



Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

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| Permit number: | CPS 10158/1 |
| Permit type: | Purpose permit |
| Applicant name: | Shire of Esperance |
| Application received: | 20 April 2023 |
| Application area: | 7.31 hectares (revised) of native vegetation within a 58.71 hectare (revised) footprint |
| Purpose of clearing: | Road Construction, State barrier fence maintenance and gravel extraction |
| Method of clearing: | Mechanical |
| Property: | Cascade Road Reserve (PIN 11642130), North Cascade West Point Road Reserve (PIN 11642288), Cascade, North Cascade and Munglinup Myrup Road Reserve (PINs 11648886 and 11648887), Myrup Fuss Road Reserve Site (PIN 11647576), East Munglinup Fisheries Road Reserve (PIN 11648536), Condingup Ridgeland Road Reserve (PIN 11645177), Condingup Boydell Road Reserve (PIN 11642282), Dalyup and Gibson and Heywood Road Reserve (PIN 11644421), Beaumont |
| Location (LGA area/s): | Shire of Esperance |
| Localities (suburb/s): | Beaumont, Cascade, Condingup, Dalyup, East Munglinup, Gibson, Grass Patch, Lort River, Myrup, and North Cascade |

1.2. Description of clearing activities

The Shire of Esperance (the Shire) proposes to clear up to 7.31 hectares of native vegetation (see Figure 1a-f, Section 1.5) across six sites (Table 1) for the purposes of road upgrades, to meet current road safety design specifications in accordance with Austroads Guide to Road Design; construction and maintenance of the State Barrier Fence and gravel extraction.

Table 1. Proposed clearing area and location of each site across the application area

| Site | Clearing | Property |
|-------------------|----------------|---|
| Site A | 3.24 ha | Cascade Road Reserve and West Point Road Reserve |
| Site B | 0.67 ha | Myrup Road Reserve |
| Site E | 0.91 ha | Fuss Road Reserve Site |
| Site F | 0.59 ha | Fisheries Road Reserve and Ridgeland Road Reserve |
| Site G | 0.16 ha | Heywood Road Reserve |
| Site H | 1.74 ha | Boydell Road Reserve |
| Total area | 7.31 ha | |

Site A – a 330 metre extension to the State Barrier Fence is required to reduce the impacts of wild dogs, dingos, emus and kangaroos on agriculture. This site was identified as a last resort for gravel extraction, required for road

maintenance, after all private property landowners in the area refused to allow the Shire to access gravel on cleared private property (Shire of Esperance 2023a; 2023b).

Site B - Myrup Road is particularly narrow resulting in safety issues during heavy vehicle passing's. Myrup Road requires widening to maintain the RAV requirement of Mainroads WA (MRWA) for the safety of road users. This road is classified as a local distributor road on the Shire road network providing a vital link to access Esperance industrial area, airport and Esperance Coolgardie Highway (Shire of Esperance 2023a; 2023c).

Site E - Fuss Road is particularly narrow resulting in safety issues during harvest season and also with caravans accessing the coastal campground and caravan park at Munglinup Beach. Fuss Road requires widening to maintain the safety of road users. This road is classified as a rural access road, providing a vital link to properties and other access roads in south west region of Esperance. Traffic counts show a significant impact of heavy vehicles occupied during harvesting season and it is an approved RAV route (Shire of Esperance 2023a; 2023f).

Site F – Ridgeland Road is particularly narrow resulting in safety issues during harvest season. Ridgeland Road requires widening to maintain the safety of road users during harvest. This road is classified as a rural access road on the Shire road network providing vital links to properties and other access roads in the eastern region of Esperance. Traffic counts show a major impact of heavy vehicle occupied during harvesting season, is an approved RAV route and a school bus route (Shire of Esperance 2023a; 2023g).

Site G – Heywood Road requires widening to maintain the safety of road users (Shire of Esperance 2023a; 2023h).

Site H - Boydell Road is particularly narrow resulting in safety issues during harvest season. Boydell Road requires widening to maintain the safety of road users during harvest. This road is classified as a rural access road on the Shire road network providing a vital link to properties and other access roads in the north west region of Esperance. Traffic counts showed a major impact of heavy vehicle occupied during harvesting season, is an approved RAV and bus route (Shire of Esperance 2023a; 2023i).

1.3. Decision on application

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| Decision: | Granted |
| Decision date: | 3 May 2024 |
| Decision area: | 7.31 hectares of native vegetation, as depicted in Section 1.5, below. |

1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). The Department of Water and Environmental Regulation (the department) 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 main purpose of the clearing which is to improve road safety across multiple roads within the Shire.

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

- the loss of 3.62 hectares of native vegetation that provides foraging habitat for Carnaby's cockatoo (*Zanda latirostris*, EN),
- the loss of 3.27 hectares of suitable breeding habitat for malleefowl (*Leipoa ocellata*, VU),
- the loss of 3.51 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 Shrublands),
- the loss of 0.31 hectares of native vegetation that is representative of the priority ecological community (PEC) 'Swamp Yate, *Eucalyptus occidentalis*, woodlands in seasonally inundated clay basins in the South Coast of Western Australia' (Swamp Yate PEC - Priority 3),

- the loss of 3.87 hectares of significant remnant vegetation, including:
 - the loss of native vegetation in an extensively cleared landscape, and
 - the loss of vegetation mapped as and representative of highly cleared Beard vegetation associations 512 and 6048.

In accordance with the Government of Western Australia's *Environmental Offsets Policy* (2011) and *Environmental Offsets Guidelines* (2014), the Delegated Officer determined that the following land acquisition offsets are required to address the above significant residual impacts:

- **Offset 1 (banked offset):** the conservation of 14.62 hectares of remnant native vegetation within Reserve 26912, which provides:
 - vegetation in Excellent condition (Keighery, 1994) within a highly cleared area,
 - high quality habitat for malleefowl.
- **Offset 2 (banked offset):** the conservation of 28.86 hectares of remnant native vegetation within Reserve 24633, which provides:
 - vegetation in Good to Excellent condition (Keighery, 1994) within a highly cleared area,
 - high quality Carnaby's black cockatoo foraging habitat,
 - vegetation representative of the Kwongkan Shrubland TEC, and
 - vegetation in Good to Excellent condition (Keighery, 1994) representative of the Swamp Yate PEC.
- **Offset 3:** the conservation of 1.05 hectares of remnant native vegetation within Reserve 31099, which provides:
 - vegetation in pristine condition (Keighery, 1994) representative of the Kwongkan Shrubland TEC.

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 and vegetation, including but not limited to conservation significant flora, Swamp Yate PEC, and Kwongkan Shrublands 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,
- potential direct and indirect impacts to adjacent creeks and wetlands, 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,
- rehabilitation of 2.89 hectares within site A post gravel extraction,
- clearing to occur in dry conditions and outside of the high flow period, and
- 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.

1.5. Site maps

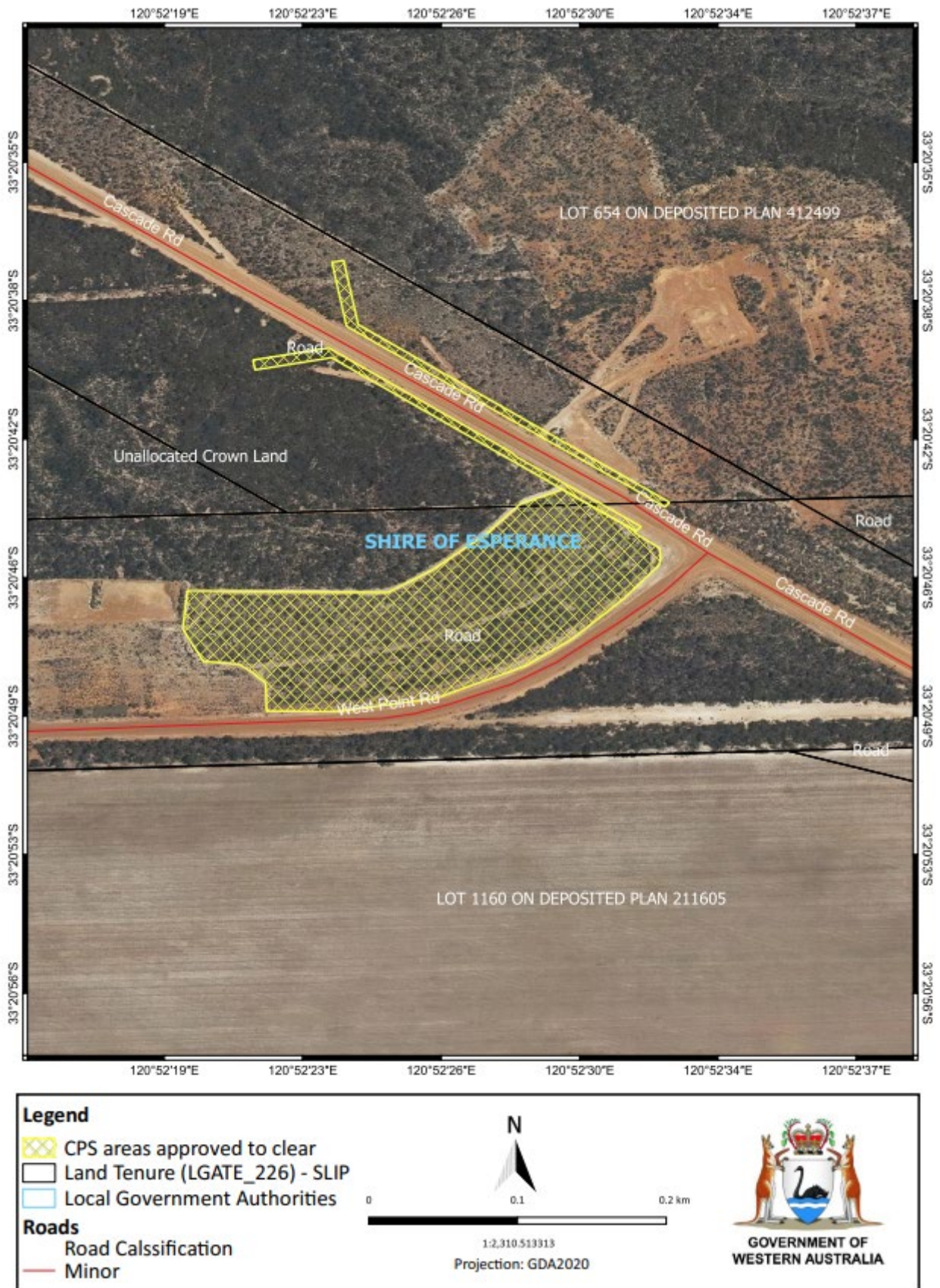


Figure 1a Map of the application area (Site A)

The areas crosshatched yellow indicate the areas authorised to be cleared under the granted clearing permit.

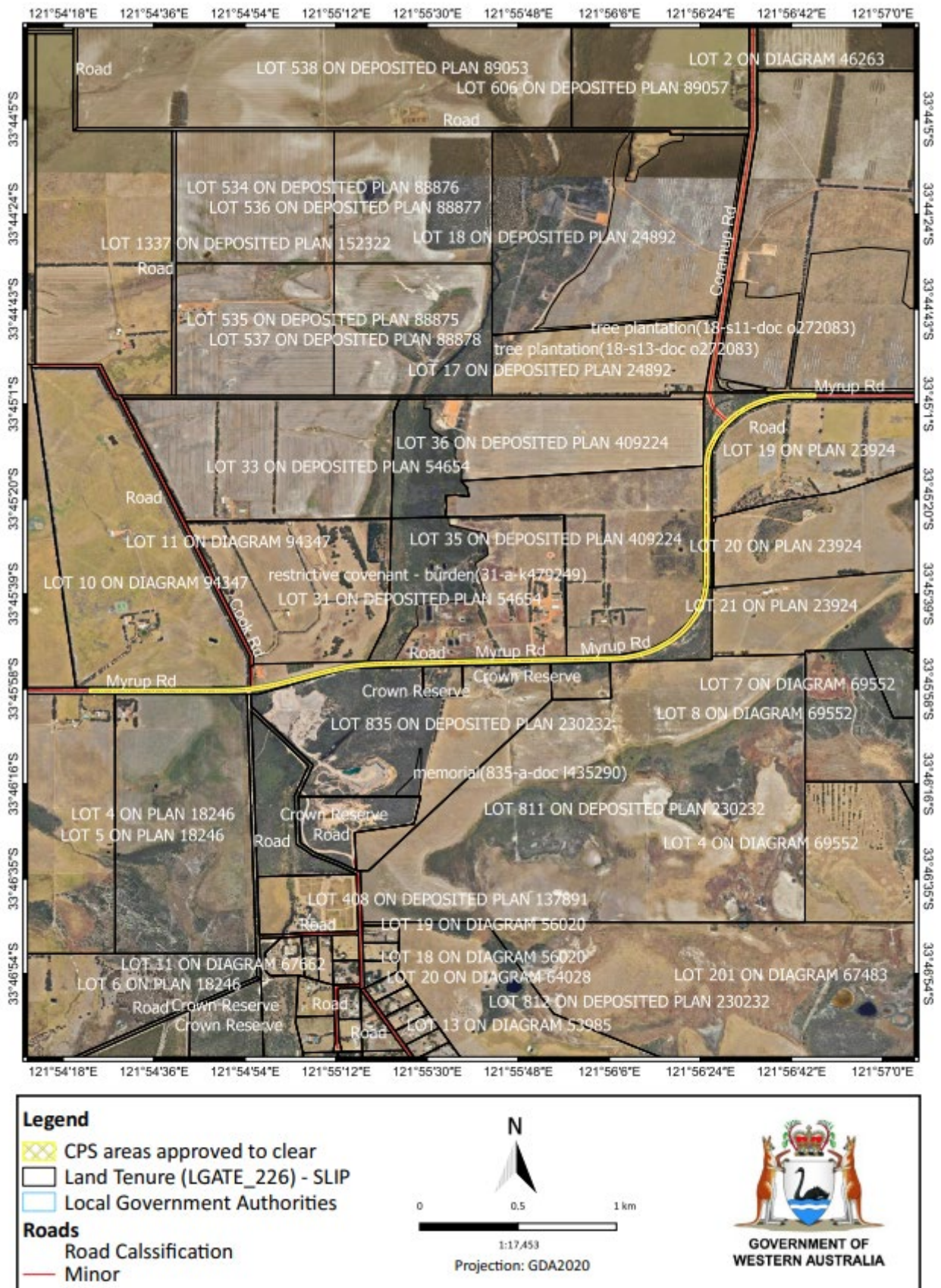


Figure 1b Map of the application area (Site B)

The areas crosshatched yellow indicate the areas authorised to be cleared under the granted clearing permit.

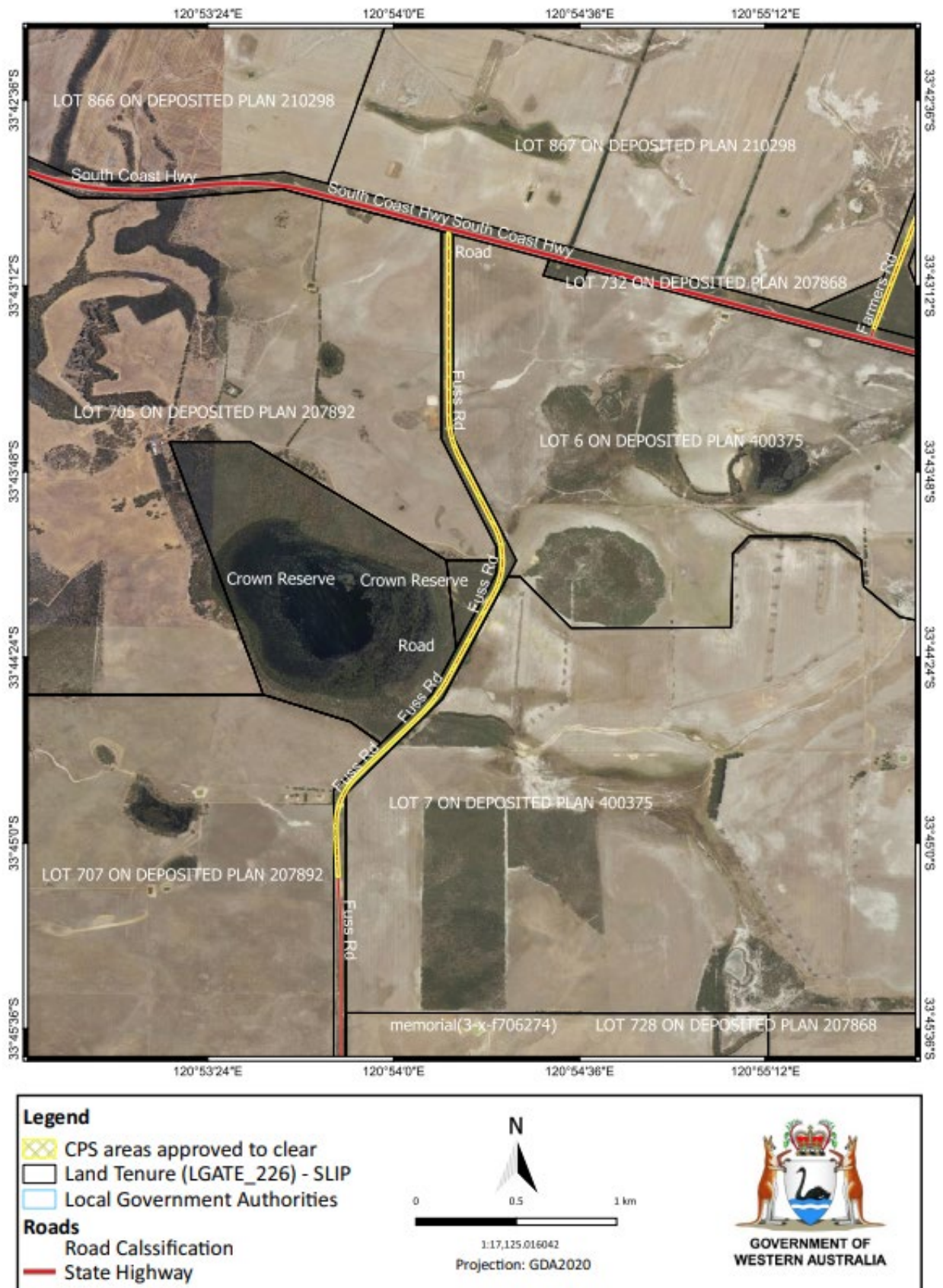


Figure 1c Map of the application area (Site E)

The areas crosshatched yellow indicate the areas authorised to be cleared under the granted clearing permit.

