GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

PERMIT DETAILS

Area Permit Number: CPS 9371/1
File Number: DWERVT8357
Duration of Permit: From 20 November 2021 to 20 November 2023

PERMIT HOLDER

Shire of Denmark

LAND ON WHICH CLEARING IS TO BE DONE

Ti Tree Lane road reserve (PIN 11247020), Denmark
Mount Shadforth Road reserve (PIN 11247010), Denmark

AUTHORISED ACTIVITY

The Permit Holder shall not clear more than 0.02 hectares of native vegetation within the areas cross-hatched yellow in Figure 1 of Schedule 1.

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 *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

27 October 2021

SCHEDULE 1

The boundary of the area authorised to be cleared is shown in

Figure below.

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

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 9371/1
Permit type:	Area permit
Applicant name:	Shire of Denmark
Application received:	2 August 2021
Application area:	0.02 hectares (ha)
Purpose of clearing:	Intersection upgrade
Method of clearing:	Manual removal
Property:	Ti Tree Lane road reserve (PIN 11247020) Mount Shadforth Road reserve (PIN 11247010)
Location (LGA area/s):	Shire of Denmark
Localities (suburb/s):	Denmark

1.2. Description of clearing activities

The application area comprises selected trees and understorey adjacent to an existing road, within a broader road reserve that has a function in maintaining connectivity between patches of remnant vegetation in the local area (for this application, the local area is defined as a 20 kilometre (km) radius from the perimeter of the application area). Information provided by the applicant indicates that the application area has been identified as a black spot site and that the proposed clearing is for realignment of the corner and for ease of access for rubbish collection vehicles (Shire of Denmark, 2021). The extent of the proposed clearing is indicated in Figure 1 (see Section 1.5).

1.3. Decision on application

Decision:	Granted
Decision date:	27 October 2021
Decision area:	0.02 hectares of native vegetation, as depicted in Section 1.5, below.

1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). The Department of Water and Environmental Regulation (DWER) advertised the application for 14 days and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix A), relevant datasets (see Appendix E.1), the photographs and information provided by the applicant, the clearing principles set out in Schedule 5 of the EP Act (see 0), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3). The Delegated Officer also took into consideration the purpose of the proposed clearing to improve safety for road users through realigning a black spot intersection.

The assessment identified that the proposed clearing would result in the loss of vegetation that:

- is growing in association with a nearby watercourse
- 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 and connectivity.

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

After consideration of the available information, the Delegated Officer determined that the impacts of the proposed clearing could be minimised and managed, and that the proposed clearing is not likely to lead to an unacceptable risk to the environment. 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

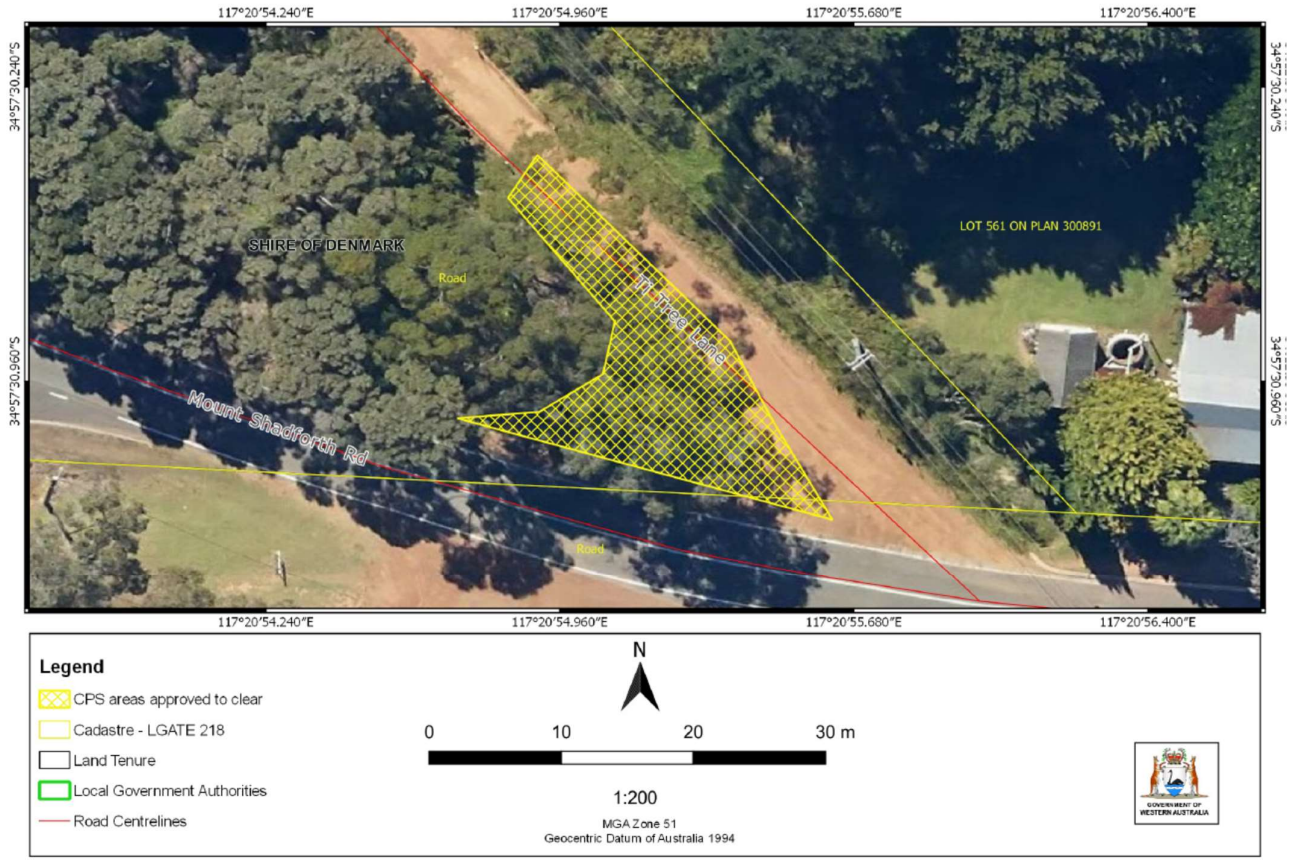

Figure 1 Map of the application area

The area cross-hatched yellow indicates the area authorised to be cleared under the granted clearing permit.

