOLDER

Shire of Serpentine-Jarrahdale

LAND ON WHICH CLEARING IS TO BE DONE

Keirnan Street reserve (PINs 11918698, 11460691, 11413979, 11413977, 11413988 and 11413989), Whitby and Mundijong

AUTHORISED ACTIVITY

The Permit Holder shall not clear more than 0.217 hectares of native vegetation within the areas cross-hatched yellow on attached Plan 8920/1a and Plan 8920/1b.

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

4. Reporting

The Permit Holder must produce the records required under condition 3 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; and

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

10 August 2020

Plan 8920/1a

Legend

CPS layers

CPS areas approved to clear

base layers

Road Centrelines

Cadastre - LGATE 218

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

N

50 0 50 100 150 200 m

Mathew Gannaway
2020.08.10 14:19:37 +08'00'

Officer delegated under section 20 of the Environmental Protection Act 1986

GOVERNMENT OF WESTERN AUSTRALIA

Plan 8920/1b

Legend

CPS layers

CPS areas approved to clear

base layers

Road Centrelines

Cadastre - LGATE 218

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

N

50 0 50 100 150 200 m

Mathew Gannaway
2020.08.10
14:20:13 +08'00'

Officer delegated under section 20 of the Environmental Protection Act 1986

GOVERNMENT OF WESTERN AUSTRALIA

Government of Western Australia
Department of Water and Environmental Regulation

Clearing Permit Decision Report

1. Application details and outcome

1.1 Permit application details

Permit number:	CPS 8920/1
Permit type:	Area permit
Applicant name:	Shire of Serpentine-Jarrahdale
Application received:	22 May 2020
Application area:	0.217 hectares (ha) of native vegetation (as revised)
Purpose of clearing:	Road upgrades
Method of clearing:	Mechanical removal
Property:	Keirnan Street reserve (PINs 11918698, 11460691, 11413979, 11413977, 11413988 and 11413989)
Location (LGA area/s):	Shire of Serpentine-Jarrahdale
Localities (suburb/s):	Whitby and Mundijong

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 area[1]. The application form states that the total area of clearing is 0.1857 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 0.217 ha. The extent of the proposed clearing is indicated in Figure 1 (see Section 1.5).

1.3 Decision on application

Decision:	Granted
Decision date:	10 August 2020
Decision area:	0.217 ha of native vegetation (see Figure 1, 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 A), relevant datasets (see Appendix E), the findings of a site inspection (see Appendix D), the clearing principles set out in Schedule 5 of the EP Act (see Appendix B), 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 a remnant of native vegetation in an extensively cleared area
- is growing in association with a mapped 'multiple use' wetland (palusplain)
- contains foraging habitat for threatened black cockatoo species (but is not considered to be significant habitat).

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.

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 and nearby native vegetation, and that weed and dieback management practices will mitigate any potential impacts to adjacent vegetation.

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

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
- take steps to minimise the risk of the introduction and spread of weeds and dieback.

