GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

PERMIT DETAILS

Area Permit Number: CPS 9892/1

File Number: DWERVT11070

Duration of Permit: From 2 February 2024 to 2 February 2026

PERMIT HOLDER

Ryan Anthony Maddams

LAND ON WHICH CLEARING IS TO BE DONE

Lot 16 on Deposited Plan 68549, Kordabup

AUTHORISED ACTIVITY

The permit holder must not clear more than 0.51 hectares of *native vegetation* within the area cross-hatched yellow in Figure 1 of Schedule 1.

CONDITIONS

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

In determining the *native vegetation* authorised to be cleared under this permit, the permit holder must apply the following principles, set out in descending order of preference:

(a) avoid the clearing of *native vegetation*;

(b) minimise the amount of *native vegetation* to be cleared; and

(c) reduce the impact of clearing on any environmental value.

2. Weed and dieback management

When undertaking any clearing authorised under this permit, the permit holder must take the following measures to minimise the risk of introduction and spread of *weeds* and *dieback*:

(a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;

(b) ensure that no known *dieback* or *weed*-affected soil, *mulch*, *fill*, or other material is brought into the area to be cleared; and

(c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

3. Directional clearing

The permit holder must conduct clearing activities in a slow, progressive manner from west to east to allow fauna to move into adjacent *native vegetation* ahead of the clearing activity.

4. Records that must be kept

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

Table 1: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	(a) the species composition, structure, and density of the cleared area; (b) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to GDA2020, expressing the geographical coordinates in Eastings and Northings; (c) the date that the area was cleared; (d) the size of the area cleared (in hectares); (e) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 1; and (f) actions taken to minimise the risk of the introduction and spread of *weeds* and *dieback* in accordance with condition 2; and (g) actions taken in accordance with condition 3.

5. Reporting

The permit holder must provide to the *CEO* the records required under condition 4 of this permit when requested by the *CEO*.

DEFINITIONS

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

Table 2: Definitions

Term	Definition
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*.

Term	Definition
clearing	has the meaning given under section 3(1) of the EP Act.
condition	a condition to which this clearing permit is subject under section 51H of the EP Act.
fill	means material used to increase the ground level, or to fill a depression.
dieback	means the effect of *Phytophthora* species on native vegetation.
department	means the department established under section 35 of the *Public Sector Management Act 1994* (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
EP Act	*Environmental Protection Act 1986* (WA)
mulch	means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation.
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
weeds	means any plant – (a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*; or (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or (c) not indigenous to the area concerned.

END OF CONDITIONS

JBurton

Jessica Burton

A/MANAGER

NATIVE VEGETATION REGULATION

Officer delegated under Section 20

of the Environmental Protection Act 1986

10 January 2024

SCHEDULE 1

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 9892/1
Permit type:	Area permit
Applicant name:	Ryan Anthony Maddams
Application received:	23 August 2022
Application area:	0.51 hectares of native vegetation
Purpose of clearing:	Dam construction
Method of clearing:	Mechanical
Property:	Lot 16 on Deposited Plan 68549
Location (LGA area):	Shire of Denmark
Localities (suburb):	Kordabup

1.2. Description of clearing activities

The vegetation proposed to be cleared consists of a single 0.51-hectare area (refer to Figure 1 below). The applicant proposes to clear this area to construct two small dams. The application area was revised during the assessment process from an original area of 3.18 hectares for the purposes of a dam, horticulture, grazing/pasture, structures, access and fire reduction (see Section 3.1 for further details).

1.3. Decision on application

Decision:	Granted
Decision date:	10 January 2024
Decision area:	0.51 hectares of native vegetation as depicted in Section 1.5 below

1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). The Department of Water and Environmental Regulation (DWER) advertised the application for 21 days and one submission was received. Consideration of matters raised in the public submission is summarised in Appendix B.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix C), relevant datasets (see Appendix G.1), the clearing principles set out in Schedule 5 of the EP Act (see Appendix D), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3).

The assessment identified that:

- the proposed clearing area may contain habitat for Australasian bittern, black cockatoo species, short-nosed snake, quenda, and peregrine falcon, however, it is not considered to comprise significant habitat for these species.

- several Priority 3 and Priority 4 listed flora species have the potential to be present within the application area, however, should they be present, the proposed clearing is unlikely to significantly impact the conservation status of these species.
- the application area is seasonally waterlogged and contains vegetation associated with riparian areas, however, noting that the application area is not connected hydrologically to other riparian areas, the proposed clearing is unlikely to impact upon water quality or other environmental values of other watercourses or wetlands within the area, and the application area is not likely to provide significant habitat for flora or fauna inhabiting riparian environments.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the impacts of the proposed clearing can be minimised and managed such that they are to unlikely lead to an unacceptable risk to environmental values, and the applicant has suitably demonstrated avoidance and minimisation measures.

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

- avoid, minimise to reduce the impacts and extent of clearing
- take hygiene steps to minimise the risk of the introduction and spread of weeds
- undertake slow, progressive one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity.

1.5. Site map

Figure 1 - Map of the application area.

The area crosshatched yellow indicates the area authorised to be cleared under the granted clearing permit.

