



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 9746/1
Permit Holder:	Talison Lithium Australia Pty Ltd
Duration of Permit:	From 8 October 2022 to 8 October 2027

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

PART I – CLEARING AUTHORISED

1. Clearing authorised (purpose)

The permit holder is authorised to clear *native vegetation* for the purpose of constructing a powerline.

2. Land on which clearing is to be done

Lot 1961 on Deposited Plan 124205, Hester Brook
Lot 616 on Deposited Plan 256844, Hester Brook
Lot 10438 on Deposited Plan 153767, Hester Brook
Lot 6799 on Deposited Plan 82511, Hester Brook
Lot 10164 on Deposited Plan 153804, Hester Brook
Lot 72 on Deposited Plan 29607, Hester Brook
Lot 4 on Deposited Plan 416270, Hester Brook
Unnamed Road Reserve (PIN 11552711), Hester Brook
South Western Highway Road Reserve (PIN 11559099), Hester Brook
South Western Highway Road Reserve (PIN 11559100), Hester Brook
Hester Road Reserve (PIN 1373192), Bridgetown

3. Clearing authorised

The permit holder must not clear more than 1.33 hectares of *native vegetation* within the combined areas cross-hatched yellow in Figure 1, Figure 2, and Figure 3 of Schedule 1.

PART II – MANAGEMENT CONDITIONS

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

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

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

5. Weed and dieback management

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

- (a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
- (b) ensure that no known *dieback* or *weed*-affected soil, *mulch*, *fill*, or other material is brought into the area to be cleared; and
- (c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

6. Directional clearing

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

PART III - RECORD KEEPING AND REPORTING

7. Records that must be kept

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

Table 1: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	<ol style="list-style-type: none">(a) the species composition, structure, and density of the cleared area;(b) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings;(c) the date that the area was cleared;(d) the size of the area cleared (in hectares);(e) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 4; and(f) actions taken to minimise the risk of the introduction and spread of <i>weeds</i> and <i>dieback</i> in accordance with condition 5;

8. Reporting

The permit holder must provide to the *CEO* the records required under condition 7 of this permit when requested by the *CEO*.

