



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 9333/1
Permit Holder:	Shire of Manjimup
Duration of Permit:	From 15 April 2022 to 15 April 2027

The permit holder is authorised to clear *native vegetation* subject to the following conditions of this permit.

PART I – CLEARING AUTHORISED

1. Clearing authorised (purpose)

The permit holder is authorised to clear *native vegetation* for the purpose of road widening and intersection upgrades.

2. Land on which clearing is to be done

Old Vasse Road reserve, PIN 11243111, Yeagarup.
Old Vasse Road reserve, PIN 11243115, Yeagarup.
Hawke Road reserve, PIN 11243113, Yeagarup.
Wheatley Coast Road reserve, PIN 11537856, Quinninup.
Perup Road reserve, PIN 11590019, Perup.

3. Clearing authorised

The permit holder must not clear more than 1.32 hectares of *native vegetation* within the areas cross-hatched yellow in Figure 1, Figure 2, and Figure 3 of Schedule 1.

PART II – MANAGEMENT CONDITIONS

4. 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:

- avoid the clearing of *native vegetation*;
- minimise the amount of *native vegetation* to be cleared; and
- reduce the impact of clearing on any environmental value.

5. 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.

6. Directional clearing

The permit holder must conduct clearing activities in a slow, progressive manner from the cleared road verge toward adjacent vegetation to allow fauna to move into adjacent native vegetation ahead of the clearing activity.

7. Fauna management – black cockatoo habitat trees

The permit holder shall not clear the one *black cockatoo habitat tree* identified red on Figure 1 of Schedule 2.

PART III - RECORD KEEPING AND REPORTING

8. 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	<ol style="list-style-type: none">(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 Geocentric Datum Australia 1994 (GDA94), 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) the direction that clearing was undertaken;(f) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 4; and(g) actions taken to minimise the risk of the

No.	Relevant matter	Specifications
		introduction and spread of <i>weeds</i> and <i>dieback</i> in accordance with condition 5; and (h) actions taken to avoid the one <i>black cockatoo habitat tree</i> in accordance with condition 7.

9. Reporting

The permit holder must provide to the *CEO* the records required under condition 8 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
black cockatoo habitat tree(s)	means trees that have a diameter, measured at 150 centimetres from the base of the tree, of 50 centimetres or greater (or 30 centimetres or greater for <i>Eucalyptus salmonophloia</i> or <i>Eucalyptus wandoo</i>) that contain hollows suitable for breeding by black cockatoo species.
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the <i>Environmental Protection Act 1986</i> .
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 <i>Phytophthora</i> species on native vegetation.
department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
EP Act	<i>Environmental Protection Act 1986</i> (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 <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.

END OF CONDITIONS

A handwritten signature in black ink, consisting of a stylized 'M' followed by a long horizontal stroke and a large loop at the end. The signature is written above a solid horizontal line.

Mathew Gannaway
MANAGER
NATIVE VEGETATION REGULATION

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

22 March 2022

Schedule 1

The boundary of the area authorised to be cleared is shown in the maps below (Figure 1, Figure 2 and Figure 3).

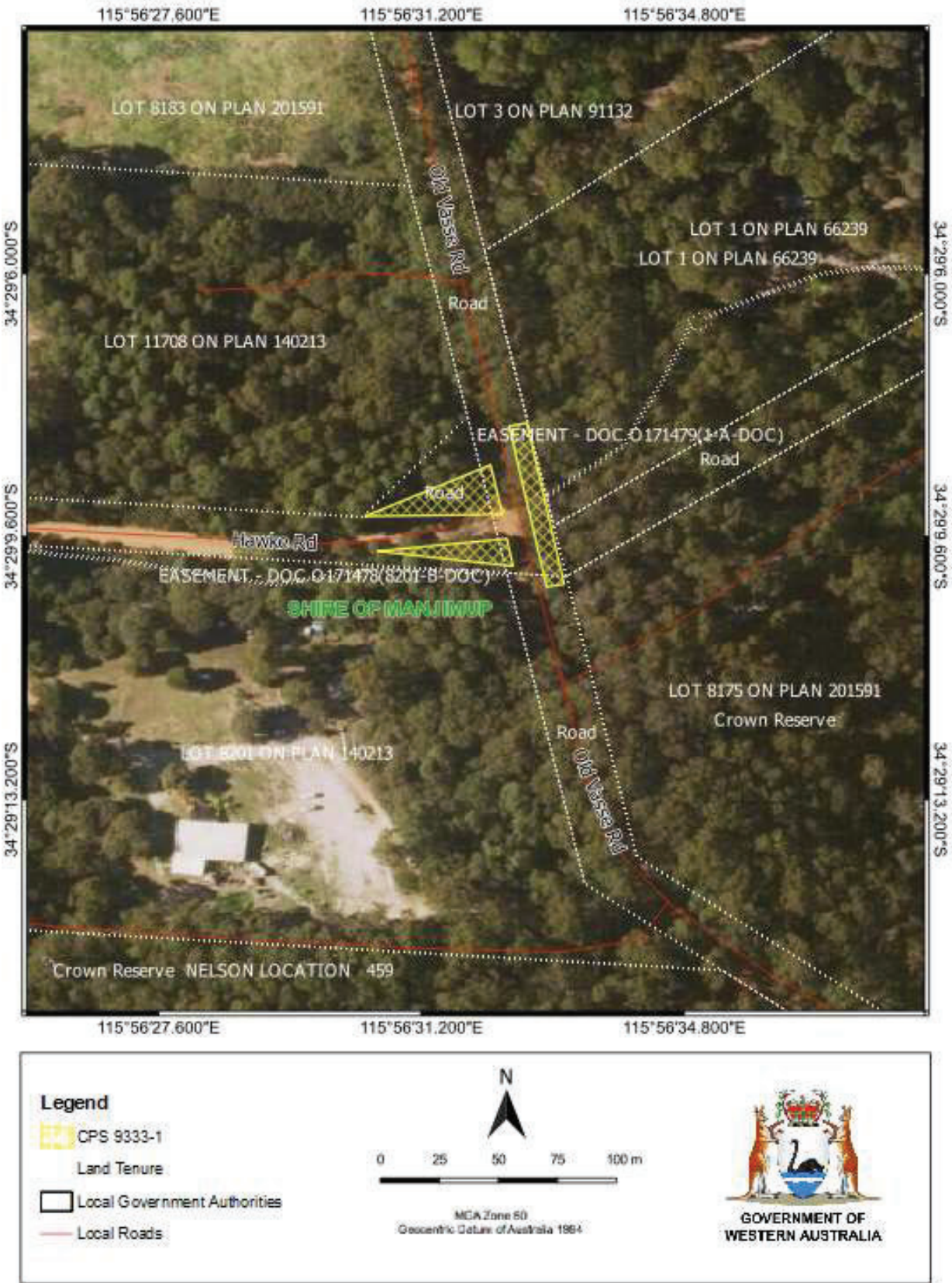


Figure 1: Map of the boundary of the area within which clearing may occur (Map A)

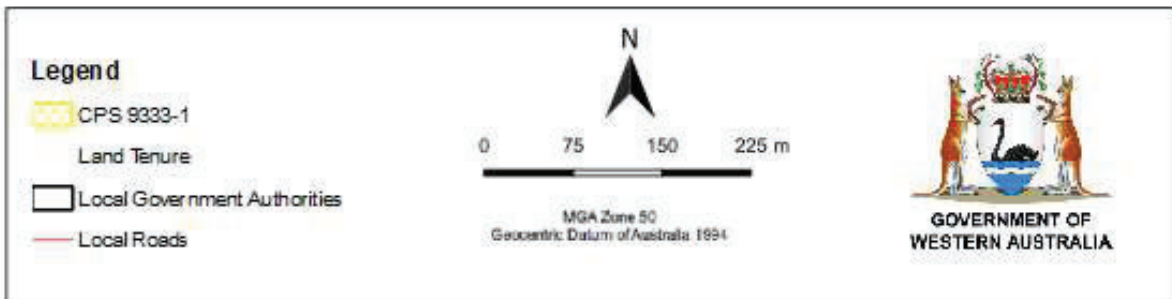


Figure 2: Map of the boundary of the area within which clearing may occur (Map B)

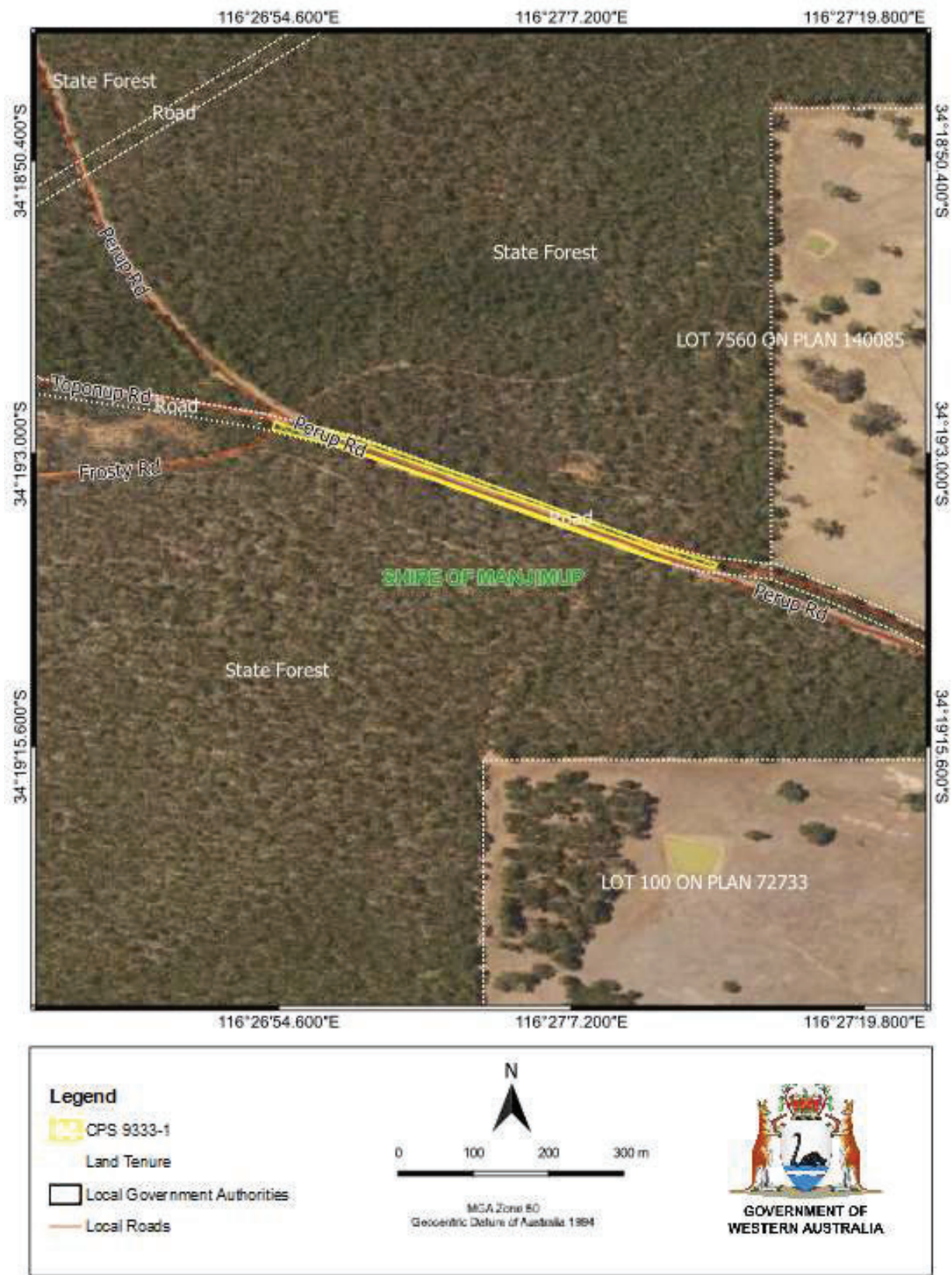


Figure 3: Map of the boundary of the area within which clearing may occur (Map C)

Schedule 2

Black cockatoo habitat trees to be retained are shown in the map below (Figure 1)

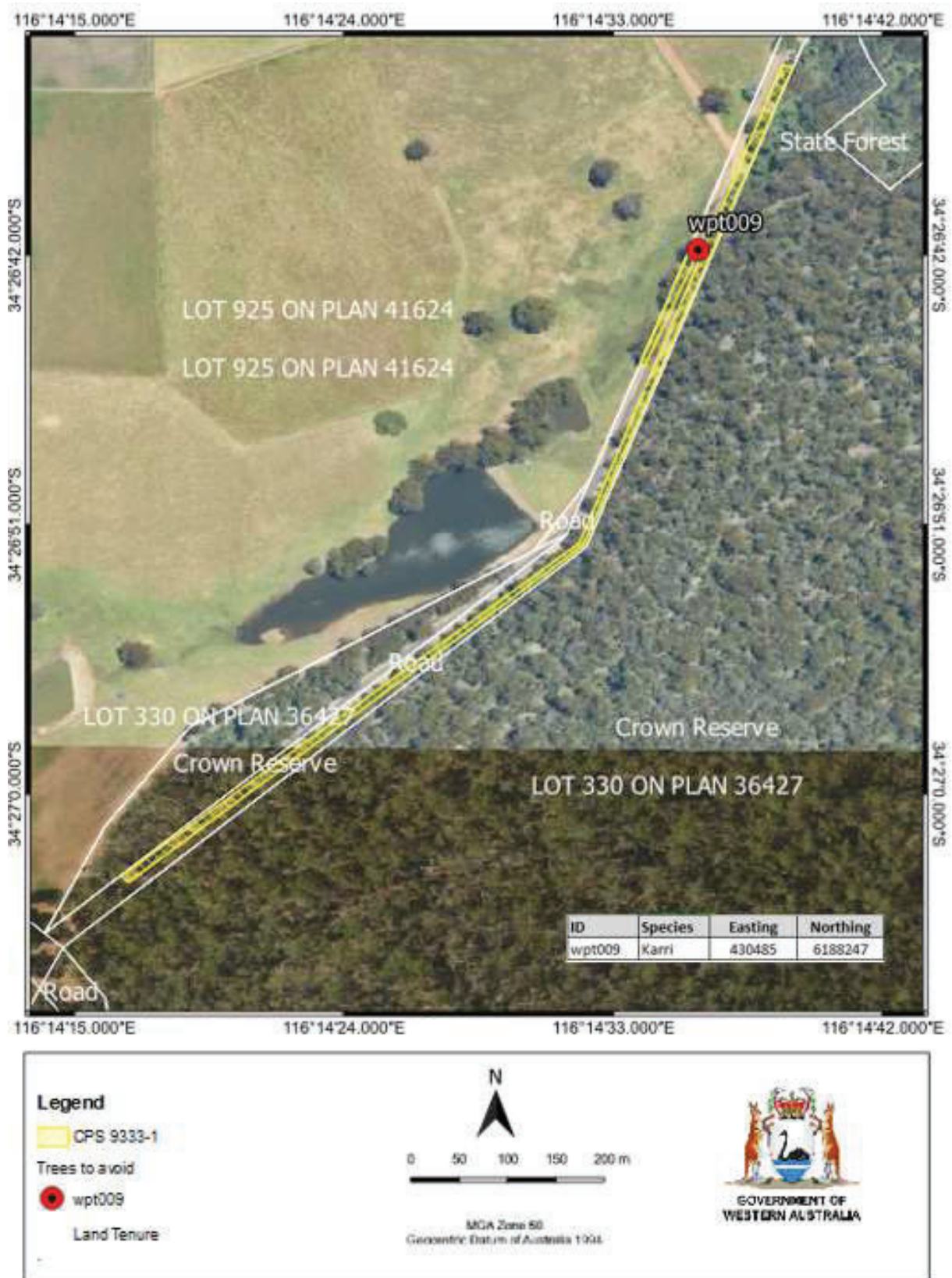


Figure 1: Black cockatoo habitat tree (wpt009) to be retained



Clearing Permit Decision Report

1. Application details and outcome

1.1. Permit application details

Permit number:	CPS 9333/1
Permit type:	Purpose permit
Applicant name:	Shire of Manjimup
Application received:	21 June 2021
Application area:	1.32 hectares (revised) of native vegetation
Purpose of clearing:	Road construction and upgrades
Method of clearing:	Mechanical clearing.
Property:	Old Vasse Road reserve: PIN 11243111, Yeagarup PIN 11243115, Yeagarup Hawke Road reserve: PIN 11243113, Yeagarup Wheatley Coast Road reserve: PIN 11537856, Quinninup Perup Road reserve: PIN 11590019, Perup
LGA area:	Shire of Manjimup
Localities:	Perup, Quinninup, and Yeagarup

1.2. Description of clearing activities

Clearing of up to 1.32 hectares of native vegetation is required to upgrade local roads within three discrete areas within the Shire of Manjimup. Up to 0.12 hectares of clearing is required to upgrade the intersection of Old Vasse Road and Hawke Road, Yeagarup, 0.77 hectares is required to widen and upgrade Wheatley Coast Road, Quinninup, and 0.44 hectares is required to widen and upgrade Perup Road, Perup.

1.3. Decision on application and key considerations

Decision:	Granted
Decision date:	22 March 2022
Decision area:	1.32 hectares of native vegetation as depicted in Section 1.5 (Figure 1, Figure 2, Figure 3).

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 and one submission was received (Appendix B).

In making this decision, the Delegated Officer had regard for the site characteristics (Appendix C), relevant datasets (Appendix G2), representative photographs of the application area (Appendix F), a fauna habitat tree assessment (Appendix A), the clearing principles set out in Schedule 5 of the EP Act (Appendix D), relevant planning instruments and any other matters considered relevant to the assessment (Section 3). The Delegated Officer also took into consideration the purpose of the clearing to improve public safety by upgrading public roads in the Shire of Manjimup.

The assessment identified that potential impacts to fauna habitat and adjacent lands managed for conservation purposes can be mitigated by avoiding and minimising the extent of clearing, avoiding hollow-bearing trees providing potential breeding habitat to Threatened black cockatoo species, implementing slow and directional clearing to allow fauna to move into adjacent vegetation ahead of the clearing activity, and taking hygiene steps to

minimise the risk of the introduction and spread of weeds and dieback into adjacent vegetation, including vegetation managed for conservation purposes.