2 Legislative context

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

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

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

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)

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 initially proposed to clear 3.18 hectares for the purposes of a dam, horticulture, grazing/pasture, structures, access and fire reduction (see Figure 2 below). In response to a request to consider further avoidance of clearing based on the environmental values present within this application area, the applicant reduced the application area to 0.51 hectares solely for dam construction, removing:

- a portion of the original clearing area proposed to be cleared for horticulture and grazing/pasture
- a portion of the original clearing area proposed to be cleared for structures, noting that an exemption for the requirement of a clearing permit was likely to apply for this clearing should development approval be granted for these structures.

Figure 2. Original 3.18 hectare application area.

The applicant justified the requirement for the proposed dams by advising that dams need to be added for drought protection for a small-scale regenerative farming operation (fruit and nut trees) proposed for the property. The applicant advised that this area was selected for the dams as it is nearly on contour with the existing dam to the north (thus can be connected via an overflow) and is also a low point on the terrain where excess water gathers naturally.

The applicant also advised that the vegetation proposed to be cleared poses a potential fire hazard as it is relatively close to the existing house (Maddams, 2023).

The applicant advised that the areas downslope from the dams as well as the exposed batters will be revegetated with perennial grasses and non-invasive trees in order to aid in the stabilisation of earthworks. This also forms part of the conditions implemented on the Development Approval granted by the Shire of Denmark. Under the Development Approval, the applicant is also required to plant screening vegetation using local endemic trees and shrubs along the southern boundary of the application area, to act as a screen from the public road reserve to the south.

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

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

Assessment:

Impacts of the clearing to the following conservation significant fauna species recorded within the local area required further consideration:

- *Pseudocheirus occidentalis* (western ringtail possum, ngwayir) (Critically Endangered)
- *Botaurus poiciloptilus* (Australasian bittern) (Endangered)
- *Cynotelopus notabilis* (Western Australian pill millipede) (Endangered)
- *Dasyurus geoffroii* (chuditch, western quoll) (Vulnerable)
- *Setonix brachyurus* (quokka) (Vulnerable)
- *Zanda baudinii* (Baudin's cockatoo) (Endangered)
- *Zanda latirostris* (Carnaby's cockatoo) (Endangered)
- *Calyptorhynchus banksii naso* (Forest red-tailed black cockatoo) (Vulnerable)
- *Elapognathus minor* (Short-nosed snake) (Priority 2)
- *Isoodon fusciventer* (quenda, southwestern brown bandicoot) (Priority 4)
- *Notamacropus irma* (western brush wallaby) (Priority 4)
- *Phascogale tapoatafa wambenger* (south-western brush-tailed phascogale, wambenger) (Conservation Dependent)
- *Falco peregrinus* (Peregrine falcon) (Other specially protected)

Western Ringtail Possum

The application area is within the south coast management zone for western ringtail possum (WRP), in which WRP inhabit coastal heath, jarrah/marri woodland and forest, peppermint woodlands, myrtaceous heaths and shrublands, bullich (*Eucalyptus megacarpa*) dominated riparian zones and karri forest (DPAW, 2017). WRP almost exclusively consume the dominant or co-dominant upper and midstorey myrtaceous plants peppermint, marri and jarrah (DPAW, 2017). Noting the absence of these food species for WRP within the application area, it is considered unlikely that they would inhabit the application area.

Australasian bittern

The Australasian Bittern inhabits permanent and seasonal wetlands with dense vegetation of 0.3-3.5 metres in height, particularly sedges, rushes and reeds and also where thickets of wetland shrubs (e.g. *Melaleuca, Agonis* spp.) provide patches of tall cover within sedge-dominated habitat (DCCEEW, 2022). It forages in still, shallow water up to 0.3 metres deep (DCCEEW, 2022). The species breeds in October to February and builds its nests within dense cover over shallow water placed about 30 centimetres above the water level (DCCEEW, 2022). It is possible the application area may occasionally provide suitable foraging habitat for the Australasian Bittern in wetter months, however noting the extent of wetland vegetation present within the application area and that the application area is unlikely to provide suitable breeding habitat as it would be dry during its breeding season, the application area is not considered to be significant habitat for this species.

Western Australian pill millipede

The Western Australian pill millipede appears to possess a very restricted range along the southern coast of Western Australia from Tinglewood in the west to Torbay Hill in the east (Main et al, 2002). The Western Australian pill millipede has been found in under rocks associated with granite tors, from under logs and karri bark, and in leaf litter (Main et al, 2002). The application area is further inland than most records of this species, and considering the vegetation and habitat present, is unlikely to contain significant amounts of refuge for this species. As such, it is considered unlikely that the Western Australian pill millipede is present within the application area.

Chuditch

The majority of remaining chuditch populations occur in jarrah (*Eucalyptus marginata*) forests and woodlands in the south-west corner of WA, and in woodlands, mallee shrublands and heaths along the south coast (DEC, 2012a). Noting the vegetation type present, the application area is unlikely to be utilised by chuditch.

Quokka

Quokka most commonly inhabit jarrah, marri and karri forests or riparian habitats with sedge understorey in the southwest of Western Australia, with a known range that encompassed the application area (DEC, 2013). The quokka has relatively high water requirements, which necessitates close proximity to fresh water throughout the year, hence, the species is often present in riparian and swamp habitat (Hayward et al. 2005), however, the feeding ecology of quokkas frequently results in their use of habitat beyond riparian zones (DBCA, 2023). The vegetation present within the application area may provide habitat for quokka, however considering the small size of the patch and its relatively poor connectivity with surrounding vegetation, is not considered likely to provide suitable habitat for quokka.

