GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 9349/1
Permit Holder:	Shire of Plantagenet
Duration of Permit:	From 13 October 2023 to 13 October 2034

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 walking trail, bike trail network and car park.

2. Land on which clearing is to be done

Lot 6923 on Deposited Plan 218597 (Crown Reserve 15162), Mount Barker

Dorey Place Road reserve (PIN 11723813), Mount Barker

Tower Road reserves (PIN 1191125 and PIN 1191126), Mount Barker

3. Clearing authorised

The permit holder must not clear more than 1.29 hectares of *native vegetation* within the areas cross-hatched yellow in Figure 1 of Schedule 1.

4. Period during which clearing is authorised

The permit holder must not clear any *native vegetation* after 13 October 2028.

PART II – MANAGEMENT CONDITIONS

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

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

(a) avoid the clearing of *native vegetation*;

(b) minimise the amount of *native vegetation* to be cleared; and

(c) reduce the impact of clearing on any environmental value.

6. Weed and dieback management

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

(a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;

(b) ensure that no known *dieback* or *weed*-affected soil, *mulch*, *fill*, or other material is brought into the area to be cleared;

(c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared;

(d) only move soils in dry conditions;

(e) where dieback or *weed*-affected soil, mulch, fill or other material is to be removed from the area to be cleared, ensure it is transferred to areas of comparable soil disease status; and

(f) at least once in each 12 month period for the term of this Permit, the Permit Holder must remove or kill any *weeds* growing within areas cleared under this Permit.

7. Directional clearing

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

8. Flora management

(a) Prior to undertaking any clearing authorised under this permit within the combined areas cross-hatched yellow in Figure 1 of Schedule 1, the permit holder must engage a *botanist* to undertake a flora survey of the permit area for the presence of *threatened flora* and *priority flora*.

(b) Where *threatened flora* is identified under condition 8(a), the permit holder must not cause or allow:

  (i) clearing within 50 metres of the identified *threatened flora*; and

  (ii) clearing of the identified *threatened flora*.

(c) Where *priority flora* are identified under condition 8(a), the permit holder must not cause or allow:

  (i) clearing within 10 metres of the identified *priority flora*; and

  (ii) clearing of the identified *priority flora*.

(d) Within three months of undertaking any clearing authorised under this permit within the combined areas cross-hatched yellow on Figure 1 of Schedule 1, the permit holder must provide the results of the flora survey in a report to the *CEO*.

9. Fauna management – black cockatoo habitat

The permit holder must not clear *black cockatoo breeding or foraging trees* found within the combined areas cross-hatched yellow in Figure 1 of Schedule 1.

10. Offset – revegetation and rehabilitation

Within 18 months of the commencement of clearing, the permit holder must implement and adhere to the 'Revegetation Plan for CPS 9349/1 - Reserves 27185 & 17394, Mount Barker, Version 2.0, 13 January 2023', including but not limited to the following actions:

(a) retain the vegetative material and topsoil removed by clearing authorised under this permit and stockpile the vegetative material and topsoil in an area that has already been cleared within the 4.53 hectare area cross-hatched red on Figure 2 of Schedule 1, within Crown Reserve 27185 and Crown Reserve 17394, Mount Barker.

(b) commence *revegetating* and *rehabilitating* 4.53 hectares within the areas cross-hatched red on Figure 2 of Schedule 1, by way of:

  (i) laying the vegetative material and topsoil retained under condition 10(a);

  (ii) ripping the soil prior to *planting*;

  (iii) deliberately *planting* tube stock, and spreading of seeds and salvaged *native vegetation* that will result in similar species composition, structure and density of *native vegetation* of the *reference site*; and

  (iv) ensuring only *local provenance* seeds and propagating material are used to *revegetate* and *rehabilitate* the area.

(c) undertake *weed* control activities prior to *planting* and/or seeding and annually thereafter for five years or until the completion criteria, as listed in Table 1, have been met;

(d) install signage to educate reserve users of the *revegetation* activities being undertaken;

(e) fencing of the offset site prior *revegetation* activities commencing and undertake regular monitoring of the fence for the entire duration of this permit;

(f) establish a minimum of three 10 x 10 metre quadrat monitoring sites;

(g) implement hygiene protocols by cleaning earth-moving machinery of soil and vegetation prior to entering and leaving the site;

(h) achieve the completion criteria specified in Table 1 after the five-year monitoring period for areas *revegetated* and *rehabilitated* under this permit:

Table 1: Completion targets and criteria

Aspect	Completion targets	Completion criteria	Monitoring
1) Species richness	60% of the native species (47) that have been recorded within the *reference site.*	Minimum of 28 native species across the offset site.	Number of species present in monitoring quadrat in total and across the offset site to be monitored during spring, annually, for the duration of this permit or until the revegetation is considered successful and have met all completion target and criteria.
2) Weeds	<5% weed cover across site. Eradication of declared Weeds of National Significance (WoNS).	<5% weed cover across the site. No declared Weeds of National Significance (WoNS).	Density/cover of weed species in monitoring quadrat and across the offset site to be monitored annually for the duration of this permit or until the revegetation is considered

			successful and have met all completion target and criteria.
4) Species density/composition	Return of dominant species per stratum (upper, middle and ground storey) and cover as per the *reference site.*	Return of 30-70% cover for each stratum (canopy, midstory, and understory) and a minimum of one species from upper stratum and four species per middle and groundstory stratum as per the *reference site.*	Percentage cover within monitoring quadrats and across the offset site to be monitored in spring, annually for the duration of this permit or until the revegetation is considered successful and have met all completion target and criteria
5) Vegetation community condition	Vegetation condition is maintained at lowest condition threshold of reference site	Revegetation area, as a whole, to reach 'Very Good' condition (Keighery, 1994).	Photo monitoring of each monitoring quadrat to be done annually for the duration of this permit or until the revegetation is considered successful and have met all completion target and criteria.

(i) undertake remedial actions for area *revegetated* and *rehabilitated* where monitoring indicates that *revegetation* has not met the completion criteria, outlined in 10(f), including:

(i) *revegetate* the area by deliberately planting *native vegetation* that will result in the minimum target in 10(h) and ensuring only *local provenance* seeds and propagating material are used;

(ii) undertake further *weed* control activities; and

(iii) annual monitoring of each *revegetated* and *rehabilitated* site, until the completion criteria, outline in 10(h) are met.

11. Offset – Crown Reserve 17394

Within 12 months of the commencement of clearing, and no later than 13 October 2024, the permit holder must:

(a) provide the *CEO* a copy of the executed change in purpose of the area cross-hatched red on Figure 2 of Schedule 1 within Crown Reserve 17394 from 'Gravel Quarry' to 'Weed Management and Revegetation"; and

(b) provide the *CEO* a copy of a licence pursuant to section 91 of the *Land Administration Act 1997* for weed management and revegetation of the area cross-hatched red on Figure 2 of Schedule 1 within Crown Reserve 17394; or

(c) in the event the licence pursuant to section 91 of the *Land Administration Act 1997* within Crown Reserve 17394 is not achieved in accordance with condition 11(b) of this Permit, the Permit Holder must develop and provide a suitable alternative offset proposal to the *CEO,* within six months and no later than 13 April 2025.

(d) once the Permit Holder has developed an offset proposal in accordance with condition 11(c), the permit holder must provide that offset proposal to the CEO for the CEO's approval.

(e) the permit holder shall implement an offset in accordance with an offset proposal approved under condition 11(d) of this permit.

PART III - RECORD KEEPING AND REPORTING

12. 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 2.

Table 2: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	(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 GDA2020, expressing the geographical coordinates in Eastings and Northings; (c) the date that the area was cleared; (d) the size of the area cleared (in hectares); (e) the direction of the area cleared; (f) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 5; and (g) actions taken to minimise the risk of the introduction and spread of *weeds* and *dieback* in accordance with condition 6.
2.	In relation to flora management pursuant to condition 8	(a) The methodology used to survey the permit area; (b) the name and location of each *threatened flora* and/or *priority flora* species, recorded using a Global Positioning System (GPS) unit set to GDA2020, expressing the geographical coordinates in Eastings and Northings; and (c) actions taken to avoid the clearing of *threatened flora* and/or *priority flora* species.
3.	In relation to fauna management pursuant to condition 9 of this permit	(a) the management measures undertaken to avoid clearing of *black cockatoo breeding and foraging trees*. (b) The location of the *black cockatoo breeding and foraging trees* retained, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020 (GDA2020), expressing the geographical coordinates in Eastings and Northings or decimal degrees; (c) Photographs of the *black cockatoo breeding and foraging* trees retained, taken after completing the clearing authorised under this permit.
4.	In relation to the *revegetation* and *rehabilitation* areas	(a) the location of any areas *revegetated* and *rehabilitated*, recorded using a Global Positioning System (GPS) unit set to

No.	Relevant matter	Specifications
	pursuant to condition 10 of this permit	Geocentric Datum Australia 2020 (GDA2020), expressing the geographical coordinates in Eastings and Northings or decimal degrees; (b) a description of the *revegetation* and *rehabilitation* activities undertaken; (c) weed control measures undertaken; (d) the date the revegetation area was fenced; (e) the size of the area *revegetated* and *rehabilitated* (in hectares); (f) the species composition, structure and density of *revegetation* and *rehabilitation*; (g) the assessment of the *revegetation* and *rehabilitation* against criterion outlined in condition 10(h); (h) any remedial actions undertaken in accordance with condition 10(i).

13. Reporting

(a) The Permit Holder must provide to the CEO on or before 30 June of each year, a written report:
  (i) of records required under condition 12 of this Permit; and
  (ii) concerning activities done by the Permit Holder under this Permit between 1 January and 31 December of the preceding calendar year.

(b) If no clearing authorised under this Permit was undertaken between 1 January to 31 December of the preceding calendar year, a written report confirming that no clearing under this permit has been carried out, must be provided to the CEO on or before 30 June of each year.

(c) Prior to 13 July 2034, the permit holder must provide to the CEO a written report of records required under condition 12 of this Permit, where these records have not already been provided under condition 13(a) of this Permit.

DEFINITIONS

In this permit, the terms in Table 3 have the meanings defined.

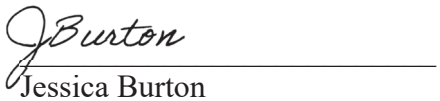
Table 3: Definitions

Term	Definition
black cockatoo breeding or foraging trees	Yate (*Eucalyptus cornuta*), Marri (*Corymbia calophylla*) or Jarrah (*Eucalyptus marginata*) trees that have a diameter, measured at 130 centimetres from the base of the tree, of 100mm or greater.
black cockatoo species	means one or more of the following species: (a) *Zanda latirostris* (Carnaby's cockatoo); (b) Zanda c*alyptorhynchus* (Baudin's cockatoo); and/or (c) *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo).
botanist	means a person who holds a tertiary qualification specialising in environmental science or equivalent, and has a minimum of two (2) years work experience in Western Australian flora identification and undertaking flora surveys native to the bioregion being inspected or

Term	Definition
	surveyed, or who is approved by the *CEO* as a suitable environmental specialist for the bioregion, and who holds a valid flora licence issued under the *Biodiversity Conservation Act 2016.*
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*.
clearing	has the meaning given under section 3(1) of the EP Act.
condition	a condition to which this clearing permit is subject under section 51H of the EP Act.
dieback	means the effect of *Phytophthora* species on native vegetation.
department	means the department established under section 35 of the *Public Sector Management Act 1994* (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
EP Act	*Environmental Protection Act 1986* (WA)
fill	means material used to increase the ground level, or to fill a depression.
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.
Local provenance	means native vegetation seeds and propagating material from natural sources within 100 kilometres and the same Interim Biogeographic Regionalisation for Australia (IBRA) subregion of the area cleared.
Planting	means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of the desired species.
priority flora	means those plant taxa described as priority flora classes 1, 2, 3, or 4 in the Department of Biodiversity, Conservation and Attractions *Threatened and Priority Flora List for Western Australia* (as amended from time to time)
reference site	Means: Vegetation Type A: Marri-Jarrah Forest on hillslope as outlined in the "Revegetation Plan for CPS 9349/1 - Reserves 27185 & 17394, Mount Barker, Version 2.0, 13 January 2023''.
Rehabilitate, rehabilitated and rehabilitation	means actively managing an area containing native vegetation in order to improve the ecological function of that area using methods such as natural regeneration, direct seeding and/or planting, so that the species composition, structure and density is similar to pre-clearing vegetation types in that area.
revegetation plan	Means plan developed by the permit holder for the revegetation and rehabilitation of a site in accordance with condition 10 of this Permit: "Revegetation Plan for CPS 9349/1 - Reserves 27185 & 17394, Mount Barker, Version 2.0, 13 January 2023'.
threatened flora	means those plant taxa listed as threatened flora under the *Biodiversity Conservation Act 2016* and *Environment Protection and Biodiversity Conservation Act 1999* (as amended from time to time)
weeds	means any plant – (a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*; or (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness

Term	Definition
	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

19 September 2023

Schedule 1

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

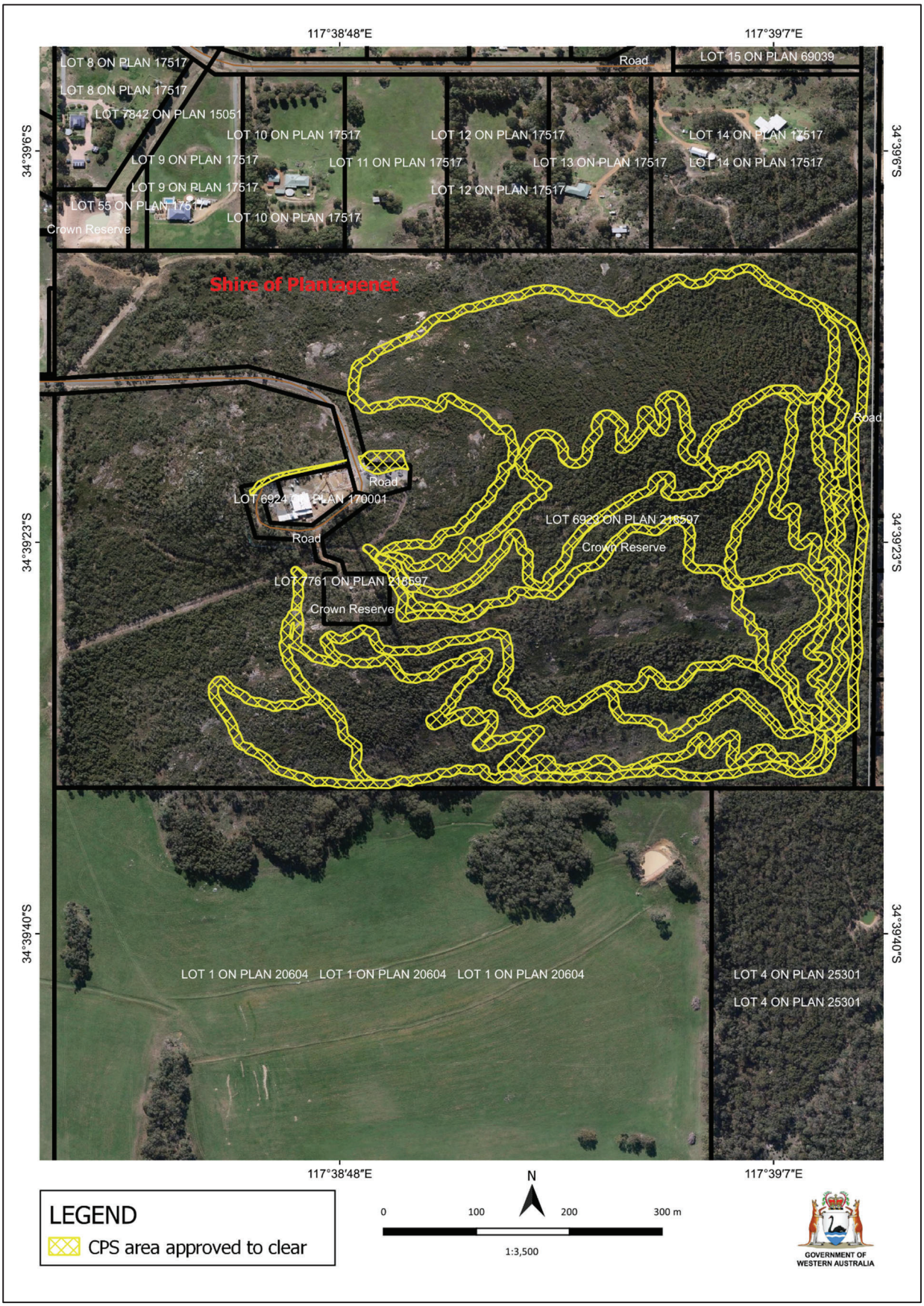


Figure 1: Map of the boundary of the areas within which clearing may occur (cross-hatched yellow).

The boundary of the area subject to specific offset – revegetation and rehabilitation conditions is shown in the map below (Figure 2).

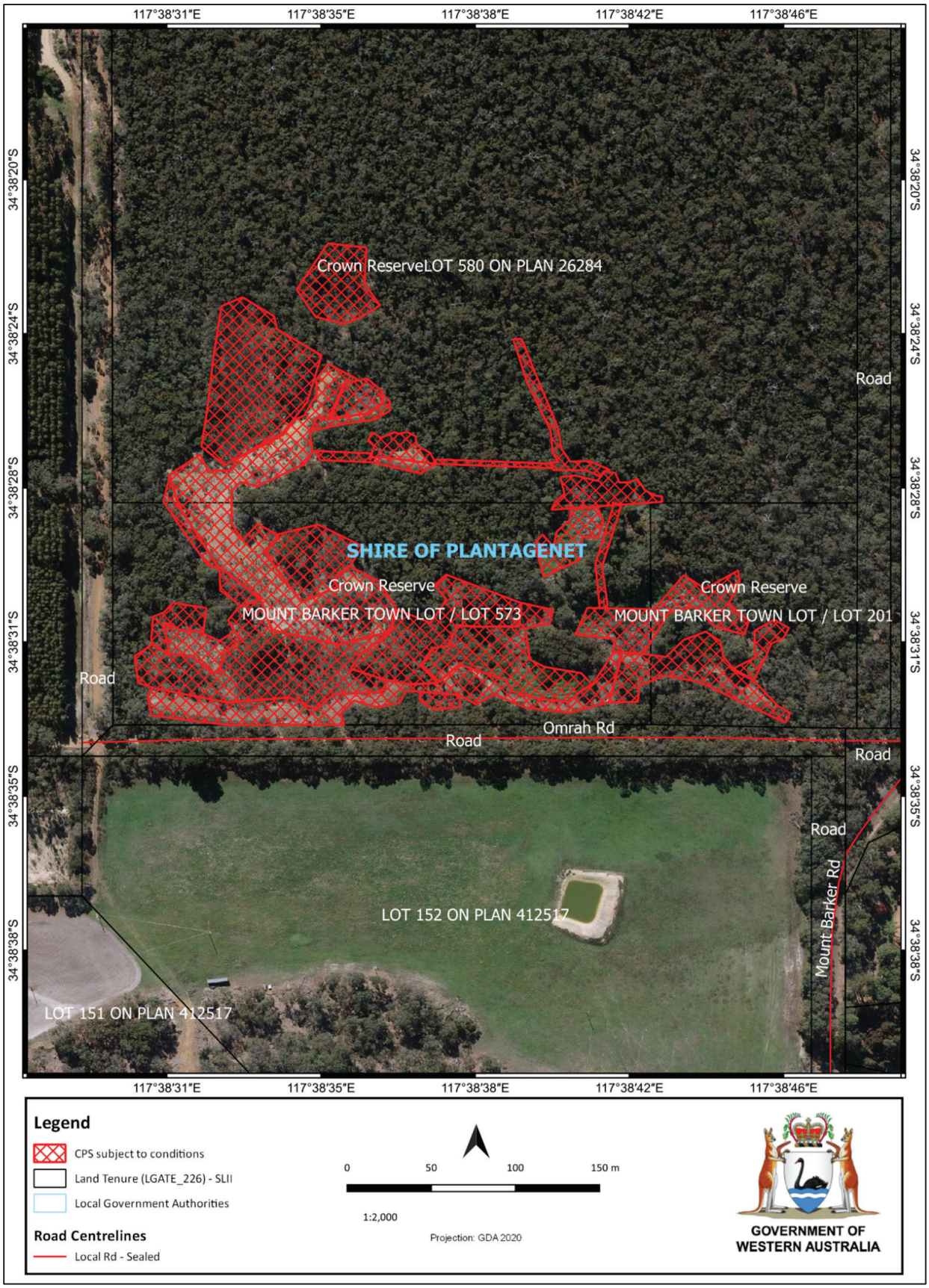


Figure 2: Map of the boundary of the area within which specific offset – revegetation and rehabilitation conditions apply (cross-hatched red).

Government of Western Australia
Department of Water and Environmental Regulation

Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 9349/1
Permit type:	Purpose permit
Applicant name:	Shire of Plantagenet
Application received:	7 July 2021
Application area:	1.29 hectares of native vegetation
Purpose of clearing:	Construction of walking trail, bike trail network and car park
Method of clearing:	Mechanical
Property:	Lot 6923 on Deposited Plan 218597 (Crown Reserve 15162) Dorey Place Road reserve (PIN 11723813) Tower road reserves (PIN 1191125 and PIN 1191126)
Location (LGA area/s):	Shire of Plantagenet
Localities (suburb/s):	Mount Barker

1.2. Description of clearing activities

The vegetation proposed to be cleared is part of a large patch of native vegetation. The Shire proposes to clear maximum of 1.29 hectares of native vegetation within a larger clearing footprint. The larger clearing footprint was designed to allow flexibility to the Shire to undertake clearing for the trails while avoiding clearing of conservation significant flora species. The proposed clearing is for the purpose of constructing a walking trail, bike trail network and a carpark (see Figure 1, Section 1.5).

According to the information available regarding this project, the necessity for this project is focussed around (MDE, 2020):

- offering local riders world-class trails to train on for competitions;
- providing suitability for diverse range of users for skill development;
- improving pedestrian access to the Tower Hill lookout, with viewing points;
- attracting users from across the Great Southern region and is designed to be capable of hosting regional events;
- complementing the universal-access pedestrian path, boardwalk and viewing platform delivered in 2011; and
- the recreational, social and economic benefit to the local community as a result of the project.

1.3. Decision on application

Decision:	Granted
Decision date:	19 September 2023
Decision area:	1.29 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 two submissions were received. Consideration of matters raised in the public submissions are 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 and fauna survey, dieback occurrence survey, a revegetation plan, 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 recreational, social and economic benefit the project would provide to the local community.

The assessment identified that the proposed clearing will result in:

- the loss of native vegetation in an area that have been extensively cleared;
- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values;
- the potential loss of priority and threatened flora species; and
- the potential mortality of fauna species that maybe utilising the application area.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing is unlikely to have long-term adverse impacts on environmental values and can be minimised and managed to unlikely lead to an unacceptable risk to environmental values. The applicant has suitably demonstrated avoidance and minimisation measures and the offset provided does counterbalance the impacts to clearing of native vegetation within an extensively cleared landscape (see Section 4).

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;
- undertake slow, progressive one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity;
- engage a botanist to undertake a pre-clearance flora survey to determine the presence of threatened flora and priority flora and to apply an appropriate buffer to the conservation significant flora identified;
- avoid clearing of any black cockatoo breeding or foraging trees; and
- revegetation and rehabilitation of 4.53 hectares within Crown Reserve 27185 and Crown Reserve 17394.

1.5. Site map

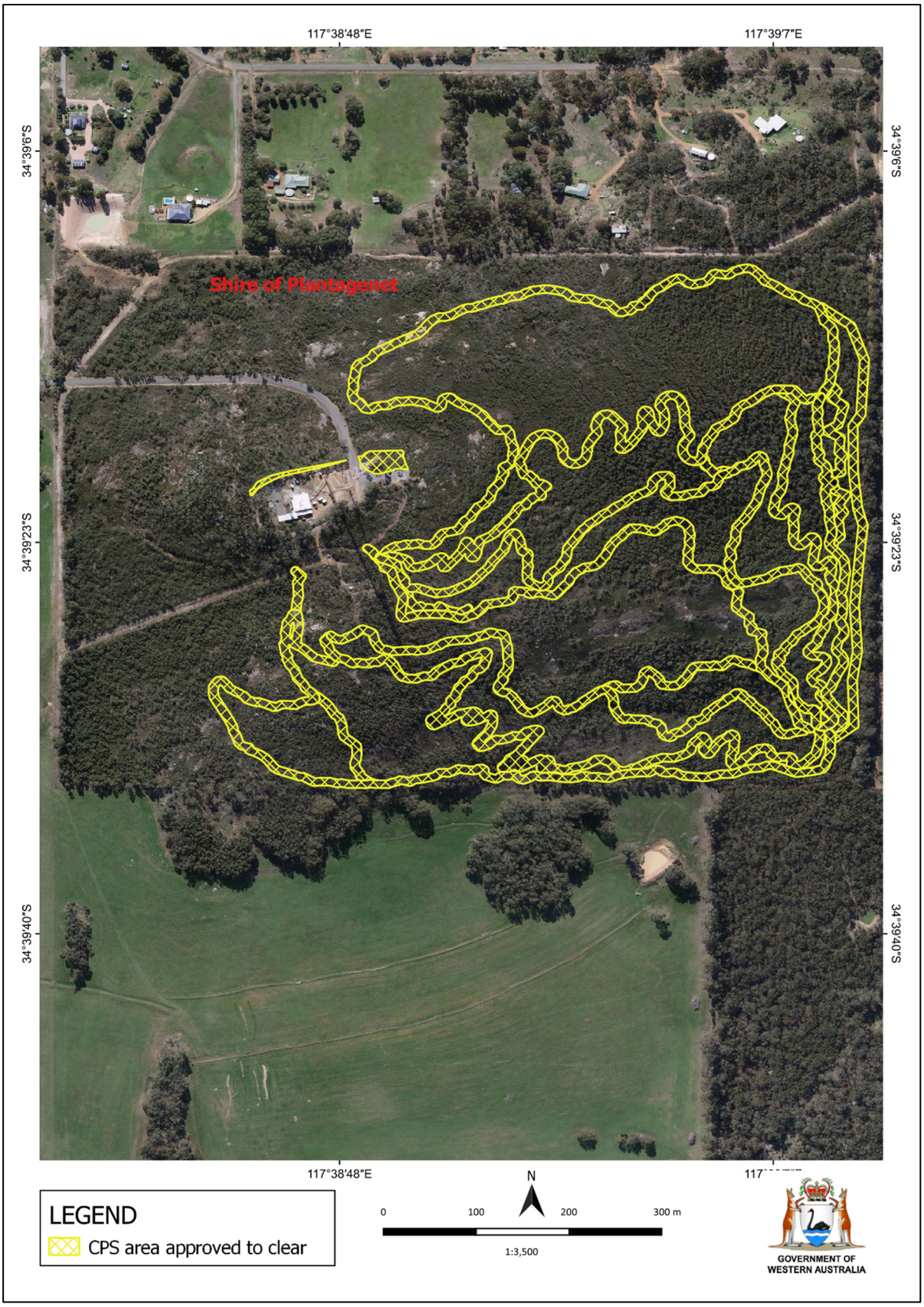


Figure 1 Map of the application area

The area cross-hatched yellow indicate the footprint in which clearing is authorised.