1.5 Site map

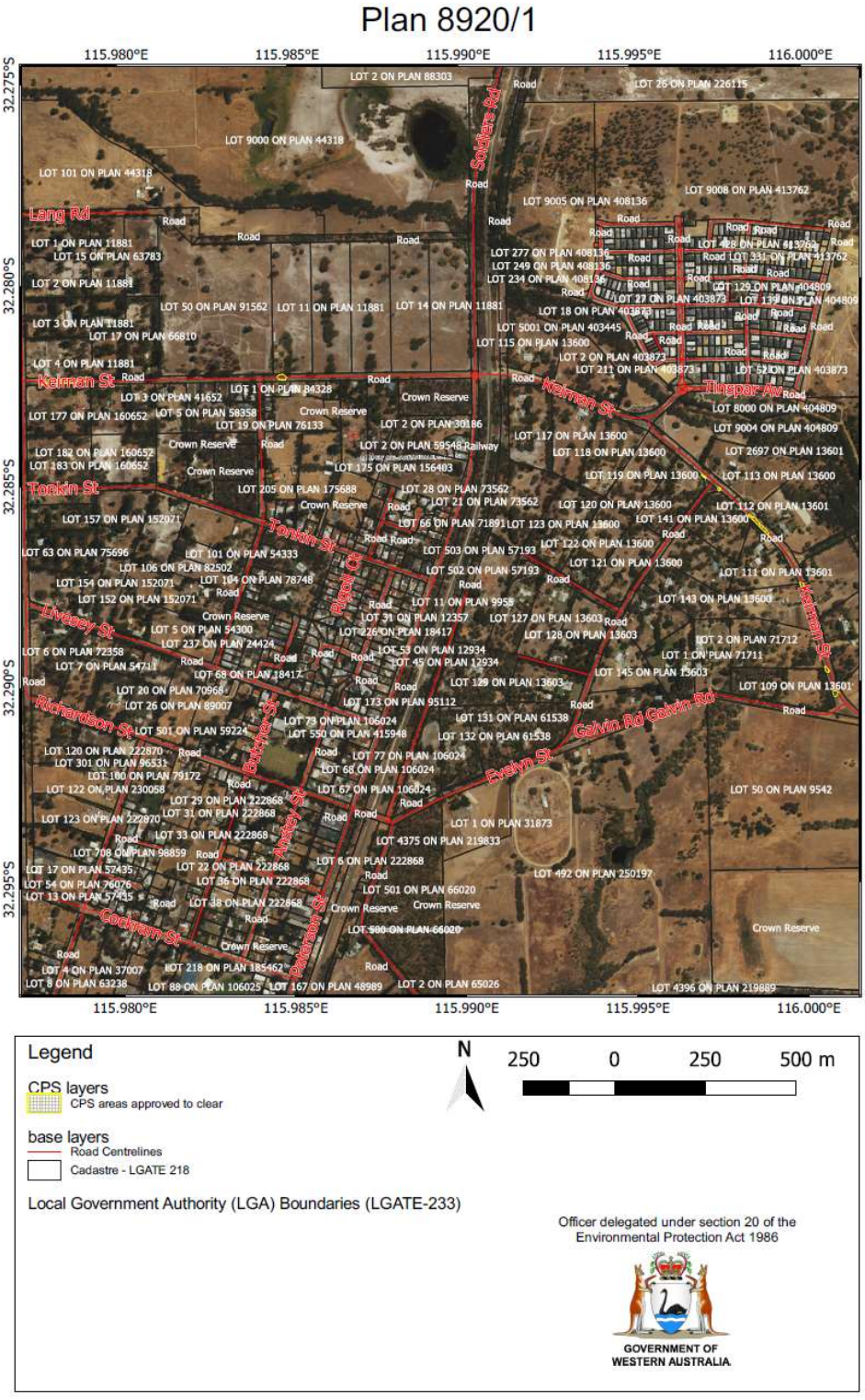

Figure 1: Map of area approved to clear

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 1.3), 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*.

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.

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 A), and considered the extent to which the impacts of the proposed clearing 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 B.

This assessment identified that the impacts of the proposed clearing present a risk to fauna habitat, adjacent vegetation 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

The value of the application area as fauna habitat is primarily associated with individual marri (*Corymbia calophylla*), flooded gum (*Eucalyptus rudis*), moonah (*Melaleuca preissiana*), swamp sheoak (*Casuarina obesa*) and orange wattle (*Acacia saligna*), given the absence of intact lower storey vegetation. Available aerial photography and spatial datasets indicate that the road reserve is largely cleared of native vegetation, and that which remains appears to be limited to pockets of trees and some midstorey plants including grasstree (*Xanthorrhoea preissii*), over a ground layer dominated by grassy weeds. The road reserve therefore has limited value in maintaining connectivity between remnants in the local area. No mapped ecological linkages occur in the local area.

Ten threatened, 13 priority, two 'conservation dependent' and one 'other specially protected' fauna, and five 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, one priority, two 'conservation dependent' and one 'other specially protected' fauna have been recorded in close proximity to the application area from similar vegetation and/or from arboreal/canopy habitat:

- Carnaby's black cockatoo (*Calyptorhynchus latirostris*; Endangered), Baudin's black cockatoo (*Calyptorhynchus baudinii*; Endangered) and forest red-tailed black cockatoo (*Calyptorhynchus banksii* subsp. *naso*; Vulnerable): Published literature sets out the habitat preferences of these species, which includes marri for foraging, roosting and breeding (Department of Environment and Conservation, 2008a; 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 nearest records are approximately 230 metres (m), 120 m and 160 m from the application area respectively. In relation to Carnaby's black cockatoo, the application area is in close proximity to a number of confirmed roosting sites, approximately 10 kilometres (km) from unconfirmed breeding sites, and approximately 23 km from the nearest confirmed breeding site. Photographs provided by the applicant indicate that the marri trees within the application area are unlikely to be of sufficient size to contain hollows suitable for breeding by these species, however in combination with other plants in the application area are likely to have value as foraging and roosting habitat. The foraging habitat is considered to be of 'low quality' based on Commonwealth guidance, that is, the vegetation proposed to be cleared comprises individual foraging plants or a small stand of foraging plants (Department of the Environment and Energy, 2017).

- 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 2.1 km from the application area. Most records in the local area associated with conservation areas. Photographs provided by the applicant and available aerial photography indicate that both sides of the Keirnan Street reserve (including the application area) are adjacent to private properties. This species may utilise the application area as a corridor for movement through the landscape, however noting the surrounding development and lack of native understorey this is considered unlikely.
- Numbat (*Myrmecobius fasciatu*s; Endangered): Numbats have historically been present in a large variety of habitat types, including *Eucalyptus* forest, *Eucalyptus* woodland, *Acacia* woodland and *Triodia* grassland (Department of Parks and Wildlife, 2017). 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 4.7 km from the application area. The application area includes *Eucalyptus* and *Acacia* species, however noting the surrounding development and lack of native understorey, the application area is unlikely to comprise suitable habitat.
- 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 0.78 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, particularly in the vicinity of the local government-vested Bella Cumming Reserve located approximately 340 m from the application area. However noting the surrounding development and lack of native understorey this is considered minimal.
- South-western brush-tailed phascogale/wambenger (*Phascogale tapoatafa* subsp. *wambenger*; Conservation Dependent): In the south-west, this species is typically found in jarrah forest (Department of Environment and Conservation, 2012b). The nearest record is approximately 1.9 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, particularly in the vicinity of the local government-vested Bella Cumming Reserve located approximately 340 m from the application area. However noting the surrounding development and lack of native understorey this is considered minimal.
- Muir's corella (*Cacatua pastinator* subsp. *pastinator*; Conservation Dependent): The habitat critical to survival and important populations of Muir's Corella comprises large live or dead eucalypts, particularly marri and jarrah, flooded gum, yate (*Eucalyptus cornuta*) and moonah in forested areas or as lone trees in paddocks and along roadsides in the region from Boyup Brook, McAlinden and Qualeup, south to Lake Muir and the lower Perup River, and east to Frankland and Rocky Gully (Department of Environment and Conservation, 2008b). The nearest record is approximately 9.1 km from the application area. The application area includes marri, flooded gum and moonah, however noting that the record is historical and that the species current range appears to occur further south, this species is unlikely to utilise the application area.
- 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 0.26 km from the application area. This species is widespread and highly mobile, and is found in various habitats. The application area may comprise suitable habitat for this species.