2 Legislative context

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

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

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

Other legislation of relevance for this assessment include:

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

The key guidance documents which inform this assessment are:

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

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

The applicant's information states that the applicant will:

- remove only trees required for re-alignment
- ensure invasive weeds not spread through disturbance activity by appropriate onsite management and post-disturbance weed control (Shire of Denmark, 2021).

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

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix 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 0.

This assessment identified that the impacts of the proposed clearing are limited and are able to be managed to be environmentally acceptable with standard avoid and minimise, and weed and dieback management conditions. 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. Environmental value: biological values

Assessment

Fauna

The application area is at the southern end of a broader patch of remnant vegetation of approximately 2.14 ha in size containing similar mapped vegetation types as the application area, which has direct linkages with larger remnants. The value of the application area as fauna habitat is primarily associated with individual trees, given the size and shape of the application area and the limited diversity of native species in the understorey.

The application area is mapped within 'Strategic Zone A' of a South Coast Macro Corridor. Zone A is described containing areas of woody vegetation where polygons greater than 30 ha in size are spaced no greater than 1 km apart and potentially form the most strategic link between major protected areas (Wilkins et al, 2006). The contribution of the application area to this linkage is considered to be minor, noting the condition and composition of the vegetation proposed to be cleared.

Thirty-six threatened, 12 priority, one 'conservation dependent' and one 'other specially protected' fauna, and 27 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.

The application area may contain suitable habitat for four threatened, one priority, one 'conservation dependent' and one 'other specially protected' fauna. These are considered below.

- *Calyptorhynchus latirostris* (Carnaby's cockatoo, Endangered), *Calyptorhynchus baudinii* (Baudin's cockatoo, Endangered) and (*Calyptorhynchus banksii* subsp. *naso* (forest red-tailed black cockatoo, 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. The nearest records are approximately 0.5 km, 1 km and 0.9 km from the application area respectively. Information and photographs provided by the applicant indicates that no hollows were observed in the mature trees proposed to be cleared and that the marri trees within the application area are unlikely to be of sufficient size to contain hollows suitable for breeding by these species (Shire of Denmark, 2021), however in combination with other plants in the application area may 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).
- *Isoodon fusciventer* (quenda/south-western brown bandicoot, 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 0.8 km from the application area. This species may utilise the application area as a corridor for movement through the landscape.
- *Dasyurus geoffroii* (chuditch/western quoll, Vulnerable): This species utilises 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 0.9 km from the application area. Records in the local area appear to be associated with large, contiguous areas of remnant vegetation. This species may utilise the application area as a corridor for movement through the landscape, however noting the surrounding development this is considered unlikely.
- *Falco peregrinus* (peregrine falcon, 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, 2021). The nearest record is approximately 1.7 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.
- *Phascogale tapoatafa* subsp. *wambenger* (wambenger/south-western brush-tailed phascogale, 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 0.9 km from the application area. Photographs provided by the applicant indicate that the application area contains large trees, and is adjacent to remnant vegetation within the road reserve. This species may utilise the application area as a corridor for movement through the landscape.

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. 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.

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

Flora and vegetation

Eight threatened and 70 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 49 priority species have been recorded from habitats that do not occur within the application area and it is considered that the application area is unlikely to comprise suitable/significant habitat for these. Five priority flora have been recorded approximately 0.9 km from the application area from habitats that do not occur

within the application area (including granite outcrops, wet areas, and soil and vegetation types). A further 12 priority flora have been recorded from soil and/or vegetation types consistent with those mapped within the application area, however five are from different landscape positions and it is considered that the application area is unlikely to comprise suitable/significant habitat for these, and seven have a distinctive growth form (such as medium to large shrub, tree, leaf shape) and would likely have been identified during the applicant's site inspection, and/or from the applicant's photographs, if they occurred within the application area.

Two priority flora have been recorded within 1 km of the application area from the same mapped soil and/or vegetation types. A further one threatened and three priority flora have been recorded from the same mapped soil and/or vegetation types as mapped within the application area. These are considered below.