Black cockatoos

The application area is within the likely breeding range for Baudin's cockatoo, Carnaby's cockatoo and forest red-tailed black cockatoo (hereafter collectively referred to as black cockatoo species) (DAWE, 2022 and DEC, 2008). Black cockatoo species nest in suitable hollows present in trees of certain eucalyptus species (including karri) of a diameter of greater than 50 centimetres at breast height (DAWE, 2022), although hollows are more likely to develop in karri trees with a diameter at breast height of greater than 70 centimetres (DPAW, 2014). There are two karri trees within the application area with a diameter at breast height of greater than 50 centimetres (approximately 50 centimetres and 60 centimetres) (Maddams, 2023b). Photographs of these trees indicate that no suitable black cockatoo hollows are likely to be present within these trees (refer to Appendix E). As such, the application area is considered unlikely to contain suitable breeding habitat for black cockatoo species.

Black cockatoo species roost within tall trees, such as the karri trees present within the application area (DAWE, 2022), however noting the extent of the vegetation to be cleared and that fairly few suitable roosting trees are present within the application area, in the context of the high proportion of remnant vegetation within the local area, it is unlikely the proposed clearing would significantly impact roosting habitat for black cockatoo species.

Black cockatoo species may forage upon karri when other foraging sources are not available, however karri is not considered to be a preferred food resource by black cockatoos (Department of Environment and Conservation, 2008; DAWE, 2022; Valentine and Stock, 2008). Noting the extent of the vegetation to be cleared and that only a few karri trees are present within the application area, as well as the high proportion of remnant vegetation within the local area, it is not considered that the proposed clearing is likely to significantly limit the amount of karri vegetation available for foraging in the context of the local area. Noting this, and that no other black cockatoo foraging species are present within the application area, it is considered that the proposed clearing is unlikely to significantly impact foraging habitat for black cockatoo species.

Other species:

- The **short-nosed snake** is associated with ephemeral wetlands, and inhabits heaths along the margin of swamps, sedgelands and wet sclerophyll forests growing on sandy soil. It shelters in low dense vegetation such as tussocks and sedges (Shine 1995, Cogger et al. 1993, Wilson and Swan 2013, Cogger 2014). The application area may provide habitat for this species, however noting its extent of the application area, it is unlikely to comprise significant habitat.
- **Quenda** inhabit dense scrubby, often swampy, vegetation with dense cover and adjacent forest and woodland (DPAW, 2018). The application area may provide habitat for this species, however noting its extent it is unlikely to comprise significant habitat.
- **Western brush wallaby** inhabit open forest or woodland, particularly favouring open, seasonally-wet flats with low grasses and open scrubby thickets, also found in some areas of mallee and heath-land, and is uncommon in karri forest (DEC, 2012b). Noting the vegetation type present, the application area is unlikely to be utilised by western brush wallaby.

- **The south-western brush-tailed phascogale** inhabits dry sclerophyll forests and open woodlands, with hollow-bearing trees (usually eucalypts) and sparse understorey (DEC, 2012c). Noting that there are no hollow bearing trees within the application area, and due to its poor connectivity with other remnant vegetation, the application area is not considered to comprise habitat for this species.
- **Peregrine falcon** are found in most habitats, from rainforests to the arid zone and at most altitudes, from the coast to alpine areas. It requires abundant prey and secure nest sites and prefers coastal and inland cliffs or open woodlands near water and may even be found nesting on high city buildings (Australian Museum, 2020). This species is widespread, highly mobile and is found in various habitats. Noting this, the application area is not considered to comprise significant habitat for this species.

Conclusion

Based on the above assessment, the application area may contain habitat for Australasian bittern, black cockatoo species, short-nosed snake, quenda, and peregrine falcon, however it is not considered to comprise significant habitat for these species.

Conditions

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

- Slow, progressive manner from west to east to allow fauna to move into adjacent native vegetation ahead of the clearing activity.

3.2.2. Biological values (flora) - Clearing Principles (a) and (c)

Assessment:

In the absence of a flora survey, noting the mapped soil type, mapped vegetation type and habitat present within the application area, the application area may contain habitat for the following flora species:

- *Amanita drummondii* (Priority 3)
- *Andersonia* sp. Amabile (N. Gibson & M. Lyons 355) (Priority 3)
- *Austroparmelina macrospora* (Priority 3)
- *Lambertia rariflora* subsp. lutea (Priority 3)
- *Banksia serra* (Priority 4)
- *Boronia virgata* (Priority 4)
- *Gonocarpus pusillus* (Priority 4)
- *Gonocarpus simplex* (Priority 4)
- *Lysinema lasianthum* (Priority 4)

Noting the extent of the application area (0.51 ha) and the numbers of records and extent of these flora species (Western Australian Herbarium, 1998-), should they be present within the application are, the proposed clearing is unlikely to significantly impact the conservation status of these species.

Conclusion:

Based on the above assessment, several Priority 3 and Priority 4 listed flora species have the potential to be present within the application area, however, should they be present, the proposed clearing is unlikely to significantly impact the conservation status of these species.

Conditions:

No flora management conditions required.

3.2.3. Land and water resources (riparian vegetation) - Clearing Principle (f)

Assessment:

The application area is seasonally waterlogged and contains vegetation associated with riparian areas, including paperbarks (*Melaleuca* species) and sedges. However, it is noted that the application area is not connected hydrologically to other riparian areas, and as such the clearing is unlikely to impact upon water quality or other environmental values of other watercourses or wetlands. Noting the small extent of the application area and that it is seasonally waterlogged, it is not likely to provide significant habitat for flora or fauna inhabiting riparian environments.

