



## CLEARING PERMIT

*Granted under section 51E of the Environmental Protection Act 1986*

<b>Purpose Permit number:</b>	CPS 7542/2
<b>Permit Holder:</b>	Stephen Ziverts
<b>Duration of Permit:</b>	25 August 2017 – 25 August 2032

The Permit Holder is authorised to clear *native vegetation* subject to the following conditions of this Permit.

### **PART I – CLEARING AUTHORISED**

**1. Purpose for which clearing may be done**

*Clearing* for the purpose of silvicultural thinning.

**2. Land on which clearing is to be done**

Lot 1253 on Deposited Plan 149328, Hazelvale

**3. Area of Clearing**

The Permit Holder must not selectively clear more than 30 hectares of *native vegetation* within the area hatched yellow on Figure 1 of Schedule 1.

**4. Period in which clearing is authorised**

The Permit Holder shall not clear any native vegetation after 25 August 2027.

**5. Application**

This Permit allows the Permit Holder to authorise persons, including employees, contractors and agents of the Permit Holder, to clear native vegetation for the purposes of this Permit subject to compliance with the conditions of this Permit and approval from the Permit Holder.

## 6. Type of clearing authorised

To the extent authorised under condition 3 of this Permit, the Permit Holder may undertake the following activities within the area cross-hatched yellow on Figure 1 of Schedule 1:

- (a) *clearing* of *understorey* where undertaken in association with the activities described under conditions 6(b), (c) and (d);
- (b) *clearing* for the establishment of a *log landing* no larger than 0.3 hectares in size;
- (c) *thinning* of karri (*Eucalyptus diversicolor*) trees;
- (d) *culling* and burning of unsaleable trees; and
- (e) *prescribed burning* of *understorey* on one occasion.

## PART II – MANAGEMENT CONDITIONS

### 7. 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.

### 8. 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*;
- (c) only move soils in *dry conditions*; and
- (d) restrict the movement of machines and other vehicles to the limits of the areas to be *cleared*.

### 9. Vegetation management

- (a) *Thinning* activities undertaken in accordance with condition 6(c) of this permit must be performed by a *forestry operator*.
- (b) The Permit Holder shall not undertake *thinning* within the area cross hatched red on Figure 2 of Schedule 1 after 17 August 2022.
- (c) Operation of logging machinery used to undertake activities authorised under this Permit must only be performed during *dry conditions*.
- (d) The Permit Holder shall not clear native vegetation within 50 metres of the *riparian vegetation* of any *watercourse* or *wetland*;
- (e) Prior to undertaking any *clearing* authorised under this permit, an *environmental specialist* must determine the species composition, structure and density of the *understorey* of areas proposed to be *thinned*;

- (f) a *forestry operator* must inspect all *habitat trees* within the area cross-hatched yellow in Figure 1 of Schedule 1 and demarcate any *habitat trees* containing hollows suitable for use by *black cockatoo species* or *Phascogale tapoatafa wambenger* (south-western brush-tailed phascogale).
- (g) The permit holder must not clear any *habitat trees* containing hollows suitable for use by black cockatoo species or *Phascogale tapoatafa wambenger* (southwestern brush-tailed phascogale) identified in accordance with condition 9(f) of this permit.
- (h) The Permit Holder must retain a minimum of two (2) *habitat trees* per hectare, where present;
- (i) Where two (2) *habitat trees* per hectare are not present within the area crosshatched yellow in Figure 1 of Schedule 1, the permit holder must retain a minimum of two (2) of the largest trees with the potential to become *habitat trees* per hectare within the area cross-hatched yellow in Figure 1 of Schedule 1.
- (j) Prior to undertaking any *clearing* authorised under this permit, the permit holder must provide locations of each *habitat tree* and potential *habitat tree* retained in accordance with condition 9(g) - 9(i), recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 94/2020 (GDA94/2020), expressing the geographical coordinates in Eastings and Northings, to the *CEO*.
- (k) A minimum retention rate of 16 m<sup>2</sup>/ha *basal area* is required within the area of *clearing* authorised under this Permit;
- (l) A minimum of one 30 metre diameter patch of *healthy representative understorey*, on average, per hectare authorised to be cleared under this Permit, is required to be retained;
- (m) On average, a minimum of one *ground habitat log* per hectare authorised to be cleared under this Permit, is required to be retained;
- (n) The permit holder must remove all *woody fuels* present within a one (1) metre radius of each *habitat tree* and potential *habitat tree* (retained under conditions 9(g) - 9(i) of this Permit) and each *ground habitat log* (retained under condition 9(m) of this permit);
- (o) The permit holder must ensure that any *prescribed burning* undertaken in accordance with condition 6(e) of this permit shall only occur:
  - i) Between spring and early summer in any year; and
  - ii) During suitable conditions.
- (p) Prior to undertaking any *clearing* authorised under this Permit, the Permit Holder must exclude all *stock* from the areas subject to *thinning* activities;
- (q) Within 3 months of 25 August 2027, the Permit Holder must *rehabilitate* any *log landings* and *extraction tracks* established within native vegetation by scarifying the soil surface to reduce compaction and facilitate natural *regeneration*; and
- (r) Within two years of 25 August-2027, the Permit Holder must:
  - i) determine the species composition, structure and density of the *understorey* of areas subject to *thinning*; and
  - ii) where, in the opinion of an *environmental specialist*, there is evidence that *understorey* will not recover and develop towards its pre-clearing composition, structure and density determined under condition 9(e), the Permit Holder must undertake *remedial action* at an *optimal time* within the next 12 months to ensure re-establishment of *understorey* prior to expiry of this Permit.

## PART III - RECORD KEEPING AND REPORTING

### 10. Records 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 <i>clearing</i> activities generally	<ul style="list-style-type: none"> <li>a) the species composition, structure, and density of the cleared area;</li> <li>b) the location where the <i>clearing</i> occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994/2020 (GDA94/2020), expressing the geographical coordinates in Eastings and Northings;</li> <li>c) the date that the area was cleared;</li> <li>d) the size of the area cleared (in hectares);</li> <li>e) actions taken to avoid, minimise, and reduce the impacts and extent of <i>clearing</i> in accordance with condition 7; and</li> <li>f) actions taken to minimise the risk of the introduction and spread of <i>weeds</i> and <i>dieback</i> in accordance with condition 8.</li> </ul>
2.	In relation to vegetation management pursuant to condition 9	<ul style="list-style-type: none"> <li>a) the name and qualifications of the <i>forestry operator</i> used to undertake <i>thinning</i>;</li> <li>b) the <i>environmental specialist's</i> report documenting the species composition, structure and density of the <i>understorey</i> in accordance with condition 9(e);</li> <li>c) for <i>habitat trees</i> retained in accordance with conditions 9(g) and 9(i): <ul style="list-style-type: none"> <li>i) the species of each tree;</li> <li>ii) the location of each tree, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994/2020 (GDA1994/2020), expressing the geographical coordinates in Eastings and Northings;</li> <li>iii) a photograph of each tree; and</li> <li>iv) the number per hectare of <i>habitat trees</i> retained;</li> </ul> </li> <li>d) monitoring undertaken to ensure that the specified minimum <i>basal area</i> is retained; the locations of patches of <i>healthy representative understorey</i> vegetation retained, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994/2020 (GDA1994/2020), expressing the geographical coordinates in Eastings and Northings;</li> <li>e) actions taken to remove <i>woody fuels</i> surrounding retained <i>habitat trees</i>, potential <i>habitat trees</i> and <i>ground habitat logs</i> in accordance with condition 9(n) of this Permit;</li> <li>f) date(s) when the <i>prescribed burning</i> activities were</li> </ul>

		<p>undertaken.</p> <p>g) number of <i>log landings</i> established;</p> <p>h) the location of <i>log landings</i>, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020/1994 (GDA94/2020), expressing the geographical coordinates in Eastings and Northings;</p> <p>i) the date(s) the <i>log landings</i> and <i>extraction tracks</i> were <i>rehabilitated</i> in accordance with condition 9(q);</p> <p>j) photographs of the <i>understorey</i> taken at one year, two years and three years after completing <i>clearing</i> authorised under this permit; and a detailed description of the nature and extent of any <i>remedial actions</i> undertaken in accordance with 9(r)(ii).</p>
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## 11. Reporting

- (a) The Permit Holder must provide to the *CEO* on or before 30 June of each year, a written report:
- i) of records required under condition 10 of this Permit; and
  - ii) concerning activities done by the Permit Holder under this Permit between 1 January to 31 December of the preceding calendar year.
- (b) If no *clearing* authorised under this Permit was undertaken between 1 January to 31 December of the preceding calendar year, a written report confirming that no *clearing* under this permit has been carried out, must be provided to the *CEO* on or before 30 June of each year.
- (c) Prior to 25 May 2032, the Permit Holder must provide to the *CEO* a written report of records required under condition 11 of this Permit where these records have not already been provided under condition 11(a) of this Permit.

## DEFINITIONS

In this Permit, the terms in Table 2 have the meaning defined.