- *Banksia goodii* (Good's banksia, Threatened): The Florabase website (Western Australian Herbarium, 1998-) indicates that this species is known from 25 recorded populations (some records may overlap) from the local government areas of Albany and Plantagenet. The Florabase website describes this species as a lignotuberous, prostrate shrub to 0.2 metres high, with orange, brown and red flowers in May or November, growing in white or grey sand over laterite. The nearest record is approximately 17.7 km from the application area, from a soil type broadly consistent with that mapped within the application area. Noting the distinctive characteristics of Banksia species (leaf shape, etc), it is likely to have been identified during the applicant's site inspection, and/or from the applicant's photographs, if it occurred within the application area.
- *Thomasia solanacea* (Priority 1): The Florabase website indicates that this species is known from 39 recorded populations (some records may overlap) from the local government areas of Albany, Denmark and Jerramungup. The Florabase website describes this species as an erect shrub to 3 metres high, with blue, purple and pink flowers in September to December, growing in alluvium, sand over limestone and rocky loam, associated with coastal areas. The nearest record is approximately 0.9 km from the application area, from a vegetation type broadly consistent with that mapped within the application area. Noting the habitat preferences of this species, in particular soils comprising alluvium and sand over limestone, the application area is unlikely to comprise suitable/significant habitat.
- *Synaphea incurva* (Priority 3): The Florabase website indicates that this species is known from 19 recorded populations (some records may overlap) from the local government areas of Albany and Denmark. The Florabase website describes this species as a clumped, spreading shrub, with yellow flowers in September to November, growing in gravelly loam and sandy soils, associated with slopes. The nearest record is approximately 0.9 km from the application area. Records indicate that this species prefers soil types broadly consistent with that mapped within the application area. Noting the habitat preferences of this species, in particular the requirement for slopes, the application area is unlikely to comprise suitable/significant habitat.
- *Amanita fibrillopes* (Priority 3): The Florabase website indicates that this species is known from 27 recorded populations (some records may overlap) from the local government areas of Albany, Armadale, Boyup Brook, Cockburn, Denmark, Manjimup, Melville, Perth, Serpentine-Jarrahdale, Swan, Waroona and Williams. The nearest record is approximately 13.1 km from the application area, from soil and vegetation types broadly consistent with those mapped within the application area. Given the distance to the nearest record this species is not expected to occur within the application area. Noting the range of this species and the number of records from which it is known, the proposed clearing is unlikely to change its conservation status if it occurs within the application area.
- *Andersonia auriculata* (Priority 3): The Florabase website indicates that this species is known from 108 recorded populations (some records may overlap) from the local government areas of Albany, Denmark, Manjimup, Nannup and Plantagenet. The Florabase website describes this species as an erect or spreading shrub to 0.5 metres high, with white and blue flowers in April or October, found in grey or peaty sand often over laterite, associated with swampy areas and granite outcrops. The nearest record is approximately 8.1 km from the application area. Records indicate that this species prefers soil and vegetation types broadly consistent with those mapped within the application area. Noting the range of this species and the number of records from which it is known, the proposed clearing is unlikely to change its conservation status if it is present.
- *Andersonia* sp. Amabile (N. Gibson & M. Lyons 355) (Priority 3): The Florabase website indicates that this species is known from 22 recorded populations (some records may overlap) from the local government areas of Augusta-Margaret River, Denmark, Manjimup, Nannup and Plantagenet. The nearest record is approximately 10.8 km from the application area. Records indicate that this species prefers soil types broadly consistent with that mapped within the application area. Given the distance to the nearest record this species is not expected to occur within the application area. Noting the range of this species and the number of records from which it is known, the proposed clearing is unlikely to change its conservation status if it is present.

Conclusion

Noting the shape and extent of the application area and the condition of the vegetation proposed to be cleared, and with regard for adjacent remnant vegetation linking with other remnant vegetation and McLean Road Nature Reserve, the application area is unlikely to be significant for the survival of indigenous fauna or be necessary for the maintenance of significant habitat, and is unlikely to contain significant habitat for threatened or priority flora.

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. Environmental value: land and water resources

Assessment

The application area is located within the broader Teasedale consanguineous wetland suite. No mapped watercourses traverse the application area; the nearest water features are a non-perennial minor watercourse approximately 7 metres from the application area, and a wetland approximately 230 metres from the application area. The potential for an increase in surface water run-off as a result of the proposed clearing has the potential to lead to sedimentation of the nearby watercourse.

Aerial photography indicates that the application area is adjacent to an existing road formation, within an area that has been developed for rural and/or residential purposes. Noting this, and the extent and purpose of the proposed clearing, impacts to the nearby watercourse 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 nearby watercourse. No clearing permit conditions are necessary in relation to this matter.

3.3. 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 a registered site ‘Denmark River’ approximately 0.76 km 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.

End

Appendix A. Site characteristics

A.1. Site characteristics

Characteristic	Details
Local context	The application area comprises native vegetation adjacent to an existing road, within a broader road reserve that has function in maintaining connectivity between native vegetation remnants within the local area. The application proposes to clear 0.02 ha, comprising up to six native trees and understorey, within the Ti Tree Lane road reserve (PIN 1124020) and Mount Shadforth Road reserve (PIN 11247010). The local area considered in the assessment of this application is defined as a 20-kilometre (km) radius from the perimeter of the application area. The local area retains approximately 63.9 per cent of native vegetation cover.
Ecological linkage	The application area is mapped within 'Strategic Zone A' of a South Coast Macro Corridor (Wilkins et al, 2006). Roadside conservation value mapping conducted in 2010-11 indicates that the road reserves in the proximity of the application area had 'Medium high' value at that time (Roadside Conservation Committee, 2011).
Conservation areas	Numerous conservation areas are mapped within the local area, comprising of lands managed by the Department of Biodiversity, Conservation and Attractions (DBCA) and privately managed conservation areas (such as conservation covenants). The nearest conservation area is McLean Road Nature Reserve approximately 0.95 km north-west of the application area.
Vegetation description	Information and photographs provided by the applicant indicate that the proposed clearing impacts four to six mature *Corymbia calophylla* (marri) and *Eucalyptus megacarpa* (bullich) trees and understorey species *Callistachys lanceolata* (wonnich), *Pteridium esculatum* (bracken), *Lepidosperma* sp., *Taxandria* sp., and introduced species (Shire of Denmark, 2021). The photographs are available in Appendix D. The vegetation present within the application area is considered to be broadly consistent with one of the mapped vegetation types, which includes bullich and marri near rock outcrops: • Keystone Complex (Kb), described as: Mosaic of tall open forest of *Eucalyptus guilfoylei* (yellow tingle) – *Eucalyptus jacksonii* (red tingle) – *Eucalyptus diversicolor* (karri) on slopes of major hills rising above coastal plain with *Allocasuarina decussata* (karri sheoak) – *Banksia grandis* (bull banksia) – *Agonis flexuosa* (peppermint) on slopes in hyperhumid and perhumid zones and tall open forest of *Eucalyptus brevistylis* (Rate's tingle) – *Eucalyptus marginata* subsp. *marginata* (jarrah) – marri and the occasional bullich near rock outcrops in hyperhumid and perhumid zones (Government of Western Australia, 2019a). • Vegetation association 1, described as: Tall forest; karri (Government of Western Australia, 2019b).
Vegetation condition	Information and photographs provided by the applicant indicates that the introduced species *Cenchrus clandestinus* (kikuyu), *Agapanthus praecox* (agapanthus) and *Watsonia* sp. (watsonia) are present within the application area (Shire of Denmark, 2021). The photographs are available in Appendix D. The vegetation within the application area is considered to be in degraded condition, described as: • 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 (Keighery, 1994). The full Keighery (1994) condition rating scale is provided in Appendix C.