Conditions:

Nil

3.3. Relevant planning instruments and other matters

Other relevant authorisations required for the proposed land use include:

- Development approval under the *Planning and Development Act 2005* (issued by the Shire of Denmark).

The Shire of Denmark approved a development approval for two new dams within the application area on 15 December 2023. Under the conditions of this Development Approval the applicant is required to:

- complete dam construction within 3 months of commencement and must spread topsoil and revegetate the exposed batters within three months.
- plant screening vegetation consisting of endemic shrubs and trees, within 6 months of the dam completion to provide a screen along the southern boundary of the application area.
- protect and retain larger trees (greater than 30 cm diameter at chest height) within the clearing area where possible; and
- fence dams, spillways and any revegetation areas to prevent stock access (Shire of Denmark, 2023).

The application area does not occur within a *Rights in Water and Irrigation Act 1914* (RIWI Act) surface water area. No licences or permits under the RIWI Act are required.

No Aboriginal sites of significance have been mapped within the application area. It is the permit holder's responsibility to comply with the *Aboriginal Heritage Act 1972* (WA) and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

End

Appendix A. Additional information provided by applicant

The applicant provided the following additional information during the assessment of this application.

Reference	Description of information (in timeline order)	Consideration of information
Maddams (2023a)	Additional photographs of application area showing vegetation present within application area	Information included in Table C.1, and factored into assessment in Section 3.2
Maddams (2023b)	Information regarding karri trees within application area	Considered in assessment of fauna habitat (Section 3.2.1)

Appendix B. Details of public submissions

Concerns raised in the public submission received for this clearing permit (Submission 2022) are summarised below

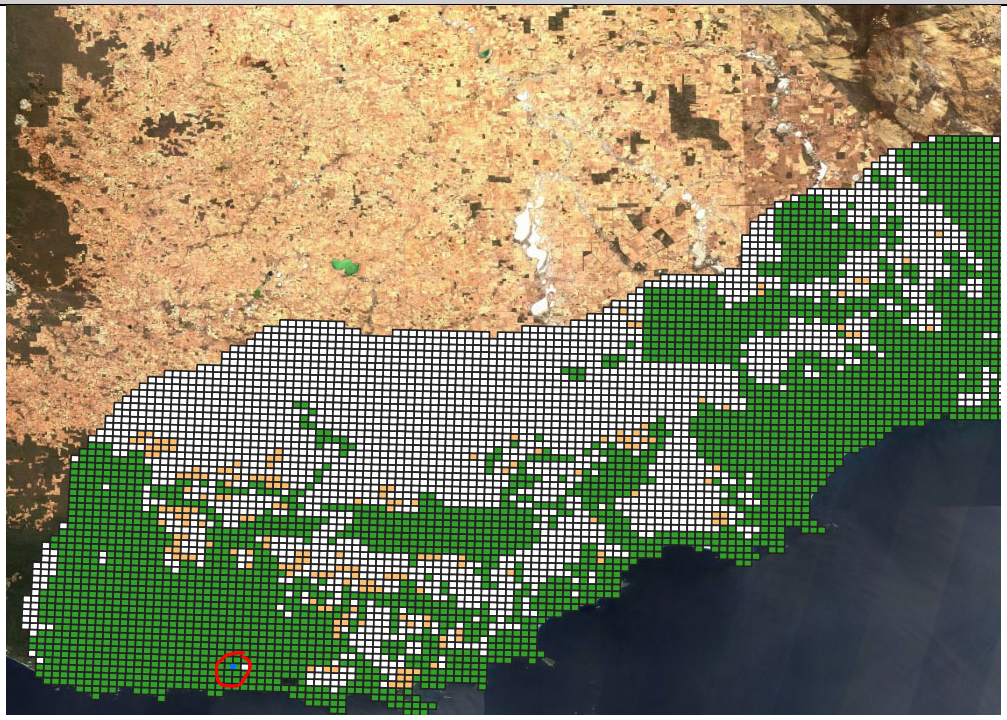
Description of comment	Consideration of comment
Application area is in range of all three black cockatoo species, and karri, marri and she-oak trees mentioned in application are likely to provide habitat for such species. Clearing should not be permitted at all or be altered accordingly to retain suitable habitat for black cockatoos, especially trees containing breeding hollows.	Impacts to black cockatoos have been considered in Section 3.2. It is noted the application area was revised since this comment was received. The 0.51 hectare area granted under this permit does not contain marri or she-oak, only smaller karri trees, and was considered unlikely to contain black cockatoo breeding habitat and to contain an insignificant source of foraging habitat.

Appendix C. Site characteristics

The information provided below describes the key characteristics of the area proposed to be cleared and is based on the best information available to DWER at the time of this assessment.

C.1 Site characteristics

Characteristic	Details
Local context	The application area is located approximately 3.5 kilometres north-west of the Koradaup townsite. The areas proposed to be cleared is connected via tracts of remnant vegetation to an expansive area of native vegetation in the intensive land use zone of WA. It is surrounded by native vegetation to the southeast and cleared agricultural land to the north, west and southwest. Aerial imagery and spatial data indicates the local area (20-kilometre radius from the centre of the area proposed to be cleared) retains approximately 73 per cent of the original native vegetation cover.
Ecological linkage	The application area is within a ‘cell’ of a wider area described as Strategic Zone A mapped within the South Coast Macro Corridor (green area in map below – application area circled in red). Strategic Zone A cells ‘contain 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’.