**Table 2: Definitions**

Term	Definition
basal area	is the method of expression of tree cover density in an area where the total area of tree trunk, measured at average adult human breast height, is expressed as square metres per hectares of land area.
direct seeding	means a method of re-establishing vegetation through the establishment of a seed bed and the introduction of seeds of the desired plant species.
black cockatoo species	means one or more of the following species: (a) <i>Zanda latirostris</i> (Carnaby's cockatoo); (b) <i>Zanda baudinii</i> (Baudin's cockatoo); and/or (c) <i>Calyptorhynchus banksii naso</i> (forest red-tailed black cockatoo).
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the EP Act.
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.
culled/ing	means the selective removal and/or killing of unsaleable trees for <i>thinning</i> , using methods including notching, felling or machine puching.
dieback	means the effect of <i>Phytophthora</i> species on native vegetation.
dry conditions	means when soils (not dust) do not freely adhere to rubber tyres, tracks, vehicle chassis or wheel arches.

environmental specialist	means an external person with experience relevant to the type of environmental advice that an environmental specialist is required to provide under this Permit, or who is approved by the CEO as a suitable environmental specialist.
extraction tracks	means tracks along which trees felled by logging machinery are moved from the cutting site to a landing or roadside.
EP Act	<i>Environmental Protection Act 1986 (WA)</i>
fill	means material used to increase the ground level, or to fill a depression.
forestry operator	means an external person with a minimum of 5 years of experience in conducting forestry activities to meet harvest and silvicultural standards required for native forest operations on lands managed by Department of Biodiversity, Conservation and Attractions.
ground habitat log	means a log with a minimum length of 3 metres and a minimum internal hollow diameter of 10 centimetres.
habitat tree(s)	means trees that have a diameter, measured over bark at 1.3 meters from the base of the tree, of at least 70 centimetres for karri ( <i>Eucalyptus diversicolor</i> ) and of at least 50 centimetres for jarrah ( <i>Eucalyptus marginata</i> ), blackbutt ( <i>Eucalyptus patens</i> ) or marri ( <i>Corymbia calophylla</i> ), that contain or have the potential to develop hollows or roosts suitable for native fauna.
healthy representative understorey	means native <i>understorey</i> vegetation that is vigorous, free of disease, and has a similar species composition to typical pre-clearing <i>understorey</i> vegetation present within the area in which <i>clearing</i> is authorised.
local provenance	means native vegetation seeds and propagating material from natural sources within 50 kilometres of the area cleared.
log landing/s	means an area established for the purpose of stockpiling commercially harvested trees, to enable loading for collection.
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.
optimal time	means the period from April to June for undertaking <i>planting</i> .
planting	means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of the desired species.
prescribed burning	is the process of planning and applying fire to a predetermined area, under specific environmental conditions, to minimise the size and intensity of fire on life, property and critical infrastructure.
regenerate/ed/ion	means re-establishment of vegetation from in situ seed banks and propagating material (such as lignotubers, bulbs, rhizomes) contained either within the topsoil or seed-bearing <i>mulch</i> .
rehabilitate/ed/ion	means actively managing an area containing native vegetation in order to improve the ecological function of that area.
remedial action/s	means for the purpose of this Permit, any activity that is required to ensure successful re-establishment of <i>understorey</i> to its pre-clearing composition, structure and density, and may include a combination of soil treatments and <i>revegetation</i> .
revegetate/ed/ion	means the re-establishment of a cover of <i>local provenance</i> native vegetation in an area using methods such as natural <i>regeneration</i> , <i>direct seeding</i> and/or <i>planting</i> , so that the species composition, structure and density is similar to pre-clearing vegetation types in that area.
riparian vegetation	has the meaning given to it in Regulation 3 of the <i>Environmental Protection (Clearing of Native Vegetation) Regulations 2004</i> .
stock	means the horses, cattle, sheep, pigs and other non-indigenous grazing animals kept or bred on a property;
suitable conditions	mean conditions that have been determined by a Bush Fire Officer appointed under the <i>Bush Fires Act 1954</i> to be suitable to allow the burning of vegetation within the area authorised under this Permit to occur.
thinned/ing	describes a silvicultural activity to promote the growth of selected trees by reducing competition through the removal of smaller stems with consideration of tree spacing to maintain the overall structure and composition of the dominant

	overstorey species.
understorey	means, for the purpose of this Permit, all native vegetation that does not include trees to be <i>culled</i> or subject to harvest.
watercourse	has the meaning given to it in section 3 of the <i>Rights in Water and Irrigation Act 1914</i> .
weeds	means any plant – (a) that is a declared pest under section 22 of the <i>Biosecurity and Agriculture Management Act 2007</i> ; 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.
wetland	means an area of seasonally, intermittently or permanently waterlogged or inundated land, whether natural or otherwise, and includes a lake, swamp, marsh, spring, dampland, tidal flat or estuary.
woody fuels	mean woody vegetative materials that have a diameter of 75 mm or greater and a length of 1 metre or greater

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**END OF CONDITIONS**



**Meenu Vitarana**  
**Manager**

NATIVE VEGETATION REGULATION

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

21 November 2022

SCHEDULE 1

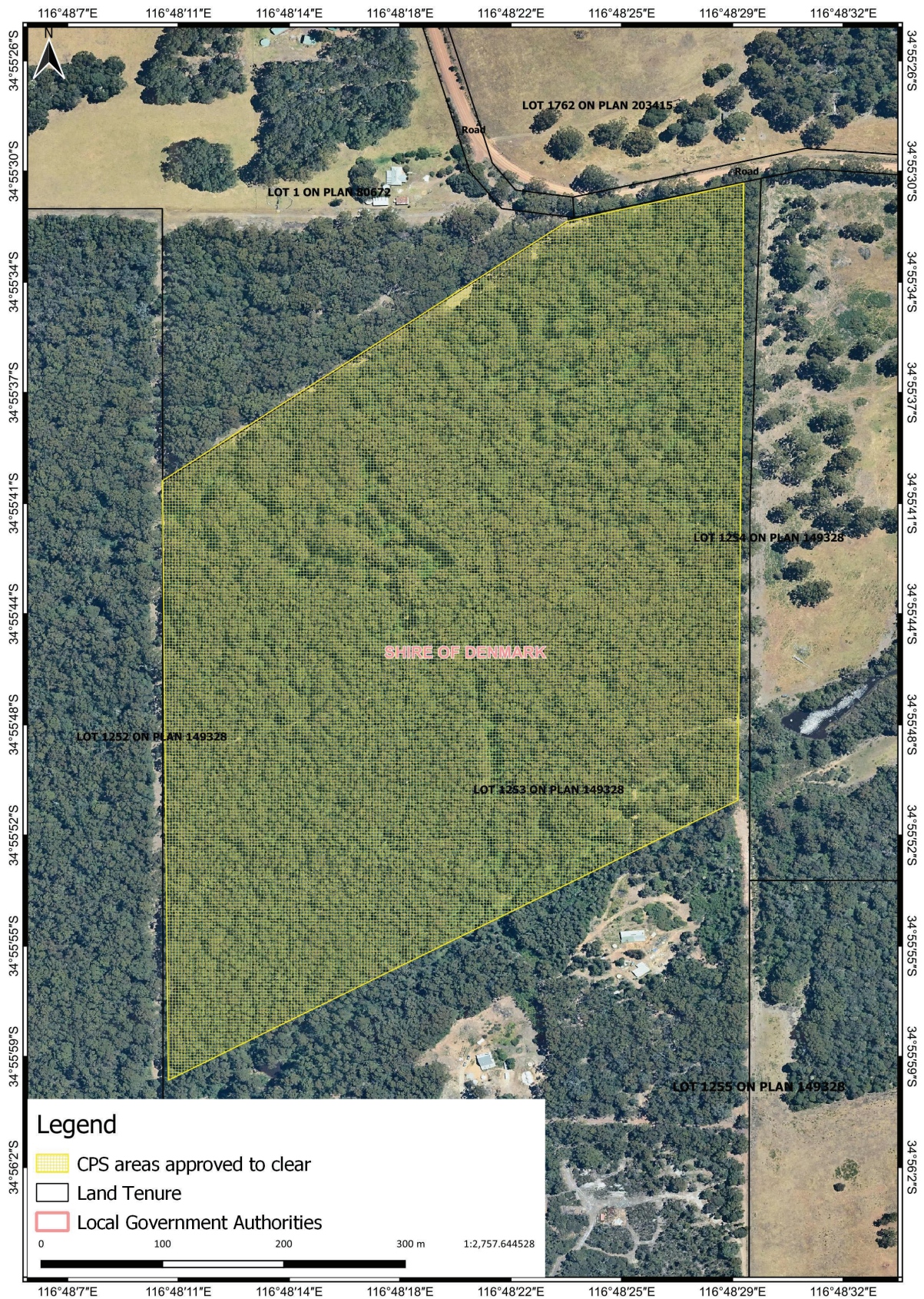


Figure 1: Map of the boundary of the area within which clearing may occur



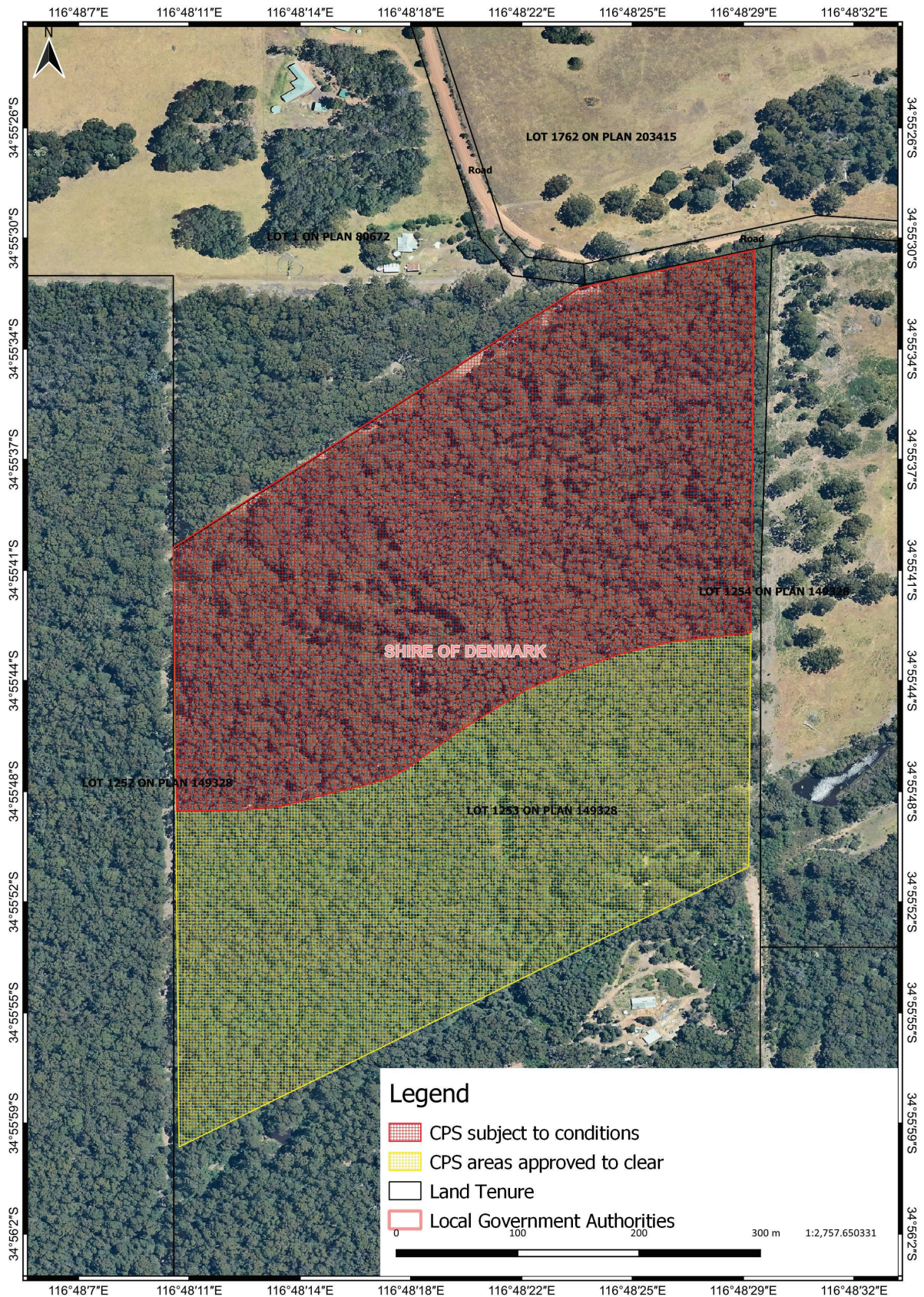


Figure 2: Map of the boundary of the area to which Condition 9(b) applies.



