



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

| | |
|-------------------------------|-------------------------------------|
| Purpose Permit number: | CPS 9341/1 |
| Permit Holder: | Shire of Esperance |
| Duration of Permit: | From 21 April 2023 to 21 April 2038 |

ADVICE NOTE

Allocation of offset site

In relation to condition 9 of this Permit, it is noted that 44.75 hectares of Reserve 35302, Lot 1985 on Plan 91222, Esperance, will be attributed to the offset for this project. The remaining balance of the property (approximately 72 hectares) may be used as a banked offset for other projects. The nominated 44.75 hectare area contains Carnaby's cockatoo (*Zanda latirostris*) habitat, vegetation representative of the 'Proteaceae Dominated Kwongkan Shrublands of the southeast coastal floristic province of Western Australia' Threatened Ecological Community and is a significant remnant within an extensively cleared landscape, in addition to other environmental values.

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 defining drains and culvert outlets and re-sheeting and sealing existing road.

2. Land on which clearing is to be done

Henke Road Reserve (PIN 11645173), Howick
Howick Road Reserve (PIN 11644424), Howick
Grass Patch Road (PIN 11417154), Grass Patch
Lot 34 on Deposited Plan 152269, Grass Patch
Lot 33 on Deposited Plan 152269, Grass Patch
Holt Road Reserve (PIN 11687003), Salmon Gums
Merivale Road Reserve (PINs 1160577, 11647523, 11648533, 11648531), Merivale
Coramup Road Reserve (PIN 11644963), Gibson
Bulumann Road Reserve (PIN 11644306), Gibson
Scaddan Road Reserve (PIN 11644340), Scaddan
Fisheries Road (PIN 11645708), Howick

3. Clearing authorised

The permit holder must not clear more than:

- (a) 1.33 hectares of *native vegetation* within the area cross-hatched yellow in Figure 1 of Schedule 1.
- (b) 1.49 hectares of *native vegetation* within the area cross-hatched yellow in Figure 2 of Schedule 1.
- (c) 1.90 hectares of *native vegetation* within the area cross-hatched yellow in Figure 3 of Schedule 1.
- (d) 5.18 hectares of *native vegetation* within the area cross-hatched yellow in Figure 4 of Schedule 1.
- (e) 2.01 hectares of *native vegetation* within the area cross-hatched yellow in Figure 5 of Schedule 1.
- (f) 3.78 hectares of *native vegetation* within the area cross-hatched yellow in Figure 6 of Schedule 1.
- (g) 3.52 hectares of *native vegetation* within the area cross-hatched yellow in Figure 7 of Schedule 1.

4. Period during which clearing is authorised

The permit holder must not clear any *native vegetation* after 21 April 2028.

PART II – MANAGEMENT CONDITIONS

5. 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.

6. 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* as per the *Dieback and Invasive Weed Management Plan* prepared by the Shire of Esperance – December 2021, including but not limited to:

- (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.

7. Priority flora management

- (a) The permit holder must ensure that:
 - (i) the boundaries of the area to be cleared are identified and demarcated using a Global Positioning System (GPS) unit set to Geocentric Datum Australia2020

(GDA20), expressing the geographical coordinates in Eastings and Northings or decimal degrees

(ii) *recorded priority flora* are identified within the clearing boundary using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020 (GDA20), expressing the geographical coordinates in Eastings and Northings or decimal degrees

(b) When undertaking any clearing authorised under this permit, the permit holder must not cause or allow the clearing of more than the *recorded priority flora* within the clearing boundary.

8. Threatened Ecological Community management

The permit holder must not clear more than 2.39 hectares of native vegetation within the area cross-hatched yellow in Figure 1, Figure 2, Figure 3, Figure 4, Figure 5, Figure 6, and Figure 7 of Schedule 1 which represent the ‘Proteaceae Dominated Kwongan Shrubland of the southeast coastal floristic province of Western Australia’ Commonwealth listed Threatened Ecological Community.

9. Fauna management – black cockatoo foraging habitat

The permit holder must not clear more than 3.41 hectares of native vegetation within the area cross-hatched yellow in Figure 1, Figure 2, Figure 3, Figure 4, Figure 5, Figure 6, and Figure 7 of Schedule 1 that provides foraging habitat for *Zanda latirostris* (Carnaby’s cockatoo).

10. Wind erosion management

The permit holder must commence construction activities no later than three (3) months after undertaking the authorised clearing activities to reduce the potential for wind erosion.

11. Directional clearing

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

12. Offset – Lot 1985 on Deposited Plan 91222

Within 12 months of the commencement of clearing authorized under this permit and no later than 1 June 2024, the permit holder must provide to the *CEO* a copy of the executed change in purpose of Lot 1985 on Deposited Plan 91222 (Reserve 35302) from ‘gravel extraction’ to ‘conservation’ within the area cross-hatched red in Figure 1 of Schedule 2 .

13. Offset – Revegetation and rehabilitation

(a) The permit holder must *revegetate* and *rehabilitate* three (3) hectares of *native vegetation* in a degraded (Keighery, 1994) condition within the area cross-hatched orange in Figure 2 of Schedule 2 (Reserve 35302, Lot 1985 on Deposited Plan 91222) of this permit, of which provides:

(i) species which provide suitable foraging habitat for Carnaby’s black cockatoo, and

- (ii) species of the ‘Proteaceae Dominated Kwongkan Shrubland of the southeast coastal floristic province of Western Australia’ Threatened Ecological Community as described in *Approved Conservation Advice*.
- (b) The *revegetation* and *rehabilitation* required under condition 13(a) of this permit, must be undertaken in accordance with the *Rehabilitation Plan* prepared by the Shire of Esperance:
- (i) *revegetation* and *rehabilitation* activities required to commence prior to 21 April 2028;
 - (ii) undertake *revegetation* and *rehabilitation* activities at an *optimal time*;
 - (iii) undertake *weed* control activities to maintain the minimum criteria specified in Schedule 2 (Completion criteria);
 - (iv) undertake remedial actions for *revegetation* and *rehabilitation* areas where monitoring indicates the completion criteria, outlined in Schedule 2 (Completion criteria), has not been met including:
 - i. deliberately planting *native vegetation* that will result in the minimum targets specified in Schedule 2 (Completion criteria) ensuring only *local provenance* species are used;
 - ii. undertake further *weed* control activities
 - (v) be maintained in accordance with the specifications detailed in the *Rehabilitation Plan*, for a period of at least ten years.
 - (vi) where an *environmental specialist* has determined that the completion criteria, outlined in Schedule 2 (Completion criteria) has been met, that report is to be provided to the *CEO*.
 - (vii) if the *CEO* does not agree with the determinations made by an *environmental specialist* under condition 13(b)(iv) of this permit, the *CEO* may require the permit holder to repeat actions under conditions 13(a) and 13(b) of this permit.

PART III - RECORD KEEPING AND REPORTING

14. 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 | <ul 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 2020 (GDA20), expressing the geographical coordinates in Eastings and Northings; (c) the date that the area was cleared; (d) the date construction activities commenced; |

| No. | Relevant matter | Specifications |
|-----|---|--|
| | | <ul style="list-style-type: none"> (e) the direction of clearing; (f) the size of the area cleared (in hectares); (g) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 5; (h) actions taken to minimise the risk of the introduction and spread of <i>weeds</i> and <i>dieback</i> in accordance with condition 6; (i) the area of Carnaby's black cockatoo foraging habitat cleared in accordance with condition 8 of this permit; (j) the area of 'Proteaceae Dominated Kwongkan Shrubland of the southeast coastal floristic province of Western Australia' TEC cleared in accordance with condition 9 of this permit; and (k) actions taken in accordance with condition 12 of this permit. |
| 2. | In relation to flora management pursuant to condition 7 | <ul style="list-style-type: none"> (a) the name and location of each priority flora species, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020 (GDA20), expressing the geographical coordinates in Eastings and Northings; (b) actions taken to demarcate the clearing boundary and <i>priority flora species</i> in accordance with condition 7(a) of this permit; (c) actions taken to avoid the clearing of priority flora species; and (d) the number of priority flora plants cleared in accordance with condition 7(b) of this permit |
| 3. | In relation to rehabilitation pursuant to condition 13 | <ul style="list-style-type: none"> (a) a description of the <i>revegetation</i> and <i>rehabilitation</i> activities undertaken; (b) the size of the areas <i>revegetated</i> and <i>rehabilitated</i> (in hectares); (c) the date that <i>revegetation</i> and <i>rehabilitation</i> works began; (d) any remediation works undertaken; (e) a copy of <i>environmental specialist</i> reports; and (f) the date that completion criteria are considered to be met. |

15. Reporting

The permit holder must provide to the *CEO* the records required under condition 14 of this permit when requested by the *CEO*.

DEFINITIONS

In this permit, the terms in Table 2 have the meanings defined.

Table 2: Definitions

| Term | Definition |
|---|--|
| approved conservation advice | means Approved Conservation Advice for the ‘Proteaceae Dominated Kwongkan Shrubland of the southeast coastal floristic province of Western Australia’ Threatened Ecological Community, available at: Proteaceae Dominated Kwongkan Shrubland: a nationally-protected ecological community (dcceew.gov.au) |
| 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. |
| dieback | means the effect of <i>Phytophthora</i> species on native vegetation. |
| Dieback and Invasive Weed Management Plan | means the Dieback and Invasive Weed Management Plan produced by the Shire of Esperance for this permit and approved by the <i>CEO</i> ‘Shire of Esperance (2022c) <i>Dieback and Invasive Weed Management Plan CPS 9341/1</i> , received 5 September 2022 (DWER Ref: DWERDT654939). |
| 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. |
| environmental specialist | means a person who holds a tertiary qualification in environmental science or equivalent and has 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. |
| EP Act | <i>Environmental Protection Act 1986</i> (WA) |
| fill | means material used to increase the ground level, or to fill a depression. |
| local provenance | means native vegetation seeds and propagating material from natural sources within 50 kilometres and the same Interim Biogeographic Regionalisation for Australia (IBRA) subregion of the area cleared. |
| 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 optimal time for undertaking direct seeding and planting for that region. |
| planting(s)/plant | means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of the desired species. |
| priority flora | means those plant taxa described as priority flora classes 1, 2, 3, or 4 in the Department of Biodiversity, Conservation and Attractions Threatened |

| Term | Definition |
|---------------------|---|
| | and Priority Flora List for Western Australia (as amended from time to time). |
| recorded | <p>means individuals of those <i>priority flora</i> species found within the area cross-hatched yellow in Figures 1-7 of Schedule 1 during the following surveys:</p> <ul style="list-style-type: none"> (a) Shire of Esperance (2021a) <i>Supporting information (survey – site B) for clearing permit application CPS 9341/1</i>, received 24 June 2021 (DWER Ref: A2033234). (b) Shire of Esperance (2021b) <i>Supporting information (survey – site E) for clearing permit application CPS 9341/1</i>, received 24 June 2021 (DWER Ref: A2033236). (c) Shire of Esperance (2021c) <i>Supporting information (survey – site O) for clearing permit application CPS 9341/1</i>, received 24 June 2021 (DWER Ref: A2033237). (d) Shire of Esperance (2021d) <i>Supporting information (survey – site P) for clearing permit application CPS 9341/1</i>, received 24 June 2021 (DWER Ref: A2033239). (e) Shire of Esperance (2021e) <i>Supporting information (survey – site S) for clearing permit application CPS 9341/1</i>, received 24 June 2021 (DWER Ref: A2033240). (f) Shire of Esperance (2021f) <i>Supporting information (survey – site V) for clearing permit application CPS 9341/1</i>, received 24 June 2021 (DWER Ref: A2033241). (g) Shire of Esperance (2021g) <i>Supporting information (survey – site X) for clearing permit application CPS 9341/1</i>, received 24 June 2021 (DWER Ref: A2033241). (h) Shire of Esperance (2022a) <i>Supporting information - response to request for further information</i>, received 11 August 2022 (DWER Ref: DWERDT643954). |
| Rehabilitation Plan | means the rehabilitation plan produced by the Shire of Esperance for this permit and approved by the CEO 'Shire of Esperance (2022b) <i>Rehabilitation plan CPS 9341/1</i> , received 5 September 2022 (DWER Ref: DWERDT717245)'. |
| rehabilitation | means actively managing an area containing native vegetation in order to improve the ecological function of that area using methods such as natural regeneration, direct seeding and/or planting, so that the species composition, structure and density is similar to pre-clearing vegetation types in that area |
| revegetation | means the re-establishment of a cover of local provenance native vegetation in an area using methods such as natural regeneration, direct seeding and/or planting, so that the species composition, structure and density is similar to pre-clearing vegetation types in that area. |
| weeds | <p>means any plant –</p> <ul style="list-style-type: none"> (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, appearing to read 'Mathew Gannaway', written over a horizontal line.

Mathew Gannaway
MANAGER
NATIVE VEGETATION REGULATION

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

28 March 2023

Schedule 1

The boundary of the area authorised to be cleared is shown in the map below (Figure 1-7).