DEFINITIONS

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

Table 2: Definitions

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

END OF CONDITIONS



Jessica Burton

A/MANAGER

NATIVE VEGETATION REGULATION

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

15 September 2022

Schedule 1

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

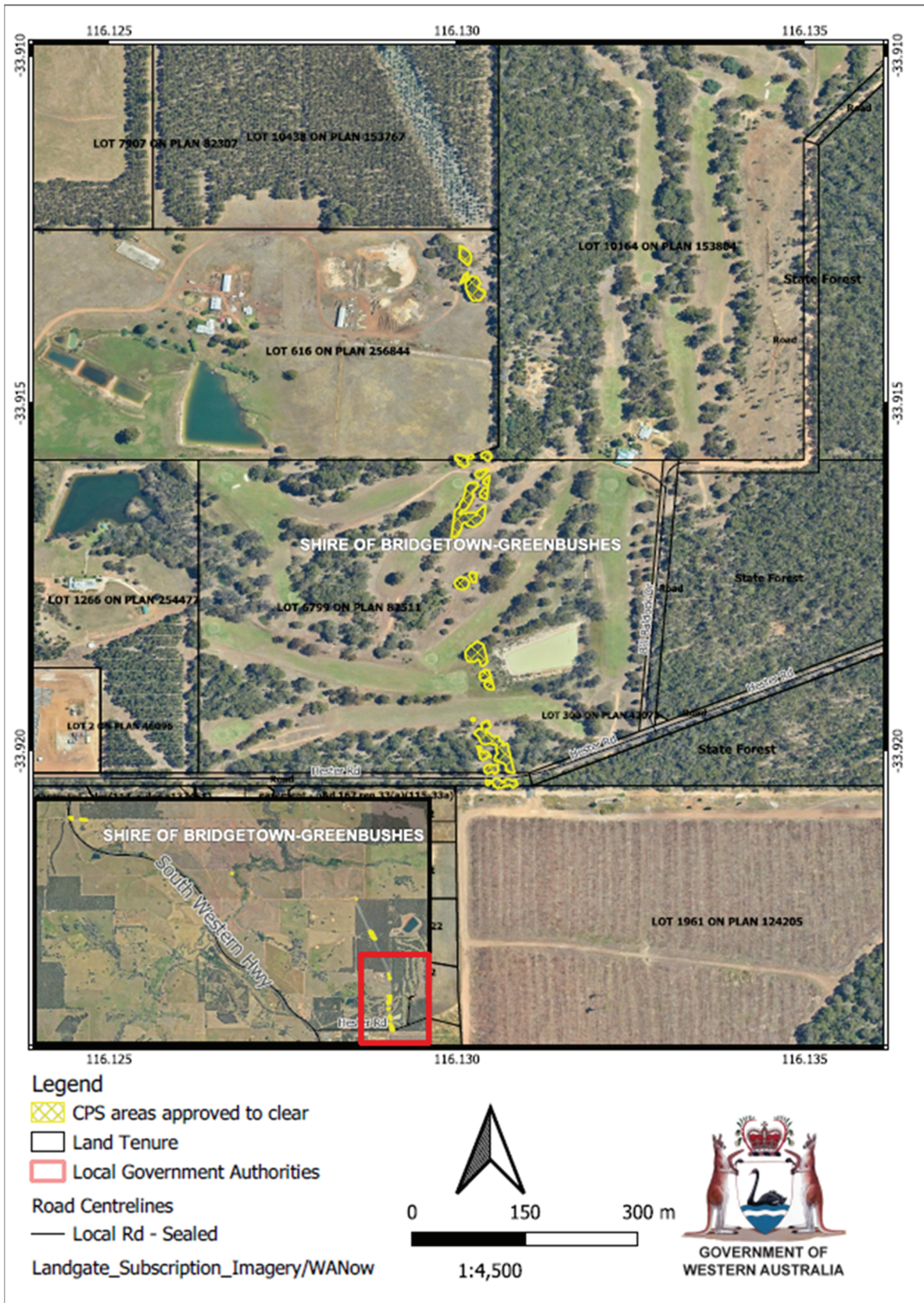


Figure 1: Map of the boundary of the area within which clearing may occur

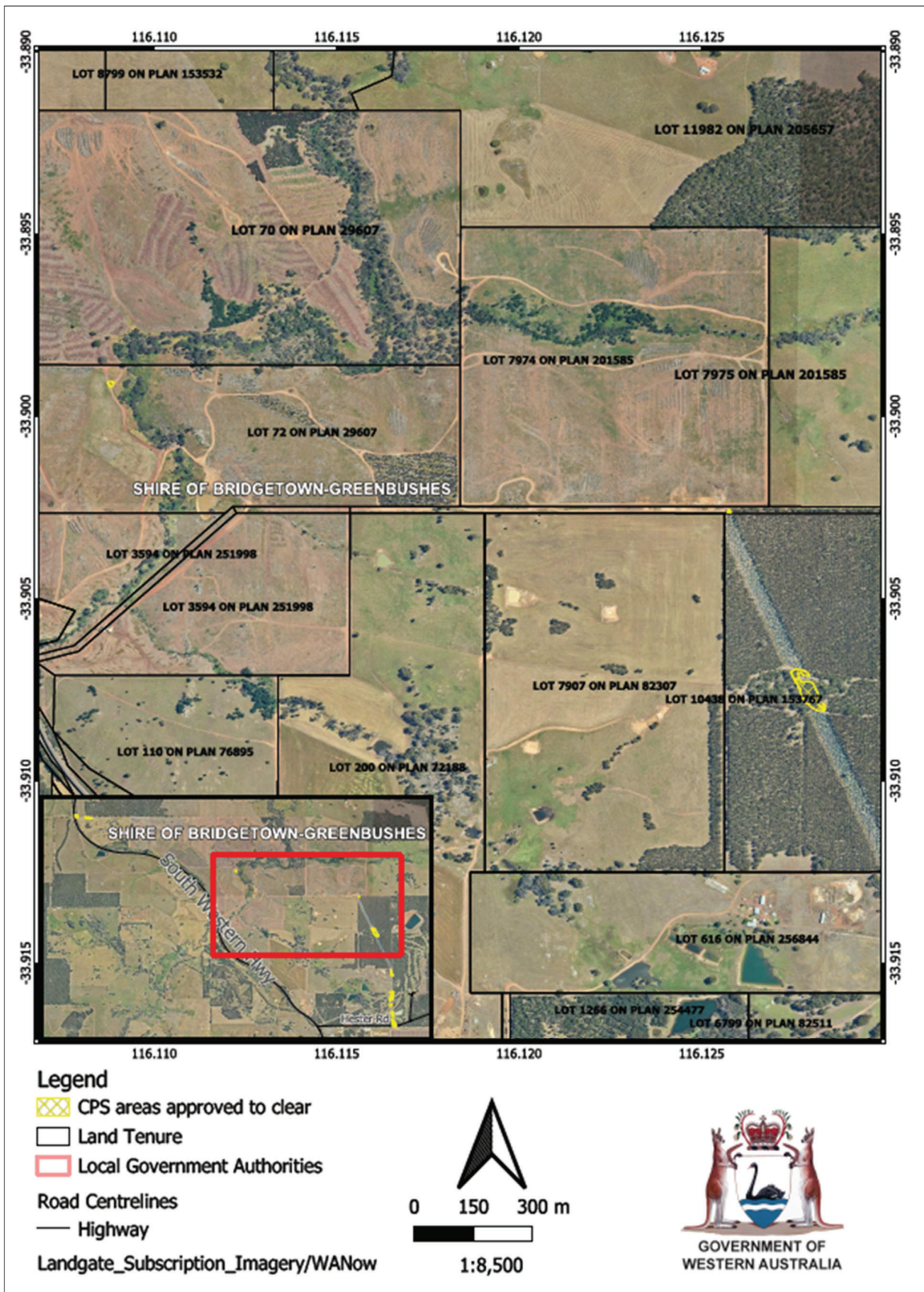


Figure 2: Map of the boundary of the area within which clearing may occur

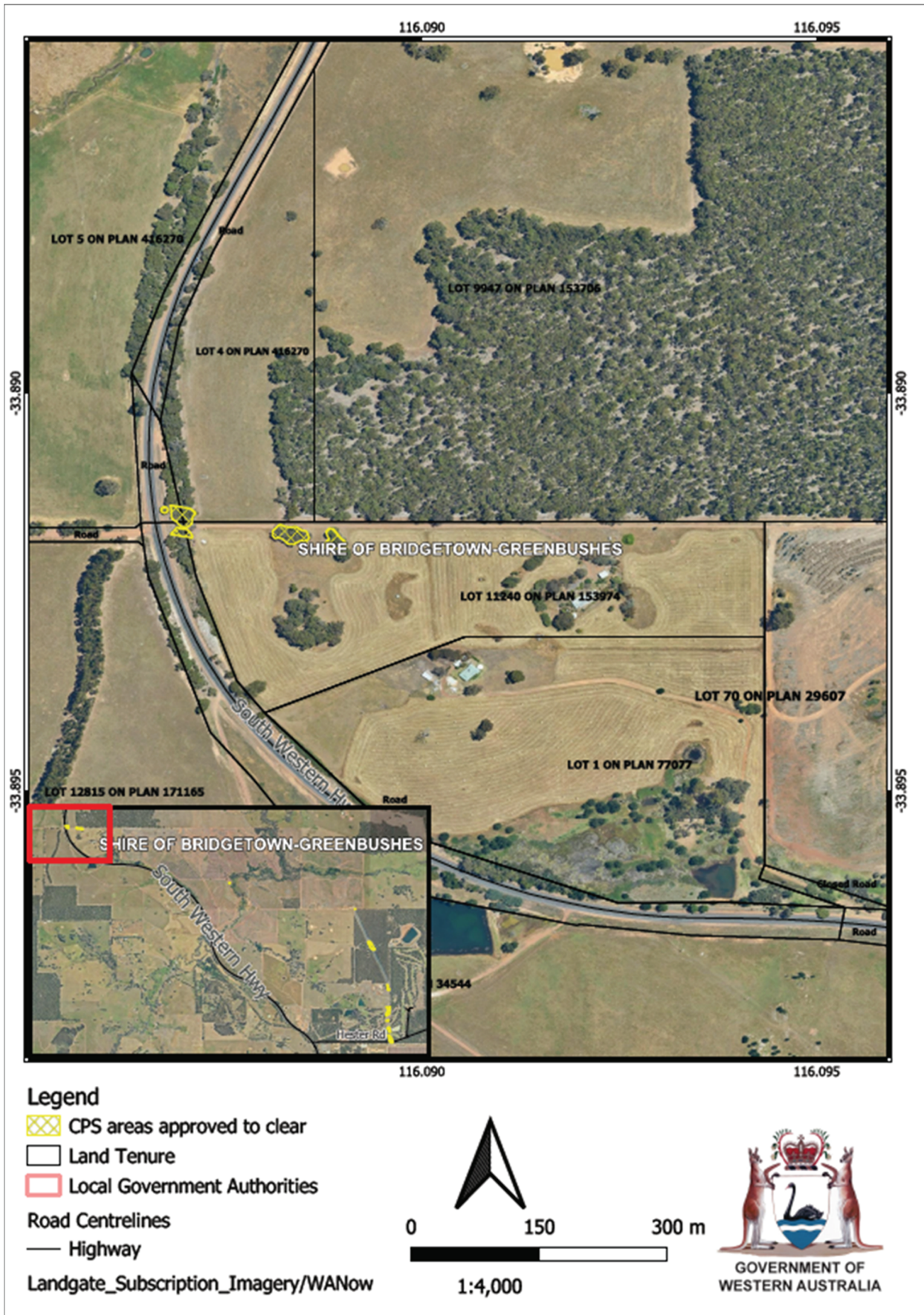


Figure 3: Map of the boundary of the area within which clearing may occur



Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 9746/1
Permit type:	Purpose permit
Applicant name:	Talison Lithium Australia Pty Ltd
Application received:	20 May 2022
Application area:	1.33 hectares of native vegetation
Purpose of clearing:	constructing a powerline
Method of clearing:	Mechanical clearing
Properties:	Lot 1961 on Deposited Plan 124205, Hester Brook Lot 616 on Deposited Plan 256844, Hester Brook Lot 10438 on Deposited Plan 153767, Hester Brook Lot 6799 on Deposited Plan 82511, Hester Brook Lot 10164 on Deposited Plan 153804, Hester Brook Lot 72 on Deposited Plan 29607, Hester Brook Lot 4 on Deposited Plan 416270, Hester Brook Unnamed Road Reserve (PIN 11552711), Hester Brook South Western Highway Road Reserve (PIN 11559099), Hester Brook South Western Highway Road Reserve (PIN 11559100), Hester Brook Hester Road Reserve (PIN 1373192), Bridgetown
Location (LGA area/s):	Shire of Bridgetown-Greenbushes
Localities (suburb/s):	Bridgetown and Hester Brook

1.2. Description of clearing activities

The proposed clearing is to construct a new 132 kilo-Volt (kV) powerline along a corridor easement extending from the southern boundary of the Mine Development Envelope (MDE) of the Greenbushes Lithium Mine, southeast to the Hester Road Western Power Substation. Construction of the powerline will occur predominantly on cleared agricultural and silvicultural land. The vegetation proposed to be cleared comprise of several fragments of native vegetation areas (see Figure 1, Section 1.5).

