



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 8850/1
Permit Holder:	Shire of Harvey
Duration of Permit:	From 18 April 2022 to 18 April 2037

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

PART I – CLEARING AUTHORISED

1. Clearing authorised (purpose)

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

2. Land on which clearing is to be done

The Promenade road reserve (PIN 11977576), Australind
Lot 7002 on Deposited Plan 420660, Australind

3. Clearing authorised

The permit holder must not clear more than 1.98 hectares of *native vegetation* within the area 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 18 April 2027.

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

7. Directional clearing

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

8. Fauna management – western ringtail possums

- (a) In relation to the area cross-hatched yellow in Figure 1 of Schedule 1, the permit holder must engage a *fauna specialist* to inspect that area immediately prior to, and for the duration of clearing activities, for the presence of western ringtail possum(s) (*Pseudocheirus occidentalis*).
- (b) Clearing activities must cease in any area where fauna referred to in condition 8(a) are identified until either:
 - (i) the western ringtail possum(s) individual has moved on from that area to adjoining *suitable habitat*; or
 - (ii) the western ringtail possum(s) individual has been removed by a *western ringtail possum specialist*.
- (c) Any western ringtail possum(s) individual removed in accordance with condition 8(b)(ii) must be relocated by a *western ringtail possum specialist* to a *suitable habitat*.
- (d) Where fauna is identified under condition 8(a), the permit holder must within 14 calendar days provide the following records to the *CEO*:
 - (i) the number of individuals identified;
 - (ii) the date each individual was identified;
 - (iii) the location where each individual was identified recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
 - (iv) the number of individuals removed and relocated;
 - (v) the relevant qualifications of the *western ringtail possum specialist* undertaking removal and relocation;
 - (vi) the date each individual was removed;
 - (vii) the method of removal;
 - (viii) the date each individual was relocated;
 - (ix) the location where each individual was relocated to, recorded using a GPS unit set to GDA94, expressing the geographical coordinates in Eastings and Northings or decimal degrees; and

- (x) details pertaining to the circumstances of any death of, or injury sustained by, an individual.

9. Offset – Rehabilitation

- (a) The permit holder must *rehabilitate* at least 5.89 hectares of *native vegetation* in a degraded (Keighery, 1994) condition within the area cross-hatched red within Lot 150 on Deposited Plan 29857, Parkfield, in Figure 1 of Schedule 2 of this permit, of which:
- (i) 5.69 hectares must contain species which provide suitable foraging and breeding habitat for *Pseudocheirus occidentalis* (western ringtail possum) as identified in the *western ringtail possum recovery plan*.
 - (ii) 5.89 hectares must contain species which provide suitable foraging habitat for *Calyptorhynchus latirostris* (Carnaby's Cockatoo), *Calyptorhynchus banksia* subsp. *naso* (Forest Red-tailed Black Cockatoo) and *Calyptorhynchus baudinii* (Baudin's Cockatoo) as identified in the *black cockatoo recovery plan*.
 - (iii) 4.13 hectares must contain species commonly found in the Banksia Woodlands of the Swan Coastal Plain ecological community as described in *Approved Conservation Advice*.
- (b) The *rehabilitation* required under condition 9(a) of this permit, must be undertaken in accordance with the *Project Rehabilitation Plan* prepared under condition 10 of this permit.

10. Offset - Project Rehabilitation Plan

- (a) Within 12 months of the commencement of clearing authorised under this permit, the permit holder must submit a *Project Rehabilitation Plan* to the CEO for approval for the areas cross-hatched red within Lot 150 on Deposited Plan 29857, Parkfield, in Figure 1 of Schedule 2, which shall be developed in accordance with *A Guide to Preparing Revegetation Plans for Clearing Permits* (Department, 2018).
- (b) The *Project Rehabilitation Plan* must be prepared by an *environmental specialist*.
- (c) The *Project Rehabilitation Plan* must include the following:
- (i) *site preparation*
 - (ii) *herbivore exclusion*
 - (iii) *weed control*
 - (iv) *a vegetation establishment period*
 - (v) *revegetation success completion criteria* shall include but not be limited to target *weed cover*, target *vegetation condition*, target density, species richness, bare ground cover and target structure
 - (vi) *revegetation success completion criteria* must be consistent with:
 - *reference site 1* for the *rehabilitation* area required under condition 9(a)(i) and 9(a)(ii) of this permit; and
 - *reference site 2* for the *rehabilitation* area required under condition 9(a)(iii) of this permit.

- (vii) *regeneration, direct seeding or planting, of local provenance species at an optimal time* in accordance with a defined species list. Species must include suitable foraging and breeding habitat for *Pseudocheirus occidentalis* (western ringtail possum), suitable foraging, breeding and roosting habitat for *Calyptorhynchus latirostris* (Carnaby's cockatoo), *Calyptorhynchus banksia* subsp. *naso* (forest red-tailed black cockatoo) and *Calyptorhynchus baudinii* (Baudin's cockatoo) and species which are commonly found in the Banksia Woodlands of the Swan Coastal Plain ecological community as described in *Approved Conservation Advice*.
 - (viii) contingency actions to be undertaken if *completion criteria* are not met
 - (ix) ongoing maintenance and monitoring of the areas required to be *revegetated and rehabilitated*
 - (x) timeframes for completion of the activities
 - (xi) management commitments that will be achieved
- (d) The permit holder shall implement the *Project Rehabilitation Plan* as approved by the *CEO* and the Director General of the Department of Biodiversity, Conservation and Attractions.

PART III - RECORD KEEPING AND REPORTING

11. Records that must be kept

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

Table 1: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	<ul style="list-style-type: none"> (a) the species composition, structure, and density of the cleared area; (b) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings; (c) the date that the area was cleared; (d) the direction that clearing was undertaken; (e) the size of the area cleared (in hectares); (f) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 5; (g) actions taken to minimise the risk of the introduction and spread of <i>weeds</i> and <i>dieback</i> in accordance with condition 6; and

No.	Relevant matter	Specifications
		(h) actions taken to manage and mitigate impacts to <i>western ringtail possums</i> in accordance with condition 8.
2.	in relation to <i>rehabilitation</i> pursuant to condition 9	(a) a description of the <i>revegetation</i> and <i>rehabilitation</i> activities undertaken; (b) the size of the areas <i>revegetated</i> and <i>rehabilitated</i> (in hectares); (c) the date that <i>revegetation</i> and <i>rehabilitation</i> works began; (d) any remediation works undertaken; and (e) the date that <i>completion criteria</i> are considered to be met.

12. 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 11 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 18 January 2037, the permit holder must provide to the *CEO* a written report of records required under condition 11 of this permit, where these records have not already been provided under condition 12(a) of this permit.

DEFINITIONS

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

Table 2: Definitions

Term	Definition
Approved Conservation Advice	means Approved Conservation Advice (incorporating listing advice) for the Banksia Woodlands of the Swan Coastal Plain ecological community prepared by the Threatened Species Scientific Committee, available at: http://www.environment.gov.au/biodiversity/threatened/communities/pubs/131-conservation-advice.pdf
black cockatoo recovery plan	means: a) A recovery plan prepared by Department of Environment and Conservation (2008) for Forest Black Cockatoo (Baudin's Cockatoo <i>Calyptorhynchus baudinii</i> and Forest Red tailed Black Cockatoo <i>Calyptorhynchus banksii naso</i>) b) A recovery plan prepared by Department of Parks and Wildlife (2013) for Carnaby's cockatoo (<i>Calyptorhynchus latirostris</i>)
black cockatoo species	means one or more of the following species: a) <i>Calyptorhynchus latirostris</i> (Carnaby's cockatoo);

Term	Definition
	b) <i>Calyptorhynchus baudinii</i> (Baudin's cockatoo); and/or c) <i>Calyptorhynchus banksii naso</i> (forest red-tailed black cockatoo).
CEO	Chief Executive Officer of the department or his/her delegates responsible for the administration of the clearing provisions under the <i>Environmental Protection Act 1986</i> .
clearing	has the meaning given under section 3(1) of the EP Act.
completion criteria	means a measurable outcome based on suitable <i>reference sites</i> , used to determine <i>revegetation/rehabilitation</i> success
condition	a <i>condition</i> to which this clearing permit is subject under section 51H of the EP Act.
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
dieback	means the effect of <i>Phytophthora</i> species on native vegetation.
direct seeding	means a method of re-establishing vegetation through establishment of a seed bed and the introduction of seeds of the desired plant species.
environmental specialist	means a person who holds a tertiary qualification in environmental science or equivalent and has experience relevant to the type of environmental advice that an environmental specialist is required to provide under this permit, or who is approved by the <i>CEO</i> as a suitable environmental specialist.
EP act	<i>Environmental Protection Act 1986</i> (WA)
fauna specialist	means a person who holds a tertiary qualification specialising in environmental science or equivalent, and has a minimum of 2 years work experience in fauna identification and surveys of fauna native to the region being inspected or surveyed, or who is approved by the <i>CEO</i> as a suitable fauna specialist for the bioregion, and who holds a valid fauna licence issued under the <i>Biodiversity Conservation Act 2016</i> .
fill	means material used to increase the ground level, or to fill a depression.
local provenance	means <i>native vegetation</i> seeds and propagating material from natural sources within 50 kilometres and the same Interim Biogeographic Regionalisation for Australia (IBRA) subregion of the area cleared.
mulch	means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation.
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
optimal time	means the period from April to July for undertaking <i>planting</i> and <i>seeding</i> .
planting	means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of the desired species.
Project Rehabilitation Plan	Means plans developed by the permit holder for the <i>revegetation</i> and <i>rehabilitation</i> of a site in accordance with condition 10 of this permit:
reference site 1	means nearby sites used to provide baseline data for planning a revegetation project. Measurements from fixed reference points or plots where biodiversity components are measured are used to set measurable completion criteria for revegetation projects. The reference sites must contain native vegetation which provides the following values: <ul style="list-style-type: none"> • provides suitable habitat for <i>Pseudocheirus occidentalis</i> (western ringtail possum) • provides suitable foraging habitat for <i>Calyptorhynchus latirostris</i>

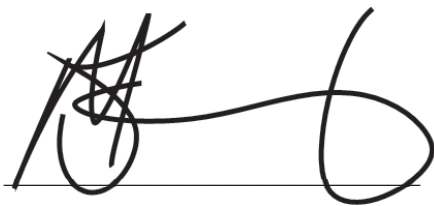
Term	Definition
	<p>(Carnaby’s cockatoo), <i>Calyptorhynchus banksia</i> subsp. <i>naso</i> (forest red-tailed black cockatoo) and <i>Calyptorhynchus baudinii</i> (Baudin’s cockatoo)</p> <ul style="list-style-type: none"> accurately represents the surrounding vegetation in adjacent lands managed by the Department of Biodiversity, Conservation and Attractions in good (Keighery, 1994) or better condition.
reference site 2	<p>means nearby sites used to provide baseline data for planning a revegetation project. Measurements from fixed reference points or plots where biodiversity components are measured are used to set measurable completion criteria for revegetation projects. The reference sites must contain the following value:</p> <ul style="list-style-type: none"> native vegetation which represents the ‘Banksia Woodlands of the Swan Coastal Plain’ State listed priority ecological community.
regeneration	<p>means revegetation that can be established from in situ seed banks contained either within the topsoil or seed-bearing mulch.</p>
rehabilitate, rehabilitated and rehabilitation	<p>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.</p>
revegetate revegetated and revegetation	<p>means the re-establishment of a cover of local provenance native vegetation in an area using methods such as natural regeneration, direct seeding and/or planting, so that the species composition, structure and density is similar to pre-clearing vegetation types in that area</p>
site preparation	<p>means management of existing site topsoil and preparation of the finished soil surface for revegetation, for example by ripping or tilling the soil surface and respreading site topsoil and chipped native vegetation</p>
suitable habitat (western ringtail possum)	<p>means habitat known to support western ringtail possums (<i>Pseudocheirus</i> (<i>Pseudocheirus occidentalis</i>) within the known current distribution of the species, typically characterised by abundant foliage, presence of suitable nesting structures such as tree hollows, as well as high canopy cover and continuity. Known habitat includes peppermint (<i>Agonis flexuosa</i>) dominated woodlands, jarrah (<i>Eucalyptus marginata</i>) and marri (<i>Corymbia calophylla</i>) forests, riparian vegetation with a canopy of Bullich (<i>Eucalyptus megacarpa</i>) or flooded gum (<i>Eucalyptus rudis</i>), karri (<i>Eucalyptus diversicolor</i>) forests, sheoak (<i>Allocasuarina fraseriana</i>) dominated woodlands, and other stands of myrtaceous trees growing near swamps, watercourses or floodplains</p>
vegetation condition	<p>means the rating given to native vegetation which refers to the impact of disturbance on each of the layers and the ability of the community to regenerate (Keighery, 1994)</p>
vegetation establishment period	<p>means a period of at least two summers after the revegetation during which time replacement and infill revegetation works may be required for areas in which revegetation has been unsuccessful, and involves regular inspections of revegetation sites to monitor the success of revegetation</p>
weeds	<p>means any plant –</p> <ol style="list-style-type: none"> that is a declared pest under section 22 of the <i>Biosecurity and Agriculture Management Act 2007</i>; or published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or <p>not indigenous to the area concerned.</p>
western ringtail possum recovery plan	<p>means a plan prepared by Department of Parks and Wildlife (2017) to guide recovery actions for the western ringtail possum for the next 10 years.</p>

Term	Definition
western ringtail possum specialist	means a fauna specialist who holds a tertiary qualification specialising in environmental science or equivalent, has a minimum of two years of work experience in western ringtail possum (<i>Pseudocheirus occidentalis</i>) identification, surveys of western ringtail possums and capture and handling of western ringtail possums, and holds a valid fauna licence issued under the Biodiversity Conservation Act 2016.

REFERENCES

- Department of Environment and Conservation (2008). Forest Black Cockatoo (Baudin's Cockatoo *Calyptorhynchus baudinii* and Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso*) Recovery Plan. Department of Environment and Conservation, Perth, Western Australia.
- Department of Parks and Wildlife (2013). Carnaby's cockatoo (*Calyptorhynchus latirostris*) Recovery Plan. Department of Parks and Wildlife, Perth, Western Australia
- Department of Parks and Wildlife (2017). Western Ringtail Possum (*Pseudocheirus occidentalis*) Recovery Plan. Wildlife Management Program No. 58.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.