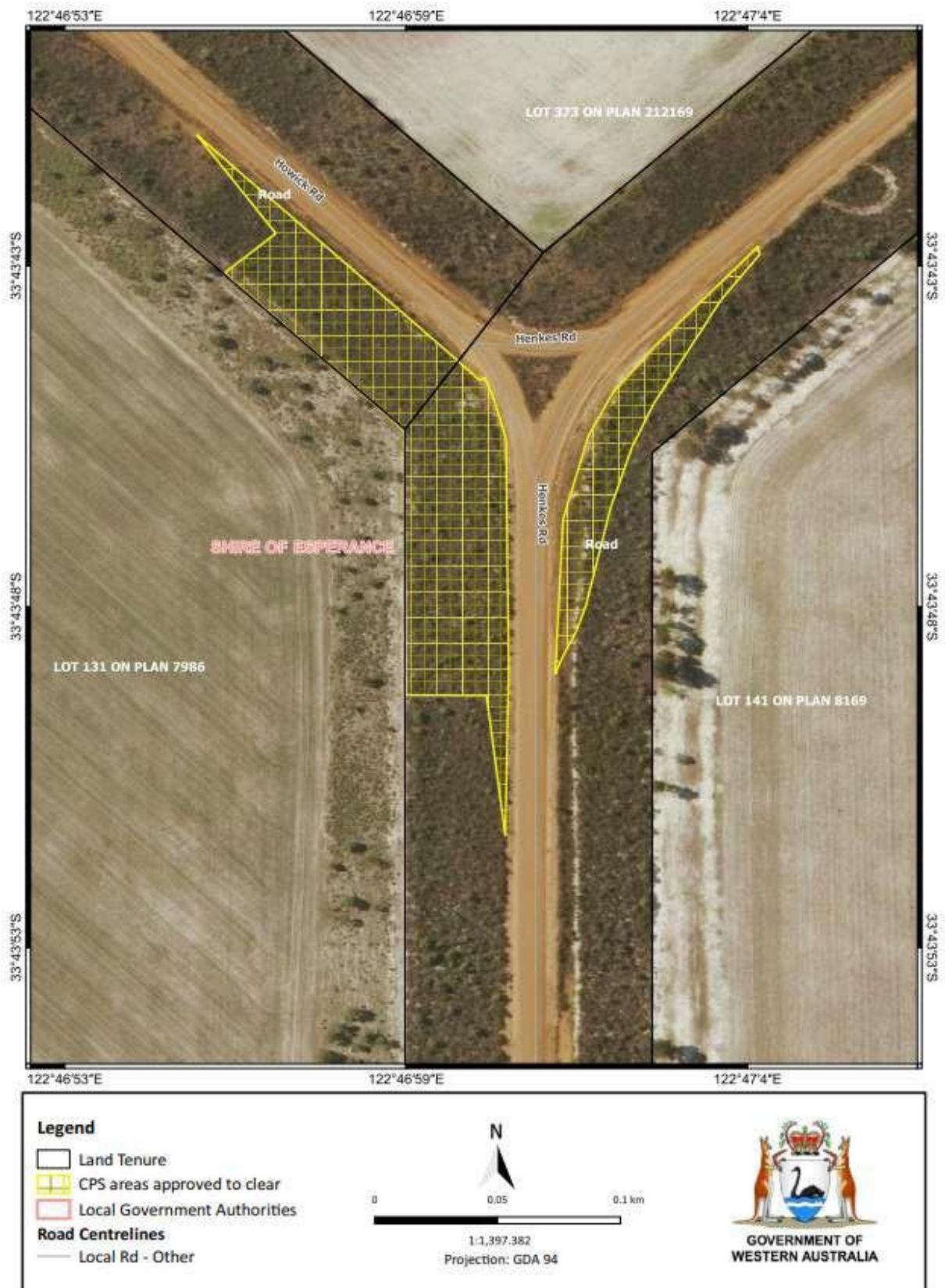


Figure 1: Map of the boundary of the area within which clearing may occur



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

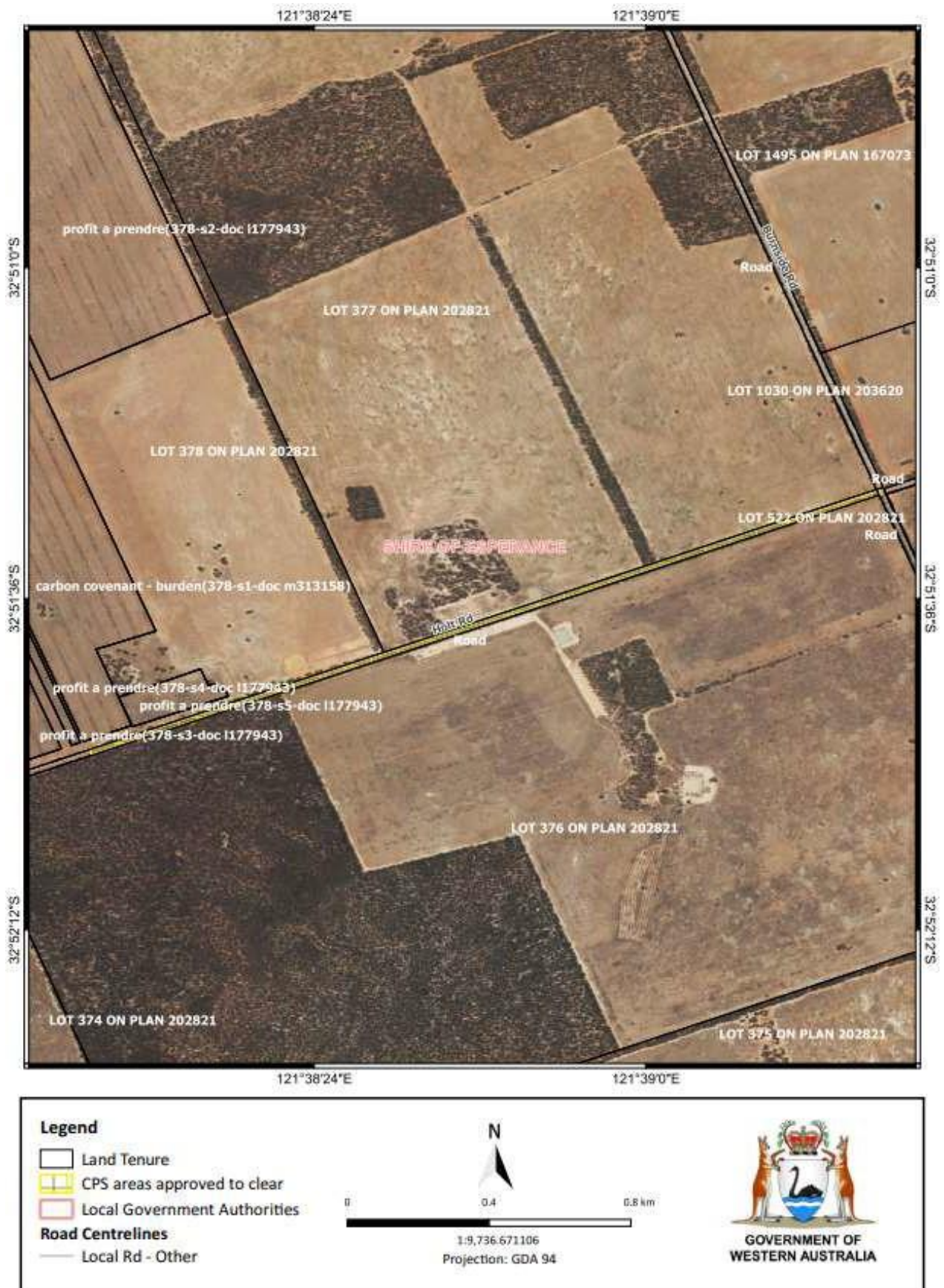


Figure 3: Map of the boundary of the area within which clearing may occur

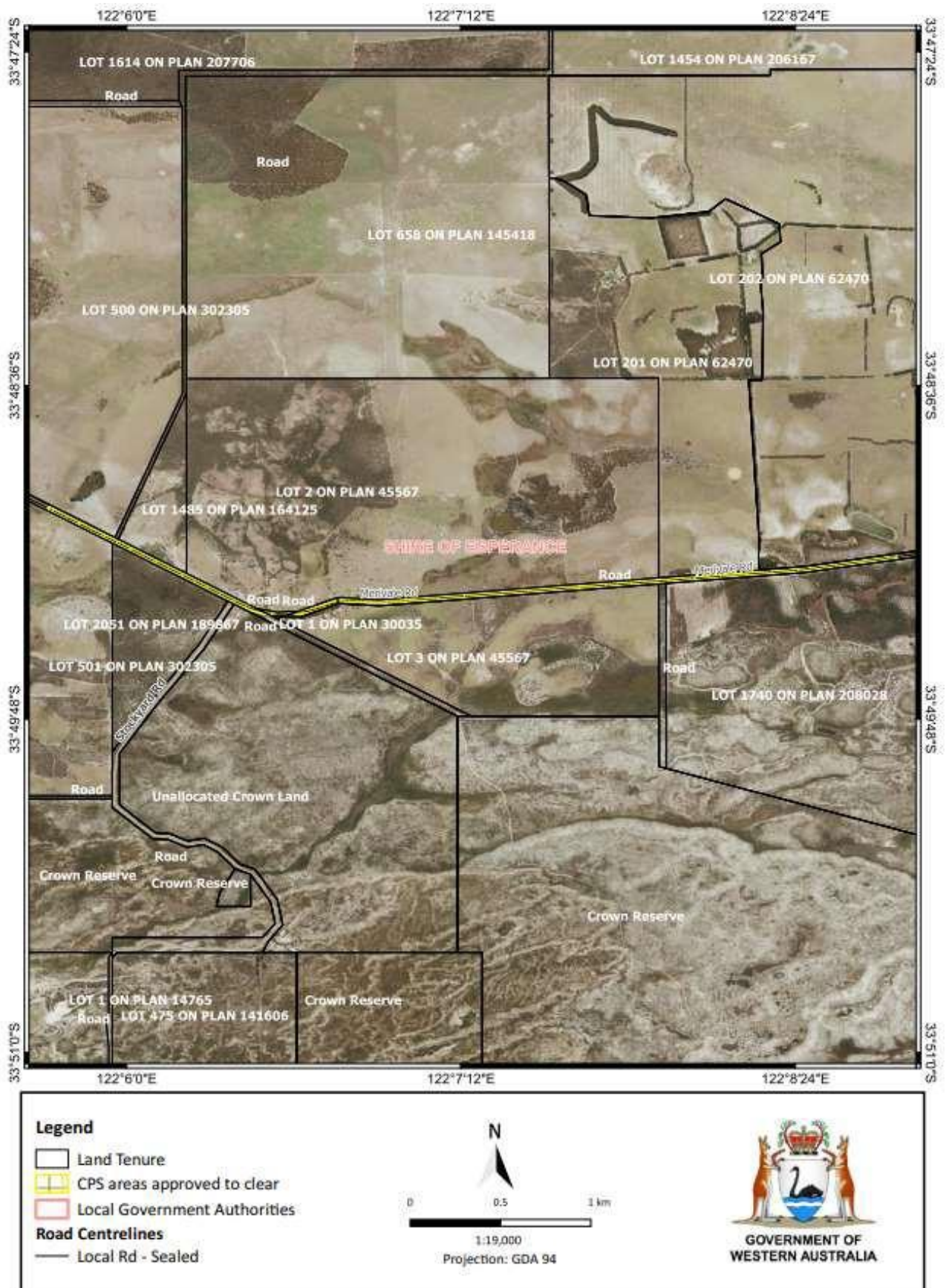


Figure 4: Map of the boundary of the area within which clearing may occur

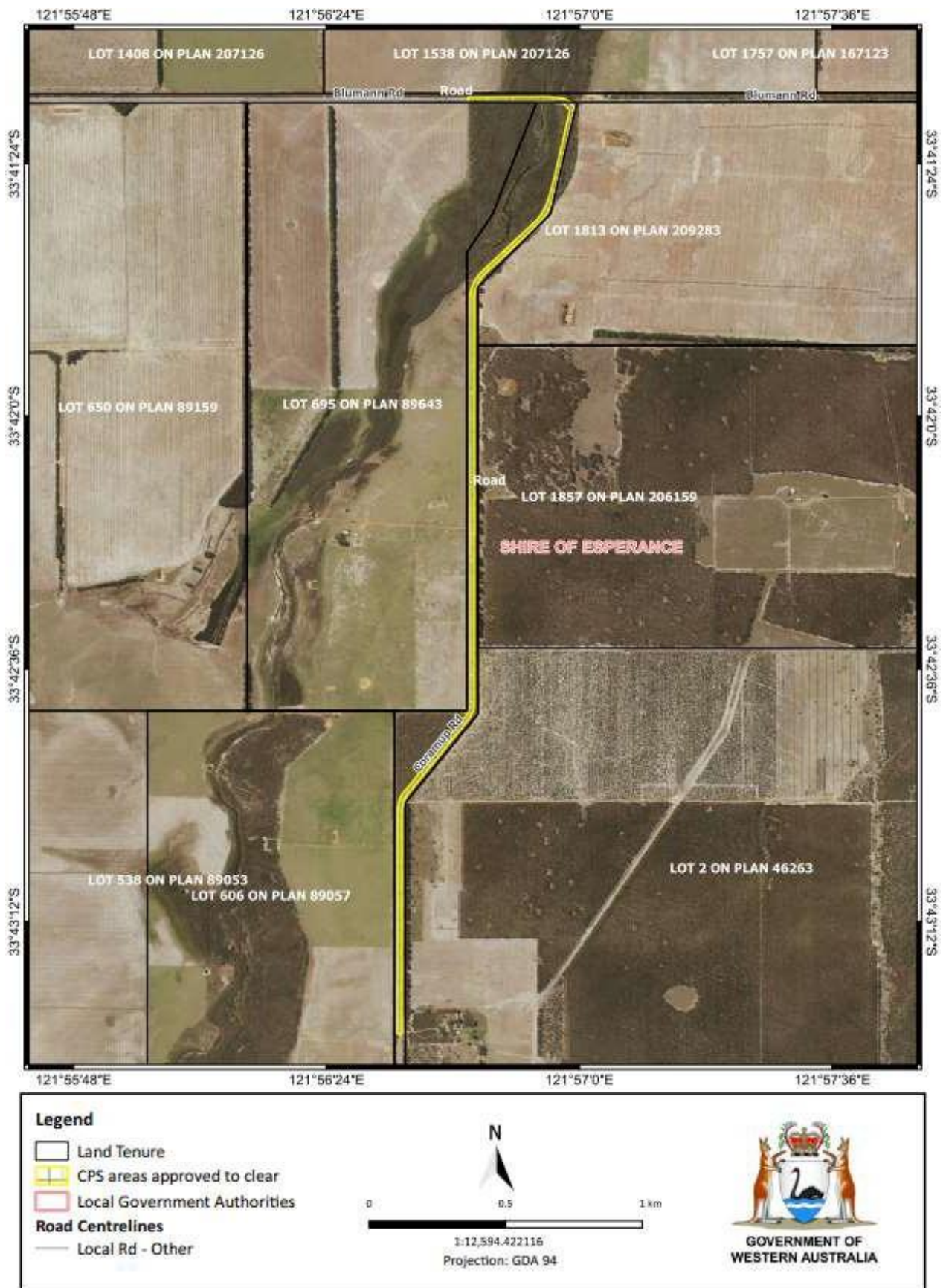


Figure 5: Map of the boundary of the area within which clearing may occur

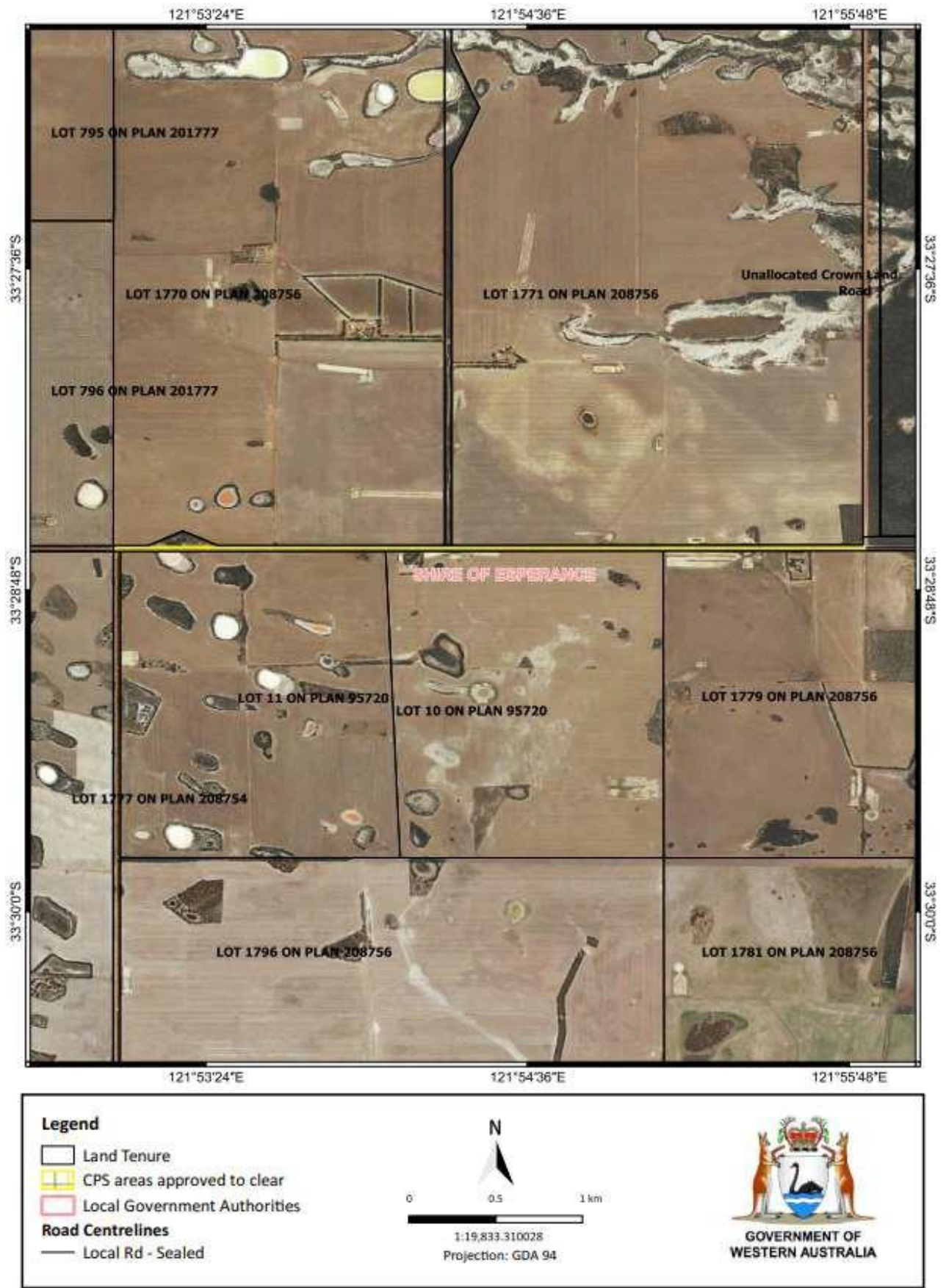


Figure 6: Map of the boundary of the area within which clearing may occur

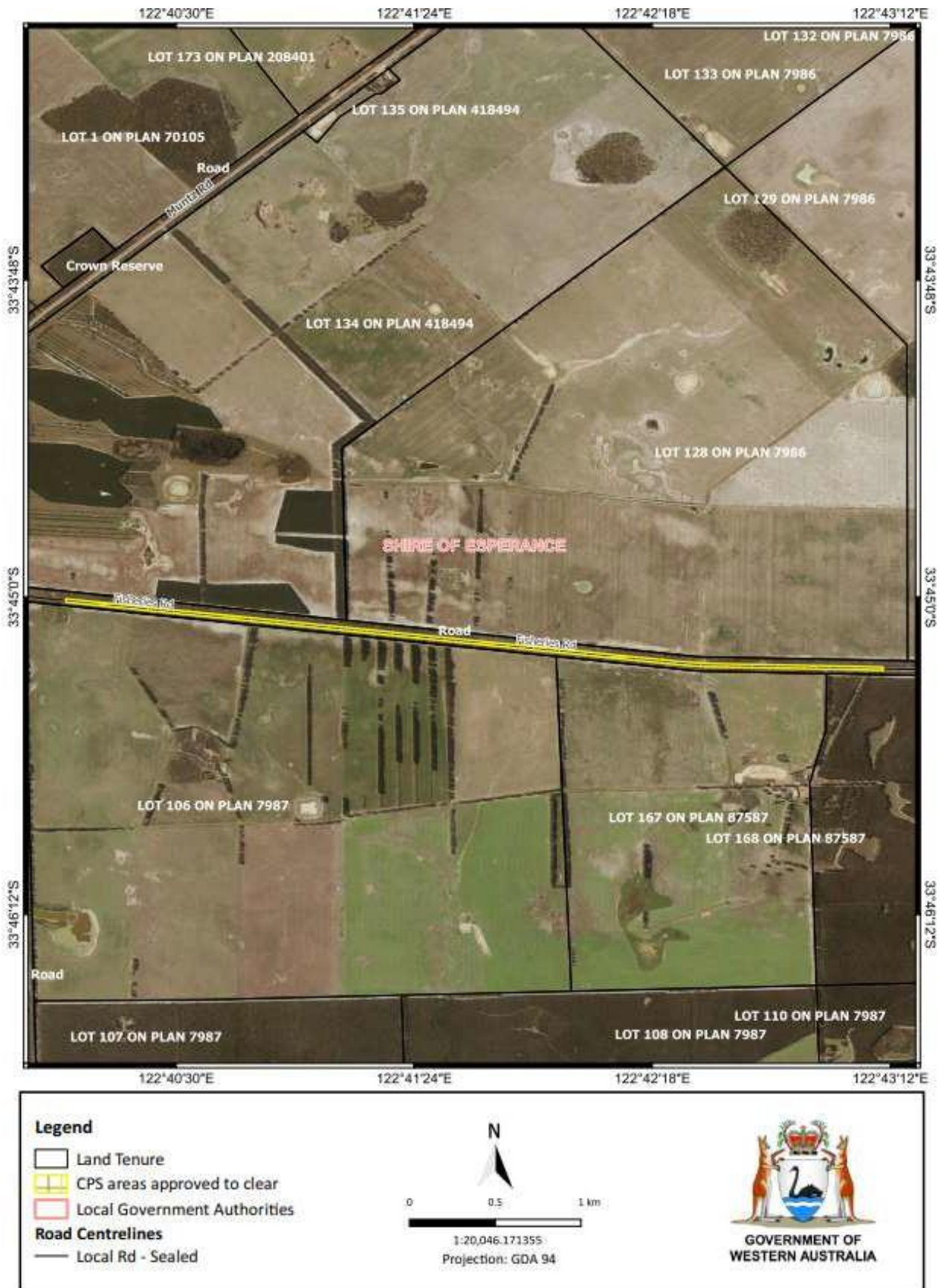


Figure 7: Map of the boundary of the area within which clearing may occur

Schedule 2

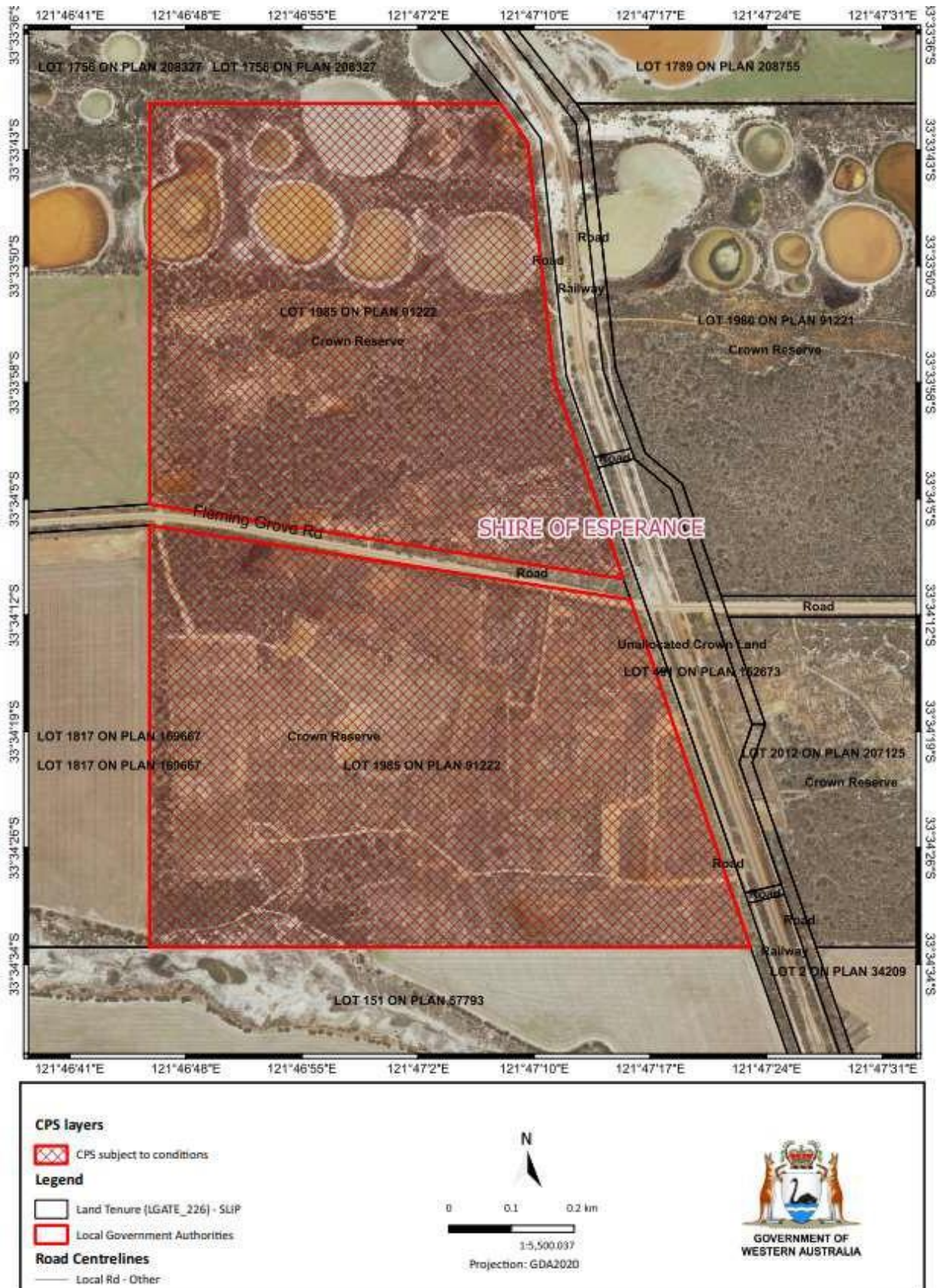


Figure 1: Map of the boundary of the area within which conditions occur

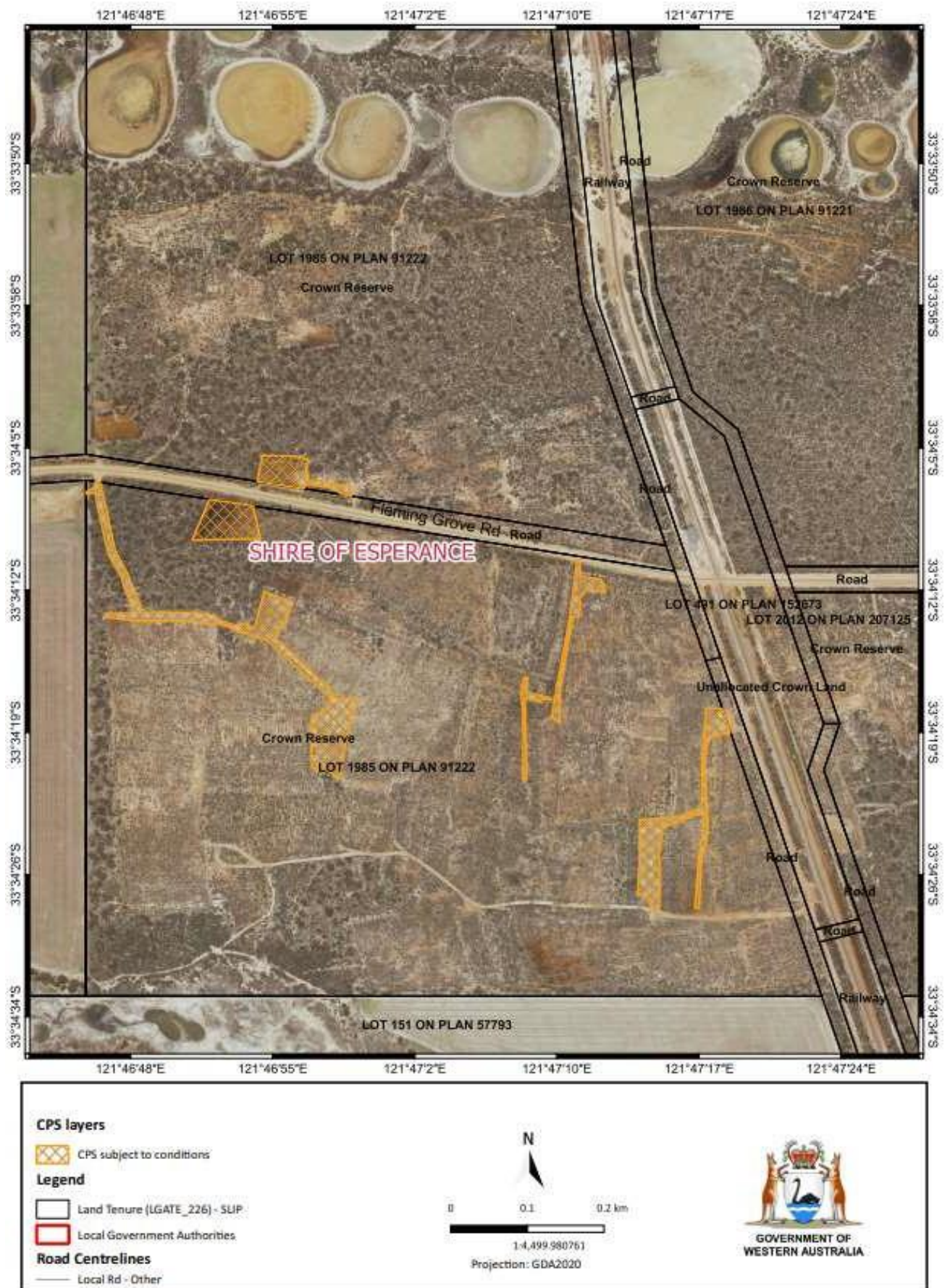


Figure 2: Map of the boundary of the area within which conditions occur

Schedule 3

Table 1: Completion criteria for the rehabilitation within the areas cross-hatched orange in Figure 2 of Schedule 2.

| Criterion | Baseline Floristic data | Completion Target | Completion Criteria |
|-----------|---|--|--|
| 1 | No baseline data exists, however based on the soil types and surrounding vegetation the site was likely to contain the Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia (Kwongkan)' threatened ecological community prior to clearing. | 80% of the Site meets the Key diagnostic characteristics and condition thresholds for Kwongkan TEC, using criterion 2b of the Approved Conservation advice for Kwongkan TEC. Note criterion 2b is used due to the disturbance. | 80% of the revegetation site has two or more diagnostic Proteaceae species present within a 0.05 ha area. This is to be achieved by 4 years post ripping. |
| 3 | <i>Eucalyptus pleurocarpa</i> and/or <i>Eucalyptus incrassata</i> or <i>Eucalyptus leptocalyx</i> is present as the dominant tree species in Vegetation A | Return of dominant tree species | <i>Eucalyptus pleurocarpa</i> , <i>Eucalyptus leptocalyx</i> and/or <i>Eucalyptus incrassata</i> is present in the rehabilitation area scattered throughout at a density of one tree per 500m ² |
| 4 | Some weeds at site but in low density | Significant Environmental weed species are absent from the revegetation site. | No <i>Acacia pycnantha</i> , <i>lavender</i> , <i>Pinus pinaster</i> , succulents, or rose pelargonium are found in the rehabilitation area |
| 5 | Planned revegetation sites have some weeds at site but in low density | No weeds mapped in Figure 14 of the Offset proposal are present. Weed cover within Reserve 35302 is restricted to edge effects from neighboring farmland and there will be no new weed species introduced to site | No new seedlings or resprouting of weeds mapped in Figure 14 of the Offset proposal. If new weeds are introduced to the site, monitoring quadrants will be installed to ensure control is effective |
| 6 | Planned revegetation sites currently have 0% ground cover | Ground cover after 10 years to be greater than 50%. | NDVI will be quantified using multispectral camera mounted on drone. |
| 7 | Planned revegetation sites vegetation condition is currently "Completely Destroyed" | Planned revegetation sites vegetation condition to meet "good" condition in 4 years and "very good" within 10 years. | |



Clearing Permit Decision Report

1 Application details and outcome

F.1. Permit application details

| | |
|-------------------------------|--|
| Permit number: | CPS 9341/1 |
| Permit type: | Purpose permit |
| Applicant name: | Shire of Esperance |
| Application received: | 24 June 2021 |
| Application area: | 19.21 (revised) hectares of native vegetation |
| Purpose of clearing: | Road widening |
| Method of clearing: | Mechanical |
| Property: | Henke Road Reserve (PIN 11645173), Howick Howick Road Reserve (PIN 11644424), Howick Grass Patch Road (PIN 11417154), Grass Patch Lots 34 and 33 on Deposited Plan 152269, Grass Patch Holt Road Reserve (PIN 11687003), Salmon Gums Merivale Road Reserve (PINs 1160577, 11647523, 11648533 and 11648531, Merivale Coramup Road Reserve (PIN 11644963), Gibson Bulumann Road Reserve (PIN 11644306), Gibson Scaddan Road Reserve (PIN 11644340), Scaddan Fisheries Road (PIN 11645708), Howick |
| Location (LGA area/s): | Shire of Esperance |
| Localities (suburb/s): | Howick, Grass Patch, Salmon Gums, Merivale, Gibson and Scaddan |

F.2. Description of clearing activities

Clearing of up to 19.21 hectares of native vegetation is required to meet current road safety design specifications in accordance with Austroads Guide to Road Design. The proposed clearing occurs over several road reserves within the Shire of Esperance. Of these, five sites (site O, P, S, V and X) are comprised of long and linear clearing areas with the remaining two sites comprise discrete patches of vegetation (see Table 1 and Figures 1a–1g).