1.3. Decision on application

Decision:	Granted
Decision date:	15 September 2022
Decision area:	1.33 hectares of native vegetation, as depicted in Section 1.5, below.

1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). The Department of Water and Environmental Regulation (DWER) advertised the application for 21 days and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix B), relevant datasets (see Appendix F.1), the findings of the flora and vegetation survey (see **Error! Reference source not found.**), the clearing principles set out in Schedule 5 of the EP Act (see Appendix C), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3).

The assessment identified that the proposed clearing will result in:

- the loss of native vegetation that is suitable foraging habitat for threatened black cockatoo species; and the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined that the proposed clearing is unlikely to lead to a long-term adverse impact on the environment and determined that potential impacts can be minimised and managed by imposing appropriate management conditions to the Permit.

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

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

1.5. Site maps

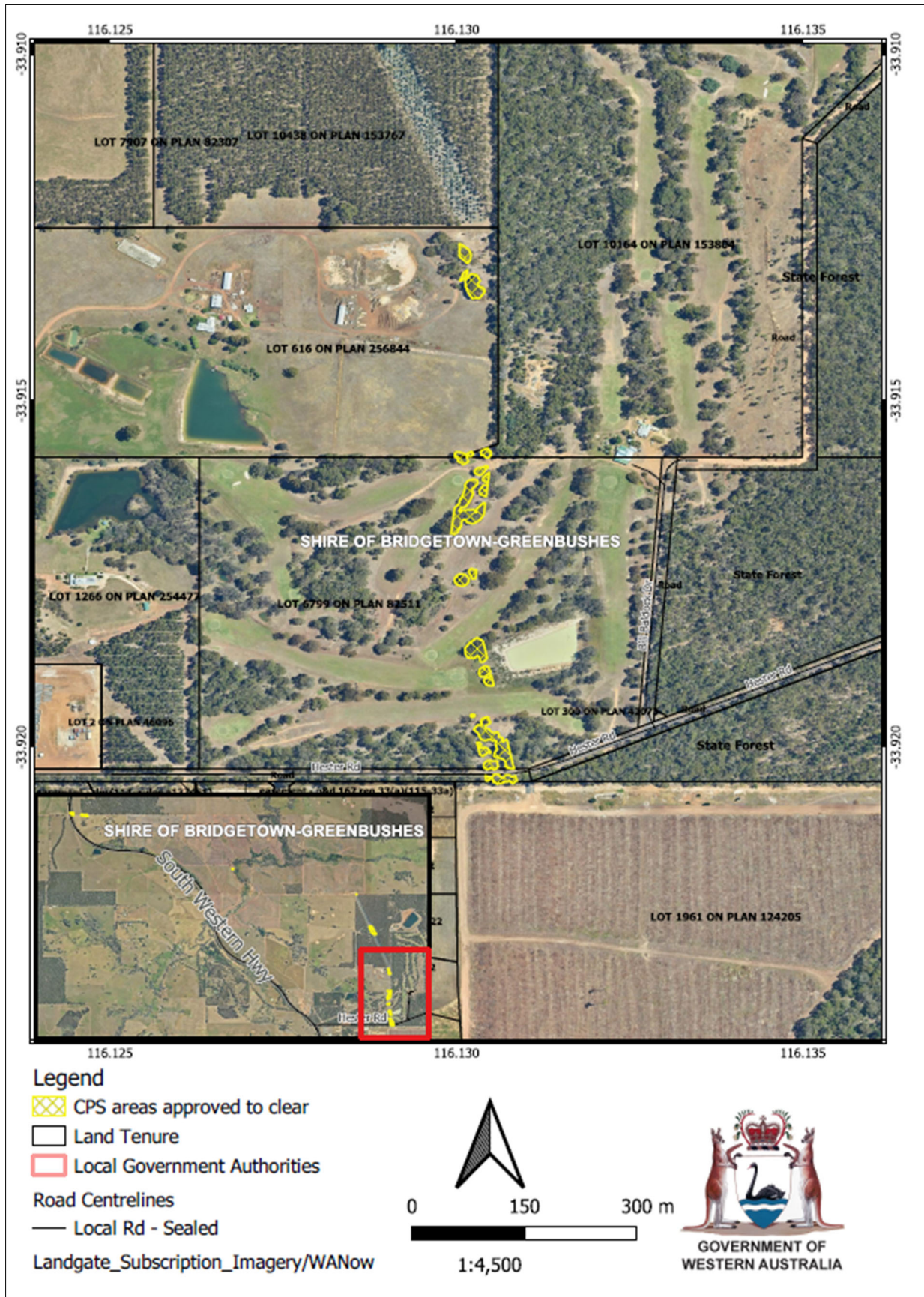


Figure 1. Map of the application area. The areas cross-hatched yellow indicate the areas authorised to be cleared under the granted clearing permit.