END OF CONDITIONS



Mathew Gannaway
MANAGER
NATIVE VEGETATION REGULATION

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

25 March 2022

Schedule 1

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

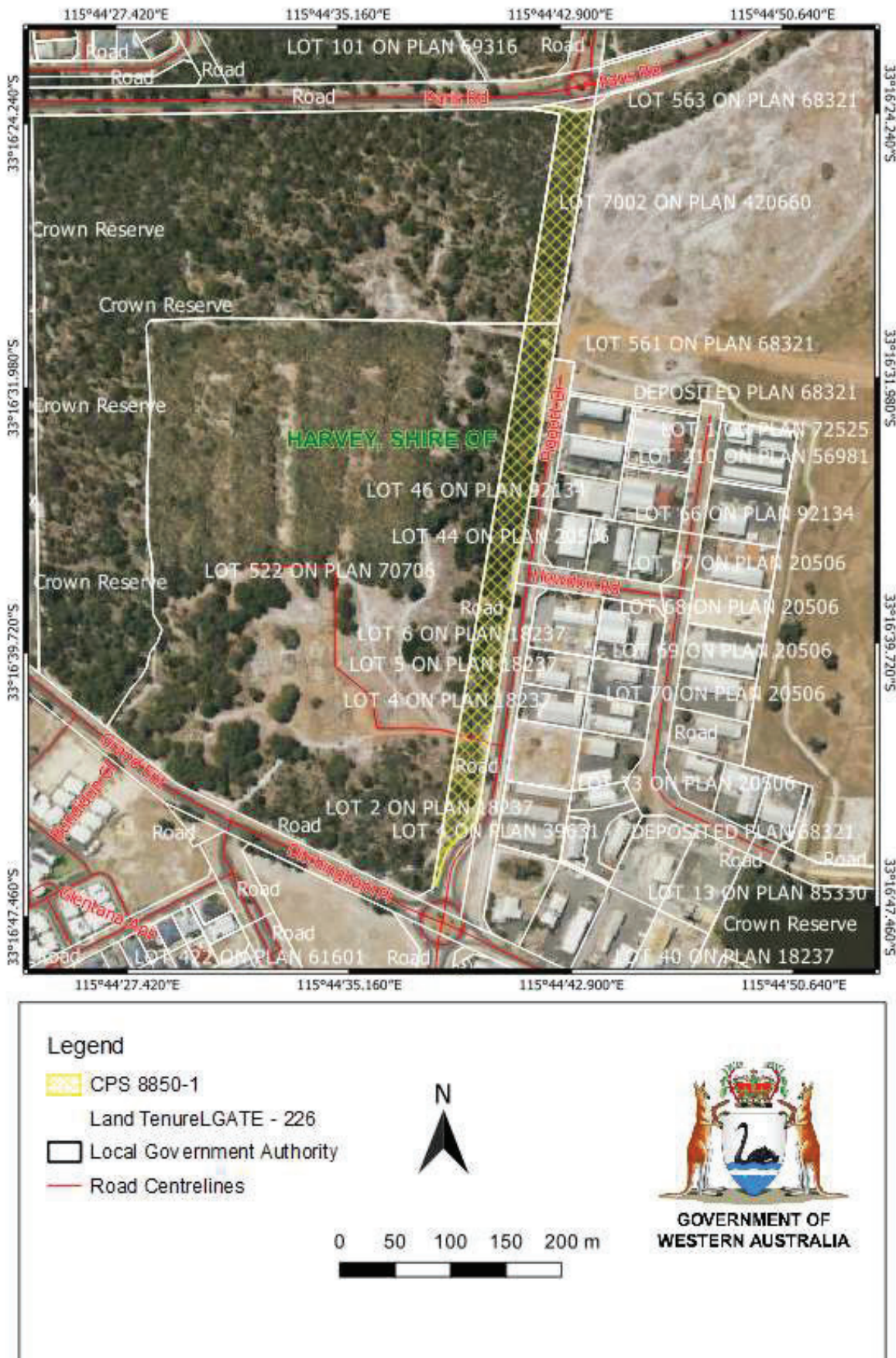


Figure 1: Map of the boundary of the area within which clearing may occur

Schedule 2

The boundary of the area of the offset site is shown in the map below (Figure 1).



Figure 1: Map of the boundary of the area within which *rehabilitation* activities may occur



Clearing Permit: Decision Report

1. Application details and outcome

1.1. Permit application details

Permit number:	CPS 8850/1
Permit type:	Purpose Permit
Applicant name:	Shire of Harvey
Application received:	23 March 2020
Application area:	1.98 hectares (revised) of native vegetation
Purpose of clearing:	Road construction and upgrades
Method of clearing:	Mechanical
Properties:	The Promenade road reserve (PIN 11977576), Australind Lot 7002 on Deposited Plan 420660, Australind
Location (LGA area):	Shire of Harvey
Locality:	Australind

1.2. Description of clearing activities

The applicant proposes to clear 1.98 hectares of native vegetation within Lot 7002 on Deposited Plan 420660 and The Promenade road reserve (PIN 11977576), Australind, for the purpose of extending Kingston Drive. Kingston Drive has been identified as a significant distributor road and as such has received funding via Main Roads Western Australia as part of the Regional Road Group allocation. As a distributor road it is designed as a split carriageway in order to convey high volumes of traffic (including cycle lanes). The median strip is required to provide both safe separation between carriageways as well as stacking distance for turning vehicles.

1.3. Decision on application

Decision:	Granted
Decision date:	25 March 2022
Assessment area:	1.98 hectares of native vegetation as depicted in Section 1.5, and Figure 1 below.

1.4. Assessment summary

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

The assessment has identified that the proposed clearing is at variance to clearing Principles (a), (b), (d) and (e) and that significant residual impacts remain after the application of the avoidance and mitigation measures provided by the applicant. Residual impact consists of the loss of:

- 1.18 hectares of the application area that provides core habitat for the Threatened Western Ringtail Possum (*Pseudocheirus occidentalis*);
- 1.60 hectares that provides suitable foraging habitat for Threatened black cockatoo species;
- 1.60 hectares of native vegetation considered a significant remnant of native vegetation in an area that has been extensively cleared; and
- 0.98 hectares that is representative of the 'Banksia Woodlands of the Swan Coastal Plain' Threatened Ecological Community.

The proposed clearing will also result in:

- potential impacts to fauna present within the application area at the time of clearing including the Threatened Western Ringtail Possum; and
- the potential introduction and spread of weeds and dieback into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values.

After consideration of the available information, it was concluded that subject to conditions, the proposed clearing can be managed to unlikely lead to an unacceptable risk to environmental values. Potential management conditions include:

- avoid, minimise and reduce the impacts and extent of clearing;

- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback;
- undertake slow, progressive one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity;
- engage an experienced Western Ringtail Possum specialist to monitor clearing activities; and
- provide an appropriate offsets package consistent with the WA Environmental Offsets Guidelines (August 2014).

The offset for this project involves revegetation and rehabilitation within Lot 150 on Deposited Plan 29857 (Lot 150) vested with the Department of Biodiversity, Conservation and Attractions (DBCA) for conservation. Revegetation and rehabilitation of existing remnant patches over Lot 150 through weed management, herbivore exclusion, and infill planting has the capacity to improve the habitat and native vegetation quality to the standard required to satisfy offset requirements. Revegetation can be used to increase the size of remnant patches, and to provide buffers or ecological connections. The areas of revegetation and rehabilitation required include





- 5.69 hectares of Western Ringtail Possum habitat from degraded to good habitat condition would offset the 1.18 hectares of residual impact to this species.
- 5.89 hectares of black cockatoo foraging habitat from degraded to good condition would offset the 1.6 hectares of residual impact to black cockatoos.
- 5.56 hectares of native vegetation from degraded to good condition (Keighery 1994) would offset the 1.6 hectares of residual impact to significant remnant vegetation.
- 4.13 hectares of Banksia Woodland from degraded to good vegetation condition (Keighery 1994) would offset the 1.6 hectares of residual impact to significant remnant vegetation.


1.5. Site map

The area cross-hatched yellow indicates the area authorised to be cleared under the granted clearing permit.

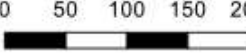


Legend


-  CPS 8850-1
-  Land Tenure LGATE - 226
-  Local Government Authority
-  Road Centrelines



N



0 50 100 150 200 m



**GOVERNMENT OF
WESTERN AUSTRALIA**

Figure 1: Map of the application area

2. Legislative context

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

In addition to the matters considered in accordance with section 51O of the EP Act (Section 3), the assessment also had regard to the objects and principles under section 4A of the EP Act, particularly:

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

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act);
- *Conservation and Land Management Act 1984* (WA) (CALM Act);
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act); and
- *Planning and Development Act 2005* (WA) (P&D Act).

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2013);
- *Procedure: Native vegetation clearing permits* (DWER, October 2019);
- *Environmental Offsets Guidelines* (August 2014);
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016); and
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA 2016).

3. Detailed assessment of application

3.1. Avoidance, minimisation and mitigation measures

The Kingston Drive extension will provide a link from Kingston into the Treendale commercial precinct. Roadworks include roundabouts located to accept the future Kingston Drive extension. These are sized to accept articulated trucks to allow access into the adjacent Light Industrial Area (LIA).

Alternative options were considered by the Shire of Harvey (Shire) focusing on the adjacent light industrial land use to the immediate east, as the adjacent Lot 561 on Deposited Plan 68321 (Lot 561) incorporates road reserves (PIN 1188529, PIN 1188528) that could potentially be extended north (Shire of Harvey 2020b). Options considered in regard to the adjacent Lot 561 all required agreement of the land owner, and the land owner (a developer) is considering a change of tenure from light industrial to urban deferred. An unconstructed road reserve occurs in the eastern section of Lot 561 and a land swap could be considered. However, there is a requirement from the Shire to maximise light industrial tenure in this area so this option could not be realised. In addition, Main Roads 'road hierarchy' applies and Kingston Drive has been identified as a significant distributor road. As a distributor road it is designed with no frontages with a split carriageway to convey high volumes of traffic. A median strip is required to provide both safe separation between carriageways as well as stacking distance for turning vehicles. Existing road reserves within Lot 561 are not adequate as they are smaller service roads with lot frontages and this option cannot be considered (Shire of Harvey 2020a).

The applicant has advised that the following road design specifications are required, whereby there is little scope to amend this design and minimise clearing (Shire of Harvey 2018; Shire of Harvey 2020a).

- Two 2.5 metre dual use paths;
- Two 4.7 metre carriageways;
- One six metre median strip (including semi mount kerbs);
- Two 0.23 metre outer semi mount kerbs; and
- The total width is 20.86 metres.

The applicant has advised that, from a safety perspective, the full width of infrastructure is required to satisfy the road designation. As such, proposed clearing is unable to be minimised given these impediments. The applicant has advised that the intention post-clearing is to revegetate the back slopes of the proposed road with native vegetation as part of a reserve management programme. Topsoil respread will facilitate this by way of local seed regeneration (Shire of Harvey 2018).

In addition, a change in tenure was required for Lot 560 on Deposited Plan 68322, via an amendment to the Greater Bunbury Regional Scheme, to remove restrictions to the activity proposed. The creation of a new Lot 7002 on Deposited Plan 420660 representing revised tenure for the previous Lot 560 consistent with the Greater Bunbury Regional Scheme and the proposed activity (Shire of Harvey 2021b; WAPC 2021) (Appendix C) resulted in a reduced application area from 2.1 hectares down to 1.98 hectares.

3.2. Assessment of application against the ten clearing principles

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

The assessment against the clearing principles identified that proposed clearing is at variance to Principles (a), (b), (d) and (e), and may be at variance to Principle (f). The impacts of the proposed clearing present a risk to the Threatened Western Ringtail Possum (*Pseudocheirus occidentalis*), Threatened black cockatoo species, the Banksia Woodlands of the Swan Coastal Plain ecological community, and a significant remnant within an extensively cleared landscape.

The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

3.2 (a) Native vegetation should not be cleared if it comprises a high level of biodiversity.

The application area is located on the Swan Coastal Plain (SWA02) bioregion as described by Thackway and Cresswell (1995) and consists of the Bassendean B2 Phase Landform (212Bs_B2), which is a flat to very gently undulating sandplain with well to moderately well drained deep bleached grey sands. The local area has been extensively cleared and retains approximately 21 per cent native vegetation. Remnant native vegetation onsite is mainly comprised of various densities of Banksia and *Kunzea glabrescens* with emergent Jarrah (*Eucalyptus marginata*) and less commonly Marri (*Corymbia calophylla*). The southern one third of the application area may have been partly cleared in the past and is now in a state of regrowth with mid-storey and groundcover species being generally sparse. This area contains a number of large non-endemic *Acacia longifolia* (Ecoedge 2018; Harewood 2018).

Five vegetation units have been described over the application area by Ecoedge (2018) (Appendix A). Three of the five units consist of Eucalypt / Banksia admixtures comprising 1.4 hectares (or 66.7 per cent) of the application area.

Several vegetation communities consisting of Banksia species are considered Priority Ecological Communities (PECs) by the Department of Biodiversity, Conservation and Attractions (DBCA), or are listed as Threatened Ecological Communities (TECs) under the Western Australian *Biodiversity Conservation Act 2016* (BA Act) or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The application area is mapped regionally as the Priority 3 PEC Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region. Ecoedge (2018) undertook an analysis of quadrat data obtained during a flora and vegetation survey of the application area during spring 2018. Vegetation within parts of the application area has similarities with two Swan Coastal Plain Floristic Community Types (FCTs) identified by Gibson *et al.*, (1994): The Swan Coastal Plain FCT 21a, and the Swan Coastal Plain FCT 21c. To match vegetation units to the corresponding FCT, quadrat data was compared against the 'typical' species (those with greater than 75 per cent frequency) and 'common' species (those with 50 per cent to 75 per cent frequency) of both FCT communities. According to the comparison undertaken by Ecoedge (2018), the application area vegetation corresponded with FCT 21a: that is, 'Central *Banksia attenuata* – *Eucalyptus marginata* woodlands'. Three of the five described vegetation units present within the application area, therefore, are inferred to be FCT21a (Gibson *et al.* 1994). This is also consistent with the Banksia Woodlands of the Swan Coastal Plain ecological community, listed as Endangered under the EPBC Act, discussed further under Principle (d).

The flora survey of Ecoedge (2018) recorded 108 vascular flora taxa (of which 30 were introduced species). The most represented genera were Fabaceae ('peas'), Orchidaceae (orchids), and Poaceae (grasses). According to available databases, 19 Priority flora taxa (and six threatened flora taxa) have been recorded within 20 kilometres of the application area. The northern portion of the application area forms part of a larger remnant of native vegetation within Crown Reserve 35061, which comprises approximately 15 hectares of native vegetation, stretching west of the application area. EPA Bulletin 1108 (EPA 2003) determined that Reserve 35061 contained three flora species currently ranked as Priority (P) species; *Acacia semitrullata* (P4), *Acacia flagelliformis* (P4), and *Caladenia speciosa* (P4) (Shire of Harvey 2018).