Characteristic	Details
	 The application area is not well linked with surrounding vegetation and is unlikely to form a significant part of a local ecological linkage.
Conservation areas	The application area does not intersect any conservation areas. The closest conservation area is an area under an "Agreement to Reserve" located approximately 190 metres south-west to the application area.
Vegetation description	A site inspection undertaken by DPIRD (CSLC, 2023) indicates the application area is a swampy depression dominated by paperbarks (*Melaleuca* species). Photographs provided by the applicant (Maddams, 2023a) indicate that karri (*Eucalyptus diversicolor*) trees, sedges, ferns and shrubs are also present. Representative photographs are available in Appendix F. This is partially consistent with the mapped vegetation type: • Keystone (Kb), which is described as Mosaic of tall open forest of *Eucalyptus guilfoylei-Eucalyptus jacksonii-Eucalyptus diversicolor* on slopes of major hills rising above coastal plain with *Allocasuarina decussata-Banksia grandis-Agonis flexuosa* on slopes in hyperhumid and perhumid zones and tall open forest of *Eucalyptus brevistylis-Eucalyptus marginata* subsp. *marginata-Corymbia calophylla* and the occasional *Eucalyptus megacarpa* near rock outcrops in hyperhumid and perhumid zones (Mattiske and Havel, 1998).
Vegetation condition	A site inspection undertaken by DPIRD (CSLC, 2023) and photographs provided by the applicant indicate the vegetation in the application area is in Good (Keighery, 1994) condition, described as: - 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. The full Keighery (1994) condition rating scale is provided in Appendix E. Representative photographs are available in Appendix F.

Characteristic	Details
Climate and topography	Temperatures range from eight degrees Celsius (°C) to 26 °C throughout the year, with rainfall approximately 1,100 mm per year and evapotranspiration 900 mm. Elevation within the application area rages from 175 m AHD in the west to 180 m AHD in the east.
Soil description	The mapped soil type within the application is Keystone brown duplex phase (254WhKYs), described as brown gravelly duplex soils and red of yellow earths; much laterite. Marri-Karri-Red Tingle-Yellow Tingle forest (10 per cent of application area) (Schoknecht et al., 2004). Soil core samples showed there are heavy clay deposits beneath the topsoil within the application area.
Land degradation risk	Mapped soil types within the application area have a high risk of phosphorus export and subsurface acidification and a moderate risk of wind and water erosion (refer to Table C.5 below). The Commissioner of Soil and Land Conservation provided the following advice following a site inspection of the original 3.18 hectare application area by a DPIRD officer (CSLC, 2023): • The likelihood of wind erosion in this location is considered low • The land identified for clearing is mainly situated on gentle slopes with duplex soils with brown gravelly surface soils. Clearing vegetation may increase likelihood of erosion. Careful management of ground cover and implementation of surface water control will reduce the threat. With good land management, clearing native vegetation is not expected to increase the likelihood of water erosion in this location • The risk of salinity causing land degradation is low; no salinity is occurring on the property; no offsite salinity was observed • The likelihood of flooding in this location is low • The area proposed for clearing is a paperbark swamp and is currently waterlogged. Clearing of native vegetation from this area is unlikely to increase the likelihood of waterlogging in this location. • The soils examined at this site possess good water and nutrient retention characteristics. Removal of native vegetation is not expected to increase the phosphorus export risk in this location.
Waterbodies	No wetlands are mapped within 5 kilometres of the application area, although it should be noted that no extensive wetland mapping is available for this area. A minor non-perennial watercourse is mapped approximately 200 m northwest of the application area, and small off-stream farm dams are located approximately 50 m and 120 m northeast of the application area.
Hydrogeography	The application area does not intersect any Public Drinking Water Source Areas proclaimed under the *Metropolitan Water Supply, Sewerage, and Drainage Act 1909* or the *Country Areas Water Supply Act 1947* or any groundwater or surface water areas proclaimed under the *Rights in Water and Irrigation Act 1914*. Groundwater salinity: 500-1000 mg/L TDS Hydrogeology: Rocks of Low Permeability, Fractured and Weathered Rocks - Local Aquifers (Gneiss, migmatite lithology)
Flora	According to available databases, there are nine threatened and 70 priority flora species recorded within the local area (20 kilometre radius), the closest of which to the application area is *Lambertia rariflora* subsp. *lutea* recorded approximately 1.7 km to the southwest.
Ecological communities	According to available databases, there are no conservation significant ecological communities mapped within the application area. The local area contains four mapped priority ecological communities with the closest being the Subtropical and Temperate

Characteristic	Details
	Coastal Saltmarsh Priority 3 ecological community, located approximately 9.6 kilometres southwest from the application area. None of these ecological communities are considered likely to occur within the application area.
Fauna	According to available databases, there are records of 32 threatened, nine priority, one conservation dependent, 17 migratory and one other specially protected fauna species within the local area, the closest of which is *Calyptorhynchus* sp. 'white-tailed black cockatoo' (considered to be either Baudin's cockatoo (*Zanda baudinii*) or Carnaby's cockatoo (*Zanda latirostris*) recorded approximately 0.7 km north of the application area. There are three confirmed black cockatoo roost sites within a 10 km radius of the application area, the closest of which is approximately 3.2 km southeast of the application area. No black cockatoo breeding sites are mapped within a 10 km radius of the application area. The application area is within the mapped range of Baudin's cockatoo (*Zanda baudinii*), forest red-tailed black cockatoo (*Calyptorhynchus banksia naso*) and Carnaby's cockatoo (*Zanda latirostris*).