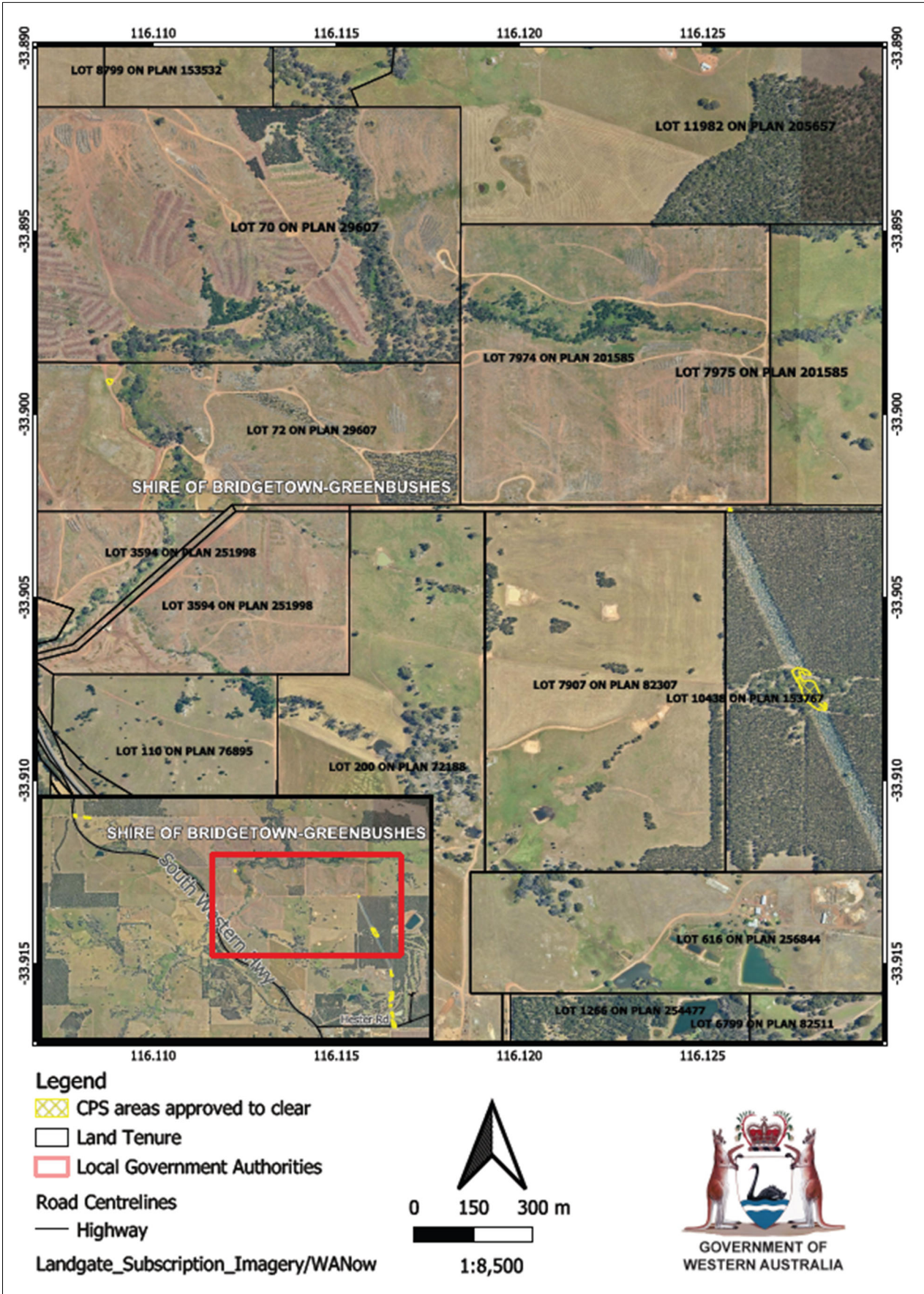


Figure 2. Map of the application area. The areas cross-hatched yellow indicate the areas authorised to be cleared under the granted clearing permit.

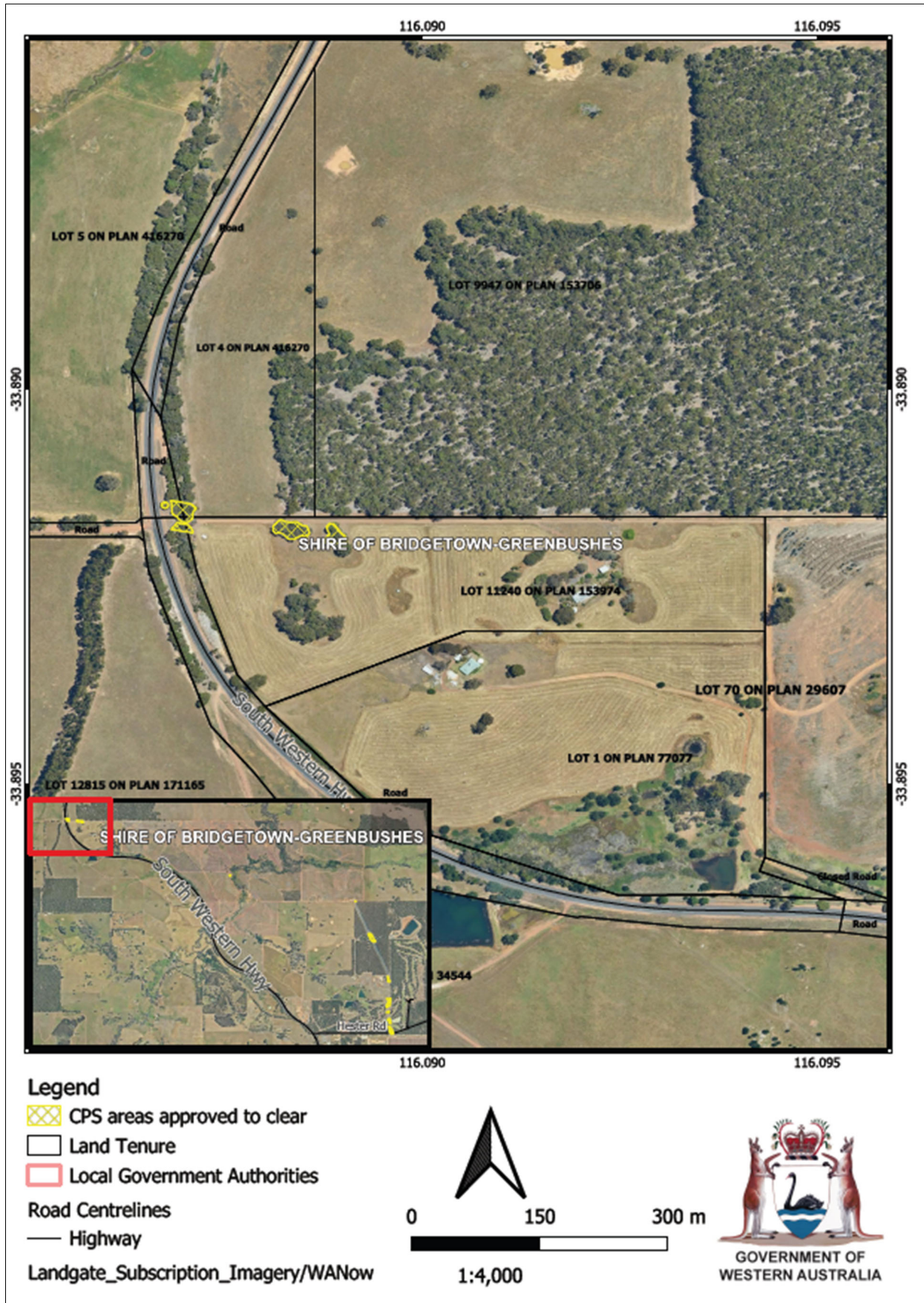


Figure 3. Map of the application area. The areas cross-hatched yellow indicate the areas authorised to be cleared under the granted clearing permit.

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)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2016)

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

The applicant advised that the extent of native vegetation clearing has been minimised during the planning and design phase of the project with consideration to the following restrictions:

- Minimum clearance requirements have been defined by Western Power in their document “Western Power Clearances advice” (2019). The Western Power Clearance advice defines the minimum requirements for clearances around new overhead power lines. These requirements state that “...further clearances of up to ten (10) metres (the Management Zone) either side of the proposed pole location/line route should be assessed and all trees and saplings with the potential to grow to become large trees within the Management Zone should be removed prior to construction”. Clearing of large trees within a minimum of 10m either side of the Power Pole therefore cannot be avoided. The clearance of smaller trees which are unlikely to grow and interfere with the Powerline will be kept wherever possible; and
- The location of the 132kV Powerline has been chosen to use existing easements wherever practicable to avoid additional clearing. In areas where there are no existing easements, powerlines will be located in areas that will have minimal impact on agricultural areas or native vegetation, such as cleared farmland or other partly cleared areas to avoid additional clearing.