After consideration of the available information, as well as the applicant's avoidance, minimisation, and mitigation measures (Section 3.1), the Delegated Officer determined the proposed clearing can be managed to be unlikely to lead to an unacceptable risk to environmental values. The Delegated Officer decided to grant a clearing permit subject to conditions to:

- avoid and minimise to reduce the impacts and extent of clearing;
- avoid a potential hollow-bearing tree (wpt009) to avoid impacts to potential black cockatoo breeding habitat;
- implement slow and directional clearing from the cleared road verge into adjacent vegetation to allow fauna to move into adjacent vegetation ahead of the clearing activity; and
- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback.

1.5. Site maps

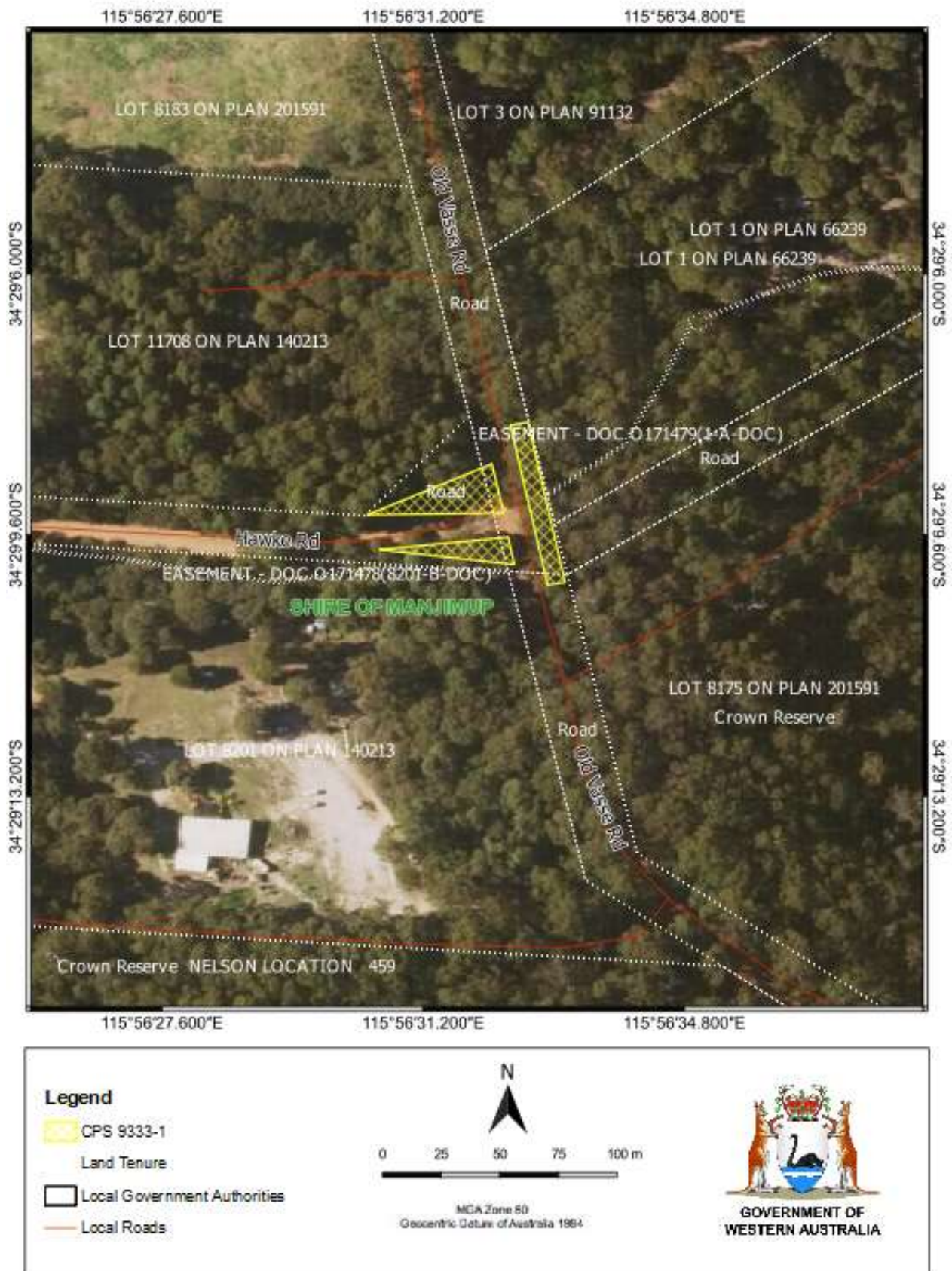


Figure 1. Map of the application area (Old Vasse Road intersection). The areas in yellow indicate the areas authorised to be cleared under the granted clearing permit.

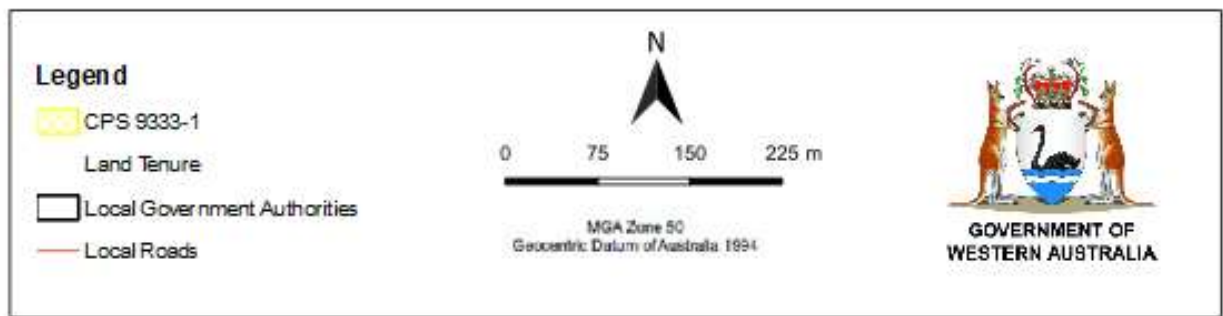
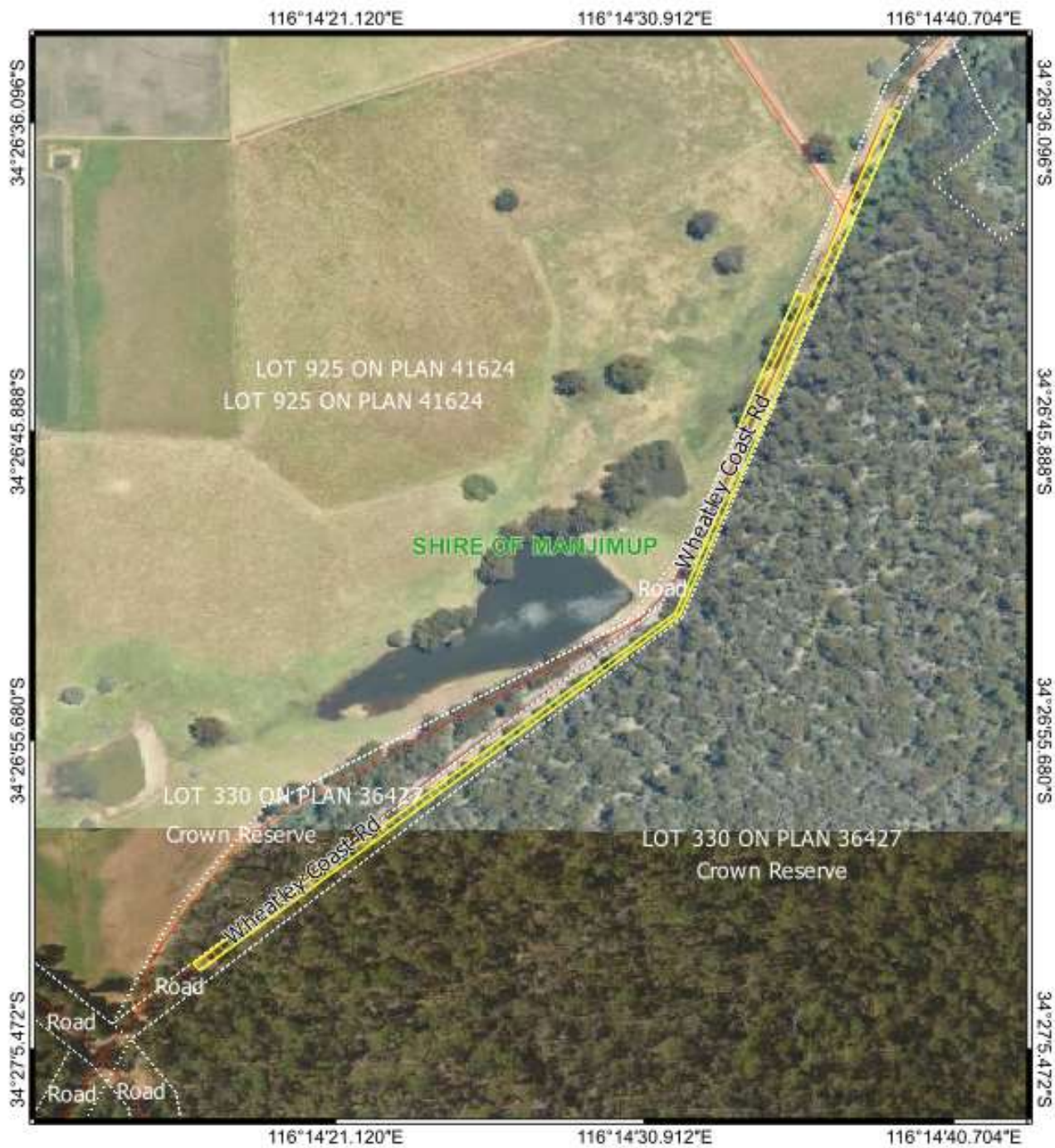


Figure 2. Map of the application area (Wheatley Coast Road). The areas in yellow indicate the areas authorised to be cleared under the granted clearing permit.

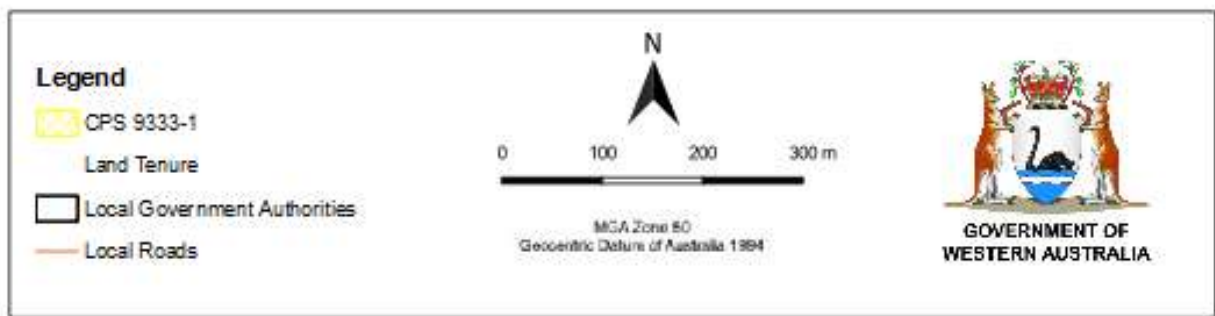


Figure 3. Map of the application area (Perup Road). The areas in yellow indicate the areas authorised to be cleared under the granted clearing permit.

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

- the precautionary principle
- the principle of the conservation of biological diversity and ecological integrity

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Biosecurity and Agriculture Management Act 2007* (BAM Act)
- *Country Areas Water Supply Act 1947* (CAWS 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* (December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)
- Technical guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016)

3. Detailed assessment of application

3.1. Avoidance and mitigation measures

The Shire of Manjimup (the Shire) has provided avoidance and minimisation strategies to minimise environmental impact of the proposed road works.

The clearing proposed is required for road safety improvements. All the relevant roads are part of the Restricted Access Vehicles (RAV) network, including Hawke Road (Shire of Manjimup 2022) and do not currently meet requirements for heavy vehicles (Shire of Manjimup 2022). The sections of Wheatley Coast Road and Perup Road require upgrading including widening. The Old Vasse Road and Hawke Road intersection in its current form does not allow heavy vehicles turning onto Hawke Road to be lane correct (MRWA 2019; MRWA nd) which creates a major safety issue (Shire of Manjimup 2022).

Habitat tree assessments have been undertaken over the three discrete clearing areas (Harewood 2021; Harewood 2022). The alignment of the road has been designed to minimise tree clearing and the Shire has committed to removing only the minimum required. One tree that potentially provides hollows for fauna species of conservation significance was identified by Harewood (2021; 2022), within the Wheatley Coast Road application area. The Shire of Manjimup (2022) have advised that this tree (wpt009) can be avoided. Only one other tree was identified by Harewood (2021 and 2022) as providing possible small hollows (unlikely to be used by any fauna of conservation significance) located over the Perup Road application area (wpt002). This tree was assessed by the Shire, and the base of the tree was noted as having evidence of white ants, and potentially dangerous for road users, and can therefore not be avoided.

After a review of habitat trees, extent of native vegetation, and tenure, the Shire of Manjimup (2022) reduced the application area from 1.86 hectares to 1.32 hectares by removing areas not required for clearing within the Perup Road component of the application area. This included two identified habitat trees and areas devoid of native vegetation, including the road surface.

3.2. Assessment of impacts on environmental values

The assessment against the clearing principles (Appendix D) identified that the impacts of the proposed clearing may present a potential risk to fauna of conservation significance and lands managed for conservation purposes. The consideration of impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

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

Assessment: Excluding aquatic species, 24 vertebrate fauna species of conservation significance have been recorded from within ten kilometres of the application area including 11 birds, 11 mammals, one reptile and one amphibian (Appendix C: Table C2.3). Of these, four birds and seven mammals have been assessed with at least the potential to occur within the application area based upon habitat requirements, habitat condition, and distance

and dates of available records (Appendix C: Table C2.4). The species most likely to occur in the application area are the three vagile species of Threatened black cockatoo that could utilise the tree canopy present.

The application consists of three discrete areas within the Shire of Manjimup all of which are adjacent to, or within close proximity to extensive areas of native vegetation, much of which is managed for conservation purposes by the DBCA (Figure 4 and Appendix H: Figure B). The Tone Perup Nature Reserve is located within 2.5 kilometres to the east of the Perup Road application area (Appendix H: Figure F). The Tone Perup Nature Reserve (and the contiguous Kingston National Park) is the site of a long-established baiting program for the control of foxes under the DBCA *Western Shield* program which has culminated in substantially increased numbers of Threatened 'critical weight range' mammals (Burbidge and McKenzie 1989). The Tone Perup Nature Reserve also has remnant and linkage value as it adjoins areas of State Forest, including those adjacent to the Perup Road application area, where Threatened mammals susceptible to fox predation such as the Numbat (*Myrmecobius fasciatus*), Chuditch (*Dasyurus geoffroii*), and Woylie (*Bettongia penicillata ogilbyi*) and the conservation-dependant Brush-tailed Phascogale (SW) (*Phascogale tapoatafa wambenger*), now occur (Appendix H: Figure E and Figure F). The Tone Perup Nature Reserve is also valuable for re-introductions or translocations of fauna (DEC 2012). Parts of the application area represent the general habitat requirements for these species, as well as the Western Brush Wallaby (*Notamacropus irma*), and Quenda (*Isoodon fusciventer*). That is, sclerophyll forests and woodlands.

The Threatened Numbat, Chuditch, and Woylie, are wide-ranging with large home ranges (van Dyke 2008) requiring large areas of habitat. Over 68 per cent of the original native vegetation extent has been retained in the local area (67,175 hectares) with over 75 per cent of this extent retained in DBCA managed lands (Appendix C: Table C3.3; Figure 4). The relatively small areas of clearing required (1.32 hectares) along existing sealed roads are unlikely to impact fauna habitat required for these species, or the four other conservation significant species identified.

The Numbat and Chuditch shelter in dens or hollow logs at ground level, and the Woylie constructs a dome-shaped nest in a shallow scrape under dense vegetation at ground level (van Dyke 2008). The Numbat, Chuditch, Woylie and Brush-tailed Phascogale are more likely to be encountered in the Perup Road application area in proximity to Tone Perup Nature Reserve where feral predator control is being undertaken (Appendix C: Table C2.4). The Perup Road application area consisting of relatively open areas along the edge of an existing road is unlikely to provide the denning or sheltering requirements for these species and the likelihood of these species denning or sheltering within the road verge at the time of clearing is considered low.

The Threatened Western Ringtail Possum (*Pseudocheirus occidentalis*) has been recorded within the local areas of all three application areas. The Perup Road application area was assessed by Harewood (2021) and consists of predominantly Jarrah trees over a low understorey and does not provide hollows or a continuous canopy required for the specie's survival outside of areas where feral predator control is being undertaken. One tree was assessed (wpt002) as providing possible small hollows, but were unlikely to be used by any fauna of conservation significance (Appendix G). No hollows suitable for any fauna species of conservation significance including both the Western Ringtail Possum and the Brush-tailed Phascogale (SW) were identified in this area (Harewood 2021) (Appendix G).

The eastern side of the Wheatley Coast Road application area supports a dense mid-storey but no hollows suitable for any fauna species of conservation significance including the Western Ringtail Possum and the Brush-tailed Phascogale (SW) were recorded by Harewood (2021) (Appendix G). The western side of the Wheatley Coast Road application area consists of a completely degraded area with isolated trees only. Considering the results of Harewood (2021), the age of records, distance to records, and small scale of clearing required along an existing road adjacent to extensive areas of contiguous habitat, the likelihood of Western Ringtail Possum and Brush-tailed Phascogale (SW) individuals present at the time of clearing is considered low.

The Old Vasse Road application area supports a dense mid-storey that has the potential to support the Western Ringtail Possum. However, no trees were identified by Harewood (2022) that contain hollows of any size and, because of this, and other factors, Harewood (2022) concluded that the Old Vasse Road application area is unlikely to represent suitable refuge or breeding habitat for any conservation-significant fauna species likely to frequent the area including black cockatoos, phascogales or the Western Ringtail Possum (Harewood 2022) (Appendix G). Due to the age of records, distance to records, and small scale of clearing required along an existing road adjacent to extensive areas of contiguous habitat, the likelihood of individual phascogales or Western Ringtail Possums being present at the time of clearing is considered low.