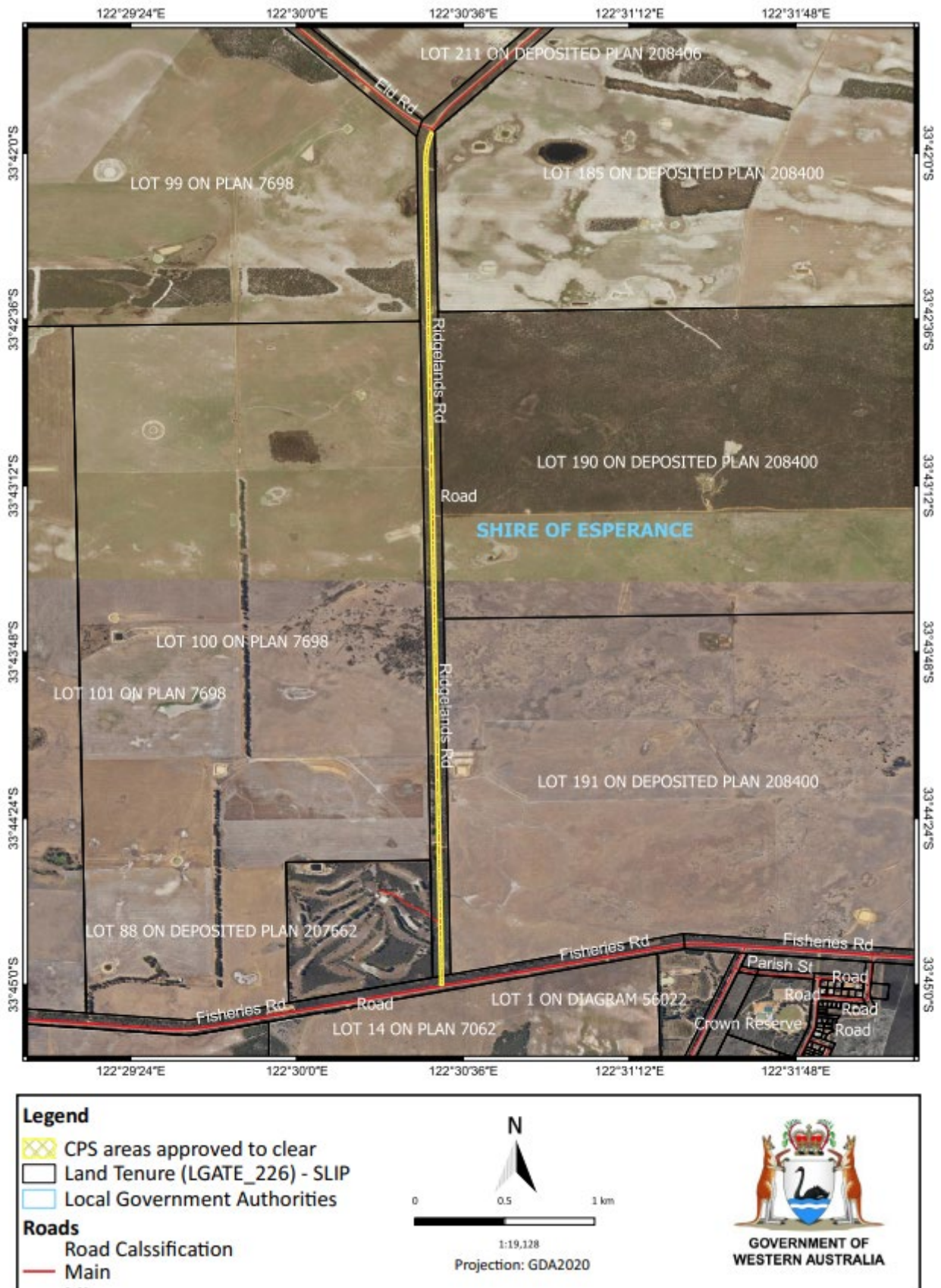


Figure 1d Map of the application area (Site F)

The areas crosshatched yellow indicate the areas authorised to be cleared under the granted clearing permit.

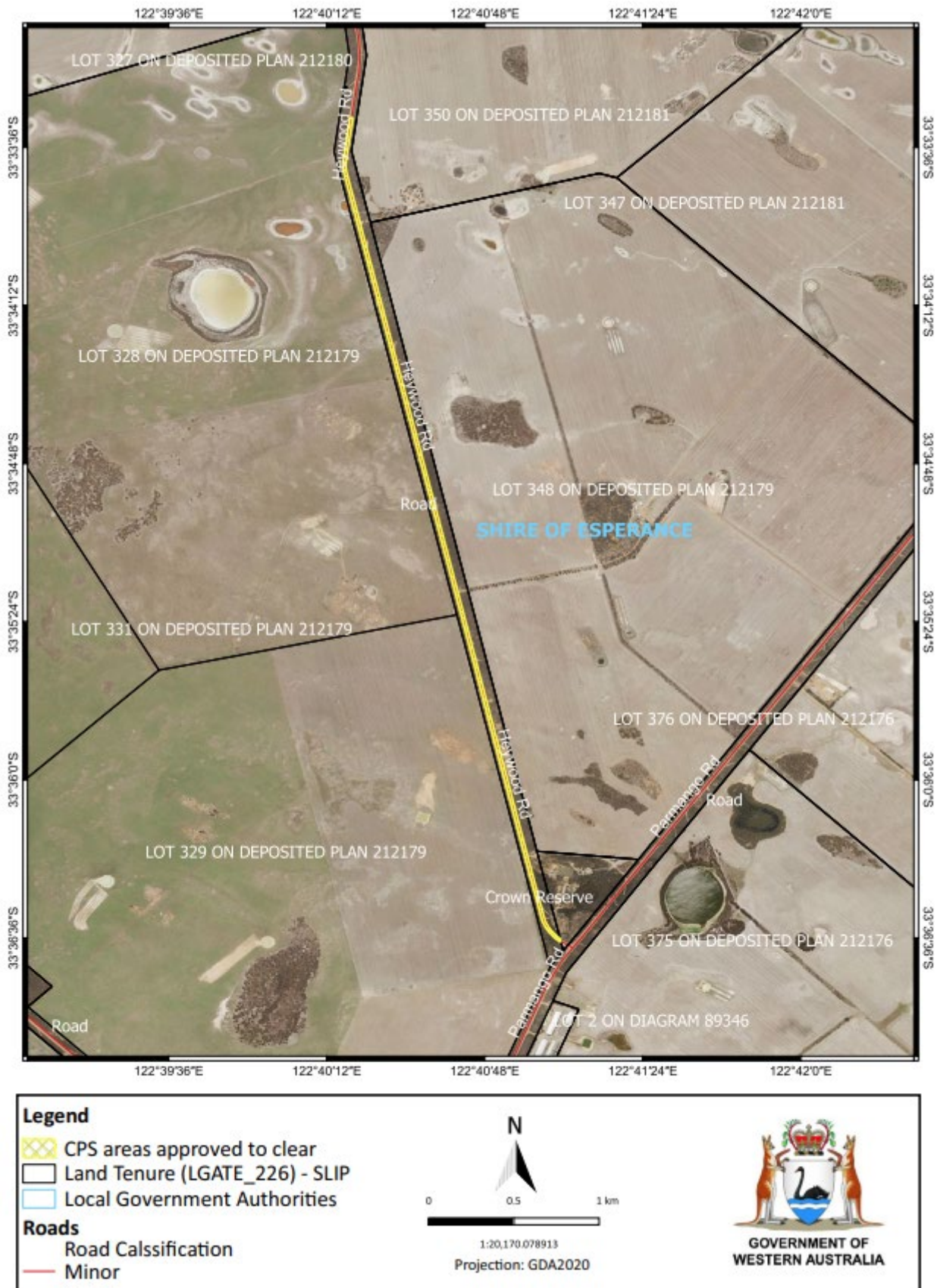


Figure 1e Map of the application area (Site G)

The areas crosshatched yellow indicate the areas authorised to be cleared under the granted clearing permit.

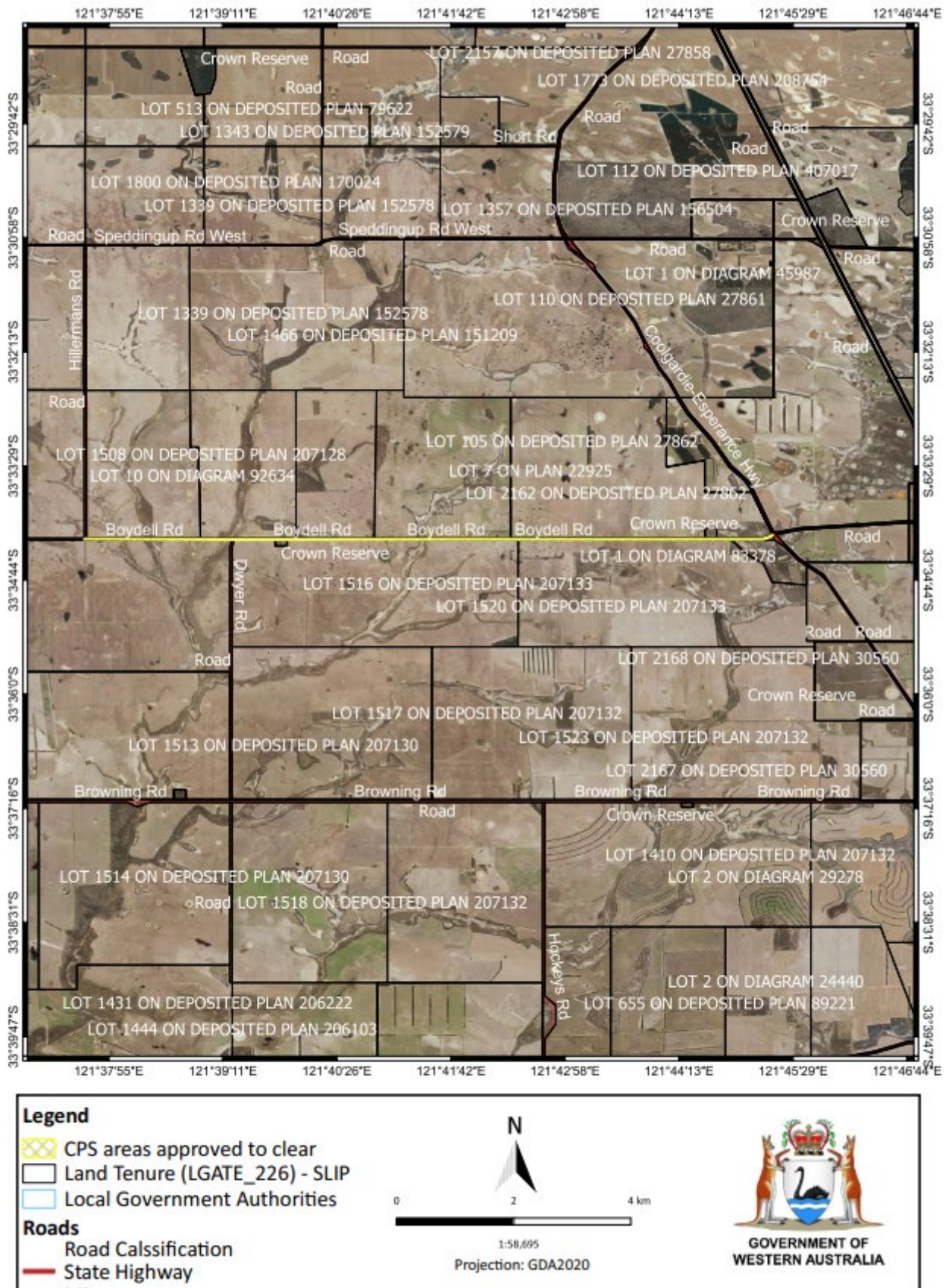


Figure 1f Map of the application area (Site H)

The areas crosshatched yellow indicate the areas authorised to be cleared under the granted clearing permit.

2 Legislative context

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

In addition to the matters considered in accordance with section 51O of the EP Act (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

Avoidance and minimisation

The original application submitted by the Shire was to clear 16.27 hectares across eight sites. This would have resulted in the following significant residual impacts:

- the loss of 5.52 hectares of suitable malleefowl breeding habitat,
- the loss of 5.30 hectares of native vegetation that provides significant foraging habitat for Carnaby's cockatoo,
- the loss of 4.56 hectares of native vegetation that is representative of the Kwongkan Shrublands TEC,
- the loss of 0.31 hectares of native vegetation that is representative of the Swamp Yate PEC,
- the loss of vegetation considered significant as remnants in a highly cleared landscape.

During the assessment process, the Shire revised the application area to 7.31 hectares. Through excluding sites C and D, the Shire reduced the significant residual impacts to:

- the loss of 3.62 hectares of native vegetation that provides foraging habitat for Carnaby's cockatoo,
- the loss of 3.27 hectares of suitable breeding habitat for malleefowl,
- the loss of 3.51 hectares of native vegetation that is representative of the Kwongkan Shrublands TEC,
- the loss of 0.31 hectares of native vegetation that is representative of the Swamp Yate PEC,
- the loss of vegetation considered significant as remnants in a highly cleared landscape

The Shire advised that the proposed clearing areas have been developed and assessed internally by the Shire's engineering team and environmental team. As a result of this development and assessment process, the clearing projects in this application are required as part of the broader road and asset management and development program with the Shire.

Mitigation

- The Shire advised that works at all sites with hydrological implications will be undertaken during the dry period of the year to minimise impacts to the local hydrology. Sediment controls will be put in place around water courses during construction (Shire of Esperance, 2023j).
- A Rehabilitation Plan was provided by the Shire for the rehabilitation of 2.89 hectares within site A, which will be rehabilitated post gravel extraction (Shire of Esperance, 2024b).

- A Dieback and Invasive Weed Management Plan was prepared by the Shire (Shire of Esperance, 2023j), 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.
 - 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.

After consideration of avoidance and mitigation measures, it was determined that an offset to counterbalance the significant residual impacts to fauna habitat, conservation significant ecological communities and significant remnant vegetation was necessary. In accordance with the Government of Western Australia's *Environmental Offsets Policy* and *Environmental Offsets Guidelines*, these significant residual impacts have been addressed through the conditioning of environmental offset requirements on the permit. The nature and suitability of the offsets provided are summarised in Section 4.

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 (fauna habitat, priority flora and ecological communities), significant remnant vegetation and land and water resources. The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

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

Assessment

The application area is mapped within the Mallee and Esperance plains IBRA regions. These regions fall within the South-west botanical province. According to the technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016), the ideal survey timing within this region is during Spring (September – November). The Shire conducted multiple surveys across the application area in accordance with this guidance (Shire of Esperance, 2023b-2023j).

A review of available databases identified 144 conservation significant flora species within the local area (20 kilometre radius of the application area). A likelihood of occurrence assessment was undertaken for these species at each site in the application area, based on preferred habitat types and mapped soil and vegetation types. The likelihood analysis concluded that the application area may comprise suitable habitat for 25 priority flora species (see Appendix C.3).

Summary of clearing areas

Site A

The proposed clearing of 3.25 hectares at site A occurs along Cascade Road and West Point Road Reserve (Figure 1a Map of the application area (Site A)). Flora and vegetation surveys were undertaken for this site during April 2022, September-October 2022 and additional targeted flora surveys in September 2023 (Shire of Esperance, 2023b; 2023j; see Appendix G). Two vegetation types were identified in site A, both in Excellent condition (Keighery, 1994; see Appendix C.1). A portion of the vegetation is considered to representative of the Kwongkan Shrublands TEC (see Table 2). No threatened flora species were recorded during the survey (Shire of Esperance, 2023b; 2023j),

however four priority flora species were recorded: *Guichenotia asteriskos* (P2), *Goodenia laevis* subsp. *laevis* (P3), *Banksia cirsioides* / *xylothemelia* (P3) and *Grevillea aneura* (P4) (Shire of Esperance, 2023b; 2023j).