Characteristic	Details
Climate and landform	Rainfall: ~1,000 millimetres per year (http://www.bom.gov.au/climate/data/) Geology: South Coast and hinterland landforms and soils – Walpole Hills System. Granitic hills and low hills, in the south of the Warren-Denmark Southland. Groundwater Salinity (Total Dissolved Solids): 500-1,000 milligrams per litre Topography: 20-25 metres above sea level.
Soil description	The mapped soil type present within the application area is: • Keystone brown duplex Phase (254WhKYb), described as: Brown gravelly duplex soils and red or yellow earths; much laterite (Department of Primary Industries and Regional Development, 2019).
Land degradation risk	The application area is mapped as having a high risk of subsurface acidification and phosphorus export, a moderate risk of water erosion and wind erosion, and a low risk of salinity, flooding, waterlogging and water repellence (refer section A.6 below).
Waterbodies	The application area is located within the broader Teasedale consanguineous wetland suite. A number of watercourses and wetlands are mapped in the local area, however none traverse the application area. The nearest of these is a mapped watercourse approximately 0.007 km from the application area. The nearest waterbody is approximately 0.23 km from the application area. The nearest wetland of significance is a South Coast Significant Wetland approximately 7.1 km from the application area.
Hydrogeography	The application area is within the 'Warren-Denmark' hydrological zone, within the Wilson Inlet-Denmark River Catchment (but not within a RiWI Act or CAWS Act area). The application area is mapped as having a moderate risk of water erosion and a low risk of salinity, flooding and waterlogging (refer section A.6 below).
Flora	Eight threatened and 70 priority flora have been recorded in the local area. The nearest records are approximately 0.9 km from the application area.
Ecological communities	One threatened and two priority ecological community (one listed as threatened by the Australian Government) have been recorded in the local area. The nearest record is approximately 6.8 km from the application area.
Fauna	Thirty-six threatened, 12 priority, one 'conservation dependent' and one 'other specially protected' fauna, and 27 fauna protected under an international agreement, have been recorded in the local area. The nearest records are approximately 0.5 km from the application area. Information provided by the applicant indicates that no hollows were observed in the four to six mature trees proposed to be cleared (Shire of Denmark, 2021).

A.2. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
IBRA bioregion*					
Warren	833,985.5	659,432.2	79.07	558,485.3	68.3
Vegetation complex					
Beard vegetation association 1*	69,118.2	53,852.1	77.91	45,171.9	66.4

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
Heddle / Mattiske vegetation complex Keystone Kb**	29,634.1	23188.1	78.25	18,283.8	61.7
Local area (calculation)					
20 km radius (terrestrial portion)	92,922.	59,401.2	63.9	-	-

*Government of Western Australia (2019b)

**Government of Western Australia (2019a)

A.3. Flora analysis table

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
Amanita drummondii	Priority 3	N	N	0.9 km	11	N/a
Borya longiscapa	Priority 3	N	N	0.9 km	46	N/a
Lepidium pseudotasmanicum	Priority 4	N	N	0.9 km	15	N/a
Melaleuca viminalis	Priority 2	N	N	0.9 km	12	N/a
Netrostylis sp. Blackwood River (A.R. Annels 3043)	Priority 3	N	N	0.9 km	10	N/a
Synaphea incurva	Priority 3	N	N	0.9 km	19	N/a
Thomasia solanacea	Priority 1	N	Y	0.9 km	39	N/a
Goodenia radicans	Priority 1	N	N	2.8 km	10	N/a
Xanthosia eichleri	Priority 4	N	Y	4.1 km	55	N/a
Andersonia sp. Virolens (G.J. Keighery 12000)	Priority 3	N	N	4.5 km	15	N/a
Banksia serra (serrate-leaved dryandra)	Priority 4	Y	Y	4.8 km	99	N/a
Eucalyptus virginea (Mount Lindesay white gum)	Priority 4	Y	Y	5.4 km	50	N/a
Grevillea fuscolutea	Threatened	N	N	6.4 km	44	N/a
Caladenia applanata subsp. *erubescens*	Priority 2	N	N	6.5 km	5	N/a
Anthocercis sylvicola	Priority 3	N	N	6.7 km	32	N/a
Microtis pulchella (beautiful mignonette orchid)	Priority 4	N	N	6.7 km	19	N/a
Boronia virgata	Priority 4	N	N	7.2 km	54	N/a
Andersonia auriculata	Priority 3	Y	Y	8.1 km	108	N/a