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)
- *Planning and Development Act 2005* (WA) (P&D 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* (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

In relation to any actions which had been considered to avoid or minimise the need for clearing, the applicant advised that (Shire of Plantagenet, 2021):

- the concept design specification required the trail designer to choose routes that minimised clearing. The findings of flora assessment (Biodiverse Solutions, 2020) were also considered when siting the trail corridors.
- the trail corridors will be further refined at the detailed design phase. The Shire noted there are possibilities for narrower trails and that the route will be selected to minimise clearing.
- the trails will be cleared by hand or by using small equipment.
- alternative sites for the trails have been considered at the feasibility stage.
- the design of the car park was revised from the original plan to avoid clearing near a granite outcrop and associated native flora. The revised location of the car park minimises the extent of clearing required.

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

3.2. Assessment of impacts on environmental values

The assessment against the clearing principles (see Attachment D) identified that the impacts of the proposed clearing present a risk to biological values (fauna, adjacent flora and vegetation) and significant remnant vegetation. 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. Environmental value: biological values (flora) – Clearing Principles (a) to (d)

Assessment:
According to the Department of Biodiversity, Conservation and Attractions (DBCA) (2022a) databases available to the department at the time of this assessment, four threatened and 13 Priority flora species are known to occur within the local area. Based on the similarities shared between the soil and vegetation types in habitats for these flora taxa and within the application area, three threatened and 10 Priority flora has the potential to occur within the application area (see C.2.). Additional six threatened species recorded outside the local area were also identified as likely to occur within the application area (BDS, 2020).

To confirm the presence/absence of the species listed within the flora analysis table (C.2.) within the application area, the applicant commissioned BDS to undertake an out of season flora and vegetation assessment of Reserve 15162 (hereafter referred to as the basic survey). The basic survey mapped vegetation composition and its condition at the reserve and identified 88 native species. These species included *Banksia porrecta* (P4) and *Verticordia* sp. with affinities to *V. endlicheriana* var. *angustifolia* (P3). No other conservation significant flora has been identified. Individuals of Borya, Laxmannia, Synaphea and Pimelea were unable to be identified to species level due to lack of flowering material (BDS, 2022). Each of these genera have species that are conservation significant that could occur in this area and within the mapped vegetation types.

The basic survey was conducted outside the spring flowering period, when the majority of flora species were not flowering. In addition, the survey did not meet criteria described in *Technical guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016) given it had been conducted shortly after a fire within the Reserve 15162 resulting in significant limitations. On this basis, it was requested that the applicant conducts an additional spring survey of the application area.

Subsequently, the applicant engaged BDS to undertake a reconnaissance flora and vegetation survey (the survey) and map populations of conservation significant flora species and/or ecological communities. The BDS (2022) flora survey was undertaken in October which is considered an appropriate month for vegetation surveys in South-West and Interzone Botanical Provenance (EPA, 2016). The survey area consisted of transects along the application area and immediately adjacent vegetation (BDS, 2022).

The survey identified 225 native and 16 introduced species. Of the native species, three were identified as conservation significant flora (BDS, 2022) and is further considered below:

- *Banksia sphaerocarpa* var. *latifolia* (P2) was recorded within the application area in jarrah-marri woodland vegetation. This is a new population of the species which was not previously recorded within Reserve 15162. The identified plants were clearly resprouting basally from the recent fire and were less than 1.5-metre high, with no flowers or fruits. BDS (2022) did not observe any germinants following the fire.

  BDS (2022) detected a total of 73 plants of *Banksia sphaerocarpa* var. *latifolia*, tightly clustered in a small area of the northeast portion of Reserve 15162. Of the 73 individuals, 41 individuals were considered to fall within the application area (BDS, 2022). The location of this *Banksia sphaerocarpa* var. *latifolia* identified is illustrated in Figure 2 below.

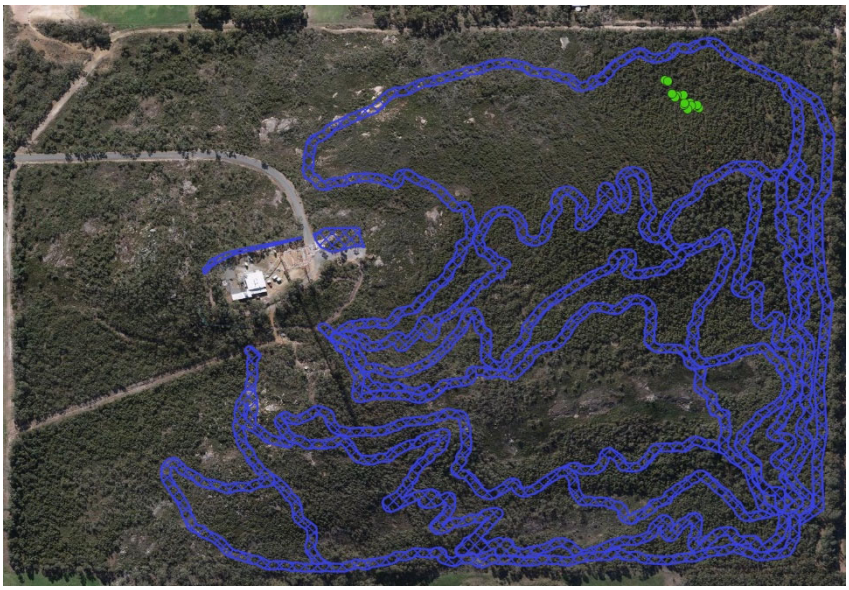


Figure 2: Location of *Banksia sphaerocarpa* var. *latifolia* (green). The application area (blue).

According to DBCA (2022a), the species is known from four populations at three locations with a spatial distribution of approximately 17 kilometres north-south and 10 kilometres east-west within Shire of Plantagenet. Noting the limited distribution of *Banksia sphaerocarpa* var. *latifolia,* the potential impacts to 41 known individuals are considered significant at the regional level (DBCA, 2022a).

Based on the above impact, a condition has been placed on the permit for the applicant to avoid the clearing of this species. The Shire has committed to the demarcating the *Banksia sphaerocarpa* var. *latifolia* and applying an appropriate buffer to the species to prevent any potential impact. Given this commitment and the pre-clearance survey requirement placed on the clearing permit, it is not likely that significant impact to *Banksia sphaerocarpa* var. *latifolia* would occur from the proposed clearing.

- *Verticordia endlicheriana* var. *angustifolia* (P3) was closely associated with the granite outcrop vegetation unit within areas of dark brown clay-loam pockets of soil on the periphery of exposed rock. BDS also recorded the species periodically in the jarrah-marri woodland vegetation but only on the periphery of boundaries of the two vegetation units of when small areas of granite were scattered within the jarrah-marri woodland. BDS (2022) noted the plants were clearly new germinants from the recent fire, below 60 centimetres in heights.

  The survey identified a total of 11,830 individuals of *Verticordia endlicheriana* var. *angustifolia* within the survey area. This number is an estimate count as due to the highly dense and large patches of germinants present, ranging from 5-60 centimetres in heights (BDS, 2022). Of the 11,830 plants identified, 1,159 (9.7 per cent) were likely to be impacted by the proposed clearing. The location of the *Verticordia endlicheriana* var. *angustifolia* species identified is illustrated in Figure 3 below.

Figure 3: Location of *Verticordia endlicheriana var. angustifolia* (pink). The application area (blue).

According to DBCA (2022a), *Verticordia endlicheriana* var. *angustifolia* is known from 42 populations with a spatial distribution of approximately 50 kilometres north-south and 100 kilometres east-west in Shires of Plantagenet, Manjimup, Denmark and City of Albany. Noting this, the proposed clearing will unlikely cause significant impacts to *V. endlicheriana* var. *angustifolia* at the regional scale or impact its conservation status (DBCA, 2022a). However, the department has requested that the Shire avoid the clearing of this species. The Shire has committed to the demarcating the *Verticordia endlicheriana* var. *angustifolia* and applying an appropriate buffer to the species to prevent any potential impact. Given this commitment and the pre-clearance survey requirement placed on the clearing permit, it is not likely that significant impact to *Verticordia endlicheriana* var. *angustifolia* would occur from the proposed clearing.

- *Synaphea preissii* (P3) was restricted to south-west portion of the Reserve 15162 and generally on boundary of granite outcrops and jarrah-marri woodland vegetation units. This is a new population of the species which was not previously recorded within Reserve 15162. The location of the *Synaphea preissii* species identified is illustrated in Figure 4 below.

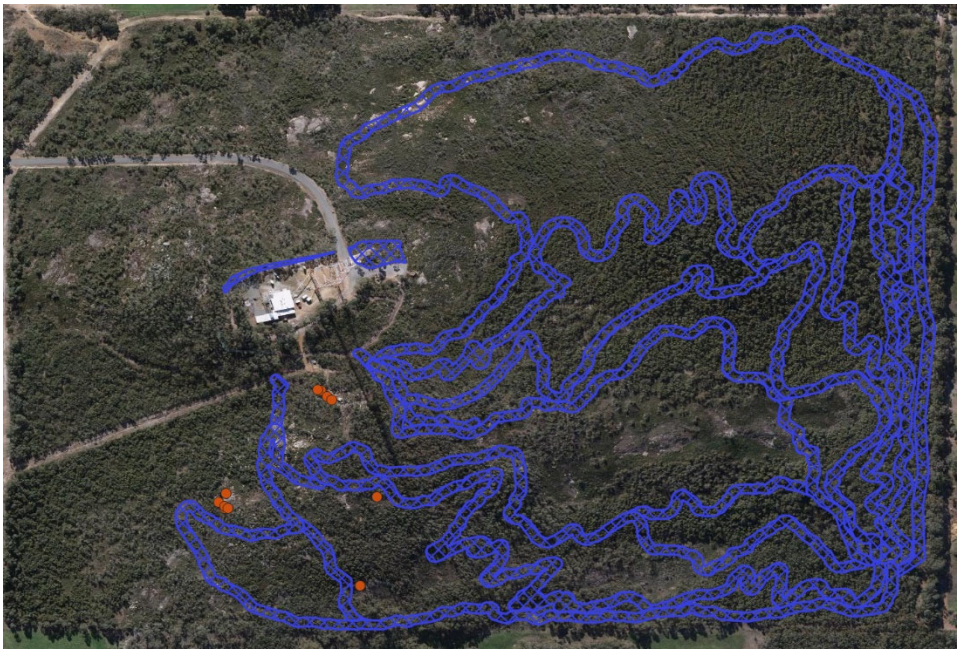


Figure 4: Location of *Synaphea preissii* (orange) within the application area (blue).

BDS (2022) identified a total of 39 individuals of *Synaphea preissii* within the survey area and eight of these individuals were identified to be impacted. According to DBCA (2022a), *Synaphea preissii* is known from 22 populations spread across approximately 85 kilometres north-south and 75 kilometres east-west within Shires of Plantagenet, Cranbrook, Gnowangerup and City of Albany. Noting this, the proposed clearing will unlikely cause significant impacts to *S. preissii* at the regional scale or impact its conservation status.

Although impact to *Synaphea preissii* was not considered as significant, the department has requested that the Shire avoid the clearing of this species. The Shire has committed to the demarcating the *Synaphea preissii* and applying an appropriate buffer to prevent clearing of *Synaphea preissii*. Given this commitment and the pre-clearance survey requirement placed on the clearing permit, it is not likely that impacts to *Verticordia endlicheriana* var. *angustifolia* would occur from the proposed clearing.