Site B

The proposed clearing of 0.67 hectares at site B occurs along Myrup Road Reserve (Figure 1b). A flora and vegetation survey was conducted for this site during October 2022 (Shire of Esperance, 2023c). The survey identified four vegetation types within site B in Very Good to Completely Degraded condition (Keighery, 1994; see Appendix C.1). The Kwongkan Shrublands TEC and the Swamp Yates PEC were recorded within the site (see Table 2). No threatened or Priority flora species were recorded during the survey (Shire of Esperance, 2023c).

Site E

The proposed clearing of 0.91 hectares at site E occurs along Fuss Road Reserve (Figure 1c). A flora and vegetation survey was conducted for this site during September 2022 (Shire of Esperance, 2023f). The survey identified six vegetation types within site E in Very Good to Completely Degraded condition (Keighery, 1994; see Appendix C.1). Vegetation representative of the Kwongkan Shrublands TEC and the Swamp Yates PEC were recorded within the site (see Table 2). No threatened flora species were recorded during the survey, however two priority flora species were recorded: *Dampiera sericantha* (P3) and *Daviesia pauciflora* (P3) (Shire of Esperance, 2023f).

Site F

The proposed clearing of 0.57 hectares at site F occurs along Ridglands Road reserve (Figure 1d). A flora and vegetation survey was conducted for this site during October and December 2022. Four vegetation types were identified within site F in Very Good to Completely Degraded condition (Keighery, 1994; see Appendix C.1). The Kwongkan Shrublands TEC and the Swamp Yates PEC were recorded within the site (see Table 2). No threatened flora species were recorded during the survey, however two priority flora species, *Bentleya diminuta* (P2) and *Conostylis seorsiflora* subsp. *longissima* (P2) were recorded (Shire of Esperance, 2023g).

Site G

The proposed clearing of 0.16 hectares at site G occurs along Heywood Road reserve (Figure 1e). A flora and vegetation survey was conducted for this site during October and December 2022. The survey identified four vegetation types within site G in Very Good to Degraded condition (Keighery, 1994; see Appendix C.1). Vegetation representative of the Kwongkan Shrublands TEC and the Swamp Yates PEC were recorded within the site (see Table 2). No threatened flora species were recorded during the survey, however six priority flora species, *Acacia bartlei* (P3), *Aotus* sp. Dundas (M.A. Burgman 2835) (P2), *Bentleya diminuta* (P2), *Goodenia laevis* subsp. *laevis* (P3), *Persoonia scabra* (P3) and *Styphelia rotundifolia* (P3) were recorded (Shire of Esperance, 2023h; 2023j).

Site H

The proposed clearing of 1.74 hectares at site H occurs along Boydell Road reserve (Figure 1f). Flora and vegetation surveys were undertaken for this site during October 2020, October- November 2022 and additional targeted flora surveys in September 2023. Seven vegetation types were identified within site H in Very Good to Completely Degraded condition (Keighery, 1994; see Appendix C.1). Vegetation representative of the Kwongkan Shrublands TEC and the Swamp Yates PEC were recorded within the site (see Table 2). No threatened flora species were recorded during the survey, however seven priority flora species, *Austrobaecka uncinella* (P3), *Brachyloma mogin* (P3), *Darwinia* sp. Gibson (R.D. Royce 3569) (P1), *Daviesia pauciflora* (P3), *Grevillea baxteri* (P4), *Kunzea salina* (P3) and *Persoonia scabra* (P3) were recorded (Shire of Esperance, 2023i).

Priority flora

Flora and vegetation surveys (Shire of Esperance, 2023b-j) undertaken for the six sites across the application area identified thirteen priority flora species within the application area:

- *Darwinia* sp. Gibson (R.D. Royce 3569) (P1),
- *Aotus* sp. Dundas (M.A. Burgman 2835) (P2),
- *Bentleya diminuta* (P2),
- *Conostylis seorsiflora* subsp. *longissima* (P2),
- *Guichenotia asteriskos* (P2),
- *Acacia bartlei* (P3),
- *Banksia cirsioides* (P3),
- *Dampiera sericantha* (P3),
- *Grevillea aneura* (P3),
- *Persoonia scabra* (P3),

- *Styphelia rotundifolia* (P3)
- *Goodenia laevis* subsp. *laevis* (P4), and
- *Grevillea baxteri* (P4).

Taking into account the results of the flora surveys (Shire of Esperance, 2023b-j), advice received from DBCA (DBCA, 2023), and a review of available data, including distribution and number of current known records, impacts on the majority of the priority flora species recorded are considered unlikely to be locally or regionally significant. Impacts to four of the recorded species; *Bentleya diminuta* (P2), *Persoonia scabra* (P3), *Goodenia laevis* subsp. *laevis* (P4) and *Grevillea baxteri* (P4) are considered likely to be locally significant, however, they are not considered to be regionally significant nor significant to the conservation of the species.

***Bentleya diminuta* (P2)**

Flora and vegetation surveys (Shire of Esperance 2023h, 2023j) recorded over 1000 individuals of *Bentleya diminuta* (P2) within site F and thousands (no exact count, estimation) of individuals within site G. Due to the large number of plants within the populations, an exact count was not undertaken. Approximately 0.9 per cent (9 of 1000 plants) are proposed to be cleared within site F and approximately 50 per cent (estimation of 500 plants) of the recorded individuals within site G (Shire of Esperance 2023h, 2023j).

B. diminuta is known from 11 records across the Coolgardie and Mallee IBRA regions (WA Herbarium, 1998~). Advice was sought from DBCA on the significance of the proposed clearing of *B. diminuta* individuals. DBCA advised that *B. diminuta* is a disturbance opportunist known to grow along the road shoulder in sites that are regularly graded. The proposed impacts within site G are considered likely to be locally significant in the short term, however given the sites occur within the species' known range, and this species is noted to be a disturbance opportunist, the proposed clearing is unlikely to have a significant impact on the conservation of the species (DBCA, 2023).

***Conostylis seorsiflora* subsp. *longissima* (P2)**

One individual *Conostylis seorsiflora* subsp. *longissima* was recorded within the proposed clearing area of site F. This species is a small herb and known only from disjunct herbarium collections (approximately 200 kilometres apart) from within Cape le Grande and Fitzgerald River National Park. DBCA advised that this new record represents a 45 kilometre range extension and is therefore a significant new record. Given this, the clearing of this individual is likely to be both regionally significant and important to the conservation of the species (DBCA, 2023).

The individual plant was recorded within the maintenance area of the shoulder of Ridgeland Road (Shire of Esperance, 2023g). The Shire acknowledges that clearing of this plant will result in a significant impact to the subspecies, however, avoidance is not possible due to the location of the individual and the safety risk of Ridgeland Road (Shire of Esperance 2023a; 2023g).

***Grevillea aneura* (P3)**

Grevillea aneura has a range spanning 330 kilometres West to East and 84 kilometres North to South with known populations in the Shire of Esperance, Lake Grace, Kondinin and Ravensthorpe. According to database records, there are a total of 51 known individuals across the Mallee and Esperance Plains IBRA regions. The nearest record is located within the application area (site A). A total of 670 individuals of *Grevillea aneura* were recorded within site A, of which, 493 are proposed to be cleared (Shire of Esperance, 2023b).

Advice received from DBCA noted that site A occurs around the centre of this species' known distribution. The taking of 73.5 per cent of the recorded plants at this location is likely to have a significant local impact. Furthermore, the proposed impacts will contribute to the cumulative impacts to this population given an additional 387 plants are approved to be taken under CPS 9524/1 at the same location (DBCA, 2023).

Upon request from the department, additional targeted surveys for *Grevillea aneura* were undertaken of the surrounding areas to determine the species' local population size and distribution and accurately assess the impacts of the proposed clearing on this species. The Shire undertook targeted flora surveys during September 2023 and identified an additional four populations of *Grevillea aneura*. These populations were recorded approximately 12 kilometres north, 2.5 kilometres east, 6.5 kilometres south and seven kilometres west of site A. While no individual plant counts were conducted, the species was considered to be "locally common" within each population (Shire of Esperance, 2023j). Given this, the department considers the proposed impacts to this species are not likely to be to be locally or regionally significant.

***Persoonia scabra* (P3),**

This species was recorded within site G (7 plants) and site H (16 plants). No plants are proposed to be cleared within site G and 3 of the 16 plants recorded at site H will be directly impacted. A total of 17 records are known from the Esperance and Mallee IBRA region (WA Herbarium, 1998~). Advice received from DBCA noted that site H is located around the centre of this species known distribution and the majority of known locations contain small number of plants. It is noted that an additional eight roadside populations have been located by the Shire during 2022 surveys. The removal of 3 of the 16 individuals is likely to have a locally significant impact, however, given the wide distribution of this species, the impacts are unlikely to be significant to the conservation of the species (DBCA, 2023).

***Grevillea baxteri* (P4)**

Within site H a total of three individuals were recorded, of which one is proposed to be cleared (Shire of Esperance, 2023i). This species is widespread with a 219 kilometre east to west and an 81 kilometre north to south range. According to florabase, 47 herbarium records occur across the Shire of Esperance (WA Herbarium, 1998~). Additional targeted surveys conducted during September 2023 recorded an additional six populations (Shire of Esperance, 2023j). Advice received from DBCA note that site H is within the western extent of this species' known distribution and the taking of 33.3 per cent of this population may be locally significant but is unlikely to be significant to the conservation of the species (DBCA, 2023).

***Goodenia laevis* subsp. *laevis* (P4)**

Surveys conducted by the Shire recorded 997 individual plants of *Goodenia laevis* subsp. *laevis* across sites A, C and G. Within site A, 110 of 295 individuals are proposed to be impacted. Surveys of site C (no longer proposed to be cleared) and G recorded 709 individuals outside of the proposed clearing area (Shire of Esperance 2023b, 2023d, 2023h).

Advice received from DBCA on the significance of the proposed clearing noted that the clearing of 110 individuals within site A is considered to have significant local impacts. Given the additional 578 plants also proposed to be taken under CPS 9524/1 and CPS 9341/1, the proposed clearing is likely to contribute to cumulative impacts to the species (DBCA, 2023).

Upon request from the department, additional targeted surveys for *Goodenia laevis* subsp. *laevis* were conducted by the Shire during September 2023. The Shire recorded an additional population of 1,498 plants extending three kilometres along Boydell Road (approximately 70 kilometres southeast of site A and two kilometres west of site C) (Shire of Esperance, 2023j). Given the number of individuals and populations recorded during the surveys, the impacts to this species are not considered significant regionally or at a species level.

Priority Ecological Communities (PEC)

The Priority 3 Swamp Yate PEC was recorded within five of the six sites (B, E, F, G and H) across the application area (Shire of Esperance, 2023c, 2023f-i). Priority Ecological Communities for Western Australia Version 32 (DBCA, 2008) defines this PEC as "Yate woodlands with intact understorey and fringing vegetation". Across the five sites, a total of 0.313 hectares of Swamp Yate PEC was recorded (Table 2) in Excellent to Good condition (Keighery, 1994).

According to advice received from DBCA (DBCA, 2022), the PEC is poorly defined, with only eight of the occurrences (all less than 21 hectares in size), currently mapped. The community is threatened by excessive inundation, altered hydrology, increasing salinity and nutrients, land clearing and impacts associated with fragmentation, land management practices, plant pathogens (dieback), altered fire regimes, invasive flora and fauna and climate change.

The proposed clearing may increase the distribution of dieback and weeds along roads and within adjacent vegetation that may represent this PEC (Shire of Esperance, 2022a-c). In addition to the proposed clearing of 0.313 hectares of the Swamp Yate PEC, 0.17 hectares has been approved to clear under the Shire's strategic purpose permit CPS 9524/1.

The distance to known occurrence of this PEC vary for each site. The closest occurrence is 16.3 kilometres from site G, however there are no mapped occurrences within the local areas of the other four sites where this PEC has been mapped. Given the lack of records within the local area of the application area and the good to excellent condition of the vegetation, the proposed clearing is considered to be significant.

Threatened Ecological Community (TEC)

The Kwongkan Shrublands TEC is listed as Endangered under the EPBC Act and regarded by DBCA as a priority 3 PEC. This ecological community is found in the south coast region of Western Australia 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. The 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).

According to available databases, multiple occurrences of the Kwongkan Shrublands TEC occur within the proposed clearing area. The flora and vegetation surveys conducted across the application area identified vegetation representative of the Kwongkan Shrublands TEC within all six sites (Table 2; Shire of Esperance, 2023b-i). A total of 3.51 hectares of vegetation in Good to Excellent condition was found to meet the guidelines for this TEC.

In addition to the above proposed clearing of 3.51 hectares of the Kwongkan Shrubland TEC, 4.85 hectares has been approved to clear under the Shire's strategic purpose permits CPS 9524/1 and CPS 9341/1.

Table 2 Priority and Threatened Ecological Communities recorded across the application area

| Site | A | B | E | F | G | H | Total |
|---|------|------|------|------|-------|------|-------------|
| Area representative of Kwongkan Shrublands TEC (ha) | 2.53 | 0.05 | 0.49 | 0.39 | <0.01 | 0.04 | 3.51 |
| Area representative of Swamp Yate PEC (ha) | 0 | 0.03 | 0.09 | 0.02 | 0.04 | 0.13 | 0.31 |

Weed invasion was recorded across the majority of the application area. The proposed clearing may increase the distribution of weeds along roads and within adjacent vegetation that may represent this TEC. Additionally, the spread of dieback into adjacent areas of the TEC is considered a risk. Large sections of the application area within site A were recorded to be missing proteaceous species and confirmed *Phytophthora cinnamomi* samples were found along Myrup road just outside of the proposed clearing area (Shire of Esperance, 2023b). According to the Phytophthora Hazard Dispersion Model, all occurrences of this TEC within the application area occur in vegetation considered susceptible to dieback (Shire of Esperance, 2023b-i). Given this, it is considered likely that the proposed clearing will increase the risk of distribution of dieback along the application areas and within adjacent vegetation that may represent the TEC.

Conclusion

Given the above, it is considered that the clearing of 3.51 hectares of Kwongkan Shrubland TEC and 0.31 hectares of Swamp Yate PEC 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.

Whilst the proposed clearing will remove individuals of priority flora, the impacts are not considered to impact the conservation status of the species.

Conditions

To address the above impacts, the following management 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, in accordance with the Shire's Dieback and Invasive Weed Management Plan (Shire of Esperance, 2023j),
- provision of an offset (see section 4).

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

Assessment

According to available databases, 59 conservation significant fauna species have been recorded within the local area (20 kilometre radius of the application area). A number of these records are associated with marine, estuarine or freshwater habitats that do not occur within the application area.

Basic fauna surveys were conducted across 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 results of the desktop assessment, the application area is considered likely to comprise suitable habitat for five conservation significant fauna species;

- Carnaby's cockatoo (*Zanda latirostris*), listed as Endangered under the EPBC Act and BC Act,
- malleefowl (*Leipoa ocellata*), listed as Vulnerable under the EPBC Act and BC Act,
- chuditch (*Dasyurus geoffroii*), listed as Vulnerable under the EPBC Act and BC Act,
- quenda (*Isodon fusciventer*), listed by DBCA as Priority 4 and
- peregrine falcon (*Falco peregrinus*), listed as Other specially protected species under the BC Act.

Carnaby's cockatoo (*Zanda latirostris*)

All six sites across the application area occur within the known distribution range of Carnaby's cockatoo (non-breeding range). Habitat requirements for black cockatoos can be categorised as foraging habitat, breeding habitat and night roosting habitat. The application area occurs within the eastern extent of the South Coast region, known to provide foraging resources for black cockatoos, in particular Carnaby's cockatoos. Carnaby's 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 (DAWE, 2022).

A total of 3.62 hectares of suitable foraging habitat for Carnaby's was recorded across the application area (all six sites) (Shire of Esperance, 2023b-i). The suitable habitat was largely due to the presence of the Proteaceae-rich vegetation across the application area, in particular, vegetation representative of the Kwongan shrublands TEC that is known to provide high quality foraging habitat (DAWE, 2022).

Breeding habitat for species of black cockatoos is described within the 'EPBC Act referral guidelines for three threatened black cockatoo species' (DAWE, 2022) which includes a list of tree 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. According to available datasets, the application area is located outside of the predicted breeding range for Carnaby's and is over 80 kilometres from the nearest breeding record for Carnaby's cockatoo. The surveys conducted across the application area recorded no suitable breeding habitat given the lack of suitable-sized trees and lack of hollows present (Shire of Esperance, 2023b-i).

Black cockatoos are known to forage in areas up to 12 kilometres from their breeding nests during the breeding season. Foraging resources 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 distance to the closest known breeding site, the vegetation within the application area is unlikely to be supporting foraging by breeding individuals.

Roosting habitat for Black cockatoos is usually located in the tallest trees within an area, and preferably in close proximity to both food supply and surface water (DAWE, 2022). No suitable roosting habitat was recorded across the application area during the fauna surveys (Shire of Esperance, 2023b-i). During the non-breeding period, black cockatoos will mainly forage in areas up to 20 kilometres from 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. According to available databases, known roost sites are recorded within close proximity to site B (1.7 kilometres), F (1.13 kilometres) and H (16 kilometres), however no known roost sites have been recorded within 20 kilometres of sites A, E or G. Given site B is within close proximity to available water sources and known roost sites, this site is likely to support foraging by roosting individuals.