Table 1. Amount of clearing proposed within each application area

| Site | Property | Clearing |
|--|---|-----------------------------------|
| site B - Henkes Road and Howick intersection | Henkes Road Reserve (PIN 11645173) Howick Road Reserve (PIN 11644424) | 1.33 ha |
| site E - Grass Patch Road | Grass Patch Road (PIN 11417154) Lot 34 on Deposited Plan 152269 Lot 33 on Deposited Plan 152269 | 1.49 ha within 2.28 ha footprint |
| site O - Holt Road | Holt Road Reserve (PIN 11687003) | 1.90 ha within 3.85 ha footprint |
| site P - Merivale Road | Merivale Road Reserve (PIN 1160577, 11647523, 11648533, 11648531) | 5.18 ha within 10.91 ha footprint |

| Site | Property | Clearing |
|-------------------------|---|---|
| site S - Coramup Road | Coramup Road Reserve (PIN 11644963) Bulumann Road Reserve (PIN 11644306) | 2.01 ha within 7.84 ha footprint |
| site V - Scaddan Road | Scaddan Road Reserve (PIN 11644340) | 3.78 ha within 9.08 ha footprint |
| site X - Fisheries road | Fisheries Road (PIN 11645708) | 3.52 ha within 10.58 ha footprint |
| Total area | | 19.21 ha within a 44.54 ha footprint |

F.3. Decision on application

| | |
|-----------------------|--|
| Decision: | Granted |
| Decision date: | 28 March 2023 |
| Decision area: | 19.21 hectares of native vegetation as depicted in Section 1.5, below. |

F.4. Reasons for decision

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

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix C), relevant datasets (see Appendix H.1), the findings of a flora, fauna and vegetation survey (see Appendix G), the clearing principles set out in Schedule 5 of the EP Act (see Appendix D), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3). The Delegated Officer also took into consideration the purpose of the clearing which is to improve road safety across multiple roads within the Shire of Esperance.

After consideration of the above information, as well as the avoidance, minimisation and mitigation actions taken by the Shire of Esperance, the Delegated Officer determined that the proposed clearing will result in the following significant residual impacts:

- the loss of 3.41 hectares of native vegetation that provides foraging habitat for Carnaby's black cockatoo
- the loss of 2.39 hectares of native vegetation that is representative of the Commonwealth listed threatened ecological community (TEC) 'Proteaceae Dominated Kwongkan Shrublands of the southeast coastal floristic province of Western Australia' (Kwongkan Shrubland)
- the combined loss of 10.18 hectares of significant remnant of native vegetation in an extensively cleared landscape

In accordance with the Government of Western Australia's *Environmental Offsets Policy and Environmental Offsets Guidelines*, the Delegated Officer determined that the following land acquisition and rehabilitation offsets are required to address the above significant residual impacts:

- the change in Crown Reserve vesting from 'gravel' to 'conservation' comprising of 44.90 hectares of native vegetation (Crown Reserve 35302), which provides:
 - excellent condition (Keighery, 1994) vegetation in a highly cleared area within the Shire of Esperance
 - a total of 11.88 hectares of Carnaby's black cockatoo foraging habitat (Excellent to Very Good condition)
 - a total of 5.89 hectares of Kwongkan Shrubland TEC (Pristine to Good condition)
- rehabilitation of three hectares of completely degraded areas within the larger offset area referred to above (Crown Reserve 35302).

The offset proposal provided by the Shire of Esperance (Shire of Esperance, 2022a) exceeded the above requirements, with a proposal to place a 116.75 hectare area of vegetation (majority of the vegetation is in excellent condition) in a highly cleared area within the Shire of Esperance that provides:

- a total of 68.60 hectares of Carnaby's black cockatoo foraging habitat (Excellent to Very Good condition)
- a total of 86.75 hectares of Kwongkan Shrubland TEC (Pristine to Good condition)
- rehabilitation of three hectares of completely degraded areas within the larger offset area referred to above (Crown Reserve 35302).

The Delegated Officer determined that the above offset was sufficient to counterbalance the significant residual impacts associated with this project. Further information on the suitability of the offsets provided are summarised in Section 4.

The Delegated Officer determined that the proposed clearing may also result in the following impacts:

- potential indirect impacts to the surrounding flora, including but not limited to the conservation significant flora and Kwongan Shrubland TEC, from risk of the introduction and spread of weeds and dieback into adjacent native vegetation
- potential risk of land degradation from minor wind erosion, and
- potential direct impacts to fauna utilising the application area during the time of clearing.

The Delegated Officer therefore decided to grant a clearing permit subject to the following conditions, which have been imposed on the clearing permit, to manage and address the impacts of clearing:

- avoid and minimise measures to reduce the impacts and extent of clearing
- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback
- construction activities to occur within three months of clearing to minimise wind erosion risks
- undertake slow, progressive one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity
- provision of an offset, as outlined above.

Given the above and noting that the offset provided (see Section 4) counterbalances the significant residual impacts, the Delegated Officer determined that the proposed clearing is unlikely to lead to an unacceptable risk to the environment.

F.5. Site maps

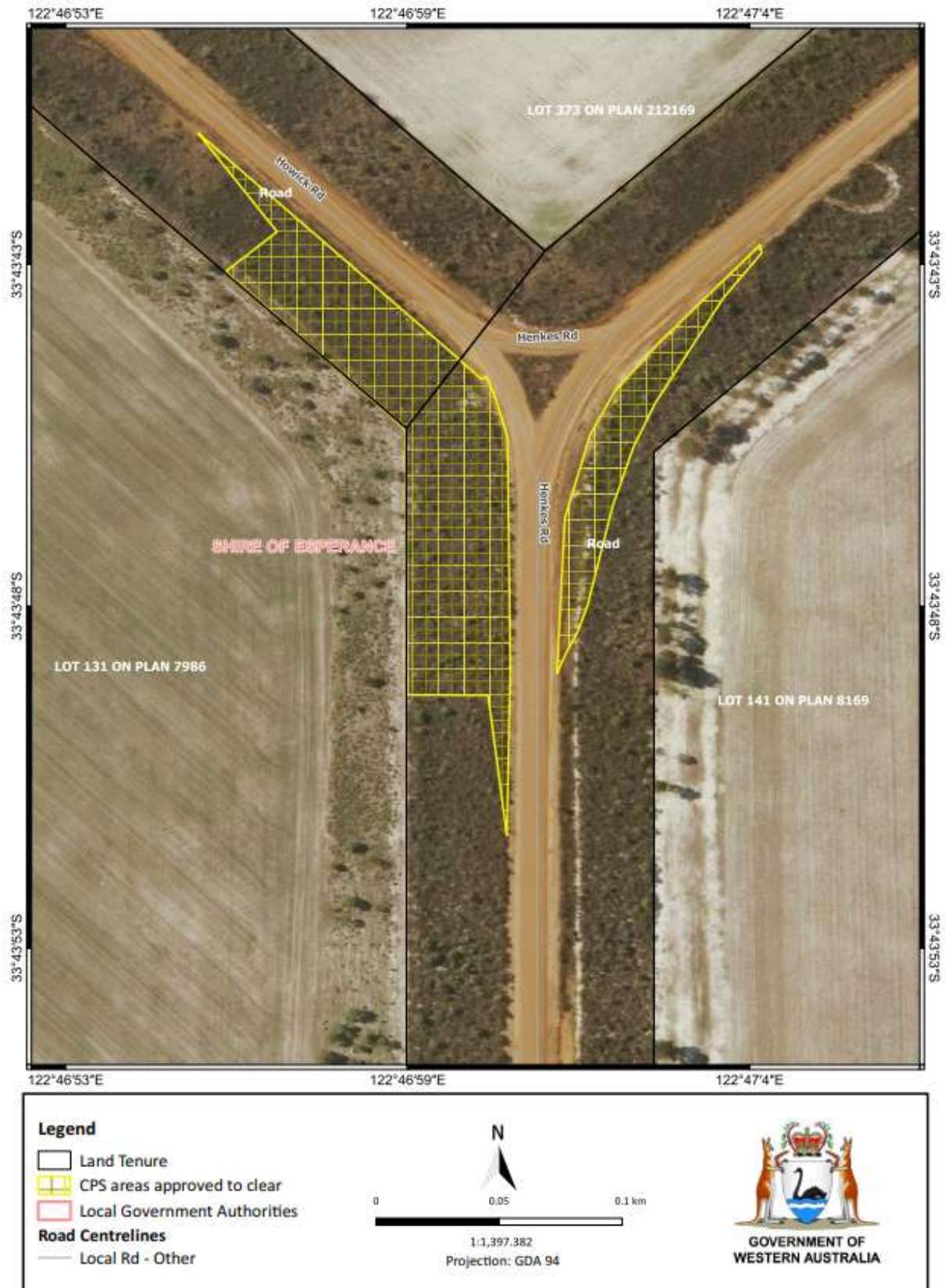


Figure 1a. Map of the application area (Howick and Henke road intersection, site B)
The area crosshatched yellow indicates the area authorised to be cleared under the granted clearing permit.



Figure 1b. Map of the application area (Grass Patch road, site E)
The area crosshatched yellow indicates the area authorised to be cleared under the granted clearing permit.

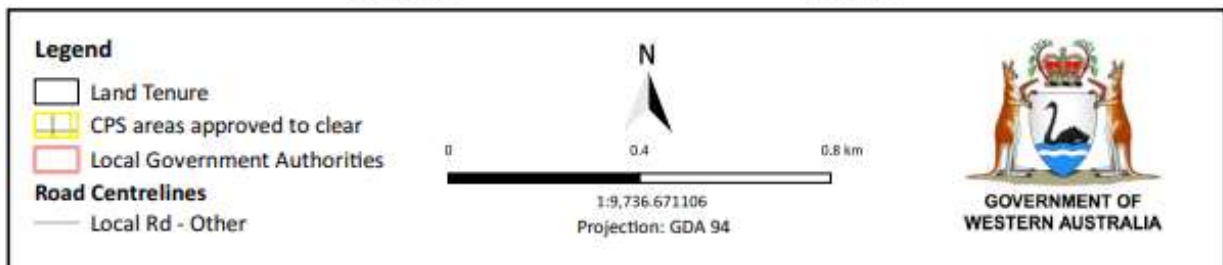
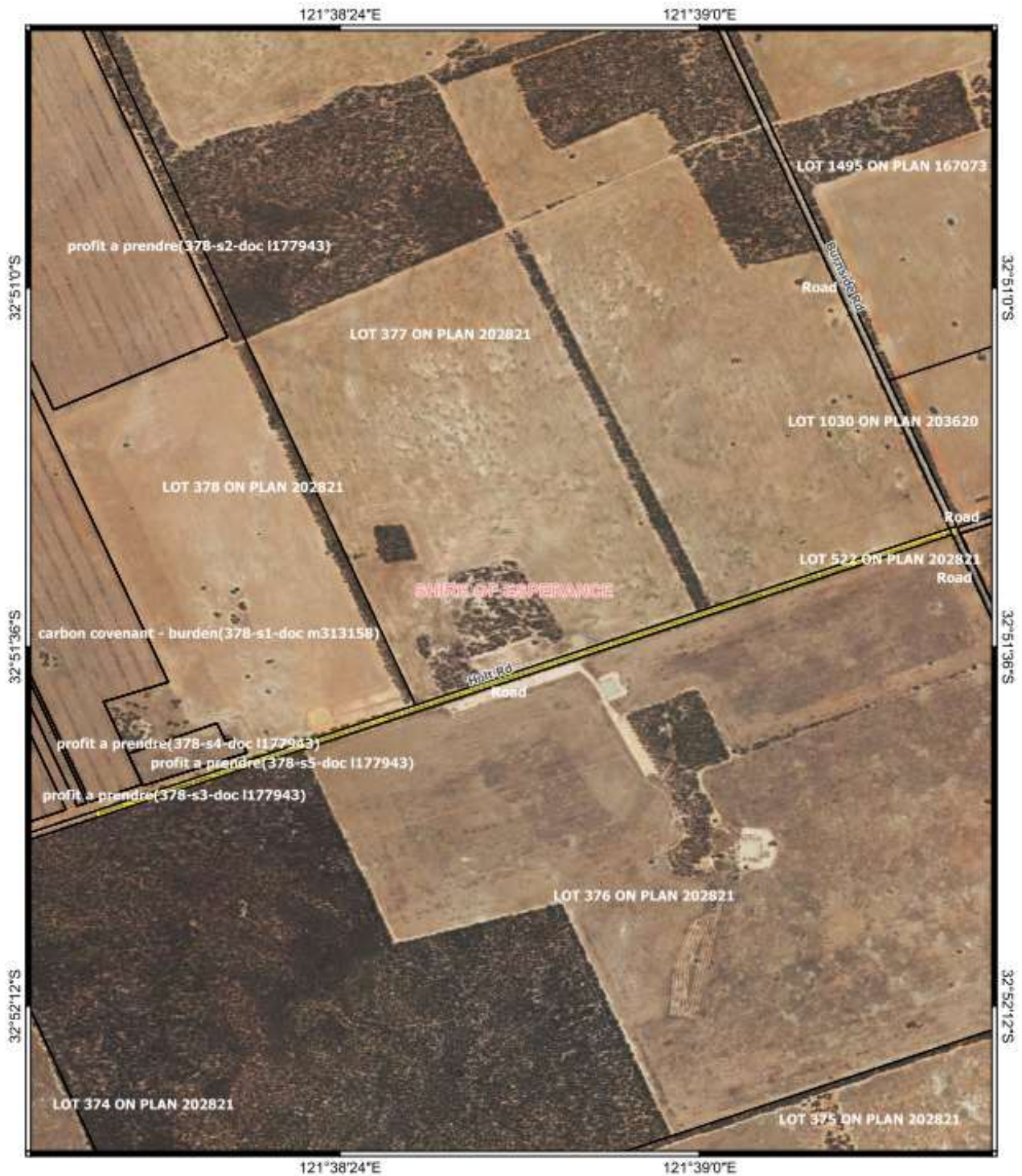


Figure 1c. Map of the application area (Holt road, site O)
 The area crosshatched yellow indicates the area authorised to be cleared under the granted clearing permit.

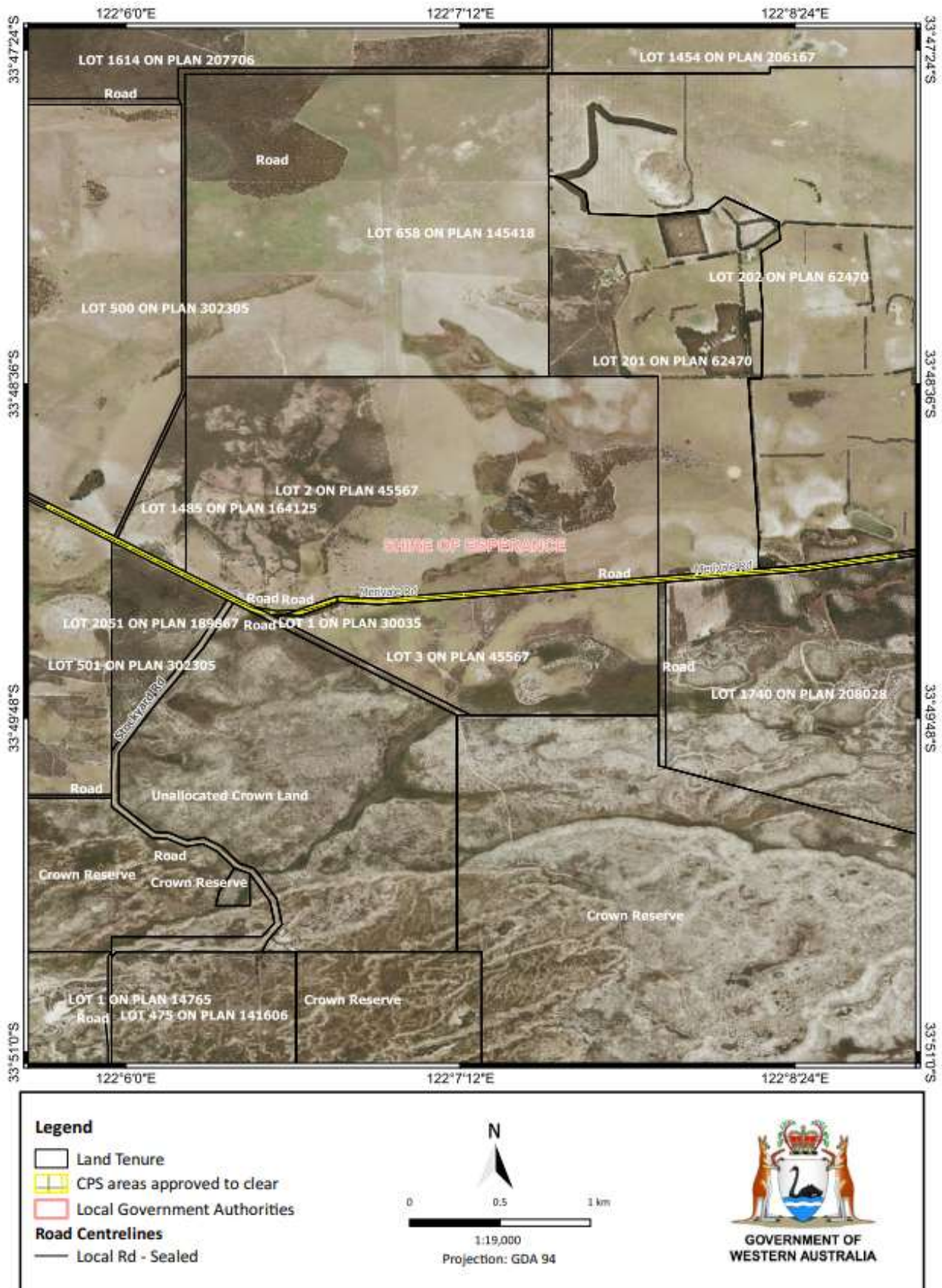


Figure 1d. Map of the application area (Merivale road, site P)
The area crosshatched yellow indicates the area authorised to be cleared under the granted clearing permit.

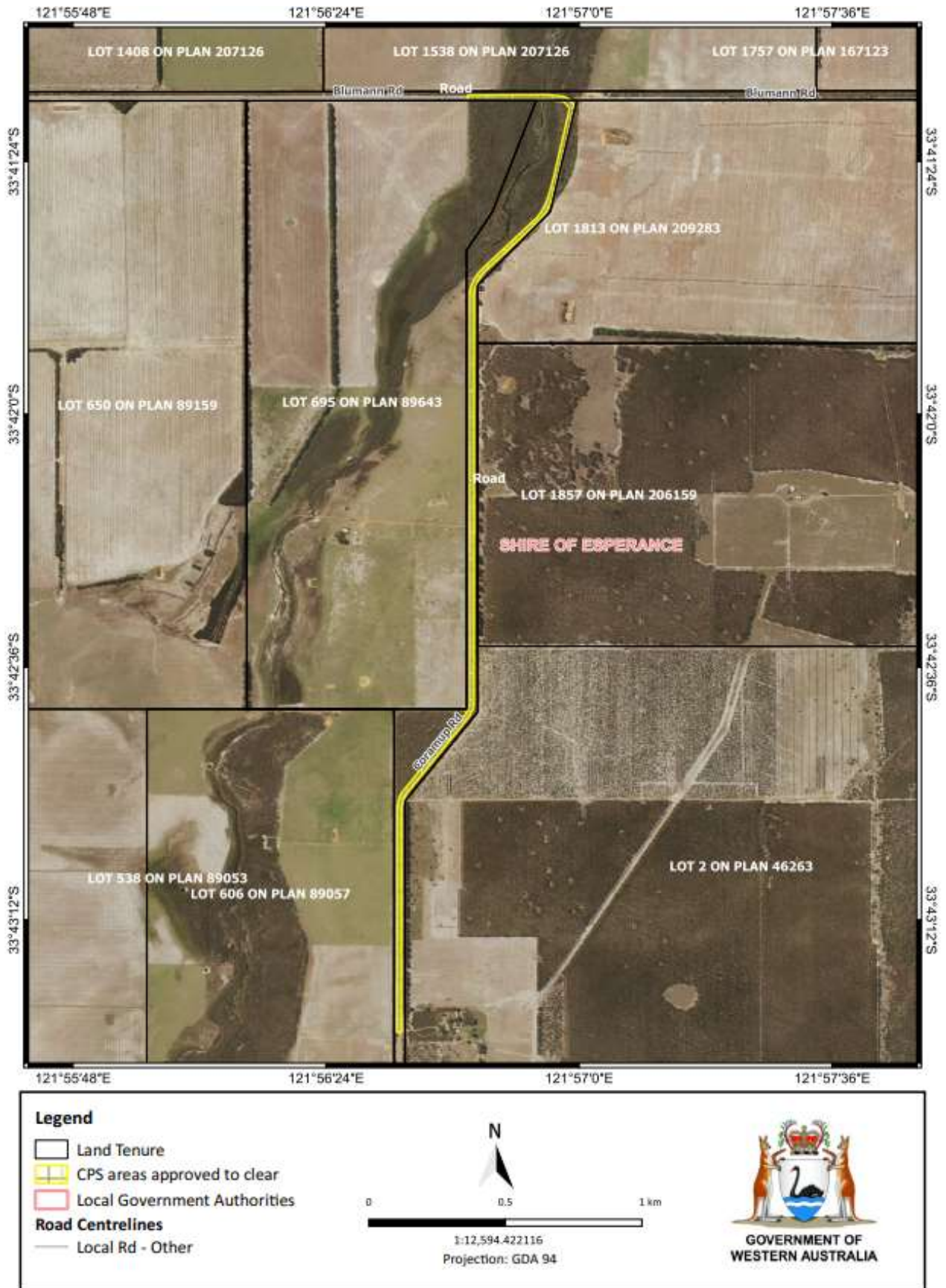


Figure 1e. Map of the application area (Coramup road, site S)
 The area crosshatched yellow indicates the area authorised to be cleared under the granted clearing permit.