Additional non-threatened species were identified with close similarities to conservation significant species (BDS, 2022):

- *Schoenus subflavus* subsp. long leaves (K.L. Wilson 2865) – bears similarities to *Schoenus* sp. Mt Barker (G.J. Keighery 9679 – P1). The specimen was submitted to the WA Herbarium for confirmation and determined as non-threatened *S. subflavus* subsp. long leaves (K.L. Wilson 2865).
- Ericaceae species bearing similarities to numerous priority flora within the area (*Andersonia auriculata* (P3), *Andersonia hammersleyana* (P2), *Andersonia* sp. Jamesii (J. Liddelow 84), *Andersonia* sp. Mitchell River (B.G. Hammersley 925)). All Ericaceae species were submitted to the WA Herbarium for confirmation. All species were returned as non-threatened and recognised as highly variable in form, which are listed below
    - *Andersonia sprengelioides*
    - *Andersonia caerulea*
    - *Styphelia discolor.*
- *Banksia alliacea* – the basic survey (BDS, 2020) had identified *Banksia porrecta* (P4). The identified plants were found, and a specimen collected. Upon submission to the WA Herbarium, this specimen was confirmed as the non-threatened *B. alliacea*.
- *Synaphea petiolaris* subsp. *petiolaris* bears similarities to *Synaphea incurva* (P3). The specimen was submitted to the WA Herbarium for confirmation, and determined as non-threatened *S. petiolaris* subsp. *petiolaris*.
- *Conostylis pusilla* – bears similarities to *Conostylis misera* (T), which was identified in the desktop assessment as likely to occur. The specimen was determined as non-threatened *C. pusilla* due to length and width of leaf, and elongated pedicle for flower. A reference population of *C. misera* was visited prior to the survey (in the near vicinity) to familiarise botanists with key identification and suitable habitat of the species.

- *Banksia gardneri* subsp. *gardneri* – bears similarities to *Banksia goodii* (T), which was identified in the desktop assessment as likely to occur. The specimen was determined as non-threatened *B. gardneri* subsp. *gardneri* due to even division of toothing on leaves and larger flower.
- *Acacia drummondii* subsp. *elegans* bears similarities to *Acacia drummondii* subsp. *elegans* Porongurup variant (R.J. Cumming 938) (P4). The species was determined as the non-threatened *A. drummondii* subsp. *elegans* due to distribution of P4 Porongurup variant restricted to the Porongurup Ranges. A scan of the specimen has been retained, given the lack of information about the species and some limitations with the rationale.
- *Hibbertia gracilipes* bears similarities to *Hibbertia sejuncta* (P2), which is a poorly recorded and relatively newly discovered species. The species has been confirmed as the non-threatened *H. gracilipes* based on short pubescent hairs, opposed to dense and long haired and lack of revolute edges of leaves.
- *Acacia heteroclita* subsp. *heteroclita* bears similarities and occurs within general proximity to *Acacia heteroclita* var. *valida* (P2). The species has been determined as the non-threatened *A. heteroclita* var. *heteroclita*, due to leaf width of 3-4 millimetres, with the P2 variant of the species having leaves 4-9 millimetres wide.
- *Bossiaea eriocarpa* and *B. ornata* – Both species of Bossiaea bear similarities to *B. lalagoides* (P3), which was assessed on the desktop assessment as "likely" to occur. Both were determined as the non-threatened species due to the size and shape of the leaves.

Of the conservation significant species classified as likely to occur within the application area, eight species were not flowering at the time of the survey. For three of these species, this may represent a limitation (BDS, 2022):

- *Banksia* sp. (*B. brownii, B. goodie, B. porrecta, B. sphaerocarpa* var. *latifolia, B. verticillata* are distinctive shrubs that retain large fruiting bodies. Therefore, identification to the species level can occur outside the flowering period.
- *Gastrolobium ferrugineum* (P2) – flowers until September but detection is possible without flowering material.
- *Thysanotus* sp. Badgingarra (E.A. Griffin 2511) (P2) flowers in December and January. Given it is a perennial herb, the survey timing represents a significant limitation.
- *Verticordia apecta* (T) flowers in November. Few early flowers would likely be present.

Noting the survey efforts, survey timing and flowering periods of the species considered as potentially occurring within the application area, the Delegated Officer considered that the application area is unlikely to provide habitat for other conservation significant flora known to occur within the local area.

Threatened and priority ecological communities

The closest conservation significant ecological community from the application area is 'Proteaceae dominated kwongkan shrublands of the southeast coastal floristic province of Western Australia' (Kwongkan Shrubland). This community is listed as Priority 3 ecological community (PEC) by DBCA and as an Endangered threatened ecological community (TEC) under the EPBC Act. This TEC is confined to the southeast botanical province of Western Australia and primarily occurs on sandplains and marine plains and lower to upper slopes and ridges, as well as uplands across this region (DCCEEW, 2014).

BDS (2022) identified that the vegetation within the application area does not represent the Kwongkan Shrubland TEC. Whilst Proteaceae species were present throughout the site, particularly in jarrah - marri woodland, these species did not dominate or exceeded 30 per cent vegetation cover; a key criterion for characterising the TEC (DCCEW, 2014). In addition, the vegetation within the application area reflects more a woodland type of vegetation which is contrary to the structure of the Kwongkan Shrubland TEC.

Conclusion

For the reasons set out above, it is considered that no impact to conservation significant flora species would occur as a result of the proposed clearing. The shire advised the department that the trail will be moved away from the priority and threatened flora and the flora of significance would be demarcated. It is also noted that DBCA are the project partners who are managing the design and construction stage of the trails.

Conditions

The following management measures will be required as conditions on the clearing permit:

- Undertake an inspection of the permit area for the presence of threatened and priority flora prior to clearing. Where threatened and priority flora are identified within the permit area, the permit holder must not cause or allow clearing of these species or within the appropriate buffer specified in the clearing permit.

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

Assessment:
According to available databases, a total of 16 conservation significant fauna species have been recorded within the local area (DBCA, 2022b). Noting the habitat requirements, distribution of the recorded species, the mapped vegetation type, the condition (Keighery, 1994) of the vegetation within the application area, as well as the findings of the vertebrate fauna assessment (Sanders, 2020), the application area is likely to comprise suitable habitat for the following species:

- Baudin's cockatoo *(Zanda Calyptorhynchus)*
- Carnaby's cockatoo *(Zanda latirostris)*
- forest red-tailed black cockatoo *(Calyptorhynchus banksii naso)*
- numbat, walpurti *(Myrmecobius fasciatus)*
- quenda, southwestern brown bandicoot *(Isoodon fusciventer)*
- south-western brush-tailed phascogale, wambenger *(Phascogale tapoatafa wambenger)*
- western brush wallaby *(Notamacropus irma);* and
- western ringtail possum, ngwayir *(Pseudocheirus occidentalis).*

Black cockatoos
The application area falls within the modelled distribution of all three black cockatoo species. Black cockatoos are classified as threatened under the BC Act. Under the EPBC Act, the Carnaby's and Baudin's cockatoo are listed as Endangered and the forest red-tailed black cockatoo is listed as Vulnerable. The seasonal movements of black cockatoos mean they require large areas of habitat for breeding, night roosting and foraging, as well as connectivity between these habitats to assist their movement through the landscape (Commonwealth of Australia, 2012). The assessment has considered the potential impacts of the proposed clearing on all types of black cockatoo habitat.

The application area does not provide suitable breeding habitat for black cockatoos. Suitable breeding habitat for these species includes trees which either have a suitable nest hollow, or are of a suitable diameter at breast height (DBH) to develop a nest hollow. Suitable DBH for nest hollows is 500 millimetres for most tree species, however, is reduced to 300 millimetres for wandoo and salmon gum (Commonwealth of Australia, 2012). Carnaby's cockatoo typically nests in eucalypt woodlands, primarily in the hollows of wandoo (*Eucalyptus wandoo*), salmon gum (*E. salmonophloia*) and marri (*Corymbia calophylla)* (Groom, 2015). The most important breeding trees for forest red-tailed black cockatoos throughout their range are large, mature marri trees, approximately 120-150 years in age with a mean overall height of 20.24 metres (Johnston, Kirkby and Sarti, 2013).

Sanders (2020) assessed the jarrah and marri trees within the survey area for the likelihood of Carnaby's and Baudin's nesting hollows. The assessment did not identify any jarrah trees of suitable size for black cockatoo breeding. Although most marri trees did not have hollows sufficiently large for black cockatoo breeding, two potentially suitable marri hollows were observed. Sanders (2020) advised it was unlikely that forest red-tailed cockatoo breeds within Reserve 15162 as this species favours hollows in mature marri trees high above the ground. To mitigate any potential impacts on black cockatoo breeding habitat, the Shire has committed to retaining all Yate (*Eucalyptus cornuta*), Marri (*Corymbia calophylla*) or Jarrah (*Eucalyptus marginata*) trees that have a diameter, measured at 130 centimetres from the base of the tree, of 100 millimetres or greater.

Noting typical food resources for black cockatoos, the application area contains approximately 1.17 hectares of foraging habitat for these species in the form of jarrah-marri woodland (approximately 1.07 hectares) and yate woodland (approximately 0.10 hectares). Forest red-tailed black cockatoo forages within jarrah and marri woodlands and forest, and edges of karri forests including wandoo and blackbutt, within the range of the subspecies. The species largely feeds on seeds of marri and jarrah, as well as other Eucalyptus species and *Allocasuarina* cones (DAWE, 2022). Baudin's cockatoo prefers foraging within Eucalypt woodlands and forest, and proteaceous woodland and heath. During the breeding season (October to late January/early February) this species prefers marri seeds. Outside the breeding season the species may feed in fruit orchards and tips of Pinus spp. (DAWE, 2022). Carnaby's cockatoo feeds on the seeds, nuts and flowers of a large variety of plants including Proteaceous species (*Banksia*, *Hakea* and *Grevillea*), as well as Allocasuarina and Eucalyptus species, *Corymbia calophylla* and a range of introduced species (Valentine and Stock, 2008).

The vegetation within application area does not contain black cockatoo foraging habitat which supports its breeding. While breeding, black cockatoos will generally forage within a 6–12-kilometre radius of their nesting site (Commonwealth of Australia, 2012). The application area is not located within the mapped confirmed breeding area

for Carnaby's cockatoo. According to available databases, there are no confirmed black cockatoo breeding points within the local area. The closest confirmed breeding site is a natural, potential breeding tree located approximately 27.5 kilometres north of the application area.

The assessment further identified that the application area provides foraging habitat that supports black cockatoo roosting. Roosting habitat is defined as a suitable tree (generally the tallest) or group of tall trees, native or introduced, usually close to an important water source, within an area of quality foraging habitat within the range of each black cockatoo species which provide black cockatoos with shelter during the heat of the day and safe resting places at night (Department of the Environment and Energy, 2017). Individual night roosting sites need suitable foraging habitat and water within six kilometres (EPA, 2019). Overlapping foraging ranges within 12 kilometres also support roosting sites and maintain habitat connectivity and movement across the landscape (EPA, 2019). There are four confirmed black cockatoo roosting site mapped within six kilometres from the application area. The six kilometre buffers of these sites remain between 18.46 and 23.83 per cent of their original vegetation extents. As mentioned previously, the Shire has committed to retaining all Yate (*Eucalyptus cornuta*), Marri (*Corymbia calophylla*) or Jarrah (*Eucalyptus marginata*) trees that have a diameter, measured at 130 centimetres from the base of the tree, of 100mm or greater. Therefore, avoiding any impact to black cockatoo foraging habitat.

Considering the relatively small extent of the application area and that native vegetation within adjacent properties provides similar habitat, the proposed clearing is not likely to restrict the ability of black cockatoos to move across the landscape.