The ongoing and historic loss and fragmentation of black cockatoo habitat has been a major contributor to the decline in populations of Carnaby's, in particular, the loss of nesting trees, loss of foraging habitat and fragmentation of breeding habitat from foraging resources. Therefore remnant patches of vegetation are considered important in maintaining black cockatoo habitat connectivity across the landscape. Advice received from DBCA on the significance of the proposed clearing on black cockatoo habitat highlighted the conservation values in the application area, specifically the proteaceous and myrtaceous woodlands which are an important food source for Carnaby's

cockatoos. The roadside vegetation also forms an integral part of the ecological linkage of vegetation for Carnaby's and other fauna in the area (DBCA, 2023).

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 3.62 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. To mitigate the loss of black cockatoo foraging habitat, the Shire has committed to revegetating site A post gravel extraction (see section 3.1).

Malleefowl

According to available databases 11 records of malleefowl occur within the local area. Habitat for malleefowl includes 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 a sandy substrate and abundant leaf litter for the successful construction of nest mounds (DPaW, 2016).

No malleefowl or evidence of malleefowl activity was encountered during the basic fauna surveys conducted across the application area. However, site A and G are considered to potentially provide low quality habitat for malleefowl due to the presence of open mallee Eucalyptus woodland and melaleuca shrubland (Shire of Esperance, 2023b; 2023h). A total of 3.27 hectares of suitable breeding habitat for Malleefowl is proposed to be cleared across the application area (within sites A and G).

Advice received from DBCA on the significance of the clearing of malleefowl habitat advised that the proposed clearing within a highly cleared landscape would be considered significant due to cumulative impacts (DBCA, 2022a). However, given the locations of the areas proposed to be cleared are relatively small, linear in nature and a number are highly disturbed, impacts are likely to be minor due to other threatening processes (i.e. weeds, increased likelihood of vehicle strike). To mitigate the loss of malleefowl habitat, the Shire has committed to revegetating site A post gravel extraction (see section 3.1).

Peregrine falcon (*Falco peregrinus*, M1)

The peregrine falcon inhabits a range of habitats, usually coastal and inland cliffs or open woodland near water. Breeding habitat for this species usually includes cliff faces, and rock ledges. Suitable habitat (Eucalypt woodlands) was identified within sites B, G and H (Shire of Esperance, 2023c; 2023h; 2023i). Due to the wide range of habitats this species may occur in and its mobile nature, the application area is not considered likely to comprise significant habitat for the peregrine falcon and the proposed clearing is not likely to significantly impact this species.

Chuditch (*Dasyurus geoffroii*, VU)

Chuditch are known to occupy a range of habitats including jarrah forests, eucalypt woodlands, mallee shrublands and heathland. The species uses denning habitat types such as hollow logs, burrows or rock crevices (DEC, 2012). According to available databases, a total of two records occur within the local area with the closest record 10.6 kilometres from the application area. Based on the survey information provided by the applicant, the application area is not likely to contain suitable denning habitat for the chuditch (Shire of Esperance 2023b-i). Advice received from DBCA noted that the areas proposed to be cleared do not provide suitable breeding or foraging habitat. However, the areas may provide linkage between remnant vegetation across the landscape.

Quenda (*Isodon fusciventer*, P4)

Quenda inhabit areas of dense vegetation including wetland fringes and heathlands. Quenda rarely venture from cover and will feed by digging in leaf litter and soil to find food and will construct nests under vegetation (DEC, 2012). On the mainland, quokka occupy jarrah, marri, and karri forests and woodlands in high rainfall areas. These habitats generally have thick understorey, nearby to swamps and will be close to more open, recently burnt vegetation (DEC, 2013). According to available databases, eight individuals have been recorded within the local area.

Given the presence of riparian vegetation within the application area (sites B, E, F and H) (Shire of Esperance, 2023b-i), the application area is considered to comprise suitable habitat for this species. Given the linear nature of these sites and the proximity to an active road, these sites are not considered to provide significant habitat for the species. It is possible that the quenda may occur within the application area while moving through the landscape.

However, the implementation of slow, directional clearing will allow any individuals present at the time of clearing to move into adjacent suitable habitat in the local area.

Ecological linkage

The proposed clearing is not within any mapped ecological linkages and the extent of clearing over most of the application area is narrow. However, noting the extent of clearing in the local area, the vegetation proposed to be cleared may contribute to an ecological linkage function enabling fauna to move between areas of remnant vegetation. The ecological linkage function is not expected to be severed by the proposed clearing.

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 3.62 hectares of significant foraging habitat for Carnaby's cockatoo and 3.27 hectares of suitable malleefowl habitat. The proposed clearing is considered to contribute to the cumulative impacts on Carnaby's cockatoo and malleefowl habitat given the approved clearing under the Shire's Clearing Permits CPS 9524/1 and CPS 9341/1. 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 considered unlikely to contain significant habitat for the remaining conservation significant fauna that have been recorded in the local area. However, individuals may utilise the application area for dispersal through the landscape. Slow, directional clearing will allow fauna species to disperse into other areas of remnant vegetation.

The clearing also has the potential to increase the risk of introduction and spread of weeds and dieback into adjacent vegetation impacting the quality of fauna habitat.

Conditions

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

- the revegetation of 2.89 hectares within site A post gravel extraction,
 - in accordance with the Shire's Rehabilitation Plan (Shire of Esperance, 2024b),
 - to ensure the identification of Eucalypt species within the revegetation area, an initial assessment against the completion criteria will be required five years post revegetation works.
- weed and dieback management to manage potential impacts to adjacent vegetation as a result of the proposed clearing,
 - in accordance with the Shire's Dieback and Invasive Weed Management Plan (Shire of Esperance, 2023j),
- slow, progressive one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity,
- provision of an offset (see section 4).

3.2.3. Significant remnant vegetation and conservation areas - Clearing Principles (e) and (h)

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).

The extent of native vegetation within the local area (20 kilometres from the application area) was calculated for each site (see section C.2). The local area of sites B, F, G and H retains less than 30 per cent of the pre-European extent (Commonwealth of Australia, 2001). Given this, 3.16 hectares of native vegetation across these sites areas are considered to be located within an extensively cleared landscape.

The application area is located within the Mallee and Esperance plains IBRA regions. Two of the Beard Vegetation Associations (BVA) mapped across the proposed clearing area, BVA 512 and 6048 retain less than 30 per cent of their pre-European extent within the IBRA bioregions (see Appendix C.2). Several vegetation types described across the proposed clearing area are considered representative of these restricted vegetation associations (Shire of

Esperance, 2023b; 2023c; 2023g). A total of 1.01 hectares of vegetation representative of BVA 512 and 6048 was recorded across sites A, B and F (see Table 3).

As mentioned in section 3.2.1 and 3.2.2 above, the application area contains significant foraging habitat for Carnaby's cockatoo, suitable habitat for malleefowl, Kwongkan Shrublands TEC, Swamp Yates PEC, and priority flora species. Given this, vegetation within sites A, B, F, G and H are considered significant as remnants in areas that have been extensively cleared.

The Munglinup Nature Reserve is located 25 metres from the application area (site E). Given the proximity of the application area to this reserve, and that weeds were recorded within this site, the proposed clearing actions may cause degradation of the native vegetation by facilitating the spread of weeds and dieback. It is considered, however, that the impact of clearing can be mitigated through the Shire's implementation of the Weed and Dieback Management Plan (Shire of Esperance, 2023j) (see section 3.1).

Conclusion

Based on the above assessment, the proposed clearing will result in the loss of 3.87 hectares of native vegetation that is a significant remnant within an extensively cleared landscape, including:

- Native vegetation representative of the highly cleared BVA 512 and 6048,
- 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:

- weed and dieback management to manage potential impacts to adjacent vegetation as a result of the proposed clearing,
- provision of an offset (see section 4).

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

Assessment

Principle (f) aims to conserve vegetated watercourses and wetlands and their buffers. Portions of the application area contain vegetation considered to be growing in, or in association with, an environment associated with a watercourse and/or wetland. Three sites (B, E and H) within the application area intersect minor waterways.

The flora and vegetation surveys conducted across the application area identified riparian vegetation within sites B, E, F and H (Shire of Esperance, 2023b-i), specifically:

- site B - vegetation types D and A were recorded growing in association with Coramup creek and several winter wet areas. A total of 0.06 hectares of vegetation within this vegetation type is proposed to be cleared (Shire of Esperance, 2023c).
- site E - vegetation types C and F are both recorded as wetland-associated vegetation. A total clearing of 0.204 hectares of this vegetation is proposed to be cleared (Shire of Esperance, 2023f).
- Site F - vegetation types B and E are both recorded to be seasonally inundated. A total of 0.09 hectares is proposed to be cleared (Shire of Esperance, 2023g).
- Site H - vegetation types A, C and F are recorded growing in association with salt lakes and winter wet areas. A total of 1.7 hectares is proposed to be cleared (Shire of Esperance, 2023i).

The department notes that the land adjacent to the proposed clearing area and local area has been modified through historical clearing for road infrastructure and agriculture. Advice received from the department's Water Licencing section (DWER, 2023) has identified that where the proposed clearing intersects or is adjacent to a significant watercourse or waterbody there is a risk of:

- Mobilisation of rocks and debris into the waterway, which can impinge its flows resulting in an altered flood regime, and care should be taken to ensure this does not occur.

- Potential for erosion, and sediment transport resulting in turbidity and sedimentation further downstream, and measures should be in place to mitigate erosion and prevent the release of sediment.
- Spills from any refuelling, servicing of equipment or other activities. These activities should be located away from the waterway and appropriate measures should be in place in the unlikely event of spills.

To manage these impacts the Shire has advised that the works at all areas with hydrological implications will be undertaken on these sites during the dry period of the year to minimise or eliminate any effects on the local hydrology. In addition, the Shire has ensured that existing drainage systems will be maintained to ensure water flow patterns are not disrupted or diverted. Sediment controls will be put in place around water courses during construction (Shire of Esperance, 2023j).

Within the application area, the mapped soils are moderately to highly susceptible to wind erosion, water repellence and subsurface acidification. Taking into consideration that the cleared areas will be replaced with a hard road surface, the risk of wind erosion is considered to be minor and temporary. It is considered that the potential impacts of wind erosion can be managed through a condition on the permit requiring construction works to begin with three months of clearing.

Given soils will not be excavated at depth, and groundwater will not be intersected, the risk of exposing any acid sulphate soils is considered low. Noting the above, the extent of the proposed clearing, 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 may result in the loss of native vegetation growing in, or in association with, an environment associated with a watercourse or wetland. For the reasons set out above, the proposed clearing is unlikely to result in any significant or long-term impacts to the quality of surface or underground water or to the ecological values of the riparian communities associated with the watercourses that transect the application area. In considering the above, the Delegated Officer determined that the impacts of the proposed clearing on water resources does not constitute a significant residual impact.

Conditions

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

- construction works will be required to begin with three months of clearing,
- clearing to occur in dry conditions and outside of the high flow period.

3.3. Relevant planning instruments and other matters

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

Rights in Water and Irrigation Act 1914

The desktop assessment identified that the proposed clearing intersects several watercourses and is located within the proclaimed Esperance Groundwater Area under the *Rights in Water and Irrigation Act 1914*. Therefore, a permit to interfere with the bed and banks of a watercourse under the RIWI Act may be required.

Advice received from the department's Water Licencing section determined that where the proposed clearing area intersects a significant watercourse, if there is likely to be any flow at the time the works are undertaken, a Section 21A Bed and Banks permit is required under the *Rights in Water and Irrigation Act (DWER, 2023)*.

To manage these impacts the Shire has advised that the works at all areas with hydrological implications will be undertaken on these sites during the dry period of the year to minimise or eliminate any effects on the local hydrology. Sediment controls will be put in place around water courses during construction (Shire of Esperance 2023j).

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 3.62 hectares of native vegetation that provides foraging habitat for Carnaby’s cockatoo,
- the loss of 3.27 hectares of suitable breeding habitat for malleefowl,
- the loss of 3.51 hectares of native vegetation that is representative of the Kwongkan Shrublands TEC,
- the loss of 0.31 hectares of native vegetation that is representative of the Swamp Yate PEC,
- the loss of 3.87 hectares of significant remnant vegetation, including:
 - the loss of native vegetation in an extensively cleared landscape, and
 - the loss of vegetation mapped as and representative of highly cleared BVAs 512 and 6048.

The Shire proposed an environmental offset consisting of the use of two banked offsets sites and one additional site.

- **Offset calculation 1 (banked offset):** the conservation of **14.62 hectares** of remnant native vegetation within **Reserve 26912**, which provides:
 - vegetation in Excellent condition (Keighery, 1994) within a highly cleared area,
 - high quality habitat for malleefowl.
- **Offset calculation 2 (banked offset):** the conservation of **28.86 hectares** of remnant native vegetation within **Reserve 24633**, which provides:
 - vegetation in Good to Excellent condition (Keighery, 1994) within a highly cleared area,
 - high-quality Carnaby’s black cockatoo foraging habitat,
 - vegetation representative of the Kwongkan Shrubland TEC, and
 - vegetation representative of the Swamp Yate PEC.
- **Offset calculation 4:** the conservation of **1.05 hectares** of remnant native vegetation within **Reserve 31099**, which provides:
 - vegetation in pristine condition (Keighery, 1994), and
 - vegetation representative of the Kwongkan Shrubland TEC.

In support of the above offset proposal, the Shire has provided site assessment reports and associated data for each of the offset sites (Shire of Esperance, 2023d; 2024). See Table 4 below for a summary of the characteristics of each offset site.

In assessing whether the proposed offsets are 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 the proposed offsets will address 100 per cent 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.

Table 3 Offset Site Characteristics

| Reserve 26912 (Lot 1536 on Deposited Plan 209681) – banked offset site | |
|---|--|
| Size | 1,661.3 hectare site <ul style="list-style-type: none"> • 251.3 hectares used for CPS 8608/1 and CPS 8884/1 • 87.16 hectares of malleefowl habitat, and 1.82 hectares of significant remnant vegetation used for CPS 9524/1 |
| Offset values | The site will offset the following: <ul style="list-style-type: none"> • remnant vegetation • malleefowl habitat |
| Location | Within the Shire, 12.7 kilometres west of the nearest clearing area. |
| Vesting | The purpose of the reserve will be changed from ‘Recreation and Parklands’ to ‘Conservation’. |
| Site values | The Shire conducted a site survey (Shire of Esperance, 2023k): <ul style="list-style-type: none"> • Vegetation in Good to Excellent condition • Vegetation consists of Beard vegetation associations 51, 482 and the highly restricted vegetation association 512 • The vegetation is characterised by the following vegetation communities: <ul style="list-style-type: none"> ○ Emergent yate forest (<i>Eucalyptus occidentalis</i>) within the wetland basin ○ Thickets of the wetland climber <i>Muehlenbeckia cunninghamii</i> |

- Dense thickets of broomebush (*Melaleuca acuminata*) fringing the wetland areas
- Fringing stands of salmon gum and York gum (*E.loxophleba*)
- Mallee woodlands of sand and blue mallee (*E.tetragona*)
- Suitable Malleefowl habitat (Vegetation type A)
- Contains populations of the Priority one flora species *Leucopogon rugulosus*.

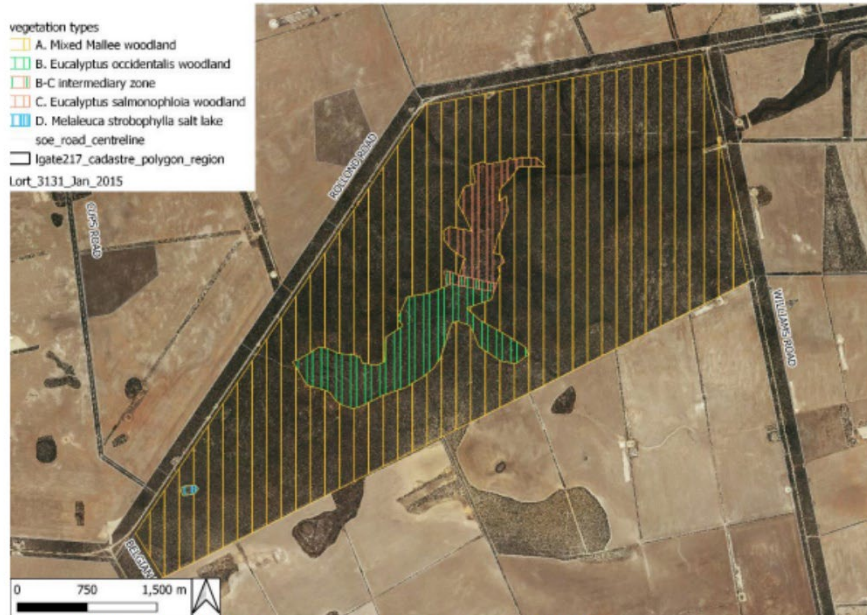



Figure 3. Map of vegetation types present within the Reserve 26912.



Figure 5. Vegetation type A (unburned): Mixed Eucalyptus woodland with mixed melaleuca shrubs. Photo taken on the 23/05/2023 by Katherine Walkerden.