The Priority 4 Quenda (*Isoodon fusciventer*) requires a dense understorey for cover (van Dyck and Strahan 2008) and the eastern side of the Wheatley Coast Road application area and the Old Vasse Road application area provide habitat. The Priority 4 Western Brush Wallaby (*Notamacropus Irma*) has been recorded, but is a grazer and optimum habitat is open forest or woodland, particularly open seasonally wet flats with low grasses (DBCA 2020). Grazing on the open areas of the road verges is possible however the narrow strips proposed for clearing are unlikely to remove core habitat, nor inhibit the species capacity to disperse across the landscape.

Of the vertebrate fauna species of conservation significance identified, the species most likely to occur over the application area are the three vagile species of black cockatoo known from the area that could utilise the tree canopy present. The application area is within the modelled distribution of the Endangered Carnaby's Cockatoo (*Calyptorhynchus latirostris*), Endangered Baudin's Cockatoo (*Calyptorhynchus baudinii*), and the Vulnerable Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*).

Black cockatoo habitat can be considered in terms of breeding habitat, night-roosting habitat, and foraging habitat (Commonwealth of Australia 2017). Food resources within the range of breeding sites and roost sites are important to sustain populations, and foraging resources are therefore viewed in the context of known breeding and night roosting sites particularly within six kilometres of an impact area (DSEWPaC 2012), and up to 12 kilometres (Commonwealth of Australia 2017). Night-roosts are usually located in the tallest trees of an area, and in close proximity to both a food supply and surface water (DAWE 2021; Le Roux 2017). Black cockatoos show some fidelity to night-roosts, however, not all night-roosts are used in every year (DPaW 2013; Le Roux 2017).

One Carnaby's Cockatoo breeding site has been recorded within 12 kilometres of the Wheatley Coast Road application area, and two black cockatoo roosts have been recorded within 12 kilometres of the Perup Road application area (Appendix A: Table C2.5; Appendix H: Figure I). The Carnaby's Cockatoo breeding site was confirmed in 2019, and one of the recorded roost sites has recorded both the Forest Red-tailed Black Cockatoo and 'white-tailed black cockatoos' (that is, either Carnaby's Cockatoo or Baudin's Cockatoo or both) in the last regional survey of 2019. No roosts have been recorded within 12 kilometres of the Wheatley Coast Road or Old Vasse Road application areas, and no breeding sites have been recorded within 12 kilometres of the Perup Road or Old Vasse Road application areas (Appendix H: Figure I).

The quality of black cockatoo foraging habitat to support populations at breeding sites or night roosting sites varies depending upon how black cockatoos utilise the habitat in that particular location. The application areas consist predominantly of Karri (*Eucalyptus diversicolor*) (Old Vasse Road and Wheatley Coast Road application areas) and Jarrah (*Eucalyptus marginata*) (Perup road application area), with some Marri (*Corymbia calophylla*). Of these three species, Marri and Jarrah are considered a high quality foraging resource with Karri less preferred and considered low to moderate quality (Bamford 2013, Commonwealth of Australia 2017, DSEWPaC 2012, Groom 2011, Johnstone *et al.* 2011).

Approximately 97,500 hectares of native vegetation has been retained in the local area, or over 68 per cent of that original extent, with over 77 per cent of this area within lands managed by the DBCA (Appendix C: Tables C3.2 and C3.3, Appendix H: Figures A and B, Section 3.2.2: Figure 4). The vast majority of remnant vegetation in the Perup Road application area, located in the Jarrah Forest bioregion, has been mapped as black cockatoo foraging habitat (Appendix H: Figures J). Black cockatoo foraging habitat has not been mapped in the Warren Bioregion (incorporating the Old Vasse Road and Wheatley Coast Road application areas) however in consideration of the vegetation complexes occurring in the local areas the majority of this vegetation too would be considered potential black cockatoo foraging habitat.

In terms of foraging habitat, due to the size and location of the clearing proposed within the landscape context it is unlikely that the application areas would provide a significant foraging resource to support black cockatoo populations utilising the two roost sites and one breeding site identified within 12 kilometres of the application areas (Appendix H: Figure I and Figure J).

Harewood (2021; 2022) undertook assessments of the trees within the application areas in respect to their potential to provide breeding hollows for black cockatoos. Larger (habitat) trees were identified and inspected over each of the application areas. Eight habitat trees were identified over the Old Vasse Road application area (Appendix H: Figure K), five over the Wheatley Coast Road application area (Appendix H: Figure L), and four over the Perup Road application area (Appendix H: Figure M).

No trees with any hollows suitable for black cockatoos (or any other conservation significant fauna species likely to frequent the area) were recorded over the Old Vasse Road application area or the Perup Road application area (Harewood 2021; 2022) (Appendix G). One Karri tree within the Wheatley Coast Road application area, on the western side of the road in a completely degraded area, was recorded with hollows (wpt009) (Appendix G), with at least one appearing to be of a size suitable for black cockatoos. No evidence of the hollow having been used for breeding, or by any other fauna of significance, was evident (Harewood 2021) (Appendix G). The Shire have committed to retaining this tree (Section 3.1).

The application areas are unlikely to provide significant habitat for fauna species of conservation significance. However, there is the potential for individuals of particular fauna species of conservation significance, including the Quenda and Brush Wallaby, to be present within the application area at the time of clearing, and the proposed clearing may introduce or spread weeds or dieback disease into adjacent fauna habitat.

Conclusion: For the reasons set out above, and the avoidance and mitigation measures provided by the Shire (Section 3.1), it is considered that potential impacts of the proposed clearing on fauna species of conservation

significance can be managed by avoiding the potential hollow-bearing tree (wpt009), implementing slow directional clearing to allow fauna to move into adjacent vegetation, and taking hygiene steps to minimise the risk of the introduction and spread of weeds and dieback.

Conditions: To address potential impacts to fauna of conservation significance and associated habitats from proposed road upgrades the following management measure will be required as a condition on the clearing permit.

- avoid and minimise to reduce the impacts and extent of clearing;
- avoid the potential hollow-bearing tree (wpt009);
- implement slow and directional clearing from the cleared road verge into adjacent vegetation to allow fauna to move into adjacent vegetation ahead of the clearing activity; and
- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback.

3.2.2. Environmental value: conservation areas – Clearing Principle (h)

Assessment: Significant areas of lands vested in the Western Australian Conservation and Parks Commission and managed by the DBCA for conservation purposes occur within the local area (Figure 4), including in proximity to the application areas (Appendix H: Figure N to Figure P). Areas of National Parks are in proximity of the Old Vasse Road and Wheatley Coast Road application areas and areas of State Forest are in proximity of the Perup Road application area (Figure 4).

The Warren National Park is located within two metres to the south-east of the Old Vasse Road application area (Appendix H: Figure N), with extensive areas occurring to the south and east (Figure 4).

The Dordagup National Park is located within two metres to the south-east of the Wheatley Coast Road application area, with a smaller disjunct area on the opposite side of the road to the north-west (Appendix H: Figure O). Sir James Mitchell National Park is located approximately 130 metres to the south-west (Appendix H: Figure O). Extensive areas of the Dordagup National Park occur to the south-east of the application area (Figure 4).

The Tone State Forest (F38) is located within two metres on the southern side of the Perup Road application area (Appendix H: Figure P) and extensive areas occur to the south. The Palgarup State Forest is within two metres to the north of the Perup Road application area and the Tone Perup Nature Reserve is within 2.5 kilometres to the east (Figure 4).

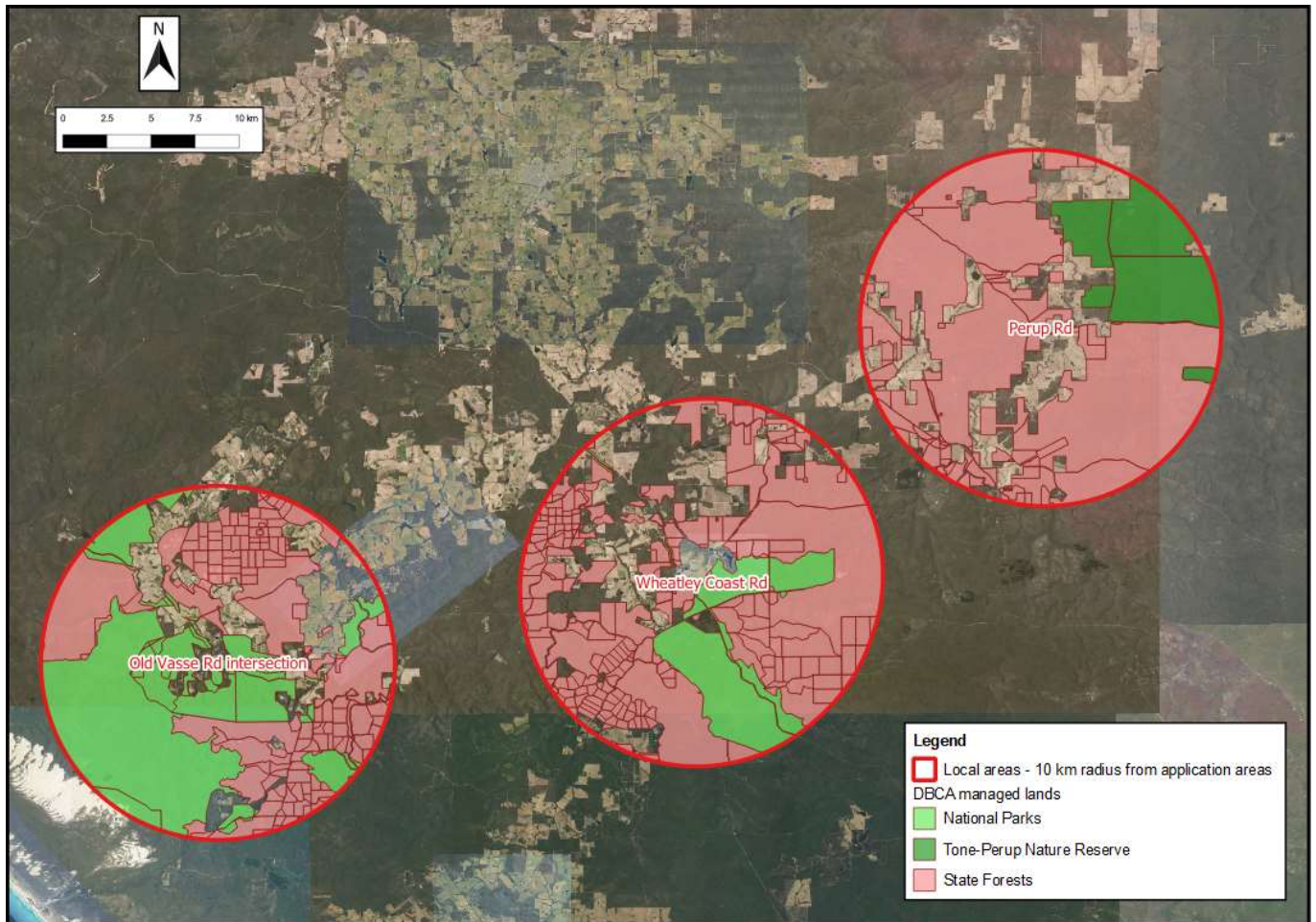


Figure 4: DBCA managed lands within the local area

Proposed clearing has the potential to impact adjacent areas managed for conservation purposes. In particular proposed clearing may introduce or spread weeds or dieback disease currently not present in the application areas into adjacent areas of native vegetation vested in the Western Australian Conservation and Parks Commission and managed by the DBCA for conservation purposes. If drainage is not appropriately controlled offsite water erosion may also impact adjacent areas. Standard and staged road construction methodologies will be employed, including strategies for erosion control. Cleared areas will be replaced with a hard road surface and any potential impacts to surrounding areas managed for conservation purposes can be managed through appropriate design.

Conclusion: For the reasons set out above, and the avoidance and mitigation measures provided by the Shire (Section 3.1), it is considered that potential impacts of the proposed clearing on adjacent lands managed for conservation purposes can be managed by taking hygiene steps to minimise the risk of the introduction and spread of weeds and dieback.

Conditions: To address potential impacts to adjacent lands managed for conservation purposes from the proposed road upgrades, the following management measure will be required as a condition on the clearing permit.

- avoid and minimise to reduce the impacts and extent of clearing; and
- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback.

3.3. Relevant planning instruments and other matters

Clearing Permit application CPS 9347/1 was advertised on the DWER website for a 14 day public comment period on 1 July 2021. One public submission was received in relation to this application (Appendix B).

The public submission asserted that Old Vasse Road is a major tourist route, part of the Karri Forest Explorer, and gateway to the Warren National Park and the Bicentennial Tree lookout, and that its visual integrity and beauty are important and should be taken into consideration. The clearing application CPS 9347/1 was assessed in accordance with section 51O of the EP Act with regard to the ten clearing principles relevant to the matter under consideration (Appendix D; Section 3.2). Historical attributes, tourism and visual amenity are not considered under the ten clearing principles and are considered by Local Government Authorities under Local Planning Schemes.

The Old Vasse Road reserve, Hawke Road reserve, Wheatley Coast Road reserve, and Perup Road reserve are all zoned 'Local Roads' under the Shire of Manjimup Local Planning Scheme No. 4. The Shire of Manjimup is the public authority that manages these road reserves, and the proposed clearing purpose is consistent with the Shire of Manjimup Local Planning Scheme No. 4 in these areas.

The Perup Road application area is confined to the Perup Road reserve. Other sections of Perup Road, unrelated to the application area, deviate from the reserve into the adjacent Tone State Forest (F38) and Palgarup and Topanup State Forest (F37), vested in the Western Australian Conservation and Parks Commission and managed by the DBCA. DBCA is aware of the inconsistency of tenure and have given in principle agreement to the Shire for the proposed clearing in particular areas (Shire of Manjimup 2022).

All three application areas are located within the Warren River and Tributaries Surface Water Area (UFI 23), proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act). One mapped watercourse intersects the Wheatley Coast Road application area; a minor, nonperennial, drainage that enters the road reserve from cleared farmland to the west. Drainage is currently controlled and managed as part of the existing sealed road. The applicant has advised that proposed clearing does not include any modification or realignment to the watercourse, that overall only small culverts will be replaced (Shire of Manjimup 2022), and that no permitting under the RIWI Act is required (Shire of Manjimup 2022).

Proposed clearing is located within the Warren River Water Reserve, a clearing control catchment gazetted under the *Country Areas Water Supply Act 1947* (CAWS Act) (Appendix C: Table C1.5). Advice was obtained from the DWER Water Source Protection team in regard to obligations under the CAWS Act (DWER 2020). The catchment has been subject to CAWS Act native vegetation clearing controls since December 1978 to prevent salinisation of water resources. DWER records show no CAWS Act compensation history for the subject lands. The proposed clearing is located within Zone A (Perup Road), Zone C (Wheatley Coast Road) and Zone D (Old Vasse Road) of the clearing control catchment. Zones A and C are very high and medium salinity risk zones respectively (with Zone D a low salinity risk area). DWER Policy and Guidelines for the "Granting of Licences to Clear Indigenous Vegetation" provide for the grant of a licence to clear for any purpose subject to the statutory requirement that 10 per cent of the land in question remains uncleared unless there are exceptional reasons for not refusing an application (Section 12C(3) of the CAWS Act). DWER Water Source Protection team has no objection or conditions relating to the application area located within Zone D of the catchment (Old Vasse Road).

For Zones A and C the guidelines allow for clearing for government and essential works subject to an equivalent sized native vegetation offset being established (that is, 1.20 hectares) in the same, or higher salinity, risk zone. Given the nature of the Shire's works program, it has been recognised that in order for a more sustainable offset to be established, offset areas may be accumulated (DWER 2020). The Shire has agreed to continue with the current system of accumulating offsets under the CAWS Act (Shire of Manjimup 2022), and whilst there is no due date for a current offset obligation to be established, the Shire has been made aware of the obligation so that it does not reach a size that may become difficult to manage (Shire of Manjimup 2022).

The Old Vasse Road application area is located within the boundaries of the Native Title Registered Claim: South West Boojarah #2 (WC2006/004), and the associated South West Boojarah #2 Indigenous Land Use Agreement (ILUA) (WI2017/013). The Wheatley Coast Road and Perup Road application areas are located within the boundaries of the Native Title Registered Claim: WAGYL KAIP (WC1998/070) and the associated WAGYL KAIP and Southern Noongar Indigenous Land Use Agreement (ILUA) (WI2017/014). All three applications are located within the boundaries of the Native Title Federal Court application: Single Noongar Claim (Area1) (WAD6006/2003)

Spatial data indicates that four Aboriginal heritage places listed in accordance with section 5 of the *Aboriginal Heritage Act 1972* (WA) occur within the local area of the Perup Road application area: Muirs Highway Ethnographic Site 2 (Place ID 17126), Muirs Highway Ethnographic Site 3 (Place ID 317127), Muirs Highway Site 4 (Place ID 17122), and Boonwiup Pool (Place ID 29676). None intersect the application area, with the closest (Place ID 17126) located approximately 550 metres to the east. Two Aboriginal Heritage sites occur within the local area of the Old Vasse Road application area: Pemberton Burial (Place ID 4519) and the Lefroy Fish Traps (Place ID 4570). None intersect the application area, with the closest (Place ID 17126) located approximately eight kilometres to the north-east. No Aboriginal Heritage sites occur within the local area of the Wheatley Coast Road application area. It is the permit holder's responsibility to comply with the *Aboriginal Heritage Act 1972* (WA) and to ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

Appendix A – Information provided by applicant

Information	Description	Reference
CPS 9333/1 Application	Native vegetation clearing permit application provided by the Shire of Manjimup for application CPS 9333/1	Shire of Manjimup (2021a)
CPS 9333/1 Supporting Information: – Photographs	Photographs of the three areas to be cleared: the intersection of Old Vasse Road and Hawke Road, Wheatley Coast Road, and Perup Road.	Shire of Manjimup (2021b)
Details of avoidance and mitigation strategies proposed	Information provided was used to clarify the mitigation strategies presented in Section 3.1 of the Decision Report.	Shire of Manjimup (2022)
CPS 9333/1 Supporting Information: – Habitat tree assessments	Habitat tree assessment out over the Wheatley Coast Road and Perup Road application areas.	Harewood (2021)
CPS 9333/1 Supporting Information: – Habitat tree assessment	Habitat tree assessment out over the Old Vasse Road and Hawke Road intersection application area.	Harewood (2022)

Appendix B – Details of public submissions

Summary of comments	Consideration of comment
One submission was received focussing on the intersection of Old Vasse Road intersection with Hawke Road application area.	
Please reject this application (Old Vasse Road and Hawke Road application area)	The CPS 9333/1 clearing permit application has been accepted and assessed in accordance with sections 51E and 51O of the EP Act.
The Old Vasse Road's forest and flora has been submitted for Road Conservation protection and listing.	The forest, flora and trees of the application area have been assessed in accordance with section 51O of the EP Act under clearing principles (a), (c), (d), and (h) (Appendix D)
The community has had many meetings in the past 20 years to discuss a variety of road related issues and it was always a 'no removal of roadside trees' decision.	
The Old Vasse Road is an historic road that dates back to the 1840s.	The clearing application was assessed in accordance with section 51O of the EP Act with regard to the ten clearing principles relevant to the matter under consideration (Appendix D; Section 3.2). Historical attributes, tourism and visual amenity are considered in planning and other matters (Section 3.3).
Old Vasse Road is a major tourist route, part of the Karri Forest Explorer, and gateway to the Warren National Park and the Bicentennial Tree lookout. Its visual integrity and beauty are a very important.	
The Shire has stated that the intersection modification was to facilitate road train access. Road trains will never fit down Hawke Road and are not part of the tourism enclave. There have been no accidents at this intersection. If there are safety issues speed restrictions should be enforced.	The Shire have advised that clearing proposed is required for road safety improvements, and that Hawke Road is part of the Restricted Access Vehicles (RAV) network and does not currently meet requirements for heavy vehicles. The Old Vasse Road and Hawke Road intersection in its current form does not allow heavy vehicles turning onto Hawke Road to be lane correct creating a major safety issue (Section 3.1) (Shire of Manjimup 2022).