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 patchy and narrow, linear shape of the application area and the composition and condition of the vegetation proposed to be cleared, the application area is unlikely to be significant for the survival of indigenous fauna or be necessary for the maintenance of significant habitat.

There is potential that the proposed clearing activities could result in the introduction or spread of weeds and dieback into remaining pockets of vegetation within the Keirnan Street road reserve, which could impact on the quality of habitat values.

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, noting the vegetation present and condition.

Conditions

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.

3.2.2 Flora and vegetation

Assessment

Conservation-significant flora

Nine threatened and 35 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.

Five threatened and 31 priority flora are unlikely to occur within the application area. This is due to a combination of distance from the application area and differences in the vegetation/soil types and landforms in which they occur compared to those present within the application area. Two threatened and two priority flora have been recorded within 2 km of the application area, however are associated with soil types and/or landforms (swamps, rivers, low-lying and/or seasonally wet areas) that do not occur within the application area. Based on similar habitat qualities and/or proximity, the application area might contain suitable habitat for two threatened and two priority flora, and these are considered in further detail.

- *Synaphea* sp. Pinjarra Plain (A.S. George 17182) (Threatened): The Florabase website (Western Australian Herbarium, 1998-) indicates that this species is known from 63 recorded populations (some records may overlap) ranging from the Shire of Murray to the Shire of Capel, typically associated with grey/brown sandy loam, clayey sand or clayey loam and laterite on flat seasonally-wet areas. The nearest record is approximately 160 m from the application area, from a soil type mapped within the application area, associated with jarrah-marri woodland on sandy loam within a railway reserve adjacent to the Paterson Road reserve.
- *Tetraria australiensis* (Threatened): The Florabase website indicates that this species is known from 37 recorded populations (some records may overlap) ranging from City of Canning to the City of Busselton and inland to the Shire of Wandering. Florabase describes this species as a tufted perennial grass-like sedge to 1 m high generally occurring in locally-abundant populations, typically associated with sandy, loamy and clayey soils on flat or gently sloping areas. The nearest record is approximately 1 km from the application area, from a soil type mapped within the application area; some other records in the local area are from a different mapped soil type.
- *Amanita fibrillopes* (Priority 3): The Florabase website indicates that this species is known from 27 recorded populations (some records may overlap) ranging from the City of Perth to the City of Albany. The nearest record is approximately 1 km from the application area, from a different mapped soil type. Other records in the local area are from a soil type mapped within the application area.
- *Amanita wadjukiorum* (Priority 3): The Florabase website indicates that this species is known from 25 recorded populations (some records may overlap) ranging from the City of Perth to the Shire of Serpentine-Jarrahdale. The nearest record is approximately 410 m from the application area, from a soil type mapped within the application area, associated with leaf litter on sandy loam in local government-vested Bella Cumming Reserve located adjacent to the Keirnan Street reserve.

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 and devoid of native vegetation, it is considered that the above conservation-significant flora species are unlikely to be present.

Conservation-significant ecological communities

Ten threatened and two priority ecological communities (TEC and PEC respectively) 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 ecological communities and their recorded proximity to the application area were considered, along with the vegetation/soil types and landforms within the application area.

Six TECs and one PEC are unlikely to occur within the application area due to a combination of distance from the application area and differences in the vegetation/soil types and landforms in which they occur compared to those present within the application area. One TEC and one PEC have been recorded approximately 100 m and 310 m respectively from the application area; both are characterised by the presence of *Banksia* species and a diverse shrub layer which do not occur within the application area. A further three TECs characterised by the presence of marri have been recorded within 1.1 km of the application area; these TECs have an associated diverse understorey comprised of species that do not occur within the application area.

Noting the composition and condition of the vegetation within the application area, the application area is unlikely to include or be necessary for the maintenance of TECs or PECs.

Conclusion

For the reasons set out above, it is considered that the proposed clearing is unlikely to impact on conservation-significant flora or ecological communities. No clearing permit conditions are necessary in relation to this matter.

3.2.3 Significance as a remnant

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 (Environmental Protection Authority, 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 (Environmental Protection Authority, 2008).

One of the mapped Vegetation Complexes have less than 10 per cent of their pre-European extents remaining (5.09 per cent), and the second mapped Vegetation Complex has 12.29 per cent remaining; both of which are considered to be extensively cleared. The local area retains approximately 33.67 per cent of its pre-European native vegetation cover; it is noted that the majority of this is associated with the Jarrahdale State Forest and Serpentine National Park within the Jarrah Forest bioregion. Available datasets and aerial imagery indicate that the portion of the local area within the Swan Coastal Plain bioregion (being the bioregion within which the proposed clearing is located) has been 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 unlikely to be biologically diverse and does not include significant fauna habitat. On this basis, the vegetation within the application area is not considered to be a significant remnant within an extensively cleared landscape.