Numbat, quenda, south-western brush-tailed phascogale, western brush wallaby and western ringtail possum

Noting the vegetation identified within the application area (BDS, 2022), the habitat requirements and distribution of the above species, the application area provides suitable habitat for each of these species. The proposed clearing of 1.29 hectares is dispersed along approximately 15,000 metres of existing and new trails and does not constitute a block of clearing. Less than one metre wide areas are proposed to be cleared for new trails. This will unlikely impact the canopy connection above the trails. Noting this, and the abundance of native vegetation remaining within Reserve 15162 post clearing in similar condition than that present within the application area, the proposed clearing is unlikely to significantly impact these species. Whilst not considered significant habitat, impacts to individuals of numbat, quenda, south-western brush-tailed phascogale, western brush wallaby and western ringtail possum may occur at the time of clearing. To minimise the potential impacts, the applicant will be required to undertake slow, progressive one directional clearing to allow terrestrial fauna to disperse ahead of the clearing activity should they occur on site at the time of clearing:

- Numbat is a small marsupial with a distinctive striped appearance. Currently, numbats are only known to be surviving in a small area of WA's Jarrah Forest and Wheatbelt bioregions, notably at Dryandra Woodland and the Upper Warren area. Suitable habitat for this species is generally woodland dominated by Eucalyptus species, with abundant hollow logs and branches for shelter and termites for food (DBCA, 2017). The species has been recorded approximately 1.5 kilometre from the application area.
- Quenda, is known to inhabit scrubby, swampy vegetation with low, dense understorey, located nearby water courses, pasture, or forest/woodland that is regularly burnt and is in areas of pasture and cropland lying close to dense cover. Populations which inhabit jarrah and wandoo forests are usually associated with watercourses (Department of Conservation, 2012a). The species has been recorded approximately five metres from the application area.
- South-western brush-tailed phascogale, wambenger - the word 'wambenger' is in common local use in southwestern Western Australia for the brush-tailed phascogale (Have, 2015). In Western Australia this species is now known to occur in the south west between Perth and Albany. Highest densities occur in the Perup/Kingston area, Collie River valley, and near Margaret River and Busselton. The preferred habitat for south-western brush-tailed phascogale in Western Australia is within dry sclerophyll forests and open woodlands that contain hollow bearing trees but a sparse groundcover. The red-tailed phascogale prefers vegetation that is unburnt for a long time, which provides continuous canopy cover to assist their arboreal habits. Fire causes high mortality amongst resident red-tailed phascogales and populations do not recover for years after fire events (Department of Environment and Conservation, 2012). The species has been recorded approximately five kilometres from the application area.
- Western brush wallaby inhabits open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets. It is also found in some areas of mallee and heathland. The species is highly mobile and does not rely on specialist niche habitats (DBCA, 2012). The species has been recorded approximately 3.1 kilometres from the application area.

- Western ringtail possum (WRP) generally occurs within coastal or near coastal forest that includes peppermint trees (*Agonis flexuosa*) as a major component (Commonwealth of Australia, 2009). Habitat critical to survival for WRP is not well understood but commonly contains high nutrient foliage availability food, suitable structure for protection/nesting and canopy continuity to avoid/escape predation and other threats (Department of Parks and Wildlife (DPaW), 2017). The application area contains jarrah-marri vegetation which is typical habitat for possums in the southern forest management zone. WRP are known to co-exist with recreational usage in similar reserves than Reserve 15162 (DBCA, 2021). The species has been recorded approximately 1.5 kilometres from the application area.

Ecological linkage

The application area is mapped approximately 4.5 kilometre north of a mapped South West Regional Ecological Linkage. Given the separation distance and the minimal extent of remnant vegetation within the application area, the proposed clearing is not likely to have an impact on the environmental value of this linkage.

The application area occurs within the South Coast Macro Corridor Network, 'Strategic Zone A' category. This network is a landscape-scale approach to habitat connectivity that acknowledges that remnant vegetation can play a very important role in developing corridors between protected areas to help achieve long-term biodiversity management outcomes. Zone A groups vegetated patches which contain areas of woody vegetation where polygons greater than 30 hectare in size are spaced no greater than one kilometre apart and potentially form the most strategic link between major protected areas. The application area lies within one of the major vegetation corridors known as the "Porongurup Range Corridor" which connects remnant vegetation to existing "Protected Area" corridors (Mount Lindesay National Park, Lake Barnes Road Nature Reserve) to the south and Porongurup National Park to the east (Wilkins et al., 2006).

Given the application relates to the construction of a narrow, linear bike track within a larger vegetated reserve and that mature trees will be retained to maintain canopy connectivity, it is not expected that the proposed clearing will significantly impact the functionality of the South West Macro Corridor.

Conclusion

For the reasons set out above, it is considered that the impacts of the proposed clearing on fauna habitat can be managed by, slow directional clearing to allow fauna to move into adjacent vegetation and ensuring that trees that would support black cockatoo breeding and foraging are retained within the application area.

Conditions

The following management measures will be required as conditions on the clearing permit:

- Slow directional clearing to allow fauna to move into adjacent vegetation ahead of the clearing activity will minimise impact to individuals.
- No authorisation to undertake clearing of Yate (*Eucalyptus cornuta*), Marri (*Corymbia calophylla*) or Jarrah (*Eucalyptus marginata*) trees that have a diameter, measured at 130cm from the base of the tree, of 100mm or greater are permitted within the permit area.

3.2.3. Environmental value: significant remnant vegetation and conservation areas – Clearing Principles (e)

Assessment:
The aim of this Clearing Principle is to maintain sufficient native vegetation in the landscape for the maintenance of ecological values. It also recognises the need to protect ecological communities that have been extensively cleared and to retain a representation of each ecological community in local areas throughout its pre-European settlement range. Cumulative impacts of clearings within the local area are also considered (Department of Environment Regulation, 2013).

The application area is located within an extensively cleared landscape. 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 is inconsistent with these thresholds as it retains approximately 23.28 per cent vegetation cover (approximately 7,877.66 hectares). The application represents approximately 0.016 per cent of the remaining vegetation within the local area and the proposed clearing will reduce the extent of native vegetation within the local area to 7,876.37 hectares.

The application area is located within the 'Jarrah Forest Interim Biogeographic Regionalisation for Australia (IBRA) bioregion which retains approximately 53.25 per cent of its pre-European vegetation extent (Government of Western Australia, 2019). The Beard vegetation association three (3) which is mapped within the application area, retains approximately 67 per cent of its original vegetation extent.

As described in sections 3.2.1 and 3.2.2 of this report, the application area provides suitable habitat for conservation significant flora and fauna respectively. Noting this, and that the local area has been extensively cleared, the native vegetation proposed to be cleared is considered as a significant remnant in an area that has been extensively cleared.

Table 1 Extents of remnant vegetation (Government of Western Australia, 2019)

	Pre-European extent (ha)	**Current extent (ha)**	**Extent remaining (%)**	**Current extent in DBCA managed land (ha)**	**Current proportion (%) of pre-European extent in DBCA managed land**
IBRA bioregion					
Jarrah Forest	4,506,660.25	2,399,838.15	53.25	69.74	37.14
Vegetation complex in IBRA bioregion					
Beard vegetation association 3	2,390,591.54	1,604,101.56	67.10	81.00	54.35
Local area (calculation - delete if not required)					
10km radius	33,835.53	7,877.66	23.28	-	-

Weed and Dieback

On behalf of the Shire, The Great Southern Centre for Outdoor Recreation Excellence (GSCORE) undertook a dieback occurrence survey using the broad area survey method. The broad area survey was conducted in accordance with DBCA guideline, *Phytophthora Dieback Interpreters Manual for lands managed by the Department* (2015). According to the survey, the application area was mapped as 'uninterpretable' and 'temporary uninterpretable'. These terms are defined as:

- Uninterpretable – Natural, undisturbed areas where susceptible plants are absent, or are too few to make a determination of the presence or absence of *P. cinnamomi*.
- Temporarily uninterpretable – Areas where disease presence or absence cannot be determined due to a level and type of site disturbance that will recover within the short to medium term, e.g.fire, rehabilitation.

It was recommended by the GSCORE that If proposed trails are limited to the vegetation classified as 'uninterpretable' then no additional survey will be required. For the areas of construction within the 'temporarily uninterpretable' areas, "works must be limited to dry soil conditions only and no in-situ soils are to be excavated and moved across the reserve". It was also recommended that "imported equipment and materials must be subject to appropriate

operational hygiene and verified as being disease free before entering the temporarily uninterpretable areas" (Great Southern Bio Logic, 2020).

There is a risk of weeds and dieback spreading into remnants of native vegetation adjacent to the proposed clearing and the applicant will be required to adhere to weed and dieback management measures (as conditioned on the clearing permit) to minimise this risk.

Conclusion

For the reasons set out above, it is considered that the impacts of the proposed clearing on significant remnant of native vegetation in an area that has been extensively cleared cannot be mitigated by the applicant's avoidance and minimisation strategies and an offset is required to counterbalance the significant residual impact remaining in consistent with the Government of Western Australia's *Environmental Offsets Policy and Environmental Offsets Guidelines*.

Weeds and dieback have the potential to out-compete native flora and reduce the biodiversity of an area. Potential impacts to biodiversity as a result of the introduction and spread of weeds and dieback may be minimised by the implementation of a weed and dieback management condition.

Conditions

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

- 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; and
- provide an offset to counterbalance the significant residual impacts to 1.29 hectares of native vegetation representing a significant remnant of native vegetation in an area that has been extensively cleared.

3.3. Relevant planning instruments and other matters

According to the Local Planning Scheme no. 5 in the Shire of Plantagenet, the proposed clearing area is zoned as 'public open space'. Areas are zoned as public open space to allow for active and passive recreation uses.

An Aboriginal heritage site considered as a 'other heritage place' is located within the application area. The type of this Aboriginal heritage place is described as Artefacts / Scatter, Ceremonial, Meeting Place, Natural Feature and is named Pwakkenbak. Tower Hill. Mount Barker. It is the permit holder's responsibility to comply with the *Aboriginal Heritage Act 1972* (WA) and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

4 Suitability of offsets

The applicant has provided evidence of avoidance and minimisation which are listed below (Shire of Plantagenet, 2021) and further described under Section 3.1.

- The concept design specification required the trail designer to choose routes that minimised clearing. The findings of flora assessment were also considered when siting the trail corridors.
- The trail corridors will be further refined at the detailed design phase. The Shire noted there are possibilities for narrower trails and that the route will be selected to minimise clearing.
- Avoided clearing of all black cockatoo breeding and foraging trees found within the application area.

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

- loss of 1.29 hectares of native vegetation representing a significant remnant of native vegetation in an that has been extensively cleared.

To offset the significant residual impact, the Shire intends to undertake revegetation of 4.53 hectares area in total within Lot 580 on Plan 26284 (reserve 27185) and the Crown Reserve 17394. The reserves are located approximately 1.3 kilometre north of the application area.

- The current vesting of Reserve 17394 is gravel quarry. There is no associated management order/vesting for the Reserve. The former gravel pit is now exhausted, and the site is no longer utilised. Weeds, including Watsonia and invasive wattles, have colonised the previously cleared areas of the site. It has also become a hot spot for illegal dumping.
- The current vesting of reserve 27185 is for conservation.

Two calculations using the WA offset metric calculator was undertaken because the proposed revegetation areas falls within two properties that have different vesting statuses. The calculations have identified that the rehabilitation/revegetation of the following properties will be sufficient to adequately address the significant residual impacts of the proposed clearing. The calculations have determined that:

- To offset clearing of 1.19 hectares of native vegetation within an extensively cleared area, an area of 4.57 hectares of rehabilitation/revegetation is required within an area currently vested under conservation. **OR**
- To offset clearing of 1.19 hectares of native vegetation within an extensively cleared area, an area of 4.10 hectares of rehabilitation/revegetation is required within an area currently vested as a gravel pit.

The department received a revegetation plan prepared by Bio Diverse Solutions (2023) for the proposed offset area on the 22 November 2022. On review of the plan, the department requested that the revegetation plan be revised. The department received the updated revegetation plan on the 17 January 2023. The updated revegetation plan is consistent with the "*A guide to preparation Revegetation Plans for Clearing Permits*". The condition of the proposed offset site varies from Very Good to Completely Degraded (Keighery, 1997) across two reserves located adjacent to each other. The Shire is focused on improving the condition rating of the areas through the actions detailed in the revegetation plan. The offset calculator has accounted for the fact that the start quality of the vegetation ranges within the offset site, therefore, an average of the quality score is used in the calculations.

The Shire propose to utilise the available areas within both reserves. According to the proposed rehabilitation shapefile provided by the Shire, 1.38 hectares is available within Reserve 27185 and 3.15 hectares is available within Reserve 17394 to undertake rehabilitation activities. These areas were used in the offset calculator to determine the offset value (as a percentage) to ensure that the sum of both the offset values equates to 100 per cent. Below are the findings.

- Rehabilitation of 1.38 hectares within the Reserve 27185 equates to an offset value of 30.2%.
- Rehabilitation of 3.15 hectares within the Reserve 17394 equates to an offset value of 76.9%.

The Shire has proposed a two stage revegetation process for this offset revegetation project due to the uncertainty over approval for the Crown Reserve 17394 to be conserved in perpetuity. Reserve 17934 has been identified for inclusion into the Noongar Land Estate (NLE) under the South West Native Title Settlement and investigations on the future of the reserve are currently being undertaken. The Department of Planning, Lands and Heritage (DPLH) advised that there is no issue with the Shire continuing to undertake weed/revegetation management activities ahead of the land being handed over through Native Title. Reserve 17394 may still be able to be managed for conservation by the Native Title group following settlement, however this has not been confirmed to date.

The revegetation within Reserve 27185 will commence first as the land matters pertaining to Reserve 17394 (stage 2) may take time to resolve.