C.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	833,985.56	659,432.21	79.07	558,485.38	66.97
Vegetation complex**					
Keystone (Kb)	29,634.10	23,188.19	78.25	18,283.86	61.70
Local area					
20km radius (excluding water)	95,757.99	60,379.01	72.54	-	-

*Government of Western Australia (2019a)

**Government of Western Australia (2019b)

C.3. Flora analysis table

With consideration for the site characteristics set out above and relevant datasets (see Appendix G.1.), impacts to the following conservation significant flora species required further consideration.

Species name	Conservation status	Same mapped soil type?	Same mapped vegetation type?	Suitable habitat present?	Distance of closest record to application area (km)	No of records in local area	Total no of Florabase records	Are surveys adequate to identify?
Amanita drummondii	P3	Y	Y	possible	2.8	3	12	NA
Andersonia sp. Amabile (N. Gibson & M. Lyons 355)	P3	N	N	possible	6.3	14	23	NA
Austroparmelina macrospora	P3	N	N	possible	9.9	1	53	NA
Banksia serra	P4	Y	Y	possible	3.2	30	100	NA
Banksia verticillata	T	N	N	unlikely	13.5	1	62	NA
Boronia virgata	P4	N	N	possible	2.8	36	54	NA
Commersonia apella	T	N	N	unlikely	1.7	1	15	NA
Diuris drummondii	T	N	N	unlikely	13.9	4	55	NA

Species name	Conservation status	Same mapped soil type?	Same mapped vegetation type?	Suitable habitat present?	Distance of closest record to application area (km)	No of records in local area	Total no of Florabase records	Are surveys adequate to identify?
Drakaea micrantha	T	N	N	unlikely	11.4	16	50	NA
Eucalyptus virginea	P4	Y	Y	unlikely	8.9	43	50	NA
Gonocarpus pusillus	P4	N	N	possible	9.5	9	30	NA
Gonocarpus simplex	P4	N	N	possible	10.1	6	26	NA
Grevillea fuscolutea	T	N	N	unlikely	12.2	74	44	NA
Kennedia glabrata	T	N	N	unlikely	9.7	8	36	NA
Lambertia rariflora subsp. lutea	P3	Y	Y	possible	1.45	10	48	NA
Laxmannia grandiflora subsp. brendae	T	N	N	unlikely	13.3	17	10	NA
Leucopogon alternifolius	P3	N	N	possible	15.9	5	17	NA
Lysinema lasianthum	P4	N	N	possible	9.6	4	30	NA
Microtis globula	T	N	N	unlikely	6.8	1	3	NA
Netrostylis sp. Blackwood River (A.R. Annels 3043)	P3	Y	Y	unlikely	9.2	2	16	NA
Pleurophascum occidentale	P4	Y	Y	unlikely	9.8	22	59	NA
Stylidium sp. Kordabup (A.R. Annels 1660)	P1	Y	Y	unlikely	4.8	2	2	NA
Verticordia fimbrilepis subsp. *australis*	T	N	N	unlikely	16.2	16	18	NA

T: threatened, P: priority

C.4 Fauna analysis table

With consideration for the site characteristics set out above and relevant datasets (see Appendix G.1), impacts to the following conservation significant fauna species required further consideration.

Species name (common name)	Conservation status	Suitable habitat features?	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
Atrichornis clamosus (noisy scrub-bird, tjimiluk)	EN	N	13.45	1	NA
Botaurus poiciloptilus (Australasian bittern)	EN	Y	14.66	3	NA
Calyptorhynchus banksii naso (forest red-tailed black cockatoo)	VU	Y	0.76	81	NA
Cynotelopus notabilis (Western Australian pill millipede)	EN	Unlikely	8.35	30	NA
Dasyornis longirostris (western bristlebird)	EN	N (out of range)	14.13	3	NA
Dasyurus geoffroii (chuditch, western quoll)	VU	Unlikely	9.70	5	NA
Elapognathus minor (Short-nosed snake)	P2	Y	3.23	6	NA
Falco peregrinus (Peregrine falcon)	OS	Y	8.57	11	NA
Galaxias truttaceus (Western Australian population) (Western trout minnow, western spotted galaxias)	EN	N	4.83	21	NA
Galaxiella munda (Mud minnow, western dwarf galaxias)	VU	N	6.32	19	NA
Galaxiella nigrostriata (black-stripe minnow, black-striped dwarf galaxias)	EN	N	13.52	4	NA
Geotria australis (Pouched lamprey)	P3	N	9.37	18	NA
Hydromys chrysogaster (water-rat, rakali)	P4	N	7.98	21	NA