Conclusion

For the reasons set out above, it is considered that the application area is located within an extensively cleared landscape. However, noting that the foraging habitat is 'low quality' and does not contain important biological values, it is considered that this does not constitute a significant residual impact. No clearing permit conditions are necessary in relation to this matter, including offsets.

3.2.4 Land and water resources

Assessment

A portion of the application area is located within a wetland (palusplain) that has a 'multiple use' management category, and is within the broader Keysbrook consanguineous wetland suite. No mapped watercourses traverse the application area; the nearest watercourses are a non-perennial minor river and the Manjedal Brook located approximately 130 m and 135 m from the application area respectively. The potential for an increase in surface water run-off has the potential to lead to sedimentation of the wetland.

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 wetland 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 impact on the hydrological and ecological values of the wetland. No clearing permit conditions are necessary in relation to this matter.

Relevant planning instruments and other matters

No registered Aboriginal sites of significance have been mapped within the application area, although several Aboriginal Heritage Places are mapped in the local area. The nearest is an 'other heritage site' known as 'MJ-09' located approximately 410 m from the application area; the nearest 'registered site' is known as 'MJ-08' located approximately 510 m from the application area. Given the separation distance, the proposed clearing is unlikely to impact on these sites. 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 a further three clearing applications under assessment and three 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, moonah, WA Christmas tree (*Nuytsia floribunda*) and stinkwood in the Punrak Road reserve (granted on 29 June 2020)
- Clearing Permit CPS 8896/1 to clear 0.189 ha of swamp sheoak 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 approximately 0.51 ha (as revised) of swamp sheoak, marri and moonah in the Mundijong Road reserve
- Application CPS 8918/1 to clear approximately 0.78 ha (as revised) of native vegetation in the Nettleton Road reserve
- Application CPS 8919/1 to clear approximately 0.722 ha (as revised) of native vegetation in the Anketell Road reserve.

The combined extent of clearing proposed by the current and above applications is approximately 2.92 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 – Site characteristics

The information below are the findings of a desktop assessment based on the best information available to the Department of Water and Environmental Regulation 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 B).

Site characteristics

Site characteristic	Details
Local context	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 area. The local area considered in the assessment of this application is defined as a 10 km radius from the perimeter of the application area, and retains approximately 33.67 per cent of native vegetation cover.
Vegetation description	The application area is mapped as: • Guildford Complex, described as mixture of open forest to tall open forest of marri - wandoo - jarrah and woodland of wandoo (with rare occurrences of salmon white gum (*Eucalyptus lane-poolei*)); minor components include flooded gum (*Eucalyptus rudis*) – swamp paperbark (*Melaleuca rhaphiophylla*). (mapped across approximately 0.122 hectares (ha) / 56.3 per cent of the application area) • Forrestfield Complex, described as ranging from open forest of marri - wandoo - jarrah to open forest of jarrah - marri - sheoak (*Allocasuarina fraseriana*) - *Banksia* species; fringing woodland of flooded gum in the gullies that dissect this landform (mapped across approximately 0.095 ha / 43.7 per cent of the southern portion of the application area). Vegetation composition was determined from the application form and supporting information (photographs) provided by the applicant. The photographs indicate that the vegetation proposed to be cleared is primarily trees over a sparse understorey dominated by weeds, and is limited to individual marri, flooded gum, moonah (*Melaleuca preissiana*), swamp sheoak (*Casuarina obesa*) and golden wattle (*Acacia saligna*).
Vegetation condition	Vegetation condition was determined from available aerial photography and the photographs provided by the applicant. The vegetation proposed to be cleared ranges from degraded to completely degraded condition on the scale described by Keighery (1994) (see Appendix C).
Soil description	The application area is mapped as: • Bassendean B2 Phase (212Bs_B2) described as flat to very undulating sandplain with well to moderately well drained deep bleached grey sands with a pale yellow B horizon or a weak iron-organic hardpan 1-2 m (mapped across approximately 0.104 ha / 48.1 per cent of the application area) • Bassendean B2a Phase (212Bs_B2a) described as for Bassendean B2 Phase[2] but with a more intensely coloured yellow B horizon usually well within 1 m of the surface (mapped across approximately 0.067 ha / 30.9 per cent of the application area) • Pinjarra P1e Phase (213Pj_P1e) described as flat to very gently undulating plain with deep acidic mottled yellow duplex (or 'effective duplex') soils comprising: shallow pale sand to sandy loam over very gravelly clay; moderately well drained (mapped across approximately 0.028 ha / 12.8 per cent of the application area) • Bassendean B6 Phase (212Bs_B6) described as a sand plain similar to Bassendean B4 Phase[3] with imperfectly drained soils (mapped across approximately 0.018 ha / 8.2 per cent of the application area).

[2] 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 m.
[3] 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.