Ecoedge (2018) undertook a likelihood of occurrence analysis of Priority species occurring over the application area (Appendix A), and of these taxa one was ranked with a High likelihood of occurrence, *Acacia semitrullata* (P4), with five ranked with a Moderate likelihood of occurrence. This included the two species above along with; *Lasiopetalum membranaceum* (P3), *Verticordia attenuata* (P3), and *Pultenaea skinneri* (P4) (Appendix A). The application area may also provide suitable habitat for *Dillwynia dillwynioides* (P3) and *Rumex drummondii* (P4) (DWER 2018).

The flora and vegetation survey of Ecoedge (2018) in September-October 2018 recorded the P4 species *Acacia semitrullata*, with 26 plants recorded across the application area. No additional Priority or Threatened flora were recorded.

Acacia semitrullata is widely distributed across the Swan Coastal Plain generally south of Myalup, with populations also extending into the Darling Plateau east of Collie and at Nannup. The species is known from 84 records over a range of approximately 265 kilometres. Four records have been made within the local area, with one location alone recording approximately 100 plants within the 50 metre diameter area inspected (WAHerb1998-). The closest regional record is approximately 420 metres to the north of the application area. Given the condition of the application area, and that it is contiguous with a larger remnant of approximately 15 hectares of native vegetation within Crown Reserve 35061 that stretches west and adjoins Wardandi Flora Reserve, the species is likely to be present within adjacent vegetation. *Acacia semitrullata* is relatively common in its preferred habitat in the Greater Bunbury Region (Ecoedge 2018) and proposed clearing is unlikely to have a significant impact on the overall population of the species (Ecoedge 2018).

A fauna assessment over the application area obtained evidence that three Threatened species of black cockatoo, as well as the Critically Endangered (CR) Western Ringtail Possum, utilise the application area (Harewood 2018). Foraging habitat occurs for black cockatoos, with at least one potential black cockatoo breeding habitat tree providing a hollow large enough for use, as well as 'core' habitat for the Western Ringtail Possum. Several other fauna species of conservation significance are also likely to occur (Harewood 2018).

The application area also contributes towards a mapped regionally significant ecological linkage (Molloy *et al.*, 2009) and the DBCA advised that 'the Greater Bunbury Region Scheme (GBRS) (Bulletin 1108, EPA 2003) considers that all of the application area (and in particular Reserve 35061) is regionally significant, and that its vegetation should be reserved in the GBRS and appropriately managed (DBCA 2018; EPA 2003; Minister for Environment 2005) consistent with EPA (2009). The ecological linkage to the west from the application area is applicable. The ecological linkage north from the application area is no longer viable as a corridor for fauna movement as it moves through an urbanised environment and across major traffic thoroughfares (Shire of Harvey 2020b).

Noting that the application area includes 0.98 hectares of native vegetation that represents a TEC, provides habitat for threatened fauna, contains Priority flora, and possesses vegetation in Good and Very Good condition forming a component of a recognised ecological linkage, the application area is considered to provide a high level of biodiversity, and the proposed clearing is at variance to Principle (a).

3.2 (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.

Excluding marine species, 39 vertebrate species of conservation significance have been recorded within ten kilometres of the application area (DBCA 2007-). Of these, 31 are either migratory shorebirds and waterbirds protected under International Agreements (particularly the Families: Scolopacidae, Charadriidae, and Glareolidae) or estuarine / wetland inhabiting species unlikely to occur due to the lack of wetland or shoreline habitat.

Of the remaining birds, three are Threatened black cockatoo species, and one is the specially protected Peregrine Falcon (*Falco peregrinus*). Seven species of mammal of conservation significance have been recorded within ten kilometres of the application area, including the CR Western Ringtail Possum (*Pseudocheirus occidentalis*).

A Level 1 fauna survey incorporating targeted searches for black cockatoo habitat and Western Ringtail Possum habitat (Harewood 2018) was undertaken over the application area over four days during August 2018, consistent with EPA (2016).

Four vertebrate fauna species of conservation significance were positively identified during the surveys of Harewood (2018); the three Threatened black cockatoo species, and the Western Ringtail Possum. An additional five vertebrate were assessed as 'possibly' occurring; the Quenda (*Isoodon fusciventer*) (P4), South-western Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) (conservation dependant), and Western False Pipistrelle (*Falsistrellus mackenziei*) (P4), as well as the Coastal Plain Skink (*Ctenotus ora*) (P3) and the Peregrine Falcon (*Falco peregrinus*) (Appendix B).

Records of all three black cockatoo species have been made within ten kilometres of the application area; the Endangered Carnaby's Cockatoo (*Calyptorhynchus latirostris*), Endangered Baudin's Cockatoo (*Calyptorhynchus baudinii*), and the Vulnerable Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*). Harewood (2018) recorded evidence of all three species over the application area.

Black cockatoo habitat can be considered in terms of breeding habitat, night roosting habitat, and foraging habitat. Black cockatoos will generally forage up to 12 kilometres from an active breeding site (DSEWPaC 2012; DoEE 2017; DPaW 2013). Following breeding, they will flock in search of food, usually within six kilometres of a night roost (DSEWPaC 2012; DoEE 2017; DPaW 2013). Food resources within the range of breeding sites and roost sites are important to sustain populations, and foraging resources are therefore viewed in the context of known breeding and night roosting sites within foraging distance.

Black cockatoo night roosts are usually located in the tallest trees of an area, and in close proximity to both a food supply and surface water (DAWE 2020a). Flocks will use different night roosts, often for weeks, or until the local food supply is exhausted. Flocks show some fidelity to night roosts with sites used in most years to access high-quality feeding sites. However, not all night roosts are used in every year (DPaW 2013). No evidence of black cockatoos roosting within the trees within the application area were recorded by Harewood (2018). However, confirmed night roosts of the Forest Red-tailed Black Cockatoo and 'White-tailed Black Cockatoos' (Carnaby's Cockatoo and/or Baudin's Cockatoo) have been recorded within six kilometres of the application area. The application area is also within the buffer for unconfirmed breeding sites, and unconfirmed roosts, of Carnaby's Cockatoo.

Seven trees that included Jarrah and Marri were recorded with a diameter at breast height (DBH) greater than 50 centimetres as per DSEWPaC (2012) guidance. Five of these trees were observed to contain hollows, or possible hollows, of some description with one possibly large enough for black cockatoos (Harewood 2018). No evidence of hollows being utilised by black cockatoos for nesting (currently or previously) was observed (Harewood 2018).

Due to the presence of night roosts within foraging distance for the three species of black cockatoo, available food resources become important to sustain populations. Foraging evidence of black cockatoos in the form of chewed Marri and Jarrah fruit as well as *Banksia attenuata* cones were recorded by Harewood (2018) at a few locations over the application area (Appendix B). Dietary preferences for the three species differ, but there is some overlap.

Carnaby's Cockatoo tends to favour proteaceous plant species such as banksias, hakeas and grevillea. Baudin's Cockatoo prefers mainly Marri (including the seeds, flowers, nectar and grubs) as well as proteaceous species. The Forest Red-tailed Black Cockatoo prefers the seeds of Marri and Jarrah (DSEWPaC 2012).

Excluding cleared areas, the entire application area provides foraging habitat for black cockatoos (that is, approximately 1.60 hectares). However, the density and distribution of primary foraging species varies across the site (Harewood 2018), and is dependent upon the particular black cockatoo species. The primary foraging species over the application area include *Banksia attenuata*, Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia calophylla*), with *Banksia ilicifolia* and *Xanthorrhoea gracilis* less dominant (Harewood 2018). Vegetation units 1, 2 and 3 incorporate a substantial Banksia component and offer quality foraging habitat for Carnaby's Cockatoo (approximately 1.28 hectares). Jarrah is dominant across vegetated areas of the entire application area (vegetation units 1 to 5) offering quality foraging habitat (1.60 hectares) for both Carnaby's Cockatoo and the Forest Red-tailed Black Cockatoo. Marri is not prevalent over the application area and quality foraging habitat for Baudin's Cockatoo is restricted to the proteaceous communities (vegetation units 1, 2 and 3).

In the local context, approximately 5,570 hectares of remnant vegetation is retained in the local area (or 21.5 percent of original vegetation). Much of this is likely to also represent black cockatoo foraging habitat of various quality. Wardandi Flora Reserve (Crown Reserve 26270) is located approximately 450 metres to the west of the application area. The application area itself forms part of a larger remnant of native vegetation within Crown Reserve 35061, which comprises approximately 15 hectares of native vegetation, which stretches west of the application area and adjoins Wardandi Flora Reserve, much of it likely to provide black cockatoo foraging habitat (Harewood 2018).

DBCA provided comment on the significance of habitat to black cockatoos and advised that "*the vegetation [under application] will also provide foraging habitat to black cockatoo species and is likely to support trees with hollows suitable for breeding use (noting again that such trees were recorded in the 2016 survey of adjoining vegetation)*" (DBCA 2018).

The Threatened (CR) Western Ringtail Possum (*Pseudocheirus occidentalis*) has been recorded 242 times within the local area, and the application area is considered to occur within the core range of this species (DPaW 2014), with the application area mapped as suitable Western Ringtail Possum habitat. The Western Ringtail Possum was recorded over the application area by Harewood (2018). An assessment undertaken within the nearby Wardandi Flora Reserve which adjoins the remnant that the application area forms part of, also identified potential Western Ringtail Possum dreys and scats (Harewood 2018; Shire of Harvey 2018).

Harewood (2018) recorded four Western Ringtail Possums (and one Common Brushtail Possum - *Trichosurus vulpecula*) during the first nocturnal survey, and four Western Ringtail Possums (and two Common Brushtail Possums) during a second nocturnal survey (Appendix B). Observations suggested that there were at least five Western Ringtail Possums utilising the application area at the time of the surveys (Harewood 2018).

Four Western Ringtail Possums dreys were also observed during the day survey (with one located just outside of the application area boundary), with scats observed at four locations. Five trees containing possible hollows suitable for possums to use for day time refuge were also recorded (Appendix B). Harewood (2018) concluded that approximately 1.3 hectares of vegetation over the application area can be regarded as "core" habitat for Western Ringtail Possums. That is, habitat providing a combination of foraging, refuge and dispersal opportunities.

The Wardandi Flora Reserve represents the closest and largest area of potential Western Ringtail Possum habitat to the application area, with vegetation along the nearby Collie and Brunswick Rivers also likely to be utilised with previous surveys confirming their presence (Harewood 2012, Harewood 2014).

DBCA advised that *“the applied vegetation is very likely to support the Critically Endangered Western Ringtail Possum (WRP), noting that the species was recorded in 2016 fauna surveys of directly adjoining, albeit now cleared vegetation. The vegetation... is a primary WRP habitat node to maintain linkages as identified in the draft WRP Corridor Linkages report currently under development”* (DBCA 2018). The application area is likely being used by Western Ringtail Possums for diurnal nesting, foraging and movement between adjacent habitats with at least 1.18 hectares of core habitat impacted by the proposed clearing.

Five additional vertebrate species were assessed by Harewood (2018) as ‘possibly’ occurring. The application area contains potentially suitable habitat for the Coastal Plain Skink (P4) and its location is within the centre of its documented range (Harewood 2018).

The Peregrine Falcon (other specially protected fauna) does not build a nest and requires cliffs, rocky outcrops, or large tree hollows to breed. No evidence of nesting was recorded by Harewood (2018) and the probability of this species breeding within the application area is very low. The Peregrine Falcon, however, may overfly the application area without utilising any of the habitats present.

The conservation dependant Southern Brush-tailed Phascogale inhabits dry sclerophyll forests and open woodlands that contain hollow-bearing trees (DEC 2012). The South-western Brush-tailed Phascogale is potentially present given the presence of suitable habitat including tree hollows.

The presence of the Western False Pipistrelle (a bat) (P4) is uncertain, however, given the presence of hollow trees providing potential daytime refuge sites, and some recent records from along the Brunswick River and at Kemerton (Harewood 2015), its presence cannot be discounted.

Quenda (P4) have a preference for habitats with dense undergrowth to provide cover (van Dyck and Strahan 2008). The northern portion of the application in particular includes vegetation that provides potential habitat (DWER 2018) and the species may inhabit some sections of the application area where ground cover is most dense.

A portion of the application area is mapped adjacent to a significant ecological linkage within the South West Regional Ecological Linkages (SWREL) technical report (DBCA 20018; Molloy *et al.*, 2009; EPA 2009). The SWREL technical report classifies linkage vegetation based on significance, and a portion of the application area (northern portion) is classified as 1A (highest value vegetation) as it is within 100 metres of the mapped linkage. Ecological linkages have been defined as *“a series of (both contiguous and non-contiguous) patches of native vegetation which...act as stepping stones of habitat which facilitate the maintenance of ecological processes and the movement of organisms within, and across, a landscape”* (Molloy *et al.* 2009). The ecological linkage to the west from the application area is applicable. The application area helps to support vegetation that forms part of a larger remnant within an extensively cleared area, and whilst the proposed clearing will not sever the linkage, the proposed clearing will result in the loss of vegetation that supports the functioning of a significant ecological linkage. DBCA support this view and advised that *“[the application area] is directly adjacent to a [SWREL] axis line and is part of and contributes to a core regional ecological linkage...”* (DBCA, 2018).

The ecological linkage north from the application area is no longer viable as a corridor for fauna movement as it moves through an urbanised environment and across major traffic thoroughfares (Shire of Harvey 2020b).

Weeds are present within the application area and the presence of dieback (*Phytophthora* spp.) is likely (Ecoedge 2018; Harewood 2018). Noting that the vegetation under application forms part of a larger remnant, the proposed clearing may result in the spread of weeds and dieback into adjacent native vegetation and inadvertently impact on its environmental values.

Based on the above assessment, the proposed clearing may result in the death or injury to any Western Ringtail Possums, or other fauna, present in the application area during the time of clearing.

Noting the linearity of the application area, and presence of approximately 15 hectares of native vegetation that stretches west of the application area and adjoins Wardandi Flora Reserve, the implementation of slow and directional clearing will mitigate any impacts to fauna within the application area at the time of clearing. An experienced Western Ringtail Possum specialist should inspect the area prior to, and for the duration of clearing activities, with clearing activities ceasing where any possums are identified until they either move on, or are appropriately removed by the specialist.

For the reasons set out above, it is considered that the impacts of the proposed clearing on adjacent native vegetation, fauna present at the time of clearing, and to individual Western Ringtail Possums, can be managed by taking steps to minimise the risk of the introduction and spread of dieback and weeds, slow directional clearing to

allow fauna to move into adjacent vegetation, and the engagement of an experienced Western Ringtail Possum specialist to monitor clearing activities.

Given that the application area provides at least 1.18 hectares of core habitat for the Western Ringtail Possum and 1.60 hectares of foraging habitat for black cockatoos, and contributes value to a recognised ecological linkage, the proposed clearing is at variance to Principle (b).

3.2 (c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, Threatened flora.