Reserve 24633 (Lot 1559 on Deposited Plan 207747)

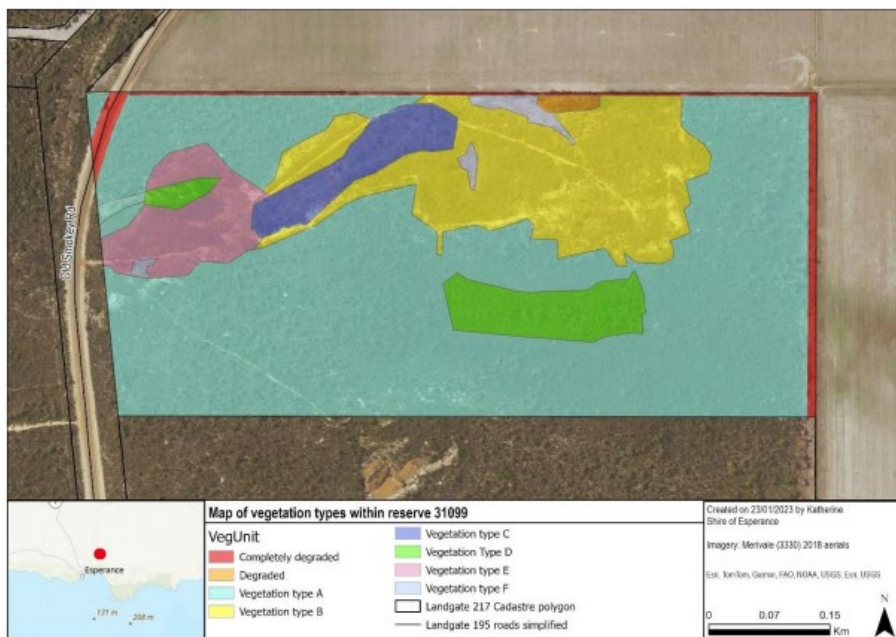
| | |
|------|---|
| Size | 201.67 hectare site <ul style="list-style-type: none"> ● 1.49 hectares is allocated for CPS 9524/1 to offset impacts to Swamp Yate PEC |
|------|---|

| | |
|---------------|--|
| Offset values | <p>The site will offset the following:</p> <ul style="list-style-type: none"> • remnant vegetation • suitable habitat for black cockatoos • Kwongkan TEC in Good to Excellent condition • Swamp Yate PEC |
| Location | Within the Shire, 27 kilometres west of the nearest clearing area |
| Vesting | Previous purpose was 'Parks and Recreation' – the purpose is now 'Environmental Conservation' |
| Site values | <p>The Shire conducted a site survey (Shire of Esperance, 2023k):</p> <ul style="list-style-type: none"> • Native vegetation in Good to Excellent condition • Vegetation consists of Beard vegetation associations 47 and 931 • 35.94 ha of Kwongkan Shrublands TEC is present within the site, with 26.16 ha classed within the 'High' condition category, and 9.78 ha under the 'Moderate' condition category. • 171.54 hectares of wetland vegetation - yate/ paperbark mixed forest. • DBCA advice confirmed the presence of the Swamp Yates PEC within the site • Approximately 86.50 hectares of Carnaby's Cockatoo foraging habitat is present, of which approximately 85.23 hectares is 'High' quality, and 1.27 hectares is 'Low' quality • Contains two Priority flora species; <i>Caesia viscida</i> (P2) and <i>Patersonia inaequalis</i> (P2). |
| |  |



Reserve 31099 (Lot 460 on Deposited Plan 175372)

| | |
|---------------|---|
| Size | 35.6 hectare site |
| Offset values | The site will offset the following: <ul style="list-style-type: none"> • Kwongkan TEC in Good to Excellent condition |
| Location | Within the Shire, 7.1 kilometres west of the nearest clearing area |
| Vesting | Current purpose is 'gravel', the purpose will be changed to 'Environmental Conservation' |
| Site values | <p>The Shire conducted a site survey (Shire of Esperance, 2024a):</p> <ul style="list-style-type: none"> • The majority (80%) of the reserve is in a pristine or Excellent condition, with remaining areas varying from a Very Good to degraded condition • Vegetation consists of Beard vegetation association 4048 • The vegetation consists of a mosaic of species-rich shrublands, Swamp Yate (<i>Eucalyptus occidentalis</i>) woodlands, and Saltwater Paperbark (<i>Melaleuca cuticularis</i>) wetlands. • 22.8 hectares represents the Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia TEC (vegetation type A), in Pristine to Very Good condition. • Contains suitable habitat for: <ul style="list-style-type: none"> ○ Carnaby's Black Cockatoo - <i>Zanda latirostris</i> – Endangered ○ Western brush wallaby - <i>Notamacropus irma</i> – Priority 4 ○ Quenda - <i>Isodon obesulus fusciventer</i> - Priority 4 • Evidence of Black Cockatoo foraging was recorded during the survey <p>Disturbance:</p> <ul style="list-style-type: none"> • Dieback is known in the neighbouring Reserve 28225 and along Fisheries Road near the intersection with Old Smokey Road. • This site has been previously used for the purpose of gravel extraction, with all gravel extraction having occurred prior to 2022. These have been rehabilitated through ripping and spreading of topsoil, historic gravel pits are in an Excellent condition. |



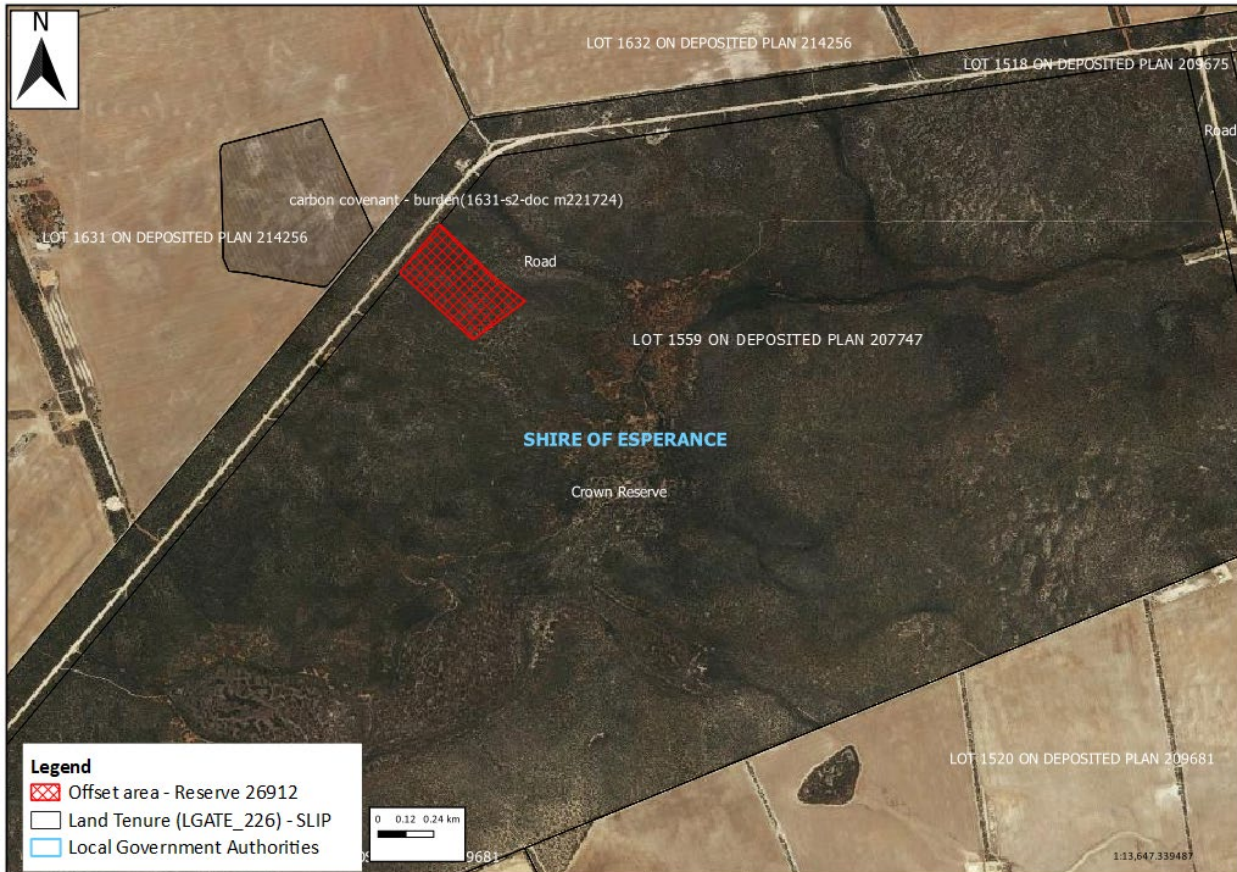


Figure 7. Offset site (Reserve 26912) proposed by the Shire of Esperance.



Figure 8. Offset site (Reserve 24633) proposed by the Shire of Esperance.

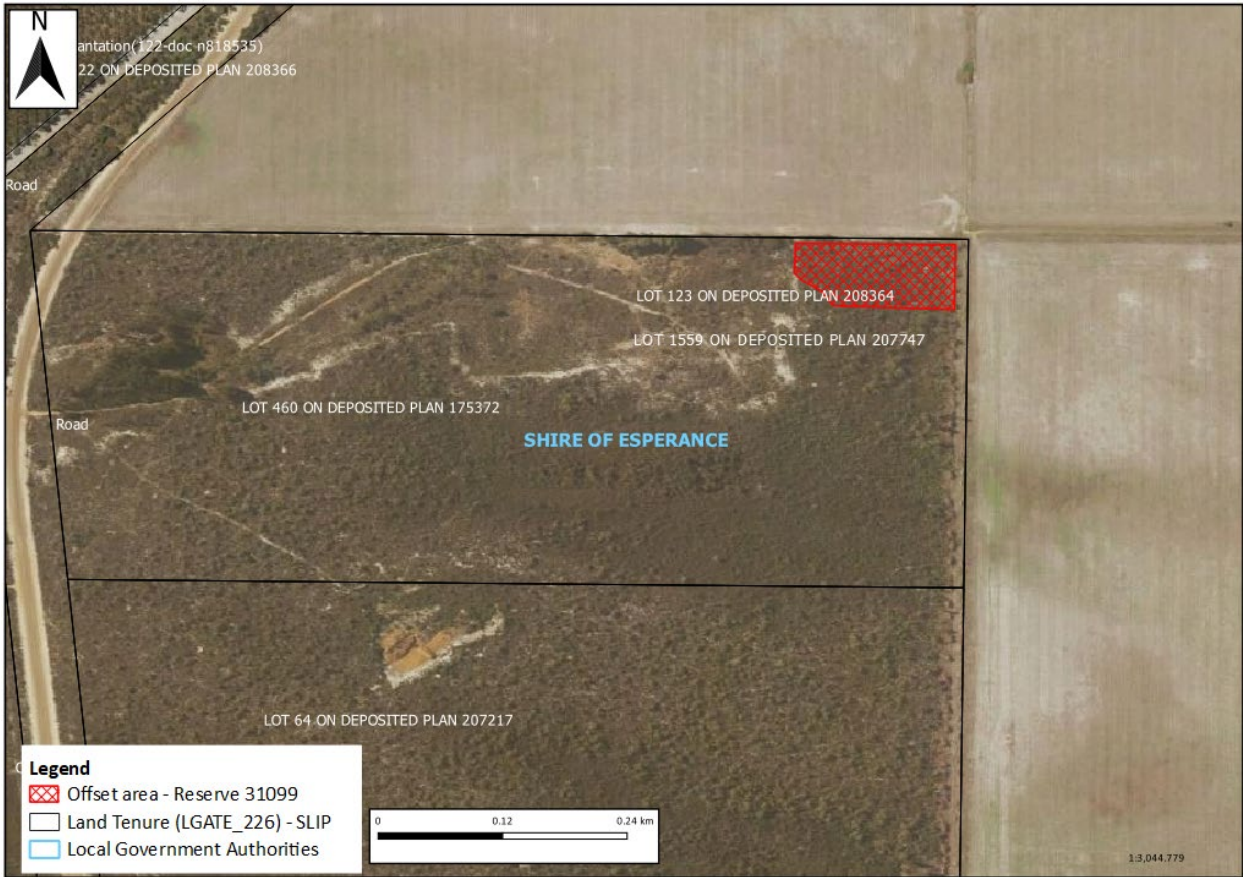


Figure 9. Offset site (Reserve 31099) proposed by the Shire of Esperance.

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 by the applicant and the application area was reduced from 16.27 hectares to 7.31 hectares. This information is presented in Section 3.1 of the Decision Report. |
| Additional targeted flora surveys | The applicant conducted additional targeted surveys with further individuals of <i>Guichenotia asteriskos</i> (P2), and <i>Goodenia laevis</i> subsp. <i>laevis</i> (P3) recorded (Shire of Esperance, 2023j). This information is presented in Section 3.2 of the Decision Report. |
| Mitigation of weed and dieback risks resulting from the proposed clearing | The applicant provided a Dieback and Invasive Weed Management Plan (Shire of Esperance, 2023j). This information is presented in Section 3.1 of the Decision Report. |
| Supporting documentation for proposed offset sites | The applicant provided an offset proposal and supporting documents for the proposed offset sites Crown Reserve 26912, Crown Reserve, Crown Reserve 24633 and Crown Reserve 31099. This information is presented in Section 4 and Appendix F of the Decision Report. |
| Revegetation plan for temporary clearing areas | The Shire provided a revegetation plan for the areas within Site A that will revegetated post gravel extraction (Shire of Esperance, 2024b). this information is presented in Section 3 and 4 of the Decision Report. |

Appendix B. Details of public submissions

One public submission was received in relation to the proposed clearing (Submission, 2023).

| Summary of comments | Consideration of comment |
|--|---|
| Insufficient information provided. Specifically: <ul style="list-style-type: none"> - no flora and fauna surveys, - insufficient assessment against the clearing principles | The Shire provided survey reports for each site proposed to be cleared, including the findings of additional survey work requested by the department. This information is presented in Section 3.1 of the Decision Report, Appendix A and Appendix G. |
| Cumulative impacts from this application and previous applications by the Shire (CPS 9524/1). | Cumulative impacts are considered and addressed under Section 3.2 of the Decision Report. |
| Concerns regarding the clearing of: <ul style="list-style-type: none"> - highly cleared vegetation associations, in particular BVA 512 - vegetation in Good to Excellent condition | Consideration of the impacts to environmental values are addressed under Section 3.2 of the Decision Report. Offset has been propose by the Shire to address significant residual impacts of clearing BVA 512. |
| Concerns regarding the clearing leading to the increased risk of the spread of dieback and weeds. | Consideration of the impact of weeds and dieback under Section 3.1 and Section 3.2 above. A Dieback and Invasive Weed Management Plan has been provided by the Shire (Shire of Esperance, 2023a). Weed and dieback management measures will be conditioned on the permit. |
| Concerns regarding land degradation, in particular, increased salinity. | Consideration of the impacts to land degradation are addressed under Section 3.2 of the Decision Report and Appendix D. |
| Concerns regarding the justification for clearing. | Justification for the proposed clearing and avoidance and mitigation measures provided by the Shire is 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 twenty-kilometre radius of the application area.