# Clearing Permit Decision Report

## 1 Application details and outcome

### 1.1. Permit application details

Permit number:	CPS 7542/2
Permit type:	Purpose permit
Applicant name:	Mr Stephen Ziverts
Application received:	23 May 2022
Application area:	30 hectares of native vegetation
Purpose of clearing:	Timber harvesting
Method of clearing:	Mechanical
Property:	Lot 1253 on Deposited Plan 149328
Location (LGA area/s):	Shire of Denmark
Localities (suburb/s):	Hazelvale

### 1.2. Description of clearing activities

This amendment application is to extend the duration of clearing of CPS 7542/1. No amendment to the clearing area or clearing conditions granted under CPS 7542/1 has been sought. Clearing (silvicultural thinning) authorised under CPS 7542/1 has taken place in the northern half of the application area prior to the granting of this amendment (refer to Figure 2). As a condition of this permit, no thinning is to occur in this portion of the application area after August 2022.

The vegetation proposed to be cleared under CPS 7542/2 is contained within a single contiguous area (see Figure 1, Section 1.5). The applicant has proposed to selectively clear (i.e., undertake silvicultural thinning of) karri regrowth and subsequently undertake prescribed burning of understorey within the application area. A tree harvester will be used to fell the trees (Clarke, 2017). Clearing for the establishment of a log landing and clearing of understorey (only where undertaken in association with the thinning and clearing for log landings) is also permitted under the permit. Extraction tracks cleared will be located primarily in a north-south direction given the slope of the land (Clarke, 2017). A log landing will be located adjacent to Dingo Flat Road (Clarke, 2017).

### 1.3. Decision on application

Decision:	Granted
Decision date:	21 November 2022
Decision area:	30 hectares of native vegetation as depicted in Section 1.5 below

### 1.4. Reasons for decision

This clearing permit amendment 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 H), the findings of an understorey vegetation survey conducted to satisfy a condition of CPS 7542/1 (Stephens, 2022) and a site inspection conducted for a previous clearing permit application (DEC, 2009), the clearing principles set out in Schedule 5 of the EP Act (see Appendix D) and relevant planning instruments and any other matters considered relevant to the assessment (see Section 3.2.3).

The assessment has not changed since the assessment for CPS 7542/1, except in the case of principles a) (previously considered “not likely to be at variance”, now “at variance”) and b) (previously considered “not likely to be at variance”, now “at variance”). The assessment identified that the clearing:

- Will result in a loss of foraging habitat for forest red-tailed black cockatoo, Baudin's cockatoo and Carnaby's cockatoo, however noting the vegetation present, the context of the application area and the type of clearing proposed, this habitat loss is not considered significant;
- Is unlikely to result in a loss of significant breeding or roosting habitat for forest red-tailed black cockatoo, Baudin's cockatoo and Carnaby's cockatoo, noting conditions on the permit to retain habitat trees;
- Is unlikely to impact significant habitat for two pygmy trapdoor spider species; and a condition to retain riparian vegetation further reduces the likelihood that the endangered tingle pygmy trapdoor spider (*Bertmainius tingle*) would be impacted by the clearing;
- Will result in loss of suitable habitat for western ringtail possum, woylie, quokka, chuditch, western false pipistrelle, quenda, southwestern brush-tailed phascogale and peregrine falcon, however, the proposed clearing is unlikely to have significant impacts on the above species subject to conditions to retain fauna habitat features and avoid riparian vegetation, being imposed on the permit.
- Is unlikely to impact priority flora species Rate's tingle (*Eucalyptus brevistylis*) present within the application area, noting the nature of the proposed clearing and vegetation management conditions being imposed on the permit;
- Has the potential to result in soil compaction and water erosion impacts, however these impacts are expected to be mitigated by conditions being imposed on the permit.

The Delegated Officer determined that the proposed amendment being sought is not likely to lead to an unacceptable risk to environmental values, subject to the placement of appropriate conditions on the permit, and that applicant has suitably demonstrated avoidance and minimisation measures.

The Delegated Officer decided to grant the amendment subject to the following updated conditions, to align with current departmental practices:

- All habitat trees (i.e. those with a DBH of greater than 50 centimetres, or greater than 70 centimetres for karri) are required to be inspected, and any such trees containing hollows suitable for black cockatoo breeding are required to be retained;
- A minimum of two habitat trees hectare are required to be retained;
- All woody fuels present within a one metre radius of each retained habitat tree are required to be removed;
- A minimum of one 30 metre diameter patch of healthy representative understorey, on average, per hectare, is required to be retained, preferencing healthy representative understorey;
- A minimum of one ground habitat log per hectare is required to be retained, and all woody fuels present within a one metre radius of these logs are to be removed;
- Clearing is not permitted within 50 metres of the riparian vegetation of any watercourse or wetland.
- Weed control conditions;
- Prescribed burning is only to be undertaken on one occasion, at certain times of the year and under suitable conditions to ensure that burning does not excessively impact retained vegetation;
- A minimum retention rate of 16 m<sup>2</sup>/ha basal area is required to be retained, rather than the 15 m<sup>2</sup>/ha rate specified in the previous permit, to be consistent with current DBCA forestry practices for karri forest;
- Where there is evidence that understorey will not recover and develop towards its pre-clearing composition, structure and density, remedial measures are required to be undertaken to ensure re-establishment of understorey;
- Rehabilitation of established *log landings* and *extraction tracks* by scarifying the soil surface is required to reduce compaction and facilitate natural regeneration.
- Operation of logging machinery used to undertake clearing activities must only be performed during dry conditions; and
- Rehabilitation of established *log landings* and *extraction tracks* by scarifying the soil surface is required to reduce compaction and facilitate natural regeneration.

## 1.5. Site map

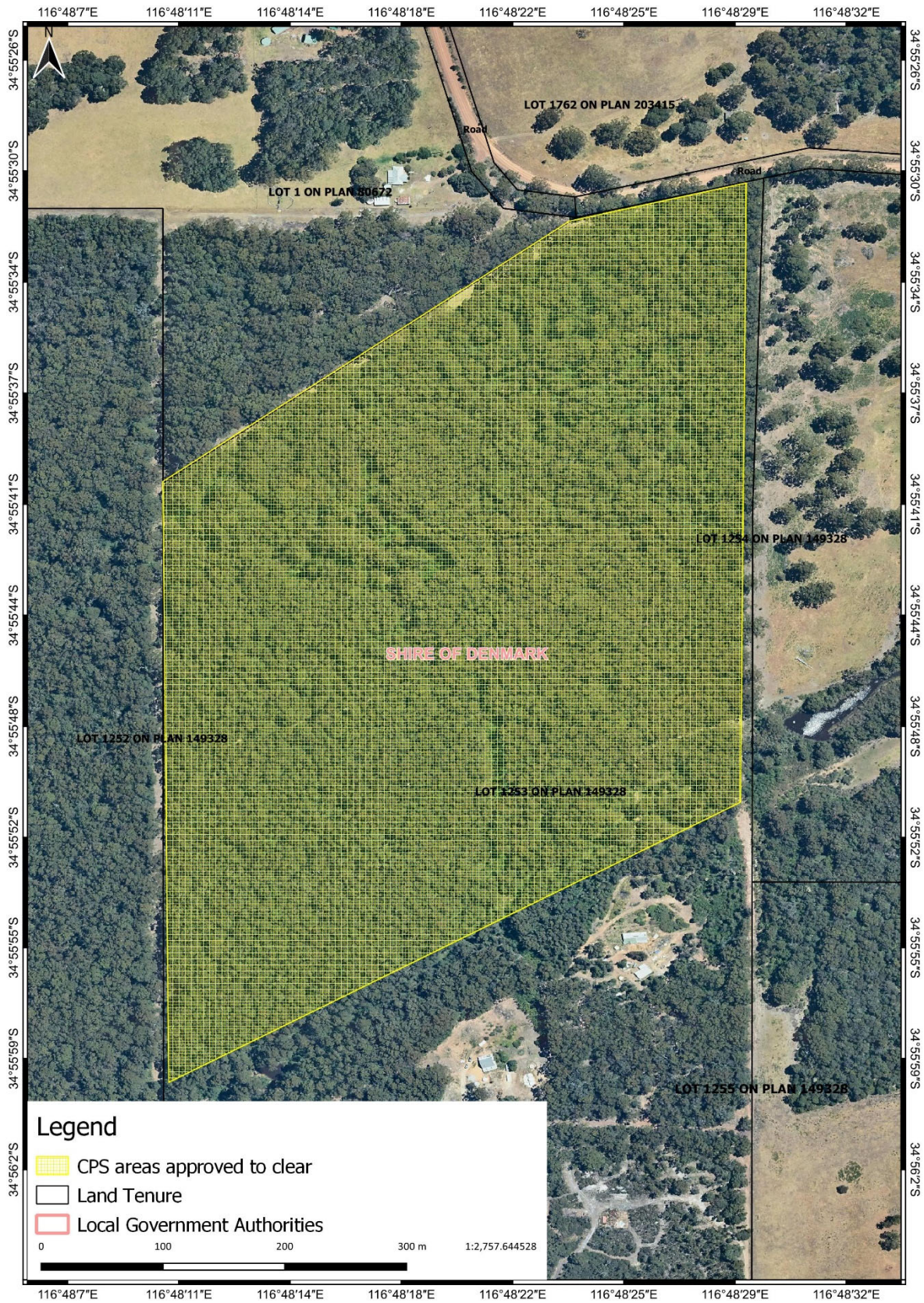


Figure 1. Map of the application area. The area crosshatched yellow indicates the area authorised to be cleared under the granted clearing permit.