According to available databases, six Threatened flora taxa, including five orchids, have been recorded within 10 kilometres of the application area; *Caladenia huegelii* (CR), *Drakaea elastica* (EN), *Drakaea micrantha* (EN), *Diuris drummondii* (VU), *Diuris micrantha* (VU), and *Eleocharis keigheryi* (VU). The closest of these is *Drakaea elastica* recorded approximately two kilometres to the north of the application area, with *Caladenia huegelii* recorded approximately 3.6 kilometres to the north-west.

Ecoedge (2018) undertook a likelihood of occurrence analysis of these species, as well as an additional ten taxa, with the potential to occur. Of these taxa, two Threatened taxa; *Caladenia huegelii* (CR) and *Drakaea micrantha* (EN) were assessed as having a Moderate likelihood of occurrence, with the remainder assessed as Low.

Caladenia huegelii is a tuberous perennial herb (an orchid) that grows to between 0.25 and 0.6 metres high and flowers green, cream and red between September and October (WAH 1998-). This species occurs within woodland of jarrah and banksia species, often favouring areas of dense undergrowth, within deep grey-white sands usually associated with the Bassendean sand-dune system (DEC 2008).

Drakaea micrantha has been recorded approximately 4.6 kilometres north of the application area. This species is a tuberous perennial herb (an orchid) that grows to between 0.15 and 0.3 metres high and flowers red and yellow between September and October, within white and grey sands (Western Australian Herbarium, 1998-). The species is usually found in open sandy patches that have been disturbed, and where competition from other plants has been removed within infertile grey sands, in *Banksia*, *Eucalyptus marginata* and *Allocasuarina fraseriana* woodland or forest and often occurs under thickets of *Kunzea ericifolia* (Commonwealth of Australia 2008).

Drakaea elastica was assessed by Ecoedge (2018) as having a Low likelihood of occurrence. However, it has been recorded approximately two kilometres to the north of the application area. *D. elastica* is a tuberous hammer-orchid species that grows between 0.12 and 0.3 metres high. It occurs in approximately 42 locations in the south-west of WA with a total population size of around 230 plants (DAWE 2020b), and is currently known from the Swan Coastal Plain over approximately 350 kilometres between Cataby in the north, and Busselton in the south. *D. elastica* can grow on bare patches of sand within otherwise dense vegetation in low-lying areas alongside winter-wet swamps (DEC 2009). *D. elastica* often occurs with other orchid species, and flowers between September to early November (DEC 2009).

Vegetation over the application area is consistent with the habitat requirements of the species above, however, the targeted flora survey of Ecoedge (2018) conducted at an appropriate seasonality did not record these species, nor any other Threatened flora taxa, and proposed clearing not likely to be at variance to Principle (c).

3.2 (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.

The Western Australian Minister for Environment has endorsed 69 ecological communities as Threatened Ecological Communities (TECs). Possible threatened ecological communities that do not meet survey criteria for a particular TEC are added to DBCA's Priority Ecological Community (PEC) list.

Two TECs endorsed by the Western Australian Minister for Environment as Threatened Ecological Communities occur within ten kilometres of the application area;

- the Critically Endangered SCP3c described as *Corymbia calophylla* - *Xanthorrhoea preissii* woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in Gibson *et al.* 1994); and
- the Vulnerable SCP08 described as Herb rich shrublands in clay pans (floristic community type 8 as originally described in Gibson *et al.* 1994).

Both these TECs occur approximately 5.5 kilometres and six kilometres south of the application area. Vegetation descriptions for these TECs do not align with the vegetation described, and mapped, over the application area by Ecoedge (2018).

Ecoedge (2018) identified an area representative of the Banksia Woodlands of the Swan Coastal Plain ecological community, listed as Endangered under the EPBC Act within the application area. To qualify as this TEC, criteria

have been developed by the Commonwealth of Australia (No Date) and the TSSC (2016). Community FCT 21a is a component of this TEC (TSSC 2016), however, vegetation condition thresholds also apply for inclusion. The FCT 21a vegetation in the application area assessed as Good condition or better (Keighery 1994) is representative of the 'Banksia Woodlands of the Swan Coastal Plain' TEC. This constitutes approximately 0.98 hectares (or 49.5 per cent) of the application area incorporating vegetation units 1, 2 and 3 in Good or better condition (Ecoedge 2018).

Given the presence of the Banksia Woodlands TEC, the proposed clearing is at variance to Principle (d).

3.2 (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.

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

The application area occurs within the Swan Coastal Plain Interim Biogeographic Regionalisation of Australia (IBRA) bioregion, which retains approximately 38.6 per cent of its pre-European vegetation extent (Government of Western Australia 2019a).

The vegetation under application is mapped regionally as the 'Bassendean Complex Central and South' - System 6 ID 44. This complex is described as woodland of *Eucalyptus marginata*, *Allocasuarina fraseriana* and *Banksia* species to low woodland of *Melaleuca* species, and sedgelands on the more mesic sites. This area includes the transition of *Eucalyptus marginata* to *Eucalyptus todtiana* in the vicinity of Perth (Mattiske and Havel 1998). Vegetation descriptions of Ecoedge (2018) broadly align with this regional description.

The Bassendean Complex Central and South vegetation complex retains approximately 23,509 hectares, or 26.9 per cent of its pre-European vegetation extent within the IBRA bioregion (Government of Western Australia 2019b). The local area (ten kilometre radius of the application area) retains approximately 21.5 per cent native vegetation cover (5,672 hectares). Just 2.1 per cent of the Bassendean Complex Central and South is retained within lands secured for conservation (Government of Western Australia 2019b).

The application area (and in particular Reserve 35061) is considered regionally significant (Bulletin 1108, EPA 2003), and contributes towards an ecological linkage within the SWREL technical report (Molloy *et al.*, 2009). The application area is considered to be significant as a remnant as it provides habitat for conservation significant fauna, is representative of a Commonwealth listed TEC, supports Priority flora and a mapped regionally significant ecological linkage. Given that the local area and the mapped vegetation complex retain less than the abovementioned 30 per cent native vegetation threshold, and the low percentage held in conservation lands, at least 1.60 hectares of native vegetation within the application area (that is excluding areas assessed as Completely Degraded) is considered a significant remnant of native vegetation in an area that has been extensively cleared, and the proposed clearing is at variance to Principle (e).

Noting that the vegetation under application forms part of a larger remnant, the proposed clearing may result in the spread of weeds and dieback into adjacent native vegetation and inadvertently impact on its environmental values. Weed and dieback management practices would assist in minimising this risk.

3.2 (f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

The application area is located on a coastal plain and within the Leschenault Estuary/Lower Collie catchment of the Collie River basin. No Ramsar listed wetlands or Wetlands of National Significance occur within ten kilometres of the application area.

The application area is broadly mapped as a multiple use palusplain, or seasonally waterlogged flat (UFI 14329) (Semeniuk and Semeniuk 2004) with this mapped occurrence covering an area of approximately 6,104 hectares. Multiple use wetlands have been highly modified and are considered to have few important ecological attributes and functions remaining (Water and Rivers Commission 2001).

Conservation category palusplains are located approximately 900 metres to the north of the application area (ID 1526) and approximately 925 metres to the west (ID 1539). No impacts to conservation category wetlands or watercourses are likely.

The Brunswick River occurs approximately 1.1 kilometres to the west of the application area, and the Collie River occurs approximately 1.6 kilometres to the south. There are no watercourses mapped within, or in the immediate vicinity of, the application area.

There were no visible signs of water identified within the application area (DWER 2018; Ecoedge 2018; Harwood 2018), and given the broad scale mapping associated with this multiple use palusplain, and highly modified

surrounding landscape, it is unclear whether the application area is representative of a palusplain. There are no typical riparian species present, however, *Kunzea glabrescens* (Spearwood) is present in thickets (DWER 2018). This species grows in clay or sandy soils on the edges of swamps, lakes, rivers, or moist depressions (WAH 1998) indicating that the application area may be winter wet, and thus the vegetation under application may be growing in association with the mapped wetland (Palusplain UFI 14329).

Given the above, the proposed clearing may be at variance to Principle (f). However, noting the size and linearity of the application area, the proposed clearing is not likely to result in significant impacts to riparian habitat within the local area.

3.2 (g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

The application area is mapped as the Bassendean B2 Phase Landform Map Unit (212Bs_B2), which is described as flat to very gently undulating sandplain with well to moderately well-drained deep bleached grey sands (Schoknecht *et al.* 2004). Flora and fauna surveys of the application area indicate that the soils on site are consistent with those mapped, comprising grey sands (Ecoedge 2018; Harewood 2018).

Sandy soils are prone to wind erosion, however, noting the relatively small size and linear shape of the application area, purpose of clearing (creation of a sealed road), and presence of native vegetation adjacent to the application area to the west, the proposed clearing is unlikely to result in appreciable land degradation via wind erosion.

The application area is mapped as a Low to Moderate risk for acid sulphate soils (DPIRD 2107). Soils will not generally be excavated at depth, and any impacts to surrounding soils and drainage can be managed through appropriate design and construction management.

The application area is mapped as a multiple use palusplain, which increases the potential for water erosion to occur post clearing. However, noting the presence of highly permeable sandy soils, linearity of the application area and lack of nearby watercourses, the proposed clearing is not likely to result in appreciable land degradation via water erosion, waterlogging or flooding.

Groundwater salinity over the application area is mapped at 500 to 1,000 total dissolved salts (TDS) milligrams per litre (mg/L) (that is, 'fresh'). Salinity risk over the application area is associated with the soil type delineations and is assessed as Low (DPIRD 2107).

Standard, and staged, road construction methodologies including strategies for the management of acid sulphate soils, drainage controls, and wind and water erosion will mitigate any potential land degradation at the local scale. Soils will not generally be excavated at depth, and any impacts to surrounding soils and drainage can be managed through appropriate design and construction management. Given the above, the proposed clearing is not likely to be at variance to Principle (g).

3.2 (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.

The closest conservation lands to the application area is Wardandi Flora Reserve (Crown Reserve 26270), located approximately 450 metres west of the application area. This Reserve is vested with the Shire of Harvey for the purpose of conservation.

The northern portion of the application area forms part of a larger remnant of native vegetation within Crown Reserve 35061, which comprises approximately 15 hectares of native vegetation that stretches west of the application area and adjoins Wardandi Flora Reserve. EPA Bulletin 1108 (EPA 2003) and Ministerial Statement 000697 (Minister for the Environment 2005) noted that the remnant vegetation within the northern and western portions of Reserve 35061 (incorporating the northern section of the application area) should be reserved in the Greater Bunbury Regional Scheme and appropriately managed for conservation.

The next closest conservation area to the application area is Morangarel Nature Reserve, which is managed by DBCA, located approximately 4.4 kilometres south-west of the application area.

The application area (and in particular Reserve 35061) is considered regionally significant (Bulletin 1108, EPA 2003), and contributes towards a mapped ecological linkage within the SWREL technical report (Molloy *et al.*, 2009). A linkage axis line has been mapped within 50 metres of the north-western boundary of the application area and the vegetation within the application area is contiguous with the mapped ecological linkage to the west. The application area has been assigned a proximity rating of '1a', which is the highest rating, and indicates that the vegetation directly forms part of a regional ecological linkage.

While the proposed clearing will not completely sever this linkage, and the linkage north is no longer viable, it will result in the loss of vegetation that contributes linkage values within an extensively cleared landscape.

Given the separation distance to Wardandi Flora Reserve (Crown Reserve 26270), the proposed clearing is not at variance to Principle (h). Noting that the vegetation under application forms part of a larger remnant that it is contiguous with Wardandi Flora Reserve, the proposed clearing may result in the spread of weeds and dieback into adjacent native vegetation and inadvertently impact on its environmental values. Weed and dieback management practices would assist in minimising this risk.

3.2 (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.

The application area is located within the Brunswick River and Tributaries surface water areas and irrigation districts, proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act), as well as the Bunbury Groundwater Area also proclaimed under the RIWI Act. No RIWI Act proclaimed rivers occur in the vicinity, and the application area is also located well outside of any *Country Areas Water Supply Act 1947* (CAWS Act) control catchments or reserves, or any Public Drinking Water Source Areas.

The application area is broadly mapped as a multiple use paulusplain (or seasonally waterlogged flat), with this mapped occurrence covering an area of approximately 6,104 hectares. There are no watercourses mapped within, or in the vicinity of, the application area.

There were no visible signs of water identified within the application area (Ecoedge 2018; DWER 2018; Harewood 2018). Given the lack of watercourses within, or within the vicinity of the application area, and the highly modified landscape to the east of the application area, the proposed clearing is not likely to result in the deterioration of surface water quality.

Groundwater salinity over the application area is mapped at 500 to 1,000 TDS mg/L (that is, 'fresh'), and salinity risk over the application area is assessed as Low (DPIRD 2017). Proposed clearing is unlikely to lead to a perceptible rise in groundwater levels and is unlikely to impact on groundwater salinity levels or surface water through salinity surface expression. Given the above, the proposed clearing is not likely to be at variance to Principle (i).

3.2 (j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

The application area receives approximately 720 millimetres of rainfall annually, predominantly from May to September (BOM 2020). The application area is located in the Bassendean B2 Phase Landform Map Unit (212Bs_B2), with flat to very gently undulating sandplain with well to moderately well-drained deep bleached grey sands which are highly permeable. Despite being located within a paulusplain (or seasonally waterlogged flat), the application area is located outside of any floodplain areas, and has been assessed as a Low flood risk (DPIRD 2017).

Noting this, the relatively small size and linearity of the application, and presence of remnant vegetation immediately west, the proposed clearing is unlikely to cause or exacerbate the incidence or intensity of flooding, and is not likely to be at variance to Principle (j).

3.3. Relevant planning instruments and other matters

An identical application area was applied for by the Shire of Harvey on 1 December 2017 (CPS 7900/1). Application CPS 7900/1 was advertised on the DWER website on 20 December 2017, with a 21 day submission period. One public submission was received regarding this application. Application CPS 7900/1 was withdrawn on 15 April 2020.

Clearing application CPS 8850/1 was applied for by the Shire of Harvey on 23 March 2020. Application CPS 8850/1 was advertised on the DWER website on 13 May, with a 21 day submission period. No public submissions were received regarding this application.

The applicant has advised that Kingston Drive has been identified as a significant distributor road and as such has received funding via Main Roads Western Australia as part of the Regional Road Group allocation.

The Promenade road reserve (PIN 11977576), Australind, is designated Urban Deferred under the Greater Bunbury Regional Scheme and Public Utilities under the Shire of Harvey's Town Planning Scheme and has the vesting and purpose to support the proposed activity.

The initial Lot 560 on Deposited Plan 68322 (Lot 560) Australind forms part of a larger remnant of native vegetation within Crown Reserve 35061 which comprises approximately 15 hectares of native vegetation, stretching west of the application area that at the time of application was zoned as Regional Open Space and not consistent with the proposed activity.