Thomasia quercifolia (oak-leaved thomasia)	Priority 4	N	N	8.2 km	26	N/a
Pleurophascum occidentale	Priority 4	N	N	8.5 km	59	N/a
Banksia sessilis var. *cordata*	Priority 4	N	N	8.7 km	58	N/a
Leucopogon alternifolius	Priority 3	N	N	8.9 km	16	N/a
Stylidium sp. Kordabup (A.R. Annels 1660)	Priority 1	N	N	9.5 km	2	N/a
Andersonia sp. Mitchell River (B.G. Hammersley 925)	Priority 3	N	N	9.6 km	24	N/a
Drosera fimbriata (Manypeaks sundew)	Priority 4	N	N	10.4 km	20	N/a
Lasiopetalum sp. Denmark (B.G. Hammersley 2012)	Priority 3	Y	Y	10.7 km	31	N/a
Andersonia sp. Amabile (N. Gibson & M. Lyons 355)	Priority 3	Y	N	10.8 km	22	N/a
Kennedia glabrata (Northcliffe kennedia)	Threatened	N	N	11.1 km	36	N/a
Ornduffia submersa	Priority 4	N	N	11.3 km	61	N/a
Andersonia hammersleyana	Priority 2	N	N	11.6 km	42	N/a
Cryptandra congesta	Priority 4	N	N	11.8 km	35	N/a
Gahnia sclerioides	Priority 4	N	N	11.9 km	29	N/a
Drepanocladus aduncus	Priority 2	N	N	12.1 km	6	N/a
Gonocarpus simplex	Priority 4	N	N	12.4 km	26	N/a
Amanita walpolei	Priority 2	N	N	12.5 km	7	N/a
Spyridium riparium	Priority 2	Y	Y	12.9 km	25	N/a
Amanita fibrillopes	Priority 3	N	Y	13.1 km	27	N/a
Isopogon buxifolius var. *buxifolius*	Priority 2	N	N	13.1 km	12	N/a
Melaleuca ordinifolia	Priority 2	N	N	13.1 km	23	N/a
Sphaerolobium calcicola	Priority 3	N	N	13.1 km	21	N/a
Drosera huegelii var. *phillmanniana*	Priority 2	N	N	13.2 km	6	N/a
Sphenotoma sp. Stirling Range (P.G. Wilson 4235)	Priority 4	N	N	13.2 km	29	N/a
Verticordia endlicheriana var. *angustifolia*	Priority 3	N	N	13.2 km	28	N/a
Drakaea micrantha	Threatened	N	N	13.4 km	49	N/a
Laxmannia grandiflora subsp. *brendae*	Threatened	N	N	13.4 km	10	N/a

Amanita carneiphylla	Priority 3	N	N	13.6 km	26	N/a
Calothamnus scabridus	Priority 2	N	N	13.7 km	14	N/a
Gonocarpus trichostachyus	Priority 3	N	N	13.7 km	12	N/a
Drosera lasiantha	Priority 2	N	N	13.8 km	7	N/a
Gonocarpus rudis	Priority 2	N	N	13.8 km	10	N/a
Goodenia sp. South Coast (A.R. Annels ARA 1846)	Priority 3	N	N	13.8 km	15	N/a
Trithuria australis	Priority 4	N	N	13.9 km	18	N/a
Sphaerolobium benetectum	Priority 2	Y	Y	14.1 km	9	N/a
Thysanotus isantherus	Priority 4	N	N	14.2 km	15	N/a
Gastrolobium ovalifolium (Runner poison)	Priority 4	N	N	14.3 km	27	N/a
Lepyrodia extensa	Priority 2	N	N	14.3 km	12	N/a
Lepyrodia heleocharoides	Priority 3	N	N	14.6 km	20	N/a
Microtis globula (South-coast mignonette orchid)	Threatened	N	N	14.6 km	3	N/a
Corybas limpidus	Priority 4	N	N	14.7 km	17	N/a
Banksia porrecta	Priority 4	N	N	14.9 km	51	N/a
Grevillea pimeleoides	Priority 4	N	N	15.4 km	36	N/a
Microtis quadrata	Priority 4	N	N	15.9 km	18	N/a
Gastrolobium sp. East Peak (E.D. Middleton EDM 43)	Priority 2	Y	N	16.4 km	7	N/a
Commersonia apella	Threatened	N	N	16.6 km	9	N/a
Stylidium leeuwinense	Priority 4	N	N	16.9 km	60	N/a
Schizaea rupestris	Priority 2	N	N	17.3 km	13	N/a
Stylidium lepidum	Priority 3	N	N	17.3 km	43	N/a
Banksia goodii (Good's banksia)	Threatened	Y	N	17.7 km	25	N/a
Schoenus benthamii	Priority 3	N	N	17.7 km	21	N/a
Stylidium roseonanum	Priority 3	N	N	17.7 km	8	N/a
Pimelea rosea subsp. *annelsii*	Priority 3	Y	Y	18.1 km	18	N/a
Lambertia rariflora subsp. *lutea*	Priority 3	Y	N	18.7 km	48	N/a
Gonocarpus pusillus	Priority 4	Y	N	18.8 km	31	N/a
Synaphea intricata	Priority 3	Y	Y	19.6 km	52	N/a
Austroparmelina macrospora	Priority 3	N	N	20+ km	52	N/a
Caladenia christineae	Threatened	Y	N	20+ km	58	N/a

Daviesia mesophylla	Priority 2	N	N	20+ km	33	N/a
Thelymitra jacksonii (Jackson's sun orchid)	Priority 3	N	N	20+ km	10	N/a

A.4. Fauna analysis table

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
Calyptorhynchus latirostris (Carnaby's cockatoo)	Endangered	Y	Y	0.5 km	20924	N/a
Dasyornis longirostris (western bristlebird)	Endangered	N	N	0.5 km	1161	N/a
Pandion cristatus (eastern osprey)	Migratory	N	N	0.5 km	4402	N/a
Hydroprogne caspia (Caspian tern)	Migratory	N	N	0.8 km	4497	N/a
Isoodon fusciventer (quenda/south-western brown bandicoot)	Priority 4	Y	Y	0.8 km	9503	N/a
Thalasseus bergii (crestern tern)	Migratory	N	N	0.8 km	6744	N/a
Tringa nebularia (common greenshank)	Migratory	N	N	0.8 km	5487	N/a
Actitis hypoleucos (common sandpiper)	Migratory	N	N	0.9 km	3487	N/a
Calyptorhynchus banksii subsp. *naso* (forest red-tailed black cockatoo)	Vulnerable	Y	Y	0.9 km	3360	N/a
Caretta (loggerhead turtle)	Endangered	N	N	0.9 km (likely error)	381	N/a
Cynotelopus notabilis (Western Australian pill millipede)	Endangered	N	N	0.9 km	169	N/a
Dasyurus geoffroii (chuditch/western quoll)	Vulnerable	Possible	Possible	0.9 km	5501	N/a
Elapognathus minor (short-nosed snake)	Priority 2	N	N	0.9 km	47	N/a
Geotria australis (pouched lamprey)	Priority 3	N	N	0.9 km	141	N/a
Leipoa ocellata (malleefowl)	Vulnerable	N	N	0.9 km	27984	N/a
Phascogale tapoatafa subsp. *wambenger* (south-western brush-tailed phascogale)	Conservation Dependent	Possible	Possible	0.9 km	1795	N/a
Calyptorhynchus baudinii (Baudin's cockatoo)	Endangered	Y	Y	1.0 km	4076	N/a