<table>
<tr><th>Site characteristic</th><th>Details</th></tr>
<tr><td>Land degradation risk</td><td>Mapped land degradation risk factors (as percentage of map unit)
<table>
<tr><th>Risk categories</th><th>212Bs_B2</th><th>212Bs_B2a</th><th>213Pj_P1e</th><th>212Bs_B6</th></tr>
<tr><td>Wind erosion</td><td>>70% has a high to extreme risk</td><td>>70% has a high to extreme risk</td><td>10-30% has a high to extreme risk</td><td>>70% has a high to extreme risk</td></tr>
<tr><td>Water erosion</td><td><3% has a high to extreme risk</td><td><3% has a high to extreme risk</td><td><3% has a high to extreme risk</td><td><3% has a high to extreme risk</td></tr>
<tr><td>Salinity</td><td>30-50% has a moderate to high risk</td><td>30-50% has a moderate to high risk</td><td>30-50% has a moderate to high risk</td><td>30-50% has a moderate to high risk</td></tr>
<tr><td>Subsurface Acidification</td><td><3% has a high risk</td><td><3% has a high risk</td><td>50-70% has a high risk</td><td>10-30% has a high risk</td></tr>
<tr><td>Flood risk</td><td><3% has a moderate to high risk</td><td><3% has a moderate to high risk</td><td><3% has a moderate to high risk</td><td><3% has a moderate to high risk</td></tr>
<tr><td>Waterlogging</td><td>3-10% has a moderate to very high risk</td><td><3% has a moderate to very high risk</td><td>30-50% has a moderate to very high risk</td><td>10-30% has a moderate to very high risk</td></tr>
<tr><td>Phosphorus export risk</td><td>>70% has a high to extreme risk</td><td>10-30% has a high to extreme risk</td><td><3% has a high to extreme risk</td><td>>70% has a high to extreme risk</td></tr>
</table></td></tr>
<tr><td>Waterbodies</td><td>The application area is located within the broader Keysbrook consanguineous wetland suite.
A number of natural watercourses and man-made drains are mapped in the local area, however none traverse the application area. The nearest of these is a non-perennial minor river located approximately 130 m from the application area.
A further 36 mapped lakes, wetlands, rivers and other water bodies occur within the local area. Those within two kilometres of the application area are outlined below.
<table>
<tr><th>Type of inland water</th><th>Description</th><th>Proximity (m)</th></tr>
<tr><td>Geomorphic Wetlands (Classification), Swan Coastal Plain</td><td>Multiple Use - Palusplain</td><td>0</td></tr>
<tr><td>Rivers</td><td>Manjedal Brook: Minor Trib</td><td>136</td></tr>
<tr><td>Geomorphic Wetlands (Classification), Swan Coastal Plain</td><td>Conservation - Palusplain</td><td>154</td></tr>
<tr><td>Geomorphic Wetlands (Classification), Swan Coastal Plain</td><td>Multiple Use - Sumpland</td><td>251</td></tr>
<tr><td>Geomorphic Wetlands (Classification), Swan Coastal Plain</td><td>Conservation - Sumpland</td><td>682</td></tr>
<tr><td>Geomorphic Wetlands (Classification), Swan Coastal Plain</td><td>Resource Enhancement - Palusplain</td><td>1207</td></tr>
<tr><td>Rivers</td><td>Gingagup Brook: Insignificant Trib</td><td>1610</td></tr>
<tr><td>Rivers</td><td>: Insignificant Trib</td><td>1835</td></tr>
<tr><td>Rivers</td><td>Medulla Brook: Major Trib</td><td>1910</td></tr>
</table></td></tr>
<tr><td>Conservation areas</td><td>The local government-vested Bella Cumming Reserve is located approximately 340 m from the application area.
There are a further 72 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 areas (some of these overlap). Those within two kilometres of the application area are outlined below.</td></tr>
</table>

Site characteristic	Details
	<table><tr><th>Theme</th><th>Description</th><th>Proximity (m)</th></tr><tr><td>Bushforever</td><td>350</td><td>304</td></tr><tr><td>DBCA Land for Wildlife Sites</td><td>13</td><td>688</td></tr><tr><td>DBCA Land for Wildlife Sites</td><td>1413</td><td>708</td></tr><tr><td>DBCA Managed Lands</td><td>Watkins Road Nature Reserve; Conservation Commission Of WA</td><td>813</td></tr><tr><td>Bushforever</td><td>360</td><td>813</td></tr><tr><td>DBCA Managed Lands</td><td>Conservation Commission Of WA (I140888)</td><td>1116</td></tr><tr><td>Bushforever</td><td>362</td><td>1116</td></tr><tr><td>Bushforever</td><td>354</td><td>1694</td></tr><tr><td>Bushforever</td><td>365</td><td>1832</td></tr><tr><td>DBCA Managed Lands</td><td>CALM Executive Body</td><td>1972</td></tr></table>
Climate and landform	Rainfall: 1,000 Evapotranspiration: 900 Geology: Alluvial, shoreline, and aeolian deposits Acid Sulfate Soil Risk: Moderate to low risk Groundwater Salinity (Total Dissolved Solids): 500-1,000 mg/L The application area is on the edge of a broad flat and a slight slope. Topography ranges from 30 to 50 m above sea level (Department of Primary Industries and Regional Development, 2017).
Hydrology and hydrogeology	The application area is within the 'Coastal Pain' Hydrological Zone, and the 'Peel Estuary – Serpentine River' Hydrographic Catchment. The application area is also within the mapped 'Serpentine' Groundwater Area under the *Rights in Water and Irrigation Act 1914*.