| Characteristic | Details | | | | | | |
|--------------------------------------|---|------|--------------------------------------|--------|--|--------|--|
| Local context | 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 across the proposed clearing area. | | | | | | |
| Conservation areas | Two conservation areas are within close proximity to the areas proposed to be cleared: <ul style="list-style-type: none"> • Munglinup Nature Reserve is located adjacent to site E • Beaumont Nature Reserve is located 1.3 kilometres from site G | | | | | | |
| Vegetation description and condition | <p>Flora and vegetation surveys (Shire of Esperance 2023a-i) were conducted by the Shire across the six proposed clearing areas.</p> <p>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> <p>Vegetation condition ranged from Excellent to Completely Degraded (Keighery, 1994) across the application area (Shire of Esperance, 2023a-i).</p> <p>The full Keighery (1994) condition rating scale is provided in Appendix E. Representative photos, survey descriptions and mapping are available in Appendix G.</p> <table border="1" data-bbox="427 1249 1465 1966"> <thead> <tr> <th>Site</th> <th>Vegetation description and condition</th> </tr> </thead> <tbody> <tr> <td>Site A</td> <td> <p>Pre-European vegetation mapping (Beard, 1973):</p> <ul style="list-style-type: none"> - Lort_512: Shrublands; mallee scrub, <i>Eucalyptus eremophila</i> & Forrest's marlock (<i>E. forrestiana</i>) <p>Survey results (Shire of Esperance, 2023b):</p> <ul style="list-style-type: none"> - Type A: Open <i>Eucalyptus pleurocarpa</i> and <i>Banksia media</i> dominated mallee woodland with <i>Acacia</i>, <i>Proteaceae</i> and <i>Goodeniaceae</i> understorey (2.535 ha) - Type B: Mixed Mallee over Mixed <i>Melaleuca</i> shrubland with <i>Acacia</i> and <i>Goodeniaceae</i> understory (0.707 ha) <p>Vegetation condition across the whole 3.243 hectare site can be classified as Excellent (Shire of Esperance, 2023b)</p> </td> </tr> <tr> <td>Site B</td> <td> <p>Pre-European vegetation mapping (Beard, 1973):</p> <ul style="list-style-type: none"> - Esperance_6048: Shrublands; scrub heath on sandplains - Esperance_931: Medium woodland; yate <p>Survey results (Shire of Esperance, 2023c):</p> <ul style="list-style-type: none"> - Type A: Shrubland: Vegetation structure lost (0.206 ha) </td> </tr> </tbody> </table> | Site | Vegetation description and condition | Site A | <p>Pre-European vegetation mapping (Beard, 1973):</p> <ul style="list-style-type: none"> - Lort_512: Shrublands; mallee scrub, <i>Eucalyptus eremophila</i> & Forrest's marlock (<i>E. forrestiana</i>) <p>Survey results (Shire of Esperance, 2023b):</p> <ul style="list-style-type: none"> - Type A: Open <i>Eucalyptus pleurocarpa</i> and <i>Banksia media</i> dominated mallee woodland with <i>Acacia</i>, <i>Proteaceae</i> and <i>Goodeniaceae</i> understorey (2.535 ha) - Type B: Mixed Mallee over Mixed <i>Melaleuca</i> shrubland with <i>Acacia</i> and <i>Goodeniaceae</i> understory (0.707 ha) <p>Vegetation condition across the whole 3.243 hectare site can be classified as Excellent (Shire of Esperance, 2023b)</p> | Site B | <p>Pre-European vegetation mapping (Beard, 1973):</p> <ul style="list-style-type: none"> - Esperance_6048: Shrublands; scrub heath on sandplains - Esperance_931: Medium woodland; yate <p>Survey results (Shire of Esperance, 2023c):</p> <ul style="list-style-type: none"> - Type A: Shrubland: Vegetation structure lost (0.206 ha) |
| Site | Vegetation description and condition | | | | | | |
| Site A | <p>Pre-European vegetation mapping (Beard, 1973):</p> <ul style="list-style-type: none"> - Lort_512: Shrublands; mallee scrub, <i>Eucalyptus eremophila</i> & Forrest's marlock (<i>E. forrestiana</i>) <p>Survey results (Shire of Esperance, 2023b):</p> <ul style="list-style-type: none"> - Type A: Open <i>Eucalyptus pleurocarpa</i> and <i>Banksia media</i> dominated mallee woodland with <i>Acacia</i>, <i>Proteaceae</i> and <i>Goodeniaceae</i> understorey (2.535 ha) - Type B: Mixed Mallee over Mixed <i>Melaleuca</i> shrubland with <i>Acacia</i> and <i>Goodeniaceae</i> understory (0.707 ha) <p>Vegetation condition across the whole 3.243 hectare site can be classified as Excellent (Shire of Esperance, 2023b)</p> | | | | | | |
| Site B | <p>Pre-European vegetation mapping (Beard, 1973):</p> <ul style="list-style-type: none"> - Esperance_6048: Shrublands; scrub heath on sandplains - Esperance_931: Medium woodland; yate <p>Survey results (Shire of Esperance, 2023c):</p> <ul style="list-style-type: none"> - Type A: Shrubland: Vegetation structure lost (0.206 ha) | | | | | | |

| Characteristic | Details |
|----------------|---|
| | <ul style="list-style-type: none"> - Type B: Scattered <i>Nuytsia</i> over mixed shrubland with <i>Lambertia inermis</i>, <i>Eucalyptus pleurocarpa</i>, <i>Acacia cyclops</i>, <i>Adenanthos cuneatus</i> (0.065 ha) - Type C: Introduced <i>Eucalyptus</i> over <i>Acacia pycnantha</i> with some remnant vegetation (0.058 ha) - Type D: <i>Eucalyptus occidentalis</i> over <i>Melaleuca cuticularis</i> and <i>Callitris drummondii</i> with <i>Gahnia</i> and <i>Taxandria callistachys</i> (0.054 ha) <p>Vegetation condition across the site ranges from Very Good to Completely Degraded (Shire of Esperance, 2023c).</p> |
| | <p>Site E</p> <p>Pre-European vegetation mapping (Beard, 1973):</p> <ul style="list-style-type: none"> - Esperance_47: Shrublands – tallerack mallee-heath <p>Survey results (Shire of Esperance, 2023f):</p> <ul style="list-style-type: none"> - Type A: <i>Banksia speciosa</i> with scattered <i>Nuytsia floribunda</i>, over mixed heath with <i>Melaleuca thyoides</i>, <i>Melaleuca striata</i>, <i>Adenanthos cuneatus</i> and <i>Lambertia inermis</i> (0.018 ha) - Type B: <i>Lambertia inermis</i>, <i>Eucalyptus pleurocarpa</i> and <i>E. tetraptera</i> over mixed heath with <i>Melaleuca striata</i>, <i>Acacia cyclops</i> (0.465 ha) - Type C: <i>Melaleuca cuticularis</i> dominated wetland with <i>Juncus</i> rushes (0.075 ha). - Type D: Dense <i>Allocasuarina huegeliana</i> dominated woodland with <i>Hakea laurina</i>, <i>Leptospermum</i> spp., <i>Acacia glaucoptera</i> and <i>Hakea lissocarpa</i> (0.093 ha) - Type E: Scattered <i>Nuytsia floribunda</i> over low <i>Melaleuca striata</i> and <i>Adenanthos cuneatus</i> dominated shrubland (0.062 ha) - Type F: <i>Eucalyptus occidentalis</i> over <i>Melaleuca cuticularis</i> dominated winter wet area (0.080 ha) <p>Vegetation condition across the site ranges from Excellent to Completely Degraded (Shire of Esperance, 2023f).</p> |
| | <p>Site F</p> <p>Pre-European vegetation mapping (Beard, 1973):</p> <ul style="list-style-type: none"> - Esperance_47: Shrublands – tallerack mallee-heath - Esperance_125: Bare areas; salt lakes - Esperance_6048: Shrublands; banksia scrub-heath on sandplain in the Esperance Plains Region <p>Survey results (Shire of Esperance, 2023g):</p> <ul style="list-style-type: none"> - Type A: <i>Nuytsia floribunda</i> over mixed proteaceous and myrtaceous heath with restiads (0.188 ha) <ul style="list-style-type: none"> o Proteaceous species absent within a portion of this vegetation type (potentially dieback affected) (0.010 ha) - Type B: <i>Eucalyptus occidentalis</i> and <i>Melaleuca cuticularis</i> dominated winter wet area with <i>Melaleuca incana</i>, <i>Phymatocarpus maxwellii</i>, <i>Melaleuca pulchella</i> - Type C: Mallee and <i>Eucalyptus pleurocarpa</i> over mixed shrubland with <i>Acacia cyclops</i>, <i>Cooperhookea strophiolata</i>, <i>Templetonia retusa</i> - Type D: <i>Eucalyptus occidentalis</i> and <i>Hakea laurina</i> over Melaleucas and Fabaceae shrubs. - Type E: <i>Melaleuca pulchella</i>, <i>Hakea cinerea</i>, <i>Melaleuca scabra</i>, over dense <i>Juncus</i> rushes |

| Characteristic | Details | | | | |
|----------------------|--|--|-------|--------|--|
| | | <ul style="list-style-type: none"> - Type F: <i>Banksia speciosa</i> dominated mixed shrubland with <i>Adenanthos cuneatus</i> and <i>Allocasuarina</i> sp. <p>Vegetation condition across the site ranges from Excellent to degraded (Shire of Esperance, 2023g).</p> | | | |
| | Site G | <p>Pre-European vegetation mapping (Beard, 1973):</p> <ul style="list-style-type: none"> - Ridley_516: Shrublands; mallee scrub, black marlock - Esperance_47: Eucalyptus open mallee shrubland <p>Survey results (Shire of Esperance, 2023h):</p> <ul style="list-style-type: none"> - Type A: Mallee and <i>Hakea cinerea</i> over scattered shrubs with dense Restionaceae and Cyperaceae sedge understorey - Type B: Open mallee over mixed Proteaceous heath - Type C: <i>Eucalyptus occidentalis</i> woodland with or without <i>Melaleuca cuticularis</i> - Type D: Mixed Eucalyptus spp., <i>Banksia media</i> and <i>Hakea cinerea</i> over mixed myrtaceous dominated shrubland - Type E: Mallee over dense Melaleuca shrubland <p>Vegetation condition across the site ranges from Excellent to Good (Shire of Esperance, 2023h).</p> | | | |
| | Site H | <p>Pre-European vegetation mapping (Beard, 1973):</p> <ul style="list-style-type: none"> - Ridley_516: Shrublands; mallee scrub, black marlock - Esperance_47: Eucalyptus open mallee shrubland <p>Survey results (Shire of Esperance, 2023i):</p> <ul style="list-style-type: none"> - Type A: <i>Melaleuca cuticularis</i> and <i>M. brevifolia</i> over mixed samphire's, <i>Austrostipa juncifolia</i>, <i>Disphyma crassifolium</i> (0.069 ha). - Type B: Mallee woodland with <i>Hakea laurina</i> over mixed Melaleuca shrubland (1.067 ha) - Type C: <i>Eucalyptus occidentalis</i> woodland in valley floor (0.134 ha). - Type D: <i>Eucalyptus occidentalis</i> and <i>Eucalyptus rigens</i> woodland (0.159 ha). - Type E: Mallee and <i>Eucalyptus pleurocarpa</i> over mixed shrubland with <i>Calothamnus quadrifidus</i>, <i>Melaleuca glaberrima</i>, <i>Allocasuarina</i> spp. (0.092 ha). - Type F: <i>Eucalyptus occidentalis</i> over <i>Melaleuca cuticularis</i> wetland with mixed samphire's (0.065 ha). - Type G: <i>Eucalyptus pleurocarpa</i> over mixed heath (0.049 ha). <p>Vegetation condition across the site ranges from Excellent to Completely Degraded (Shire of Esperance, 2023i).</p> | | | |
| Climate and landform | <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> | | | | |
| Soil description | <p>The soil across the application area is mapped as:</p> | | | | |
| | <table border="1"> <thead> <tr> <th data-bbox="416 1818 624 1859">Site</th> <th data-bbox="624 1818 1479 1859">Soils</th> </tr> </thead> <tbody> <tr> <td data-bbox="416 1859 624 1910">Site A</td> <td data-bbox="624 1859 1479 1910"> <ul style="list-style-type: none"> • Scaddan 4 Subsystem: Red alkaline gradational soils. </td> </tr> </tbody> </table> | Site | Soils | Site A | <ul style="list-style-type: none"> • Scaddan 4 Subsystem: Red alkaline gradational soils. |
| Site | Soils | | | | |
| Site A | <ul style="list-style-type: none"> • Scaddan 4 Subsystem: Red alkaline gradational soils. | | | | |

| Characteristic | Details | |
|----------------|---------|---|
| | Site B | <ul style="list-style-type: none"> • Esperance 1b Phase: Grey deep sandy duplex (gravelly) soils with associated duplex sandy gravels and minor pale deep sands and shallow gravels. On gently undulating plain. • Esperance 2a Phase: Gravelly, yellow mottled duplex soil with < 30 cm of sand over gravel layer (Fleming (shallow)), Dy5.82, on level plain, • Esperance 3b Phase: Pale deep sands, on gently undulating plain. Slope 1-3%, relief <9m • Esperance 3e Phase: Deep uniform sand, Podzol > 80 cm (Corinup), Uc2.25, on escarpment, 3-6% slope • Esperance 4E5c Phase: Moderately deep grey-brown duplex soil overlying Siltstone (Myrup), Dy4.44 on escarpment, 3-6% slope • Esperance 5 b Phase: Moderately deep grey-brown duplex soil overlying Siltstone (Myrup), Dy4.43, on minor river valleys, 3-8% slope • Esperance 9E3f Phase: Deep uniform sand, Podzol > 80 cm (Corinup), Uc2.26, on minor river valleys, 3-8% slope. |
| | Site E | <ul style="list-style-type: none"> • Munglinup 1 Subsystem: Externally drained plains and rises with gently inclined slopes some small level plains on upper slopes and catchment divides. Grey deep and shallow sandy duplex (gravelly) minor pale deep sands and gravelly duplex and deep sandy gravels, • Munglinup 6 Subsystem: Gently sloping rises consisting of broad crests in upper landscape positions. Duplex sandy gravels and associated grey deep sandy (gravelly) duplex soils and minor pale deep sands. |
| | Site F | <ul style="list-style-type: none"> • Esperance 1 Subsystem: Gravelly yellow mottled duplex soils (<30 cm sand over gravel). • Esperance 5 Subsystem: Shallow grey-brown duplex soils developed over spongelite. • Condingup 1 Subsystem: Gently undulating plain with subdued sandsheets and dunes. Aeolian sands / Pallinup formation. Pale deep sands and associated grey deep sandy duplex soils (some gravelly). Shrubland of <i>Banksia speciosa</i> and associated mallee heath • Condingup 2 Subsystem: Gently undulating plain with minor depressions. Aeolian sands / Pallinup formation. Grey deep sandy duplex soils (some gravelly) with associated pale deep sands. Mallee shrubland of <i>Eucalyptus tetragona</i> and heath. |
| | Site G | <ul style="list-style-type: none"> • Scaddan 10 Subsystem: Slightly elevated gently undulating plain. Tertiary marine sediments / Prot. granite & gneiss. Alkaline grey shallow sandy duplex soils & calcareous loamy earths. Mallee shrubland / <i>Melaleuca</i> species with <i>Eucalyptus occidentalis</i> woodland in Swamps. • Ney 2 Subsystem: Gently inclined to moderately inclined hillslopes. Proterozoic granite and gneiss and associated colluvium. Grey deep sandy duplex soils and pale deep sands with minor shallow gravel and grey non-cracking clays. Heath and shrubland • Esperance 6 Subsystem: Red-brown to grey brown alluvial sands. |
| | Site H | <ul style="list-style-type: none"> • Esperance 1 b Phase: Grey deep sandy duplex (gravelly) soils with associated duplex sandy gravels and minor pale deep sands and shallow gravels. On gently undulating plain. • Esperance 1 a Phase: Gravelly, yellow mottled duplex soil with < 30 cm of sand over gravel layer (Fleming (shallow)), Dy5.82, on level plain, |

| Characteristic | Details | | | | | | | | | | | | | | |
|-----------------------|---|------|------|--------|---|--------|---|--------|--|--------|--|--------|---|--------|--|
| | <ul style="list-style-type: none"> Scaddan 1 b Phase: Solonetzic, yellow sodic, alkaline, duplex soil (Scaddan), Dy4.44, on gently undulating plain, 1-3% slope Scaddan 4 c Phase: Red, sodic, alkaline, gradational soil (Kumarl), Gc1.24, on gently undulating , 1-3% slope Scaddan 4 d Phase: Red, sodic, alkaline, gradational soil, with crabhole gilgai microrelief (Kumarl), Gc1.25, on gently undulating , 1-3% slope with crabhole gilgai microrelief. Esperance 3sd Phase Saline drainage lines. Scaddan 7 c Phase: Duplex red-brown columnar soil complex (Scaddan-Kumarl), Dy4.43, Gc1.24, on gently undulating plain, 1-3% slope Young 4Y1 Phase: Soil complex dominated by yellow to red solonetzic soils, on sloping valley sides. | | | | | | | | | | | | | | |
| Land degradation risk | <p>Land degradation risk across the application area is mapped as:</p> <table border="1" data-bbox="432 658 1447 1196"> <thead> <tr> <th data-bbox="432 658 624 696">Site</th> <th data-bbox="624 658 1447 696">Risk</th> </tr> </thead> <tbody> <tr> <td data-bbox="432 696 624 734">Site A</td> <td data-bbox="624 696 1447 734"> <ul style="list-style-type: none"> Medium risk of wind erosion </td> </tr> <tr> <td data-bbox="432 734 624 846">Site B</td> <td data-bbox="624 734 1447 846"> <ul style="list-style-type: none"> High risk of wind erosion Medium to high risk of water repellence High risk of subsurface acidification </td> </tr> <tr> <td data-bbox="432 846 624 920">Site E</td> <td data-bbox="624 846 1447 920"> <ul style="list-style-type: none"> High risk of wind erosion High risk of subsurface acidification </td> </tr> <tr> <td data-bbox="432 920 624 994">Site F</td> <td data-bbox="624 920 1447 994"> <ul style="list-style-type: none"> High risk of wind erosion Medium risk of waterlogging </td> </tr> <tr> <td data-bbox="432 994 624 1093">Site G</td> <td data-bbox="624 994 1447 1093"> <ul style="list-style-type: none"> Medium to high risk of wind erosion Medium risk of water repellence Medium to high risk of subsurface acidification </td> </tr> <tr> <td data-bbox="432 1093 624 1196">Site H</td> <td data-bbox="624 1093 1447 1196"> <ul style="list-style-type: none"> Medium to high risk of wind erosion Low to medium risk of waterlogging Medium to high risk of subsurface acidification </td> </tr> </tbody> </table> | Site | Risk | Site A | <ul style="list-style-type: none"> Medium risk of wind erosion | Site B | <ul style="list-style-type: none"> High risk of wind erosion Medium to high risk of water repellence High risk of subsurface acidification | Site E | <ul style="list-style-type: none"> High risk of wind erosion High risk of subsurface acidification | Site F | <ul style="list-style-type: none"> High risk of wind erosion Medium risk of waterlogging | Site G | <ul style="list-style-type: none"> Medium to high risk of wind erosion Medium risk of water repellence Medium to high risk of subsurface acidification | Site H | <ul style="list-style-type: none"> Medium to high risk of wind erosion Low to medium risk of waterlogging Medium to high risk of subsurface acidification |
| Site | Risk | | | | | | | | | | | | | | |
| Site A | <ul style="list-style-type: none"> Medium risk of wind erosion | | | | | | | | | | | | | | |
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| Site E | <ul style="list-style-type: none"> High risk of wind erosion High risk of subsurface acidification | | | | | | | | | | | | | | |
| Site F | <ul style="list-style-type: none"> High risk of wind erosion Medium risk of waterlogging | | | | | | | | | | | | | | |
| Site G | <ul style="list-style-type: none"> Medium to high risk of wind erosion Medium risk of water repellence Medium to high risk of subsurface acidification | | | | | | | | | | | | | | |
| Site H | <ul style="list-style-type: none"> Medium to high risk of wind erosion Low to medium risk of waterlogging Medium to high risk of subsurface acidification | | | | | | | | | | | | | | |
| Waterbodies | <p>The desktop assessment and aerial imagery indicated that:</p> <ul style="list-style-type: none"> Site A is 0.29 kilometres from a minor tributary of the Young River, Site B intersects a minor tributary of the Coramup creek, Site E intersects a minor nonperennial river, the Munglinginup river Site F is 0.66 kilometres from a natural, nonperennial swamp, Site G is 0.22 kilometres from a nonperennial lake, intersects a minor tributary of the Young River, Site H intersects the minor nonperennial river, the Dalyup river. | | | | | | | | | | | | | | |
| Hydrogeography | <p>The application area is located across several Catchments.</p> <ul style="list-style-type: none"> Site A is located within the Stokes Inlet: Lake_Young catchment, Site B is located within the Bandy Creek catchment, Site E is located within the Oldfield River catchment, Site F is within the Dailey River and Munglinginup Creek catchment, Site H is within the Lake Gore catchment, Site G is within the Alexander River and Munglinginup Creek catchment. <p>Site B is located within the proclaimed Esperance Groundwater Area under the <i>Rights in Water and Irrigation Act 1914</i> (RIWI Act). The remaining sites are not within any proclaimed areas under the RIWI Act.</p> <p>The application area is not located within any areas proclaimed under the <i>Country Areas Water Supply Act 1947</i>.</p> | | | | | | | | | | | | | | |