To minimise impact of the clearing on the environment, the applicant proposes the following control measures:

- To further reduce any potential impact on the environment, activities will be in accordance with ground disturbance permitting procedures that apply to activities within the Development Envelope. These include ensuring that an appropriately qualified and experienced fauna spotter is on site during clearing activities to assess tree hollows for fauna occupation, to handle and move significant fauna if required, to administer emergency care to injured and or displaced fauna if required, and to ensure access to a care facility for injured fauna if required.
- Cleared native vegetation at the site will be mulched in situ to reduce bulk, and it is proposed that this material will be spread within the cleared corridor to reduce the potential for introduced species to establish on disturbed surfaces (Talison, 2022b).

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

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix B) 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 **Error! Reference source not found.**) identified that the impacts of the proposed clearing present a risk to biological values (fauna and flora) and conservation areas. The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

3.2.1 Biological values (Fauna) - Clearing Principles (a) and (b)

Assessment

Twenty-one conservation significant fauna have been recorded within 10 km from the application areas. Some of the recorded fauna are of historical records or are extinct and therefore habitat is unlikely to occur for these species. Considering the proximity, time and number of records, and habitat requirements and their resemblance with the application area, habitat for the following fauna species have been assessed to likely be present within the application areas;

- *Dasyurus geoffroii* (chuditch) – VU
- *Falco peregrinus* (Peregrine falcon) - OS
- *Isodon fusciventer* (quenda) – P4
- *Notamacropus Irma* (western brush wallaby) – P4
- *Phascogale tapoafa wamberger* (Red-tailed phascogale) – CD
- *Tyto novaehollandiae* (masked owl) -P3
- Black Cockatoos include:
 - Carnaby's black cockatoo *Zanda latirostris*
 - IUCN listed as *Endangered*
 - EPBC Act listed as *Endangered*
 - BC Act listed as *Endangered*
 - Baudin's black cockatoo *Zanda baudinii*
 - IUCN listed as *Critically Endangered*
 - EPBC Act listed as *Endangered*
 - EP Act listed as *Endangered*
 - Forest red-tailed black cockatoo *Calyptorhynchus banksii naso*
 - IUCN listed as *Least Concern*
 - EPBC Act listed as *Vulnerable*
 - BC Act listed as *Vulnerable*

Desktop assessment indicates that Peregrine falcon (*Falco peregrinus*) has been known from the local area (10-kilometre radius from the application area). The Falcon typically nests on rocky ledges in tall, vertical cliff faces and gorges, or in tall trees associated with drainage lines, and can hunt in a range of habitat types including timbered watercourses, riverine environments, wetlands, plains, open woodlands, and pylons and spires of buildings. The application area and surrounds exhibit some of these characteristics that it is likely to provide suitable habitat for the Falcon. Given the sparsely extent of clearing, the large movement range of the Falcon, and the availability of the large and intact tracks of vegetation within the State Forests nearby, whilst the Falcon may fly by or utilise the area in transit, it is unlikely that the application area represents a significant habitat for this fauna.

Chuditch are known to occur within the local area with the closest record located within five kilometres from the application area. Range of habitats suitable for chuditch include jarrah forests, eucalypt woodlands, mallee shrublands and heathland. The large unfragmented forests with dense jarrah forests adjacent to the application area could provide habitat for the Chuditch. However, given the degraded vegetation condition, and the availability of intact vegetation within the adjacent State Forests, the application area is unlikely to comprise significant habitat for this species.

Within the local context, the closest record of western brush wallaby was within approximately four kilometres from the application area. Given its known home-range of about 10 to 12 ha, this species may utilize the application area. Western brush wallaby prefers *Banksia sp.* woodlands, possibly due to the availability of canopy cover. The vegetation condition ranges from good to completely degraded and is poor of canopy cover within the application area. Consequently, although dispersing western brush wallaby may utilise the application area, it is unlikely that this species would inhabit the application area.

Brush-tailed phascogale inhabits dry sclerophyll forest and open woodlands with hollow bearing trees. Vegetations in parts of the application area are mapped as that of associated with valleys, valley floors and swamps which can be wet from time to time and avoided by phascogale. On the upland parts of the application area, phascogale may

occur. In addition to the mostly degraded condition of the roadside vegetation and the presence of an intact forest adjacent to the application area, the proposed clearing area is unlikely to comprise significant habitat for this species.

Nine records of quenda have been recorded in the local area with the closest record approximately three kilometres from the application area. Quenda inhabits forest, woodland and heathland, usually with dense understorey vegetation, sometime wetland fringes; forages for plant material, fungi and insects by digging in leaf litter and soil. Quenda may be present in the local area as it contains tall and dense vegetation, especially within the State Forest areas. The application area, however, does not contain dense understorey preferred by quenda for cover (van Dyck, S., and Strahan, R., 2008; Watson 2018). Although dispersing quenda may use the habitat, the availability of the densely vegetated area in the adjacent State Forest indicate quenda is unlikely to prolong inhabitants of the application area.

Eleven records of the mask owl have been known from the local area. The closest record of the owl was made from within one kilometre from the application area. The masked owl is known to inhabit open forests, woodlands, timbered waterways and open country on the fringe of these areas. The owl requires tall trees with suitable hollows for nesting and roosting and adjacent areas for foraging. Given the habitat characteristics and previous records, the masked owl is considered likely to be present in the application area and vicinity. The occurrence of masked owl in the local area cannot be ruled out, given the findings from the desktop assessment, it is considered likely that the masked owl inhabit the application area.

Of the vertebrate fauna species of conservation significance identified, the species most likely to occur over the application area are the black cockatoo species. Numerous records of black cockatoo are known from the local area, with the nearest record is from within three hundred metres of the application area. The most recent records of black cockatoos in the local area mainly occur within the State Forests areas, especially in the North Donnelly State Forest, south of the Brockman Highway. The application area is also mapped within the modelled distribution areas for the Baudin's, Carnaby's and Red-tailed black cockatoo species.

Black cockatoo habitat can be considered in terms of breeding habitat, night roosting habitat, and foraging habitat. Black cockatoos will generally forage up to 12 kilometres from an active breeding site (DSEWPaC 2012; DPaW 2013). Following breeding, they will flock in search of food, usually within six kilometres of a night roost (DSEWPaC 2012; DPaW 2013) but may range up to 20 kilometres (Commonwealth of Australia 2017). Black cockatoo night roosts are usually located in the tallest trees of an area, and near both a food supply and surface water (Commonwealth of Australia 2017).

Previous survey (Talison, 2022d) was carried out within a large study area which also included the areas under application. The survey investigated trees within the application area for suitability as breeding habitat for black cockatoo species (particularly Carnaby's cockatoo). There was no evidence of foraging by Black Cockatoos observed from within the study area including the application area. It is determined that up to 0.89 hectares of native vegetation scattered within small, isolated and degraded remnants within the proposed powerline easement, provides suitable foraging habitat for black cockatoo species.

To assess the potential for breeding habitat within the study area, suitable tree species (i.e. *Corymbia/Eucalyptus* species) that had a diameter at breast height (DBH) of equal to or greater than 50 centimetres were evaluated. Habitat assessment of the application area found no suitable hollows for black cockatoos.

The application area proposes to remove a total of 0.89 hectares of native vegetation which includes species known to be foraging resources for black cockatoos. Table 1 indicates the primary and secondary foraging habitats for black cockatoos.