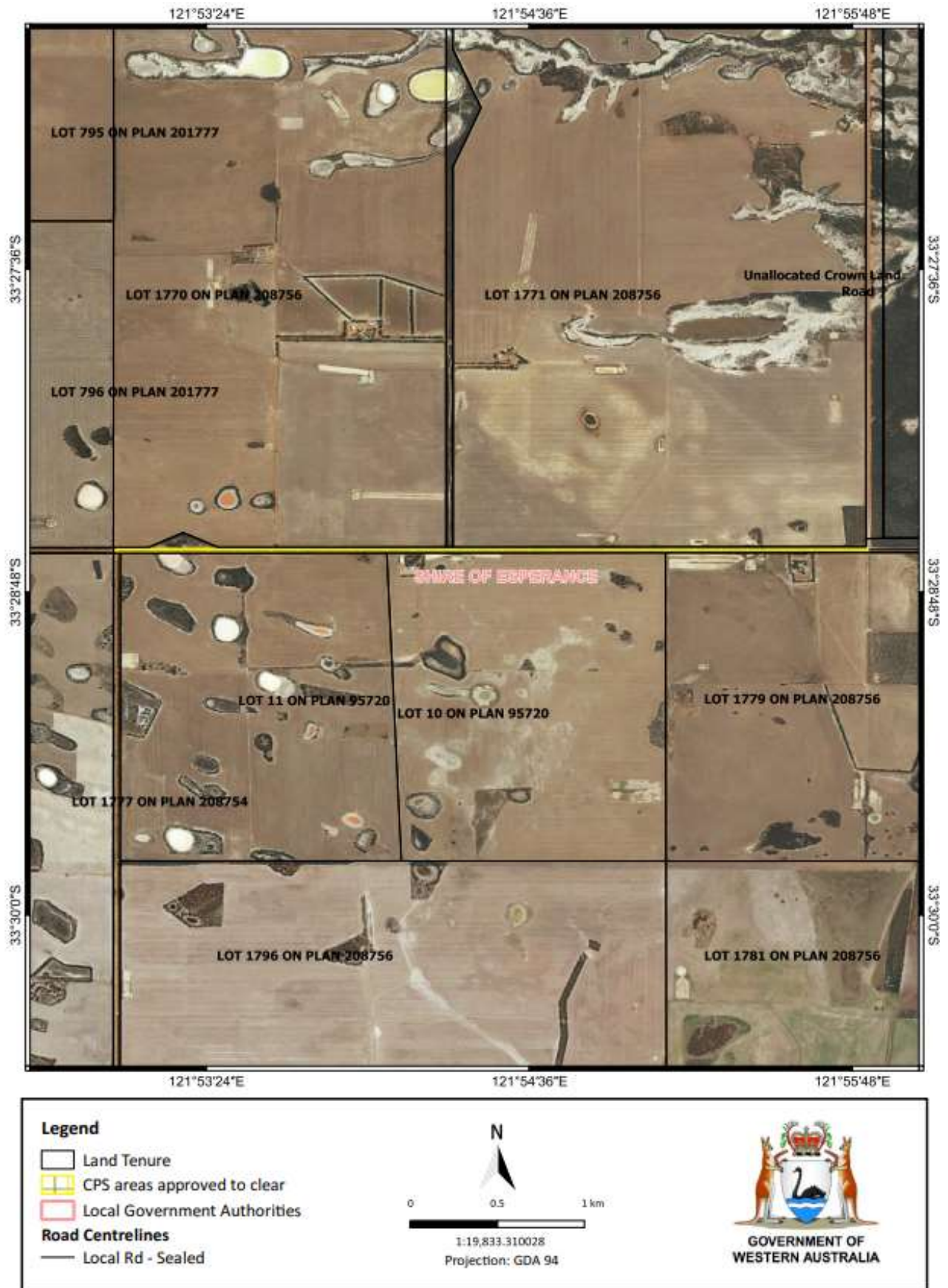


Figure 1f. Map of the application area (Scaddan road, site V)
 The area crosshatched yellow indicates the area authorised to be cleared under the granted clearing permit.

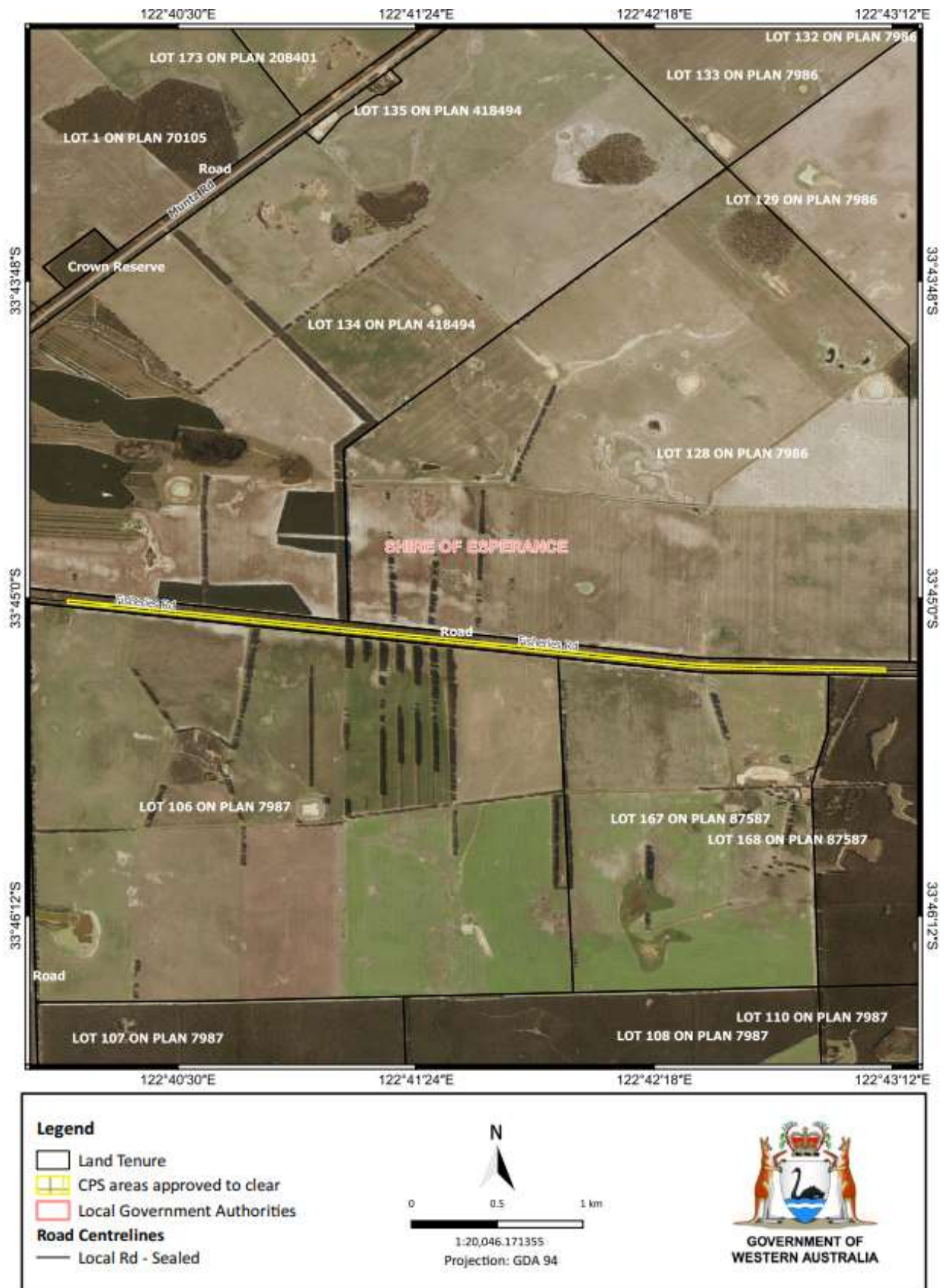


Figure 1g. Map of the application area (Fisheries road, site X)
 The area crosshatched yellow indicates the area authorised to be cleared under the granted clearing permit.

2 Legislative context

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

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

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

Other legislation of relevance for this assessment include:

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

Relevant policies considered during the assessment include:

- *Environmental Offsets Policy* (2011)

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)
- *Environmental Offsets Guidelines* (August 2014)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2016)

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

The Shire of Esperance (the Shire) initially applied to clear 32.89 hectares of native vegetation which would have resulted in the following significant residual impacts:

- the loss of 9.17 hectares of native vegetation that provides significant foraging habitat for Carnaby's cockatoo
- the loss of 6.88 ha of native vegetation that is representative of the Kwongkan Shrublands TEC

The applicant later revised the application area to 19.21 hectares to reduce the significant residual impacts to:

- the loss of 3.41 ha of native vegetation that provides significant foraging habitat for Carnaby's cockatoo
- the loss of 2.39 ha of native vegetation that is representative of the Kwongkan Shrublands TEC

The applicant achieved the reduction in clearing area through excluding sites C and W, and further revision of the proposed clearing of sites B and V. In particular, the clearing area of site B was considerably reduced from 5.30 hectares to 1.33 hectares, thereby avoiding impacts to the Priority Ecological Community "Swamp Yate (*Eucalyptus occidentalis*) woodlands in seasonally inundated clay basins (South Coast)" and three priority flora species, *Grevillea baxteri* (P4), *Isopogon alpicornis* (P3), and *Persoonia scabra* (P3). The proposed clearing at site V was reduced from 3.84 hectares to 3.78 hectares, with the footprint reduced from 28 metres to 21 metres.

The Shire (2021) advised that steep cut and fill batters will be used to reduce the amount of clearing required. The Shire further advised that no advantages for clearing one side of the road have been identified as the same amount of clearing would be required and there is significant cost associated with realigning the road with drainage, establishing levels and earthworks.

Regarding site E, the Shire (2021) advised that due to drought tanks and other infrastructure getting placed in the existing cleared area, clearing of native vegetation is needed for materials storage. No nearby cleared Shire land exists and no private landowners were willing to allow the Shire of Esperance to use their land for this purpose. The clearing extent has been minimised through design of the laydown area, but some clearing will still be necessary.

The Shire (2021) also provided the following specific avoid/minimise information regarding several of the sites:

- site 0 - the Shire has already reduced the proposed impact at this site. After initial discussions, the proposed width of widening has been reduced from 20 metres to 16 metres to preserve 2 metres on either side of the road, to preserve the native vegetation of the road reserve and retain a fauna corridor.

- site S - During the first pass discussions with the road teams, it was proposed to widen Coramup road to 28 metres, which was adjusted to 16 metres to ensure a suitable width of vegetation remained within the road reserve as a fauna linkage corridor and reduce general degradation, such as erosion, dust and excessive water shedding. Likewise, the proposed 28 metre width for clearing for the area along Blumann road was reduced to 22 metres, which is the absolute minimum width required for clearing.

Regarding all sites, the Shire advised that to mitigate impacts of clearing vegetation, where feasible clearing will not occur to the full permitted width, conserving vegetation.

As standard practice the Shire noted that Project Managers and Project Supervisors communicate the location of significant flora and vegetation areas to staff in onsite debriefs. Additionally, it is standard practice for Shire Environmental Officers to demarcate significant flora and vegetation areas to avoid unnecessary or accidental vegetation impacts prior to commencement of work.

Upon request from the department, the Shire prepared a Dieback and Invasive Weed Management Plan (Shire of Esperance, 2022b), outlining the risks of weed and dieback introduction and spread within each site and the management measures to be undertaken, including:

- schedule activities in high dieback risk areas for low rainfall months and avoid wet or muddy conditions.
- be aware of dieback free and infested areas prior to activities commencing.
- regularly clean all vehicles and equipment, to keep in a clean condition
- clean all vehicles and equipment prior to starting works at a new location
- additional regular clean down measures including regular washdowns will be carried out for project areas that have vegetation in excellent condition such as site B, V, S, and O
- construction works at each site to start at sections of least weed infestation and move to the more weedy sections
- stay on established roads and tracks.

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

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix C) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

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

3.2.1. Biological values (flora and vegetation) - Clearing Principles (a, c, d,)

Assessment

According to available databases, seven threatened flora and 112 priority flora species have been recorded within a 10 kilometre radius of each of the seven sites across the application area.

A likelihood of occurrence assessment for threatened and priority flora located within the local area was undertaken for all areas under application (Shire of Esperance, 2021a-2021g). Noting the preferred habitat types, including soil and vegetation types mapped over the various sites across the application area, the likelihood analysis concluded that the application area may comprise suitable habitat for 17 priority flora species.

Spring flora and vegetation surveys were undertaken across the application area (Shire of Esperance, 2021a-g). The surveys conducted by the Shire were considered adequate to identify conservation significant flora species potentially occurring within the application area. The targeted flora surveys identified eight conservation significant flora species within the application area, including one Priority 2, six Priority 3, and one Priority 4 species: *Acacia amyctica* (P2), *Daviesia pauciflora* (P3), *Goodenia laevis* subsp. *laevis* (P3), *Isopogon alpicornis* (P3), *Leucopogon interruptus* (P3), *Melaleuca dempta* (P3), *Persoonia scabra* (P3) and *Grevillea baxteri* (P4).

The application area has been revised since these surveys were conducted and three priority flora (identified within Site B) have been avoided completely (Shire of Esperance, 2021a). A total of five priority flora species remain within the revised application area: *Acacia amyctica* (P2), *Daviesia pauciflora* (P3), *Goodenia laevis* subsp. *laevis* (P3), *Leucopogon interruptus* (P3) and *Melaleuca dempta* (P3). Biological values of flora and vegetation of each project area are discussed below.

site B – Henkes road

Ten vegetation communities were identified within site B (see Appendix C) ranging from excellent to good (Keighery, 1994) condition. No threatened flora species were recorded during the survey, however three priority flora species, *Grevillea baxteri* (P4), *Isopogon alpicornis* (P3) and *Persoonia scabra* (P3) were recorded (Shire of Esperance, 2021a). Site B has been revised since the surveys were conducted with the area proposed to be cleared reduced, thereby avoiding impacts to all three priority flora species.

site E – Grass Patch

One vegetation community was identified within site E (see Appendix C) occurring in good (Keighery, 1994) condition. No threatened flora species were recorded during the flora survey, however one priority 3 species, *Goodenia laevis* subsp. *laevis* (P3) was recorded (Shire of Esperance, 2021b).

site O – Holt road

Five vegetation communities were identified within site O (see Appendix C) all occurring in excellent (Keighery, 1994) condition. No threatened flora species were recorded during the flora survey, however one priority 3 and one priority 2 flora species, *Goodenia laevis* subsp. *laevis* (P3) and *Acacia amyctica* (P2) were recorded (Shire of Esperance, 2021c).

site P – Merivale Rd

Seven vegetation communities were identified within site P (see Appendix C) in good to degraded (Keighery, 1994) condition. Within this site, vegetation type B was identified as the Kwongkan Shrubland TEC, listed as Endangered under the EPBC Act. No threatened flora species were recorded during the flora survey, however two priority 3 flora species, *Leucopogon interruptus* (P3) and *Daviesia pauciflora* (P3) were recorded (Shire of Esperance, 2021d). An additional targeted survey for *Leucopogon interruptus* (P3) was undertaken during August of 2022 that identified additional plants outside of the proposed clearing area.

site S – Coramup Rd

Four vegetation communities were identified within site S (see Appendix C) predominantly occurring in a good to excellent (Keighery, 1994) condition. Within this site, vegetation types A and B were identified as the Kwongkan Shrubland TEC. No threatened or priority flora species were recorded during the flora survey (Shire of Esperance, 2021e).

site V – Scaddan Rd

Five vegetation communities were identified within site V (see Appendix C) predominantly occurring in a degraded to good (Keighery, 1994) condition. No threatened flora species were recorded during the flora survey, however one priority 3 flora species, *Melaleuca dempta* (P3) was recorded (Shire of Esperance, 2021f).

site X – Fisheries Rd

Three vegetation communities were identified within site X (see Appendix C) predominantly occurring in a good to degraded (Keighery, 1994) condition. Vegetation type C was identified as the Kwongkan Shrubland TEC. No threatened flora species were recorded during the flora survey, however one priority 3 flora species, *Daviesia pauciflora* (P3) was recorded (Shire of Esperance, 2021g).

Priority Flora

Acacia amyctica (P2)

Within site O, five individuals of *Acacia amyctica* (P2) are proposed to be cleared from a population of 52 individuals (Shire of Esperance, 2021c; 2022a). Advice was sought from the Department of Biodiversity, Conservation and Attractions (DBCA) on the significance of the clearing of five *A. amyctica* individuals. DBCA noted that this species

is known from six locations (12 confirmed sub populations) with 2,765 plants in total recorded within the Esperance region and site O represents the eastern range extent of this species. DBCA advised the department that the potential loss of five plants from this subpopulation is unlikely to be considered significant to the conservation of the species as the clearing represents an impact of less than one per cent to the species overall.

Daviesia pauciflora (P3)

Two populations were recorded with numerous individuals recorded at site P (given high number individual count was not undertaken) and one individual recorded at site X (Shire of Esperance, 2021d; 2021g). The proposed clearing would result in the loss of three individuals at site P and one individual at site X. According to databases, this species is known from 29 records across a large distribution. Given numerous individuals will remain adjacent to site P, the proposed clearing is not considered to significantly impact on the conservation status, or local or regional extent of this species.

Goodenia laevis subsp. *laevis* (P3)

This species was recorded within site E and O (Shire of Esperance, 2021b; 2021c). The proposed clearing will impact 87 of 94 recorded individuals (92 per cent) within site E, and 83 of over 120 individuals recorded at site O (69.1 per cent). The Shire has advised that *Goodenia laevis* subsp. *laevis* has been nominated for downgrading of conservation status by the Esperance District DBCA Conservation Officer on the basis of its commonality throughout the Shire of Esperance (Shire of Esperance, 2022a). Specifically, the Shire noted that:

“*Goodenia laevis* subsp. *laevis* occurs across a large geographical area from northwest of Cascade, east to Cape Arid and north to Norseman, extending into the Bremer Range. The extent of occurrence for *Goodenia laevis* subsp. *laevis* is more than 18,000 km²”.

Given this, the proposed clearing is not considered to significantly impact on the occurrence of this species.

Leucopogon interruptus (P3)

The total extent of impact to this species is 15 out of 39 total individuals (38 per cent) within site P (Shire of Esperance 2021d). Available databases indicate that there are eight known populations (not including that recorded within site P) located within the Esperance region. Seven of these populations are in secure conservation tenure being either within National Parks or Nature Reserves. The proposed impact of 38.4 per cent has the potential to be significant at the local level, however is not considered likely to impact the conservation status of this species.

Melaleuca dempta (P3)

One population consisting of 34 individuals of *Melaleuca dempta* was recorded at site V (Shire of Esperance, 2021f). The proposed clearing initially proposed to impact on 26 individuals of this species, however the Shire has revised the footprint of site V to reduce the impact to nine of the 34 individuals (Shire of Esperance, 2022a). The Shire proposes that any plants that will be taken will be harvested for seed prior to taking so that seed can be grown and be planted at the pre-existing population and nearby salt lakes within the Scaddan Road reserve to also mitigate impacts to this species.

Database records indicate that this species is known from 17 locations over a restricted range and is associated with the edges of salt lakes, with one record occurring within a conservation estate. The population recorded within the application area at site V occurs within the middle of this species known range.

Melaleuca dempta is present within the proposed offset site at Reserve 35302 (see Section 4). The total population within this reserve includes 12 mature shrubs and 172 juvenile plants, having recently experienced a germination event (Shire of Esperance, 2022a). Given this species occurs within the offset site (Reserve 35302) that will be conserved in perpetuity, the proposed clearing is not considered to impact the conservation status of this species.

Priority ecological communities (PEC)

The Priority 3 ‘Swamp Yate, *Eucalyptus occidentalis*, woodlands in seasonally inundated clay basins in the South Coast of Western Australia’ (Swamp Yate) Priority Ecological Community (PEC) was initially recorded within site B (Shire of Esperance, 2021a). Approximately 0.16 hectares of native vegetation within this site was identified as Swamp Yate PEC vegetation in very good (Keighery, 1994) condition.

The Shire revised the boundary of the proposed clearing within site B to avoid any clearing of the PEC or vegetation within 100 metres of the PEC. Given this and the proposed weed and dieback measures proposed by the Shire (Shire of Esperance, 2022b), the proposed clearing is not considered likely to impact the PEC nor is it considered close enough to result in edge effects or the spread of weeds or dieback to this PEC location (Shire of Esperance, 2022a).

Threatened ecological communities (TEC)

The Kwongkan Shrubland TEC, listed as Endangered under the EPBC Act, was recorded within the application area. In total, 2.39 hectares of Kwongkan Shrubland TEC occurs within the application area across three sites P, S and X (Shire of Esperance, 2021d; 2021e; 2021g):

- 0.23 hectares within site P – Merivale Road;
- 1.09 hectares within site S – Coramup Road; and
- 1.06 hectares within site X – Fisheries Road

This ecological community is found in the south coast region of WA dominated by flowering shrub species from the Proteaceae family (e.g. *Banksia*, *Grevillea*, *Hakea*). It is facing a high level of threat due to fragmentation that has resulted in a severe reduction in its integrity across its geographic distribution. Remaining areas of this TEC are vulnerable to the impacts of threats such as dieback due to *Phytophthora cinnamomi*, changing fire regimes, land clearing, invasive species, and climate change (Commonwealth of Australia, 2014).

The areas considered critical to the survival of the Kwongkan Shrubland TEC cover all patches that meet the key diagnostic characteristics and condition thresholds for the ecological community, and the buffer zones, particularly where this comprises surrounding native vegetation (Commonwealth of Australia, 2014). Approximately 619,577 hectares (52 per cent) of the extant of this ecological community occurs within large and significant reserves in south-west Western Australia, notably Stirling Range National Park, Fitzgerald River National Park, Cape Le Grand National Park and Cape Arid National Park.

The conservation advice for this TEC states that the priority is to protect and conserve remaining areas of the ecological community. Further clearance of this endangered ecological community and nearby native vegetation including connecting corridors should be prevented. Where further clearance is unavoidable, offsets should be considered. The conservation advice also recommends that the spread of weeds and *Phytophthora cinnamomi* into areas not yet infested should be avoided by ensuring appropriate hygiene practices are in place (Department of the Environment, 2014).

Invasive plant species were found across the majority of the application area, however the burden of these species on the natural vegetation varied from low to high across the various sites. Overall, 35 invasive species were identified during the surveys conducted by the Shire (Shire of Esperance, 2022b). Of these, the most extensive and of serious concern were Golden Wattle (*Acacia pycnantha*) and African Love Grass (*Eragrostis curvula*). The proposed clearing may increase the distribution of weeds along roads and within adjacent vegetation that may represent this TEC.