EPA Bulletin 1108 (EPA 2003) and Ministerial Statement 000697 (Minister for the Environment 2005) noted that the remnant vegetation within the northern and western portions of Reserve 35061 (incorporating Lot 560) should be reserved in the Greater Bunbury Regional Scheme and appropriately managed for conservation. The CPS 8850/1 application area within Lot 560 at the time of application also represented a reserve under consideration for transfer to the Noongar Land estate under the South West Native Title Agreement.

A change in tenure was required for Lot 560 on Plan 68322, via an amendment to the Greater Bunbury Regional Scheme, to remove restrictions to the activity proposed. The Shire of Harvey applied to the Western Australian Planning Commission (WAPC) to amend the Greater Bunbury Region Scheme by rezoning Part Lot 562 (proposed Lot 7002) Paris Road Australind from Regional Open Space Reserve to Urban Zone to facilitate the completion of Kingston Drive between Kingston Drive and Ditchingham Place (Shire of Harvey 2021b; WAPC 2021).

Associated Native Title issues were resolved and an amendment to the Greater Bunbury Region Scheme was initiated by the Department of Planning, Lands and Heritage (DPLH), whereby Lot 560 on Plan 68322 was referred to the Environmental Protection Authority (EPA) under Part IV of the EP Act. The EPA (2021) determined not to assess the proposal and concluded that implementation of the amendment can be managed to meet the EPA's environmental objectives through standard planning requirements and other statutory processes, including the clearing of native vegetation in accordance with a permit under Part V Division 2 (Clearing) of the EP Act (EPA 2021).

The applicant has provided a Deposited Plan 420660 from Landgate, confirming the creation of a new Lot 7002 on Deposited Plan 420660 representing revised tenure for the previous Lot 560 on Deposited Plan 68322 consistent with the Greater Bunbury Regional Scheme and the proposed activity (Shire of Harvey 2021b; WAPC 2021) (Appendix C).

The revised tenure provided was not consistent with the original application submitted, and a revised application area consistent with the appropriate tenure was provided by the applicant on 12 November 2021 (Appendix D). The revised application area reduced the clearing required from 2.10 hectares to 1.98 hectares.

A registered Native Title claim applies over the application area; Gnaala Karla Booja (WAD6274/1998), with an associated Indigenous Land Use Agreement (ILUA) (WI2015/005).

The Gnaala Karla Booja native title claimants and the South West Aboriginal Land and Sea Council (act on behalf of the claimants) were notified of the proposed clearing on 19 December 2017 in association with CPS 7900/1 and on 12 May 2020 in association with CPS 8850/1. The South West Aboriginal Land and Sea Council provided comment on 12 February 2018 in regard to CPS 7900/1, advising that *"As this permit involves the removal of native vegetation on a Crown Reserve, there should be at least two (2) Noongar Monitors present at all times"* (South West Aboriginal Land and Sea Council 2018). It is the permit holders responsibility to liaise with the South West Aboriginal Land and Sea Council regarding the presence of Noongar Monitors.

Spatial data indicates that no Aboriginal sites of significance listed in accordance with section 5 of the *Aboriginal Heritage Act 1972 (WA)* occur over the application area. Other heritage Place ID 5167 occurs approximately 260 metres to the north of the application area, intersecting Kingston Drive. 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.

No RIWI Act proclaimed rivers occur within the vicinity of the application area, and the application area is also located well outside of any *Country Areas Water Supply Act 1947 (CAWS Act)* control catchments or reserves, or any Public Drinking Water Source Areas. No additional permitting under the RIWI Act or CAWS Act is required.

4. Suitability of offsets

The applicant has provided evidence of avoidance and minimisation strategies (Section 3.1). The applicant has advised that, from a safety perspective, the full width of infrastructure is required to satisfy the road designation. As such, proposed clearing is unable to be minimised further.

Through the detailed assessment outlined in Section 3.2 above, it has been concluded that significant residual impacts remain after the application of the avoidance and mitigation measures summarised in Section 3.1. Residual impact consists of:

- 1.18 hectares of the application area that provides core habitat for the Threatened Western Ringtail Possum (*Pseudocheirus occidentalis*);
- 1.60 hectares that provides suitable foraging habitat for the Threatened Carnaby's Cockatoo (*Calyptorhynchus latirostris*), the Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii*) and Baudin's Cockatoo (*Calyptorhynchus baudinii*);
- 1.60 hectares of native vegetation considered a significant remnant of native vegetation in an area that has been extensively cleared; and
- 0.98 hectares that is representative of the 'Banksia Woodlands of the Swan Coastal Plain' Threatened Ecological Community listed as Endangered under the EPBC Act, and a Priority 3 Priority Ecological Community as listed by the DBCA;

The applicant has provided an offset proposal (Shire of Harvey 2022) that consists of the revegetation and rehabilitation of remnant native vegetation in degraded condition (Keighery 1994) over Lot 150 on Deposited Plan 29857, Parkfield (Lot 150) (Figure 2; Appendix E).

Lot 150 is Section 34A freehold land under the CALM Act managed by DBCA for conservation, and Zoned as the Kemerton industry buffer (763) (Scheme No 1) under the Shire of Harvey District Planning Scheme No. 1.

Due to the existing tenure and purpose, the offset parcel identified (Lot 150) provides no improved security of tenure (or restriction of the use of the land) prompted by the residual impacts arising from application CPS 8850/1. However, due to the tenure and purpose of the proposed site, revegetation and rehabilitation works within Lot 150 may be considered as offsets.

The attributes of Lot 150 (Figure 2 below) can be summarised as:

- Tenure is section 34A freehold land under the CALM Act and managed by the DBCA, and comparable DBCA lands surround the proposed offset site (Appendix E: Figure 1).
- Lot 150 is approximately 102 hectares in area with approximately 24 hectares mapped as remnant native vegetation (Appendix E: Figure 2), of which:
 - approximately 14 hectares has been mapped as either the Tuart Woodlands and Forests of the Swan Coastal Plain (Tuart Woodlands) or the Banksia Woodlands of the Swan Coastal Plain (Banksia Woodlands) (Appendix E: Figure 3, and Figure 7);
 - approximately 24 hectares has been mapped as either High or Medium Western Ringtail Possum habitat (Appendix E: Figure 4);
 - approximately 18 hectares has been mapped as Carnaby's Cockatoo areas requiring investigation as feeding habitat (Appendix E: Figure 5); and
 - Black cockatoo roosts (and potential foraging habitat) are known from within 12 kilometres of the proposed offset site (Appendix E: Figure 6).

Over 170 records (including recent records) of the Western Ringtail Possum have been made within 10 kilometres both north and south of the proposed offset site in the localities of Parkfield, Binningup, Australind, Kemerton, Myalup, Leschenault, and Wellesley. At least 24.02 hectares of either High or Medium quality Western Ringtail Possum habitat has been mapped over the proposed offset site, and extensive areas of Western Ringtail Possum habitat have been mapped in contiguous native vegetation within adjacent lands managed for conservation purposes by the DBCA (Appendix E: Figure 4).

Over 90 Threatened black cockatoo records (including recent records) have been made within 10 kilometres of the proposed offset site, including all three species, in the localities of Parkfield, Binningup, Kemerton, Myalup, Leschenault, Wokalup and Wellesley. Approximately 18 hectares of areas requiring investigation as Carnaby's Cockatoo feeding habitat has been mapped over the proposed offset site (Appendix E: Figure 5), and extensive areas of such habitat have been mapped in contiguous native vegetation in adjacent lands managed for conservation purposes by the DBCA. Black cockatoos will generally forage up to 12 kilometres from a night roost site (DSEWPAC 2012) and foraging resources within the range of roost sites are important to sustain populations (Commonwealth of

Australia 2017). At least seven black cockatoo roosts have been recorded within 12 kilometres of the proposed offset site (Appendix E: Figure 6), thereby elevating the importance of the foraging habitat present over Lot 150.

Approximately 14 hectares of the native vegetation has been mapped over the proposed offset site as either Tuart Woodlands or Banksia Woodlands (Appendix E: Figure 3), with at least two hectares mapped as Banksia Woodlands. Tuart Woodlands can also include a Banksia component (TSSC 2016), and extensive areas of Banksia Woodlands have been mapped in contiguous native vegetation in adjacent areas to the south, east, and north in lands managed for conservation purposes by the DBCA.

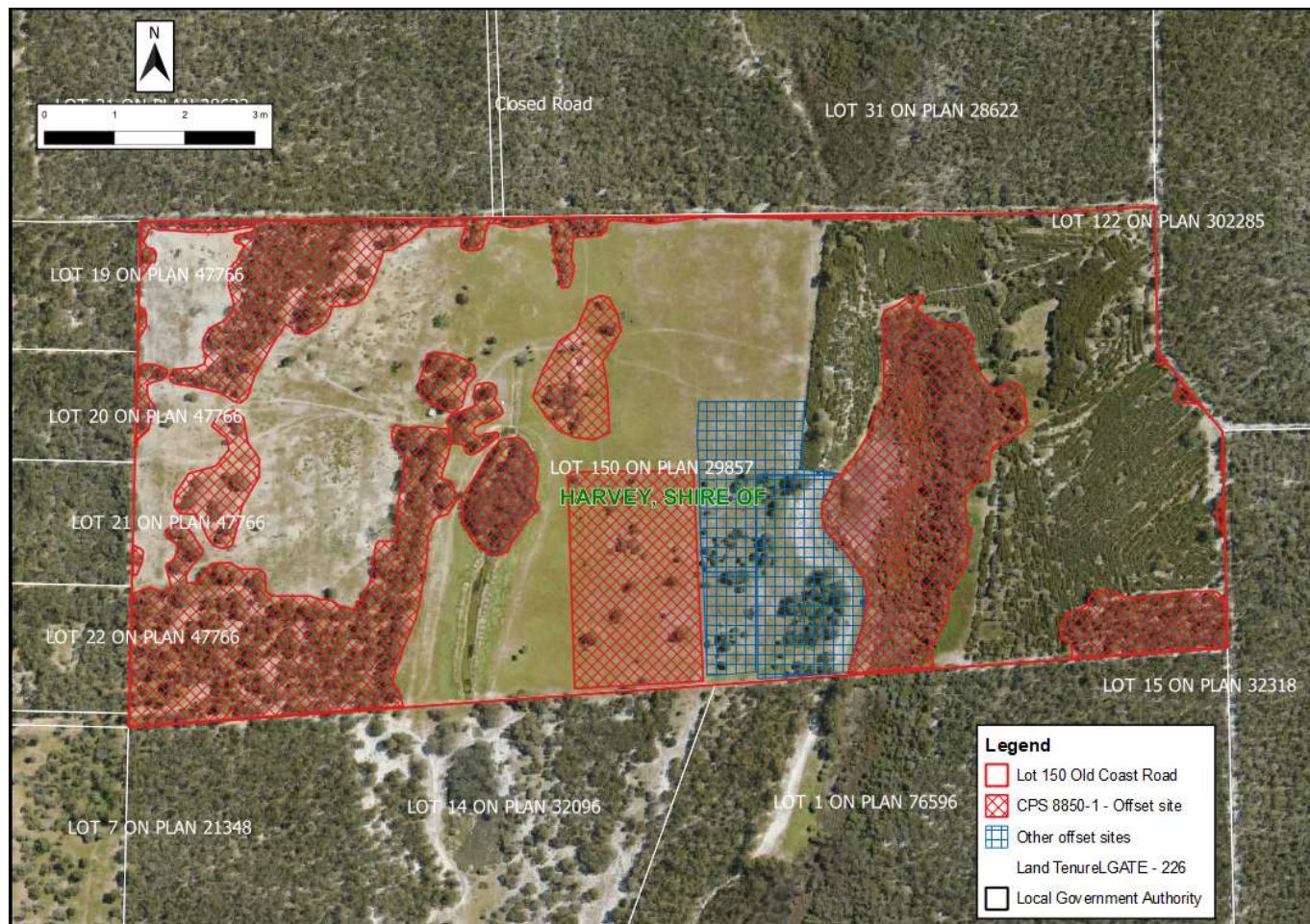


Figure 2: Proposed offset site

In consideration of:

- the tenure and location of Lot 150,
- the attributes identified within the Lot, and the
- landscape scale context of adjacent native vegetation within lands managed for conservation purposes

revegetation and rehabilitation of degraded portions of remnant vegetation within the proposed offset site has the capacity to improve habitat quality for the Western Ringtail Possum, foraging habitat quality for black cockatoo species, improved vegetation condition of the Banksia Woodlands of the Swan Coastal Plain, and improve the overall condition of a significant remnant of native vegetation.

The proposed offset (Shire of Harvey 2022) has been assessed against the WA State Government' Environmental Offsets Policy and Environmental Offsets Guidelines and informed by the application of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Offset Assessment Guide and calculator. Calculated offset values suggest that:

- The revegetation and rehabilitation of 5.69 hectares of Western Ringtail Possum habitat from degraded to good habitat condition would offset the 1.18 hectares of residual impact to this species.
- The revegetation and rehabilitation of 5.89 hectares of black cockatoo foraging habitat from degraded to good condition would offset the 1.6 hectares of residual impact to black cockatoos.

- The revegetation and rehabilitation of 5.56 hectares of native vegetation from degraded to good condition (Keighery 1994) would offset the 1.6 hectares of residual impact to significant remnant vegetation.
- The revegetation and rehabilitation of 4.13 hectares of Banksia Woodland from degraded to good vegetation condition (Keighery 1994) would offset the 1.6 hectares of residual impact to significant remnant vegetation.

The justification for the values used in the offset calculation are provided in **Error! Reference source not found.**

Revegetation and rehabilitation of existing remnant patches over Lot 150 through weed management, herbivore exclusion, and infill planting has the capacity to improve the habitat and native vegetation quality to the standard required to satisfy offset requirements. Revegetation can be used to increase the size of remnant patches, and to provide buffers or ecological connections.

In consideration of the attributes of Lot 150, more than one value is likely to be present within one larger remnant and revegetated or rehabilitated remnants could satisfy more than one offset consideration. For example improvements to Western Ringtail Possum habitat that consists of eucalypts and banksia species is likely to also provide improved foraging habitat for black cockatoo species, as could rehabilitated Banksia Woodland.

Approximately two hectares of remnant vegetation over Lot 150 has been mapped as Banksia Woodlands. That is less, than the required area calculated above to appropriately offset the residual impact to Banksia Woodlands. The Spearwood sands over the proposed offset site supports the Yoongarillup and Karrakatta vegetation complexes of Hedde *et al.* (1980), and the vegetation association 998 (Spearwood 998) of Shepherd *et al.* (2001). These vegetation units incorporate Tuart as a structural component either as a woodland, medium woodland, tall woodland or open forest (Hedde *et al.* 1980; Shepherd *et al.* 2001). Banksia occurring within these vegetation units on Spearwood sands is likely to at least partially correspond to the Banksia Woodlands ecological community (TSSC 2016). In consideration of the soil types and vegetation types present over Lot 150, the at least 24 hectares of remnant native vegetation occurring (Appendix E: Figure 2), and the 35 hectares identified as an offset site (Figure 2) it is considered that proposed management actions can restore Banksia Woodlands to the required outcome, and the DBCA have confirmed that Lot 150 contains the attributes required to enable the restoration of Banksia Woodlands to the required offset outcome (DBCA 2022) (Appendix E: Figure 7).