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. This information was used to inform the assessment of the clearing against the Clearing Principles, contained in Appendix D. The 'local area' is considered a ten kilometre radius of the application areas.

C.1 Site characteristics

Site characteristic	Details																								
Local context	The Old Vasse Road and Wheatley Coast Road application areas are located within the Warren IBRA Bioregion (WAR) of Thackway and Cresswell (1995). The Perup Road application area is located within the Jarrah Forest IBRA Bioregion (JAF). The application areas are located south of the town of Manjimup within the Shire of Manjimup.																								
Vegetation description	<p>Mattiske and Havel (1998) as updated by Webb <i>et al.</i> (2016) produced regional vegetation mapping of complexes over the Southwest Forest Region (SWF). Four of these complexes have been mapped over the three application areas:</p> <table border="1"> <thead> <tr> <th colspan="4">Table C1.1: Mapped vegetation complexes over the application areas</th> </tr> <tr> <th>Label</th> <th>Extent</th> <th>SWF ID</th> <th>Descriptor</th> </tr> </thead> <tbody> <tr> <td>Old Vasse Road</td> <td>All</td> <td>1</td> <td>Open forest of <i>Eucalyptus marginata</i> subsp. <i>marginata</i>-<i>Banksia ilicifolia</i>-<i>Nuytsia floribunda</i> with some <i>Eucalyptus diversicolor</i> on gently sloping sandy terrain in hyperhumid and perhumid zones.</td> </tr> <tr> <td>Wheatley Coast Road</td> <td>Major</td> <td>167</td> <td>Tall open forest of <i>Eucalyptus diversicolor</i>-<i>Corymbia calophylla</i> on slopes and low woodland of <i>Agonis juniperina</i>-<i>Callistachys lanceolata</i> on lower slopes in hyperhumid and perhumid zones.</td> </tr> <tr> <td>Wheatley Coast Road</td> <td>Minor</td> <td>68</td> <td>Tall open forest of <i>Corymbia calophylla</i>-<i>Eucalyptus diversicolor</i> on upper slopes with <i>Allocasuarina decussata</i>-<i>Banksia grandis</i> on upper slopes in hyperhumid and perhumid zones.</td> </tr> <tr> <td>Perup Road</td> <td>All</td> <td>302</td> <td>Open forest of <i>Corymbia calophylla</i> with some <i>Eucalyptus marginata</i> subsp. <i>marginata</i> on slopes and tall shrubland of <i>Melaleuca</i> spp. on valley floors in the humid zone.</td> </tr> </tbody> </table>	Table C1.1: Mapped vegetation complexes over the application areas				Label	Extent	SWF ID	Descriptor	Old Vasse Road	All	1	Open forest of <i>Eucalyptus marginata</i> subsp. <i>marginata</i> - <i>Banksia ilicifolia</i> - <i>Nuytsia floribunda</i> with some <i>Eucalyptus diversicolor</i> on gently sloping sandy terrain in hyperhumid and perhumid zones.	Wheatley Coast Road	Major	167	Tall open forest of <i>Eucalyptus diversicolor</i> - <i>Corymbia calophylla</i> on slopes and low woodland of <i>Agonis juniperina</i> - <i>Callistachys lanceolata</i> on lower slopes in hyperhumid and perhumid zones.	Wheatley Coast Road	Minor	68	Tall open forest of <i>Corymbia calophylla</i> - <i>Eucalyptus diversicolor</i> on upper slopes with <i>Allocasuarina decussata</i> - <i>Banksia grandis</i> on upper slopes in hyperhumid and perhumid zones.	Perup Road	All	302	Open forest of <i>Corymbia calophylla</i> with some <i>Eucalyptus marginata</i> subsp. <i>marginata</i> on slopes and tall shrubland of <i>Melaleuca</i> spp. on valley floors in the humid zone.
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Vegetation condition	<p>From an interpretation of the photographs and reports provided:</p> <p><u>Old Vasse Road</u> The native vegetation within the application area incorporates the edges of Old Vasse Road and Hawke Road Coast Road intersection within the two road reserves. From an interpretation of the photographs and reports provided the vegetation ranges from good to very good condition.</p> <p><u>Wheatley Coast Road</u> The native vegetation within the application area incorporates the edges of Wheatley Coast Road within the Wheatley Coast Road reserve. Much of the application area incorporates open (unvegetated) areas immediately adjacent to the existing road. From an interpretation of the photographs and reports provided the western side of the road is in completely degraded condition with no native understorey. The eastern side of the road includes vegetation ranging from degraded to good condition. Due to edge effects</p>																								

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	<p>pioneering species are present.</p> <p><u>Perup Road</u> The native vegetation within the application area incorporates the edges of Perup Road within the Perup Road reserve. From an interpretation of the photographs and reports provided much of the application area incorporates open (unvegetated) areas immediately adjacent to the existing road. A recent fire has impacted the area. Native vegetation condition appears degraded to very good condition. Due to edge effects pioneering species are present.</p> <p>The full Keighery (1994) condition rating scale is provided in Appendix E.</p>																		
Soil description	<table border="1"> <thead> <tr> <th colspan="2" data-bbox="379 651 1409 689">Table C1.2: Mapped soil types over the application areas</th> </tr> </thead> <tbody> <tr> <td data-bbox="379 689 560 853" rowspan="3">Old Vasse Road</td> <td data-bbox="560 689 1409 728">Angove Subsystem (Pimelia)</td> </tr> <tr> <td data-bbox="560 728 1409 766">254PvAN</td> </tr> <tr> <td data-bbox="560 766 1409 853">Gently sloping sandy terrain; slight dissections. Humus podzols on broad crests; Sandy yellow duplex soils in shallow dissections.</td> </tr> <tr> <td data-bbox="379 891 560 1070" rowspan="3">Wheatley Coast Road (1)</td> <td data-bbox="560 891 1409 929">Lefroy Subsystem (Dwalganup)</td> </tr> <tr> <td data-bbox="560 929 1409 967">254DwLF</td> </tr> <tr> <td data-bbox="560 967 1409 1070">Valleys 40 to 60 m deep. Slopes smooth, 10 to 20 deg. Narrow terrace. Red gradational soils, not calcareous with some red and brown duplex profiles.</td> </tr> <tr> <td data-bbox="379 1070 560 1227" rowspan="3">Wheatley Coast Road (2)</td> <td data-bbox="560 1070 1409 1108">Crowea (Dwalganup), brown duplex Phase</td> </tr> <tr> <td data-bbox="560 1108 1409 1146">254DwCRb</td> </tr> <tr> <td data-bbox="560 1146 1409 1227">Brown gravelly duplex soils and red earths; karri-marri forest.</td> </tr> <tr> <td data-bbox="379 1265 560 1473" rowspan="3">Perup Road</td> <td data-bbox="560 1265 1409 1303">Wilgarup Valleys Subsystem</td> </tr> <tr> <td data-bbox="560 1303 1409 1341">254WvWL</td> </tr> <tr> <td data-bbox="560 1341 1409 1473">Valleys (40-100 m deep) with sooth and irregular slopes of variable steepness and a narrow terrace on the valley floor; granite with some dolerite dykes; Red and yellow duplexes; Marri tall woodlands and open forests.</td> </tr> </tbody> </table>	Table C1.2: Mapped soil types over the application areas		Old Vasse Road	Angove Subsystem (Pimelia)	254PvAN	Gently sloping sandy terrain; slight dissections. Humus podzols on broad crests; Sandy yellow duplex soils in shallow dissections.	Wheatley Coast Road (1)	Lefroy Subsystem (Dwalganup)	254DwLF	Valleys 40 to 60 m deep. Slopes smooth, 10 to 20 deg. Narrow terrace. Red gradational soils, not calcareous with some red and brown duplex profiles.	Wheatley Coast Road (2)	Crowea (Dwalganup), brown duplex Phase	254DwCRb	Brown gravelly duplex soils and red earths; karri-marri forest.	Perup Road	Wilgarup Valleys Subsystem	254WvWL	Valleys (40-100 m deep) with sooth and irregular slopes of variable steepness and a narrow terrace on the valley floor; granite with some dolerite dykes; Red and yellow duplexes; Marri tall woodlands and open forests.
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Waterbodies	<p data-bbox="379 920 1417 1010">No wetlands or natural watercourses intersect the Old Vasse Road or Perup Road application areas. One minor, nonperennial watercourse intersects the Wheatley Coast Road application area.</p> <p data-bbox="379 1025 1441 1149">The Perup River is a major river located approximately 540 metres to the east of the Perup Road application area, with a tributary located approximately 120 metres to the north and running parallel with the application area. A minor, nonperennial watercourse is located approximately 212 metres east of Old Vasse Road application area.</p> <table border="1" data-bbox="379 1167 1345 1727"> <thead> <tr> <th colspan="3" data-bbox="379 1167 1345 1223">Table C1.4: Mapped water features in the vicinity of the application areas</th> </tr> <tr> <th data-bbox="379 1223 683 1267">Type of inland water</th> <th data-bbox="683 1223 1098 1267">Description</th> <th data-bbox="1098 1223 1345 1267">Proximity (~m)</th> </tr> </thead> <tbody> <tr> <td colspan="3" data-bbox="379 1267 1345 1312">Old Vasse Road</td> </tr> <tr> <td data-bbox="379 1312 683 1357">Watercourse</td> <td data-bbox="683 1312 1098 1357">Minor, nonperennial</td> <td data-bbox="1098 1312 1345 1357">212m east</td> </tr> <tr> <td data-bbox="379 1357 683 1402">Wetland</td> <td data-bbox="683 1357 1098 1402">Palusplain</td> <td data-bbox="1098 1357 1345 1402">233m east</td> </tr> <tr> <td colspan="3" data-bbox="379 1402 1345 1447">Wheatley Coast Rd</td> </tr> <tr> <td data-bbox="379 1447 683 1491">Watercourse</td> <td data-bbox="683 1447 1098 1491">Minor, nonperennial</td> <td data-bbox="1098 1447 1345 1491">Intersects</td> </tr> <tr> <td data-bbox="379 1491 683 1536">Earth dam</td> <td data-bbox="683 1491 1098 1536">Perennial</td> <td data-bbox="1098 1491 1345 1536">Within 35m</td> </tr> <tr> <td data-bbox="379 1536 683 1581">Earth dam</td> <td data-bbox="683 1536 1098 1581">Perennial</td> <td data-bbox="1098 1536 1345 1581">Within 35m</td> </tr> <tr> <td data-bbox="379 1581 683 1626">Significant Stream</td> <td data-bbox="683 1581 1098 1626">Quinninup Brook</td> <td data-bbox="1098 1581 1345 1626">75m north-east</td> </tr> <tr> <td colspan="3" data-bbox="379 1626 1345 1671">Perup Road</td> </tr> <tr> <td data-bbox="379 1671 683 1715">Minor river</td> <td data-bbox="683 1671 1098 1715">Nonperennial tributary (Perup River)</td> <td data-bbox="1098 1671 1345 1715">120m north</td> </tr> <tr> <td data-bbox="379 1715 683 1738">Minor river</td> <td data-bbox="683 1715 1098 1738">Minor, nonperennial</td> <td data-bbox="1098 1715 1345 1738">160m south-east</td> </tr> </tbody> </table>	Table C1.4: Mapped water features in the vicinity of the application areas			Type of inland water	Description	Proximity (~m)	Old Vasse Road			Watercourse	Minor, nonperennial	212m east	Wetland	Palusplain	233m east	Wheatley Coast Rd			Watercourse	Minor, nonperennial	Intersects	Earth dam	Perennial	Within 35m	Earth dam	Perennial	Within 35m	Significant Stream	Quinninup Brook	75m north-east	Perup Road			Minor river	Nonperennial tributary (Perup River)	120m north	Minor river	Minor, nonperennial	160m south-east										
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Site characteristic	Details
Climate and Landform	<p>The south west of Western Australia experiences a Mediterranean climate of hot dry summers and cool wet winters, and the proposed clearing area is situated within the 'Temperate – distinctly dry and warm summer' Köppen climate class (Commonwealth of Australia 2005). An average of 987 millimetres of rainfall is recorded annually from the Manjimup weather station.</p> <p>The site occurs on the Swan Coastal Plain, which is the geomorphic unit that characterises much of the Perth metropolitan area. The site is not known to contain any restricted landforms or unique geological features.</p> <p>The Warren Denmark Southland Hydrozone is characterised by a topography that rises in a series of broad benches from the Southern Ocean north to the Blackwood Valley catchment divide. Drainage near catchment divides can be sluggish because of the flat landscape. Deeply weathered granite and gneiss overlain by Tertiary and Quaternary sediments in the south. When groundwater rises occur, localised hillside seeps and salinity become evident. The dominant soils are Loamy gravel, Duplex sandy gravel, Wet and Semi-wet soil, shallow and Deep sandy gravel and Grey deep sandy duplexes.</p>

C.2 Ecosystem, flora and fauna analysis

C.2.1 Significant ecosystems

No Threatened Ecological Communities or Priority Ecological Communities have been mapped within ten kilometres of the three application areas.

C.2.2 Significant flora

Table C2.2: Conservation significant flora recorded within ten kilometres of the application areas

Old Vasse Road						
Threatened Taxon	Status	Count	Landform / Vegetation	Soils	Closest record (m)	Likelihood
<i>Commersonia apella</i>	CR	2	Valleys 40 to 60 m deep. Slopes smooth, 10 to 20 deg. Narrow terraces.	Grey sand over laterite.	8,952	Unlikely
<i>Caladenia harringtoniae</i>	VU	1	Winter-wet flats, margins of lakes, creeklines, granite outcrops	Sandy loam.	9,370	Unlikely
Priority Taxon	Status	Count	Landform / Vegetation	Soils	Closest record (m)	Likelihood
<i>Rorippa cygnorum</i>	P2	1	Open damp depression. Valleys riverbank. Narrow swampy terraces on valley floors with stream channels incised 1-2 m. Granite outcrops.	Moist grey sand to brown loam soil. Brown loam over granite.	3,733	Unlikely
<i>Inocybe redolens</i> (Fungi)	P2	1	Karri-marri forest.	Fungi - One WAH record only.	9,035	Unlikely
<i>Poa billardierei</i>	P3	1	Coastal dunes	White sand.	2,458	Unlikely
<i>Pultenaea pinifolia</i>	P3	3	Floodplains, swampy areas.	Sandy loam or clay.	5,390	Unlikely
<i>Actinotus repens</i>	P3	1	Valleys in granitic terrain.	Narrow swampy floor.	5,558	Unlikely
<i>Amanita fibrilloses</i> (Fungi)	P3	1	Gently sloping sandy terrain. Kangaroo Grass sedgeland, Teatree heath, Jarrah woodland.	Humus podzols on broad crests. Sandy yellow duplex soils in shallow dissections.	7,344	Unlikely
<i>Amanita kalamundae</i> (Fungi)	P3	1	Jarrah-marri forest.	Gravelly yellow duplex soils.	8,046	Unlikely

Wheatley Coast Road

Threatened Taxon	Status	Count	Landform / Vegetation	Soils	Closest record (m)	Likelihood
<i>Caladenia winfieldii</i>	EN	1	Winter-wet depressions, swamps	Grey-black sand, sandy loam.	7,145	Unlikely
<i>Kennedia glabrata</i>	VU	1	Granite outcrops.	Soil pockets, sandy soils.	4,285	Unlikely
Priority Taxon	Status	Count	Landform / Vegetation	Soils	Closest record (m)	Likelihood
<i>Cardamine paucijuga</i>	P2	1	Karri-marri forest.	Brown gravelly duplex soils and red earths.	674	Possible
<i>Eryngium sp. Lake Muir</i> (E. Wittwer 2293)	P2	1	Winter-wet swamps.	Black peaty silty soils.	9,991	Unlikely

Wheatley Coast Road

Threatened Taxon	Status	Count	Landform / Vegetation	Soils	Closest record (m)	Likelihood
<i>Placynthium nigrum</i>	P3	1	Complex of swampy tracts and low rises. Fringe of winter wetlands	White sand. Bare to littered grey sand. Cryptogamic brown clay over granite.	2,537	Unlikely
<i>Tetratheca exasperata</i>	P3	1	Broad, gently sloping (3-15%) divides on laterite	White-grey sand, sandy loam with gravel, orange-brown gravelly loam.	2,674	Unlikely
<i>Hemigenia microphylla</i>	P3	1	Winter-wet depressions. Granite.	Sandy clay, peaty clay,	9,991	Unlikely
<i>Gonocarpus pusillus</i>	P4	1	Complex of swampy tracts and low rises.	Semi-wet soils and pale deep sands occur with yellow/brown and grey deep sandy duplex soils on low rises.	1,132	Unlikely
<i>Actinotus repens</i>	P3	1	Valleys in granitic terrain.	Narrow swampy floor	9,855	Unlikely
<i>Schoenus natans</i>	P4	1	Winter-wet depressions.	Brown gravelly clays	9,991	Unlikely