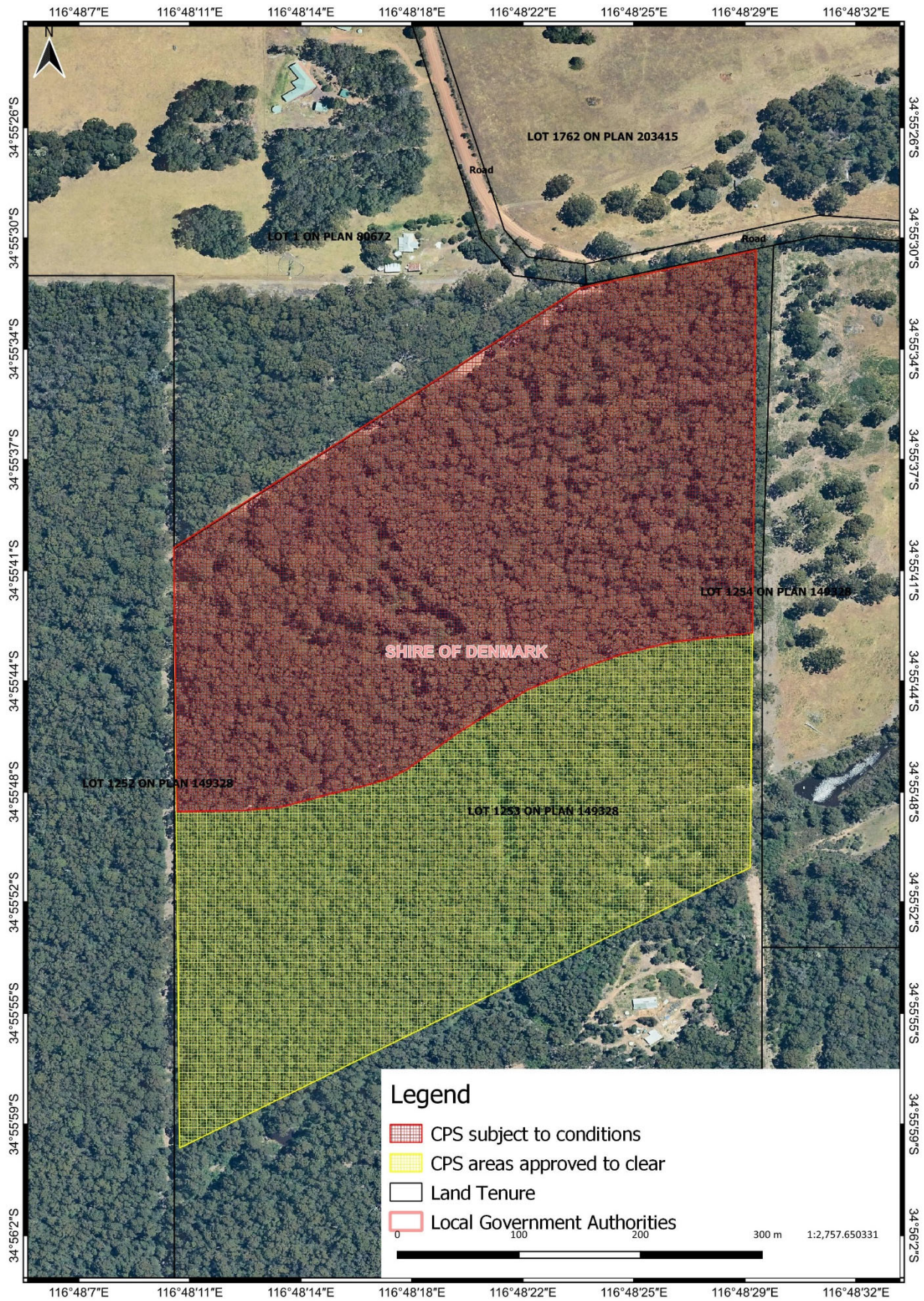


Figure 1. The red cross hatched area is the area in which thinning has already occurred, and thinning is not permitted beyond August 2022.

## 2 Legislative context

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

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

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

Other legislation of relevance for this assessment include:

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

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

A forestry management plan submitted along with application documents for CPS 7542/1 (Clarke, 2017) outlines the following measures to avoid an/or mitigate impacts of the clearing:

- At least two habitat trees per hectare will be retained;
- Harvesting will be carried out by an experienced and qualified harvesting contractor using machinery applicable to karri regrowth harvesting;
- Harvesting slash will be removed from around the bases of all retained trees
- Following the completion of extraction, any extraction tracks with exposed soil on slopes will be treated with erosion barriers;
- All harvesting activity will be conducted in accordance with the WA timber industry Codes of Practice;
- Following harvesting, the area will be “tops burnt”, that is harvesting debris will be burnt under cool conditions such that only the recently dried harvesting slash and rolled understorey vegetation will burn.

### 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 impacts of the proposed clearing present a risk biological values (fauna and flora) and or land and water resources. The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

The assessment against the clearing principles have changed from the Clearing Permit Decision Report CPS 7542/1, for principles a) (previously considered “not likely to be at variance”, now “at variance”) and b) (previously considered “not likely to be at variance”, now “at variance”). The reasons for these changes are outlined below. The assessment against the remaining clearing principles have not changed and are available in the Decision Report for CPS 7542/1, with a summary included in Appendix D.

### 3.2.1. Environmental value: biological values (fauna) – Clearing Principle (b)

#### Assessment:

Noting the habitat requirements, distribution of the recorded species and vegetation type and condition present within the application area, it was considered that the application area is likely to comprise suitable habitat for the following conservation significant fauna species:

- *Pseudocheirus occidentalis* (western ringtail possum) - Critically Endangered;
- *Bettongia penicillata ogilbyi* (woylie, brush-tailed bettong) – Critically Endangered;
- *Bertmainius tingle* (tingle pygmy trapdoor spider) – Endangered;
- *Zanda* (formerly *Calyptorhynchus baudinii*) (Baudin's cockatoo) – Endangered;
- *Zanda* (formerly *Calyptorhynchus latirostris*) (Carnaby's cockatoo) -Endangered;
- *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo) – Vulnerable;
- *Dasyurus geoffroyi* (chuditch, western quoll) – Vulnerable;
- *Setonix brachyurus* (quokka) – Vulnerable;
- *Bertmainius mysticus* (mystical pygmy trapdoor spider) – Priority 2;
- *Falsistrellus mackenziei* (western false pipistrelle, western falsistrelle) – Priority 4;
- *Isoodon fusciventer* (quenda, southwestern brown bandicoot) – Priority 4;
- *Phascogale tapoatafa wambenger* (south-western brush-tailed phascogale, wambenger) – Conservation Dependent; and
- *Falco peregrinus* (peregrine falcon) – Other specially protected.

#### Black cockatoos

The application area is within both the known ranges and known breeding ranges of Baudin's cockatoo, Carnaby's cockatoo and forest red-tailed black cockatoo (DAWE, 2022 and DEC, 2008a). All of these species nest in hollows of live or dead Eucalypt trees, including karri and marri (DAWE, 2022). Only karri trees will be cleared under this permit. Suitable nest hollows are only found in live karri trees with a diameter at breast height (DBH) of at least 50 centimetres, but usually 70 cm (Department of Parks and Wildlife, 2014). Trees with a DBH of 30 centimetres or greater may be suitable to develop a nest hollow in the future (DAWE, 2022). A site inspection (DEC, 2009) noted very few trees with a DBH greater than 70 centimetres were present within the northern portion of the application area. It is considered that the application area may contain a small number of trees that are likely to provide suitable breeding habitat for black cockatoo species presently and in the future. Noting declining habitat for black cockatoo species, all current breeding habitat for black cockatoos is considered significant. To mitigate impacts to black cockatoo breeding habitat, it is required as a condition of this permit that all potential habitat trees (i.e. those with a DBH of greater than 70 centimetres for karri and a DBH greater than 50 centimetres for other species) are to be inspected, and any such trees containing hollows suitable for black cockatoo breeding are required to be retained. A condition requiring that the applicant retain a minimum of two habitat trees per hectare or potential habitat trees per hectare will also mitigate impacts to future black cockatoo breeding habitat.

It is also considered that although no known roosting trees are present within the application area, the application area would contain trees suitable for black cockatoo roosting, given the presence of suitable species and that the application area is close to riparian areas (DAWE, 2022). A condition placed on this permit requiring the permit holder to retain a minimum of two habitat trees/potential habitat trees per hectare will ensure that the application area would retain the most suitable trees for roosting, such that impacts to black cockatoo roosting habitat would not be significant.

Karri is not a commonly foraged tree species for black cockatoo species, although red-tailed black cockatoos may forage on the edge of karri forests (DAWE, 2022). Marri trees present within the application area are likely to provide foraging habitat for black cockatoo species (DAWE, 2022), however it is noted there are relatively few marri trees present within the application area that no marri trees (and only karri trees) will be cleared under this permit. Black cockatoos are known to forage within 20 kilometres of night roost sites and in areas up to 12 km from their nest during the breeding season, (DAWE, 2022). The application area is not within 20 kilometres of a known roost site or 12 kilometres of a known breeding site, however given the relative absence of black cockatoo habitat information in the south-west region of Western Australia, the presence of unrecorded breeding or roosting trees in the vicinity of the application area cannot be ruled out. The application area was also considered in the context of the local area, of which 85 per cent contains remnant vegetation, the majority of which is within lands managed by DBCA. It is also expected that, as the clearing entails thinning and not complete removal of all vegetation, retained trees will take advantage of the reduced competition from thinned trees and will grow such that the temporarily reduced canopy cover (and foraging area) will eventually fill in. Given the above, it is considered unlikely that the proposed clearing would significantly impact black cockatoo foraging habitat.