- Stage 1 – Reserve 27185 (currently vested under conservation)
- Stage 2 – Reserve 17394 (currently vested as a gravel pit, pending approval of transfer of management to Shire of Plantagenet for conservation through Native Title)

The Shire has confirmed that DPLH is willing to grant a 12 month access lease to undertake revegetation in the proposed offset site (Reserve 17394) and DPLH may be able to provide a rolling 12 months lease until native title settlement is agreed to. However, if this does fail, the Shire has informed that several alternative offset options are available that are under the Shire management

Given the above, the offset proposed by the Shire adequately counterbalance the significant residual impact listed above, representing 100 per cent of the offset contribution consistent with the WA Environmental Offset Policy. The Delegated Officer considers that this adequately counterbalances the significant residual impacts resulting from the proposed clearing. The justification for the values used in the offset calculation is provided in Appendix F.

Appendix A. Additional information provided by applicant

Information	Description
Vertebrate Fauna Assessment of Tower Hill/Pwakkenbak Reserve 15162 (Sanders. A, 2020)	Great Southern Centre for Outdoor Recreation Excellence (GSCORE), on behalf of the Shire of Plantagenet, commissioned a vertebrate fauna assessment of the Tower Hill/Pwakkenbak Reserve 15162 in March 2020, prior to future development of recreational trails. The aim of the survey was to: 1. Carry out a desktop search to highlight any potential threatened or priority fauna that may occur on the reserve, and 2. Carry out a field assessment searching for suitable habitat and evidence to determine the presence of threatened or priority fauna at the reserve.
Fauna and vegetation survey report for Reserve 15162 Tower Road Mount Barker undertaken by Bio Diverse Solutions (2021)	Great Southern Centre for Outdoor Recreation Excellence commissioned Bio Diverse Solutions to undertake an out of season flora and vegetation assessment of Reserve 15162. The scope of works included: 1. Desktop assessment including all publicly available database searches and utilising advice from DBCA provided by GSCORE; 2. Conduct a single phase (out of season) reconnaissance survey across the survey area through low intensity; 3. sampling in vegetation types present, and mapping the boundaries of vegetation types and vegetation condition; 4. mapping according to the Keighery condition rating scale (Keighery 1994); 5. Identify and map any TEC or PECs present within the survey area; and 6. Preparation of brief desktop assessment report detailing all findings, including likelihood of occurrence of conservation significant flora.
Dieback occurrence survey Tower Hill (Great Southern Bio Logic, 2021)	A Dieback Occurrence survey was performed by Great Southern Bio Logic The objectives of the Phytophthora Dieback survey were to: 1. determine the presence/absence of the disease within areas of remnant native vegetation within the Tower Hill Reserve; and 2. apply relevant criteria to areas of disease-free vegetation to determine the distribution of vegetation that may require a detailed assessment should ground disturbing works be programmed for that area.
reconnaissance flora, vegetation and basic fauna survey report (Bio Diverse Solutions, 2022) in response to a formal Request for Further Information issued by DWER on 19 January 2022.	Bio Divserse Solution was commissioned to undertake reconnaissance flora, vegetation and basic fauna survey that meets the EPA Guidance. The information contained within the reconnaissance flora, vegetation and basic fauna survey report (Bio Diverse Solutions, 2022) is summarised in Appendix G and its findings have been used to inform the *Assessment of impacts on environmental values* (see Section 3) and *Site characteristics* (see Appendix C).

Information	Description
Revised offset revegetation plan (Bio Diverse Solutions, 2023)	Bio Diverse solutions was commissioned to prepare a Revegetation Plan to offset the proposed clearing. This Revegetation Plan has been developed in line with DWER's *Guide to Preparing Revegetation Plans for Clearing Permits*.

Appendix B. Details of public submissions (Submission 2021a, Submission 2021b)

Summary of comments	Consideration of comment
The proposed clearing area occurs within the range of Baudin's cockatoo, Carnaby's cockatoo and the forest red-tailed black cockatoo and is likely to provide suitable habitat for all three species. Any habitat present within the application area that provides for breeding, roosting, or foraging by black cockatoo species should be retained.	See section 3.2.2 of the decision report. Given the applicant's avoidance measures, the assessment concludes that no impact to black cockatoo habitat would occur from the proposed clearing.
The proposed clearing area has not been adequately surveyed, given: • The *Vertebrate Fauna Assessment of Tower Hill/Pwakkenbak Reserve 15162* (Sanders, 2020) was undertaken following a severe burn which is likely to have significantly altered fauna habitat and the likelihood of occurrence of fauna species, and • The *Flora and Vegetation Survey Report - Reserve 15162 Tower Road Mount Barker* (Bio Diverse Solutions, 2020) was undertaken outside of the spring flowering season and within six months of a severe burn– Survey limitations and constrains as being likely to have resulted in issues with flora identification and underestimation of species richness.	in response to a formal Request for Further Information issued by DWER on 19 January 2022, an additional reconnaissance flora, vegetation and basic fauna survey was conducted. For further details see section 3.2.1 of the decision report.
The extent and distribution of the proposed mountain bike trails will fragment vegetation in Very Good to Excellent (Keighery, 1994) condition and will create a series of vegetation patches with a total edge length far greater than at present. This increase in edge effects will significantly increase the potential for weed invasion, the spread of plant and animal disease, feral animal invasion, waste dumping and arson, and the establishment of illegal trails for mountain biking and off-road motorcycles. The loss of biological values through this proposal outweighs any economic benefit that this proposal derives as it decreases both the natural and passive recreation values the project area offers.	The assessment notes the risk of weed spread. This matter is further discussed under section 3.2.3 of the decision report. A requirement to undertake weed control management is conditioned within the clearing permit.
The species and vegetation communities present within the application area are highly susceptible to dieback. Consideration and planning should be undertaken to assess the potential for dieback introduction and spread within the reserve as a result	A dieback occurrence survey was undertaken for this project. This matter is further discussed under section 3.2.3 of the decision report. A requirement to undertake dieback control management is conditioned within the clearing permit.

Summary of comments	Consideration of comment
of the proposed clearing and ongoing use of the proposed trails.	

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 DWER at the time of this assessment. This information was used to inform the assessment of the clearing against the Clearing Principles, contained in Appendix D.

Characteristic	Details
Local context	The application area occurs within Crown Reserve 15162 which is located approximately five kilometres southwest of the Mount Barker townsite in Shire of Plantagenet, within the Jarrah Forest Interim Biogeographic Regionalisation for Australia (IBRA) bioregion, Southern Jarrah Forest subregion. Spatial data indicates the local area (10-kilometre radius of the application area) retains approximately 23.28 per cent of the original native vegetation cover (see Appendix C.2).
Ecological linkage	The application area is mapped within Strategic Zone A of the South West Macro Corridor, which represents a continuous strip of vegetation along the Fitzgerald River valley linking the Fitzgerald River National Park with Lake Magenta Nature Reserve (Wilkins, et al., 2006). The main objective of the South West Macro Corridor project was to improve the long-term future of wildlife within national parks and nature reserves within the South Coast Region of Western Australia by further developing and promoting a regional-scale Macro Corridor Network of native vegetation with inland linkages along major river systems to protected areas and uncleared bushland (Wilkins, et al., 2006). The application area lies within one of the major vegetation corridors known as the “Porongurup Range Corridor” which connects remnant vegetation to existing “Protected Area” corridors (Mount Lindesay National Park, Lake Barnes Road Nature Reserve) to the south and Porongurup National Park to the east (Wilkins et al., 2006). Given the application relates to a narrow, linear track within the larger, intact vegetated reserve, the application area is likely contributing to ecological linkage values of Crown Reserve 15162 and the functionality of the South West Macro Corridor at present.
Conservation areas	The closest conservation area is an un-named reserve (R 10003) approximately 4.2 kilometres east of the application area, which is managed for the purpose of conservation of flora and fauna. According to available databases, approximately 584 hectares of vegetation in the local area occurs within the conservation estate managed by DBCA.
Vegetation description	A reconnaissance flora and vegetation survey undertaken by Bio Diverse Solutions in October 2021 mapped four vegetation units within the application area, described in Table 2. The full survey descriptions and maps are available in Appendix G. Table 2. Vegetation units mapped within the application area for CPS 9349/1 (Bio Diverse Solutions, 2022).

Vegetation unit	Area (ha)	Area (%)
Granite Outcrop	0.08	6
Jarrah / Marri Woodland	1.07	83
Yate Woodland	0.10	8
Cleared	0.04	3
Total	1.29	100

<table>
<tr><th>Characteristic</th><th>Details</th></tr>
<tr><td></td><td>This is consistent with the mapped Beard vegetation association 3, which is described as medium forest; jarrah – marri (Shepherd et al, 2001). This vegetation association retains approximately 67 per cent of the original extent (Government of Western Australia, 2019).</td></tr>
<tr><td>Vegetation condition</td><td>The reconnaissance flora and vegetation survey undertaken by Bio Diverse Solutions (2022) identified that the vegetation condition within the application area is in Very Good to Excellent (Keighery, 1994) condition, with some historically cleared areas, as outlined in Table 3.

Table 3. Vegetation condition mapped within the application area (Bio Diverse Solutions, 2022).
<table>
<tr><th>Vegetation condition (Keighery, 1994)</th><th>Area (ha)</th><th>Area (%)</th></tr>
<tr><td>Excellent</td><td>1.17</td><td>91</td></tr>
<tr><td>Very good</td><td>0.08</td><td>6</td></tr>
<tr><td>Cleared</td><td>0.04</td><td>3</td></tr>
<tr><td>Total</td><td>1.29</td><td>100</td></tr>
</table>
The full Keighery (1994) condition rating scale is provided in Appendix E. The full survey descriptions and mapping are available in Appendix G.</td></tr>
<tr><td>Climate and landform</td><td>The application area slopes down from a high point at around 405 metres Australian Height Datum (mAHD) in the central portion of the application area down towards 390 and 325 mAHD along western and eastern boundary of the application area, respectively.

The application area has a mean annual maximum temperature of 20.1°C and a mean annual minimum temperature of 8.1°C. The annual rainfall is approximately 800 millimetres and annual evapotranspiration rate is 700 millimetres.</td></tr>
<tr><td>Soil description and land degradation risk</td><td>The Department of Primary Industries and Regional Development (DPIRD) (2022) has mapped two soil systems within the application area, described in Table 4.

Table 4. Soil systems mapped within the application area (DPIRD, 2022).
<table>
<tr><th>Soils system</th><th>Description (Schoknecht et al., 2004)</th><th>Area (ha)</th><th>Area (%)</th></tr>
<tr><td>Barrow upper slope Phase (242PrBAg)</td><td>Granite outcrop.</td><td>1.06</td><td>83%</td></tr>
<tr><td>Barrow lower slope Phase (242PrBAf)</td><td>Yellow duplex soils, sands, gravels; Jarrah-Marri-Yate forest.</td><td>0.22</td><td>17%</td></tr>
<tr><td></td><td>Total</td><td>1.29</td><td>100%</td></tr>
</table>
The mapped soil systems have elevated risks of subsurface acidification, but the risks of land degradation in the form of water and wind erosion, salinity, eutrophication, flooding, and waterlogging are low (DPIRD, 2022).</td></tr>
<tr><td>Waterbodies and hydrogeography</td><td>According to available databases, the south-eastern portion of the application area intersects an approximately 185-metre non-perennial tributary of Hay River. The closest mapped wetland is Lake Barnes, approximately eight kilometres south of the application area.

The application area is not mapped within any surface or groundwater areas proclaimed under the Rights in Water and Irrigation Act 1914 (the RIWI Act) and does not transect any water resources proclaimed under either the Metropolitan Water Supply Sewerage and Drainage Act 1909 or Country Areas Water Supply Act 1947 (CAWS Act).

Groundwater salinity within the application area is mapped at 3000 to 7000 milligrams per litre total dissolved solids.</td></tr>
</table>

Characteristic	Details
Flora	The desktop assessment identified that a total of 17 rare flora species have been recorded within the local area, comprising two Priority 1 (P1) flora, four Priority 2 (P2) flora, four Priority 3 (P3) flora, three Priority 4 (P4) flora, and four threatened (T) flora species (Western Australian Herbarium, 1998-). None of these existing records occur within the application area itself but several occur within Crown Reserve 15162 in vegetation adjacent to the application area, including occurrences of *Banksia sphaerocarpa* var. *latifolia* (P2), *Banksia verticillata* (T), *Pimelea rosea* subsp. *annelsii* (P3), *Synaphea preissii* (P3), and *Verticordia endlicheriana* var. *angustifolia* (P3). The reconnaissance flora and vegetation survey undertaken by Bio Diverse Solutions (2022) over two days in October 2021 identified three priority flora species occurring within or immediately adjacent to the application area, comprising *Banksia sphaerocarpa* var. *latifolia*, *Synaphea preissii*, and *Verticordia endlicheriana* var. *angustifolia*. The survey report also acknowledges that the expertise of the surveyors was not adequate to identify *Xanthoparmelia sargentii* (P1), which is a species of lichen (Bio Diverse Solutions, 2022). With consideration for the site characteristics set out above, relevant datasets (see Appendix H.1), the habitat preferences and conservation statuses of the aforementioned species, the distribution and extent of existing records, and biological survey information (Bio Diverse Solutions, 2022), impacts to these species required further consideration (see Appendix C.2).
Ecological communities	No threatened (TEC) or priority ecological communities (PEC) are mapped within the local area (DBCA, 2022c). The vegetation within the application area does not represent 'Proteaceae dominated kwongkan shrublands of the southeast coastal floristic province of Western Australia' listed as Priority 3 by DBCA and Endangered under the EPBC Act (Bio Diverse Solutions, 2022).
Fauna	According to available databases, a total of 16 conservation significant fauna species have been recorded within the local area (DBCA, 2022b). Noting the habitat requirements, distribution of the recorded species, the mapped vegetation type, the condition of the vegetation within the application area, and the findings of the vertebrate fauna assessment (Sanders, 2020), the application area is likely to comprise suitable habitat for eight conservation significant fauna species. Impact to these species required further consideration (see Appendix C.3)

C.2. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix F), and biological survey information (Bio Diverse Solutions, 2022), impacts to the following conservation significant flora required further consideration.