In addition, spreading dieback into adjacent areas of the TEC is considered a risk. Signs of dieback were observed throughout the application area, within all sites except site E and O. It is considered for site B, site C, site P and site V to have moderate to extreme risk of dieback dispersion according to the Phytophthora Hazard Dispersion Model as part of Project Dieback (Shire of Esperance, 2022b). Given this, it is considered likely that the proposed clearing will increase the distribution of dieback along the application areas and within adjacent vegetation that may represent the TEC.

Considering the above impacts to conservation significant flora and TEC, and advice received from DBCA (DBCA, 2021), the department requested mitigation and management measures to be provided by the Shire. The Shire prepared a Weed and Dieback Management Plan outlining the risks of weed and dieback introduction and spread within each site and the management measures to be undertaken (Shire of Esperance, 2022b), see Section 3.1 above.

Given the above, it is considered that the proposed clearing of 2.39 hectares of Kwongkan Shrubland TEC constitutes a significant residual impact. In accordance with the Government of Western Australia's *Environmental Offsets Policy* and *Environmental Offsets Guidelines*, this significant residual impact has been addressed through the conditioning of environmental offset requirement, see Section 4 below.

Conclusion

Based on the above assessment, the proposed clearing will result in the loss of 2.39 hectares of the Kwongkan Shrublands TEC and individuals of five priority flora species: *Acacia amyctica* (P2), *Melaleuca dempta* (P3), *Daviesia pauciflora* (P3), *Goodenia laevis* subsp. *laevis* (P3) and *Leucopogon interruptus* (P3). The proposed works also has the potential to lead to indirect impacts to the Kwongkan Shrublands TEC and above priority flora from the introduction and/or spread of weeds and dieback.

Whilst impacting priority flora, the proposed clearing will not impact the conservation status of the species being impacted, or result in a significant regional impact. It is considered that the impacts of the proposed clearing on the Kwongkan Shrubland TEC constitutes a significant residual impact, and an offset is required (see Section 4).

Conditions

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

- weed and dieback management to manage potential impacts to adjacent vegetation as a result of the proposed clearing.
- offset – land acquisition, conserved in perpetuity, which includes:
 - 5.89 hectares of vegetation representative of the Kwongkan Woodland Shrublands;
 - 3 hectares of vegetation in completely degraded condition to good condition that is representative of the Kwongkan Woodland Shrublands;
 - 26 individuals of *Melaleuca dempta* (P3) (See section 4).

3.2.2. Biological values (fauna) - Clearing Principle (b)

Assessment

The application area is located across the Mallee and Esperance Plains IBRA regions of WA. According to available databases, 12 conservation significant fauna species have been recorded within the local area (10 kilometre radius of the application area). A number of records are associated with marine, estuarine or freshwater habitats that do not occur within the application area. In determining the likelihood of conservation significant fauna occurring within the proposed clearing area, consideration was given to the results of the preferred habitat types, proximity of records to the application area, and the type and condition of the vegetation within the application area.

Basic fauna surveys were conducted across the various sites within the application area in accordance with the technical guidance - *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2016). Taking into account the findings of these surveys and the likelihood assessment, the application area is considered to comprises suitable habitat for five conservation significant fauna species:

- *Zanda latirostris* (Carnaby's cockatoo), listed as Endangered under the EPBC Act and BC Act;
- *Leipoa ocellata* (Malleefowl), listed as Vulnerable under the EPBC Act and BC Act;
- *Dasyurus geoffroii* (Chuditch), listed as Vulnerable under the EPBC Act and BC Act.
- *Falco peregrinus* (Peregrine falcon), listed as Other specially protected species under BC Act
- *Acanthophis antarcticus* (Southern death adder) listed as Priority 3 by DBCA;

Carnaby's cockatoo

The majority of the application area (five of the seven sites) occurs within the known distribution of Carnaby's cockatoo. Site E (Grass Patch Materials Storage) occurs on the edge of the mapped distribution for Carnaby's and site 0 (Holt road) occurs to the north of the known distribution. Habitat requirements for Carnaby's cockatoos can be categorised as breeding habitat, night roosting habitat and foraging habitat.

Breeding Habitat

Breeding habitat for species of black cockatoos is described within the 'EPBC Act referral guidelines for threatened black cockatoo species' (Commonwealth of Australia, 2022) which includes a list of trees species known to support breeding which either, have a suitable nest hollow or are of a suitable diameter at breast height (DBH) to develop a nest hollow. For most tree species, suitable DBH is 500 mm (Commonwealth of Australia, 2022).

Carnaby's generally breed in woodland or forest, but are also known to breed in partially cleared woodland or forest and isolated trees. Carnaby's nest in hollows in live or dead trees of wandoo, including marri (*Corymbia calophylla*), jarrah (*Eucalyptus marginata*), karri (*Eucalyptus diversicolor*), wandoo (*Eucalyptus wandoo*), tuart (*Eucalyptus gomocephala*), flooded gum (*Eucalyptus rudis*), and other *Eucalyptus* spp..

A review of available desktop data revealed no documented breeding records occurring within 12-kilometres of any of the sites across the application area, and there are no documented breeding sites within the Shire of Esperance. The closest known breeding site is approximately 120 kilometres west of the application area. The Shire of Esperance undertook a Black Cockatoo assessment in accordance with the 'EPBC Act referral guidelines for three threatened black cockatoo species' (Commonwealth of Australia, 2022). The assessment included the identification, description and recording of:

- potential and actual breeding habitat (relevant tree species with a Diameter at Breast Height (DBH) greater than 500 mm)
- existing tree hollows, including size and any evidence of use by Black Cockatoos
- potential night roosting habitat and foraging evidence
- suitable foraging habitat.

The black cockatoo habitat assessments conducted across the application area (Shire of Esperance, 2021a-g) recorded only one pine tree, *Pinus pinaster*, greater than 500 mm DBH. This tree was recorded within site S - Coramup Road, however no hollows were present. Within the remaining sites, no trees of suitable DBH or with suitable hollows were recorded. Given this, and that the application area is outside of the modelled breeding range for Carnaby's cockatoo, it is considered that the application area is not likely to provide significant breeding habitat for Carnaby's (Figure 2).

Roosting habitat

During the non-breeding season, black cockatoos are known to forage within 20 km of night roosting habitat, though in some cases, foraging distances can be greater. According to available databases, there are 13 known roost sites within 20 kilometres of the application area. Given the lack of large trees within the application area, it is unlikely to provide significant roost habitat for Carnaby's cockatoo. During the black cockatoo habitat assessment (Shire of Esperance, 2021a-g), large trees (such as Tuart and *Eucalyptus globulus*) were observed in the surrounding area of site C, site E, site P, site S and site V, and considered suitable roosting habitat for Carnaby's cockatoos. During the cockatoo habitat assessment conducted at site S, Carnaby cockatoos were observed roosting in the large trees adjacent to the proposed clearing area (Shire of Esperance, 2021e).

Foraging habitat

The application area is located within the South Coast. This region provides a range of foraging resources for black cockatoos. Carnaby's cockatoos forage on the seeds, nuts and flowers of a variety of plants, including Proteaceous species (*Banksia*, *Hakea* and *Grevillea*), as well as *Allocasuarina* and *Eucalyptus* species, marri and a range of introduced species (Commonwealth of Australia, 2022).

The Black cockatoo assessments (Shire of Esperance, 2021a-g) identified a variety of vegetation types across the application area that provide suitable foraging habitat for Carnaby's cockatoo. A total of 3.41 hectares of suitable foraging habitat was recorded across three sites:

- site P (Merivale Rd) contains 0.81 hectares of scattered *Banksia speciosa* and *Nuytsia* with dominant *Melaleuca* and *Adenanthos* shrubland.
- site S (Coramup Rd) contains 0.86 hectares of open *Nuytsia floribunda* woodland over diverse Proteaceous shrubland and, 0.33 hectares of *Banksia speciosa* woodland, over *Lambertia inermis* and mixed Proteaceous shrubland.
- site X (Fisheries d) contains 1.41 hectares of Banksia dominated shrubland on sand rise, with mixed *Nuytsia* and Sheoak.

During the breeding season, black cockatoos are known to forage in areas up to 12 km from their breeding nests. Foraging resources therefore, in proximity to known breeding sites are significant as black cockatoos rely on these foraging resources to successfully raise chicks. Given no suitable breeding habitat trees were recorded within the application area and the closest known breeding site is over 100 kilometres from the clearing sites, the vegetation within the application area is unlikely to be supporting foraging by breeding individuals.

During the non-breeding period, black cockatoos will mainly forage in areas up to 20 km from known night roosting habitat, and in some cases this distance is greater. Black cockatoos rely upon the availability of night roosting habitat in proximity to foraging resources, and rely on access to watering points in selecting night roost sites, with roost sites usually within two kilometres of a watering point. Given sites P, S and X are within 20 kilometres of known roost sites,

have suitable roosting habitat adjacent and in close proximity to available water sources, these sites are likely to support foraging by roosting individuals (Figure 2).

Connecting patches of vegetation between foraging resources, breeding habitat and night roosting habitat are essential to enable black cockatoos to access resources across their range. Carnaby's cockatoo has been significantly impacted by historical clearing of its habitat. Broad-scale clearing of native vegetation has resulted in fragmentation of breeding and foraging habitat, loss of breeding hollows, changes in the species distribution, and genetic partitioning (EPA, 2019). Therefore remnant patches of vegetation are considered important in maintaining black cockatoo habitat connectivity across the landscape.

Advice was sought from DBCA on the significance of the proposed clearing on black cockatoo habitat. DBCA noted that the initial proposed clearing of 7.77 hectares of foraging habitat for Carnaby's cockatoo within a highly cleared landscape is significant due to cumulative impacts. However, the majority of locations proposed to be cleared are relatively small, linear in nature and highly disturbed with weeds and/or dieback observed at a number of sites. Therefore, whilst the cumulative impact is regionally significant, the level of consequence at the majority of the sites is likely to be minor due to current disturbance factors impacting the proposed areas (i.e. weeds, dieback, proximity to a road and increased likelihood of vehicle strike). Since this advice was received, the application area has been reduced and the proposed clearing of black cockatoo foraging habitat revised to 3.41 hectares.

Given the above, it is considered that the remaining suitable habitat for this species within its current range is likely to be significant. Specifically, it is considered that the 3.41 hectares of foraging habitat within the application area is significant for Carnaby's cockatoo due to the dominance of preferred foraging species (native proteaceous plant species); the good to excellent condition of the majority of the vegetation across the application area and the highly cleared nature of the surrounding local areas, specifically sites S, V and X retaining less than 30 per cent pre-European vegetation (Table 2).

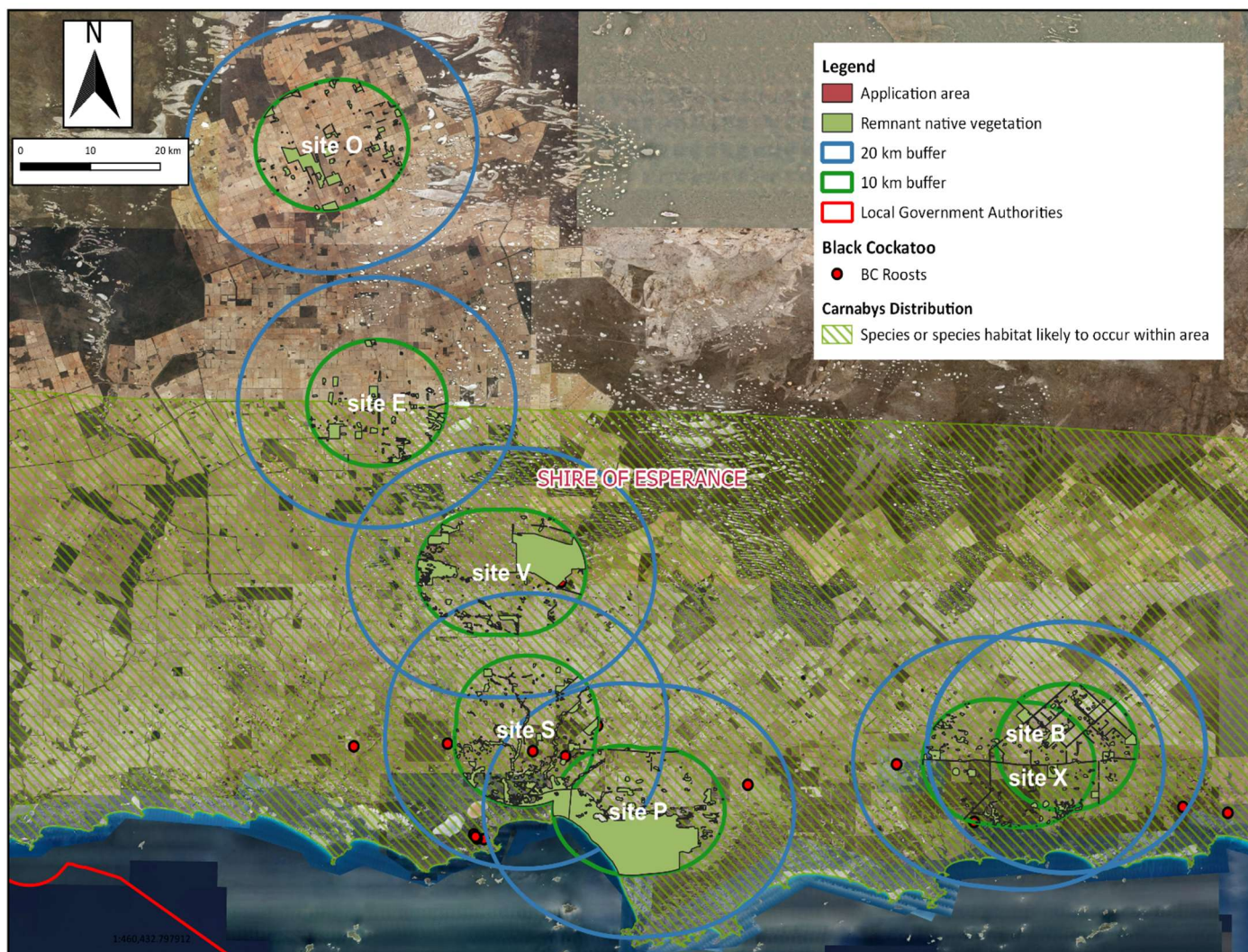


Figure 2. Black cockatoo distribution and roost sites relative to the application area

Malleefowl (*Leipoa ocellata*, VU)

Malleefowl are found in arid and semi-arid areas dominated by mallee eucalypts on sandy soils (DPaW, 2016). They are known to also occur in Mulga (*Acacia aneura*), Broombush (*Melaleuca uncinata*), Scrub Pine (*Callitris verrucosa*), Eucalyptus woodlands and coastal heathlands. Malleefowl require abundant leaf litter and a sandy substrate for the successful construction of nest mounds (DPaW, 2016). Its remaining populations are highly fragmented due to extensive land clearing. Noting its habitat requirements, four sites (site O, site P, site S and site V) contain woodland and shrublands considered potentially suitable habitat for Malleefowl (Shire of Esperance 2021a-g). However, given the narrow extent of clearing proposed at these sites and the presence of nature reserves within the local area, the application area is not likely to provide significant habitat for this species.

Southern death adder (*Acanthophis antarcticus*, P3)

The Southern death adder is known from Yanchep to Pinjarra and inland to Narrogin and Cunderdin within its northern population extent, and from Hopetoun to the Western Australian - South Australian border within 200 kilometres of the coastline in its southern population extent. This species occurs within a wide variety of habitats in association with deep leaf litter, including coastal heathlands and chenopod dominated shrublands (DEHP, 2015). Based on the known habitat of this species and the habitat present within the application area, it is considered likely that the species inhabits vegetation within the application area. However, given the range of this species, and that it occupies a wide range of habitats, the application area is not considered likely to provide significant habitat for this species. Mechanical clearing activities would however pose a risk of fauna fatalities should this species occur within the application area. Slow, directional clearing may allow for dispersal of this species into other areas of remnant vegetation.

Chuditch (*Dasyurus geoffroi*, VU)

Most chuditch are found in varying densities throughout the jarrah forest and south coast of Western Australia, and in a range of habitats including forest, mallee shrublands, woodland and desert (DEC, 2012). The species uses denning habitat types such as hollow logs, burrows or rock crevices (DEC, 2012). Based on information provided by the applicant, the application area is not likely to contain suitable denning habitat for the chuditch (Shire of Esperance 2021a-g). Due to the habitat preferences of this species, it is not considered likely that habitat for this species is present within the application area.

Peregrine Falcon (*Falco peregrinus*, M1)

The Peregrine Falcon is found in most habitats, from rainforests to the arid zone, and at most altitudes, from the coast to alpine areas. It requires abundant prey and secure nest sites and prefers coastal and inland cliffs or open woodlands near water and may even be found nesting on high city buildings. It has been recorded within the local areas of sites E and X. Due to the wide range of habitats this species may occur in and its mobile nature, the application area is not likely to comprise significant habitat for the Peregrine Falcon and the proposed clearing is not likely to significantly impact this species.

Ecological linkage

Given the extent to which the local area has been previously cleared (Table 2), the application area may contribute towards fauna dispersal within the landscape. However, due to the vegetation that will remain within the road reserves after the proposed clearing, it is not likely that the proposed clearing will have a significant impact to linkage and dispersal values.

The proposed clearing may cause degradation of adjacent and nearby remnant native vegetation by facilitating the spread of weeds and dieback. It is considered that the impact of clearing can be mitigated through the Shire's implementation of the Weed and Dieback Management Plan (see section 3.1).

Conclusion

Based on the above assessment, the proposed clearing will result in the loss of 3.41 hectares of significant foraging habitat for Carnaby's cockatoo. For the reasons set out above, it is considered that the impacts of the proposed clearing on Carnaby's cockatoo foraging habitat constitutes a significant residual impact.

The proposed clearing is not likely to impact significant habitat for the remaining conservation significant fauna that have been recorded in the local area. How individuals may utilise the application area to disperse through the landscape. Mechanical clearing activities may pose a risk of fauna fatalities should individuals occur within the application area. Slow, directional clearing to allow for dispersal of species into other areas of remnant vegetation will mitigate this risk.

Conditions

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

- offset – land acquisition, conserved in perpetuity, which includes:
 - 11.88 hectares of vegetation that provides significant foraging habitat for Carnaby’s cockatoo, to address the significant residual impacts of the proposed clearing (see section 4)
- slow, progressive one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of clearing activity

3.2.3. Biological values (significant remnant vegetation) - Clearing Principle (e)

Assessment

The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001).

Four of the sites across the application area are located within an extensively cleared landscape which retain less than the abovementioned 30 per cent threshold, including site E, S, V and X. In addition, Beard Vegetation Associations (BVA) 512, 4801 and 6048, retain less than 30 per cent of their pre-European extent within the IBRA bioregions. Given this, the proposed clearing will further reduce the extent of these associations (see Table 2).

As mentioned in section 3.2.1 and 3.2.2 above, the application area contains the Kwongkan Shrublands TEC, five priority flora species, and significant foraging habitat for Carnaby’s cockatoo. Given this, the areas proposed to be cleared are considered significant as remnants in areas that have been extensively cleared.

Table 2 Highly cleared vegetation associations within the application area

| Site | Clearing proposed (ha) | Local area vegetation extent (%) | Clearing within BVA 512 (ha) | Clearing within BVA 4801 (ha) | Clearing within BVA 6048 (ha) |
|---|------------------------|----------------------------------|------------------------------|-------------------------------|-------------------------------|
| B - Henkes Road and Howick Road intersection | 1.33 | 30 | N/A | 1.79 | N/A |
| E - Grass Patch | 1.49 | 13 | 1.49 | N/A | N/A |
| O - Holt Road | 1.90 | 31 | N/A | N/A | N/A |
| P - Merivale Road | 5.18 | 38 | N/A | 0.76 | 1.14 |
| S - Coramup Road | 2.01 | 18 | N/A | N/A | 1.09 |
| V - Scaddan Road | 3.78 | 23 | N/A | N/A | N/A |
| X - Fisheries road | 3.52 | 21 | N/A | 2.50 | 1.41 |
| Total | 19.21 | - | 1.49 | 5.05 | 3.64 |

Conclusion

Based on the above assessment, the proposed clearing will result in:

- the loss of 1.49 hectares of the highly cleared Beard Vegetation Association (BVA) 512
- the loss of 5.05 hectares of the highly cleared BVA 4801
- the loss of 3.64 hectares of the highly cleared BVA 6048
- the loss of 10.18 hectares of native vegetation that is a significant remnant within an extensively cleared landscape.

For the reasons set out above, it is considered that the impacts of the proposed clearing on significant remnant vegetation constitutes a significant residual impact.

Conditions

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

- offset – land acquisition, conserved in perpetuity, which includes:
 - 44.75 hectares of vegetation that constitutes a significant remnant within an extensively cleared landscape; and
 - rehabilitation of 3 hectares of vegetation in completely degraded condition to good condition within and extensively cleared landscape (see section 4).

3.2.4. Land and water resources - Clearing Principle (f) and (g)

Assessment

This principle aims to conserve vegetated watercourses and wetlands and their buffers. As a portion of the application area is mapped within a minor non perennial river and a salt lake, the vegetation within the application area is considered to be growing in, or in association with, an environment associated with a wetland.

Riparian vegetation was mapped within site V and site S (Shire of Esperance, 2021e-f) as:

- site S contains 0.07 hectares of Bullrushes and *Juncus* within creek line;
- site V contains 0.49 hectares of scattered *Melaleuca cuticularis* and Samphire community on salt lake periphery.

It is acknowledged that the areas of riparian vegetation proposed to be cleared have been modified through historical clearing for road infrastructure. It is, therefore considered unlikely that the vegetation within the application area is contributing significantly to the function of riparian communities in the local area. Given the extent of the proposed clearing of riparian vegetation, and adjacent land uses, the proposed clearing is not considered likely to result in any significant or long-term impacts to the ecological values of the vegetation communities associated with the mapped wetland and creek line within the application area.

The mapped soil types across the application area have a medium to high risk of land degradation in the form of wind erosion and subsurface acidification. The risks from waterlogging, flooding, and salinity have been assessed to be low risk (DPIRD 2019; Appendix C.1). Water erosion risk ranges from low to high (DPIRD 2019).

Given the purpose of the proposed clearing, cleared areas will be replaced with a hard road surface negating any potential for wind erosion (with the exemption of site E). Soils will not be excavated at depth, and groundwater will not be intersected, reducing the risk of exposing any acid sulphate soils. Noting the extent of the proposed clearing, the condition of the vegetation, and standard road construction methods employed, the proposed clearing is not likely to cause appreciable land degradation.

Conclusion

Based on the above assessment, the proposed clearing is unlikely to result in significant impacts to the ecological values of vegetation communities associated with a watercourse or salt lake. For the reasons set out above, it is considered that the impacts of the proposed clearing are considered likely to be minimal, localised and short-term.