Perup Road

Threatened Taxon	Status	Count	Landform / Vegetation	Soils	Closest record (m)	Likelihood
<i>Caladenia christineae</i>	EN	1	Inundated area covered with moss.	Inundated areas.	1,414	Unlikely
<i>Verticordia densiflora var. pedunculata</i>	EN	2	Winter-wet low-lying areas.	Grey/yellow sand, sandy loam.	4,223	Unlikely
Priority Taxon	Status	Count	Landform / Vegetation	Soils	Closest record (m)	Likelihood
<i>Caladenia validinervia</i>	P1	1	Minor valleys < 20 m deep with slopes < 5%.	Semi-wet soils with deep sandy gravels and pale deep sands with humus podzols in valley floors.	8,196	Unlikely
<i>Deyeuxia inaequalis</i>	P1	1	Valleys with < 20 m relief with smooth gentle slopes (3-8%)	Loam, Black sandy clay. Gravelly brown clay	8,961	Unlikely
<i>Caladenia ultima</i>	P2	1	Minor valleys < 20 m deep with slopes < 5%.	Predominantly semi-wet soils with deep sandy gravels and pale deep sands with humus podzols in valley floors.	8,069	Unlikely
<i>Thysanotus sp. Badgingarra (EA Griffin 2511)</i>	P2	1	Gentle valley slopes.	Grey sand with lateritic gravel.	8,888	Unlikely
<i>Amanita drummondii</i> (Fungi)	P3	1	Valleys (40-100 m deep) with smooth and irregular slopes of variable steepness and a narrow terrace on the valley floor. Marri tall woodlands and open forests.	Red and yellow duplexes	84	Possible
<i>Leptinella drummondii</i>	P3	1	Along rivers. Valleys with < 20 m relief with smooth gentle slopes (3-8%)	Clay loam, mud.	7,732	Unlikely
<i>Synaphea decumbens</i>	P3	1	Complex of swampy tracts and low rises.	Semi-wet soils and pale deep sands occur with yellow/brown and grey deep sandy duplex soils on low rises.	1,389	Unlikely

C.2.3 Significant fauna

Table C2.3: Conservation significant vertebrate fauna recorded within ten kilometres of the application areas

Old Vasse Road

Common name	Scientific name	Status	Count	Habitat present	Closest record (m)	Likelihood
Bird						
Carnaby's Cockatoo	<i>Calyptorhynchus latirostris</i>	EN	3	Yes	2.22	Likely
White-tailed Black Cockatoo	<i>Calyptorhynchus sp. 'white-tailed'</i>	EN	14	Yes	0.92	Likely
Baudin's Cockatoo	<i>Calyptorhynchus baudinii</i>	EN	33	Yes	2.57	Likely
Forest Red-tailed Black Cockatoo	<i>Calyptorhynchus banksii naso</i>	VU	5	Yes	5.76	Likely
Muir's Corella	<i>Cacatua pastinator pastinator</i>	CD	2	No	6.98	Unlikely
Curlew Sandpiper	<i>Calidris ferruginea</i>	CR	1	No	8.08	Unlikely
Black Bittern (SW)	<i>Ixobrychus flavicollis australis</i>	P2	1	No	8.57	Unlikely
Blue-Billed Duck	<i>Oxyura australis</i>	P4	1	No	9.70	Unlikely
Masked Owl (SW)	<i>Tyto novaehollandiae</i>	P3	2	Yes	9.23	Unlikely
Osprey, Eastern Osprey	<i>Pandion cristatus</i>	MI	1	No	9.03	Unlikely
Mammal						
Western Ringtail Possum	<i>Pseudocheirus occidentalis</i>	CR	9	Yes	0.55	Possible
Woylie	<i>Bettongia penicillata ogilbyi</i>	CR	2	No	9.23	Unlikely
Quokka	<i>Setonix brachyurus</i>	VU	28	Yes	2.70	Unlikely
Brush-Tailed Phascogale (SW)	<i>Phascogale tapoatafa wambenger</i>	CD	7	Yes	5.49	Possible
Water Rat	<i>Hydromys chrysogaster</i>	P4	19	No	3.18	Unlikely
Quenda	<i>Isodon fusciventer</i>	P4	9	Yes	6.86	Possible
Reptile						
Short-Nosed Snake	<i>Elapognathus minor</i>	P2	2	No	7.46	Unlikely

Wheatley Coast Road

Common name	Scientific name	Status	Count	Habitat present	Closest record (m)	Likelihood
Bird						
White-Tailed Black Cockatoo	<i>Calyptorhynchus sp. 'white-tailed'</i>	EN	6	Yes	3.15	Likely
Baudin's Cockatoo	<i>Calyptorhynchus baudinii</i>	EN	12	Yes	5.35	Likely
Forest Red-tailed Black Cockatoo	<i>Calyptorhynchus banksii naso</i>	VU	3	Yes	4.15	Likely
Muir's Corella	<i>Cacatua pastinator pastinator</i>	CD	1	No	5.56	Unlikely
Malleefowl	<i>Leipoa ocellata</i>	VU	2	No	1.92	Unlikely
Mammal						
Woylie	<i>Bettongia penicillata ogilbyi</i>	CR	11	No	9.96	Unlikely
Western Ringtail Possum	<i>Pseudocheirus occidentalis</i>	CR	6	Marginal	0.11	Unlikely
Numbat	<i>Myrmecobius fasciatus</i>	EN	1	No	5.88	Unlikely
Chuditch	<i>Dasyurus geoffroii</i>	VU	8	Yes	1.98	Possible
Bilby	<i>Macrotis lagotis</i>	VU	1	No	6.40	Unlikely
Quokka	<i>Setonix brachyurus</i>	VU	17	No	7.95	Unlikely
Brush-tailed Phascogale (SW)	<i>Phascogale tapoatafa wambenger</i>	CD	3	Yes	9.59	Possible
Quenda	<i>Isodon fusciventer</i>	P4	1	Yes	9.43	Possible
Western Brush Wallaby	<i>Notamacropus irma</i>	P4	10	Yes	7.01	Unlikely
Water Rat	<i>Hydromys chrysogaster</i>	P4	7	No	6.45	Unlikely
Amphibian						
Sunset Frog	<i>Spicospina flammocaerulea</i>	VU	1	No	7.84	Unlikely

Perup Road						
Common name	Scientific name	Status	Count	Habitat present	Closest record (m)	Likelihood
Bird						
Carnaby's Cockatoo	<i>Calyptorhynchus latirostris</i>	EN	1	Yes	2.97	Likely
White-tailed Black Cockatoo	<i>Calyptorhynchus sp. 'white-tailed'</i>	EN	4	Yes	5.18	Likely
Baudin's Cockatoo	<i>Calyptorhynchus baudinii</i>	EN	2	Yes	4.75	Likely
Forest Red-tailed Black Cockatoo	<i>Calyptorhynchus banksii naso</i>	VU	16	Yes	2.94	Likely
Muir's Corella	<i>Cacatua pastinator pastinator</i>	CD	1	Marginal	9.61	Possible
Blue-billed Duck	<i>Oxyura australis</i>	P4	18	No	4.32	Unlikely
Mammal						
Woylie	<i>Bettongia penicillata ogilbyi</i>	CR	597	Yes	1.63	Possible
Western Ringtail Possum	<i>Pseudocheirus occidentalis</i>	CR	23	No	3.06	Unlikely
Numbat	<i>Myrmecobius fasciatus</i>	EN	72	Yes	4.77	Possible
Chuditch	<i>Dasyurus geoffroii</i>	VU	390	Yes	1.63	Possible
Quokka	<i>Setonix brachyurus</i>	VU	23	No	8.19	Unlikely
Brush-tailed Phascogale (SW)	<i>Phascogale tapoatafa wambenger</i>	CD	79	Yes	1.63	Possible
Quenda	<i>Isodon fusciventer</i>	P4	8	Marginal	2.23	Unlikely
Tammar Wallaby	<i>Notamacropus eugenii derbianus</i>	P4	68	No	6.77	Unlikely
Western Brush Wallaby	<i>Notamacropus irma</i>	P4	139	Yes	1.63	Possible
Water Rat	<i>Hydromys chrysogaster</i>	P4	2	No	9.39	Unlikely

Table C2.4: Summary of conservation significant vertebrate fauna assessed as possibly or likely occurring over the application areas

Species		Old Vasse	Wheatley	Perup
Birds				
Carnaby's Cockatoo	EN	Likely	Likely	Likely
Baudin's Cockatoo	EN	Likely	Likely	Likely
Forest Red-tailed Black Cockatoo	VU	Likely	Likely	Likely
Muir's Corella	CD			Possible
Mammals				
Western Ringtail Possum	CR	Possible		
Woylie	CR			Possible
Numbat	EN			Possible
Chuditch	VU		Possible	Possible
Brush-Tailed Phascogale (SW)	CD	Possible	Possible	Possible
Western Brush Wallaby	P4		Possible	Possible
Quenda	P4	Possible	Possible	

Table C2.5: Mapped black cockatoo elements within twelve kilometres of the application area

CPS 9333-1 (12km radius)	Old Vasse Road	Wheatley Coast Road	Perup Road
Within range: Carnaby's Cockatoo, Baudin's Cockatoo, Forest Red-tailed Black Cockatoo	Yes	Yes	Yes
Night roosts	-	-	2 (forest red-tail and white-tail)
Confirmed nesting sites	-	1 (Carnaby's)	-
Potential nesting sites (artificial hollows)	-	-	-
Mapped foraging habitat (ha) (JAF)	WAR Bioregion not mapped	WAR Bioregion not mapped	24,689 ha (JAF) (76% of local area)

C.3 Vegetation extent

Table C3.1: Mapped Southwest Forest vegetation complexes (SWF) in the local area (10km radius)

Factor		Pre-European extent (ha)	Current extent (ha)	Remaining (%)	Current extent in all DBCA managed land (ha)	Current extent in all DBCA managed land (%)
Application area	IBRA bioregion:					
Vasse and Wheatley	Warren (WAR)	833,986	659,432	79.1	558,485	84.7
Perup	Jarrah Forest (JAF)	4,506,660	2,399,838	53.3	1,673,614	69.7
Application area	SCF vegetation complex:					
Vasse	Angove (SWF ID 1)	39,698	34,737	87.5	31,437	79.2
Wheatley	Lefroy (SWF ID 167)	20,126	16,460	81.8	14,737	73.2
Wheatley	Crowea (SWF ID 68)	52,753	45,425	86.1	43,136	81.8
Perup	Wilgarup (SWF ID 302)	5,906	3,461	58.6	2,739	46.4

Table C3.2: Mapped remnant vegetation in the local area (10km radius)

Application area	Factor	Pre-European extent (ha)	Current extent (ha)	Remaining (%)
Vasse	Remnant vegetation	31,531	21,451	68.0
Wheatley	Remnant vegetation	33,488	19,735	58.9
Perup	Remnant vegetation	32,489	25,989	80.0
TOTAL	Remnant vegetation	97,508	67,175	68.9

Table C3.3: Mapped DBCA managed lands in the local area (10km radius)

Application area	Factor	Remnant vegetation in local area (ha)	DBCA managed lands - Extent (ha)	Proportion of remnant vegetation in DBCA managed (%)
Vasse	DBCA managed lands	21,451	17,869	83.3
Wheatley	DBCA managed lands	19,735	12,769	64.7
Perup	DBCA managed lands	25,989	21,493	82.7
TOTAL	DBCA managed lands	67,175	52,131	77.6

Appendix D – Assessment against the Clearing Principles

Assessment against the Clearing Principles	Variance level	Is further consideration required?
Environmental value: biological values		
<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> Native vegetation over the application area consists of native eucalypt trees immediately adjacent to existing roads over an understorey ranging from degraded to very good condition (Keighery 1994). The native vegetation of the application areas does not represent any conservation significant ecological communities, and is unlikely to support Threatened flora taxa. Twenty-one Priority flora taxa have been recorded from within ten kilometres of the three application areas. In consideration of the soil types present, the small scale of clearing required, condition of the vegetation, separation distances and age of records, and the location along an existing road, the native vegetation within the application areas is unlikely to be necessary for the continued existence of conservation significant flora or fauna and is unlikely to comprises a high level of biodiversity, particularly in consideration of extensive areas of adjacent lands managed for conservation purposes with vegetation in better condition to that occurring over the application areas.</p>	Not likely to be at variance	No
<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 application areas are immediately adjacent to lands managed for conservation purposes that provide habitat for mobile fauna species of conservation significance (Appendix H: Figure B). The application area is located within the modelled distribution of three Threatened black cockatoo species that potentially utilise the tree canopy for foraging habitat and the larger trees for breeding or roosting habitat.</p>	May be at variance	Yes Section 3.2.1
<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> Six Threatened flora species have been recorded within ten kilometres of the three application areas (Appendix C: Table C2.2), including three orchid species (Appendix H: Figure C). No records are within 4.2 kilometres of the application areas, apart from <i>Caladenia christineae</i> located approximately 1.4 kilometres from the Perup Road application area (Appendix C: Table C2.2). The Threatened flora species recorded from within ten kilometres of the application areas occur in different soil types and vegetation types to that mapped and occurring over the application areas (Appendix C: Table C2.2) (Appendix H: Figure C). Due to the separation distances, soil types present, the small scale of clearing required and condition of the vegetation, the native vegetation within the application areas is unlikely to include, or be necessary for the continued existence of, Threatened flora.</p>	Not likely to be at variance	No
<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> No Threatened Ecological Communities listed by the Minister for Environment or under the EPBC Act have been mapped within ten kilometres of the application area. The native vegetation of the application</p>	Not at variance	No

Assessment against the Clearing Principles	Variance level	Is further consideration required?
<p>area does not align with any Threatened Ecological Communities listed by the Minister for Environment or under the EPBC Act. Native vegetation proposed to be cleared does not comprise the whole or a part of, nor is it necessary for, the maintenance of a Threatened Ecological Community.</p>		
Environmental values: significant remnant vegetation and conservation areas		
<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 national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present prior to 1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia 2001). The application areas are not located within an extensively cleared landscape, with the majority protected within DBCA managed lands (Appendix H: Figure B). In consideration of the local context, the small scale of clearing required and condition of the vegetation along an existing road, the native vegetation within the application areas is not considered to be part of a significant ecological linkage, nor considered significant as a remnant of native vegetation.</p>	Not at variance	No
<p><u>Principle (h):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.”</i></p> <p><u>Assessment:</u> Large areas of DBCA lands managed for conservation purposes occur within the local area (Appendix H: Figure B). Areas of National Parks are within two metres of the Old Vasse Road and Wheatley Coast Road application areas and areas of State Forest are within two metres of the Perup Road application area (Appendix H: Figure N to Figure P). The applicant’s avoidance and minimisation strategies, drainage controls and dieback and weed management will mitigate impacts.</p>	Not likely to be at variance	Yes Section 3.2.2
Environmental values: land and water resources		
<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> No Ramsar listed wetlands or wetlands listed within the directory of important wetlands in Australia have been mapped within ten kilometres of the three application areas. The three application areas do not intersect any mapped wetlands, nor do they possess native vegetation typically associated with wetlands or watercourses. A minor, nonperennial watercourse is located approximately 212 metres east of Old Vasse Road application area, and a minor, nonperennial, tributary of the Perup River is located approximately 120 metres north of the Perup Road application area. Just one mapped watercourse intersects the three application areas; a degraded minor, nonperennial, drainage line that bisects the Wheatley Coast Road application area (Appendix C: Table C1.4) (Appendix H: Figure K), with drainage controlled and managed as part of the existing sealed road. No riparian vegetation occurs within the application areas. The proposed clearing areas do not support native vegetation growing in, or in association with, an environment associated with a watercourse or wetland.</p>	Not likely to be at variance	No
<p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the</i></p>	Not likely to be at	No

Assessment against the Clearing Principles	Variance level	Is further consideration required?
<p><i>vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u> Land degradation risks for the mapped soil types are high for wind erosion over the Old Vasse Road application area and a component of the Wheatley Coast Road application area, and for Phosphorus export over the Perup Road application area and a component of the Wheatley Coast Road application area. Other land degradation factors are mapped as low or medium (Appendix C: Table C1.3). Standard and staged road construction methodologies will be employed, including strategies for erosion control. Eutrophication (Phosphorus export) is not likely to be a risk in consideration of the final land use as a public road. Cleared areas will be replaced with a hard road surface negating any potential for wind erosion. Soils will not be excavated at depth, and groundwater will not be intersected, reducing the risk of exposing any acid sulphate soils. Given the scale and location of the application area, proposed clearing is unlikely to contribute to rising salinity. Any impacts to surrounding landscapes, soils and drainage can be managed through appropriate design. Noting the extent of the proposed clearing, the condition of the vegetation, and standard road construction methods employed proposed clearing is not likely to cause appreciable land degradation.</p>	variance	
<p><u>Principle (i):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.”</i></p> <p><u>Assessment:</u> Just one mapped drainage line intersects the three application areas; a degraded minor, nonperennial, drainage line bisects the Wheatley Coast Road application area (Appendix H: Figure K). Soils will not be excavated at depth and risks to groundwater are low. The proposed clearing may cause some short-term surface water sedimentation during works, however, surface water flow will be controlled by incorporating drainage management design and by implementing standard road construction methodologies for drainage control and water erosion. Proposed clearing is not likely to cause deterioration in the quality of surface or underground water.</p>	Not likely to be at variance	No
<p><u>Principle (j):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</i></p> <p><u>Assessment:</u> The mapped risk for flooding potential over the three application areas is rated at low. The application area is not located within any annual exceedance probability (AEP) floodplains, and none are mapped within ten kilometres of the application areas. Just one minor drainage line bisects the application area (Appendix H: Figure K) and standard and staged road construction methodologies will be employed, including strategies for drainage controls and water erosion. Noting the location and extent of the proposed clearing and standard management prescriptions employed the proposed clearing of native vegetation is not likely to cause, or exacerbate, the incidence or intensity of flooding.</p>	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.