Table 1: primary and secondary foraging habitats for black cockatoos

	<i>Vegetation association</i>	<i>Percentage of application area</i>
Primary foraging habitats	HC CcEcaEciEsa - Parkland Cleared Forest of <i>Corymbia calophylla</i> (Marri)	35.37548739
	HS Bg- Forest of <i>Corymbia calophylla</i> (Marri) and <i>Eucalyptus marginata</i> (Jarrah)	52.93690894

Secondary foraging habitat
(not within the application
area)

DLEr- Low Woodland A of *Eucalyptus rudis* subsp. *Rudis* 11.68760367
(Flooded Gum)

Within the local context, the desktop assessment identified eleven roosting sites within the local area (10-kilometre radius). The nearest active roosting sites include one located approximately 0.9 kilometres from a part of the application area. In addition, a known breeding site is recorded within 12 km radius from the application areas.

Food resources within the range of breeding sites and roost sites are important to sustain populations, and foraging resources are therefore viewed in the context of known breeding and night roosting sites, particularly within 12 kilometres of an impact area (Commonwealth of Australia 2017). The *Corymbia calophylla* (marri) and *Eucalyptus marginata* (jarrah) trees present within areas of closed scrub vegetation such as that of the Greenbushes State Forest and Hester State Forest provide suitable foraging habitat for Black cockatoos.

Although, clearing of the marri and jarrah trees from within the application area would remove some of this foraging habitat, in the context of large area of intact vegetation within the protected reserves immediately east and west, the foraging habitat being removed within the application area is unlikely to be significant. Therefore, the proposed clearing is not likely to cause a long-term adverse impact on the existence and maintenance of Black cockatoos and their habitat within the local and regional context.

Conclusion

Based on the above assessment, the proposed clearing may clear habitat for the fauna species listed above. Given the vegetation condition of the application area and the availability of vast, intact, and more suitable vegetation within the adjacent State Forests; the application area is unlikely to comprise significant habitat for fauna within the local and regional context. The proposed clearing is unlikely to result in a detrimental impact on the conservation of the fauna species. It is considered that the impacts of the proposed clearing on the fauna individuals can be managed through suitable conditions.

Conditions

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

- a staged and slow directional clearing is required to allow fauna to move into adjacent vegetation ahead of clearing activity.

3.2.2 Biological value – Flora diversity and Flora – Clearing principles (a) and (c)

Spatial data indicates that eight conservation significant flora have been known from the local area (10-kilometre radius). One of these species is listed as Threatened (*C. harringtoniae*), and the rests are listed as Priority 1,2, 3 and 4. Although none of these records occur within the application area, the likelihood of their occurrence has been assessed based on soil type, habitat preference and proximity to the application area, as summarised in Appendix C.

Only one record of *C. harringtoniae* has been known from the local area. This tuberous, perennial herb of between 0.2 to 0,4 m high is often found on winter wet flats, margin of lakes or creeks and around granite outcrops and areas seasonally inundated with water, including on roadsides and drainage. In the local area, however, record of *C. harringtoniae* concentrate within the Greenbushes State Forest, with a minimum distance of approximately five kilometres from the top portion of application area along a minor tributary. This suggests that the flora species is more likely to be present within the State Forest boundaries where the vegetation is in much better condition, in its suitable habitat.

Furthermore, the flora survey (Talison, 2022a), confirmed that the application area does not have any records of the occurrence of *C. harringtoniae* (T) or any of the other Priority species within the application area.

Conclusion:

Based on the above assessment, it is unlikely that the proposed clearing has a detrimental impact on the flora diversity and habitat of threatened flora within the local context.

Condition:

Nil condition

3.2.3 Environmental value (Conservation area) - Clearing Principles (h)

Assessment:

Parts of the application area are adjacent to the Greenbushes State Forest and Hester State Forest. A Flora and Vegetation survey (Talison, 2022a) confirmed a total of 26 introduced species recorded from within the study area. Out of these 26 species, two taxa were listed as Declared Plants under the BAM Act and are also considered weeds of national significance (WONs):

- *Asparagus asparagoides (Bridal Creeper) - s22(2); and
- *Rubus anglocandicans (Blackberry) - s22(2) (C3 Exempt).

The diversity of weeds within the study area was relatively high and reflected the small size and isolated nature of the native vegetation remnants, combined with close proximity of surrounding agricultural land. Many of the weed species would have volunteered from adjacent annual pasture on cleared farmland (Talison, 2022a).

Whilst the proposed clearing will not directly remove vegetation from these conservation areas, clearing of the application area may facilitate the spread of weeds and dieback into State Forest. Given the limited extent of the proposed clearing, it is considered that these impacts can largely be managed through suitable weed and dieback conditions.

Conclusion

Based on the above assessment, the proposed clearing may result in the spread of weeds and dieback into the adjacent Greenbushes State Forest and Hester State Forest. These impacts can be managed through imposing suitable conditions.

Conditions

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

- Weed and dieback management assist in minimising the risk of the proposed clearing resulting in the spread of weeds and dieback into adjacent conservation areas.

3.3. Relevant planning instruments and other matters

The Shire of Bridgetown-Greenbushes advised that they did not have any objections to the proposed clearing on Shire controlled/owned land proposed under application CPS 9746/1. The development approval has been granted by the Shire of Bridgetown-Greenbushes on 28 March 2022 (Talison, 2022e).

Talison is required to obtain Miscellaneous Licence under the *Mining Act 1978* as the powerline installation is for the Greenbushes mining activity.

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

End

Appendix A. Additional information provided by applicant

Summary of comments	Consideration of comment
Flora and vegetation survey (IBSA -2022-0175)	Results of flora survey have been incorporated in the assessment outlined under section 3.2.
The applicant provided representative photographs of the vegetation communities within the application area, as well as their location on 1 July 2022 (Talison, 2022c).	The representative photographs of the vegetation communities within the application area were considered to provide context to the site characteristics (see Appendix B) and were used to inform the detailed assessment of impacts to biological values (see Section 3).

Appendix B. Site characteristics

B.1. Site characteristics

Characteristic	Details
Local context	<p>The area proposed to be cleared comprise several isolated patches of native vegetation in the intensive land use zone of Western Australia. Areas proposed to be cleared are adjacent to Southwestern Highway and surrounded by historically cleared paddock areas.</p> <p>Spatial data indicates the local area (10-kilometre radius from the centre of the area proposed to be cleared) retains approximately 35.37 per cent of the original native vegetation cover.</p>
Ecological linkage	<p>The application area does not intersect any formally mapped ecological linkages. It does not form a significant area of intact vegetation that may support meta-populations of fauna. The closest mapped ecological linkage is a mapped South West Regional Ecological Linkage located 5k m to the east (Molloy et al., 2009).</p> <p>Given the application area consists of fragmented and isolated patches of remnant native vegetation surrounded by historically cleared paddock, it is not considered to be contributing significantly to the values of the nearby mapped linkages or to any formal or informal ecological linkages in the local area.</p>
Conservation areas	<p>The application areas are adjacent to State Forest, with the closest point from the State Forest, being the Hester State Forest, approximately 30 metres and separated by cleared land and ground disruptions.</p> <p>The proposed areas of clearing do not provide a buffer or a significant ecological linkage to the conservation areas present in the proximity.</p>
Vegetation description	<p>The vegetation within the application area occurs within the Darling Plateau subregion of the Southwest Forests Bioregion of WA. The mapped vegetation complexes within the application area include:</p> <ul style="list-style-type: none"> Balingup, BL; described as open forest of <i>Eucalyptus marginata</i> subsp. <i>marginata</i>-<i>Corymbia calophylla</i> on slopes and woodland of <i>Eucalyptus rudis</i> on the valley floor in the humid zone. Hester, HR; described as tall open forest to open forest of <i>Eucalyptus marginata</i> subsp. <i>marginata</i>-<i>Corymbia calophylla</i> on lateritic uplands in perhumid and humid zones. Catterick, CC1; described as open forest of <i>Eucalyptus marginata</i> subsp. <i>marginata</i>-<i>Corymbia calophylla</i> mixed with <i>Eucalyptus patens</i> on slopes, <i>Eucalyptus rudis</i> and <i>Banksia littoralis</i> on valley floors in the humid zone.