Species name	Cons status	Suitable habitat features ?	Suitable vegetation type?	Suitable soil type?	Distance of closest record to application area (m)	Number of records in local area*	Are surveys adequate to identify?
Banksia brownii	T	Yes	Yes	Yes	1,868	2	Yes
Banksia goodii	T	Yes	Yes	Yes	18,660	0	Yes
Banksia porrecta	4	Yes	Yes	Yes	2,672	4	Yes
Banksia sphaerocarpa var. *latifolia*	2	Yes	Yes	Yes	2,900	3	Yes
Banksia verticillata	T	Yes	Yes	Yes	7	2	Yes
Bossiaea lalagoides	3	Yes	Yes	Yes	5,783	1	Yes
Caladenia harringtoniae	T	Yes	Yes	Yes	21,150	0	Yes
Conostylis misera	T	Yes	Yes	Yes	5,003	8	Yes

Species name	Cons status	Suitable habitat features ?	Suitable vegetation type?	Suitable soil type?	Distance of closest record to application area (m)	Number of records in local area*	Are surveys adequate to identify?
Drakea micrantha	T	Yes	Yes	Yes	34,570	0	Yes
Gastrolobium ferrugineum	2	Yes	Yes	Yes	3,265	1	No
Isopogon uncinatus	T	Yes	Yes	Yes	13,110	0	Yes
Pimelea rosea subsp. *annelsii*	3	Yes	Yes	Yes	7	4	Yes
Schoenus sp. Mt Barker (G.J. Keighery 9679)	1	Yes	Yes	Yes	1,789	1	Yes
Sphenotoma drummondii	T	Yes	Yes	Yes	18,053	0	Yes
Synaphea preissii	3	Yes	Yes	Yes	5,838	2	Yes
Thysanotus sp. Badgingarra (E.A. Griffin 2511)	2	Yes	Yes	Yes	2,672	1	No
Verticordia apecta	T	Yes	Yes	Yes	16,120	0	Yes
Verticordia endlicheriana var. *angustifolia*	3	Yes	Yes	Yes	6	10	Yes
Xanthoparmelia sargentii	1	Yes	Yes	Yes	513	1	No

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

*The table may include duplicate records. The total number of each species is indicative only.

C.3. Fauna analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix FH.1), and a vertebrate fauna assessment (Sanders, 2020), impacts to the following conservation significant fauna required further consideration.

Species name	Conservation status	Suitable habitat features?	Distance of closest record to application area (m)	Are surveys adequate to identify?
Baudin's cockatoo	EN	Yes	1,764	Yes
Carnaby's cockatoo	EN	Yes	267	Yes
forest red-tailed black cockatoo	VU	Yes	2,635	Yes
numbat, walpurti	EN	Yes	1,526	No
quenda, southwestern brown bandicoot	P4	Yes	5	No
south-western brush-tailed phascogale, wambenger	CD	Yes	5,028	No
western brush wallaby	P4	Yes	3,133	No
western ringtail possum, ngwayir	CR	Yes	1,526	No

CR: critically endangered, EN: endangered, VU: vulnerable, EX: Presumed extinct species, IA (M) Migratory birds protected under an international agreement, CD: Conservation dependent fauna, OS: Other specially protected fauna

Appendix D. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment: The application area contains values which are considered to indicate a high level of biodiversity; namely: • Suitable habitat for conservation significant flora; and • significant habitat for conservation significant fauna.	At variance	Yes Refer to Section 3.2.1, above.

Assessment against the clearing principles	Variance level	Is further consideration required?
Principle (b): *"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."* Assessment: The proposed clearing area contains significant foraging habitat for black cockatoo. Ground dwelling conservation significant fauna may also utilise the application area.	At variance	Yes Refer to Section 3.2.2, above.
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: The application area is unlikely to contain habitat for threatened flora species listed under the BC Act due to the completely degraded condition (Keighery, 1994) of the vegetation within the application area, comprising a thick understorey layer of *Rubus* sp.	Not likely to be at variance	No *Refer to Section 3.2.1, above.*
Principle (d): *"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."* Assessment: The proposed clearing area does not contain species composition indicative of a TEC listed under the BC Act or EPBC Act.	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		
Principle (e): *"Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared."* Assessment: The extent of the mapped vegetation type and native vegetation in the local area is inconsistent with the national objectives and targets for biodiversity conservation in Australia. In addition, the application area provides habitat for conservation significant flora and fauna species. On this basis, the native vegetation proposed to be cleared represents a significant remnant of native vegetation in an area that has been extensively cleared.	At variance	No *Refer to Section 3.2.3, above.*
Principle (h): *"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."* Assessment: Given the separation distance between the application area and the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of nearby conservation areas.	Not likely to be at variance	No
Environmental value: land and water resources		
Principle (f): *"Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."* Assessment: A small extent of the vegetation proposed to be cleared is growing in an environment associated with Wilgarrup River. The proposed clearing may cause sedimentation, turbidity and/or changes to other water qualities. Noting the size of the river and extent of the proposed clearing, the impacts will likely	At variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
be localised and temporary only. No long-term adverse impacts on the ecological functions of the river are anticipated.		
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: The mapped soils are not susceptible to land degradation in form of soil erosion, salinity and eutrophication. Noting the extent of the application area and native vegetation within the local area, the proposed clearing is not likely to have an appreciable impact on land degradation. Due to the sandy soils type, the application area has an increased risk of wind erosion. However, noting the fragmented, liner extent of the application area, the proposed clearing is not likely to cause appreciable impact on land degradation.	Not likely to be at variance	No
Principle (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."* Assessment: Given the abundance of native vegetation in the local area and marginal (Mayer et al., 2005) level of salinity mapped within the application area, the proposed clearing will unlikely lead to a perceptible rise in the water table and an increase in groundwater salinity levels. The clearing at the crossings with mapped watercourse may increase sediment loads. Given the relatively small, linear and fragmented extent of vegetation proposed to be cleared at the crossings, the sediment increase is considered to be minor and temporary only. No long-term impacts on quality of surface and underground water are anticipated.	Not likely to be at variance	No
Principle (j): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding."* Assessment: Given the small extent of watercourse recorded within the application area, the proposed clearing is unlikely to contribute to waterlogging. 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.	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

Calculation 1: Rehabilitation within the Reserve 17394 currently vested under a gravel pit.

Field Name	Description	Justification for value used
Area of impact (habitat/community) or Quantum of impact (features/individuals)	The area of habitat/community impacted or number of features/individuals impacted	**1.29** - hectares of native vegetation that is significant as a remnant within an area which has been extensively cleared.
Quality of impacted area (habitat/community)	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	**8** - The Reconnaissance Flora and Vegetation Survey Report – Part Reserve 15162 Tower Road, Mount Barker (Bio Diverse Solutions, 2022) identified that the vegetation within the application area is in Excellent (Keighery, 1994) condition. The application area is part of a larger remnant of vegetation within a fragmented landscape and provides habitat for conservation significant flora and fauna.
Time over which loss is averted (habitat/community)	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.
Time until ecological benefit (habitat/community) or Time horizon (features/individuals)	This describes the estimated time (in years) that it will take for the main benefit of the quality (habitat/community) or value (features/individuals) improvement of the proposed mitigation to be realised	**10** - It is assumed that the benefits of rehabilitation of native vegetation that is significant as a remnant within an area which has been extensively cleared will be available after 10 years.
Start area (habitat/community) or Start value (features/individuals)	The area of habitat/community or number of features/individuals proposed to mitigate the impacts	**3.15** - The rehabilitation offset area available within Reserve 17394 for rehabilitation
Start quality (habitat/community)	The quality score for the area of habitat/community proposed as mitigation - a measure of how well a particular site supports a particular threatened species or ecological community and contributes to its ongoing viability	**2** - The native vegetation within the offset site (Reserve 17394) to be rehabilitated ranges from good to completely degraded (Keighery, 1994) with majority of the area mapped as degraded. An average quality score of 2 as a starting value is therefore used.
Future quality without offset (habitat/community) or Future value without offset (features/individuals)	The predicted future quality score (habitat/community) or value (features/individuals) of the proposed mitigation site without the mitigation	**2** - It is not expected that the quality of native vegetation within the offset site will significantly change over a one year period, in the absence of the offset.
Future quality with offset (habitat/community) or Future value with offset (features/individuals)	The predicted future quality score (habitat/community) or value (features/individuals) of the proposed mitigation site with the mitigation	**5** - It is assumed that with appropriate rehabilitation measures, the condition and quality of native vegetation that is significant as a remnant within an area which has been extensively cleared within the offset site (Crown Reserve 17394) will be improved in accordance with the rehabilitation management plan.
Risk of loss (%) without offset (habitat/community)	This describes the chance that the habitat/community on the proposed	**15%** - The revegetation offset site (Crown Reserve 17394) is currently

	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	vested for use as a Gravel Pit. Therefore, there is a moderate risk of loss without the offset.
Risk of loss (%) with offset (habitat/community)	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%** - The vesting of the revegetation offset site (Crown Reserve 17394) will be changed to conservation. Therefore, the risk of loss is reduced with the offset.
Confidence in result (%) – Change in quality (habitat/community) or Change in value (features/individuals)	The level of certainty about the successful achievement of the proposed change in quality (habitat/community) or value (features/individuals)	**80%** - There is a moderate level of confidence that the offset will achieve the predicted result, given rehabilitation will be undertaken in accordance with a revegetation/rehabilitation plan.
Revegetation credit (net present value)	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	**76.9%** - obtained through the input of variables explained above.

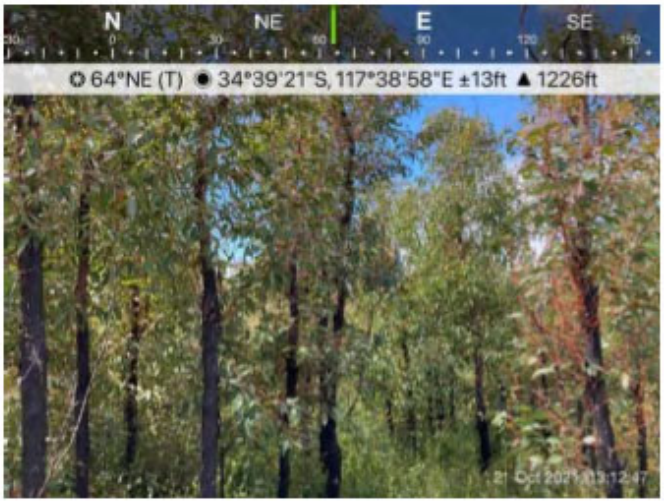
Calculation 2: Rehabilitation within Reserve 27185 currently vested under conservation.