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

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

Appendix F – Photographs of the application area (Shire of Manjimup 2021b)



Old Vasse Road and Hawke Road intersection



Wheatley Coast Road



Perup Road

OLD VASSE ROAD INTERSECTION

SUMMARY

This report details the results of a habitat tree assessment carried out over sections of the Old Coast Road in the Shire of Manjimup (the Shire).

The Shire has applied for a permit to clear vegetation from within various road reserves (CPS 9333/1). Upon review the Department of Water and Environmental Regulation (DWER) have advised the Shire that in order to determine the impacts to conservation significant fauna, a habitat tree assessment is required of trees likely to require removal in each area. This report details the results of an assessment carried out to satisfy this request.

The assessment was carried out at the following location:

- Old Vase Road/Hawk Road Intersection – eight trees.

Primary Findings

None of the trees identified as likely to require clearing appear to contain hollows of any size.

Because of this and other factors the trees in question have been assessed as unlikely to represent suitable refuge/breeding habitat for any conservation significant fauna species likely to frequent the general area (e.g. black cockatoos, phascogales and western ringtail possums).

Table 1: Summary of Tree Observations

Wpt	Side of Road	Number of Possible Hollows	Status	Comments
1	Centre	0	No hollows observed	Small/Medium sized (DBH >50cm) karri tree, no hollows observed.
2	East	0	No hollows observed	Small sized (DBH <50cm) marri tree, no hollows observed.
3	East	0	No hollows observed	Small/Medium sized (DBH >50cm) marri tree, no hollows observed.
4	East	0	No hollows observed	Small/Medium sized (DBH >50cm) marri tree, no hollows observed.
5	East	0	No hollows observed	Very small sized (DBH <50cm) dead marri tree, no hollows observed.
6	East	0	No hollows observed	Medium sized (DBH <50cm) karri tree, no hollows observed.
7	East	0	No hollows observed	Small sized (DBH <50cm) marri tree, no hollows observed.
8	West	0	No hollows observed	Small sized (DBH <50cm) marri tree, no hollows observed.

WHEATLEY COAST ROAD

5. RESULTS

5.1 WHEATLEY COAST ROAD

Four of the five trees marked at this location were not observed to contain hollows of any size.

One large karri tree (~SLK 13.51) had dead upper branches, some of which contain hollows of various sizes. These were examined where possible in closer detail with a drone and photographed. At least one of the hollows appeared to be of a size that may be suitable for black cockatoos however there appeared to be no residual evidence of the hollow having been used for this purpose (i.e. chew marks) or by any other fauna of significance.

A summary of observations made are provided in Table 1 below.

Additional details of each tree can be found in Appendix A.

Table 1: Wheatly Coast Road - Summary of Tree Observations

Wpt	SLK	Side of Road	Number of Possible Hollows	Status	Comments
5	13.74	East	0	No hollows observed	Small karri tree, no hollows observed.
6	13.63	West	0	No hollows observed	Small marri tree, no hollows observed.
7	13.62	West	0	No hollows observed	Small karri tree, no hollows observed.
8	13.54	West	0	No hollows observed	Large karri tree, no hollows observed.
9	13.51	West	2+	Several possible small hollows	Large karri tree, several possible hollows in upper dead branches, at least one possibly large enough for black cockatoos. No evidence of current or previous use by cockatoos or any other species.

PERUP ROAD

5.2 PERUP ROAD

Three of the four trees marked at this location were not observed to contain hollows of any size. One tree (~SLK 32.83) had dead upper branches that may contain small hollows but this could not be confirmed. Because of their likely small size, location and orientation it has been concluded that they are unlikely to be suitable for any conservation significant fauna species likely to frequent the general area (e.g. black cockatoos or phascogales).

A summary of observations made are provided in Table 2 below.

Additional details of each tree can be found in Appendix A.

Table 2: Perup Road - Summary of Tree Observations

Wpt	SLK	Side of Road	Number of Possible Hollows	Status	Comments
1	32.46	Nth	0	No hollows observed	Large jarrah tree, no hollows observed.
2	32.83	Nth	2+	Several possible small hollows	Large marri tree with some dead upper branches that may contain small hollows (<5cm diameter entrances). Unlikely to be used by any fauna species of conservation significance.
3	32.90	Sth	0	No hollows observed	Medium sized jarrah tree, no hollows observed.
4	32.91	Sth	0	No hollows observed	Small jarrah tree, no hollows observed.

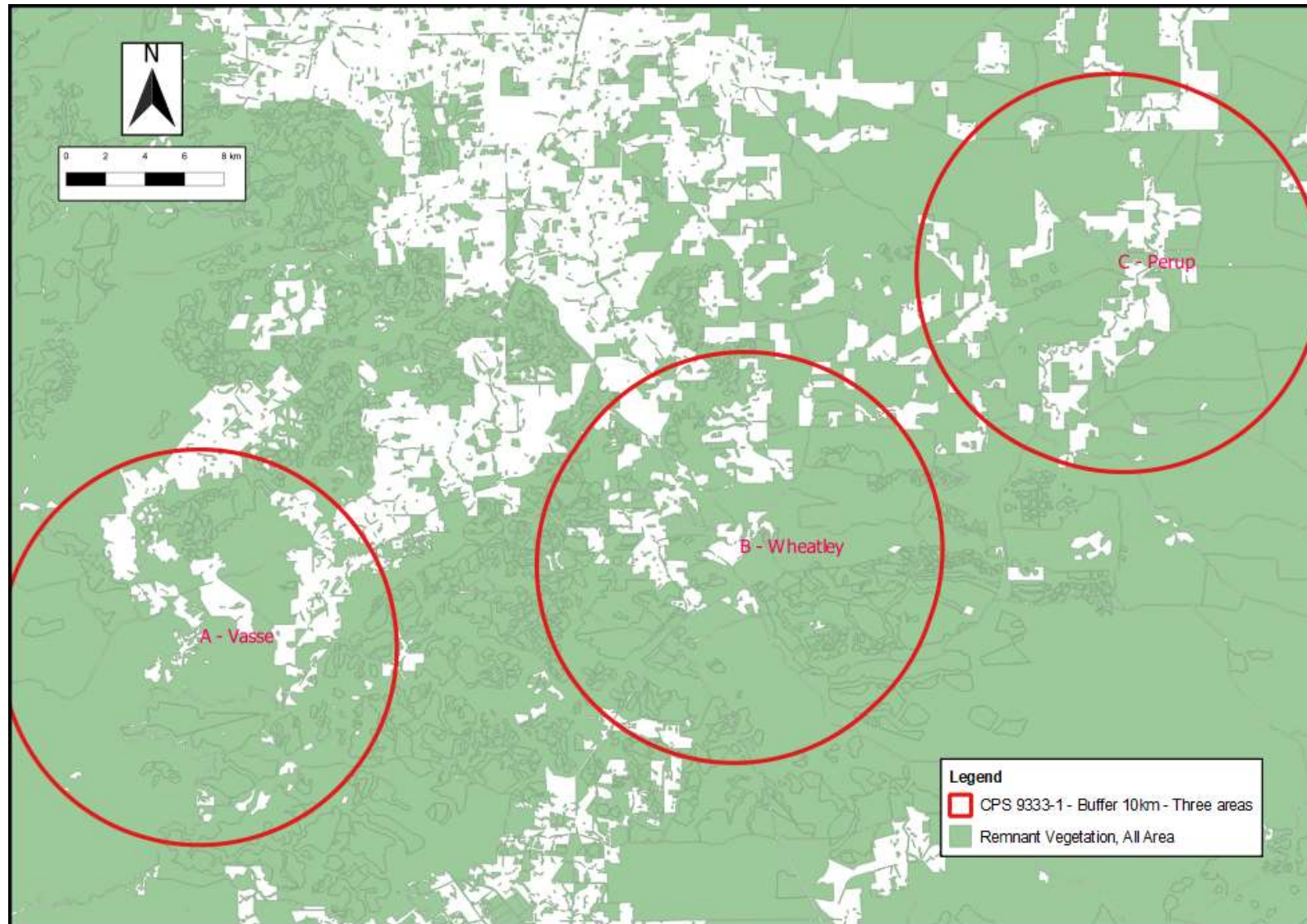


Figure A: Remnant vegetation mapped within ten kilometres of the application areas

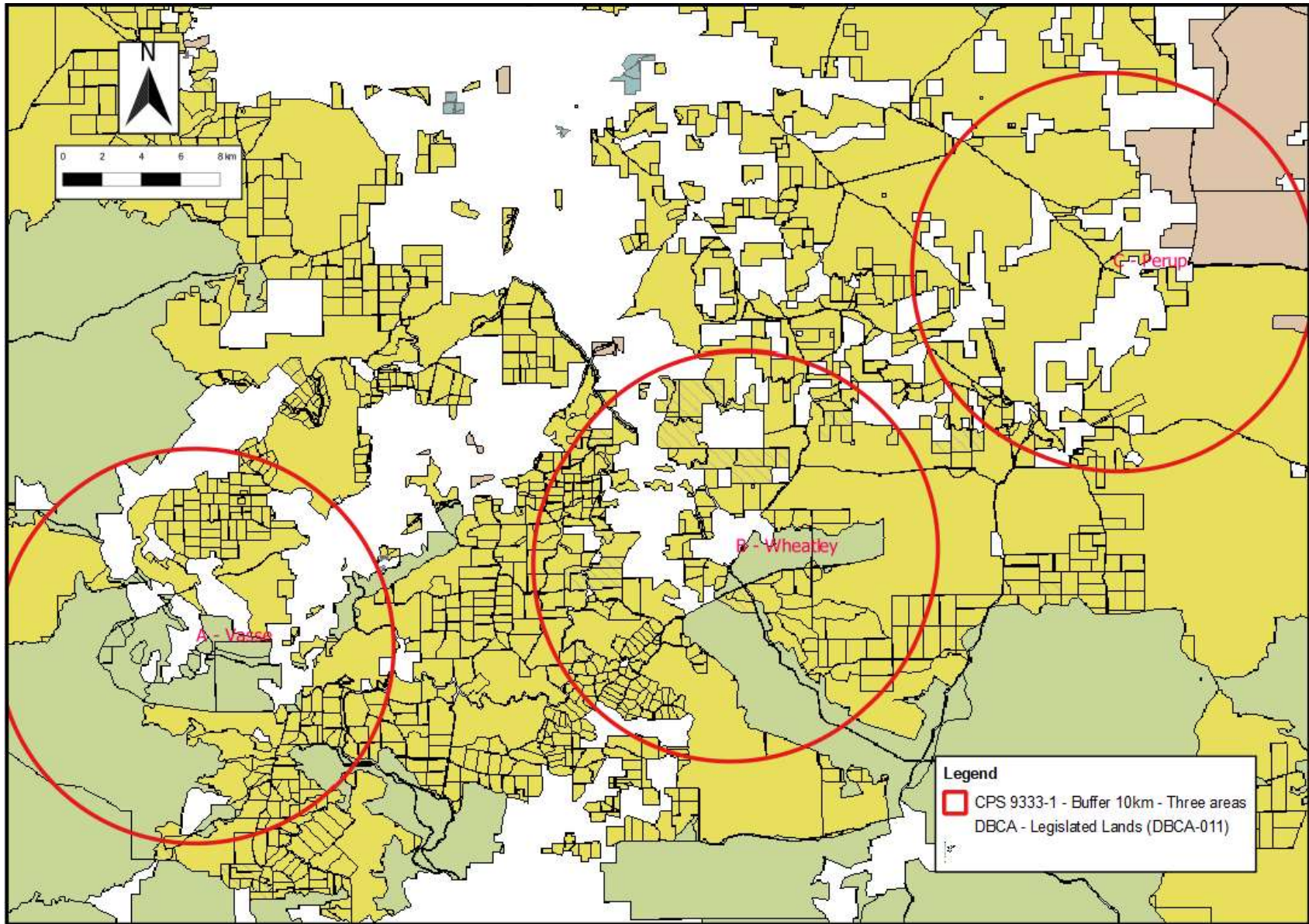


Figure B: DBCA managed lands within ten kilometres of the application areas

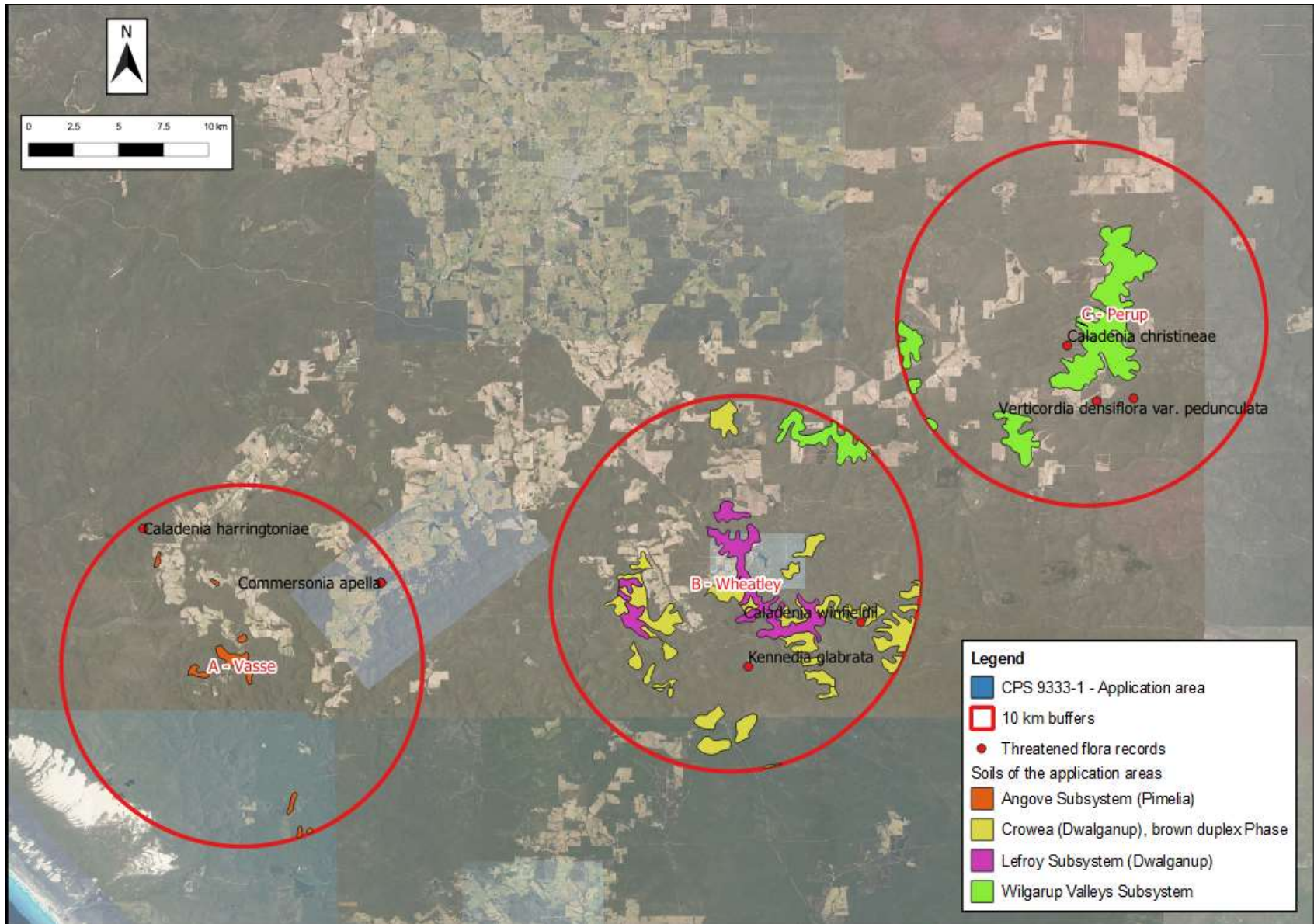


Figure C: Threatened flora taxa recorded within ten kilometres of the application areas

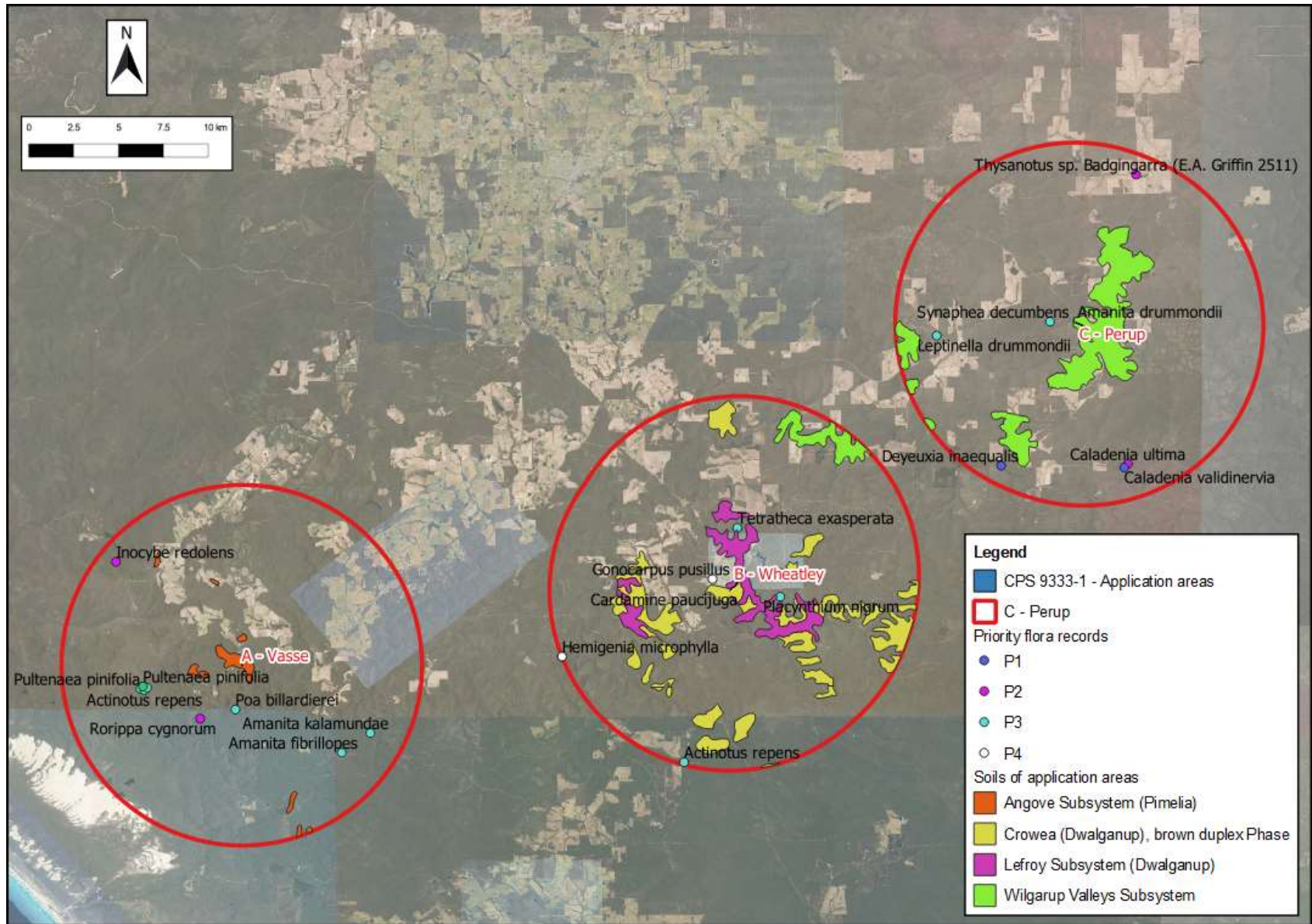


Figure D: Priority flora taxa recorded within ten kilometres of the application areas