Species name (common name)	Conservation status	Suitable habitat features?	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
Isoodon fusciventer (quenda, southwestern brown bandicoot)	P4	Y	5.70	22	NA
Leipoa ocellata (malleefowl)	VU	N	10.45	5	NA
Nannatherina balstoni (Balston's pygmy perch)	VU	N	6.32	39	NA
Nannoperca pygmaea (Little pygmy perch)	EN	N	13.39	15	NA
Notamacropus irma (western brush wallaby)	P4	Unlikely	13.11	1	NA
Oxyura australis (Blue-billed duck)	P4	N	6.14	3	NA
Pezoporus flaviventris (western ground parrot)	CR	N (out of range)	10.44	2	NA
Phascogale tapoatafa wambenger (south-western brush-tailed phascogale, wambenger)	CD	N	7.04	31	NA
Pseudocheirus occidentalis (western ringtail possum, ngwayir)	CR	Unlikely	8.93	6	NA
Setonix brachyurus (quokka)	VU	N	5.45	10	NA
Spicospina flammocaerulea (sunset frog)	VU	N (out of range)	15.96	8	NA
Westralunio carteri (Carter's freshwater mussel)	VU	N	4.79	12	NA
Zanda baudinii (Baudin's cockatoo)	EN	Y	5.0	54*	NA
Zanda latirostris (Carnaby's cockatoo)	EN	Y	3.4	63*	NA
Zephyrarchaea mainae (Main's assassin spider)	VU	N	9.40	12	NA

CR: critically endangered, EN: endangered, VU: vulnerable, P: priority, CD: conservation dependent, OS: other specially protected

* A further 94 records of *Calyptorhynchus* sp. 'white-tailed black cockatoo' are present within the local area, which comprise either of these species

C.5 Land degradation risk table

Risk categories	***Keystone brown duplex phase (254WhKYs)***
Wind erosion	M1: 10-30% of the map unit has a high to extreme wind erosion risk
Water erosion	M2: 30-50% of map unit has a high to extreme water erosion risk
Salinity	L1: <3% of the map unit has a moderate to high hazard or is presently saline
Subsurface Acidification	H2: 50-70% of map unit has a high to extreme subsurface acidification risk
Flood risk	L1: <3% of the map unit has a moderate to high hazard
Water logging	L1: <3% of the map unit has a moderate to high waterlogging risk
Phosphorus export risk	H2: 50-70% of map unit has a high to extreme phosphorus export risk

Appendix D. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment: The area proposed to be cleared may contain locally significant flora and fauna.	May be at variance	Yes *Refer to Sections 3.2.1 and 3.2.2 above.*

Assessment against the clearing principles	Variance level	Is further consideration required?
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: Based on the presence of suitable habitat and the proximity of previous fauna records the application area may provide habitat for conservation significant fauna species, however it is unlikely to comprise significant habitat.	Not likely to be at variance	Yes *Refer to Section 3.2.2 above.*
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: The area proposed to be cleared is unlikely to contain suitable habitat for flora species listed under the BC Act.	Not likely to be at variance	Yes *Refer to Section 3.2.2 above.*
Principle (d): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community."* Assessment: The area proposed to be cleared does not contain vegetation indicative of a threatened ecological community.	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 the mapped vegetation type and native vegetation in the local area are consistent with the national objectives and targets for biodiversity conservation in Australia. While the vegetation within the application area is within a 'cell' described as Strategic Zone A mapped within the South Coast Macro Corridor, due to its extent and location within the context of this zone it is not considered to play an integral role in faunal movement within the landscape.	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: Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of nearby conservation areas.	Not likely to be at variance	No
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: The vegetation proposed to be cleared in within a waterlogged depression and contains riparian vegetation.	At variance	Yes *Refer to Section 3.2.3 above.*

Assessment against the clearing principles	Variance level	Is further consideration required?
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: The mapped soils have a high risk of subsurface acidification and phosphorus export and a moderate risk of wind and water erosion, however noting the extent of the clearing, the proposed end land use (dams) and that the applicant plans to revegetate the areas downslope from the dams, the proposed clearing is not likely to have an appreciable impact on 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: Given the extent of the clearing, distance to the nearest surface waterbodies, the soil type present within the application area and that no sensitive Public Drinking Water Sources Areas or groundwater resources are mapped within the application area, the proposed clearing is unlikely to impact surface or ground water quality.	Not likely to be at variance	No
Principle (j): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding."* Assessment: Given the proposed end land use (dams, the clearing is not considered likely to result in increased flooding or waterlogging in the areas surrounding the application area.	Not likely to be at variance	No

Appendix E. 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 Keighery (1994) scale below was used to measure the condition of the vegetation proposed to be cleared.

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.

Condition	Description
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 F. Photographs of the vegetation

Figure F-1. Looking north from southern boundary of application area – karri trees, paperbarks, ferns (CSLC, 2023).

Figure F-2. Looking west from northeastern corner of application area –paperbarks, sedges, shrubs (Maddams, 2023a).

Figure F-3. Looking north from southern boundary of application area – canopies of karri trees (Maddams, 2023a)

Figure F-4. Canopies of two karri trees with diameter at breast height of greater than 50 centimetres (Maddams, 2023a).

Appendix G. Sources of information

G.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)
- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- Contours (DPIRD-073)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Imagery
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Offsets Register – Offsets (DWER-078)
- Pre-European Vegetation Statistics
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available
- Soil Landscape Mapping – Systems

Restricted GIS Databases used:

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

G.2. References

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

Commissioner of Soil and Land Conservation (CSLC) (2022) *Land Degradation Advice and Assessment Report for clearing permit application CPS 9892/1,* received 22 December 2022, Department of Primary Industries and Regional Development, Western Australia (DWER Ref: DWERDT704383).