Field Name	Description	Justification for value used
Area of impact (habitat/community) or Quantum of impact (features/individuals)	The area of habitat/community impacted or number of features/individuals impacted	**1.29** hectares of native vegetation that is significant as a remnant within an area which has been extensively cleared.
Quality of impacted area (habitat/community)	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	**8** - The Reconnaissance Flora and Vegetation Survey Report – Part Reserve 15162 Tower Road, Mount Barker (Bio Diverse Solutions, 2022) identified that the vegetation within the application area is in Excellent (Keighery, 1994) condition. The application area is part of a larger remnant of vegetation within a fragmented landscape and provides habitat for conservation significant flora and fauna.
Time over which loss is averted (habitat/community)	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.
Time until ecological benefit (habitat/community) or Time horizon (features/individuals)	This describes the estimated time (in years) that it will take for the main benefit of the quality (habitat/community) or value (features/individuals) improvement of the proposed mitigation to be realised	**10** - It is assumed that the benefits of rehabilitation of native vegetation that is significant as a remnant within an area which has been extensively cleared will be available after 10 years.
Start area (habitat/community) or Start value (features/individuals)	The area of habitat/community or number of features/individuals proposed to mitigate the impacts	**1.38** - The rehabilitation offset area available within Reserve 17394 for rehabilitation

Start quality (habitat/community)	The quality score for the area of habitat/community proposed as mitigation - a measure of how well a particular site supports a particular threatened species or ecological community and contributes to its ongoing viability	**3** - The native vegetation within the offset site (Crown Reserve 27185) to be rehabilitated ranged from very good to completely degraded (Keighery, 1994) condition, hence an average of 3 as a starting quality is used.
Future quality without offset (habitat/community) or Future value without offset (features/individuals)	The predicted future quality score (habitat/community) or value (features/individuals) of the proposed mitigation site without the mitigation	**3** - It is not expected that the quality of native vegetation within the offset site will significantly change over a one year period, in the absence of the offset.
Future quality with offset (habitat/community) or Future value with offset (features/individuals)	The predicted future quality score (habitat/community) or value (features/individuals) of the proposed mitigation site with the mitigation	**6** - It is assumed that with appropriate rehabilitation measures provided in the rehabilitation plan, the condition and quality of native vegetation that is significant as a remnant within an area which has been extensively cleared within the offset site (Crown Reserve 27185) will be improved.
Risk of loss (%) without offset (habitat/community)	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	**5%** - The revegetation offset site (Crown Reserve 27185) is currently vested for Conservation in perpetuity. Therefore, there is a low risk of loss without the offset.
Risk of loss (%) with offset (habitat/community)	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%** - The revegetation offset site (Crown Reserve 27185) is currently vested for Conservation in perpetuity. Therefore, there is a low risk of loss without the offset.
Confidence in result (%) – Change in quality (habitat/community) or Change in value (features/individuals)	The level of certainty about the successful achievement of the proposed change in quality (habitat/community) or value (features/individuals)	**80%** - There is a moderate level of confidence that the offset will achieve the predicted result, given rehabilitation will be undertaken in accordance with a revegetation/rehabilitation plan.
Revegetation credit (net present value)	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	**30.2%** - obtained through the input of variables explained above.

Appendix G. Biological survey information excerpts / photographs of the vegetation

Photographs and survey excerpts from the Reconnaissance flora and vegetation survey report



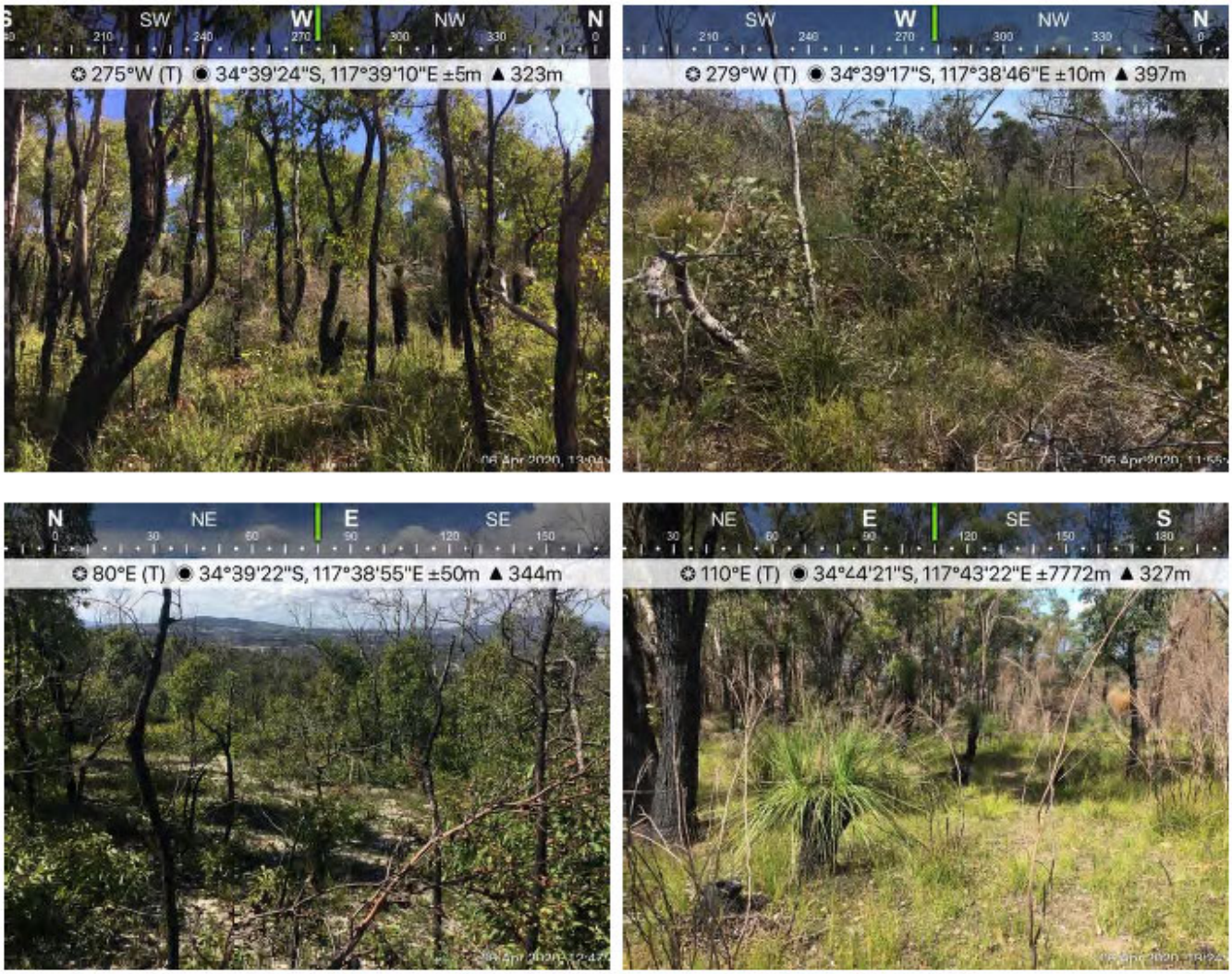


Figure 5: Photographs of they survey area.

Table 5: Vegetation condition rating within the survey area

Vegetation type	Condition rating	Area (ha)
Yate Woodland	Excellent	1.89
	Very Good	0.05
Jarrah / Marri Woodland	Excellent	49.83
	Very Good	1.90
Open Granite Outcrops	Excellent	4.88
	Very Good	0.05
Total		**58.60**

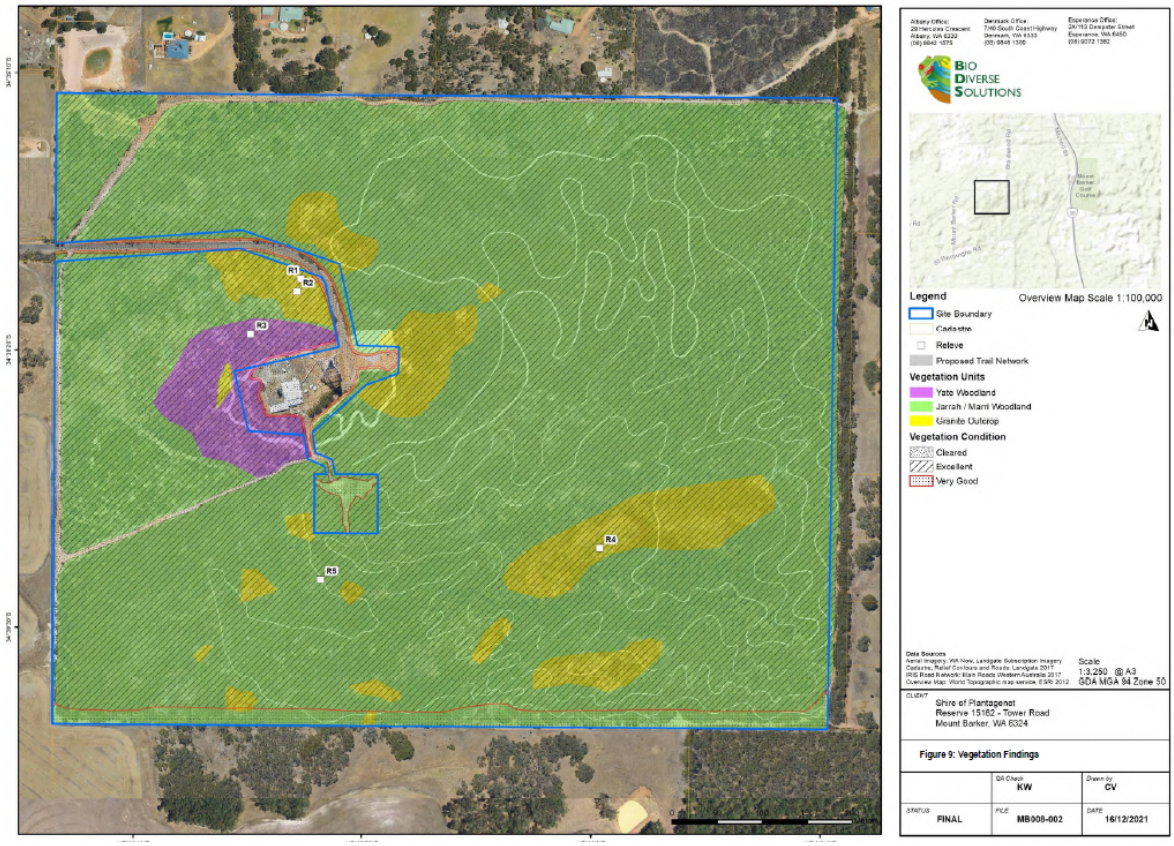


Figure 6: Vegetation units mapped within the survey area.

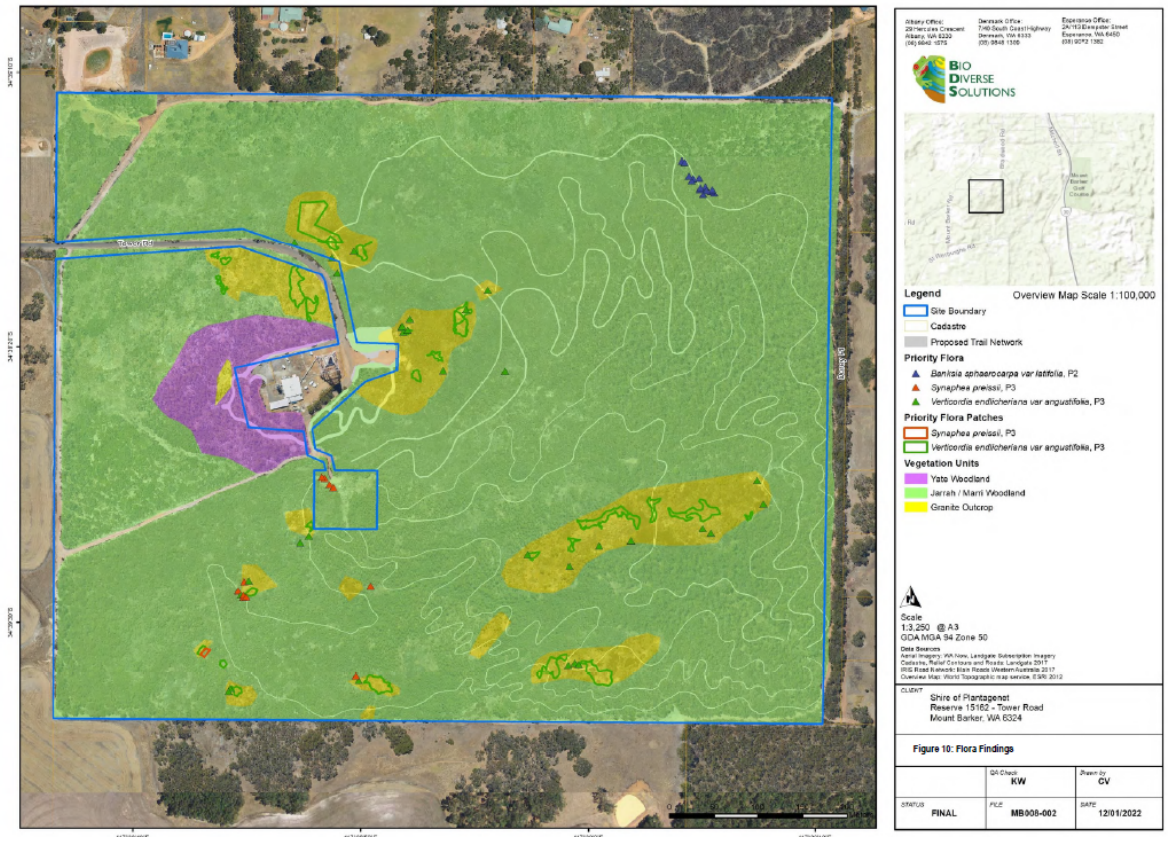


Figure 7: Location of the priority flora species identified within the survey area.

Figure 8: A map illustrating tracks walked, black cockatoo habitat and sites.

Figure 9 – Tree hollows identified within the reserve.

Dieback occurrence survey

Table 6 – Area of disease occurrence

Tower Hill Reserve – Summary of Key Statistics	
Area of Assessable Vegetation	60.55 ha
Infested Vegetation	1.77 ha
Uninfested Vegetation	0 ha
Uninterpretable Vegetation	46.20 ha
Temporarily Uninterpretable	12.57 ha

Figure 10 – A map representing the phytophthora dieback disease status.

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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