Flora, fauna and ecosystem analysis

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

Roadside Conservation Committee roadside conservation values: Low (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 E), and photographs provided by the applicant (see Appendix D), the likelihood of their occurrences within the application area has been assessed.

Species / Ecological Community	Distance to nearest record (km)	Suitable soil type?	Suitable vegetation type?	Suitable habitat features?	Surveys adequate to identify?
Fauna					
Baudin's black cockatoo (*Calyptorhynchus baudinii*; Endangered)	Approximately 0.12 km		Y	Y	N/A
Forest red-tailed black cockatoo (*Calyptorhynchus banksii* subsp. *naso*; Vulnerable)	Approximately 0.16 km		Y	Y	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.

Species / Ecological Community	Distance to nearest record (km)	Suitable soil type?	Suitable vegetation type?	Suitable habitat features?	Surveys adequate to identify?
Carnaby's black cockatoo (*Calyptorhynchus latirostris*; Endangered)	Approximately 0.23 km		Y	Y	N/A
Peregrine Falcon (*Falco peregrinus*; Other Specially Protected)	Approximately 0.26 km			Y	N/A
South-western brown bandicoot/quenda (*Isoodon fusciventer*; Priority 4)	Approximately 0.78 km			Y	N/A
Curlew sandpiper (*Calidris ruficollis*; International Agreement)	Approximately 0.9 km			N	N/A
Carter's freshwater mussel (*Westralunio carteri*; Vulnerable)	Approximately 1.1 km			N	N/A
Inornate trapdoor spider (northern jarrah forest) (*Euoplos inornatus*; Priority 3)	Approximately 1.9 km			N	N/A
Swan Coastal Plain shield-backed trapdoor spider (*Idiosoma sigillatum*; Priority 3)	Approximately 1.9 km			N	N/A
South-western brush-tailed phascogale/wambenger (*Phascogale tapoatafa* subsp. *wambenger*; Conservation Dependent)	Approximately 1.9 km			Y	N/A
Chuditch/western quoll (*Dasyurus geoffroii*; Vulnerable)	Approximately 2.1 km			N	N/A
Quokka (*Setonix brachyurus*; Threatened)	Approximately 4.3 km			N	N/A
Numbat (*Myrmecobius fasciatus*; Endangered)	Approximately 4.7 km			N	N/A
Tammar wallaby (*Notamacropus eugenii* subsp. *derbianus*; Priority 4)	Approximately 5.1 km			N	N/A
Southern death adder (*Acanthophis antarticus*; Priority 3)	Approximately 5.7 km	N		N	N/A
Caspian tern (*Hydroprogne caspia*; International Agreement)	Approximately 5.9 km			N	N/A
Western brush wallaby (*Notamacropus irma*; Priority 4)	Approximately 6.2 km			N	N/A
Western ringtail possum (*Pseudocheirus occidentalis*; Critically Endangered)	Approximately 6.6 km			N	N/A
Blue-billed duck (*Oxyura australis*; Priority 4)	Approximately 6.7 km			N	N/A
Glossy ibis (*Plegadis falcinellus*; International Agreement)	Approximately 6.7 km			N	N/A
Curlew sandpiper (*Calidris ferruginea*; Critically Endangered)	Approximately 6.9 km			N	N/A
Marsh sandpiper/little greenshank (*Tringa nebularia*; International Agreement)	Approximately 6.9 km			N	N/A

Species / Ecological Community	Distance to nearest record (km)	Suitable soil type?	Suitable vegetation type?	Suitable habitat features?	Surveys adequate to identify?
Malleefowl (*Leipoa ocellata*; Vulnerable)	Approximately 7.2 km			N	N/A
Water-rat/rakali (*Hydromys chrysogaster*; Priority 4)	Approximately 7.2 km			N	N/A
Common sandpiper (*Actitis hypoleucos*; International Agreement)	Approximately 8.4 km			N	N/A
Pouched lamprey (*Geotria australis*; Priority 3)	Approximately 8.6 km			N	N/A
Perth slider/lined skink (*Lerista lineata*; Priority 3)	Approximately 9.1 km			N	N/A
Black-striped burrowing snake (*Neelaps calonotus*; Priority 3)	Approximately 9.1 km			N	N/A
Muir's corella (*Cacatua pastinator* subsp. *pastinator*; Conservation Dependent)	Approximately 9.1 km		Y	Y	N/A
Dell's skink/Darling Range southwest ctenotus (*Ctenotus delli*; Priority 4)	Approximately 9.2 km			N	N/A
Jarrah forest freshwater snail (*Glacidorbis occidentalis*; Priority 3)	Approximately 9.8 km			N	N/A
Flora					
Synaphea sp. Pinjarra Plain (A.S. George 17182) (Threatened)	Approximately 0.16 km	Y	Y	Y	N/A
Amanita wadjukiorum (Priority 3)	Approximately 0.41 km	Y		Y	N/A
Tetraria australiensis (Threatened)	Approximately 1 km	Y		Y	N/A
Amanita fibrillopes (Priority 3)	Approximately 1 km	Y		Y	N/A
Amanita carneiphylla (Priority 3)	Approximately 1.5 km	N		N	N/A
Synaphea sp. Serpentine (G.R. Brand 103) (Threatened)	Approximately 1.8 km	Y		N	N/A
Diuris purdiei (Threatened)	Approximately 1.9 km	N		N	N/A
Johnsonia pubescens subsp. *cygnorum* (Priority 2)	Approximately 1.9 km	Y		N	N/A
Babingtonia urbana (Priority 3)	Approximately 2 km	N		N	N/A
Lepidosperma rostratum (Threatened)	Approximately 2.2 km	N	N	N	N/A
Calectasia grandiflora (Priority 2)	Approximately 2.2 km	N		N	N/A
Drakaea elastica (Threatened)	Approximately 2.4 km	N		N	N/A
Jacksonia gracillima (Priority 3)	Approximately 2.5 km	N	N	N	N/A