It is considered that the potential impacts of wind erosion can be managed through the implementation of wind erosion management strategies (Shire of Esperance, 2022b).

Conditions

To address potential impacts to nearby native vegetation from the proposed clearing, construction works will be required to begin with three months of clearing

3.3. Relevant planning instruments and other matters

Several Aboriginal sites of significance have been mapped within the local area and surrounding local area. None occur 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.

4. Suitability of offsets

Through the detailed assessment outlined in Section 3.2 above, the Delegated Officer has determined that the following significant residual impacts remain after the application of the avoidance and mitigation measures summarised in Section 3.1:

- the loss of 3.41 hectares of significant foraging habitat for *Zanda latirostris* (Carnaby's cockatoo)
- the loss of 2.39 hectares of native vegetation that is representative of the Commonwealth listed Kwongkan Shrublands TEC
- the loss of 10.18 hectares of native vegetation that is a significant remnant within an extensively cleared landscape

The applicant has proposed an environmental offset consisting of a 116.75 hectare site, reserve 35302 (Lot 1985 on Plan 91222), located approximately 12 kilometres west of site V and 20 kilometres west of site S. The management order of the reserve will be changed from 'gravel extraction' to 'conservation'.

Within the offset site, the Shire proposes to rehabilitate three hectares of heavily cleared previously un-ripped portions of the site from completely degraded condition to very good condition, that provides:

- species suitable for black cockatoo foraging habitat,
- species that resemble the Kwongkan Shrublands TEC, and
- significant remnant vegetation within an extensively cleared landscape

A Rehabilitation Plan provided by the Shire (Shire of Esperance, 2022c) was reviewed, and approved by the department.

The department notes that the proposed offset site does not include the specific Beard vegetation associations impacted by the proposed clearing. While multiple options were exhausted, an offset site providing all of the values impacted was not identified. The department notes that the proposed offset site and rehabilitation proposed achieves a 'like for similar' and a greater environmental outcome by conserving priority flora and large areas of TEC and Carnaby's black cockatoo foraging habitat.

In assessing whether the proposed offset is adequate and proportionate to the significance of environmental values being impacted, a calculation using the WA State Offset Metric was undertaken. The calculation indicates that when combined, the proposed offsets will exceed the required values to address 100 percent of the significant residual impacts of clearing and is therefore consistent with the WA Environmental Offsets Policy, September 2011. The justification for the values used in the offset calculation is provided in Appendix F.

Using the WA State Offset Metric calculator, the following values are required to offset the significant residual impact of the proposed clearing:

- revegetation of 3 hectares of native vegetation from degraded condition to very good condition, proposed by the Shire, that provides:
 - a significant remnant within an extensively cleared landscape
 - black cockatoo foraging habitat; and
 - will be revegetated to resemble the Kwongkan Shrublands TEC
- to address the remaining residual significant impacts the following offset is required:
 - 44.75 hectares of significant remnant vegetation
 - 11.88 hectares of black cockatoo foraging habitat
 - 5.89 hectares of Kwongkan Shrublands TEC

The proposed offset site contains:

- vegetation within an extensively cleared local area with approximately 15 per cent vegetation cover remaining
- approximately 42 per cent of the site is in Pristine condition, with the remainder largely in Excellent to Good condition. Only a small portion is in Degraded to Completely Degraded condition,
- a total of 68.6 hectares of Carnaby black cockatoo foraging habitat (Excellent to Very Good condition)
- a total of 86.75 hectares of Kwongkan Shrubland TEC in Pristine to Good condition
- critical habitat for *Eremophila glabra* subsp. *scaddan* (EN) recorded less than five metres from the site
- nine species of priority flora;
 - *Darwinia* sp. Gibson P1,
 - *Daviesia pauciflora* P3,
 - *Conostephium marchoriatum* P3,
 - *Kunzea salina* P3,
 - *Melaleuca dempta* P3 (being impacted in one of the application areas),

- *Persoonia scabra* P3,
- *Austrobaecka uncinella* P3,
- *Brachyloma mogin* P3, and
- *Melaleuca fissurata* P4.

Given the above, the Delegated Officer considers that the offset provided by the applicant adequately counterbalances the significant residual impacts listed above.

End

Appendix A. Additional information provided by applicant

During the assessment, the applicant responded to requests for information on the following (see below).

| Request for information | Further information provided |
|--|---|
| Avoidance and mitigation measures | Details of avoidance and mitigation measures were provided and the application area was reduced from 32.89 hectares to 19.21 hectares. This information is presented in Section 3.1 of the Decision Report. |
| Additional targeted flora surveys for <i>Leucopogon interruptus</i> (P3). | The Shire conducted an additional targeted survey on 3 August 2022. Additional <i>Leucopogon interruptus</i> (P3) were recorded (Shire of Esperance, 2022a). This information is presented in Section 3.2.1 of the Decision Report. |
| Mitigation of weed and dieback risks resulting from the proposed clearing. | The Shire provided a Dieback and Invasive Weed Management plan (Shire of Esperance, 2022b). This information is presented in Section 3.1 of the Decision Report. |
| Rehabilitation plan for the proposed offset site | The Shire provided a Rehabilitation Plan (Shire of Esperance, 2022c). This information is presented in Section 4 of the Decision Report. |

Appendix B. Details of public submissions

One public submission was received in relation to the proposed clearing (Submission, 2022).

| Summary of comments | Consideration of comment |
|--|--|
| The width of the clearing required being greater than 20 metres. The footprint of the road formation can be further reduced by construction on one side of the road, reducing the area of disturbance required for topsoil placement and clearing to allow movement of machinery. | The Shire has reduced the overall clearing width for a number of the road reserves to less than 20 meters. Further avoidance and mitigation measures provided by the Shire is in Section 3.1 above. |
| The documents provided indicate that no provision has been made for control of dieback and weed spread in the management of construction activities. | Weed and dieback management measures will be conditioned on the permit, including a Dieback and Invasive Weed Management Plan provided by the Shire (Shire of Esperance, 2022b). Consideration of the impact of weeds under Section 3.1 and Section 3.2 above. |
| <p>Assessment against the clearing principles:</p> <ul style="list-style-type: none"> Most of the site reports provided indicate high biodiversity across the site with the exception of Sites E, O and W. Therefore the application is significantly at variance with Principle (a). Whilst it was assumed disturbance of these species would not threaten the overall population, that the assumption is based on unreliable data. Thus the project should be considered with Principle (c). At specific sites, the project is at variance with Principle (d) as it affects areas which can be classed as Kwongan Shrubland TEC The project as a whole is significantly at variance with Principle (e) as it occurs in an area where land clearing has removed in excess of 30 per cent of the pre-European coverage of native vegetation. | <p>Consideration within Section 3.2 above.</p> <p>Advice has been sought from DBCA regarding the impacts to conservation significant flora, fauna and ecological communities. This information is provided in Section 3.2 above.</p> <p>The departments assessment against the clearing principles is provided in Appendix D.</p> <p>The Shire has provided an offset for impacts to Carnaby's foraging habitat (Principle (b)), Kwongan Shrubland TEC (Principle (d)) and clearing within an extensively cleared landscape (Principle (e)).</p> |

| Summary of comments | Consideration of comment |
|--|--|
| <ul style="list-style-type: none"> site S crosses a watercourse and abuts riparian vegetation and is at variance to Principle (f). No sites are at variance with Principles (g) and (h) | |
| <p>Broader survey required for the Grass Patch townsite to identify additional populations and enable a better understanding of the impact of the clearing on the immediate area around the site.</p> | <p>Advice has been sought from DBCA regarding the impacts to conservation significant flora, fauna and ecological communities. This information is provided in Section 3.2 above.</p> <p>No threatened flora species or communities resembling the Kwongkan Shrubland TEC were recorded during the flora survey for Grass Patch. However, one priority 3 species, <i>Goodenia laevis</i> subsp. <i>laevis</i> (P3) was recorded. Impacts to this occurrence is not deemed to be significant.</p> |
| <p>The impact of the project on the Kwongkan TEC and Swamp Yate PEC warrants the requirement to offset areas to account for the loss that will occur.</p> | <p>Through further avoidance and mitigation measures the Shire has avoided clearing of the Swamp Yate PEC, detailed in Section 3.1 and Section 3.2 above.</p> |
| <p>The management proposed for Threatened and Priority Communities and Species is inadequate.</p> | <p>Advice has been sought from DBCA regarding the impacts to conservation significant flora, fauna and ecological communities. This information is provided in Section 3.2 above. Impacts to <i>Melaleuca dempta</i> were not deemed to be significant.</p> <p>Details of offsets provided in Section 4 above, with an offset required for impacts to Kwongkan Shrubland TEC.</p> |
| <p>The presence of <i>Melaleuca dempta</i> around the salt lake within the project area and its overall population size should be considered and a permit to take gained by the Shire before approval to clear is granted, particularly given its low representation in the conservation estate.</p> | |
| <p>Amount of remnant remaining for each of the Beard Associations and the extent of associations represented in land managed by DBCA.</p> | <p>Considered in Section 3.2 above and Appendix C.C.2 below.</p> |
| <p>Recommend the removal of <i>Leptospermum laevigatum</i> using non-mechanical methods is carried out prior to clearing of any areas as this plant disperses its seed rapidly on disturbance and needs to be contained within a very short time after cutting to avoid spread of seed onto the surrounding soil.</p> | <p>Considered upon review of the Dieback and Invasive Weed Management Plan (Shire of Esperance, 2022b) provided by the Shire.</p> |
| <p>Specific construction management plan is required to identify:</p> <ol style="list-style-type: none"> 1. Clearing controls to be put in place; 2. Topsoil management; 3. Weed management 4. Dieback control measures; 5. Drainage management; 6. Improvement measures for areas not meeting TEC criteria; 7. Offsets proposed for TEC cleared. | <p>Considered in Section 3.1 and Section 3.2 above.</p> <p>Dieback and Invasive Weed Management Plan provided (Shire of Esperance, 2022b) upon request from the department.</p> |
| <p>site E - The creation of a cleared hardstand storage area in this location will result in additional runoff into areas surrounding the proposed site.</p> | <p>Considered in Section 3.2.4 above.</p> |
| <p>site O - the potential loss of two Priority species in the area may also be minimised by clearing on one side of the road.</p> | <p>Considered in Section 3.1 above. The Shire advised that moving the works to one side of the road is not feasible.</p> |

| Summary of comments | Consideration of comment |
|--|--|
| site S - The justification for widening the road is not clear. Given its minor status, it appears it is mainly to improve access for large agricultural equipment – a poor justification for removal of good quality vegetation. | <p>The Shire advised it is required to meet current road safety design specifications. Considered in Section 3.1 above.</p> <p>The Shire is responsible for planning, building and maintaining the road network in its jurisdiction and has the relevant expertise and experience to determine the technical options, solutions and engineering standards of the proposed works.</p> |
| site V - Reduction of the active road footprint to 20 m or less will allow retention of a 20 m wide vegetation corridor to allow fauna movement to and from the vegetated block at the end of project area. | Footprint reduced from 28 metres to 21 metres, detailed in Section 3.1 above. |

Appendix C. Site characteristics

C.1. 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 the department 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 area.

| Characteristic | Details |
|--------------------|---|
| Local context | The majority of the areas proposed to be cleared are located within road reserves in the Shire of Esperance, which falls within the intensive land use zone of Western Australia. The majority of the proposed clearing areas are directly adjacent to agricultural land. |
| Ecological linkage | The areas proposed to be cleared may contribute towards fauna dispersal within the landscape due to the extensive clearing that has occurred within the local area, however there are no formal linkages mapped and the proposed clearing will not sever any linkages. |
| Conservation areas | <p>The nearest conservation areas to the areas proposed to be cleared are as follows:</p> <ul style="list-style-type: none"> • Alexander Nature Reserve, located 11.61 kilometres from the application area (site B, Henkes Rd) • Jeffrey Lagoon Nature Reserve, located 4.8 kilometres from the application area (site E, Grass Patch site) • Un-named Nature Reserve, located 14.1 kilometres from the application area (site O, Holt Rd) • Cape Le Grand National Park, located 10.25 kilometres from the application area (site P, Merivale Rd) • Woody Lake Nature Reserve, located 6.88 kilometres from the application area (site S, Coramup Rd) • Mount Ridley Nature Reserve, located 8.11 kilometres from the application area (site V, Scaddan Rd) • Un-named Nature Reserve, located 10.06 kilometres from the application area (site X, Fisheries Rd) |

| Characteristic | Details | | | | | | | | | | | | |
|-------------------------|---|------|-------------------------------|------------------|--|-------------------------|--|----------------|---|--------------------|---|-------------------|--|
| Vegetation description | <p>Flora and vegetation surveys (Shire of Esperance 2021a – 2021j) were conducted by the Shire of Esperance across the seven proposed clearing areas. The full survey descriptions and mapping are available in Appendix G. The vegetation described in the surveys provided by the Shire broadly align with the pre-European mapping across the application area.</p> <table border="1"> <thead> <tr> <th>Site</th> <th>Veg description and condition</th> </tr> </thead> <tbody> <tr> <td>site B Henkes Rd</td> <td> <p>Pre-European mapping (Esperance_4801):</p> <ul style="list-style-type: none"> Mixed heath with scattered tall shrubs <i>Acacia</i> spp., Proteaceae and Myrtaceae. <p>Survey vegetation description:</p> <ul style="list-style-type: none"> Scattered <i>Nuytsia floribunda</i> with dense <i>Allocasuarina</i> and <i>Melaleuca</i> shrubland. <i>Allocasuarina</i> shrubland with <i>Nuytsia</i> and <i>Anarthria</i> sedgeland. </td> </tr> <tr> <td>site E Grass Patch site</td> <td> <p>Pre-European mapping (Lort_512):</p> <ul style="list-style-type: none"> Eucalypt shrubland <i>Eucalyptus eremophila</i>, <i>E. redunca</i>, <i>E. spp.</i> <p>Survey vegetation description:</p> <ul style="list-style-type: none"> Semi-open Mallee Eucalyptus woodland with very sparse to bare under and mid story with the majority in good condition </td> </tr> <tr> <td>site O Holt Rd</td> <td> <p>Pre-European mapping (Salmon Gums_486):</p> <ul style="list-style-type: none"> Woodland/Mallee <p>Survey vegetation description:</p> <ul style="list-style-type: none"> Mixed Eucalyptus Mallee closed woodland with no under-story. Scattered shrub mid-story. Closed Eucalyptus Mallee woodland over scattered open <i>Melaleuca</i> mid-story. Semi-open Mallet Eucalyptus woodland over low shrubland Eucalyptus woodland, dominated by <i>Eucalyptus diptera</i>. Scattered <i>Melaleuca teuthidoides</i> shrubland and chenopod understory present. Eucalyptus closed woodland with minimal mid story present. </td> </tr> <tr> <td>site P Merivale Rd</td> <td> <p>Pre-European mapping (Esperance_47, Esperance_6048 and Fanny Cove_7048):</p> <ul style="list-style-type: none"> Mixed heath with scattered mallee e.g. tallerack <i>Eucalyptus tetragona</i> Mixed heath with scattered tall shrubs <i>Acacia</i> spp., Proteaceae and Myrtaceae. <p>Survey vegetation description:</p> <ul style="list-style-type: none"> Degraded <i>Nuytsia</i> and <i>Acacia</i> shrubland with Pines, Victorian Tea Tree and Lovegrass Scattered <i>Banksia speciosa</i> and <i>Nuytsia</i> with dominant <i>Melaleuca</i> and <i>Adenanthos</i> shrubland <i>Melaleuca cuticularis</i> wetland Scattered <i>Nuytsia</i> over dense <i>Anarthria</i> wetland with sedges <i>Baumea</i> wetland <i>Melaleuca cuticularis</i> and <i>Hakea adnata</i> wetland with sedges and scattered <i>Taxandria callistachys</i> and <i>Acacia cyclops</i> <i>Nuytsia</i> over low, diverse shrubland with no understory or <i>Banksia speciosa</i> </td> </tr> <tr> <td>site S Coramup Rd</td> <td> <p>Pre-European mapping (Esperance_6084 and Esperance_931):</p> <ul style="list-style-type: none"> Mixed heath with scattered tall shrubs <i>Acacia</i> spp., Proteaceae and Myrtaceae. Wheatbelt; York gum, salmon gum etc. <i>Eucalyptus loxophleba</i>, <i>E. salmonophloia</i>. Goldfields; gimlet, redwood etc. <i>E. salubris</i>, <i>E. oleosa</i>. Riverine; rivergum <i>E. camaldulensis</i>. </td> </tr> </tbody> </table> | Site | Veg description and condition | site B Henkes Rd | <p>Pre-European mapping (Esperance_4801):</p> <ul style="list-style-type: none"> Mixed heath with scattered tall shrubs <i>Acacia</i> spp., Proteaceae and Myrtaceae. <p>Survey vegetation description:</p> <ul style="list-style-type: none"> Scattered <i>Nuytsia floribunda</i> with dense <i>Allocasuarina</i> and <i>Melaleuca</i> shrubland. <i>Allocasuarina</i> shrubland with <i>Nuytsia</i> and <i>Anarthria</i> sedgeland. | site E Grass Patch site | <p>Pre-European mapping (Lort_512):</p> <ul style="list-style-type: none"> Eucalypt shrubland <i>Eucalyptus eremophila</i>, <i>E. redunca</i>, <i>E. spp.</i> <p>Survey vegetation description:</p> <ul style="list-style-type: none"> Semi-open Mallee Eucalyptus woodland with very sparse to bare under and mid story with the majority in good condition | site O Holt Rd | <p>Pre-European mapping (Salmon Gums_486):</p> <ul style="list-style-type: none"> Woodland/Mallee <p>Survey vegetation description:</p> <ul style="list-style-type: none"> Mixed Eucalyptus Mallee closed woodland with no under-story. Scattered shrub mid-story. Closed Eucalyptus Mallee woodland over scattered open <i>Melaleuca</i> mid-story. Semi-open Mallet Eucalyptus woodland over low shrubland Eucalyptus woodland, dominated by <i>Eucalyptus diptera</i>. Scattered <i>Melaleuca teuthidoides</i> shrubland and chenopod understory present. Eucalyptus closed woodland with minimal mid story present. | site P Merivale Rd | <p>Pre-European mapping (Esperance_47, Esperance_6048 and Fanny Cove_7048):</p> <ul style="list-style-type: none"> Mixed heath with scattered mallee e.g. tallerack <i>Eucalyptus tetragona</i> Mixed heath with scattered tall shrubs <i>Acacia</i> spp., Proteaceae and Myrtaceae. <p>Survey vegetation description:</p> <ul style="list-style-type: none"> Degraded <i>Nuytsia</i> and <i>Acacia</i> shrubland with Pines, Victorian Tea Tree and Lovegrass Scattered <i>Banksia speciosa</i> and <i>Nuytsia</i> with dominant <i>Melaleuca</i> and <i>Adenanthos</i> shrubland <i>Melaleuca cuticularis</i> wetland Scattered <i>Nuytsia</i> over dense <i>Anarthria</i> wetland with sedges <i>Baumea</i> wetland <i>Melaleuca cuticularis</i> and <i>Hakea adnata</i> wetland with sedges and scattered <i>Taxandria callistachys</i> and <i>Acacia cyclops</i> <i>Nuytsia</i> over low, diverse shrubland with no understory or <i>Banksia speciosa</i> | site S Coramup Rd | <p>Pre-European mapping (Esperance_6084 and Esperance_931):</p> <ul style="list-style-type: none"> Mixed heath with scattered tall shrubs <i>Acacia</i> spp., Proteaceae and Myrtaceae. Wheatbelt; York gum, salmon gum etc. <i>Eucalyptus loxophleba</i>, <i>E. salmonophloia</i>. Goldfields; gimlet, redwood etc. <i>E. salubris</i>, <i>E. oleosa</i>. Riverine; rivergum <i>E. camaldulensis</i>. |
| Site | Veg description and condition | | | | | | | | | | | | |
| site B Henkes Rd | <p>Pre-European mapping (Esperance_4801):</p> <ul style="list-style-type: none"> Mixed heath with scattered tall shrubs <i>Acacia</i> spp., Proteaceae and Myrtaceae. <p>Survey vegetation description:</p> <ul style="list-style-type: none"> Scattered <i>Nuytsia floribunda</i> with dense <i>Allocasuarina</i> and <i>Melaleuca</i> shrubland. <i>Allocasuarina</i> shrubland with <i>Nuytsia</i> and <i>Anarthria</i> sedgeland. | | | | | | | | | | | | |
| site E Grass Patch site | <p>Pre-European mapping (Lort_512):</p> <ul style="list-style-type: none"> Eucalypt shrubland <i>Eucalyptus eremophila</i>, <i>E. redunca</i>, <i>E. spp.</i> <p>Survey vegetation description:</p> <ul style="list-style-type: none"> Semi-open Mallee Eucalyptus woodland with very sparse to bare under and mid story with the majority in good condition | | | | | | | | | | | | |
| site O Holt Rd | <p>Pre-European mapping (Salmon Gums_486):</p> <ul style="list-style-type: none"> Woodland/Mallee <p>Survey vegetation description:</p> <ul style="list-style-type: none"> Mixed Eucalyptus Mallee closed woodland with no under-story. Scattered shrub mid-story. Closed Eucalyptus Mallee woodland over scattered open <i>Melaleuca</i> mid-story. Semi-open Mallet Eucalyptus woodland over low shrubland Eucalyptus woodland, dominated by <i>Eucalyptus diptera</i>. Scattered <i>Melaleuca teuthidoides</i> shrubland and chenopod understory present. Eucalyptus closed woodland with minimal mid story present. | | | | | | | | | | | | |
| site P Merivale Rd | <p>Pre-European mapping (Esperance_47, Esperance_6048 and Fanny Cove_7048):</p> <ul style="list-style-type: none"> Mixed heath with scattered mallee e.g. tallerack <i>Eucalyptus tetragona</i> Mixed heath with scattered tall shrubs <i>Acacia</i> spp., Proteaceae and Myrtaceae. <p>Survey vegetation description:</p> <ul style="list-style-type: none"> Degraded <i>Nuytsia</i> and <i>Acacia</i> shrubland with Pines, Victorian Tea Tree and Lovegrass Scattered <i>Banksia speciosa</i> and <i>Nuytsia</i> with dominant <i>Melaleuca</i> and <i>Adenanthos</i> shrubland <i>Melaleuca cuticularis</i> wetland Scattered <i>Nuytsia</i> over dense <i>Anarthria</i> wetland with sedges <i>Baumea</i> wetland <i>Melaleuca cuticularis</i> and <i>Hakea adnata</i> wetland with sedges and scattered <i>Taxandria callistachys</i> and <i>Acacia cyclops</i> <i>Nuytsia</i> over low, diverse shrubland with no understory or <i>Banksia speciosa</i> | | | | | | | | | | | | |
| site S Coramup Rd | <p>Pre-European mapping (Esperance_6084 and Esperance_931):</p> <ul style="list-style-type: none"> Mixed heath with scattered tall shrubs <i>Acacia</i> spp., Proteaceae and Myrtaceae. Wheatbelt; York gum, salmon gum etc. <i>Eucalyptus loxophleba</i>, <i>E. salmonophloia</i>. Goldfields; gimlet, redwood etc. <i>E. salubris</i>, <i>E. oleosa</i>. Riverine; rivergum <i>E. camaldulensis</i>. | | | | | | | | | | | | |