## Western ringtail possums

The application area is on the border of the south coast management zone for the western ringtail possum (WRP) (DPAW, 2017). Populations of WRP in the south coast management zone are associated with a diverse range of habitats including coastal heath, jarrah/marri woodland and forest, peppermint woodlands, myrtaceous heaths and shrublands, Bullich (*Eucalyptus megacarpa*) dominated riparian zones and karri forest (DPAW, 2017). Habitat critical to the survival of the WRP comprises forests with limited anthropogenic disturbance (unlogged or lightly logged, and a low intensity and low frequency fire history) that are intensively fox baited and have low incidents of fragmentation (DPAW, 2017). The closest WRP record to the application area is 7.8 kilometres to the southwest. It is noted that all WRP records in the local area (i.e. the western portion of the south coast management zone) are significantly closer to the coast than the application area. DBCA (2022) have also advised that due to the habitat present within the application area, it is unlikely to provide significant habitat for the WRP. Overall, while it is possible that WRP may occur within the application area, the impacts of the clearing on WRP are unlikely to be significant. The following conditions placed on the permit will further mitigate impacts to WRP habitat and individuals (should they be present):

- A minimum of one 30 metre diameter patch of healthy representative understorey, on average, per hectare, is required to be retained, preferencing healthy representative understorey, where present containing suitable western ringtail possum habitat;
- A minimum of two habitat trees/potential habitat trees per hectare is required to be retained, as well as all trees with suitable hollows for black cockatoo species and brush-tailed phascogales (which may also provide suitable refuge sites for WRP);
- A minimum of one ground habitat log per hectare is required to be retained, and all woody fuels present within a 1 metre radius of these logs are to be removed;
- Clearing is not permitted within 50 metres of the riparian vegetation of any watercourse or wetland.

## Pygmy trapdoor spiders

The mystical and tingle pygmy trapdoor spiders construct shallow burrows in the tree bark of tingle trees (*Eucalyptus guilfoylei*, *E. jacksonii* and *E. brevistylis*) and the tingle pygmy trapdoor spider also construct burrows in soil on the banks of creek lines and gullies in a small area of the high rainfall, closed-forest ecosystem of the Warren bioregion on the far south coast of WA (Harvey et. al., 2015). The mystical pygmy trapdoor spider is only known from populations in Keystone State Forest and Walpole Nornalup National Park to the west of Walpole inlet. These species may also be found on karri trees, however are more commonly present in a mixed tingle/karri forest type (DBCA, 2022). As such, the likelihood of these species occurring in karri regrowth are considered quite low (DBCA, 2022) and it is considered unlikely that the proposed clearing would significantly impact these species. A condition requiring the applicant to retain vegetation within 50 metres of the riparian vegetation of any watercourse or wetland further reduces the likelihood that the tingle pygmy trapdoor spider would be impacted by the clearing.

## Other fauna

Vegetation within the application area is also considered likely to provide habitat for the woylie, quokka, chuditch, quenda, western false pipistrelle, southwestern brush-tailed phascogale, and peregrine falcon, noting the habitat requirements and distributions of these species:

- **Woylie** inhabit tall eucalypt forest and woodland, dense myrtaceous shrubland and kwongan or mallee heath, including within the Upper Warren region (Yeatman and Groom, 2012). The application area may provide habitat for woylie, however the level of predator control within the application area is unlikely to be sufficient to sustain populations of this species.
- **Quokka** most commonly inhabit jarrah, marri and karri forests or riparian habitats with sedge understorey in the southwest of Western Australia (DEC, 2013).
- **Chuditch** use a range of habitats including forest, mallee shrublands, woodland and desert, with the most dense populations found in riparian jarrah forest. Most chuditch are now found in varying densities throughout the jarrah forest and south coast of Western Australia (DEC, 2012a).
- **Quenda** inhabit dense scrubby, often swampy, vegetation with dense cover and adjacent forest and woodland (DPAW, 2012b).
- **Western false pipistrelle** inhabit high rainfall forests dominated by jarrah, karri, marri, and tuart trees and roost in colonies of up to 30 animals in hollows in old trees, branches and stumps (Australian Museum, 2020a). This species is a specialist of tall, mature forest (Start and McKenzie, 2008).
- **Southwestern brush-tailed phascogale** inhabit dry sclerophyll forests and open woodlands that contain hollow bearing trees but a sparse groundcover. In the south-west, this species is typically found in jarrah forest (DEC, 2012c). While understorey vegetation within application area is not sparse, it is considered possible that the southwestern brush-tailed phascogale may still inhabit the application area.
- **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, 2020b). This species is widespread, highly mobile and is found in various habitats.

Although the application area contains suitable habitat for the above species, the proposed clearing is not likely to result in significant impacts to habitat for these species, noting the following:

- The extent of the proposed clearing relative to the surrounding native vegetation;
- The abundance of native vegetation in the vicinity of the application area within lands managed by DBCA for conservation, which are likely to comprise vegetation in similar or better condition than that present within the application area;
- That the proposed clearing is thinning of trees and associated activities only, and not complete clearing, and a minimum basal area of 16 m<sup>2</sup> per hectare is required to be retained.

The following conditions placed on the permit will further mitigate impacts to fauna species:

- A minimum of one 30 metre diameter patch of healthy representative understorey, on average, per hectare, is required to be retained, preferencing healthy representative understorey. This will ensure habitat diversity is retained within the application area and provide refuge areas for ground dwelling fauna species.
- A minimum of one ground habitat log per hectare is required to be retained and all woody fuels present within a 1 metre radius of these logs are to be removed. These retained ground habitat logs will provide habitat for ground dwelling fauna species.
- A minimum of two habitat trees/potential habitat trees per hectare and all trees with hollows suitable for black cockatoos and south-western brush tailed phascogales are required to be retained. The retention of these hollow bearing trees will also minimise impacts to western false pipistrelle which may also use these trees for roosting.
- Clearing is not permitted within 50 metres of the riparian vegetation of any watercourse or wetland, which comprises optimal habitat for woylie, quokka and quenda.

In addition to the above, multiple species were recorded within the local area that are associated exclusively with waterbodies and adjacent riparian areas (refer to Table C.5). Given that a condition will be placed on the permit requiring that no clearing is permitted within 50 metres of the riparian vegetation of any watercourse or wetland, the proposed clearing is not likely to have a significant impact upon these species.

**Conclusion:** Based on the above assessment, the proposed clearing will result in loss of foraging habitat for forest red-tailed black cockatoo, Baudin's cockatoo and Carnaby's cockatoo, however this habitat loss is not considered significant and is likely to be restored in the future noting the nature of the proposed clearing. While the application area may contain significant breeding and roosting habitat for black cockatoo species, conditions placed on the permit will ensure this breeding habitat and potential roosting habitat is not cleared.

The application area is unlikely to contain significant habitat for pygmy trapdoor spider species, and a condition to retain riparian vegetation further reduces the likelihood that the tingle pygmy trapdoor spider would be impacted by the clearing. The application area may also contain suitable habitat for western ringtail possum, woylie, quokka, chuditch, western false pipistrelle, quenda, southwestern brush-tailed phascogale and peregrine falcon, however, the proposed clearing is unlikely to have significant impacts on the above species subject to conditions being imposed on the permit.

The applicant may have notification responsibilities under the EPBC Act for impacts to Baudin's cockatoo, Carnaby's cockatoo, and forest red-tailed black cockatoo and their habitats, as set out in the EPBC Act Referral guideline for 3 WA threatened black cockatoo species Carnaby's Cockatoo (*Zanda latirostris*), Baudin's Cockatoo (*Zanda baudinii*) and the Forest Red-tailed Black-cockatoo (*Calyptorhynchus banksii naso*) (DAWE, 2022). The applicant has been advised to contact the federal Department of Climate Change, Energy the Environment and Water (DCCEW) to discuss EPBC Act referral requirements.

**Conditions:** To address the above impacts, the following conditions will be added to the permit:

- All habitat trees (i.e. those with a DBH of greater than 50 centimetres, or greater than 70 centimetres for karri) are required to be inspected, and any such trees containing hollows suitable for black cockatoo breeding are required to be retained;
- A minimum of two habitat trees/potential habitat trees per hectare are required to be retained;
- All woody fuels present within a 1 metre radius of each retained habitat tree are required to be removed;
- A minimum of one 30 metre diameter patch of healthy representative understorey, on average, per hectare, is required to be retained, preferencing healthy representative understorey;
- A minimum of one ground habitat log per hectare is required to be retained, and all woody fuels present within a 1 metre radius of these logs are to be removed;
- Clearing is not permitted within 50 metres of the riparian vegetation of any watercourse or wetland.

### 3.2.2. Environmental value: biological values (flora) – Clearing Principle (a)

#### Assessment:

Noting the mapped soil type, vegetation type and habitats present within the application area, the application area is likely to provide suitable habitat for the following conservation significant flora species:

- *Eucalyptus brevistylis* (Rate's tingle) (P4)
- *Gahnia sclerioides* (P4);

and may provide suitable habitat for the following conservation significant flora species:

- *Thomasia quercifolia* (P4).

Occasional occurrences of Rate's tingle are present within the application area (Stephens, 2022). However, noting the nature of the clearing permitted under this permit, Rate's tingle cannot be cleared under this permit unless it is present within the log landing area. It is noted that a log landing is likely to have already been established under clearing permitted under CPS 7542/1, noting that the applicant intended to position the log landing adjacent to Dingo Flat Road (i.e. along the northern boundary of the application area where thinning has already been undertaken). Given the above, the proposed clearing is unlikely to significantly impact Rate's tingle.

*Gahnia sclerioides* occurs in moist shaded situations in loam and sandy soils, often in karri forests (Western Australian Herbarium, 1998-). *Thomasia quercifolia* is generally found in coastal areas associated with limestone and heath vegetation, but has also been recorded in karri forest (Western Australian Herbarium, 1998-). It is noted that the proposed clearing will only entail the removal of understorey as required to undertake thinning activities and one occasion of understorey burning. If populations of these species were to be present within the application area, it would be unlikely that thinning activities would result in the complete removal of these species. Furthermore, it is noted that there are numerous records of both of these species (Western Australian Herbarium, 1998-) and in the vicinity of the application area, the majority of records of these species have been recorded in DBCA managed lands and as such any clearing of these species within the application area would be unlikely to impact the conservation status of these species.

A condition to be placed on the permit requiring the applicant to undertake remedial action in the event that understorey will not recover and develop towards its pre-clearing composition, structure and density will ensure that should the clearing result in impacts to the above species, these impacts are mitigated. Weed control and soil management measures conditioned on the permit will prevent weeds and soil compaction from inhibiting the regeneration of these species following the clearing.