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

Department of Agriculture, Water and the Environment (DAWE) (2022). *Referral guideline for 3 WA threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed Black cockatoo*. Department of Agriculture, Water and the Environment, Canberra, February

Department of Biodiversity, Conservation and Attractions (DBCA) (2023). *Species and Communities Branch fauna advice for clearing permit application CPS 9594/1*, received 13 April 2023. Department of Biodiversity, Conservation and Attractions, Western Australia (DWER Ref: DWERDT764813).

Department of Climate Change, Energy, the Environment and Water (DCCEEW) (2022). *National Recovery Plan for the Australasian Bittern* (Botaurus poiciloptilus). Department of Climate Change, Energy, the Environment and Water, Canberra. Available from: http://www.dcceew.gov.au/environment/biodiversity/threatened/publications/recovery/australasian-bittern

Department of Environment and Conservation (DEC) (2008). *Forest Black Cockatoo* (Baudin's Cockatoo Calyptorhynchus baudinii *and Forest Red-tailed Black Cockatoo* Calyptorhynchus banksia naso*) Recovery Plan*, Department of Environment and Conservation, Western Australia. Retrieved from https://www.dcceew.gov.au/sites/default/files/documents/wa-forest-black-cockatoos-recovery-plan.pdf

Department of Environment and Conservation. (2012a). *Fauna Profiles. Chuditch* Dasyurus geoffroii. Government of Western Australia.

Department of Environment and Conservation (DEC) (2012b). Fauna profiles - Western Brush Wallaby - Macropus irma. Department of Environment and Conservation, Western Australia.

Department of Environment and Conservation. (DEC) (2012c). Fauna profiles. Brush-tailed Phascogale. Phascogale tapoatafa (Meyer, 1793). Retrieved from https://library.dbca.wa.gov.au/static/FullTextFiles/925273.pdf

Department of Environment and Conservation (DEC) (2013). *Quokka* Setonix brachyurus *Recovery Plan*. Wildlife Management Program No. 56. Department of Environment and Conservation, Perth, WA.

Department of Environment Regulation (DER) (2013). *A guide to the assessment of applications to clear native vegetation*. Perth. Available from: https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Guidelines/Guide2_assessment_native_veg.pdf

Department of Parks and Wildlife (DPAW) (2014). *Karri Silviculture Guideline.* Sustainable Forest Management Series, FEM Guideline 3.

Department of Parks and Wildlife (DPAW) (2017). *Western Ringtail Possum (Pseudocheirus occidentalis) Recovery Plan*. Wildlife Management Program No. 58. Department of Parks and Wildlife, Perth, WA. Available from: http://www.environment.gov.au/biodiversity/threatened/publications/recovery/western-ringtail-possum-recovery-plan.

Department of Parks and Wildlife (DPAW) (2018). Fauna notes – Living with quenda. Retrieved from https://www.dbca.wa.gov.au/media/2147/download

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 30 November 2023).

Department of Water and Environmental Regulation (DWER) (2019). *Procedure: Native vegetation clearing permits*. Joondalup. Available from: https://dwer.wa.gov.au/sites/default/files/Procedure_Native_vegetation_clearing_permits_v1.PDF.

Government of Western Australia (2019). *2018 South West Vegetation Complex Statistics. Current as of March 2019*. WA Department of Biodiversity, Conservation and Attractions, Perth, https://catalogue.data.wa.gov.au/dataset/dbca

Government of Western Australia. (2019). *2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019.* WA Department of Biodiversity, Conservation and Attractions. https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics

Hayward, M.W., de Tores, P.J. & Banks, P.J. (2005). Habitat use of the Quokka, *Setonix bracyhurus* (Macropodidae: Marsupalia), in the Northern Jarrah Forest of Australia. *Journal of Mammalogy.* 86(4):683-688

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

Maddams, R. (2022). *Clearing permit application CPS 9892/1 and supporting documentation*, received 23 September 2022 (DWER Ref: DWERDT662847).

Maddams, R. (2023a). *Additional photographs of application area,* received 27 September 2023 and 16 October 2023 (DWER refs: DWERDT845219 and DWERDT850793).

Maddams, R. (2023b). *Information regarding karri trees within application area,* received 30 September 2023 (DWER ref: DWERDT845220).

Main, B.Y., Harvey, M.S. & Waldock, J.M. (2002) The distribution of the Western Australian pill millipede, Cynotelopus notabilis Jeekel (Sphaerotheriidae). *Records of the Western Australian Museum*, 20, 383–385.

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.

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

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.

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 (2023). *Copy of Development Approval for Lot 16 Mcleod Road, Kordabup.* Received 15 December 2023. DWERref DWERDT881915

Submission (2022). *Public submission in relation to clearing permit application CPS 9892/1,* received 12 November 2022 (DWER Ref: DWERDT686085).

Valentine, L.E. and Stock, W. (2008). Food Resources of Carnaby's Black Cockatoo (Calyptorhynchus latirostris) in the Gnangara Sustainability Strategy Study Area. Edith Cowan University and Department of Environment and Conservation. December 2008.

Western Australian Herbarium (1998-). *FloraBase - the Western Australian Flora*. Department of Biodiversity, Conservation and Attractions, Western Australia. https://florabase.dpaw.wa.gov.au/ (Accessed 23 November 2023).