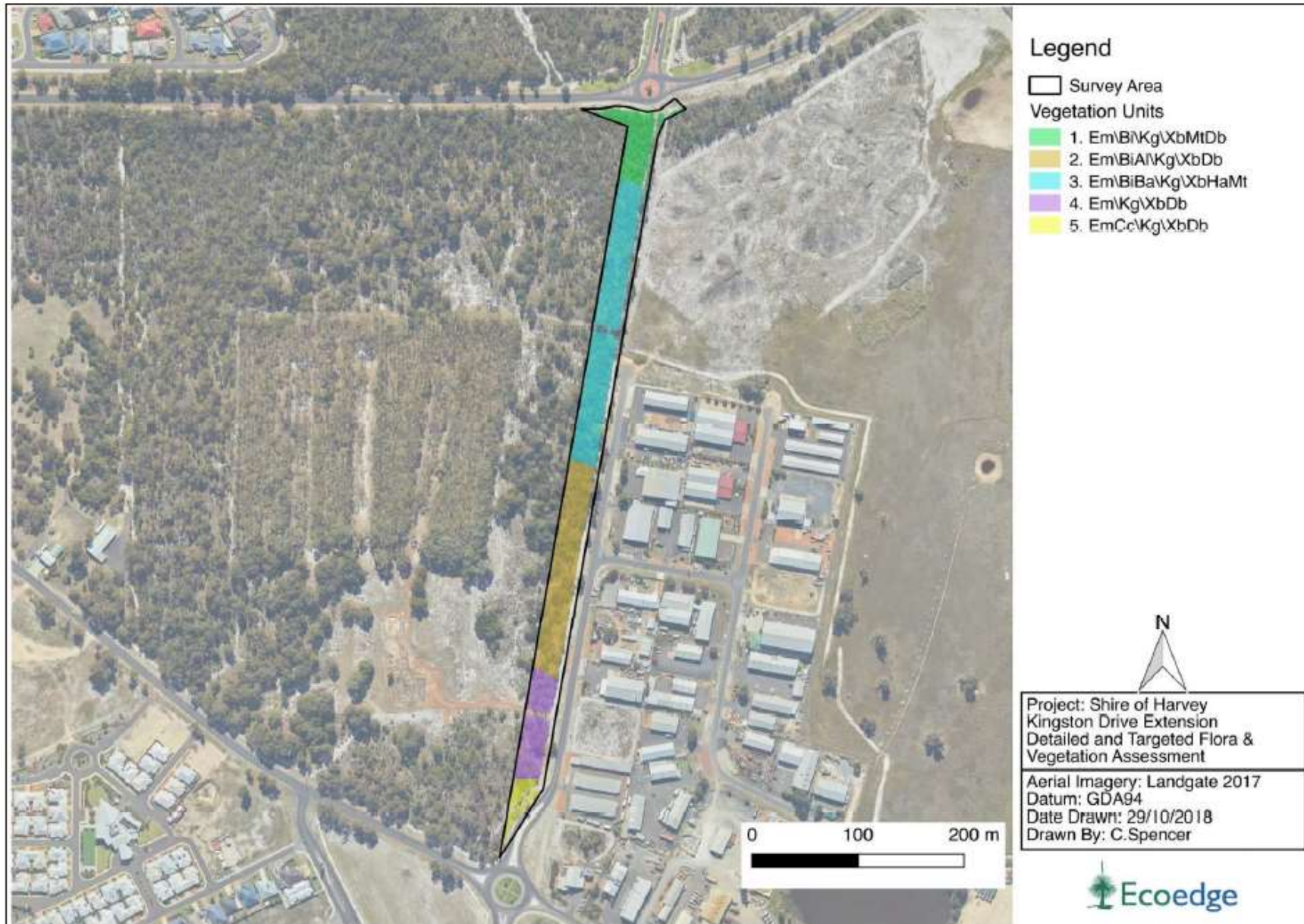
Offset projects undertaken within conservation areas must be such that the actions being proposed are additional to work routinely undertaken by the relevant land manager, and not be part of normal responsibilities (WA Offsets Guideline, August 2014). The DBCA have recommended Lot 150 as a preferred offset location whereby approximately 60 hectares of previous pasture lands, held by DBCA as freehold land, is to be managed for conservation purposes and is available for revegetation and rehabilitation actions (Shire of Harvey 2022). The DBCA have agreed to the Shire of Harvey accessing Lot 150 for rehabilitation and revegetation purposes (DBCA 2022), and advised that the proposed offset actions will add and enhance degraded lands within the Conservation Estate in a location that is a current focus of restoration efforts (Shire of Harvey 2022). The proposed offset will augment other offset areas located on Lot 150 associated with clearing permits CPS 8933/1, CPS 8932/1, and CPS 8116/2 (Figure 2) and therefore contribute to the overall enhancement of Lot 150.

The DBCA have advised that is prepared to make up to 20 hectares available within Lot 150 to the Shire of Harvey, comprised of one or multiple parcels, for the purposes of environmental offsets, subject to agreement being reached on the details contained in a Rehabilitation Plan to be prepared by the Shire and approved by the DBCA (DBCA 2022). The DBCA considers that Lot 150 will fulfill offset requirements for the residual impacts identified and offers the opportunity to recreate and restore components of the Banksia Woodland TEC vegetation community, and re-establish connectivity with natural occurrences on the northern and southern boundaries of the Lot (DBCA 2022) (Appendix E: Figure 7).

The applicant proposes to provide the entirety of the resources required to undertake the proposed rehabilitation actions within Lot 150. Preparation and coordination of the offset will be undertaken in consultation with the DBCA including revegetation and rehabilitation targets, success criteria, monitoring, and timeframes pertaining to each of the residual impacts that will be included within a revegetation plan consistent with "A Guide to Preparing Revegetation Plans for Clearing Permits under Part V of the Environmental Protection Act 1986". A final revegetation and rehabilitation plan pertaining to Lot 150 will require approval from both DWER and the DBCA. Once the final areas of rehabilitation have been identified in consultation with DBCA, the location of rehabilitation activities will be updated on the relevant plans.

The Delegated Officer considers that this adequately counterbalances the significant residual impacts identified. The justification for the values used in offset calculations is provided in **Error! Reference source not found.**

Appendix A – Biological survey excerpts – Flora and vegetation (Ecoedge 2018)



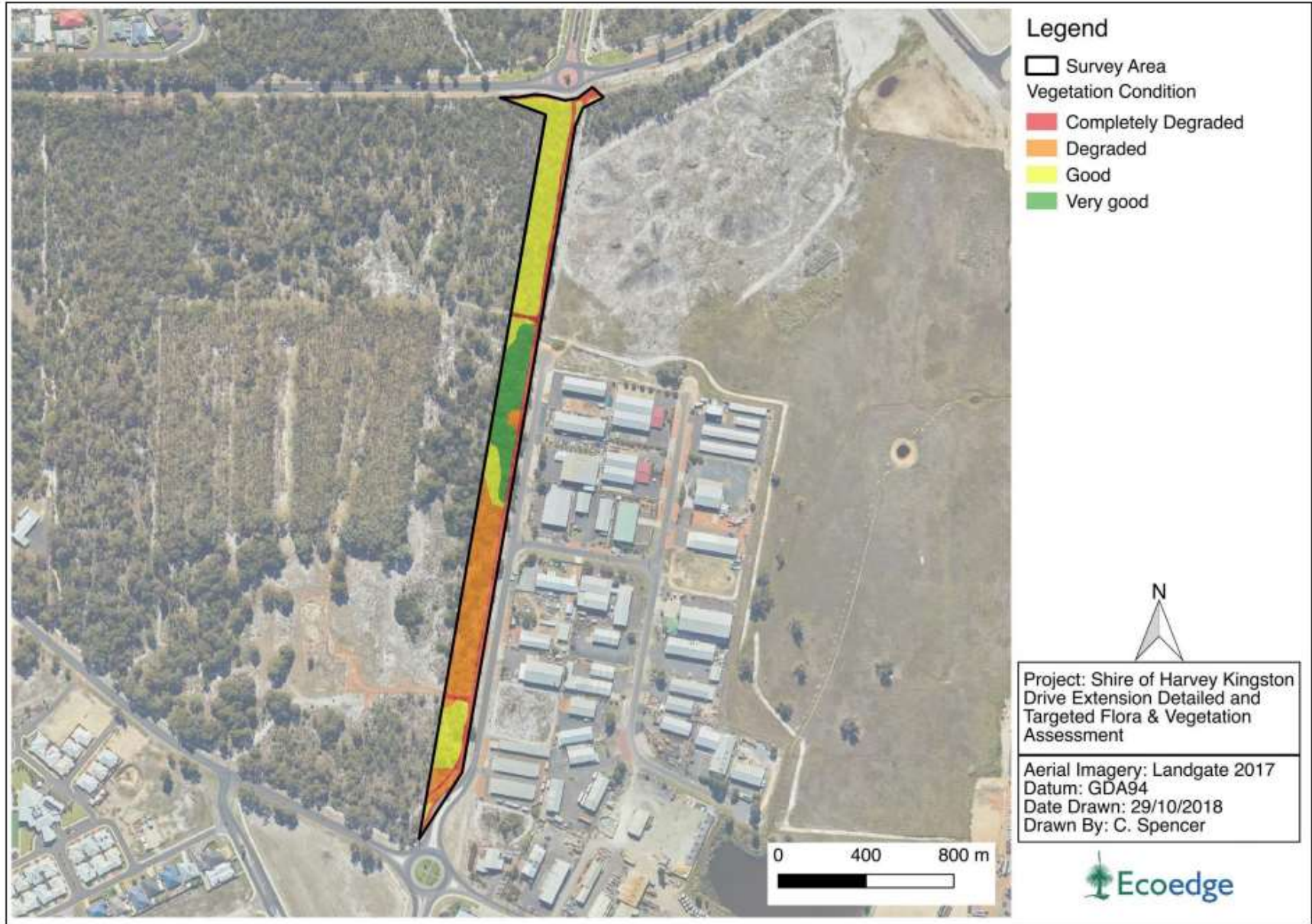


Table 5. Threatened and Priority flora known to occur within ten km of the Survey Area (DBCA, 2018a, 2018b; DotEE, 2018b).

Species	Cons Status*	Flowering	Description and Habitat	Likelihood of Occurrence
<i>Acacia flagelliformis</i>	P4	May-Sep	Rush-like, erect or sprawling shrub, 0.3-0.75(-1.6) m high. Fl. yellow. Sandy soils. Winter-wet areas.	Moderate
<i>Acacia semitrullata</i>	P4	May-Oct	Slender, erect, pungent shrub, (0.1-)0.2-0.7(-1.5) m high. Fl. cream, white. White/grey sand, sometimes over laterite, clay. Sandplains, swampy areas.	High
<i>Andersonia gracilis</i>	T (EN)	Sep-Nov	Slender erect or open straggly shrub, 0.1-0.5(-1) m high. Fl. white-pink-purple. White/grey sand, sandy clay, gravelly loam. Winter-wet areas, near swamps.	Low
<i>Aponogeton hexatepalus</i>	P4	Jul-Oct	Rhizomatous or cormous, aquatic perennial, herb, leaves floating. Fl. green, white. Mud. Freshwater: ponds, rivers, claypans.	None
<i>Banksia nivea</i> subsp. <i>uliginosa</i>	T (EN)	July-Sep	Dense, erect, non-lignotuberous shrub, 0.2–1.5 m high. Fl. yellow, brown. Sandy clay, gravel.	None
<i>Banksia squarrosa</i> subsp. <i>argillacea</i>	T (VU)	Jun-Nov	Erect, open, non-lignotuberous shrub, 1.2–4 m high. Fl. yellow, Jun–Nov. White/grey sand, gravelly clay or loam. Winter-wet flats, clay flats.	Low
<i>Brachyscias verecundus</i>	T (CE)	Nov	Annual (or ephemeral), herb, 0.012-0.022 m high, entirely glabrous. Fl. white/cream. In a moss sward. On a granite outcrop.	None
<i>Caladenia huegelii</i>	T (EN)	Sep-Oct	Tuberous, perennial, herb, 0.25-0.6 m high. Fl. green, cream, red. Grey or brown sand, clay loam.	Moderate
<i>Caladenia speciosa</i>	P4	Sep-Oct	Tuberous, perennial, herb, 0.35-0.6 m high. Fl. white, pink. White, grey or black sand.	Moderate
<i>Carex tereticaulis</i>	P1	Sep-Oct	Monoecious, rhizomatous, tufted perennial, grass-like or herb (sedge), 0.7 m high. Fl. brown. Black peaty sand.	Low
<i>Chamaescilla gibsonii</i>	P3	Sep	Clumped tuberous, herb. Fl. blue. Clay to sandy clay. Winter-wet flats, shallow water-filled claypans.	Low
<i>Chamelaucium</i> sp. S Coastal Plain (R.D. Royce 4872)	T (VU)	Oct-Dec	Winter-wet areas, loams and ironstone.	None

Species	Cons Status*	Flowering	Description and Habitat	Likelihood of Occurrence
<i>Craspedia</i> sp. Waterloo (G.J. Keighery 13724)	P2	Aug-Sep or Oct	Completely glabrous. Fl. Bright yellow. Growing in water on seasonally inundated heavy soils of the Pinjarra plain near Waterloo.	None
<i>Dillwynia dillwynioides</i>	P3	Aug-Dec	Decumbent or erect, slender shrub, 0.3–1.2 m high. Fl. red, yellow, orange,. Sandy soils. Winter-wet depressions, inundated flats generally alongside rivers or deeper swamps.	Low
<i>Diuris drummondii</i>	T (VU)	Nov-Jan	Tuberous, perennial, herb, 0.5-1.05 m high. Fl. yellow. Low-lying depressions, swamps.	Low
<i>Diuris micrantha</i>	T (VU)	Sep-Oct	Tuberous, perennial, herb, 0.3–0.6 m high. Fl. yellow, brown. Brown loamy clay. Winter-wet swamps, in shallow water.	Low
<i>Diuris purdiei</i>	T (EN)	Sep-Oct	Tuberous, perennial, herb, 0.15-0.35 m high. Fl. yellow. Grey-black sand, moist. Winter-wet swamps.	Low
<i>Drakaea elastica</i>	T (EN)	Oct-Nov	Tuberous, perennial, herb, 0.12-0.3 m high. Fl. red, green, yellow. White or grey sand. Low-lying situations adjoining winter-wet swamps.	Low
<i>Drakaea micrantha</i>	T (VU)	Sep-Oct	Tuberous, perennial, herb, 0.15–0.3 m high. Fl. red, yellow. White-grey sand.	Moderate
<i>Eleocharis keigheryi</i>	T (VU)	Aug-Nov	Rhizomatous, clumped perennial, grass-like or herb (sedge), to 0.4 m high. Fl. green. Clay, sandy loam. Emergent in freshwater: creeks, claypans	Low
<i>Grevillea rosieri</i>	P2	Jul-Sep	Shrubs, 0.5 m high. Flowers red or brown. Gravelly soil, or sand; sandplains; gravel pits.	Low
<i>Lambertia echinata</i> subsp. <i>occidentalis</i>	T (EN)	Feb/May-Jun/Oct	Prickly, much-branched, non-lignotuberous shrub, to 3 m high. Fl. yellow. White sandy soils over laterite, orange/brown-red clay over ironstone.	None
<i>Lasiopetalum membranaceum</i>	P3	Sep-Dec	Multi-stemmed shrub, 0.2-1 m high. Fl. pink, blue, purple. Sand over limestone.	Moderate
<i>Ornduffia submersa</i>	P4	Sep-Oct	Tuberous emergent aquatic perennial dwarf shrub, height to 35 cm; flowers white; leaves floating on surface of water. Clay-based ponds and swamps (semi-aquatic)	None