In addition to the above, multiple species were recorded within the local area that are associated with waterbodies and adjacent riparian areas (refer to Table C.3). Given that a condition will be placed on the permit requiring the permit to retain riparian vegetation, preferred by these species, and the applicant will be thinning rather than clearing all vegetation, the proposed clearing is not likely to have a significant impact upon these species.

Outcome: Based on the above assessment, while Rate's tingle is present within the application area, it is unlikely to be significantly impacted by the proposed clearing noting the nature of the clearing proposed. *Gahnia sclerioides* and *Thomasia quercifolia* may also be present within the application area, however if present are unlikely to be significantly impacted by the proposed clearing, and the below conditions placed on the permit will further reduce the risks of any impacts to these species.

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

- Weed control conditions;
- Where there is evidence that understorey will not recover and develop towards its pre-clearing composition, structure and density, remedial measures are required to be undertaken to ensure re-establishment of understorey; and
- Rehabilitation of established *log landings* and *extraction tracks* by scarifying the soil surface is required to reduce compaction and facilitate natural regeneration.

### 3.2.3. Environmental value: land and water resources (land degradation) – Clearing Principle (g)

Assessment: Soil types within the application area have high risks of subsurface acidification and phosphorus export, and moderate risks of subsurface compaction, waterlogging and water erosion. Given that the proposed clearing is thinning and burning, and therefore that a reasonable amount of vegetation will remain within the application area,

that the risk the clearing resulting in appreciable subsurface acidification, phosphorus export, waterlogging or water erosion are low.

Activities associated with karri forest silviculture, such as establishment of extraction tracks and log landings, can result in soil compaction, particularly when undertaken during moist soil conditions (DPAW, 2014). It is therefore considered that the proposed clearing may result in soil compaction. To mitigate soil compaction impacts, as a condition of this permit the applicant will only be permitted to operate logging machinery during dry conditions, and will be required to rehabilitate log landings and extraction tracks by scarifying the soil surface.

Noting the slope of the property and the risks of water erosion, it is considered that some water erosion could occur if significant clearing is to occur under wet conditions. A condition requiring the applicant to only operate logging machinery under dry conditions will prevent water erosion from occurring.

Outcome: Based on the above assessment, the proposed clearing may result in soil compaction and water erosion, however these impacts are expected to be mitigated subject to the below conditions being imposed on the permit.

Conditions: To address the above impacts, the following conditions will be added to the permit:

- Operation of logging machinery used to undertake clearing activities must only be performed during dry conditions; and
- Rehabilitation of established *log landings* and *extraction tracks* by scarifying the soil surface is required to reduce compaction and facilitate natural regeneration.

#### **3.2.4. Relevant planning instruments and other matters**

The Shire of Denmark advised DWER that a development approval had been issued for the thinning approved under CPS 7542/1, however that this approval had expired, and the applicant was required to obtain a new development approval (Shire of Denmark, 2022a). A new development approval was issued on 27 October 2022, subject to the following conditions:

- Only karri to be felled;
- A 50m buffer from the creekline is to be maintained;
- Existing mature she-oak (*Allocasuarina fraseriana*) and yellow tingle (*Eucalyptus guilfoylei*) trees are to be retained;
- All habitat trees to be retained (with a *minimum* at the stipulated 2 habitat trees per hectare);
- Thinning should ensure retention of tree basal area of 15m<sup>2</sup>/ hectare (evenly spaced);
- Clearing is not to occur in the wetter months, due to the soil type and slope of the terrain;
- No further clearing is to occur in the northern stand (already thinned);
- Low intensity patch burning is recommended to be employed post-harvest within the stands to encourage germination of the existing seedbank;
- Harvesting slash to be removed from around the base of retained trees;
- Extraction tracks are to be treated with erosion barriers (particularly on steeper slopes);
- Hygiene management practices are to be employed at all times including machinery and vehicles being clean and free of soil debris on entry and exit to and from the site (Shire of Denmark, 2022b).

Several 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

Summary of comments	Consideration of comment
Applicant provided flora and vegetation survey for understorey vegetation (Stephens, 2022) completed to satisfy a condition of CPS 7542/1)	Considered in Section 3.2.2
Applicant provided location of areas already thinned to Shire of Denmark, which was included in development approval (Shire of Denmark, 2022b)	Considered in Section 1.2

## Appendix B. Details of public submissions

Summary of comments	Consideration of comment
It is not clear how much of the habitat has already been cleared/thinned	Area of previous thinning are described and mapped in Section 1.2
Impacts to black cockatoos:	Impacts of the clearing to black cockatoos have been considered in Section 3.2.1. Note that additional conditions to those required on CPS 7542/1 to manage impacts to black cockatoo breeding habitat have been imposed on this permit
Since CPS 7542/1 was granted, all three species of black cockatoo in WA have continued to decline in number	
A black cockatoo habitat assessment should be done	
Any trees with confirmed breeding hollows, suitable breeding hollows or potential breeding hollows must not be felled and if required to be felled, artificial hollows should be placed	
Permit conditions which require the loss of foraging habitat to be counterbalanced effectively by revegetation are commended, to ensure no net foraging habitat loss	

## Appendix C. Site characteristics

### C.1. Site characteristics

Characteristic	Details
Local context	The area proposed to be cleared is part of an expansive tract of native vegetation in the intensive land use zone of Western Australia. It is surrounded by native vegetation to the west and south and land cleared for agriculture to the north and east.  Spatial data indicates the local area (20-kilometre radius from the centre of the area proposed to be cleared, excluding ocean areas) retains approximately 85 per cent of the original native vegetation cover.
Ecological linkage	An axis line mapped within the South West Regional Ecological Linkages (Molloy et al., 2009), is located approximately 800 m southwest of the application area, within vegetation contiguous with the application area.
Conservation areas	The Walpole-Nornalup National Park is located approximately 420 m south of the application area, and an unnamed Crown Reserve with management vested in the Conservation and Parks Commission of WA is located approximately 520 m north of the application area.
Vegetation description	An understorey vegetation survey required as a condition of 7542/1 (Stephens, 2022) indicates the vegetation within the majority of the application area consists of forest of primarily regrowth <i>Eucalyptus diversicolor</i> (karri), with occasional <i>Corymbia calophylla</i> (marri), <i>Eucalyptus patens</i> (blackbutt) and <i>Eucalyptus brevistylis</i> (Rate's tingle), with middle storey species including <i>Allocasuarina decussata</i> (more common on lower

Characteristic	Details
	<p>slopes), and ground cover dominated by <i>Lepidospermum gladiatum</i> with scattered <i>Acacia alata</i> var <i>alata</i>, <i>Clematis pubescens</i>, <i>Hibbertia cundeiformis</i> and <i>Tremandra stelligera</i>. Vegetation closer to the watercourse along the southern boundary of the application area consisted of a shrubland of <i>Taxandria</i> spp., <i>Calystachys lanceolata</i>, and <i>Lepidosperma</i> spp.. Representative photos are available in Appendix F.</p> <p>This is consistent with the vegetation type mapped within the southern 11 hectares of the application area:</p> <ul style="list-style-type: none"> <li>Southern approximately 11 hectares - Granite Valleys, S1: Tall open forest of <i>Eucalyptus diversicolor-Corymbia calophylla</i> on slopes with some <i>Eucalyptus patens</i> and <i>Eucalyptus megacarpa</i> on valley floors in hyperhumid and perhumid zones;</li> </ul> <p>but less consistent with the other vegetation types mapped within the application area:</p> <ul style="list-style-type: none"> <li>Northern approximately 19 hectares - Keystone, Ky: Open forest of <i>Eucalyptus marginata</i> subsp. <i>marginata-Corymbia calophylla-Banksia grandis</i> on mild slopes of hills in perhumid zone and open forest to tall open forest of <i>Eucalyptus brevistylis</i> on slopes below outcrops in hyperhumid and perhumid zones</li> <li>Eastern 0.1 hectare – Quagering, Q: Mosaic of low open woodland of <i>Eucalyptus marginata</i> subsp. <i>marginata-Banksia ilicifolia-Nuytsia floribunda</i> and low open woodland of <i>Eucalyptus patens-Melaleuca preissiana-Nuytsia floribunda</i> on less undulating flats in hyperhumid and perhumid zones (Mattiske and Havel, 1998).</li> </ul> <p>The mapped vegetation types retain approximately 85, 90 and 93 per cent of their original extents respectively (Government of Western Australia, 2019).</p>
Vegetation condition	<p>An understory vegetation survey required as a condition of 7542/1 (Stephens, 2022) indicates the vegetation within the application area was in Good to Excellent (Keighery, 1994) condition prior to thinning conducted under CPS 7542/1, described as:</p> <ul style="list-style-type: none"> <li>Excellent - Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species;</li> <li>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.</li> <li>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.</li> </ul> <p>The full Keighery (1994) condition rating scale is provided in Appendix E. Representative photos are available in Appendix F.</p>
Climate	<p>Rainfall: 1300</p> <p>Evapotranspiration: 900</p>
Topography	<p>Elevation within the application area ranges from 65 m AHD in the south to 160 m AHD in the north.</p>
Soil description	<p>The soil is mapped as:</p> <ul style="list-style-type: none"> <li>Northern portion – Keystone yellow duplex Phase (254WhKYy), described as Gravelly yellow duplex soils; Jarrah-Marri forest.</li> <li>Southern portion - Minor Valleys S1 Subsystem (Walpole) (254WhS1), described as Valleys in granitic terrain, narrow swampy floor; &lt;20 m relief. Gravelly yellow duplex soils on smooth flanks; Jarrah-Marri-Karri forest. Peaty soils on narrow floor; Wattle low forest.</li> <li>Small eastern portion - Quagering Subsystem (Walpole) (254WhQA), described as Broadly convex sandy crests and valley divides; occasional swamps. Humus and peaty podzols; Kangaroo Grass sedgeland, Teatree heath.</li> </ul>

Characteristic	Details
Land degradation risk	Soils within the application area have a high risk of wind erosion, subsurface acidification and phosphorus export, and a moderate risk of water erosion, waterlogging and subsurface compaction (refer to Table C.6).
Surface water	A minor non-perennial watercourse within the Frankland River catchment (and approximately 1.4 km upstream of the Frankland River) is located within the application area near its southern boundary. A dam is located approximately 35 m east of the application area and upstream of the watercourse. The Frankland River, and associated floodplain areas, is located approximately 780 metres southwest of the application area.
Hydrogeography	Groundwater salinity: 500-1000 mg/L TDS Hydrogeology: Rocks of Low Permeability, Fractured and Weathered Rocks - Local Aquifers (gneiss, migmatite geology)
Flora	There are records of 9 Threatened and 78 Priority flora species within the local area, the closest of which to the application area is Priority 4 species <i>Pleurophascum occidentale</i> located approximately 1.2 km southwest of the application area. Of these, 63 species occur in either the same mapped soil system or same mapped vegetation type as the application area.
Ecological communities	There are records of 3 Priority ecological communities within the local area, the closest of which to the application area is the <i>Reedia spathacea - Empodisma gracillimum - Schoenus multiglumis</i> dominated peat paluslopes and sandy mud floodplains of the Warren Biogeographical Region, located approximately 5.2 km southwest of the application area.
Fauna	There are records of 29 Threatened, 11 Priority, one conservation dependent, nine migratory and two other specially protected fauna species within the local area, the closest of which to the application area is Threatened <i>Westralunio carteri</i> (Carter's freshwater mussel) located approximately 0.3 km west of the application area.