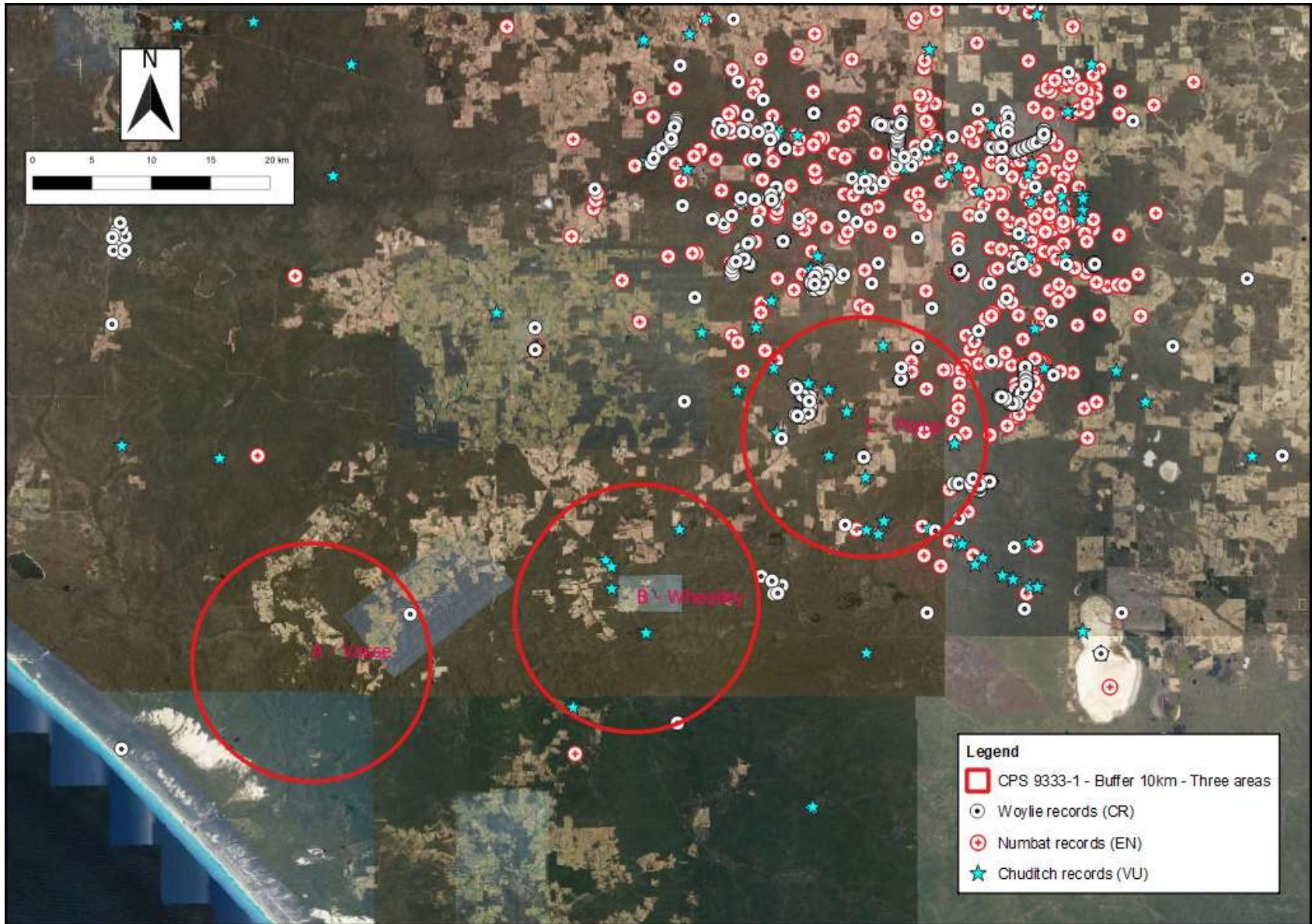


Figure E: Woylie, Numbat and Chuditch records within ten kilometres of the application areas

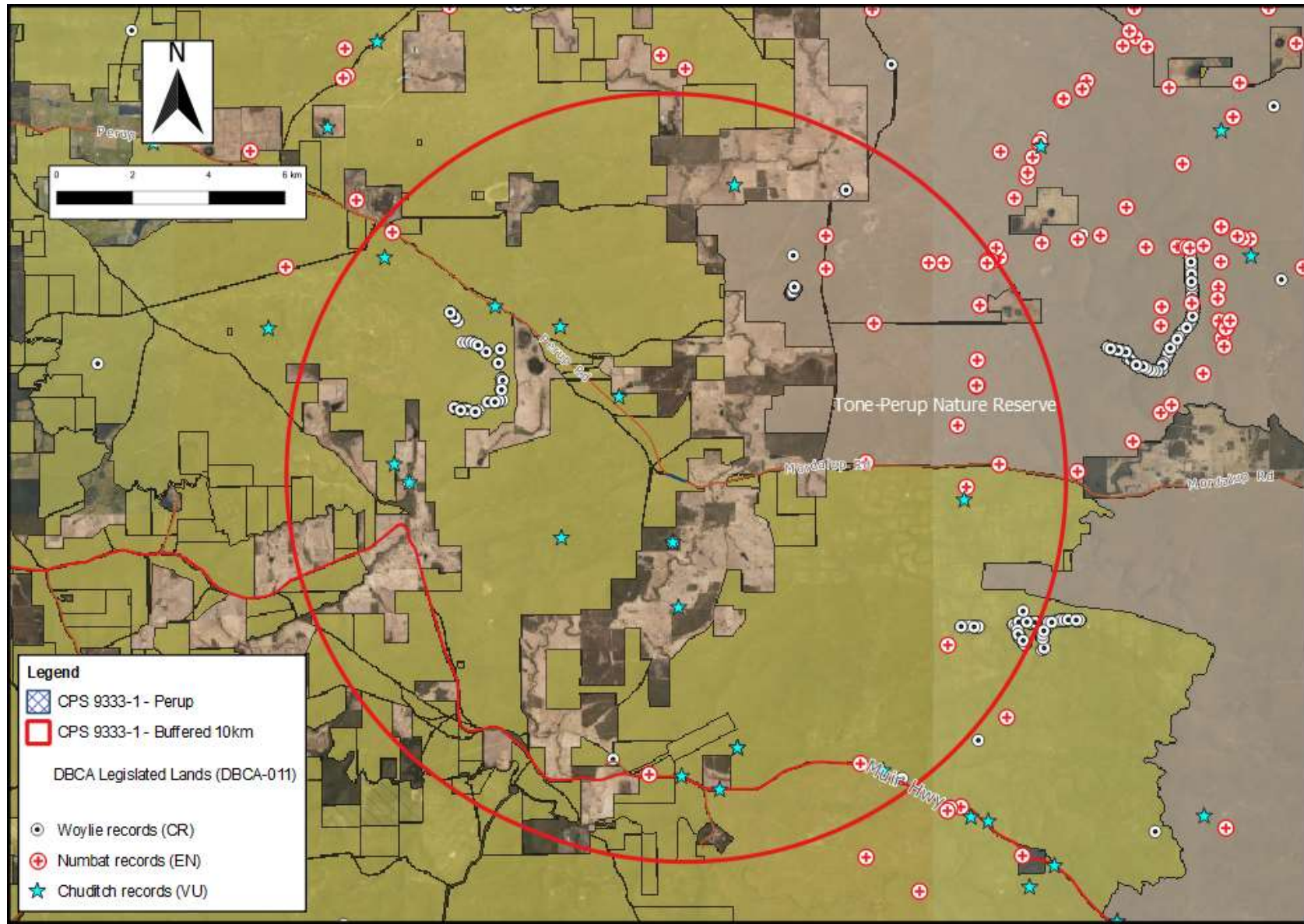


Figure F: Woylie, Numbat and Chuditch records within ten kilometres of the Perup Road application area

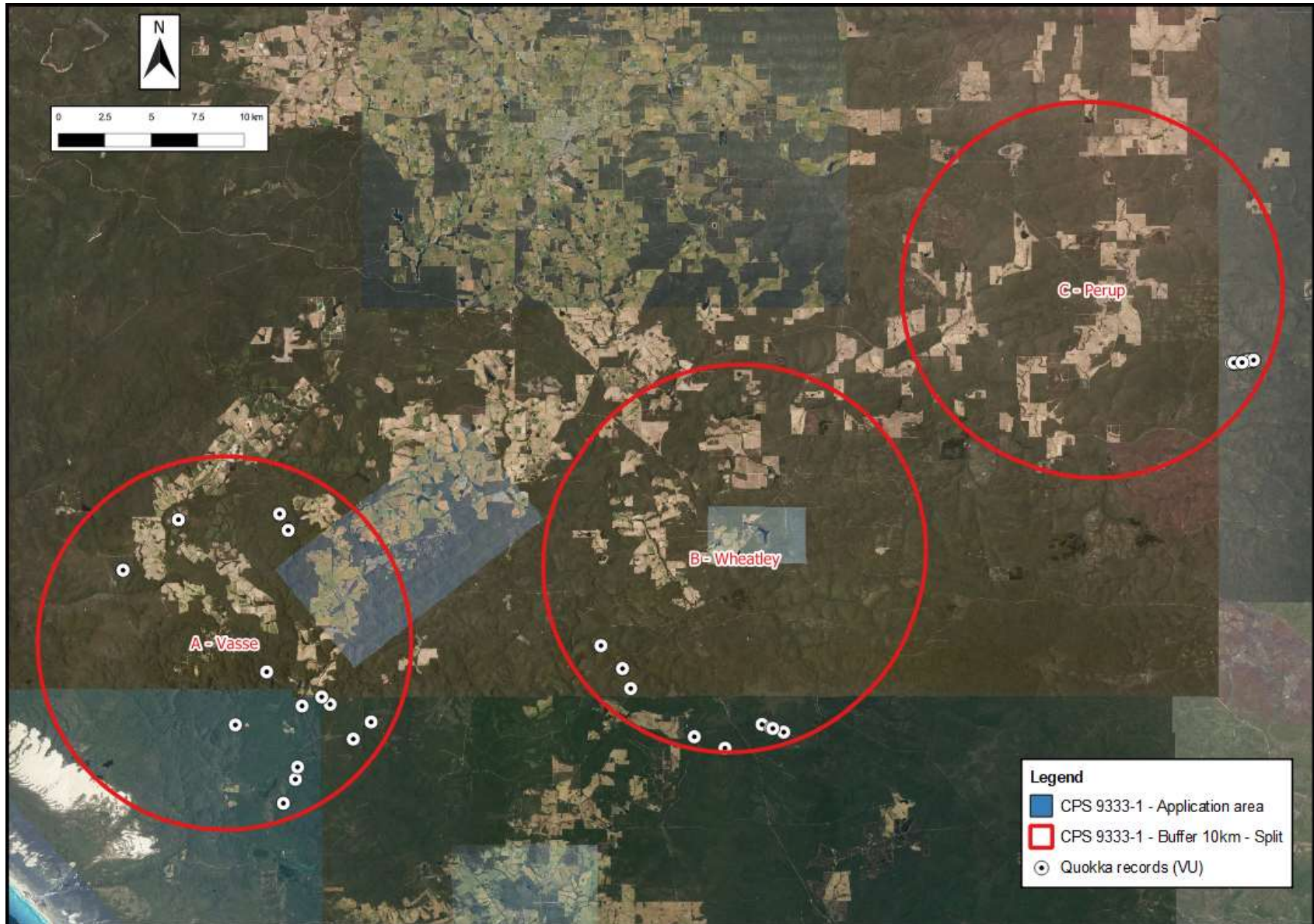


Figure G: Quokka records within ten kilometres of the application areas

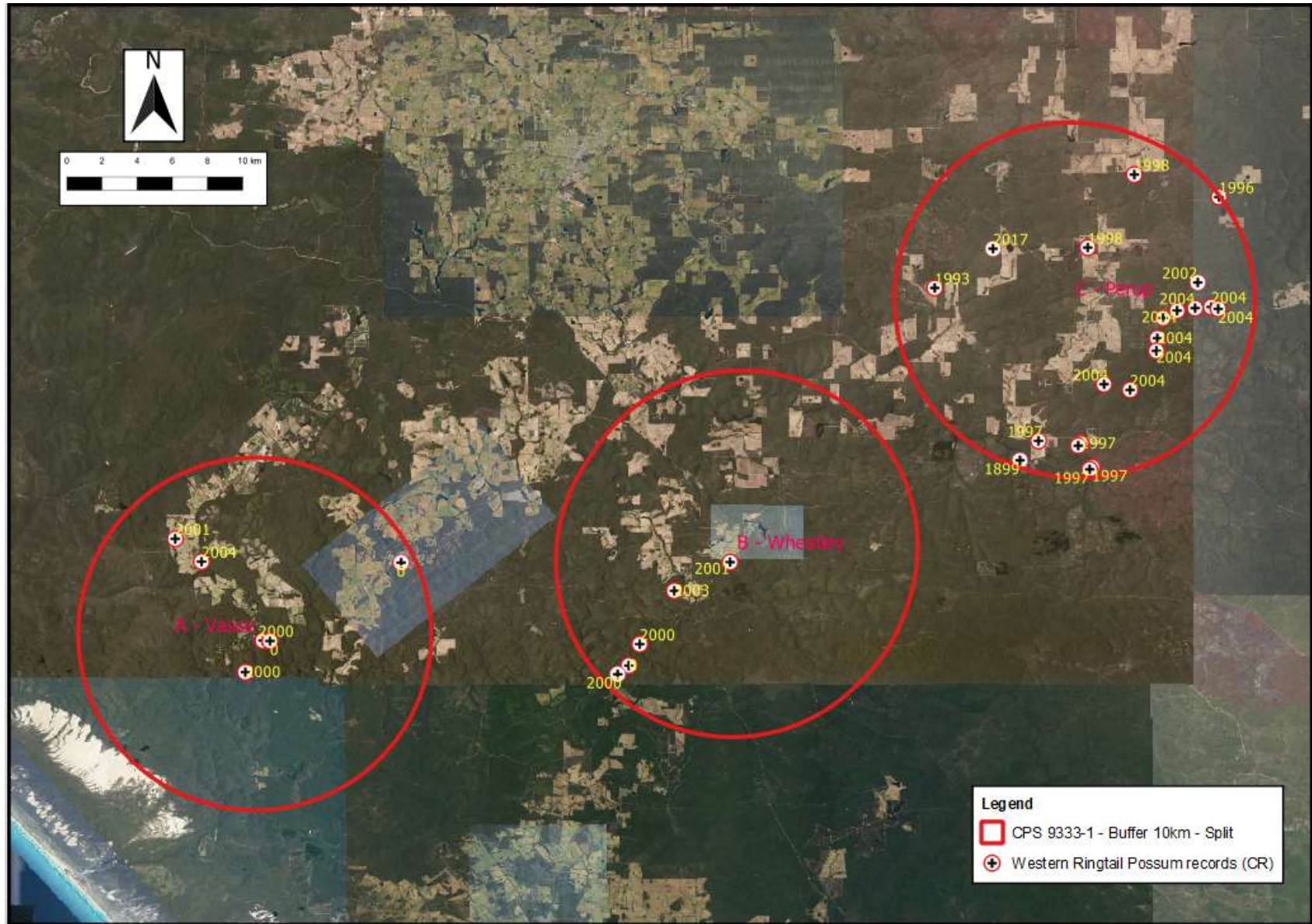


Figure H: Western Ringtail Possum records within ten kilometres of the application areas