Species	Cons Status*	Flowering	Description and Habitat	Likelihood of Occurrence
<i>Pterostylis frenchii</i>	P2	Nov-Dec	Tuberous, herb, to 0.35 m high, with rosette leaves. Fl. white. Calcareous sand with limestone, laterite. Flatlands and gentle slopes.	Moderate
<i>Puccinellia vassica</i>	P1	Sep-Nov	Caespitose annual or perennial, grass-like or herb, 0.41–0.55 m high. Saline soils. On the outer margins of coastal saltmarshes	None
<i>Pultenaea skinneri</i>	P4	Jul-Sep	Slender shrub, 1-2 m high. Fl. yellow, orange, red. Sandy or clayey soils. Winter-wet depressions.	Moderate
<i>Rumex drummondii</i>	P4		Erect perennial, herb, 0.6-0.9 m high. Winter-wet disturbed areas.	Low
<i>Schoenus capillifolius</i>	P3	Oct-Nov	Semi-aquatic tufted annual, grass-like or herb (sedge), 0.05 m high. Fl. green. Brown mud. Claypans.	None
<i>Stylidium paludicola</i>	P3	Oct-Dec	Reed-like perennial, herb, 0.35-1 m high, Leaves tufted, linear or subulate or narrowly oblanceolate, 0.5-4 cm long, 0.5-1.5 mm wide, apex acute, margin entire, glabrous. Scape mostly glabrous, inflorescence axis glandular. Inflorescence racemose. Fl. pink. Peaty sand over clay. Winter wet habitats. Marri and Melaleuca woodland, Melaleuca shrubland.	Low
<i>Synaphea odocoileops</i>	P1	Aug-Oct	Tufted, compact shrub, 0.2–0.5 m high. Fl. yellow. Brown-orange loam & sandy clay, granite. Swamps, winter-wet areas.	None
<i>Synaphea</i> sp. Fairbridge Farm (D. Popenfus 696)	T	Oct	Dense, clumped shrub, to 0.3 m high, to 0.4 m wide. Fl. Yellow. Sandy with lateritic pebbles. Near winter-wet flats, in low woodland with weedy grasses.	None
<i>Synaphea</i> sp. Serpentine	T	Sep-Oct	Shrublands and woodlands on loamy soils	None
<i>Synaphea stenoloba</i>	T (EN)	Aug-Oct	Caespitose shrub, 0.3–0.45 m high. Fl. Yellow. Sandy or sandy clay soils. Winter-wet flats, granite. Shrublands and woodlands on loamy soils. Considered endemic to	None
<i>Verticordia attenuata</i>	P3	Dec-May	Shrub, 0.4–1 m high. Fl. pink. White or grey sand. Winter-wet depressions	Moderate

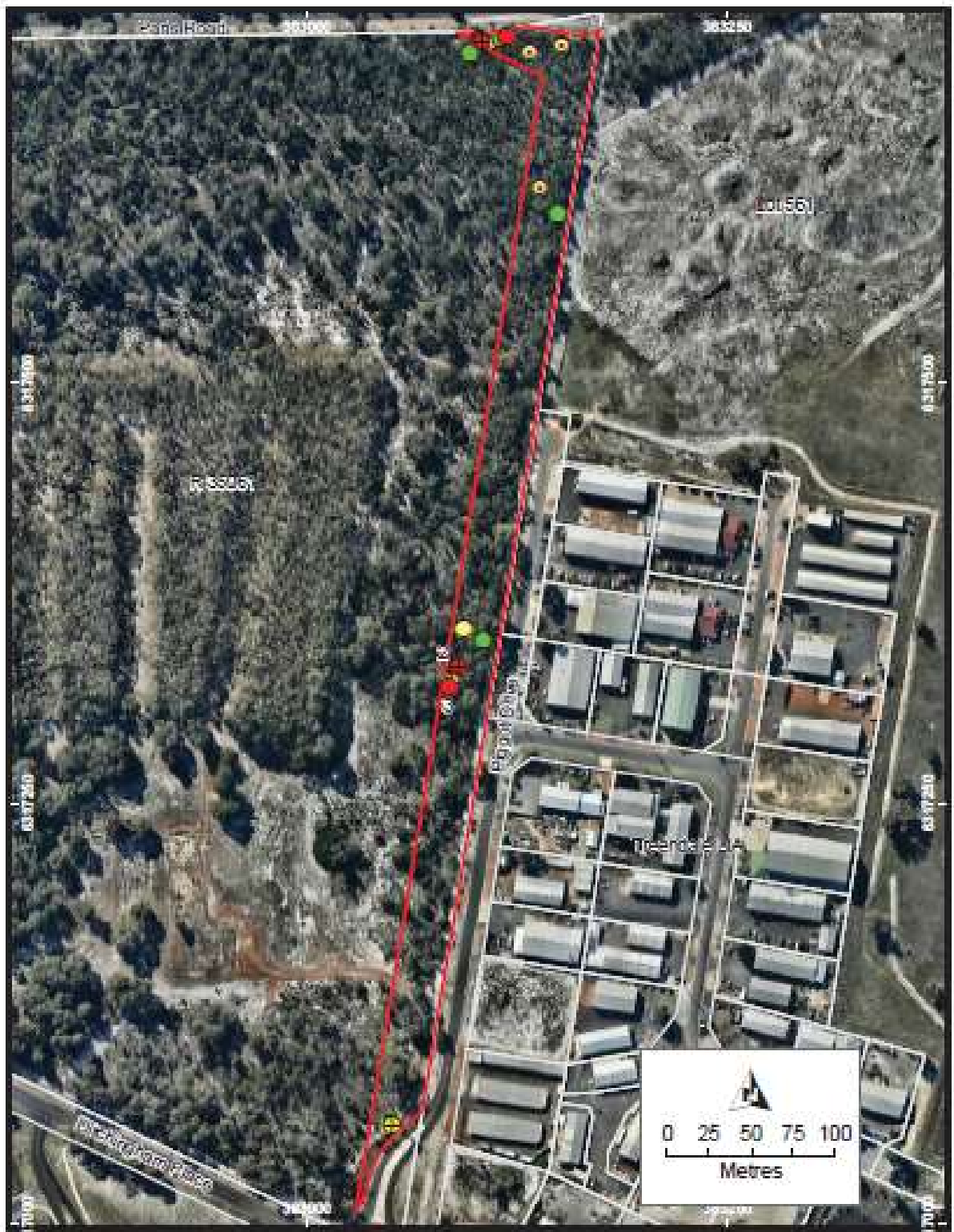
Note: The WC Act Conservation Status is shown, EPBC Act status, where relevant, is in brackets.

Appendix B – Biological survey excerpts – Fauna (Harewood 2018)

Table 4: Likelihood of Occurrence and Possible Impacts – Fauna Species of Conservation Significance (continues on following pages).

Common Name	Genus & Species	Conservation Status (See Appendix A for codes)	Habitat Present	Likelihood of Occurrence	Possible Impacts/ Significance of Possible Impacts
Carter's Freshwater Mussel	<i>Westralunio carteri</i>	VU, VU	No	Would Not Occur	No impact.
Black-stripe Minnow	<i>Galaxiella nigrostriata</i>	EN	No	Would Not Occur	No impact.
Balston's Pygmy Perch	<i>Nannatherina balstoni</i>	VU, VU	No	Would Not Occur	No impact.
Pouched Lamprey	<i>Geotria australis</i>	P1	No	Would Not Occur	No impact.
Perth Lined Lerista	<i>Lerista lineata</i>	P3	No/Marginal	Unlikely to Occur	No impact.
The Bunbury Skink	<i>Hemiergis 'koontoolasi'</i>	P1	No	Would Not Occur - species locally extinct.	No Impact.
Coastal Plains Skink	<i>Ctenotus ora</i>	P3	Yes/Marginal	Possible	Loss/modification of very small areas of habitat/Low.
Australasian Bittern	<i>Botaurus poiciloptilus</i>	S2, EN	No/Very Marginal.	Would Not Occur	No impact.
Black Bittern	<i>Ixobrychus flavicollis australis</i>	P1	No/Very Marginal.	Would Not Occur	No impact.
Little Bittern	<i>Ixobrychus minutus</i>	P4	No/Very Marginal.	Would Not Occur	No impact.
Migratory Shorebirds/Wetland/Marine Species	Various	Mig, Various	No	Would Not Occur	No impact.
Blue-billed Duck	<i>Oxyura australis</i>	P4	No	Would Not Occur	No impact.
Eastern Osprey	<i>Pandion haliaetus</i>	S5, Mig	No	Would Not Occur	No impact.
Peregrine Falcon	<i>Falco peregrinus</i>	S6	Yes	Possibly Occurs but only rarely.	Loss/modification of very small areas of foraging habitat/ Negligible.
Barking Owl	<i>Ninox connivens connivens</i>	P2	No	Would Not Occur	No impact.
Masked Owl	<i>Tyto novaehollandae novaehollandae</i>	P3	No/Marginal	Unlikely to Occur	No impact.

Common Name	Genus & Species	Conservation Status (See Appendix A for codes)	Habitat Present	Likelihood of Occurrence	Possible Impacts/ Significance of Possible Impacts
Fork-tailed Swift	<i>Apus pacificus</i>	S5, Mig	Yes	Unlikely to Occur, Flyover only on very rare occasions.	No impact.
Grey Wagtail	<i>Motacilla cinerea</i>	S5, Mig	No	Would Not Occur	No impact.
Western Whipbird	<i>Psophodes nigrogularis nigrogularis</i>	S2, EN	No	Would Not Occur	No impact.
Camaby's Black Cockatoo	<i>Calyptorhynchus latirostris</i>	S2, EN	Yes	Known to Occur	Loss of a small area of habitat/Low.
Baudin's Black Cockatoo	<i>Calyptorhynchus baudinii</i>	S3, VU	Yes	Known to Occur	Loss of a small area of habitat/Low.
Forest Red-tailed Black Cockatoo	<i>Calyptorhynchus banksii naso</i>	S3, VU	Yes	Known to Occur.	Loss of small areas of habitat/Low.
Chuditch	<i>Dasyurus geoffroii</i>	S3, VU	No	Would not Occur – Locally extinct.	No impact.
Numbat	<i>Myrmecobius fasciatus</i>	S2, EN	No	Would not Occur – Locally extinct.	No impact.
South-western Brush-tailed Phascogale	<i>Phascogale tapoatafa wambenger</i>	S6	Yes	Possibly Occurs	Loss/modification of very small areas of habitat/Low. Death or injury of individuals during clearing.
Quenda	<i>Isodon fusciventer</i>	P4	Yes	Possibly Occurs	Loss/modification of very small areas of habitat/Low. Death or injury of individuals during clearing.
Western Ringtail Possum	<i>Pseudocheirus occidentalis</i>	S1, CR	Yes	Known to Occur	Loss of a small area of habitat/Low -Moderate. Death or injury of individuals during clearing.
Woylie	<i>Bettongia penicillate ogilbyi</i>	CR, EN	No	Would not Occur – Locally extinct.	No impact.
Western Brush Wallaby	<i>Macropus irma</i>	P4	No	Would Not Occur	No impact.
Quokka	<i>Setonix brachyurus</i>	VU, VU	No	Would not Occur	No impact.
Western False Pipistrelle	<i>Falsistrellus mackenziei</i>	P4	Yes	Possibly Occurs	Loss/modification of very small areas of habitat/Low.
Water Rat	<i>Hydromys chrysogaster</i>	P4	No	Would not Occur	No impact.