Species / Ecological Community	Distance to nearest record (km)	Suitable soil type?	Suitable vegetation type?	Suitable habitat features?	Surveys adequate to identify?
Schoenus sp. Waroona (G.J. Keighery 12235) (Priority 3)	Approximately 3 km	N	N	N	N/A
Pithocarpa corymbulosa (Priority 3)	Approximately 3 km	N		N	N/A
Schoenus capillifolius (Priority 3)	Approximately 3 km	N		N	N/A
Stylidium aceratum (Priority 3)	Approximately 3.1 km	N		N	N/A
Millotia tenuifolia var. *laevis* (Priority 2)	Approximately 3.5 km	N	N	N	N/A
Verticordia lindleyi subsp. *lindleyi* (Priority 4)	Approximately 4.5 km	N		N	N/A
Amanita wadulawitu (Priority 3)	Approximately 4.6 km	N		N	N/A
Angianthus drummondii (Priority 3)	Approximately 4.6 km	N		N	N/A
Acacia lasiocarpa var. *bracteolata* long peduncle variant (G.J. Keighery 5026) (Priority 1)	Approximately 5 km	N		N	N/A
Parsonsia diaphanophleba (Priority 4)	Approximately 5 km	Y		N	N/A
Amanita kalamundae (Priority 3)	Approximately 5.7 km	N		N	N/A
Drosera occidentalis (Priority 4)	Approximately 5.8 km	N			N/A
Schoenus pennisetis (Priority 3)	Approximately 5.9 km	N		N	N/A
Dillwynia dillwynioides (Priority 3)	Approximately 7.1 km	N		N	N/A
Grevillea crowleyae (Priority 2)	Approximately 8.1 km	N		N	N/A
Lasiopetalum pterocarpum (Threatened)	Approximately 8.2 km	N		N	N/A
Acacia horridula (Priority 3)	Approximately 8.3 km	N		N	N/A
Synaphea sp. Fairbridge Farm (D. Papenfus 696) (Threatened)	Approximately 8.6 km	N		N	N/A
Acacia oncinophylla subsp. *oncinophylla* (Priority 3)	Approximately 8.6 km	N			N/A
Eucalyptus rudis subsp. *cratyantha* (Priority 4)	Approximately 8.6 km	N			N/A
Isopogon autumnalis (Priority 3)	Approximately 8.8 km	N			N/A
Verticordia plumosa var. *ananeotes* (Threatened)	Approximately 8.9 km	N		N	N/A
Carex tereticaulis (Priority 3)	Approximately 8.9 km	N			N/A

Species / Ecological Community	Distance to nearest record (km)	Suitable soil type?	Suitable vegetation type?	Suitable habitat features?	Surveys adequate to identify?
Synaphea odocoileops (Priority 1)	Approximately 9 km	N		N	N/A
Senecio leucoglossus (Priority 4)	Approximately 9 km	N		N	N/A
Aponogeton hexatepalus (Priority 4)	Approximately 9.2 km	N		N	N/A
Pimelea rara (Priority 4)	Approximately 9.3 km	N			N/A
Eryngium pinnatifidum subsp. *palustre* (G.J. Keighery 13459) (Priority 3)	Approximately 9.5 km	N			N/A
Stylidium longitubum (Priority 4)	Approximately 9.7 km	N		N	N/A
Cyathochaeta teretifolia (Priority 3)	Approximately 9.8 km	N		N	N/A
Boronia juncea subsp. *juncea* (Priority 1)	Approximately 9.9 km	N	N		N/A
Ecological communities					
Banksia Dominated Woodlands of the Swan Coastal Plain IBRA region (Priority 3)	Approximately 0.1 km	Y	N No *Banksia*		N/A
Banksia attenuata and/or *Eucalyptus marginata* woodlands of the eastern side of the Swan Coastal Plain (floristic community type[5] (FCT) 20b) (Threatened)	Approximately 0.31 km	Y	N No *Banksia*		N/A
Southern wet shrublands, Swan Coastal Plain (floristic community type 2) (Threatened)	Approximately 0.9 km	N	N		N/A
Corymbia calophylla – Kingia australis woodlands on heavy soils, Swan Coastal Plain (FCT 3a) (Threatened)	Approximately 1 km	N	N No *Kingia*		N/A
Corymbia calophylla – Xanthorrhoea preissii woodlands and shublands, Swan Coastal Plain (FCT 3c) (Threatened)	Approximately 1 km	Y	N		N/A
Corymbia calophylla – Eucalyptus marginata woodlands on sandy clay soils of the southern Swan Coastal Plain (FCT 3b) (Threatened)	Approximately 1.1 km	Y	N		N/A
Herb rich shrublands in clay pans (FCT 8) (Threatened)	Approximately 2.2 km	N	N		N/A
Dense shrublands on clay flats (floristic community type 9) (Threatened)	Approximately 5.9 km	N	N		N/A