Characteristic	Details
	<p>Photographs supplied by the applicant (Talison, 2022c) and the Vegetation survey (Talison, 2022a) indicate the vegetation within the proposed clearing areas mainly consists of <i>Eucalyptus marginata</i> subsp. <i>marginata-Corymbia calophylla</i> which is consistent with the general characteristics of most of the vegetation complexes in the local area.</p> <p>Representative photos and the full survey descriptions and maps are available in Error! Reference source not found. E and in Talison (2022c)</p>
Vegetation condition	<p>Photographs supplied by the applicant (Talison, 2022c) and the vegetation survey (Talison, 2022a) indicate the vegetation within the proposed clearing area is in good to completely degraded condition. With most of the vegetation in a degraded to completely degraded condition.</p> <p>(Keighery, 1994) condition, described as:</p> <ul style="list-style-type: none"> • 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. <p>Vegetation remnants comprised exotic eucalypts and all supported highly disturbed understorey strata, with many described as parkland cleared. Disturbances including recent wildfire, grazing by domestic stock, elevated numbers of kangaroos seeking refuge, surface soil disturbance, colonisation of weeds from adjacent pasture and golf course (in the southeast), and altered surface drainage (Talison, 2022a).</p> <p>The full Keighery (1994) condition rating scale is provided in Appendix D. Representative photos and the full survey descriptions are available in Appendix E and in Talison,2022a and Talison, 2022c.</p>
Climate and landform	<p>The study area occurs on a boundary between the dry Mediterranean region to the north which experiences six dry months per year, and the moderate Mediterranean region to the south which experiences four dry months per year (Beard, 1981). The Greenbushes region has cool wet winters and hot dry summers. Average annual rainfall for the town of Greenbushes is 923.0 millimetre (Bureau of Meteorology [BOM], 2022), with the majority of falls occurring during the winter months of June and July associated with cold fronts moving across the south-west of Western Australia.</p> <p>The study area occurs within the Hester, Balingup and Catterick Sub-system of the Darling Plateau System and consists of two broad landforms and mainly comprising of undulating ridges and hill crests formed on laterite and gneiss which typically slope downwards off the main plateau into the surrounding Lowden Valleys System.</p>
Soil description	<p>The soils across the application areas are mapped as:</p> <ul style="list-style-type: none"> • Hester Subsystem 255DpHR • Balingup moderate slopes Phase 255LvBL4

Characteristic	Details
	<ul style="list-style-type: none"> Yarragil upstream valleys Phase 255DpYGu <p>The soils are mostly loamy gravels, sandy gravels and loamy earths (Talison, 2022a).</p>
Land degradation risk	<p>The mapped soil types within the application area have the following risks:</p> <ul style="list-style-type: none"> Nutrient export risk: Medium to High Subsurface acidification risk: High Water erosion risk: Low to High Waterlogging risk: Low to Medium Wind erosion risk: Low to Extremely high
Waterbodies	The desktop assessment and aerial imagery indicate that no watercourses or wetlands occur within the areas proposed to be cleared.
Hydrogeography	The groundwater salinity (Total Dissolved Solids) in the application area ranges from 500-1000 mg/L.
Flora	<p>Eight flora species have been recorded in the local area. There is only one threatened flora, <i>Caladenia harringtoniae</i>, within five-kilometre, found on the same soil type as one of the portions of the application area.</p> <p>Desktop assessment has identified seven priority flora species within 10-kilometre radius of the application area.</p> <p>The diversity of weeds within the study area was relatively high and reflected the small size and isolated nature of the native vegetation remnants, combined with close proximity of surrounding agricultural land. Many of the weed species would have volunteered from adjacent annual pasture on cleared farmland (Talison, 2022a).</p>
Ecological communities	No TECs listed from the Commonwealth database occurring within or surrounding the study area were recorded. There were no PECs known to occur within a 90 km radius of the study area.
Fauna	There are records of 21 fauna of conservation significance and 11 known black cockatoo roost sites within the local area (10-kilometre radius). The fauna counts comprise of eight bird species, ten mammal species, one reptile and two invertebrate species.

B.2. Land degradation risk table

Subsystem	Risks	Land Map unit
Hester Subsystem, 255Dp	Wind erosion	H2 >70% of map unit has a high to extreme wind erosion risk
	Water erosion	L2 3-10% of map unit has a high to extreme water erosion risk
	Water logging	L1 <3% of map unit has a moderate to very high waterlogging risk
	Subsurface Acidification	H2 >70% of map unit has a high subsurface acidification risk or is presently acid
	Phosphorus export risk	M2 30-50% of map unit has a high to extreme phosphorus export risk
	Salinity	L1 30-50% of map unit has a moderate to high salinity risk or is presently saline
Balingup moderate slopes Phase, 255Lv	Wind erosion	L2 3-10% of map unit has a high to extreme wind erosion risk
	Water erosion	H1 50-70% of map unit has a high to extreme water erosion risk
	Water logging	L1 <3% of map unit has a moderate to very high waterlogging risk

	Subsurface Acidification Phosphorus export risk Salinity	H2 H2 L1	>70% of the map unit has a high subsurface acidification risk >70% of map unit has a high to extreme phosphorus export risk 30-50% of map unit has a moderate to high salinity risk or is presently saline
Yarragil upstream valleys Phase, 255Dp	Wind erosion Water erosion Water logging Subsurface Acidification Phosphorus export risk Salinity	H2 M1 M1 H2 M2 M2	>70% of map unit has a high to extreme wind erosion risk 10-30% of map unit has a high to extreme water erosion risk 10-30% of map unit has a moderate to very high waterlogging risk >70% of the map unit has a high subsurface acidification risk 30-50% of map unit has a high to extreme phosphorus export risk 30-50% of map unit has a high to extreme phosphorus export risk

Appendix C. 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> "Native vegetation should not be cleared if it comprises a high level of biodiversity."</p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared contain locally significant flora and fauna. Noting the size of the clearing, it will not impact on any areas supporting significant biodiversity. Vegetation was determined to be of low conservation value owing to the high level of disturbance and reduced vegetation condition, combined with the small area.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1 and 3.2.2, above.</i>
<p><u>Principle (b):</u> "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."</p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared may contain foraging and roosting habitat for conservation significant fauna. The clearing will remove trees that may have potential to offer habitat to conservation significant species in the future, particularly the clearing of trees with a DBH >50cm (Talison, 2022b).</p>	May be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (c):</u> "Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."</p> <p><u>Assessment:</u></p> <p>No Threatened flora taxa were identified within the project area during the detailed flora and vegetation survey (Talison, 2022a). The desktop assessment identified the closest record of a threatened species, <i>Caladenia harringtoniae</i>, within state forest approximately 5 kilometre west from the western boundary of the study area. However, its habitat type was not represented within the study area (Talison, 2022a). The application area is unlikely to contain habitat for flora species listed under the BC Act.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.2, above.</i>