| Characteristic | Details |
|----------------------|--|
| | <p>Survey vegetation description:</p> <ul style="list-style-type: none"> • Open <i>Nuytsia floribunda</i> woodland over diverse Proteaceous shrubland • <i>Banksia speciosa</i> woodland, over <i>Lambertia inermis</i> and mixed proteaceous shrubland • <i>Taxandria lineraris</i> closed shrubland (Riparian) • Bullrushes and <i>Juncus</i> within creekline <p>site V Scaddan Rd</p> <p>Pre-European mapping (Ridley_1516):</p> <ul style="list-style-type: none"> • Eucalypt shrubland <i>Eucalyptus eremophila</i>, <i>E. redunca</i>, <i>E. spp.</i> <p>Survey vegetation description:</p> <ul style="list-style-type: none"> • Highly disturbed mixed <i>Acacia</i> and Proteaceae shrubland • Open <i>Eucalyptus kessellii</i> subsp. <i>kessellii</i> woodland over <i>Acacia cyclops</i> shrubland • Regenerating <i>Eucalyptus</i> Mallee over <i>Acacia cyclops</i> shrubland • <i>Eucalyptus</i> Mallee over <i>Melaleuca</i> shrubland • Scattered <i>Melaleuca cuticularis</i> and Samphire community on salt lake periphery <p>site X Fisheries Rd</p> <p>Pre-European mapping (Esperance_6048):</p> <ul style="list-style-type: none"> • Mixed heath with scattered tall shrubs <i>Acacia spp.</i>, Proteaceae and Myrtaceae. <p>Survey vegetation description:</p> <ul style="list-style-type: none"> • <i>Allocasuarina</i> sp. and scattered low <i>Nuytsia floribunda</i> with sparse <i>Melaleuca</i> shrubland • <i>Melaleuca cuticularis</i> dominated wetland • <i>Banksia speciosa</i> dominated shrubland on sand rise, with mixed <i>Nuytsia floribunda</i> and <i>Allocasuarina</i> |
| Vegetation condition | <p>Flora and vegetation surveys (Shire of Esperance 2021a – 2021j) indicate the vegetation within the proposed clearing area ranges from completely degraded to excellent condition (Keighery, 1994).</p> <p>The full Keighery (1994) condition rating scale is provided in Appendix E. Survey descriptions and mapping are available in Appendix G.</p> |
| Climate | <p>The Esperance climate is described as Mediterranean, characterised by cool wet winters and dry warm summers (BoM 2019). The area receives an average annual rainfall of 350 to 500 millimetres.</p> |

| Characteristic | Details | | | | | | | | | | | | | | | | |
|-------------------------|---|---|-----------|------------------------|--|----------------------|--|----------------------|---|-----------------------|--|----------------|--|-------------------------|---|---------------------|--|
| Soil description | The soil across the application area is mapped as: | | | | | | | | | | | | | | | | |
| | <table border="1"> <thead> <tr> <th>Site</th> <th>Soil type</th> </tr> </thead> <tbody> <tr> <td>site X Fisheries Rd</td> <td>The soil of 'site X - Fisheries Road, East of Daniels Road' is broadly defined as sands or duplex soils (sand or gravel) (Schnoknecht et al. 2004). Within the area, there has been two soil types recorded. These include: <ul style="list-style-type: none"> • Esperance 6 Subsystem (245Es_6): Red-brown to grey brown alluvial sands • Esperance 2 Subsystem (245Es_2): Gravelly yellow mottled duplex soils, (30-80 cm sand over gravel). </td> </tr> <tr> <td>site V Scaddan Rd</td> <td>The soil of 'site V – Scaddan Road Resheet, Yates Rd to Styles Rd' is primarily alkaline duplex soils (Schnoknecht et al. 2004). Within the area, there has been one other soil type recorded: alkaline grey deep and shallow sandy duplex and associated salt lake soils, pale deep sands and calcareous loamy earth.</td> </tr> <tr> <td>site S Coramup Rd</td> <td>The soil of 'site S – Coramup Road' is broadly defined as deep uniform sands to gravelly, yellow mottled duplex soils (Schnoknecht et al. 2004). Within the area, there has been four soil types recorded. These include: <ul style="list-style-type: none"> • Esperance 9E3f Phase (245Es_9E3f): Deep uniform sand, Podzol > 80 cm (Corinup), Uc2.26, on minor river valleys, 3-8% slope - 2.65 ha • Esperance 9E2f Phase (245Es_9E2f): Gravelly, yellow mottled duplex soil with < 30 cm of sand over gravel layer (Fleming (shallow)), Dy5.87, on minor river valleys, 3-8% slope - 1.00 ha • Esperance 2 2b Phase (245Es_2E2b): Gravelly, yellow mottled duplex soil with 30-80 cm of sand over gravel layer (Fleming), Dy5.83, on gently undulating plain, 1-3% slope - 1.46 ha • Esperance 2E3b Phase (245Es_2E3b): Deep uniform sand, Podzol > 80 cm (Corinup), Uc2.22, on gently undulating plain, 1-3% slope - 2.72 ha </td> </tr> <tr> <td>site P Merivale Rd</td> <td>The soil of 'site P - Merivale Road Widening' is broadly defined as deep uniform sand (Schnoknecht et al. 2004). Within the area, there has been two other soil types recorded. These include: <ul style="list-style-type: none"> • Gravelly, yellow mottled duplex soil with < 30 cm of sand over gravel, and • Rock outcrops (granite). </td> </tr> <tr> <td>site O Holt Rd</td> <td>Soil of site O is broadly defined as poorly drained calcareous, loamy soils (Schnoknecht et al. 2004).</td> </tr> <tr> <td>site E Grass Patch site</td> <td>The soil of 'site E is broadly defined as Scaddan 1 Subsystem (246Sc_1): alkaline solonchic duplex soils (Schnoknecht et al. 2004).</td> </tr> <tr> <td>site B Henkes Rd</td> <td>The soil of 'site B is predominantly red-brown to grey brown alluvial sands (Schnoknecht et al. 2004).</td> </tr> </tbody> </table> | Site | Soil type | site X Fisheries Rd | The soil of 'site X - Fisheries Road, East of Daniels Road' is broadly defined as sands or duplex soils (sand or gravel) (Schnoknecht et al. 2004). Within the area, there has been two soil types recorded. 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These include: <ul style="list-style-type: none"> • Gravelly, yellow mottled duplex soil with < 30 cm of sand over gravel, and • Rock outcrops (granite). | site O Holt Rd | Soil of site O is broadly defined as poorly drained calcareous, loamy soils (Schnoknecht et al. 2004). | site E Grass Patch site | The soil of 'site E is broadly defined as Scaddan 1 Subsystem (246Sc_1): alkaline solonchic duplex soils (Schnoknecht et al. 2004). | site B Henkes Rd | The soil of 'site B is predominantly red-brown to grey brown alluvial sands (Schnoknecht et al. 2004). |
| | Site | Soil type | | | | | | | | | | | | | | | |
| | site X Fisheries Rd | The soil of 'site X - Fisheries Road, East of Daniels Road' is broadly defined as sands or duplex soils (sand or gravel) (Schnoknecht et al. 2004). Within the area, there has been two soil types recorded. These include: <ul style="list-style-type: none"> • Esperance 6 Subsystem (245Es_6): Red-brown to grey brown alluvial sands • Esperance 2 Subsystem (245Es_2): Gravelly yellow mottled duplex soils, (30-80 cm sand over gravel). | | | | | | | | | | | | | | | |
| | site V Scaddan Rd | The soil of 'site V – Scaddan Road Resheet, Yates Rd to Styles Rd' is primarily alkaline duplex soils (Schnoknecht et al. 2004). Within the area, there has been one other soil type recorded: alkaline grey deep and shallow sandy duplex and associated salt lake soils, pale deep sands and calcareous loamy earth. | | | | | | | | | | | | | | | |
| | site S Coramup Rd | The soil of 'site S – Coramup Road' is broadly defined as deep uniform sands to gravelly, yellow mottled duplex soils (Schnoknecht et al. 2004). Within the area, there has been four soil types recorded. These include: <ul style="list-style-type: none"> • Esperance 9E3f Phase (245Es_9E3f): Deep uniform sand, Podzol > 80 cm (Corinup), Uc2.26, on minor river valleys, 3-8% slope - 2.65 ha • Esperance 9E2f Phase (245Es_9E2f): Gravelly, yellow mottled duplex soil with < 30 cm of sand over gravel layer (Fleming (shallow)), Dy5.87, on minor river valleys, 3-8% slope - 1.00 ha • Esperance 2 2b Phase (245Es_2E2b): Gravelly, yellow mottled duplex soil with 30-80 cm of sand over gravel layer (Fleming), Dy5.83, on gently undulating plain, 1-3% slope - 1.46 ha • Esperance 2E3b Phase (245Es_2E3b): Deep uniform sand, Podzol > 80 cm (Corinup), Uc2.22, on gently undulating plain, 1-3% slope - 2.72 ha | | | | | | | | | | | | | | | |
| | site P Merivale Rd | The soil of 'site P - Merivale Road Widening' is broadly defined as deep uniform sand (Schnoknecht et al. 2004). Within the area, there has been two other soil types recorded. These include: <ul style="list-style-type: none"> • Gravelly, yellow mottled duplex soil with < 30 cm of sand over gravel, and • Rock outcrops (granite). | | | | | | | | | | | | | | | |
| | site O Holt Rd | Soil of site O is broadly defined as poorly drained calcareous, loamy soils (Schnoknecht et al. 2004). | | | | | | | | | | | | | | | |
| site E Grass Patch site | The soil of 'site E is broadly defined as Scaddan 1 Subsystem (246Sc_1): alkaline solonchic duplex soils (Schnoknecht et al. 2004). | | | | | | | | | | | | | | | | |
| site B Henkes Rd | The soil of 'site B is predominantly red-brown to grey brown alluvial sands (Schnoknecht et al. 2004). | | | | | | | | | | | | | | | | |

| Characteristic | Details | | | | | | | | | | | | | | | | |
|-------------------------|--|------|-----------|------------------------|---|----------------------|--|----------------------|--|-----------------------|---|----------------------|---|-------------------------|---|---------------------|---|
| Land degradation risk | <p>Land degradation risk across the application area is mapped as:</p> <table border="1"> <thead> <tr> <th>Site</th> <th>Soil type</th> </tr> </thead> <tbody> <tr> <td>site X Fisheries Rd</td> <td>The site is mapped as having a high susceptibility to wind erosion and substrate acidification. Mapped as having a medium to low risk of land degradation from phosphorus export.</td> </tr> <tr> <td>site V Scaddan Rd</td> <td>The site is mapped as having a medium to high susceptibility to wind erosion and substrate acidification. A portion has been mapped as having a medium risk of land degradation from salinity.</td> </tr> <tr> <td>site S Coramup Rd</td> <td>The site is mapped as having a high susceptibility to wind erosion and substrate acidification. A portion is mapped as having a medium to high risk of land degradation from water repellence.</td> </tr> <tr> <td>site P Merivale Rd</td> <td>The site is mapped as having a high susceptibility to wind erosion, water repellence risk and substrate acidification. A portion has been mapped as having a medium risk of land degradation from salinity.</td> </tr> <tr> <td>site O Holt Rd</td> <td>The site is mapped as having a medium susceptibility to wind erosion and substrate acidification.</td> </tr> <tr> <td>site E Grass Patch site</td> <td>The site is mapped as having a medium susceptibility to wind erosion and substrate acidification.</td> </tr> <tr> <td>site B Henkes Rd</td> <td>The site is mapped as having a high susceptibility to wind erosion and substrate acidification.</td> </tr> </tbody> </table> | Site | Soil type | site X Fisheries Rd | The site is mapped as having a high susceptibility to wind erosion and substrate acidification. Mapped as having a medium to low risk of land degradation from phosphorus export. | site V Scaddan Rd | The site is mapped as having a medium to high susceptibility to wind erosion and substrate acidification. A portion has been mapped as having a medium risk of land degradation from salinity. | site S Coramup Rd | The site is mapped as having a high susceptibility to wind erosion and substrate acidification. A portion is mapped as having a medium to high risk of land degradation from water repellence. | site P Merivale Rd | The site is mapped as having a high susceptibility to wind erosion, water repellence risk and substrate acidification. A portion has been mapped as having a medium risk of land degradation from salinity. | site O Holt Rd | The site is mapped as having a medium susceptibility to wind erosion and substrate acidification. | site E Grass Patch site | The site is mapped as having a medium susceptibility to wind erosion and substrate acidification. | site B Henkes Rd | The site is mapped as having a high susceptibility to wind erosion and substrate acidification. |
| Site | Soil type | | | | | | | | | | | | | | | | |
| site X Fisheries Rd | The site is mapped as having a high susceptibility to wind erosion and substrate acidification. Mapped as having a medium to low risk of land degradation from phosphorus export. | | | | | | | | | | | | | | | | |
| site V Scaddan Rd | The site is mapped as having a medium to high susceptibility to wind erosion and substrate acidification. A portion has been mapped as having a medium risk of land degradation from salinity. | | | | | | | | | | | | | | | | |
| site S Coramup Rd | The site is mapped as having a high susceptibility to wind erosion and substrate acidification. A portion is mapped as having a medium to high risk of land degradation from water repellence. | | | | | | | | | | | | | | | | |
| site P Merivale Rd | The site is mapped as having a high susceptibility to wind erosion, water repellence risk and substrate acidification. A portion has been mapped as having a medium risk of land degradation from salinity. | | | | | | | | | | | | | | | | |
| site O Holt Rd | The site is mapped as having a medium susceptibility to wind erosion and substrate acidification. | | | | | | | | | | | | | | | | |
| site E Grass Patch site | The site is mapped as having a medium susceptibility to wind erosion and substrate acidification. | | | | | | | | | | | | | | | | |
| site B Henkes Rd | The site is mapped as having a high susceptibility to wind erosion and substrate acidification. | | | | | | | | | | | | | | | | |
| Waterbodies | Of the seven areas proposed to be cleared, two intersect minor waterbodies. The proposed clearing within site V along Scaddan road intersects a small non perennial waterbody, and the proposed clearing within site S, along Coramup road intersects a non perennial tributary of Coramup Creek. | | | | | | | | | | | | | | | | |
| Hydrogeography | <p>Application area is located across several Catchments.</p> <table border="1"> <thead> <tr> <th>Site</th> <th>Catchment</th> </tr> </thead> <tbody> <tr> <td>site O - Holt Rd</td> <td>Balladonia Catchment</td> </tr> <tr> <td>site E - Grass Patch</td> <td>Bandy Creek Catchment</td> </tr> <tr> <td>site V - Scaddan Rd</td> <td>Bandy Creek Catchment</td> </tr> <tr> <td>site S - Coramup Rd</td> <td>Bandy Creek Catchment</td> </tr> <tr> <td>site P - Merivale Rd</td> <td>Coastal Catchment</td> </tr> <tr> <td>site X - Fisheries Rd</td> <td>Munglignup Creek Catchment</td> </tr> <tr> <td>site B - Henkes Rd</td> <td>Alexander River Catchment</td> </tr> </tbody> </table> <p>The application area is not within any proclaimed areas under the <i>Rights in Water and Irrigation Act 1914</i> or the <i>Country Areas Water Supply Act 1947</i></p> | Site | Catchment | site O - Holt Rd | Balladonia Catchment | site E - Grass Patch | Bandy Creek Catchment | site V - Scaddan Rd | Bandy Creek Catchment | site S - Coramup Rd | Bandy Creek Catchment | site P - Merivale Rd | Coastal Catchment | site X - Fisheries Rd | Munglignup Creek Catchment | site B - Henkes Rd | Alexander River Catchment |
| Site | Catchment | | | | | | | | | | | | | | | | |
| site O - Holt Rd | Balladonia Catchment | | | | | | | | | | | | | | | | |
| site E - Grass Patch | Bandy Creek Catchment | | | | | | | | | | | | | | | | |
| site V - Scaddan Rd | Bandy Creek Catchment | | | | | | | | | | | | | | | | |
| site S - Coramup Rd | Bandy Creek Catchment | | | | | | | | | | | | | | | | |
| site P - Merivale Rd | Coastal Catchment | | | | | | | | | | | | | | | | |
| site X - Fisheries Rd | Munglignup Creek Catchment | | | | | | | | | | | | | | | | |
| site B - Henkes Rd | Alexander River Catchment | | | | | | | | | | | | | | | | |
| Flora | According to databases recorded seven threatened flora and 112 priority flora species have been recorded within a 10 km radius of the application areas, combined. | | | | | | | | | | | | | | | | |
| Ecological communities | <p>The federally listed (EPBC Act) threatened ecological community 'Proteaceae Dominated Kwongkan Shrubland of the Southeast Coastal Floristic Province of Western Australia' has been recorded within the local area of the proposed clearing areas.</p> <p>The Priority 3 'Swamp Yate, <i>Eucalyptus occidentalis</i>, woodlands in seasonally inundated clay basins in the South Coast of Western Australia' (Swamp Yate) PEC has also been recorded within the local area of the proposed clearing areas.</p> | | | | | | | | | | | | | | | | |
| Fauna | Desktop records identified 34 records of conservation significant species within the local area. Of these, five are considered possible to occur within the application area. A basic fauna survey recorded foraging habitat for Carnaby's cockatoos within the application area, however, no roosts or hollows were identified. | | | | | | | | | | | | | | | | |

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* | | | | | |
| Mallee | 7,395,894.36 | 4,180,937.68 | 56.53 | 1333257.35 | 17.43 |
| Esperance Plains | 2,899,940.66 | 1,494,450.87 | 51.53 | 822,666.27 | 28.37 |
| Vegetation complex* | | | | | |
| Beard vegetation association in Esperance Plains bioregion | | | | | |
| 4801 | 58,196.27 | 6,499.26 | 11.17 | 1934.26 | 3.32 |
| 6048 | 113,688.87 | 16,099.85 | 14.16 | 4000.26 | 3.52 |
| 516 | 318,746.74 | 219,798.44 | 68.96 | 91555.75 | 28.72 |
| 47 | 959,935.91 | 336,492.07 | 35.05 | 178325.54 | 18.58 |
| 41 | 6,241.93 | 2,522.92 | 40.42 | 1307.59 | 20.95 |
| 931 | 21,209.61 | 10,304.97 | 48.59 | 1777.66 | 8.28 |
| 7048 | 134,614.91 | 106,268.22 | 78.94 | 87559.9 | 65.04 |
| 1047 | 217,776.70 | 185,586.85 | 85.22 | 119810.24 | 55.02 |
| 51 | 577.06 | 520.99 | 90.28 | 120.24 | 20.84 |
| 27 | 1,779.08 | 796.48 | 44.77 | 133.57 | 7.51 |
| Beard vegetation association in Mallee bioregion | | | | | |
| 47 | 66,127.02 | 31,535.89 | 47.69 | 5812.62 | 8.75 |
| 486 | 351,116.16 | 171,015.92 | 48.71 | 21602.93 | 5 |
| 512 | 237,682.29 | 62,771.24 | 26.41 | 5714.39 | 2.38 |
| 931 | 8,856.91 | 3,220.49 | 36.36 | 479.91 | 3.16 |
| 6048 | 446.35 | 114.38 | 25.63 | 100.47 | 6.96 |

*Government of Western Australia (2019a)

C.3. Flora analysis table

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

| Species name | Conservation status | Suitable habitat features? [Y/N] | Suitable vegetation type? [Y/N] | Suitable soil type? [Y/N] | Distance of closest record to application area (km) | Number of known records (total) | Are surveys adequate to identify? [Y, N, N/A] |
|--|---------------------|----------------------------------|---------------------------------|---------------------------|---|---------------------------------|---|
| <i>Daviesia pauciflora</i> | 3 | Y | Y | Y | 0.01 | 5 | Y |
| <i>Leucopogon corymbiformis</i> | 2 | Y | Y | Y | 0.28 | 2 | Y |
| <i>Vittadinia blackii</i> | 2 | Y | Y | Y | 0.72 | 2 | Y |
| <i>Eucalyptus semiglobosa</i> | 2 | Y | Y | Y | 1.15 | 6 | Y |
| <i>Grevillea baxteri</i> | 3 | Y | Y | Y | 1.36 | 6 | Y |
| <i>Astroloma</i> sp. Grass Patch (A.J.G. Wilson 110) | 2 | Y | Y | Y | 1.64 | 6 | Y |
| <i>Hibbertia hamata</i> | 2 | Y | Y | Y | 1.90 | 6 | Y |
| <i>Stylidium roseonum</i> | 2 | Y | Y | Y | 2.63 | 2 | Y |

| Species name | Conservation status | Suitable habitat features? [Y/N] | Suitable vegetation type? [Y/N] | Suitable soil type? [Y/N] | Distance of closest record to application area (km) | Number of known records (total) | Are surveys adequate to identify? [Y, N, N/A] |
|---|---------------------|----------------------------------|---------------------------------|---------------------------|---|---------------------------------|---|
| <i>Kennedia beckxiana</i> | 2 | Y | Y | Y | 2.88 | 4 | Y |
| <i>Pterostylis faceta</i> | 2 | Y | Y | Y | 3.04 | 2 | Y |
| <i>Conostephium marchantiorum</i> | 3 | Y | Y | Y | 3.10 | 13 | Y |
| <i>Goodenia laevis</i> subsp. <i>laevis</i> | 2 | Y | Y | Y | 3.22 | 2 | Y |
| <i>Persoonia scabra</i> | 2 | Y | Y | Y | 3.95 | 2 | Y |
| <i>Beyeria physaphylla</i> | 2 | Y | Y | Y | 5.34 | 11 | Y |
| <i>Isopogon alpicornis</i> | 2 | Y | Y | Y | 5.40 | 4 | Y |
| <i>Dampiera sericantha</i> | 2 | Y | Y | Y | 6.24 | 2 | Y |
| <i>Calectasia jubilaea</i> | 2 | Y | Y | Y | 6.78 | 2 | Y |

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

C.4. Fauna analysis table

| Species name | Conservation status | Suitable habitat features? [Y/N] | Suitable vegetation type? [Y/N] | Are surveys adequate to identify? [Y, N, N/A] |
|---|---------------------|----------------------------------|---------------------------------|---|
| <i>Zanda latirostris</i> (Carnaby's cockatoo) | EN | Y | Y | Y |
| <i>Acanthophis antarcticus</i> (Southern death adder) | P3 | Y | Y | Y |
| <i>Leipoa ocellata</i> (malleefowl) | VU | Y | Y | Y |
| <i>Falco peregrinus</i> (Peregrine falcon) | OS | Y | Y | Y |
| <i>Dasyurus geoffroi</i> (chuditch) | VU | Y | Y | Y |

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority, OS: Other specially protected fauna.