Hydromys chrysogaster (water-rat/rakali)	Priority 4	N	N	1.0 km	813	N/a
Falco peregrinus (peregrine falcon)	Other Specially Protected	Possible	Possible	1.7 km	1786	N/a
Sterna hirundo (common tern)	Migratory	N	N	2.6 km	710	N/a
Calidris acuminata (sharp-tailed sandpiper)	Migratory	N	N	2.7 km	2140	N/a
Calidris ferruginea (curlew sandpiper)	Critically Endangered	N	N	2.7 km	2333	N/a
Calidris ruficollis (red-necked stint)	Migratory	N	N	2.7 km	5551	N/a
Oxyura australis (blue-billed duck)	Priority 4	N	N	4.5 km	2342	N/a
Galaxiella munda (mud minnow/western dwarf galaxias)	Vulnerable	N	N	5.9 km	302	N/a
Thinornis rubricollis (hooded plover/dotterel)	Priority 4	N	N	6.2 km	2978	N/a
Arenaria interpres (ruddy turnstone)	Migratory	N	N	6.8 km	3445	N/a
Calidris canutus (red knot)	Endangered	N	N	6.8 km	1495	N/a
Limosa lapponica (bar-tailed godwit)	Migratory	N	N	6.8 km	3317	N/a
Pluvialis squatarola (grey plover)	Migratory	N	N	6.8 km	2603	N/a
Tringa brevipes (grey-tailed tattler)	Priority 4	N	N	6.8 km	2930	N/a
Calidris alba (sanderling)	Migratory	N	N	6.9 km	1517	N/a
Calidris subminuta (long-toed stint)	Migratory	N	N	6.9 km	374	N/a
Calidris tenuirostris (great knot)	Critically Endangered	N	N	6.9 km	2167	N/a
Charadrius leschenaultii (greater/large sand plover)	Vulnerable	N	N	6.9 km	2854	N/a
Thalassarche chlororhynchos (Atlantic yellow-nosed albatross)	Vulnerable	N	N	7.1 km	154	N/a
Chlidonias leucopterus (white-winged black tern)	Migratory	N	N	7.3 km	657	N/a
Setonix brachyurus (quokka)	Vulnerable	N	N	7.5 km	6626	N/a
Ardenna carneipes (flesh/y-footed shearwater)	Vulnerable	N	N	7.6 km	481	N/a

Zephyrarchaea mainae (Main's assassin spider)	Vulnerable	N	N	7.7 km	84	N/a
Neophoca cinerea (Australian sea-lion)	Vulnerable	N	N	8.1 km	531	N/a
Ardenna tenuirostris (short-tailed shearwater)	Migratory	N	N	8.7 km	72	N/a
Notamacropus irma (western brush wallaby)	Priority 4	N	N	8.9 km	5412	N/a
Puffinus huttoni (Hutton's shearwater)	Endangered	N	N	8.9 km	58	N/a
Tringa stagnatilis (marsh/little sandpiper)	Migratory	N	N	9.0 km	983	N/a
Atrichornis clamosus (noisy scrub-bird, tjimiluk)	Endangered	N	N	9.1 km	1132	N/a
Nannatherina balstoni (Balston's pygmy perch)	Vulnerable	N	N	9.7 km	232	N/a
Sternula nereis subsp. *nereis* (fairy tern)	Vulnerable	N	N	9.7 km	610	N/a
Pluvialis fulva (Pacific golden plover)	Migratory	N	N	9.9 km	1129	N/a
Ixobrychus flavicollis subsp. *australis* (black bittern, south-west sub-population)	Priority 2	N	N	10.4 km	19	N/a
Pezoporus flaviventris (western ground parrot)	Critically Endangered	N	N	11.0 km	331	N/a
Physeter macrocephalus (sperm whale)	Vulnerable	N	N	11.2 km	90	N/a
Gelochelidon nilotica (gull-billed tern)	Migratory	N	N	11.8 km	1164	N/a
Charadrius bicinctus (double-banded plover)	Migratory	N	N	12.5 km	41	N/a
Limosa limosa (black-tailed godwit)	Migratory	N	N	12.5 km	870	N/a
Charadrius mongolus (lesser sand plover)	Endangered	N	N	12.7 km	1238	N/a
Pseudocheirus occidentalis (western ringtail possum)	Critically Endangered	N	N	12.7 km	14583	N/a
Calidris melanotos (pectoral sandpiper)	Migratory	N	N	14.2 km	108	N/a
Glareola maldivarum (oriental pratincole)	Migratory	N	N	15.2 km	443	N/a
Plegadis falcinellus (glossy ibis)	Migratory	N	N	15.3 km	1700	N/a
Limicola falcinellus (broad-billed sandpiper)	Migratory	N	N	15.5 km	399	N/a