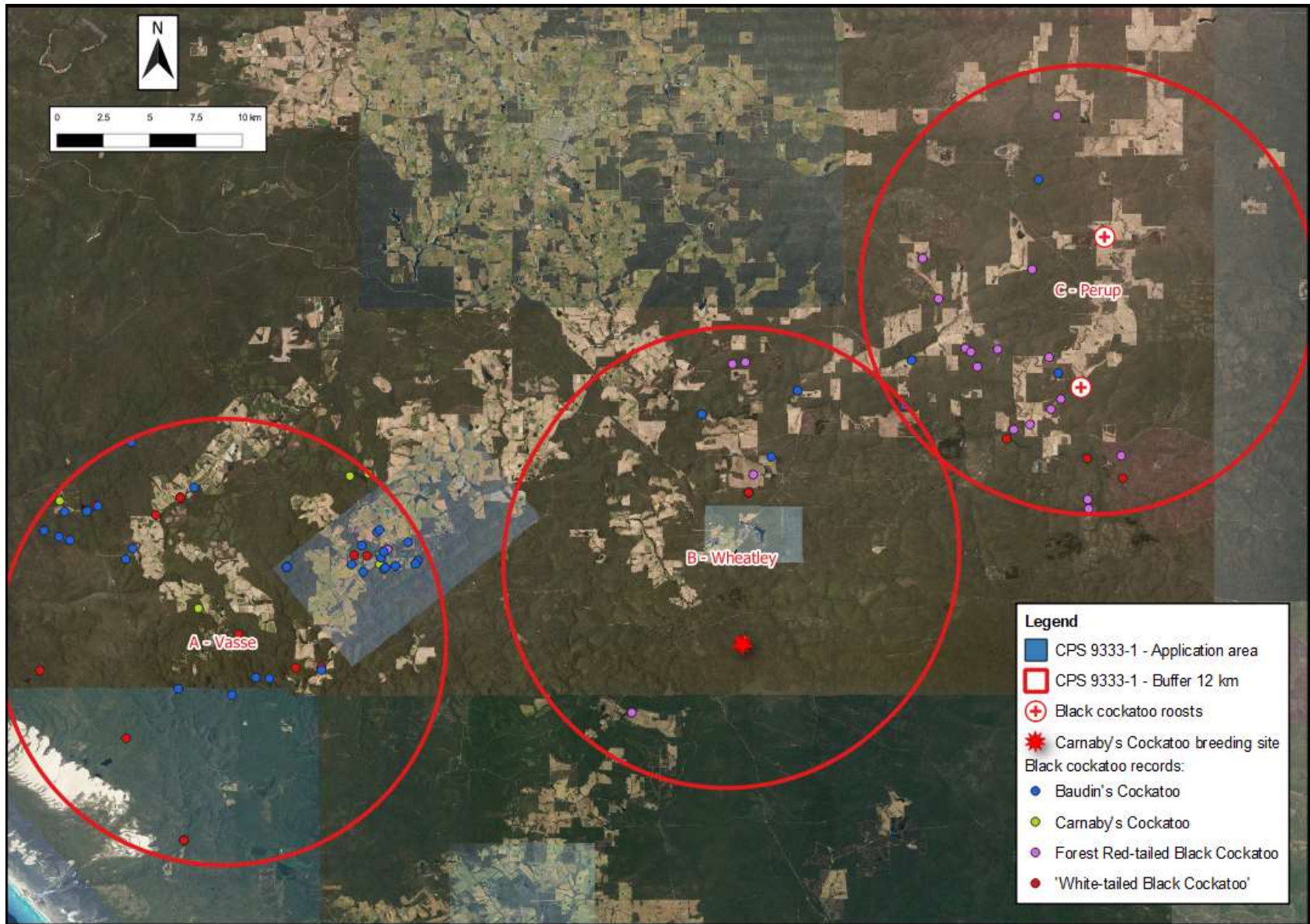


Figure I: Black cockatoo data recorded within 12 kilometres of the application areas

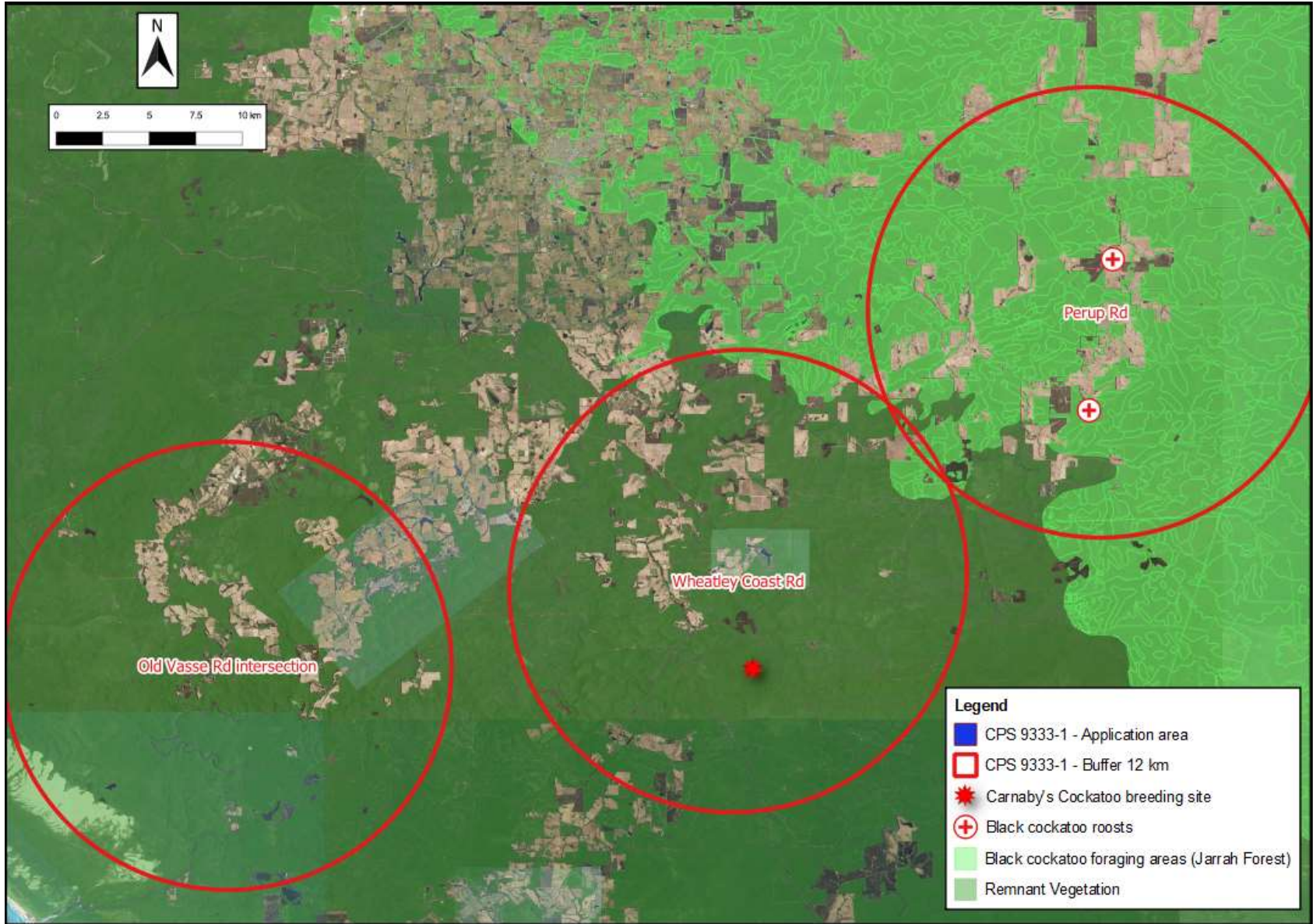


Figure J: Black cockatoo foraging habitat over the Jarrah Forest bioregion and remnant vegetation

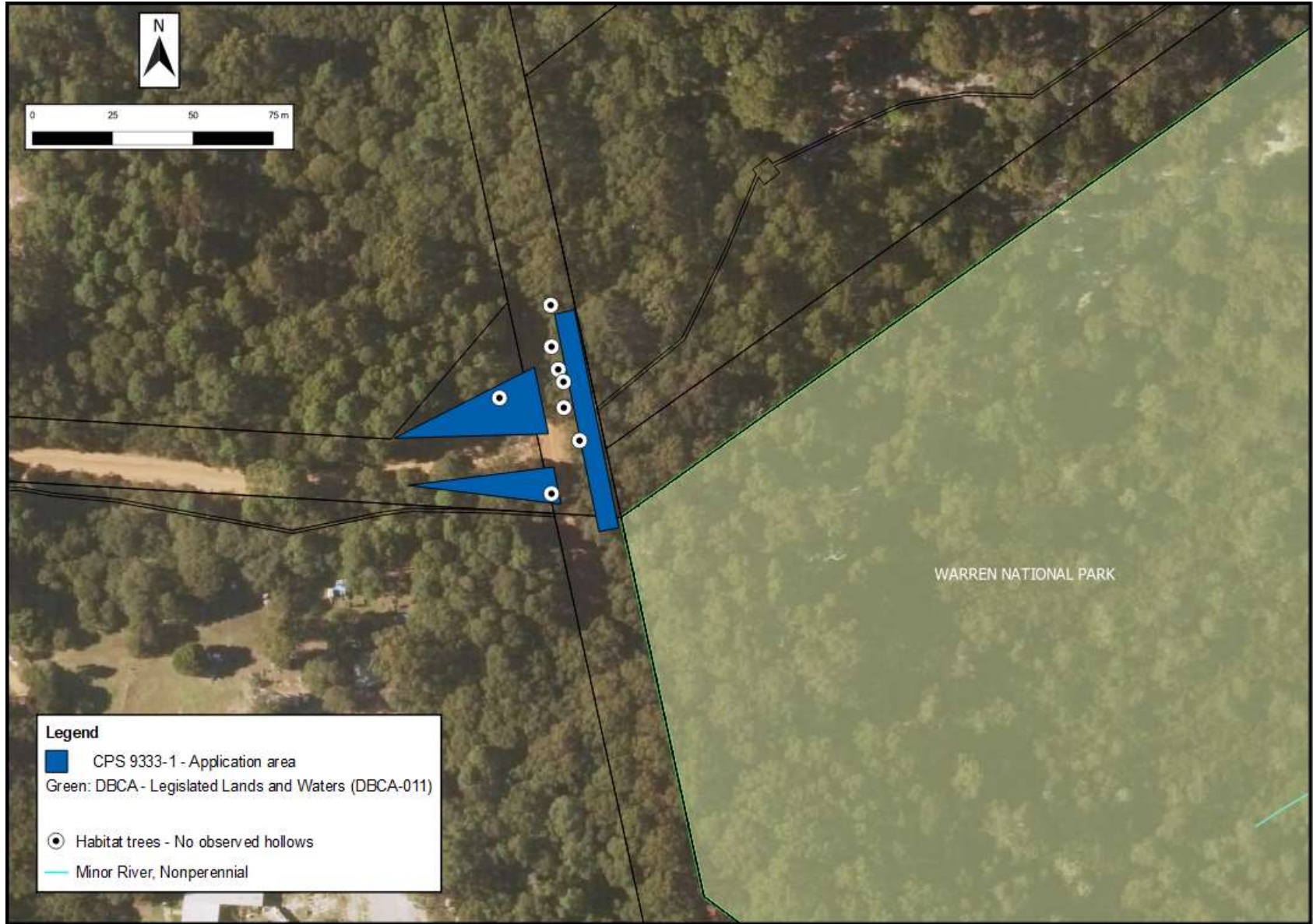


Figure K: Habitat trees identified over the Old Vasse Road application area (Harewood 2022)

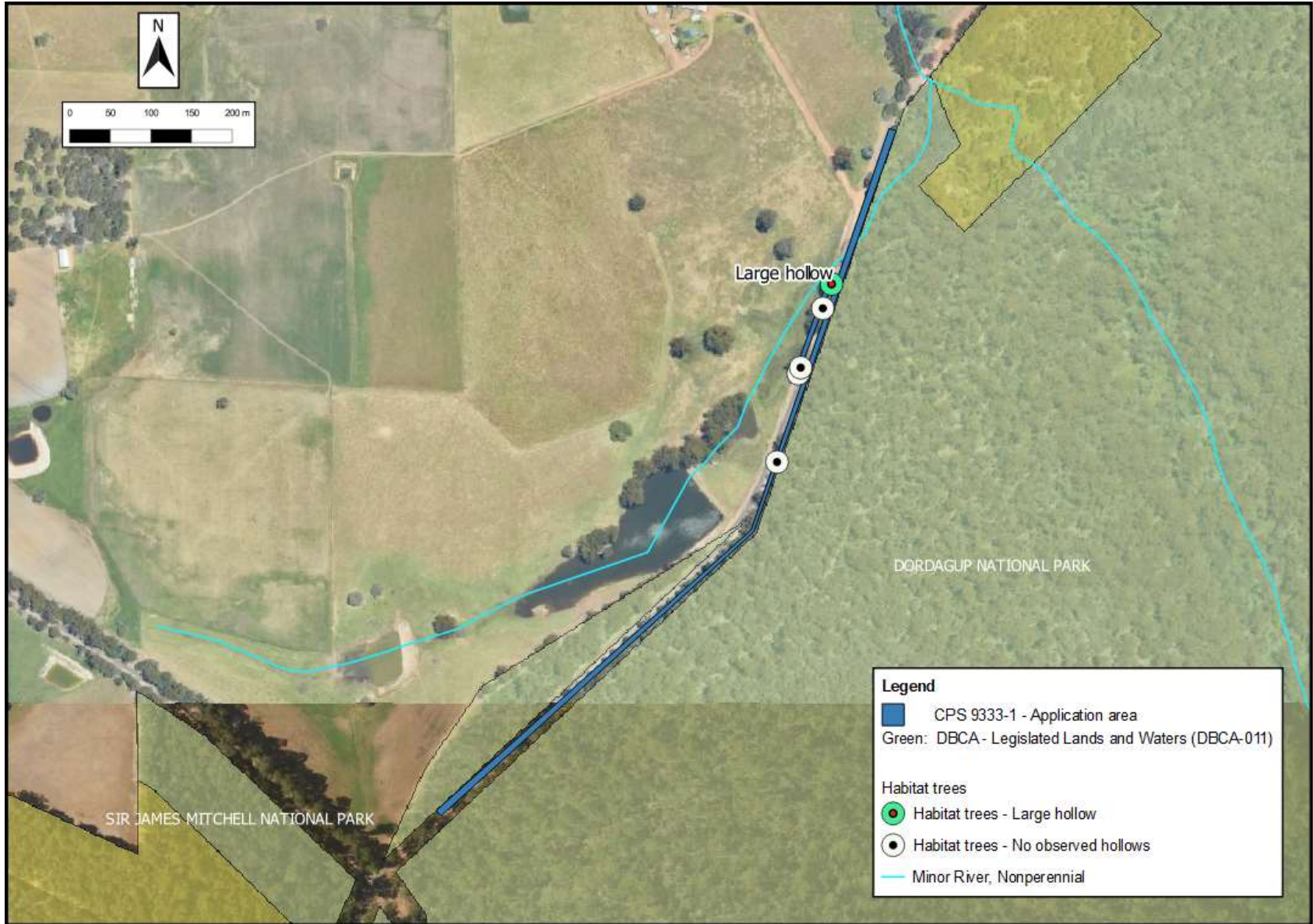


Figure L: Habitat trees identified over the Wheatley Coast Road application area (Harewood 2021)



Figure M: Habitat trees identified over the Perup Road application area (Harewood 2021)



Figure N: DBCA managed lands mapped in the vicinity of the Old Vasse Road application area



Figure O: DBCA managed lands mapped in the vicinity of the Wheatley Coast Road application area

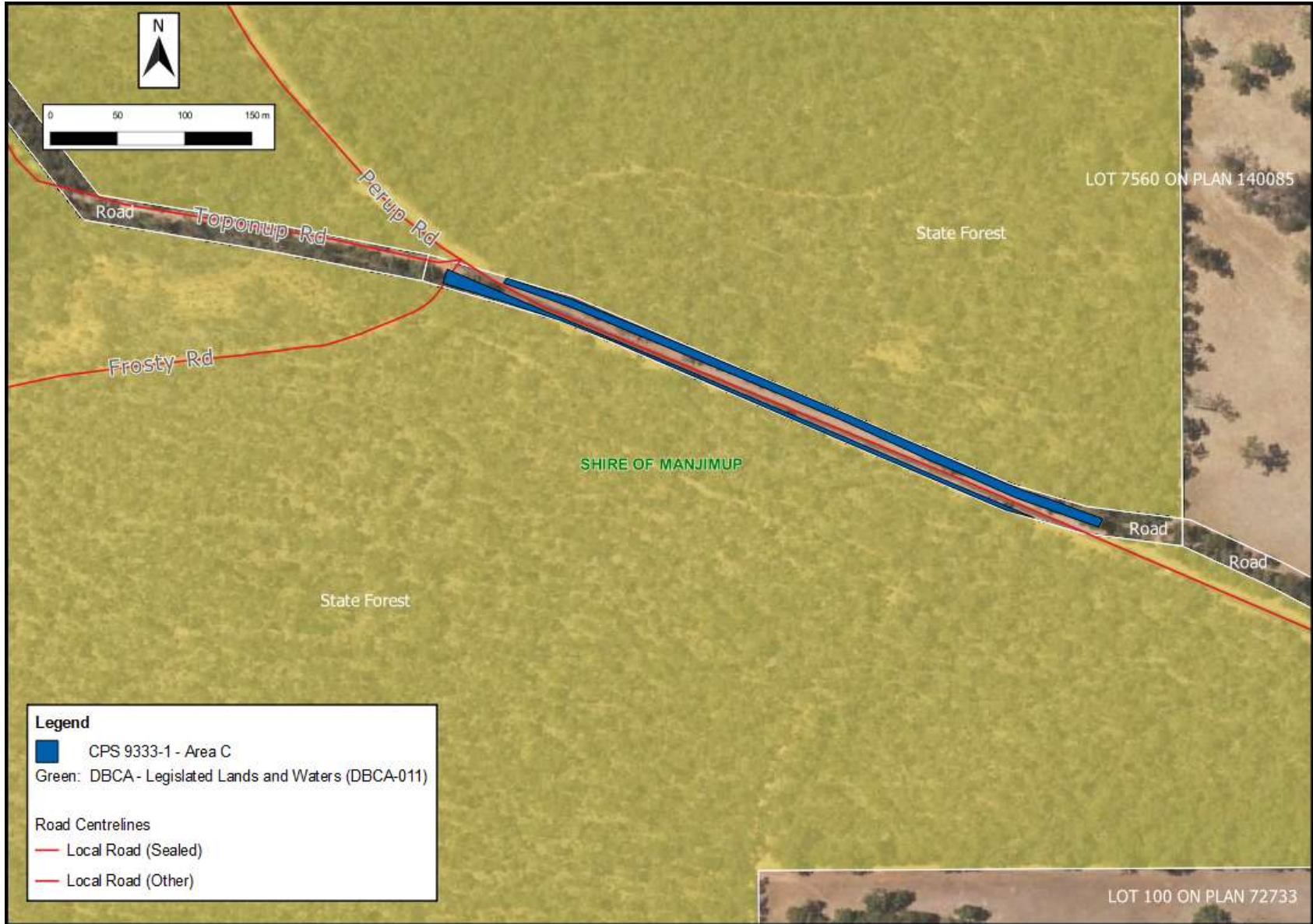


Figure P: DBCA managed lands mapped in the vicinity of the Perup Road application area

Appendix I – References and databases

I.1 References

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I.2 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)
- Pre-European Vegetation Statistics
- Remnant Vegetation, All Areas
- Native Vegetation Extent (DPIRD-005)
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – 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:

- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)