## 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					
Granite Valleys, S**	25,606.64	21,661.73	84.59	19,515.81	76.21
Keystone, Ky**	15,012.58	13,482.12	89.81	12,332.76	82.15
Quagering, Q**	14,981.84	14,003.79	93.47	13,483.92	90.00
Local area					
20km radius	108,353.4697	92,282.69757	85.17	-	-

\*Government of Western Australia (2019a)

\*\*Government of Western Australia (2019b)

## C.3. Flora analysis table

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

Species name	Conservation status	Likely to occur?	Same mapped vegetation type?	Same mapped soil system?	Same mapped soil subsystem?	Distance of closest record to application area (km)	Number of records in local area (total)	Number of known records (total)	Are surveys adequate to identify?
<i>Acacia euthyphylla</i>	P3	N	Y	N	N	6.6	1	28	N
<i>Acacia semitrullata</i>	P4	N	N	Y	N	13.6	1	88	N
<i>Adelphacme minima</i>	P3	N	Y	Y	Y	4.9	16	19	N
<i>Amanita kalamundae</i>	P3	N	Y	Y	N	7.9	2	19	N
<i>Amanita walpolei</i>	P2	N	Y	Y	N	5.8	3	7	N
<i>Andersonia redolens</i>	P2	N	Y	Y	Y	4.5	14	14	N
<i>Andersonia</i> sp. Amabile (N. Gibson & M. Lyons 355)	P3	N	N	Y	N	6.5	6	22	N
<i>Andersonia</i> sp. Mitchell River (B.G. Hammersley 925)	P3	N	N	Y	N	12.3	1	24	N
<i>Andersonia</i> sp. Virolens (G.J. Keighery 12000)	P3	N	Y	Y	N	13.6	2	15	N
<i>Anthocercis sylvicola</i>	P3	Y	Y	Y	Y	4.7	34	32	N
<i>Banksia serra</i>	P4	N	Y	Y	N	6.7	14	99	N
<i>Banksia sessilis</i> var. <i>cordata</i>	P4	N	Y	Y	N	11.4	9	58	N
<i>Banksia verticillata</i>	T	N	Y	Y	N	7.4	9	60	N
<i>Boronia anceps</i>	P3	N	Y	Y	N	17.0	1	17	N
<i>Bossiaea</i> sp. Mt Frankland (L. Graham 2174)	P2	N	Y	Y	N	11.0	3	5	N
<i>Caladenia interjacens</i>	P4	N		Y	N	9.6	8	21	N
<i>Calymperastrum latifolium</i>	P2	N	Y	Y	Y	6.4	2	3	N
<i>Caustis</i> sp. Boyanup (G.S. McCutcheon 1706)	P3	N	Y	Y	N	10.6	1	23	N
<i>Chamaexeros longicaulis</i>	P2	N	Y	Y	N	4.3	33	20	N
<i>Chamelaucium floriferum</i> subsp. <i>diffusum</i>	P2	N	Y	Y	N	13.4	17	38	N
<i>Chamelaucium floriferum</i> subsp. <i>floriferum</i>	P2	N	Y	Y	N	13.6	21	17	N
<i>Chamelaucium forrestii</i>	P2	N	Y		N	16.6	7	31	N
<i>Drakaea micrantha</i>	T	N	Y	Y	N	3.5	8	49	N
<i>Drosera huegelii</i> var. <i>phillmanniana</i>	P2	N		Y	N	13.6	1	6	N
<i>Eucalyptus brevistylis</i>	P4	Y	Y	Y	Y	2.9	53	49	N
<i>Gahnia sclerioides</i>	P4	Y	Y	Y	N	3.2	10	29	N
<i>Kennedia glabrata</i>	T	N	Y	Y	N	17.2	7	36	N
<i>Lambertia rariflora</i> subsp. <i>lutea</i>	P3	N	Y	Y	N	14.2	29	48	N
<i>Myriophyllum trifidum</i>	P4	N	Y	Y	N	13.2	9	38	N
<i>Pleurophascum occidentale</i>	P4	N	Y	Y	N	1.1	28	59	N

Species name	Conservation status	Likely to occur?	Same mapped vegetation type?	Same mapped soil system?	Same mapped soil subsystem?	Distance of closest record to application area (km)	Number of records in local area (total)	Number of known records (total)	Are surveys adequate to identify?
<i>Sphenotoma drummondii</i>	T	N	Y	Y	N	10.4	3	32	N
<i>Styphelia graniticola</i>	P2	N	Y	Y	N	10.4	6	10	N
<i>Thomasia quercifolia</i>	P4	poss.	Y	Y	N	11.6	6	27	N
<i>Xanthosia eichleri</i>	P4	N	Y	Y	N	11.5	7	55	N
<b>Species associated with wetlands/watercourses/riparian areas</b>									
<i>Actinotus repens</i>	P3	Y	N	Y	N	8.0	6	33	N
<i>Alexgeorgea ganopoda</i>	P3	Y	Y	Y	Y	5.7	30	32	N
<i>Andersonia auriculata</i>	P3	Y	Y	Y	N	3.8	121	108	N
<i>Boronia virgata</i>	P4	Y	Y	Y	Y	4.8	38	54	N
<i>Chordifex gracilior</i>	P3	Y	Y	N	N	18.3	1	31	N
<i>Chordifex jacksonii</i>	PP	Y	N	Y	N	7.5	11	31	N
<i>Corybas abditus</i>	P3	Y	N	Y	N	9.8	1	5	N
<i>Cyathochaeta stipoides</i>	P3	Y	Y	Y	N	11.8	3	23	N
<i>Drosera binate</i>	P2	Y	N	Y	N	7.8	7	11	N
<i>Gonocarpus pusillus</i>	P4	Y	Y		N	17.8	4	30	N
<i>Gonocarpus simplex</i>	P4	Y	N	Y	N	5.0	16	26	N
<i>Hypocalymma verticillare</i>	P2	Y	Y	Y	Y	13.5	5	5	N
<i>Juncus meianthus</i>	P3	Y	Y	Y	N	6.7	4	24	N
<i>Lasiopetalum</i> sp. Denmark (B.G. Hammersley 2012)	P3	Y	Y	Y	N	12.3	7	31	N
<i>Leptinella drummondii</i>	P3	Y	Y	Y	N	8.1	1	14	N
<i>Lepyrodia extensa</i>	P2	Y	N	Y	Y	3.9	4	12	N
<i>Leucopogon alternifolius</i>	P3	Y	Y	Y	N	7.3	7	16	N
<i>Lysinema lasianthum</i>	P4	Y	Y	N	N	7.4	4	30	N
<i>Microtis globula</i>	T	Y	Y	N	N	6.1	6	3	N
<i>Microtis pulchella</i>	P4	Y	N	Y	N	5.9	7	19	N
<i>Reedia spathacea</i>	T	Y	Y	Y	N	5.3	16	26	N
<i>Rhacocarpus rehmannianus</i> var. <i>webbianus</i>	T	Y	Y	N	N	18.8	2	6	N
<i>Rorippa cygnorum</i>	P2	Y	Y	Y	N	9.8	10	15	N
<i>Sphagnum novozelandicum</i>	P2	Y	Y	Y	Y	5.9	4	3	N
<i>Stirlingia divaricatissima</i>	P3	Y	Y	N	N	18.6	1	20	N
<i>Stylidium leeuwinense</i>	P4	Y	Y	Y	N	8.2	29	60	N
<i>Stylidium lepidum</i>	P3	Y	Y	N	N	17.7	1	43	N
<i>Tripterococcus</i> sp. <i>Brachylobus</i> (A.S. George 14234)	P4	Y	Y	N	N	18.5	1	27	N
<i>Warnstorfia fluitans</i>	P2	Y	Y	N	N	18.8	1	3	N

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority



#### C.4. Ecological communities analysis table

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

Community name	Conservation status	Likely to occur?	Distance of closest record to application area (km)	Number of records in local area (total)	Are surveys adequate to identify?
<i>Reedia spathacea</i> - <i>Empodisma gracillimum</i> - <i>Schoenus multiglumis</i> dominated peat paluslopes and sandy mud floodplains of the Warren Biogeographical Region.	P1	N	5.1	10	N
Southwest Coastal Grassland	P1	N	17.2	1	N
Subtropical and Temperate Coastal Saltmarsh	P3	N	7.9	7	N