Ixobrychus dubius (Australian little bittern)	Priority 4	N	N	15.6 km	102	N/a
Falsistrellus mackenziei (western false pipistrelle)	Priority 4	N	N	15.7 km	530	N/a
Onychoprion anaethetus (bridled tern)	Migratory	N	N	15.7 km	1278	N/a
Tringa glareola (wood sandpiper)	Migratory	N	N	15.8 km	1280	N/a
Psophodes nigrogularis subsp. *nigrogularis* (western whipbird, western heath)	Endangered	N	N	16.6 km	624	N/a
Galaxiella nigrostriata (Black-stripe minnow/black-striped dwarf galaxias)	Endangered	N	N	16.7 km	287	N/a
Nannoperca pygmaea (little pygmy perch)	Endangered	N	N	17.1 km	63	N/a
Myrmecobius fasciatus (numbat/walpurti)	Endangered	N	N	17.5 km	2059	N/a
Thalassarche melanophris (black-browed albatross)	Endangered	N	N	18.4 km	64	N/a
Westralunio carteri (Carter's freshwater mussel)	Vulnerable	N	N	18.6 km	433	N/a
Botaurus poiciloptilus (Australasian bittern)	Endangered	N	N	20+ km	419	N/a
Eubalaena australis (southern right whale)	Vulnerable	N	N	20+ km	124	N/a
Galaxias truttaceus (Western Australian population) (western trout minnow/spotted galaxias)	Endangered	N	N	20+ km	219	N/a
Numenius madagascariensis (eastern curlew)	Critically Endangered	N	N	20+ km	1784	N/a
Numenius phaeopus (whimbrel)	Migratory	N	N	20+ km	2714	N/a
Stercorarius antarcticus subsp. *lonnbergi* (brown/sub-Antarctic skua)	Priority 4	N	N	20+ km	53	N/a

A.5. Ecological community analysis table

Community name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
Subtropical and Temperate Coastal Saltmarsh	Priority 3 (Cth Vulnerable)	N	N	N	6.8 km	261	N/a
Mount Lindesay - Little Lindesay Vegetation Complex	Endangered	N	N	N	11.7	2	N/a
Melaleuca spathulata/ *Melaleuca viminea* Swamp Heath	Priority 1	N	N	N	13.1	23	N/a

A.6. Land degradation risk table

Risk categories	*Land Unit 1*
Wind erosion	M1: 10-30% of the map unit has a high to extreme risk.
Water erosion	M2: 30-50% of the map unit has a high to extreme risk.
Salinity	L1: <3% of the map unit has a moderate or high risk or is presently saline
Subsurface acidification	H2: >70% of the map unit has a high risk
Flood risk	L1: <3% of the map unit has a moderate to high risk
Waterlogging	L1: <3% of the map unit has a moderate to very high risk.
Phosphorus export risk	H1: 50-70% of the map unit has a high to extreme risk
Water repellence	L1: <3% of the map unit has a high risk.

Appendix B. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment: Noting the shape and extent of the application area, and the condition and composition of the vegetation proposed to be cleared, and with regard for adjacent and nearby remnant vegetation, the vegetation within the application area is not likely to contain locally or regionally significant flora, fauna, habitats or plant assemblages.	Not likely to be at variance	Yes Refer to Section 3.2.1, above.
Principle (b): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna."* Assessment: The application area is located within a mapped ecological corridor, and may contain suitable habitat for four threatened, one priority, one 'conservation dependent' and one 'other specially protected' fauna. Noting the size of the application area and the vegetation composition/ condition, the application area is unlikely to be significant for the survival of indigenous fauna.	Not likely to be at variance	Yes Refer to Section 3.2.1 (Fauna) above.
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: Eight threatened flora have been recorded in the local area. The application area may contain suitable habitat for one of these. Noting the distinctive characteristics of this species, it is likely to have been identified if it occurred within the application area. Noting the size of the application area and the vegetation composition/condition, the application area is unlikely to contain threatened flora or be necessary for their continued existence.	Not likely to be at variance	Yes Refer to Section 3.2.1 (Flora and vegetation), above.
Principle (d): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community."* Assessment: One threatened ecological community 'Mount Lindesay - Little Lindesay Vegetation Complex' has been recorded in the local area. The application area does not contain a species composition that would indicate the presence of this ecological community, nor suitable habitat to support it.	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		
Principle (e): *"Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared."* Assessment: The extents of mapped vegetation types and native vegetation cover in the local area are above the thresholds stated in the national objectives and targets for biodiversity conservation in Australia (that is, more than 30 per cent pre-European extent remaining). The application area is within 'Strategic Zone A' of a South Coast Macro Corridor, however noting the condition and composition of the vegetation proposed to be cleared the contribution of the application area to this linkage is considered to be minor.	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 area is McLean Road Nature Reserve approximately 0.95 km north-west of the application area. This conservation area is connected to the application area by vegetation within road reserves and on private property. With regard for the separation	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
distance between the application area and this conservation area, the proposed clearing is unlikely to impact on its environmental values or connection with other remnants.		
Environmental value: land and water resources		
Principle (f): *"Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."* Assessment: No mapped watercourses traverse the application area; the nearest water features are a non-perennial minor watercourse approximately 7 metres from the application area, and a wetland approximately 230 metres from the application area. At least two of the native understorey species within the application area (wonnich and bracken) are typically associated with damp or moist sandy soils along watercourses (Western Australian Herbarium, 1998-). Noting this, the vegetation within the application area is growing in association with the wetland.	At variance	Yes Refer to Section 3.2.2 above.
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: Soils within the application area are mapped as brown gravelly duplex soils, red or yellow earths, and laterite. The primary land degradation risks are from subsurface acidification, phosphorus export and water erosion. Noting the condition of the vegetation within the application area, the extent of the proposed clearing, and that vegetation will remain within the adjacent road reserve, the proposed clearing is unlikely to cause appreciable land degradation.	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 as a result of the proposed clearing has the potential to lead to sedimentation of a nearby watercourse. 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.	Not likely to be at variance	Yes Refer to Section 3.2.2 above.
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 application area has a mapped low risk of flooding. Given this, and noting the condition of the vegetation within the application area, the extent of the proposed clearing, and that vegetation will remain within the adjacent road reserve, the proposed clearing is unlikely to contribute to waterlogging or exacerbate the incidence or intensity of flooding.	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.