[5] 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)	Suitable soil type?	Suitable vegetation type?	Suitable habitat features?	Surveys adequate to identify?
Low lying *Banksia attenuata* woodlands or shrublands (Priority 3)	Approximately 6.8 km	Y	N No *Banksia*		N/A
Shrublands on dry clay flats (FCT 10a) (Threatened)	Approximately 7.8 km	N	N		N/A
Herb rich saline shrublands in clay pans (FCT 7) (Threatened)	Approximately 9.4 km	N	N		N/A
Communities of Tumulus Springs (Organic Mound Springs, Swan Coastal Plain) (Threatened)	Approximately 10 km	N	N		N/A

Vegetation extent

	Pre-European (ha)	Current extent (ha)	Current extent (%)	Current extent (ha) in DBCA[6]-managed lands	Current extent (%) in DBCA-managed lands
IBRA[7] bioregion (as at March 2019)					
Swan Coastal Plain	1,501,221.93	579,813.47	38.62	269,964.76	17.98
Vegetation Complex					
Guildford	90,513.13	4,607.91	5.09	390.92	0.32
Forrestfield	22,812.92	2,803.36	12.29	461.04	1.67
Local area					
10-kilometre radius	36,443.62	12,273.19	33.67	N/a	N/a

[6] Department of Biodiversity, Conservation and Attractions. Current extent as proportion of pre-European extent within DBCA-managed lands.
[7] Interim Biogeographic Regionalisation for Australia.

Appendix B – Assessment against the Clearing Principles

Assessment against the Clearing Principles	Variance level	Is further consideration required?
Principle (a): "*Native vegetation should not be cleared if it comprises a high level of biodiversity*."[8] Assessment: The photographs and information provided by the applicant indicate that the vegetation within the application area comprises individual marri (*Corymbia calophylla*), flooded gum (*Eucalyptus rudis*), moonah (*Melaleuca preissiana*), swamp sheoak (*Casuarina obesa*) and orange wattle (*Acacia saligna*) over a sparse understorey dominated by weeds, in degraded to completely degraded condition. None of the threatened and priority flora and ecological communities recorded in the local area are likely to occur within the application area. The application area does not contain significant habitat for fauna.	Not likely to be at variance	Yes Sections 3.2.1 and 3.2.2
Principle (b): "*Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna*." Assessment: The application area comprises suitable habitat for three threatened and one 'other specially protected' fauna. Noting the patchy and narrow, linear shape of the application area and the vegetation composition and condition, the application area is unlikely to be significant for the survival of indigenous fauna.	Not likely to be at variance	Yes Section 3.2.1
Principle (c): "*Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora*." Assessment: Nine threatened flora have been recorded in the local area, however none of these are likely to occur within the application area.	Not likely to be at variance	Yes Section 3.2.2
Principle (d): "*Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community*."[9] Assessment: Ten threatened ecological communities (TEC) have been recorded in the local area, some from soil types mapped within the application 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.	Not likely to be at variance	Yes Section 3.2.2
Principle (e): "*Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared*." Assessment: The application area includes vegetation that is mapped as types that are below the national target and objective for biodiversity conservation (that is, less than 30 per cent pre-European extent remaining). On this basis the vegetation proposed to be cleared is considered to be in an extensively cleared area.	Is at variance	Yes Section 3.2.3

[8] 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'.

[9] 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.

Principle (f): "*Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland*." Assessment: The application area is located within a wetland (palusplain). No mapped watercourses traverse the application area. The vegetation within the application area is growing in association with the wetland.	Is at variance	Yes Section 3.2.4
Principle (g): "*Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation*." Assessment: The main land degradation risks associated with the soil types mapped across the application area are high to extreme risks of wind erosion and phosphorus export (affecting approximately 87.2 per cent and 56.3 per cent of the application area respectively), and a moderate to high risk of salinity across the whole 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.	Not likely to be at variance	No
Principle (h): "*Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area*." Assessment: The nearest conservation areas are Bush Forever area 350 which traverses Keirnan Street and is located approximately 300 m from the application area. With regard to the separation distance between the application area and conservation areas in the local area, the proposed clearing is unlikely to impact on their environmental values or connection with other remnants.	Not likely to be at variance	No
Principle (i): "*Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water*." Assessment: The potential for an increase in surface water run-off has the potential to lead to sedimentation of the wetland (palusplain) in 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.	Not likely to be at variance	Yes Section 3.2.4
Principle (j): "*Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding*." Assessment: The soil types mapped across the application area have a low flood risk.	Not likely to be 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.

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 D – Photographs of the vegetation

Photographs of the Keirnan Street reserve provided as supporting information by the applicant, heading east from the intersection of Taylor Street. This supporting information is published on the Department of Water and Environmental Regulation's website at: ftp://ftp.dwer.wa.gov.au/permit/8920/.


Keirnan St


nearmap


nearmap

Appendix E – 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

References

Australian Museum (2020) *Peregrine Falcon*. Government of New South Wales. Available at: https://australianmuseum.net.au/learn/animals/birds/peregrine-falcon/.

Commonwealth of Australia (2001) *National Objectives and Targets for Biodiversity Conservation 2001-2005*. Commonwealth of Australia, Canberra.

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