| Characteristic | Details | | | | | | | | | | | | | | |
|------------------------|--|------|--------------------------------|--------|---|--------|--|--------|--|--------|--|--------|---|--------|---|
| Flora | <p>A total of 144 flora records occur in the local area. There are records of 25 conservation significant flora species found on the same soil and vegetation types as the application, of which six occur within one kilometre of the application area.</p> <p>Targeted flora surveys (Shire of Esperance, 2023b-j) conducted across the application area recorded several priority flora within the proposed clearing area.</p> <table border="1" data-bbox="432 416 1445 1294"> <thead> <tr> <th data-bbox="432 416 660 450">Site</th> <th data-bbox="660 416 1445 450">Conservation significant flora</th> </tr> </thead> <tbody> <tr> <td data-bbox="432 450 660 600">Site A</td> <td data-bbox="660 450 1445 600"> <ul style="list-style-type: none"> • <i>Banksia cirsioides / xylothemelia</i> (P3) • <i>Goodenia laevis</i> subsp. <i>laevis</i> (P4) • <i>Grevillea aneura</i> (P3) • <i>Guichenotia asteriskos</i> (P2) </td> </tr> <tr> <td data-bbox="432 600 660 685">Site B</td> <td data-bbox="660 600 1445 685">No Threatened or priority species, were identified within the clearing area.</td> </tr> <tr> <td data-bbox="432 685 660 770">Site E</td> <td data-bbox="660 685 1445 770"> <ul style="list-style-type: none"> • <i>Dampiera sericantha</i> (P3) • <i>Daviesia pauciflora</i> (P3) </td> </tr> <tr> <td data-bbox="432 770 660 855">Site F</td> <td data-bbox="660 770 1445 855"> <ul style="list-style-type: none"> • <i>Bentleya diminuta</i> (P2) • <i>Conostylis seorsiflora</i> subsp. <i>longissima</i> (P2) </td> </tr> <tr> <td data-bbox="432 855 660 1066">Site G</td> <td data-bbox="660 855 1445 1066"> <ul style="list-style-type: none"> • <i>Acacia bartlei</i> (P3) • <i>Aotus</i> sp. Dundas (M.A. Burgman 2835) (P2) • <i>Bentleya diminuta</i> (P2) • <i>Goodenia laevis</i> subsp. <i>laevis</i> (P3) • <i>Persoonia scabra</i> (P3) • <i>Styphelia rotundifolia</i> (P3) </td> </tr> <tr> <td data-bbox="432 1066 660 1294">Site H</td> <td data-bbox="660 1066 1445 1294"> <ul style="list-style-type: none"> • <i>Austrobaeckea uncinella</i> (P3) • <i>Brachyloma mogin</i> (P3) • <i>Darwinia</i> sp. Gibson (R.D. Royce 3569) (P1) • <i>Daviesia pauciflora</i> (P3) • <i>Grevillea baxteri</i> (P4) • <i>Kunzea salina</i> (P3) • <i>Persoonia scabra</i> (P3) </td> </tr> </tbody> </table> | Site | Conservation significant flora | Site A | <ul style="list-style-type: none"> • <i>Banksia cirsioides / xylothemelia</i> (P3) • <i>Goodenia laevis</i> subsp. <i>laevis</i> (P4) • <i>Grevillea aneura</i> (P3) • <i>Guichenotia asteriskos</i> (P2) | Site B | No Threatened or priority species, were identified within the clearing area. | Site E | <ul style="list-style-type: none"> • <i>Dampiera sericantha</i> (P3) • <i>Daviesia pauciflora</i> (P3) | Site F | <ul style="list-style-type: none"> • <i>Bentleya diminuta</i> (P2) • <i>Conostylis seorsiflora</i> subsp. <i>longissima</i> (P2) | Site G | <ul style="list-style-type: none"> • <i>Acacia bartlei</i> (P3) • <i>Aotus</i> sp. Dundas (M.A. Burgman 2835) (P2) • <i>Bentleya diminuta</i> (P2) • <i>Goodenia laevis</i> subsp. <i>laevis</i> (P3) • <i>Persoonia scabra</i> (P3) • <i>Styphelia rotundifolia</i> (P3) | Site H | <ul style="list-style-type: none"> • <i>Austrobaeckea uncinella</i> (P3) • <i>Brachyloma mogin</i> (P3) • <i>Darwinia</i> sp. Gibson (R.D. Royce 3569) (P1) • <i>Daviesia pauciflora</i> (P3) • <i>Grevillea baxteri</i> (P4) • <i>Kunzea salina</i> (P3) • <i>Persoonia scabra</i> (P3) |
| Site | Conservation significant flora | | | | | | | | | | | | | | |
| Site A | <ul style="list-style-type: none"> • <i>Banksia cirsioides / xylothemelia</i> (P3) • <i>Goodenia laevis</i> subsp. <i>laevis</i> (P4) • <i>Grevillea aneura</i> (P3) • <i>Guichenotia asteriskos</i> (P2) | | | | | | | | | | | | | | |
| Site B | No Threatened or priority species, were identified within the clearing area. | | | | | | | | | | | | | | |
| Site E | <ul style="list-style-type: none"> • <i>Dampiera sericantha</i> (P3) • <i>Daviesia pauciflora</i> (P3) | | | | | | | | | | | | | | |
| Site F | <ul style="list-style-type: none"> • <i>Bentleya diminuta</i> (P2) • <i>Conostylis seorsiflora</i> subsp. <i>longissima</i> (P2) | | | | | | | | | | | | | | |
| Site G | <ul style="list-style-type: none"> • <i>Acacia bartlei</i> (P3) • <i>Aotus</i> sp. Dundas (M.A. Burgman 2835) (P2) • <i>Bentleya diminuta</i> (P2) • <i>Goodenia laevis</i> subsp. <i>laevis</i> (P3) • <i>Persoonia scabra</i> (P3) • <i>Styphelia rotundifolia</i> (P3) | | | | | | | | | | | | | | |
| Site H | <ul style="list-style-type: none"> • <i>Austrobaeckea uncinella</i> (P3) • <i>Brachyloma mogin</i> (P3) • <i>Darwinia</i> sp. Gibson (R.D. Royce 3569) (P1) • <i>Daviesia pauciflora</i> (P3) • <i>Grevillea baxteri</i> (P4) • <i>Kunzea salina</i> (P3) • <i>Persoonia scabra</i> (P3) | | | | | | | | | | | | | | |
| Ecological communities | <p>The federally listed (EPBC Act) Kwongkan shrubland TEC has been recorded within the local area of the proposed clearing areas.</p> <p>Biological surveys undertaken for the application area recorded vegetation representative of the Kwongkan shrubland TEC within all six proposed clearing areas (3.51 ha) and the Swamp Yates PEC within five of the six clearing areas (0.31 ha).</p> | | | | | | | | | | | | | | |
| Fauna | <p>Desktop records identified 59 records of conservation significant species within the local area. Of these, five are considered likely to occur within the application area.</p> <p>The application area is within the mapped distribution of Carnaby's cockatoos but outside of the mapped breeding distribution. A total of 13 recorded roosts occur within the local area of the proposed clearing sites. No breeding has been recorded within the local area of the proposed clearing sites.</p> <p>A basic fauna survey (Shire of Esperance, 2023b-j) recorded foraging habitat for Carnaby's cockatoo (<i>Zanda latirostris</i>, EN) across all sites within the application area, however, no roosts or hollows were identified.</p> <p>Several sites (site A and G) were considered to contain suitable habitat for malleefowl (<i>Leipoa ocellata</i>, VU).</p> | | | | | | | | | | | | | | |

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* | | | | | |
| Esperance plains | 2,899,940.66 | 1,494,450.87 | 51.53 | 2,899,940.66 | 20.84 |
| Mallee | 7,395,894.36 | 4,180,937.68 | 56.53 | 1,289,384.08 | 17.43 |
| Vegetation complex* | | | | | |
| Beard vegetation association in Esperance plains bioregion | | | | | |
| Esperance_47 | 959,935.91 | 336,492.07 | 35.05 | 178,325.54 | 18.71 |
| Esperance_125 | 23,442.63 | 17,364.18 | 74.07 | 16,086.00 | 84.34 |
| Esperance_931 | 21,209.61 | 10,304.97 | 48.59 | 1,777.66 | 9.22 |
| Esperance_6048 | 113,688.87 | 16,099.85 | 14.16 | 4,000.26 | 4.04 |
| Ridley_516 | 318,746.74 | 219,798.44 | 68.96 | 91,555.75 | 28.79 |
| Beard vegetation association in Mallee bioregion | | | | | |
| Salmon Gums_486 | 351,116.16 | 171,015.92 | 48.71 | 17,554.12 | 6.15 |
| Lort_512 | 237,682.29 | 62,771.24 | 26.41 | 5,654.35 | 2.40 |
| Ridley_519 | 2,100,313.59 | 1,248,661.16 | 59.45 | 225,928.43 | 10.85 |
| Local area (10km radius) | | | | | |
| Site A | 71834.55 | 127741.71 | 56.23 | - | - |
| Site B | 9606.586 | 38757.25 | 24.79 | - | - |
| Site E | 38096.44 | 126423.13 | 30.13 | - | - |
| Site F | 30996.12 | 147794.90 | 20.97 | - | - |
| Site G | 30990.46 | 149541.06 | 20.72 | - | - |
| Site H | 19278.78 | 172928.16 | 11.15 | - | - |

*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 (Shire of Esperance 2023a-j), impacts to the following conservation significant flora required further consideration.

| Species name | Conservation status | 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>Conostylis seorsiflora</i> subsp. <i>longissima</i> | 2 | Y | N | 0.00 | 1 | Y |
| <i>Persoonia cymbifolia</i> | 3 | N | Y | 0.00 | 7 | Y |
| <i>Thysanotus parviflorus</i> | 4 | Y | Y | 0.00 | 2 | Y |
| <i>Aotus</i> sp. Dundas (M.A. Burgman 2835) | 2 | Y | Y | 0.00 | 2 | Y |
| <i>Persoonia scabra</i> | 3 | N | Y | 0.01 | 7 | Y |

| Species name | Conservation status | 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 | 0.01 | 18 | Y |
| <i>Darwinia</i> sp. Gibson (R.D. Royce 3569) | 1 | N | Y | 0.01 | 15 | Y |
| <i>Kunzea salina</i> | 3 | Y | Y | 0.01 | 14 | Y |
| <i>Grevillea aneura</i> | 3 | N | Y | 0.00 | 7 | Y |
| <i>Isopogon alcornis</i> | 3 | N | Y | 0.01 | 7 | Y |
| <i>Melaleuca dempta</i> | 3 | Y | Y | 0.01 | 18 | Y |
| <i>Austrobaecka uncinella</i> | 1 | N | Y | 0.01 | 15 | Y |
| <i>Styphelia rotundifolia</i> | 3 | Y | Y | 0.01 | 14 | Y |
| <i>Dampiera sericantha</i> | 4 | N | Y | 0.03 | 11 | Y |
| <i>Eucalyptus semiglobosa</i> | 3 | N | Y | 0.07 | 12 | Y |
| <i>Conostylis lepidospermoides</i> | 3 | N | Y | 0.09 | 15 | Y |
| <i>Goodenia laevis</i> subsp. <i>laevis</i> | 3 | N | Y | 0.43 | 12 | Y |
| <i>Conostephium marchantiorum</i> | 3 | N | Y | 0.47 | 6 | Y |
| <i>Myoporum turbinatum</i> | 3 | N | Y | 0.57 | 12 | Y |
| <i>Grevillea baxteri</i> | 3 | N | Y | 0.84 | 9 | Y |
| <i>Anigozanthos bicolor</i> subsp. <i>minor</i> | T | N | Y | 1.81 | 21 | Y |
| <i>Leucopogon</i> sp. Cascades (M. Hislop 3693) | 3 | N | Y | 1.92 | 11 | Y |
| <i>Leucopogon corymbiformis</i> | 3 | N | Y | 2.57 | 15 | Y |
| <i>Eucalyptus foliosa</i> | 4 | Y | N | 2.96 | 39 | Y |
| <i>Leucopogon remotus</i> | 4 | N | Y | 3.30 | 19 | Y |
| <i>Hibbertia turleyana</i> | T | N | Y | 3.82 | 9 | Y |
| <i>Verticordia verticordina</i> | 1 | N | Y | 4.04 | 6 | Y |

C.4. Fauna analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix H.1), and biological survey information (Shire of Esperance 2023b-j), impacts to the following conservation significant fauna required further consideration.

| Species name | Conservation status | Suitable habitat features? [Y/N] | Suitable vegetation type? [Y/N] | Distance of closest record to application area (km) | Number of known records (total) | Are surveys adequate to identify? [Y, N, N/A] |
|---|---------------------|----------------------------------|---------------------------------|---|---------------------------------|---|
| malleefowl (<i>Leipoa ocellata</i>) | VU | Y | Y | 0.11 | 11 | Y |
| Carnaby's cockatoo (<i>Zanda latirostris</i>) | EN | Y | Y | 0.17 | 124 | Y |
| quenda (<i>Isoodon fusciventer</i>) | P4 | Y | Y | 1.71 | 8 | Y |
| peregrine falcon (<i>Falco peregrinus</i>) | SP | Y | Y | 2.61 | 15 | Y |
| chuditch (<i>Dasyurus geoffroii</i>) | VU | Y | Y | 10.60 | 2 | Y |

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

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 Kwongan Shrublands of the southeast coastal floristic province of Western Australia | EN (EPBC Act) P3 (DBCA) | Y | Y | Y | Within application area | Y |
| Swamp Yate, <i>Eucalyptus occidentalis</i> , woodlands in seasonally inundated clay basins in the South Coast of Western Australia | P3 (DBCA) | Y | Y | Y | 16.3 km | Y |