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

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

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species.
Very good	Vegetation structure altered, with obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and/or grazing.
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 vegetation within the application area provided by the applicant (Shire of Denmark, 2021).

Appendix E. Sources of information

E.1. GIS databases

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

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- Contaminated Sites Database (DWER-059)
- DBCA Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography, Linear (Hierarchy) (DWER-031)
- Hydrological Zones of Western Australia (DPIRD-069)
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Mining Tenements (DMIRS-003)
- Native Title (ILUA) (LGATE-067)
- Offsets Register – Offsets (DWER-078)
- Pre-European Vegetation (DPIRD-006)
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Salinity Risk (DPIRD-009)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available (DPIRD-027)
- Soil Landscape Mapping – Systems (DPIRD-064)
- Vegetation Complexes – South West forest region of Western Australia (DBCA-047)

Other/restricted GIS Databases used:

- Hydrography – Inland Waters – Waterlines
- ICMS (Incident Complaints Management System) – Points and Polygons
- Imagery
- South Coast Macro corridor
- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

E.2. References

Australian Bureau of Meteorology website: http://www.bom.gov.au/climate/data/ (accessed October 2021).

Australian Museum (2021) 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*, Canberra.

Department of Biodiversity, Conservation and Attractions (2017) *Fauna Notes - Living with Quenda*. Government of Western Australia.

Department of Environment and Conservation (2008) *Forest black cockatoo (Baudin's cockatoo Calyptorhynchus baudinii and forest red-tailed black cockatoo Calyptorhynchus banksii naso) Recovery Plan*. Department of Environment and Conservation, Western Australia.

Department of Environment and Conservation (2012a) *Chuditch (Dasyurus geoffroii) Recovery Plan*. Wildlife Management Program No. 54. Department of Environment and Conservation, Perth, Western Australia.

Department of Environment and Conservation (2012b) *Fauna profiles - Brush-tailed Phascogale - Phascogale tapoatafa*. Department of Environment and Conservation, Western Australia.

Department of Environment and Conservation (2012c) *Fauna profiles - Quenda - Isoodon obesulus*. Department of Environment and Conservation, Western Australia.

Department of Environment Regulation (DER) (2014). *A guide to the assessment of applications to clear native vegetation*. Perth. Available from: https://www.der.wa.gov.au/our-work/clearing-permits/48-guidelines-clearing-permits

Department of Parks and Wildlife (2013) *Carnaby's Cockatoo (Calyptorhynchus latirostris) Recovery Plan*. Department of Parks and Wildlife, Western Australia.

Department of Primary Industries and Regional Development (DPIRD) (2019). *NRInfo Digital Mapping. Department of Primary Industries and Regional Development.* Government of Western Australia. URL: https://maps.agric.wa.gov.au/nrm-info/ (accessed 8 October 2021).

Department of Sustainability, Environment, Water, Population and Communities (2012) *Environment Protection and Biodiversity Conservation Act 1999 referral guidelines for three threatened black cockatoo species: Carnaby's cockatoo (endangered) Calyptorhynchus latirostris, Baudin's cockatoo (vulnerable) Calyptorhynchus baudinii, Forest red-tailed black cockatoo (vulnerable) Calyptorhynchus banksii naso*. Commonwealth of Australia, Canberra.

Department of the Environment and Energy (2017) *Revised draft referral guideline for three threatened black cockatoo species: Carnaby's Cockatoo (Endangered) Calyptorhynchus latirostris Baudin's Cockatoo (Vulnerable) Calyptorhynchus baudinii Forest Red-tailed Black Cockatoo (Vulnerable) Calyptorhynchus banksii naso*. Commonwealth of Australia.

Department of the Environment, Water, Heritage and the Arts (2009) *Approved Conservation Advice for Calyptorhynchus banksii naso (Forest Red-tailed Black Cockatoo)*. Canberra: Department of the Environment, Water, Heritage and the Arts.

Government of Western Australia. (2019a). *2018 South West Vegetation Complex Statistics*. Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions, Perth

Government of Western Australia. (2019b). *2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report)*. Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions, Perth.

Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

Mattiske, E.M. and Havel, J.J. (1998) *Vegetation Complexes of the South-west Forest Region of Western Australia.* Maps and report prepared as part of the Regional Forest Agreement, Western Australia for the Department of Conservation and Land Management and Environment Australia.

Northcote, K.H. with Beckmann G.G, Bettenay E., Churchward H.M., van Dijk D.C., Dimmock G.M., Hubble G.D., Isbell R.F., McArthur W.M., Murtha G.G., Nicolls K.D., Paton T.R., Thompson C.H., Webb A.A. and Wright M.J. (1960-68) *Atlas of Australian Soils*, Sheets 1 to 10, with explanatory data. CSIRO and Melbourne University Press: Melbourne.

Roadside Conservation Committee (2011) *Shire of Denmark Roadside Conservation Value*. Field capture October 2010 and May 2011.

Schoknecht, N., Tille, P. and Purdie, B. (2004) *Soil-landscape mapping in South-Western Australia – Overview of Methodology and output*s Resource Management Technical Report No. 280. Department of Agriculture.

Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) *Native Vegetation in Western Australia, Extent, Type and Status*. Resource Management Technical Report 249. Department of Agriculture, Western Australia.

Shire of Denmark (2021) *Clearing permit application CPS 9317/1 (including attachments), received 2 August 2021*. (DWER Ref: DWERDT485497).

Western Australian Herbarium (1998-). *FloraBase - the Western Australian Flora*. Department of Biodiversity, Conservation and Attractions, Western Australia. https://florabase.dpaw.wa.gov.au/ (Accessed October 2021)

Wilkins, P., Gilfillan, S., Watson, J. and Sanders, A. (ed). (2006) *The Western Australian South Coast Macro Corridor Network – a bioregional strategy for nature conservation*. Department of Conservation and Land Management (CALM) and South Coast Regional Initiative Planning Team (SCRIPT), Albany, Western Australia.