#### C.5. Fauna analysis table

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

Species name	Conservation status	Suitable habitat features?	Most recent record in local area	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify?
<i>Bertmainius mysticus</i> (Mystical pygmy trapdoor spider)	P2	Y	2014	5.8	34	N/A
<i>Bertmainius tingle</i> (Tingle pygmy trapdoor spider)	EN	Y	2005	3.1	38	N/A
<i>Bettongia penicillata ogilbyi</i> (Woylie, brush-tailed bettong)	CR	Y	2016	5.3	5	N/A
<i>Calyptorhynchus banksii naso</i> (forest red-tailed black cockatoo)	VU	Y	2017	7.9	20	N/A
<i>Zanda baudinii</i> (Baudin's cockatoo)	EN	Y	2018	1.3	194*	N/A
<i>Zanda latirostris</i> (Carnaby's cockatoo)	EN	Y	2017	5.6	31*	N/A
<i>Cynotelopus notabilis</i> (Western Australian Pill Millipede)	EN	N	2006	5.6	56	N/A
<i>Dasyurus geoffroyi</i> (chuditch, western quoll)	VU	Y	2015	10.6	5	N/A
<i>Elapognathus minor</i> (Short-nosed snake)	P2	N	2012	12.3	3	N/A
<i>Falco peregrinus</i> (Peregrine falcon)	OS	Y	2014	4.9	5	N/A
<i>Falsistrellus mackenziei</i> (Western false pipistrelle, western falsistrelle)	P4	Y	1981	7.0	6	N/A
<i>Isodon fusciventer</i> (Quenda, southwestern brown bandicoot)	P4	Y	2012	4.3	42	N/A
<i>Leipoa ocellata</i> (malleefowl)	VU	N	1972	18.7	1	N/A
<i>Notamacropus eugenii derbianus</i> (tammar wallaby)	P4	N	2015	10.1	2	N/A
<i>Pezoporus flaviventris</i> (western ground parrot)	CR	N	2012	8.4	10	N/A
<i>Phascogale tapoatafa wambenger</i> (South-western brush-tailed phascogale, wambenger)	CD	Y	2017	4.1	43	N/A
<i>Pseudocheirus occidentalis</i> (western ringtail possum, ngwayir)	CR	N	1999	7.8	8	N/A
<i>Psophodes nigrogularis</i> (western whipbird (western heath))	EN	N	1912	14.6	3	N/A
<i>Setonix brachyurus</i> (Quokka)	VU	Y	2017	2.8	72	N/A
<i>Zephyrarchaea mainae</i> (Main's assassin spider)	VU	N	2010	9.1	4	N/A
<b>Species exclusively associated with wetlands/watercourses/riparian areas</b>						
<i>Engaewa walpolea</i> (Walpole burrowing crayfish)	EN	Y	2007	6.4	61	N/A

Species name	Conservation status	Suitable habitat features?	Most recent record in local area	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify?
<i>Galaxiella munda</i> (Mud minnow, western dwarf galaxias)	VU	Y	2014	5.6	18	N/A
<i>Galaxiella nigrostriata</i> (black-stripe minnow, black-striped dwarf galaxias)	EN	Y	1996	10.6	8	N/A
<i>Geocrinia lutea</i> (Nornalup frog)	P4	Y	2014	1.7	17	N/A
<i>Geotria australis</i> (Pouched lamprey)	P3	Y	2014	5.6	8	N/A
<i>Hydromys chrysogaster</i> (water-rat, rakali)	P4	Y	2019	0.8	28	N/A
<i>Lepidogalaxias salamandroides</i> (Salamanderfish)	EN	Y	1975	13.2	2	N/A
<i>Nannatherina balstoni</i> (Balston's pygmy perch)	VU	Y	2014	12.0	4	N/A
<i>Oxyura australis</i> (Blue-billed duck)	P4	Y	2005	1.6	2	N/A
<i>Spicospina flammocaerulea</i> (Sunset frog)	VU	Y	2017	3.9	228	N/A
<i>Westralunio carteri</i> (Carter's freshwater mussel)	VU	Y	2011	0.3	7	N/A

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

\* An additional 170 records of *Calyptorhynchus* sp. 'white-tailed black cockatoo' (white-tailed black cockatoo) have been recorded within the local area, which may comprise either of these species

## C.6. Land degradation risk tables

Risk categories	Keystone yellow duplex Phase (254WhKYy),
Wind erosion	H1: 50-70% of the map unit has a high to extreme hazard
Water erosion	M1: 10-30% of the map unit has a very high to extreme hazard
Salinity	L1: <3% of the map unit has a moderate or high hazard or is presently saline
Subsurface Acidification	H2: >70% of the map unit has a high susceptibility
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 very high to risk
Phosphorus export risk	H1: 50-70% of the map unit has a high to extreme hazard
Subsurface compaction	M2: 30-50% of the map unit has a high subsurface compaction risk

Risk categories	Minor Valleys S1 Subsystem (Walpole) (254WhS1)
Wind erosion	H2: <70% of the map unit has a high to extreme hazard
Water erosion	M1: 10-30% of the map unit has a very high to extreme hazard
Salinity	L1: <3% of the map unit has a moderate or high hazard or is presently saline
Subsurface Acidification	H2: >70% of the map unit has a high susceptibility
Flood risk	L2: 3-10% of the map unit has a moderate to high hazard
Water logging	M1: 10-30% of the map unit has a moderate to very high to risk
Phosphorus export risk	H1: 50-70% of the map unit has a high to extreme hazard
Subsurface compaction	M1: 10-30% of the map unit has a high subsurface compaction risk

Risk categories	Quagering Subsystem (Walpole) (254WhQA),
Wind erosion	H1: 50-70% of the map unit has a high to extreme hazard
Water erosion	M1: 10-30% of the map unit has a very high to extreme hazard
Salinity	L1: <3% of the map unit has a moderate or high hazard or is presently saline
Subsurface Acidification	H2: >70% of the map unit has a high susceptibility
Flood risk	L1: <3% of the map unit has a moderate to high hazard
Water logging	M2: 30-50% of the map unit has a moderate to very high to risk
Phosphorus export risk	H1: 50-70% of the map unit has a high to extreme hazard
Subsurface compaction	M1: 10-30% of the map unit has a high subsurface compaction risk

## Appendix D. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
<b>Environmental value: biological values</b>		
<p><u>Principle (a):</u> <i>“Native vegetation should not be cleared if it comprises a high level of biodiversity.”</i></p> <p><u>Assessment:</u> The area proposed to be cleared may contain significant breeding and roosting habitat for black cockatoo species, and contains priority listed flora species.</p>	<p>At variance</p> <p>(changed from CPS 7542/1)</p>	<p>Yes</p> <p><i>Refer to Section 3.2.1 and Section 3.2.2 above.</i></p>
<p><u>Principle (b):</u> <i>“Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna.”</i></p> <p><u>Assessment:</u> The area proposed to be cleared may contain breeding and roosting habitat significant for black cockatoo species.</p>	<p>At variance</p> <p>(changed from CPS 7542/1)</p>	<p>Yes</p> <p><i>Refer to Section 3.2.1 above.</i></p>
<p><u>Principle (c):</u> <i>“Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</i></p> <p><u>Assessment:</u> The area proposed to be cleared is unlikely to contain flora species listed under the BC Act.</p>	<p>Not likely to be at variance</p> <p>(as per CPS 7542/1)</p>	<p>Yes</p> <p><i>Refer to Section 3.2.2 above.</i></p>
<p><u>Principle (d):</u> <i>“Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community.”</i></p> <p><u>Assessment:</u> The area proposed to be cleared does not contain species indicative of a threatened ecological community.</p>	<p>Not likely to be at variance</p> <p>(as per CPS 7542/1)</p>	<p>No</p>
<b>Environmental value: significant remnant vegetation and conservation areas</b>		
<p><u>Principle (e):</u> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u> The 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. The vegetation proposed to be cleared is not considered to be an integral part of a significant ecological linkage in the local area.</p>	<p>Not likely to be at variance</p> <p>(as per CPS 7542/1)</p>	<p>No</p>
<p><u>Principle (h):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.”</i></p> <p><u>Assessment:</u></p> <p>Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of nearby conservation areas.</p>	<p>Not likely to be at variance</p> <p>(as per CPS 7542/1)</p>	<p>No</p>
<b>Environmental value: land and water resources</b>		
<p><u>Principle (f):</u> <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment:</u> A minor non-perennial watercourse within the Frankland River catchment is located within the application area near its southern boundary and is associated with riparian vegetation.</p>	<p>At variance</p> <p>(as per CPS 7542/1)</p>	<p>Yes</p> <p><i>Refer to Section 3.2.3 above</i></p>

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Principle (g):</u> “Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</p> <p><u>Assessment:</u> The mapped soils have a high risk of wind erosion, subsurface acidification and phosphorus export, and a moderate risk of water erosion and subsurface compaction. Given that the proposed clearing is thinning and burning, and therefore that a reasonable amount of vegetation will remain within the application area, that the risk the clearing resulting in appreciable subsurface acidification, phosphorus export are low. Activities associated with proposed clearing may result in soil compaction and water erosion, however these impacts are expected to be largely mitigated through conditions placed on the permit.</p>	<p>May be at variance</p> <p>(as per CPS 7542/1)</p>	<p>Yes</p> <p>Refer to Section 3.2.3 above</p>
<p><u>Principle (i):</u> “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.”</p> <p><u>Assessment:</u> Given a condition to retain vegetation within 50 metres of the riparian vegetation associated with the watercourse, and that the proposed clearing is thinning and not complete removal of vegetation, the proposed clearing is unlikely to impact surface or ground water quality.</p>	<p>Not likely to be at variance</p> <p>(as per CPS 7542/1)</p>	<p>No</p>
<p><u>Principle (j):</u> “Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</p> <p><u>Assessment:</u> The mapped soils and topographic contours in the surrounding area do not indicate the proposed clearing is likely to contribute to increased incidence or intensity of flooding. Noting retain riparian vegetation will be retained as condition on the permit, the clearing is unlikely to contribute to waterlogging.</p>	<p>Not likely to be at variance</p> <p>(as per CPS 7542/1)</p>	<p>No</p>

## 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 scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from Keighery (1994).

### 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. Eastern Edge of Lot 1253 showing the thick shrub edge vegetation. Photograph taken prior to thinning (Stephens, 2022)



Figure F.2. Northern edge vegetation showing the dense shrubs that grow where there is more light. Photograph taken prior to thinning (Stephens, 2022)



Figure F.3. Vegetation under dense overstorey cover, dominated by *Lepidosperma galdiatum*. Photograph taken prior to thinning (Stephens, 2022)



Figure F.4. Vegetation lower down the hill towards the watercourse with *Allocasuarina decussata*. Photograph taken prior to thinning (Stephens, 2022)



Figure F.5. Area thinned under CPS 7542/1 (Shire of Denmark, 2022b)

## Appendix H. Sources of information

### H.1. GIS databases

Publicly available GIS Databases used (sourced from [www.data.wa.gov.au](http://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
- Wheatbelt Wetlands Stage 1 (DBCA-021)

Restricted GIS Databases used:

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