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

Appendix D. Assessment against the clearing principles

| Assessment against the clearing principles | Variance level | Is further consideration required? |
|--|------------------------------|--|
| Environmental value: biological values | | |
| <p><u>Principle (a):</u> <i>“Native vegetation should not be cleared if it comprises a high level of biodiversity.”</i></p> <p><u>Assessment:</u></p> <p>The areas proposed to be cleared contains priority flora, fauna habitat, the priority listed Swamp Yate PEC and the federally listed Kwongkan Shrublands TEC.</p> | At variance | Yes <i>Refer to Section 3.2.1, above.</i> |
| <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 and potential breeding habitat for mallefowl.</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 areas proposed to be cleared are unlikely to contain habitat for threatened flora. No Threatened flora were considered likely to occur within the proposed clearing area. No records occur within the local area and none were recorded during the surveys and targeted searches conducted across the application area (Shire of Esperance, 2023b-j).</p> | Not likely to be at variance | No |
| <p><u>Principle (d):</u> <i>“Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community.”</i></p> <p><u>Assessment:</u></p> <p>The areas proposed to be cleared contain 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 area, the proposed clearing may impact on the environmental values of nearby conservation areas. It is considered that this risk can be mitigated by the application of the Shire’s</p> | May be at variance | Yes <i>Refer to Section 3.2.3, above.</i> |

| Assessment against the clearing principles | Variance level | Is further consideration required? |
|--|------------------------------|--|
| weed and disease management plan and a weed and dieback condition on the permit. | | |
| 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>The area proposed to be cleared intersects several minor nonperennial tributaries, therefore the vegetation proposed to be cleared is 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> |
| <p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u></p> <p>Within the application area, the mapped soils are moderately to highly susceptible to wind erosion, water repellence and subsurface acidification. Taking into consideration that the cleared areas will be replaced with a hard road surface, the risk of wind erosion is considered to be minor and temporary. It is considered that the potential impacts of wind erosion can be managed through a condition on the permit requiring construction works to begin with three months of clearing.</p> | Not likely to be at variance | Yes <i>Refer to Section 3.2.4, above.</i> |
| <p><u>Principle (i):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.”</i></p> <p><u>Assessment:</u></p> <p>The application area intersects several minor nonperennial tributaries. 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> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</i></p> <p><u>Assessment:</u></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. The clearing proposed at site B has a medium risk of increased flooding associated with the intersected wetland. 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. |
| 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

| Field Name | Description | Justification for value used |
|---|---|---|
| Significant impact | | |
| <i>Description</i> | Conservation significance of the habitat/community impacted | 0.1% - Afforded to significant remnant vegetation that has less than 30% remaining within the bioregion. |
| | | 0.2% - Afforded to Malleefowl habitat as this species is listed as Vulnerable under the BC Act and the EPBC Act. |
| | | 1.2% - Afforded to Carnaby's cockatoo habitat as this species is listed as Endangered under the BC Act and the EPBC Act. |
| | | 1.2% - Afforded to Kwongkan Shrublands TEC as this community is listed as Endangered under the EPBC Act. |
| | | 0.12% - Afforded to Swamp Yates PEC as this community is identified by DBCA as a priority ecological community. |
| <i>Area of impact (habitat/community) or Quantum of impact (features/individuals)</i> | The area of habitat/community impacted | 3.87 ha – The application area comprises 3.87 hectares of significant remnant vegetation. |
| | | 3.27 ha - The application area comprises 3.27 hectares of Malleefowl habitat. |

| Field Name | Description | Justification for value used |
|--|---|---|
| | | <p>3.62 ha - The application area comprises 3.62 hectares of Carnaby's cockatoo foraging habitat.</p> <p>3.51 ha - The application area includes 3.51 hectares of vegetation representative of Kwongkan shrublands TEC.</p> <p>0.31 ha – The application area includes 0.31 hectares of vegetation representative of the Swamp Yate PEC.</p> |
| <p><i>Quality of impacted area (habitat/community)</i></p> | <p>The quality score for area of habitat/community being impacted - a measure of how well a particular site supports a particular threatened species or ecological community and contributes to its ongoing viability</p> | <p>7 - best fit (average) for the combination of vegetation condition (Excellent to Completely Degraded) for the significant remnant vegetation within a highly cleared landscape.</p> <p>7 - best fit (average) for the combination of site context and habitat attributes for Malleefowl habitat.</p> <ul style="list-style-type: none"> - moderate context – within known distribution, records within local area - moderate to high – mallee shrublands <p>7 – best fit (average) for the combination of site and foraging habitat species for Carnaby's cockatoo.</p> <ul style="list-style-type: none"> - moderate context – within known distribution but no breeding sites within local area, and few roost sites, - contains high quality foraging species including Kwongkan shrublands TEC <p>8 - best fit (average) for the combination of vegetation condition of the Kwongkan Shrubland TEC (Good to Excellent condition).</p> <p>8 – best fit (average) for the combination of vegetation condition of the Swamp Yate PEC (Excellent to Good condition).</p> |
| <p>Rehabilitation credit</p> | | |
| <p><i>Description</i></p> | | <p>2.89 ha to be rehabilitated post gravel extraction</p> |
| <p><i>Current quality of rehabilitation site</i></p> | <p>The quality score for the area of habitat/community proposed to be rehabilitated - a measure of how well a particular site supports a particular threatened species or ecological community and contributes to its ongoing viability</p> | <p>1 – the area will be degraded post gravel extraction but will maintain site context values</p> |
| <p><i>Future quality WITHOUT rehabilitation</i></p> | <p>The predicted future quality score (habitat/community) of the proposed mitigation site without the mitigation</p> | <p>1 – the area is not expected to improve or decline without intervention</p> |
| <p><i>Future quality WITH rehabilitation</i></p> | <p>The predicted future quality score</p> | <p>6 – afforded based on the provision of a revegetation plan</p> |

| Field Name | Description | Justification for value used |
|---|--|--|
| | (habitat/community) of the proposed mitigation site with the mitigation | |
| <i>Time until ecological benefit (years)</i> | This describes the estimated time (in years) that it will take for the main benefit of the quality (habitat/community) to be realised | 10 years – the time required for the vegetation to establish and represent the Kwongkan Shrublands TEC . |
| | | 15 years – the time required for the vegetation to establish and mature to provide Malleefowl and black cockatoo habitat values |
| <i>Confidence in rehabilitation result (%)</i> | The capacity of the rehabilitation to achieved the main benefit of the quality (habitat/community) to be realised | 80% - moderate to high level of confidence based on the revegetation plan provided by the Shire |
| <i>Revegetation credit (net present value)</i> | The net present value of the mitigation (area of habitat/community or number of individuals/features) that will be applied to the quantum of impact | 1.12 credit – for revegetation of malleefowl habitat |
| | | 0.51 credit – for revegetation of 1.445 hectares of Kwongkan Shrublands TEC |
| | | 0.48 credit – for revegetation of 1.445 hectares of Carnaby's cockatoo foraging habitat |
| Offset | | |
| <i>Proposed offset area (area in hectares)</i> | Calculated area required to offset significant residual impacts | 33.9 ha – of significant remnant vegetation within Reserve 26912 and Reserve 24633. |
| | | 14.62 ha – of Malleefowl habitat within Reserve 26912. |
| | | 25.94ha – of Carnaby's cockatoo foraging habitat within Reserve 24633. |
| | | 33.15 ha – of Kwongkan Shrubland TEC within Reserve 24633 and Reserve 31099. |
| | | 3.10 ha – of Swamp Yates PEC within Reserve 24633. |
| <i>Duration (habitat/community)</i> | This describes the timeframe over which changes in the level of risk to the proposed mitigation site can be considered and quantified | 20 - The offset site will be vested as 'Conservation'. 20 years is the maximum value associated with this field. |
| <i>Time until ecological benefit (habitat/community) or Time horizon (features/individuals)</i> | This describes the estimated time (in years) that it will take for the main benefit of the quality (habitat/community) improvement of the proposed mitigation to be realised | 1 - one year has been assigned, being the time until reserve vesting can be changed. |
| <i>Start quality (habitat/community)</i> | The quality score for the area of habitat/community proposed as mitigation - a | 8 - Reserve 24633 contains significant remnant vegetation in Excellent condition and high quality Carnaby's cockatoo foraging habitat . |

| Field Name | Description | Justification for value used |
|--|---|---|
| | measure of how well a particular site supports a particular threatened species or ecological community and contributes to its ongoing viability | <p>8 - Reserve 24633 contains Kwongkan shrublands TEC in high to moderate condition category.</p> <p>9 - Reserve 31099 contains Kwongkan shrublands TEC in pristine condition.</p> <p>8 - Reserve 26912 contains significant remnant vegetation in Excellent condition and high-quality Malleefowl habitat (Yate forest, Melaleuca shrublands and Mallee woodlands)</p> <p>8 - Reserve 24633 contains vegetation in Excellent condition representative of the Swamp Yate PEC</p> |
| <i>Future quality without offset (habitat/community) or Future value without offset (features/individuals)</i> | The predicted future quality score (habitat/community) of the proposed mitigation site without the mitigation | <p>8 – the vegetation condition and habitat values within Reserve 26912 and 24633 are not expected to decline or increase.</p> <p>7 - the condition of the Kwongkan shrublands TEC within 24633 is not expected to decline or increase.</p> <p>9 – the condition of the Kwongkan shrublands TEC within 31099 is not expected to decline or increase.</p> |
| <i>Future quality with offset (habitat/community) or Future value with offset (features/individuals)</i> | The predicted future quality score (habitat/community) of the proposed mitigation site with the mitigation | <p>8 – managing the reserves as conservation will ensure the vegetation condition and habitat values within Reserve 26912 and 24633 are maintained.</p> <p>7 - the condition of the Kwongkan shrublands TEC within 24633 is not expected to decline or increase.</p> <p>9 – the condition of the Kwongkan shrublands TEC within 31099 is not expected to decline or increase.</p> |
| <i>Risk of loss (%) without offset (habitat/community)</i> | This describes the chance that the habitat/community on the proposed mitigation site will be completely lost (i.e. no longer hold any value for the protected matter of concern) over the foreseeable future without the mitigation | <p>15% - The current management order of Reserves 26912 and 24633 is ‘Parks and Recreation’ therefore there is a moderate to low risk of future loss. This value is consistent with the banked offsets (CPS 8884/1).</p> <p>20% - The current management order of Reserve 31099 is ‘Gravel extraction’ therefore there is a high risk of future loss.</p> |

| Field Name | Description | Justification for value used |
|---|--|---|
| <i>Risk of loss (%) with offset (habitat/community)</i> | This describes the chance that the habitat/community on the proposed mitigation site will be completely lost (i.e. no longer hold any value for the protected matter of concern) over the foreseeable future with the mitigation | 5% - Reserves 26912, 24633 and 31099 will be conserved in perpetuity through a change in tenure to 'Conservation' and therefore the risk of loss is low. |
| <i>31099Confidence in result (%) – risk of loss (habitat/community)</i> | The capacity of measures to mitigate risk of loss of the mitigation site | 90% - there is a high level of certainty that Reserves 26912, 24633 and 31099 will be conserved in perpetuity. |

Appendix G. Biological survey information excerpts (Shire of Esperance, 2023b -j)**Site A vegetation (Shire of Esperance, 2023b)**

Figure 10. Vegetation type A identified in site A described as 'Open *Eucalyptus pleurocarpa* and *Banksia media* dominated mallee woodland with *Acacia*, Proteaceae and Goodeniaceae understory' (top). Vegetation type B identified in Site A (bottom).

Site B vegetation (Shire of Esperance, 2023c)



Figure 11. Vegetation type A described as 'Shrubland – Vegetation structure lost' (top left); Vegetation type B described as 'Scattered *Nuytsia* over mixed shrubland with *Lambertia inermis*, *Eucalyptus pleurocarpa*, *Acacia cyclops*, *Adenanthos cuneatus*' (bottom left). Vegetation type C described as 'Introduced *Eucalyptus* over *Acacia pycnantha* with some remnant vegetation' (top right); Vegetation type D, described as '*Eucalyptus occidentalis* over *Melaleuca cuticularis* and *Callitris drummondii* with *Gahnia* and *Taxandria callistachys*'.

Site C vegetation (Shire of Esperance, 2023d)



Figure 12. Vegetation type A described as '*Eucalyptus* over *Acacia* and mixed *Melaleuca* shrubland' (top). Vegetation type B described as *Calothamnus quadrifidus* and *Eucalyptus pleurocarpa* dominated mixed sand heath' (bottom).



Figure 13. Vegetation type C described as *Eucalyptus occidentalis* dominated valley floor (top). Vegetation type D described as *Eucalyptus pleurocarpa* and *Banksia media* low woodland (bottom).

Site D (shire of Esperance, 2023d)



Figure 14. Vegetation type A described as 'Open *Nuytsia floribunda*, *Lambertia inermis*, and *Eucalyptus tetraptera* over mixed Proteaceae dominated scrub heath' (top); Vegetation type B described as '*Melaleuca cuticularis* wetland over *Gahnia trifida* and samphire'(middle); Vegetation type C described as 'Open mixed heath dominated by *Lepidosperma*' (bottom).

Site E (Shire of Esperance, 2023e)



Figure 15. Vegetation type A described as '*Banksia speciosa* with scattered *Nuytsia floribunda*, over mixed heath with *Melaleuca thyoides*, *Melaleuca striata*, *Adenanthos cuneatus* and *Lambertia inermis*' (top). Vegetation type B described as *Lambertia inermis*, *Eucalyptus pleurocarpa* and *E. tetraptera* over mixed heath with *Melaleuca striata*, *Acacia cyclops*' (middle). Vegetation type C described as *Melaleuca cuticularis* dominated wetland with *Juncus* rushes (bottom).



Figure 16. Vegetation type D described as *Allocasuarina huegeliana* dominated woodland with *Hakea laurina*, *Leptospermum* spp., *Acacia glaucoptera* and *Hakea lissocarpha*' (top). Vegetation type E described as 'Scattered *Nuytsia floribunda* over low *Melaleuca striata* and *Adenanthos cuneatus* dominated shrubland' (middle). Vegetation type F described as *Eucalyptus occidentalis* over *Melaleuca cuticularis* dominated winter wet area' (bottom).

Site F (Shire of Esperance, 2023f)

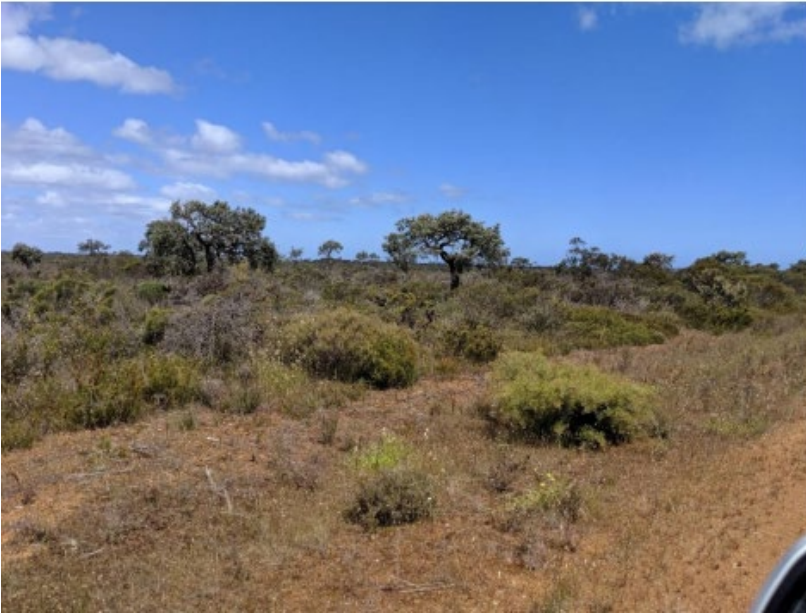


Figure 17. Vegetation type A described as *Nuytsia floribunda* over mixed Proteaceous and Myrtaceous heath with restiads' (top). Vegetation type B described as *Eucalyptus occidentalis* and *Melaleuca cuticularis* dominated winter wet area with *Melaleuca incana*, *Phymatocarpus maxwellii*, *Melaleuca pulchella*' (middle). Vegetation type C described as Mallee and *Eucalyptus pleurocarpa* over mixed shrubland with *Acacia cyclops*, *Cooperhooikia strophiolata*, *Templetonia retusa*' (bottom).



Figure 18. Vegetation type D described as *Eucalyptus occidentalis* and *Hakea laurina* over *Melaleucas* and Fabaceae shrubs' (top). Vegetation type E described as *Melaleuca pulchella*, *Hakea cinerea*, *Melaleuca scabra*, over dense *Juncus* rushes' (middle). Vegetation type F described as *Banksia speciosa* dominated mixed shrubland with *Adenanthos cuneatus* and *Allocasuarina* sp.' (bottom).

Site G (Shire of Esperance, 2023g)



Figure 19. Vegetation type A described as 'Mallee and *Hakea cinerea* over scattered shrubs with dense Restionaceae and Cyperaceae sedge understory' (top). Vegetation type B described as 'Open mallee over mixed Proteaceous heath' (middle). Vegetation type C described as *Eucalyptus occidentalis* woodland with or without *Melaleuca cuticularis*' (bottom).



Figure 20. Vegetation type C described as 'Mixed *Eucalyptus* spp., *Banksia media* and *Hakea cinerea* over mixed Myrtaceous dominated shrubland' (top); Vegetation type E described as 'Mallee over dense *Melaleuca* shrubland' (bottom).

Site H (Shire of Esperance, 2023h)



Figure 21. Vegetation type A described as '*Melaleuca cuticularis* and *M. brevifolia* over mixed samphire's, *Austrostipa juncifolia*, *Disphyma crassifolium*' (top); Vegetation type B described as 'Mallee woodland with *Hakea laurina* over mixed *Melaleuca* shrubland' (middle); Vegetation type C described as '*Eucalyptus occidentalis* woodland in valley floor' (bottom).



Figure 22. Vegetation type D described as '*Eucalyptus occidentalis* and *Eucalyptus rigens* woodland' (top); Vegetation type E described as 'Mallee and *Eucalyptus pleurocarpa* over mixed shrubland with *Calothamnus quadrifidus*, *Melaleuca glaberrima*, *Allocasuarina* spp.' (bottom).



Figure 23. Vegetation type F described as '*Eucalyptus occidentalis* over *Melaleuca cuticularis* wetland with mixed samphires' (top); Vegetation type G described as '*Eucalyptus pleurocarpa* over mixed heath' (bottom).

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)

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