Assessment against the clearing principles	Variance level	Is further consideration required?
<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 area proposed to be cleared does not contain species that can indicate a threatened ecological community.</p>	Not likely to be at variance	No
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 type is consistent with the national objectives and targets for biodiversity conservation in Australia. The vegetation proposed to be cleared is not considered to be part of a significant ecological linkage in the local area.</p>	Not likely to be at variance	No
<p><u>Principle (h):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.”</i></p> <p><u>Assessment:</u></p> <p>A portion of the application area is adjacent to the Greenbushes State Forest and Hester State Forest. Clearing may introduce and spread weeds and dieback into these conservation areas.</p>	May be at variance	Yes <i>Refer to Section 3.2.3, above.</i>
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>No mapped wetlands or watercourses occur within the application areas. Considering the size of the area, the proposed clearing is unlikely to have an impact on on- or off-site hydrology.</p>	Not likely to be at variance	No
<p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u></p> <p>The maximum area to be cleared is 1.33 hectares and within isolated native remnants that have historically been impacted by multiple disturbances, including severe fire impacts, resulting in a reduction to vegetation condition. As such, the small amount of proposed clearing is unlikely to cause appreciable land degradation.</p>	Not likely to be at variance	No
<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 powerline corridor passes over the Hester Brook drainage line, but there will be no requirement to clear native vegetation associated with the drainage line complex, and the design has ensured that no power poles will be positioned within the drainage line vegetation (Talison, 2022b). The proposed clearing is unlikely to impact surface or ground water quality.</p>	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Principle (j)</u>: “Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</p> <p><u>Assessment</u>:</p> <p>The proposed area of clearing is relatively small and occurs on elevated hills slopes that are not at risk from flooding and unlikely to increase the potential for surface water run-off. All cleared areas will be stabilised during construction of the powerline to ensure there is no uncontrolled surface water run-off from the project area (Talison, 2022b).</p>	Not likely to be at variance	No

Appendix D. 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 E. Biological survey information excerpts (Talison, 2022a)

Vegetation condition within the ten remnants forming the study area was rated as good (54%), degraded (23%) and completely degraded (23%) (Table 9). There was no vegetation rated within the highest three condition categories of pristine, excellent or very good, reflecting the small and isolated nature of the remnants amongst predominantly cleared agricultural land (Figure 6). Many of the remnants comprised exotic eucalypts and all supported highly disturbed understorey strata, with many described as parkland cleared. Disturbances including recent wildfire, grazing by domestic stock, elevated numbers of kangaroos seeking refuge, surface soil disturbance, colonisation of weeds from adjacent pasture and golf course (in the southeast), and altered surface drainage.

Table 9 Area of vegetation condition classes within the study area.

Vegetation Association	Area (ha)	% of Study Area
Good	0.48	53.7
Degraded	0.20	22.9
Completely Degraded	0.21	23.4
Total	0.89	100.0

Broad Floristic Formation Vegetation Association	<i>Corymbia</i> Forest
	HS Bg - Forest of <i>Corymbia calophylla</i> and <i>Eucalyptus marginata</i> subsp. <i>marginata</i> over Open Low Scrub A of <i>Bossiaea linophylla</i> over Dwarf Scrub C of <i>Pteridium esculentum</i> and <i>Billardiera fusiformis</i> over Open Low Grass of <i>Ehrharta calycina</i> , <i>Avena barbata</i> and <i>Briza maxima</i> on brown sandy loam on lateritic hill crests / upper hill slopes
	
Area Mapped	0.420 ha or 47% of the study area
Quadrats Sampled	PD01, PD02, PD06, PD09
Soils	Brown sandy loam
Land Form	Lateritic hill crests and upper hillslope
Priority Ecological Community	No
Conservation Significant Flora	None
Introduced Species	<i>Asparagus asparagoides</i> , <i>Avena barbata</i> , <i>Briza maxima</i> , <i>Bromus diandrus</i> , <i>Disa bracteata</i> , <i>Ehrharta calycina</i> , <i>Hypochaeris glabra</i> , <i>Orobancha minor</i> , <i>Petrorhagia dubia</i> , <i>Pinus radiata</i> , <i>Plantago lanceolata</i> , <i>Romulea rosea</i> , <i>Sonchus oleraceus</i> , <i>Watsonia meriana</i>
Vegetation Condition	Good to Completely Degraded
Disturbances	Rubbish, weeds, soil disturbance (historic)
Average Fire Age	Old (6+ years) and Recent (0 to 2 years)

Broad Floristic Formation *Corymbia* Forest
Vegetation Association HC CcEcaEciEsa - Parkland Cleared Forest of *Corymbia calophylla* (*Eucalyptus camaldulensis*, *Eucalyptus citriodora*, *Eucalyptus saligna*) on brown sandy loam on lateritic hill crests / upper hill slopes



Area Mapped	0.457 ha or 51% of the study area
Quadrats Sampled	PD07, PD08, PD10
Soils	Brown sandy loam
Land Form	Lateritic hill crests and upper hill slopes
Priority Ecological Community	No
Conservation Significant Flora	None
Introduced Species	* <i>Corymbia citriodora</i> , * <i>Cynodon dactylon</i> , * <i>Eucalyptus camaldulensis</i> , * <i>Eucalyptus saligna</i> , * <i>Pinus radiata</i> , * <i>Plantago lanceolata</i>
Vegetation Condition	Degraded to Completely Degraded
Disturbances	Weeds, adjacent golf course, altered drainage line
Average Fire Age	Recent (0-2 years)

Broad Floristic Formation *Eucalyptus* Low Woodland A
Vegetation Association DL Er - Low Woodland A of *Eucalyptus rudis* subsp. *rudis* over Open Dwarf Scrub C/D of *Acacia saligna* and **Rubus anglocandicans* on brown silty clay loam on medium drainage lines and floodplains



Area Mapped	0.017 ha or 2% of the study area
Quadrats Sampled	PD03, PD04, PD05
Soils	Brown silty clay loam
Land Form	Drainage lines and floodplains
Priority Ecological Community	No
Conservation Significant Flora	None
Introduced Species	* <i>Brassica tournefortii</i> , * <i>Cortaderia selloana</i> , * <i>Hypochaeris glabra</i> , * <i>Lupinus luteus</i> , * <i>Phalaris aquatica</i> , * <i>Rubus anglocandicans</i> , * <i>Rumex conglomeratus</i> , * <i>Stenotaphrum secundatum</i>
Vegetation Condition	Degraded
Disturbances	Mining exploration, road/access track, weeds, kangaroo grazing
Average Fire Age	Recent (0-2 years)

PD01



PD03



PD02



PD04



PD05



PD07



PD06



PD08



PD09



PD10



Appendix F. Sources of information

F.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)
- Environmentally Sensitive Areas (DWER-046)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Imagery
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Pre-European Vegetation Statistics
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)

- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available
- Soil Landscape Mapping – Systems

Restricted GIS Databases used:

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

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