C.5. Ecological community analysis table

| Community name | Conservation status | Suitable habitat features? [Y/N] | Suitable vegetation type? [Y/N] | Suitable soil type? [Y/N] | Distance of closest record to application area (km) | Are surveys adequate to identify? [Y, N, N/A] |
|---|-----------------------------|----------------------------------|---------------------------------|---------------------------|---|---|
| Proteaceae Dominated Kwongkan Shrublands of the southeast coastal floristic province of Western Australia | EN (EPBC Act) P3 (state) | Y | Y | Y | Within application areas | Y |

Appendix D. Assessment against the clearing principles

| Assessment against the clearing principles | Variance level | Is further consideration required? |
|---|----------------|--|
| Environmental value: biological values | | |
| <p>Principle (a): "Native vegetation should not be cleared if it comprises a high level of biodiversity."</p> <p><u>Assessment:</u></p> <p>The areas proposed to be cleared contain priority flora, fauna habitat and the federally listed Kwongkan Shrublands TEC.</p> | At variance | <p>Yes</p> <p>Refer to Section 3.2.1, above.</p> |

| Assessment against the clearing principles | Variance level | Is further consideration required? |
|--|------------------------------|--|
| <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></p> <p>The areas proposed to be cleared contains habitat for conservation significant fauna, including significant foraging habitat for Carnaby's cockatoo.</p> | At variance | Yes <i>Refer to Section 3.2.2, above.</i> |
| <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></p> <p>The application area is unlikely to contain habitat for Threatened flora. No Threatened flora were identified during flora surveys of the application area.</p> | Not likely to be at variance | Yes <i>Refer to Section 3.2.1, above.</i> |
| <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></p> <p>The proposed clearing areas include vegetation that represents the federally listed Kwongkan Shrublands TEC.</p> | At variance | Yes <i>Refer to Section 3.2.1, above.</i> |
| Environmental value: 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></p> <p>The extent of the mapped vegetation types and native vegetation in the local area are below the national objectives and targets for biodiversity conservation in Australia. The vegetation proposed to be cleared is considered to be part of significant remnant in an extensively cleared landscape.</p> | At variance | Yes <i>Refer to Section 3.2.3, above.</i> |
| <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 areas, the proposed clearing is not likely to have an impact on the environmental values of nearby conservation areas.</p> | Not likely to be at variance | No |
| Environmental value: 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></p> <p>Two of the seven areas proposed to be cleared intersect minor waterbodies. The vegetation proposed to be cleared within these two sites (site V and site S) is therefore considered to be growing in, or in association with, an environment associated with a watercourse or wetland.</p> | At variance | Yes <i>Refer to Section 3.2.4, above.</i> |

| 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></p> <p>The mapped soils are moderately susceptible to wind erosion and substrate acidification. Noting the linearity of the application area and the final land use of the clearing, the proposed clearing is not likely to cause significant wind erosion. The soils will be exposed on a short-term basis with cleared areas to be covered by bitumen and gravel. Any wind erosion is likely to be minimal given soil exposure is short term.</p> | May be at variance | Yes <i>Refer to Section 3.2.4, above.</i> |
| <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></p> <p>The application area intersects minor waterbodies within two sites. Given the small extent of vegetation proposed to be cleared, any change resulting from the clearing of native vegetation is considered to be minor and temporary. No long-term impacts on quality of surface and underground water are anticipated as a result of clearing native vegetation.</p> | Not likely to be at variance | No |
| <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></p> <p>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.</p> <p>Given the small amount of proposed clearing of riparian vegetation over two sites, the proposed clearing is unlikely to 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.

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

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

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

| Condition | Description |
|---------------------|--|
| 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. Offset calculator value justification

4.1. Environmental value: Significant remnant vegetation in a highly cleared landscape

| Calculation | Score (Area) | Rationale |
|--|--|--|
| Conservation significance | | |
| Description | Principle e | Beard vegetations (512, 4801 and 6048) mapped across the application area retains less than 30 per cent of their pre-European vegetation extent. Vegetation in degraded to excellent condition (Keighery, 1994). |
| Type of environmental value | Vegetation/Habitat | Vegetation considered significant as a remnant due to the highly cleared nature of the vegetation within the local area and provides foraging habitat for black cockatoos |
| Conservation significance of environmental value | Terrestrial native vegetation complex - <30% extent remaining in the bioregion | Vegetation resembles the beard associations: 4801 (11.17% extent remaining for Esperance Plains) and 6048 (14.16% extent remaining for Esperance Plains IBRA region and 25% extent remaining for Mallee IBRA) and 512 (26.41% extent remaining for Mallee IBRA) Local areas for sites E, S, V and X also below the 30 % threshold |
| Landscape level value impacted | yes/no | Yes |
| Significant impact | | |
| Description | Significant remnant vegetation | Beard vegetations (512, 4801 and 6048) mapped across the application area as well as the local areas surrounding sites E, S, V and X retain less than 30 per cent of the of the pre-European vegetation extent. Vegetation in degraded to excellent condition (Keighery, 1994). |
| Significant impact (hectares) | 10.18 | 10.18 hectares of vegetation within the application area represent the Beard vegetation associations above. |
| Quality (scale) | 7.00 | Biological surveys of the application area indicate the vegetation condition ranges from degraded to excellent condition (Keighery, 1994) with moderate to high habitat values. |
| Rehabilitation credit | | |
| Description | 1.17 | Revegetation of 3 hectares of native vegetation from degraded condition to very good condition that is a significant remnant within an extensively cleared landscape and contains black cockatoo foraging habitat, and resembles the Kwongkan Shrublands TEC. |
| Offset | | |
| Description | 0 | Proposed offset site is Reserve 35302 (Lot 1985 on Plan 91222). |

| Calculation | Score (Area) | Rationale |
|--|--------------|--|
| proposed offset (area in hectares) | 44.75 | 116.75 hectares (remainder will be 'banked' for consideration as an offset for alternate proposals) |
| Current quality of offset site | 9.00 | The majority of the vegetation within the offset site is in excellent to pristine condition. |
| Future quality WITHOUT offset | 9.00 | The quality is considered unlikely to improve or decline beyond its current quality over the next 20 years. |
| Future quality WITH offset | 9.00 | The quality is considered unlikely to improve or decline beyond its current quality over the next 20 years. |
| Time until ecological benefit (years) | 1.00 | It is expected that the transfer will be complete within 12 months. |
| Confidence in offset result (%) | 90% | There is a high level of confidence that the land tenure will be changed to 'conservation' and that the habitat quality will not deteriorate with the offset's implementation. |
| Duration of offset implementation (maximum 20 years) | 20.00 | The offset site will be protected in perpetuity |
| Time until offset site secured (years) | 1.00 | It is expected that the transfer will be complete within 12 months. |
| Risk of future loss WITHOUT offset (%) | 20.0% | The current management order of the offset site is 'gravel extraction' therefore there is a moderate to high risk of future loss |
| Risk of future loss WITH offset (%) | 5.0% | The management order of the offset site will be changed from 'gravel extraction' to 'conservation' thus the risk of loss is considered to be low |
| Offset ratio (Conservation area only) | N/A | N/A |
| Landscape level values of offset? | N/A | N/A |

4.2. Environmental value: Carnaby black cockatoo foraging habitat

| Calculation | Score (Area) | Rationale |
|--|--------------------------------------|--|
| Conservation significance | | |
| Description | Carnaby's black cockatoo habitat | Black cockatoo foraging habitat supporting roosting individuals within the known distribution of Carnaby's black cockatoos. Application area is located within an extensively cleared landscape. |
| Type of environmental value | Species (Flora/Fauna) | Carnaby's black cockatoo foraging habitat supporting roosting individuals. |
| Conservation significance of environmental value | Rare/Threatened Species - Endangered | Carnaby's cockatoo is listed as endangered under the BC Act and EPBC Act |
| Landscape level value impacted | yes/no | Yes |
| Significant impact | | |
| Description | Carnaby's cockatoo habitat | Black cockatoo foraging habitat supporting roosting individuals within the known distribution of Carnaby's black cockatoos. |
| Significant impact (hectares) | 3.41 | 3.41 hectares of suitable foraging habitat across three sites (site P, site S and site X). |
| Quality (scale) | 7.00 | Biological surveys of the application area indicate the vegetation ranges from good to pristine condition, water sources are within close proximity, known roost sites are within 20 kilometres and suitable roosting habitat is within close proximity. |
| Rehabilitation credit | | |
| Description | 0.98 | Revegetation of 3 hectares of native vegetation from degraded condition to very good condition that is a significant remnant within an extensively cleared landscape and |

| Calculation | Score (Area) | Rationale |
|--|--------------|--|
| | | contains black cockatoo foraging habitat, and resembles the Kwongkan Shrublands TEC. |
| Offset | | |
| Description | 0 | Proposed offset site is Reserve 35302 (Lot 1985 on Plan 91222) |
| Proposed offset (area in hectares) | 11.88 | Offset site is 116.75 hectares (remainder will be 'banked' for consideration as an offset for alternate proposals) |
| Current quality of offset site | 8.00 | 68.6 hectares of suitable black cockatoo foraging habitat occurs within the 116.75 hectare offset site, in very good to excellent condition. |
| Future quality WITHOUT offset | 8.00 | The quality is considered unlikely to improve or decline beyond its current quality over the next 20 years. |
| Future quality WITH offset | 8.00 | The quality is considered unlikely to improve or decline beyond its current quality over the next 20 years. |
| Time until ecological benefit (years) | 1.00 | It is expected that the transfer will be complete within 12 months. |
| Confidence in offset result (%) | 90% | There is a high level of confidence that the land tenure will be changed to 'conservation' and that the habitat quality will not deteriorate with the offset's implementation. |
| Duration of offset implementation (maximum 20 years) | 20.00 | The offset site will be protected in perpetuity |
| Time until offset site secured (years) | 1.00 | It is expected that the transfer will be complete within 12 months. |
| Risk of future loss WITHOUT offset (%) | 20.0% | The current management order of the offset site is 'gravel extraction' therefore there is a moderate risk of future loss |
| Risk of future loss WITH offset (%) | 5.0% | The management order of the offset site will be changed from 'gravel extraction' to 'conservation' thus the risk of loss is considered to be low |
| Offset ratio (Conservation area only) | N/A | N/A |
| Landscape level values of offset? | N/A | N/A |

4.3. Environmental value: Kwongkan shrubland TEC

| Calculation | Score (Area) | Rationale |
|--|--|--|
| Conservation significance | | |
| Description | Kwongkan shrubland TEC | Kwongkan shrubland Threatened Ecological Community in good to excellent condition (Keighery, 1994). |
| Type of environmental value | Ecological Community | Threatened Ecological Community (TEC) |
| Conservation significance of environmental value | Threatened Ecological Community - Endangered | Threatened Ecological Community (TEC), listed as Endangered under the EPBC Act |
| Landscape level value impacted | yes/no | Yes |
| Significant impact | | |
| Description | Kwongkan shrubland TEC | Kwongkan shrubland Threatened Ecological Community in good to excellent condition (Keighery, 1994). |
| Significant impact (hectares) | 2.39 | Biological surveys of the application area indicate 2.39 hectares of vegetation in good to excellent condition represents the Kwongkan shrubland TEC |

| Calculation | Score (Area) | Rationale |
|--|--------------|---|
| Quality (scale) | 8 | Biological surveys of the application area indicate the vegetation condition ranges from good to excellent condition. |
| Rehabilitation credit | | |
| Description | 0.98 | Revegetation of 3 hectares of native vegetation from degraded condition to very good condition that is a significant remnant within an extensively cleared landscape and contains black cockatoo foraging habitat, and resembles the Kwongkan Shrublands TEC. |
| Offset | | |
| Description | 0 | Proposed offset site is Reserve 35302 (Lot 1985 on Plan 91222) |
| Proposed offset (area in hectares) | 5.89 | Offset site is 116.75 hectares (remainder will be 'banked' for consideration as an offset for alternate proposals) |
| Current quality of offset site | 8.00 | 86.75 hectares of Kwongkan Shrubland TEC in good to pristine condition occurs within the 116.75 hectare offset site. |
| Future quality WITHOUT offset | 8.00 | The quality is considered unlikely to improve or decline beyond its current quality over the next 20 years. |
| Future quality WITH offset | 8.00 | The quality is considered unlikely to improve or decline beyond its current quality over the next 20 years. |
| Time until ecological benefit (years) | 1.00 | It is expected that the transfer will be complete within 12 months. |
| Confidence in offset result (%) | 90% | There is a high level of confidence that the land tenure will be changed to 'conservation' and that the habitat quality will not deteriorate with the offset's implementation. |
| Duration of offset implementation (maximum 20 years) | 20.00 | The offset site will be protected in perpetuity |
| Time until offset site secured (years) | 1.00 | It is expected that the transfer will be complete within 12 months. |
| Risk of future loss WITHOUT offset (%) | 20.0% | The current management order of the offset site is 'gravel extraction' therefore there is a moderate risk of future loss |
| Risk of future loss WITH offset (%) | 5.0% | The management order of the offset site will be changed from 'gravel extraction' to 'conservation' thus the risk of loss is considered to be low |
| Offset ratio (Conservation area only) | N/A | N/A |
| Landscape level values of offset? | N/A | N/A |

4.4. Revegetation credit

The following values were used for calculating the revegetation credit attributed to each of the environmental values listed above within the offset site.

| Calculation | Score (Area) | Rationale |
|------------------------------------|--------------|---|
| Offset | | |
| Description | 0 | Shire of Esperance propose to rehabilitate areas of vegetation in completely degraded condition within the offset site (Reserve 35302 (Lot 1985 on Plan 91222)). |
| Proposed offset (area in hectares) | 3.00 | Revegetation of 3 hectares of native vegetation from degraded condition to very good condition that is a significant remnant within an extensively cleared landscape and contains black cockatoo foraging habitat, and resembles the Kwongkan Shrublands TEC. |
| Current quality of offset site | 0.00 | Vegetation is in completely degraded condition |

| Calculation | Score (Area) | Rationale |
|--|--------------|---|
| Future quality WITHOUT offset | 0.00 | Vegetation is assumed to remain at the same condition without intervention |
| Future quality WITH offset | 5.00 | With the proposed rehabilitation, the vegetation is assumed to be improved to good condition |
| Time until ecological benefit (years) | 20.00 | Time for vegetation to establish and resemble the quality of vegetation lost is considered to be high (20 years) given the starting condition is completely degraded and the environmental values required to be obtained |
| Confidence in offset result (%) | 0.8 | Confidence is 80% given the starting condition of the vegetation is completely degraded and therefore revegetation success is considered more challenging. The Shire has undertaken revegetation activities nearby and have shown success in their ability to revegetate the values required. |
| Duration of offset implementation (maximum 20 years) | 20.00 | The offset site will be protected in perpetuity |
| Time until offset site secured (years) | 1.00 | It is expected that the transfer will be complete within 12 months. |
| Risk of future loss WITHOUT offset (%) | 20.0% | The current management order of the offset site is 'gravel extraction' therefore there is a moderate risk of future loss |
| Risk of future loss WITH offset (%) | 5.0% | The management order of the offset site will be changed from 'gravel extraction' to 'conservation' thus the risk of loss is considered to be low |
| Offset ratio (Conservation area only) | N/A | N/A |
| Landscape level values of offset? | N/A | N/A |



Figure 21. Vegetation type I identified in 'Site B – Henkes Road Resheet and Howick Henkes Intersection upgrade' project, described as 'Mixed dense *Acacia cyclops*, *Eucalyptus angulosa* and *Allocasuarina* shrubland with Cyperaceae sedgeland and no Proteaceae species.'



Figure 22. Vegetation type J identified in 'Site B – Henkes Road Resheet and Howick Henkes Intersection upgrade' project, described as 'Closed Mallee woodland with dense *Hakea corymbosa* mid-story and dense sedge under-story.'

Figure 1. site B Henkes and Howick Road intersection – vegetation proposed to be cleared



Figure 4. Loss of community structure due to high weed burden at 'Site C – Scaddan Road Construction, West of Backmans Rd'.



Figure 3. Vegetation identified in 'Site E – Grass Patch Material Storage' project, described as *semi-open mallee Eucalyptus woodland with very sparse to bare under and mid story*. Photo taken facing in a westerly direction at 380256.2X, 6322286.4 (UTM Zone 51H, GDA94) on 22/01/2020.

Figure 2. site E Grass Patch Road – vegetation proposed to be cleared



Figure 7. Vegetation type A described as Mixed Eucalyptus Mallee closed woodland with no understorey. Scattered shrub mid-story.



Figure 8. Vegetation type B described as Eucalyptus dominant with rough bark. Closed Eucalyptus Mallee woodland over scattered open Melaleuca mid-story.

Figure 3. site O Holt Road - vegetation proposed to be cleared



Figure 6. Vegetation type A identified in 'Site P - Merivale Road Widening' project, described as 'Degraded *Nuytsia* and *Acacia* shrubland with Pines, Victorian Tea Tree and Lovegrass'



Figure 7. Vegetation type B identified in 'Site P - Merivale Road Widening' project, described as 'Scattered *Banksia speciosa* and *Nuytsia* with dominant *Melaleuca* and *Adenanthos* shrubland'

Figure 4. site P Merivale Road - vegetation proposed to be cleared



Figure 9. Vegetation type D described as "*Taxandria lineraris* closed shrubland (Riparian)"



Figure 10. Vegetation type E described as "Bullrushes and *Juncus* within creekline"

Figure 5. site S Coramup Road - vegetation proposed to be cleared



Figure 7. Vegetation type B identified in 'Site V – Scaddan Road Resheet, Yates Rd to Styles Rd' project, described as 'Open Yate *Eucalyptus occidentalis* woodland over *Acacia cyclops* shrubland'.



Figure 8. Vegetation type C identified in 'Site V – Scaddan Road Resheet, Yates Rd to Styles Rd' project, described as 'Regenerating *Eucalyptus* Mallee over *Acacia cyclops* shrubland'.

Figure 6. site V Scaddan Road - vegetation proposed to be cleared



Figure 5. Vegetation type C identified in 'Site X – Fisheries road, East of Daniels Road', described as 'Banksia dominated shrubland on sand rise, with mixed Nuytsia & Sheoak'.



Figure 4. Vegetation type B identified in in 'Site X – Fisheries road, East of Daniels Road', described as *Melaleuca cuticularis* dominated wetland.

Figure 7. site X Fisheries Road - vegetation proposed to be cleared

Appendix H. Sources of information

H.1. GIS databases

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

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)

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

H.2. References

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

Commonwealth of Australia (2012) *EPBC Act referral guidelines for three threatened black cockatoo species*. Department of Sustainability, Environment, Water, Populations and Communities, Canberra.

Commonwealth of Australia (2014) *Proteaceae Dominated Kwongan Shrubland: a nationally-protected ecological community*. Department of the Environment, Canberra.

Department of the Environment (2014). Approved Conservation Advice for Proteaceae Dominated Kwongan Shrublands of the southeast coastal floristic province of Western Australia. Canberra: Department of the Environment. Available from:
<http://www.environment.gov.au/biodiversity/threatened/communities/pubs/126-conservation-advice.pdf>

Department of Biodiversity, Conservation and Attractions (DBCA) (2022) *Species and Communities Branch flora and fauna advice for clearing permit application CPS 9341/1*, received 30 March 2022. Department of Biodiversity, Conservation and Attractions, Western Australia (DWER Ref: DWERDT583830).

- Department of Environment and Conservation (DEC) (2012) *Chuditch (Dasyurus geoffroii) Recovery Plan*. Wildlife Management Program No. 54. Department of Environment and Conservation, Perth, Western Australia.
- Department of Environment and Heritage Protection (2015) *Common Death Adder in Wildlife and ecosystems*, Department of Environment and Heritage Protection, Queensland.
- Department of Environment Regulation (DER) (2013). *A guide to the assessment of applications to clear native vegetation*. Perth. Available from: https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Guidelines/Guide2_assessment_native_veg.pdf.
- Department of Parks and Wildlife (2016). *Fauna profiles: Malleefowl Leipoa ocellata*. Retrieved from: <http://www.dpaw.wa.gov.au/>
- Department of Primary Industries and Regional Development (DPIRD) (2019). NRInfo Digital Mapping. Department of Primary Industries and Regional Development. Government of Western Australia. URL: <https://maps.agric.wa.gov.au/nrm-info/> (accessed 30 June 2021).
- Department of Water and Environmental Regulation (DWER) (2019). *Procedure: Native vegetation clearing permits*. Joondalup. Available from: https://dwer.wa.gov.au/sites/default/files/Procedure_Native_vegetation_clearing_permits_v1.PDF.
- Environmental Protection Authority (EPA) (2016). *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment*. Available from: http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey_Dec13.pdf.
- Environmental Protection Authority (EPA) (2019) EPA Technical Report: Carnaby's Cockatoo in Environmental Impact Assessment in the Perth and Peel Region Advice of the Environmental Protection Authority under Section 16(j) of the *Environmental Protection Act 1986*.
- Government of Western Australia. (2019) *2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019*. WA Department of Biodiversity, Conservation and Attractions. <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics>
- Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Schoknecht, N., Tille, P. and Purdie, B. (2004) *Soil-landscape mapping in South-Western Australia – Overview of Methodology and outputs* Resource Management Technical Report No. 280. Department of Agriculture.
- Shire of Esperance (2021) *Clearing permit application CPS 9341/1*, received 24 June 2021 (DWER Ref: DWERDT470271).
- Shire of Esperance (2021a) *Supporting information (survey – site B) for clearing permit application CPS 9341/1*, received 24 June 2021 (DWER Ref: A2033234).
- Shire of Esperance (2021b) *Supporting information (survey – site E) for clearing permit application CPS 9341/1*, received 24 June 2021 (DWER Ref: A2033236).
- Shire of Esperance (2021c) *Supporting information (survey – site O) for clearing permit application CPS 9341/1*, received 24 June 2021 (DWER Ref: A2033237).
- Shire of Esperance (2021d) *Supporting information (survey – site P) for clearing permit application CPS 9341/1*, received 24 June 2021 (DWER Ref: A2033239).
- Shire of Esperance (2021e) *Supporting information (survey – site S) for clearing permit application CPS 9341/1*, received 24 June 2021 (DWER Ref: A2033240).
- Shire of Esperance (2021f) *Supporting information (survey – site V) for clearing permit application CPS 9341/1*, received 24 June 2021 (DWER Ref: A2033241).

Shire of Esperance (2021g) *Supporting information (survey – site X) for clearing permit application CPS 9341/1*, received 24 June 2021 (DWER Ref: A2033241).

Shire of Esperance (2022a) *Supporting information - response to request for further information*, received 11 August 2022 (DWER Ref: DWERDT643954).

Shire of Esperance (2022b) *Dieback and Invasive Weed Management Plan CPS 9341/1*, received 5 September 2022 (DWER Ref: DWERDT654939).

Shire of Esperance (2022c) *Rehabilitation plan CPS 9341/1*, received 5 September 2022 (DWER Ref: DWERDT717245).

Submission (2022) *Public submission in relation to clearing permit application CPS 9341/1*, received 30 August 2021 (DWERDT497685).