Legend

- | | | |
|-----------------------|-------------------------|-------------------------|
| Subject Site | Night 1 | Night 2 |
| Daytime Survey | Western Ringtail Possum | Western Ringtail Possum |
| WRP Drey | Common Brushtail Possum | Common Brushtail Possum |
| WRP Scats | | Common Brushtail Possum |





Fauna Assessment
 Group of Herpetologists
 Date: Aug 2018
 Scale: 1:3,000



CPS 7000/1
 KINGSTON DRIVE EXTENSION
 SHIRE OF HARVEY

Possum Observations

Project/Coordinate System: UTM/MGA Zone 52 Figure 3

Table 3: Foraging evidence examples

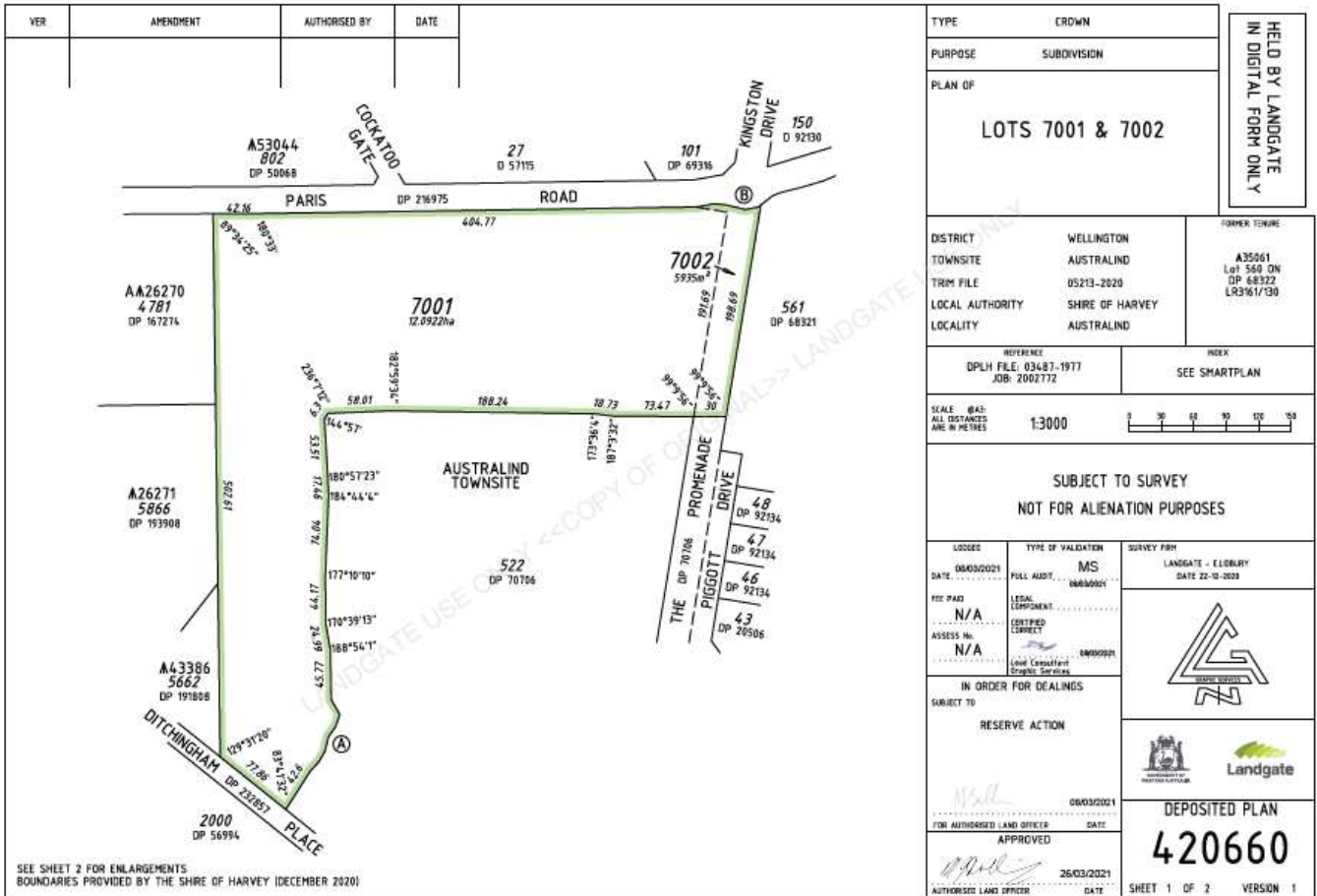
Foraging Evidence Description	Example Image
Marri Fruits – foraging activity attributed to the forest red-tailed black-cockatoo.	
Marri fruits – foraging activity attributed to the Carnaby's black cockatoo.	
Marri fruits – foraging activity attributed to the Baudin's black cockatoo.	

Foraging Evidence Description	Example Image
Jarrah Fruits – foraging activity attributed to the forest red-tailed or Carnaby's black-cockatoo.	
Banksia Cone – foraging activity attributed to the Carnaby's black-cockatoo.	

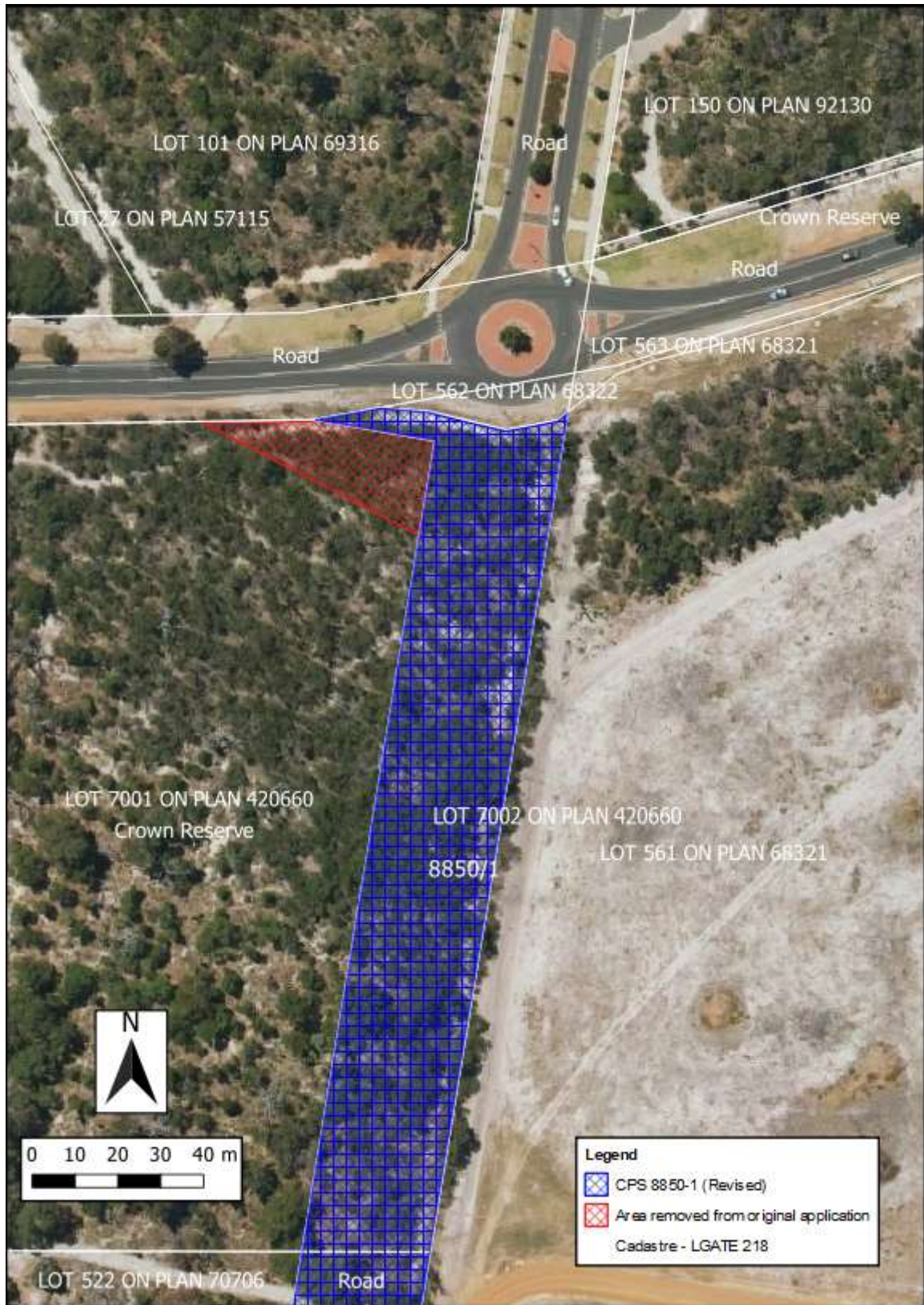
Appendix C – Plan submitted for the creation of new Lot 7002 on Deposited Plan 420660 (WAPC 2021)

LANDGATE USE ONLY, COPY OF ORIGINAL, NOT TO SCALE

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Appendix D – Revised application area consistent with revised tenure



Appendix E – Proposed offset site: Attributes

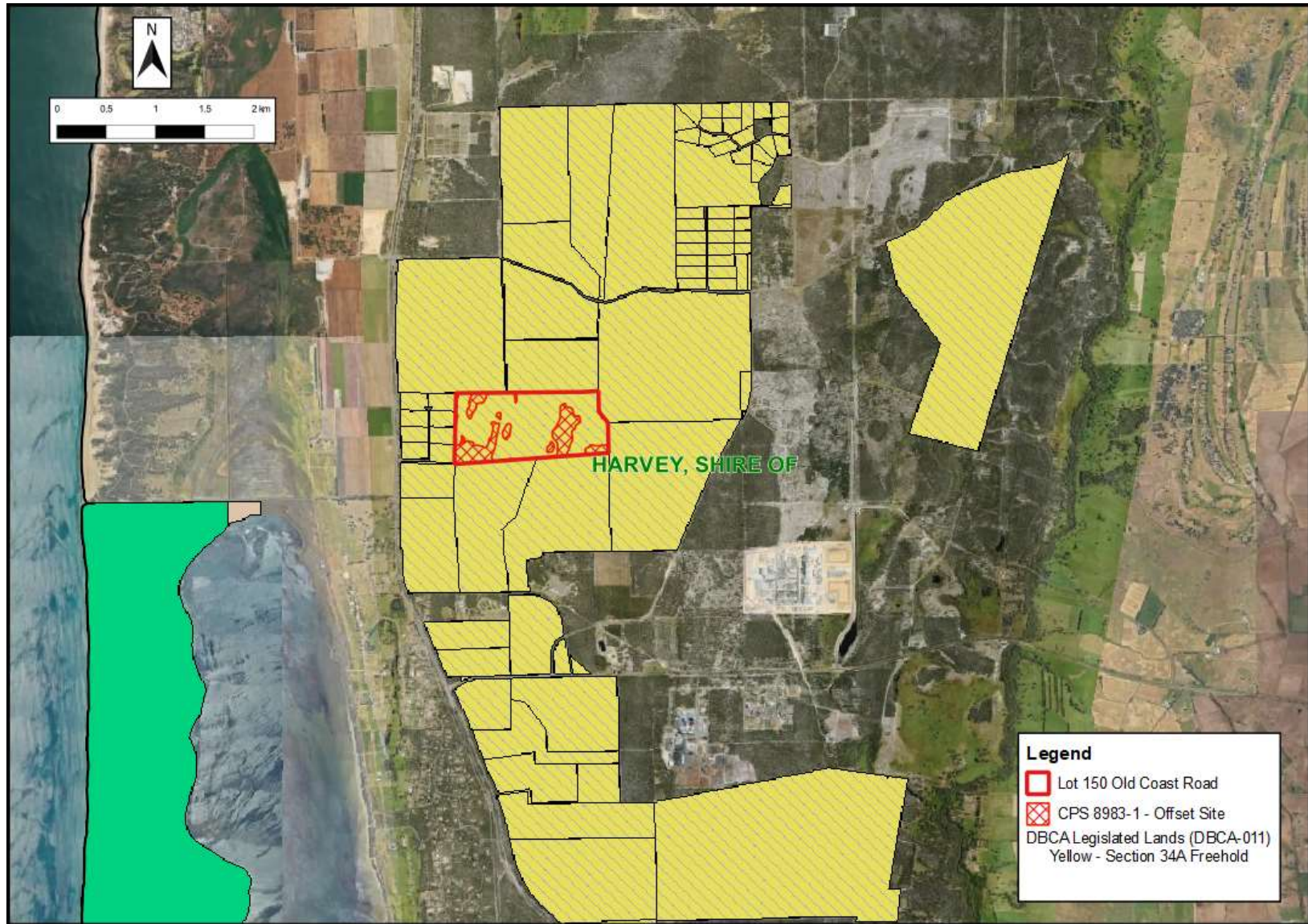


Figure 1: Offset tenure



Figure 2: Mapped remnant vegetation

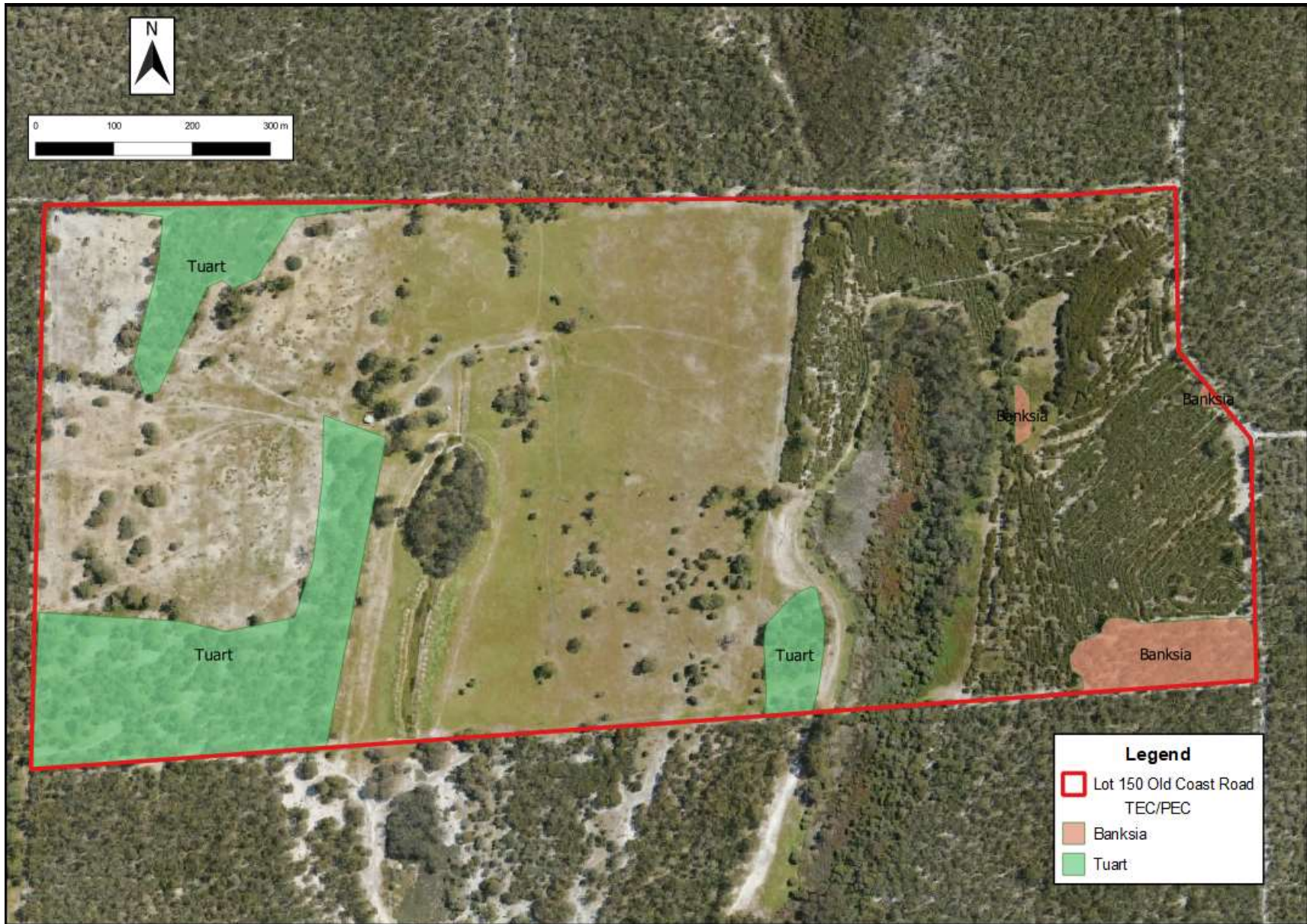


Figure 3: Mapped significant ecological communities



Figure 4: Mapped Western Ringtail Possum habitat

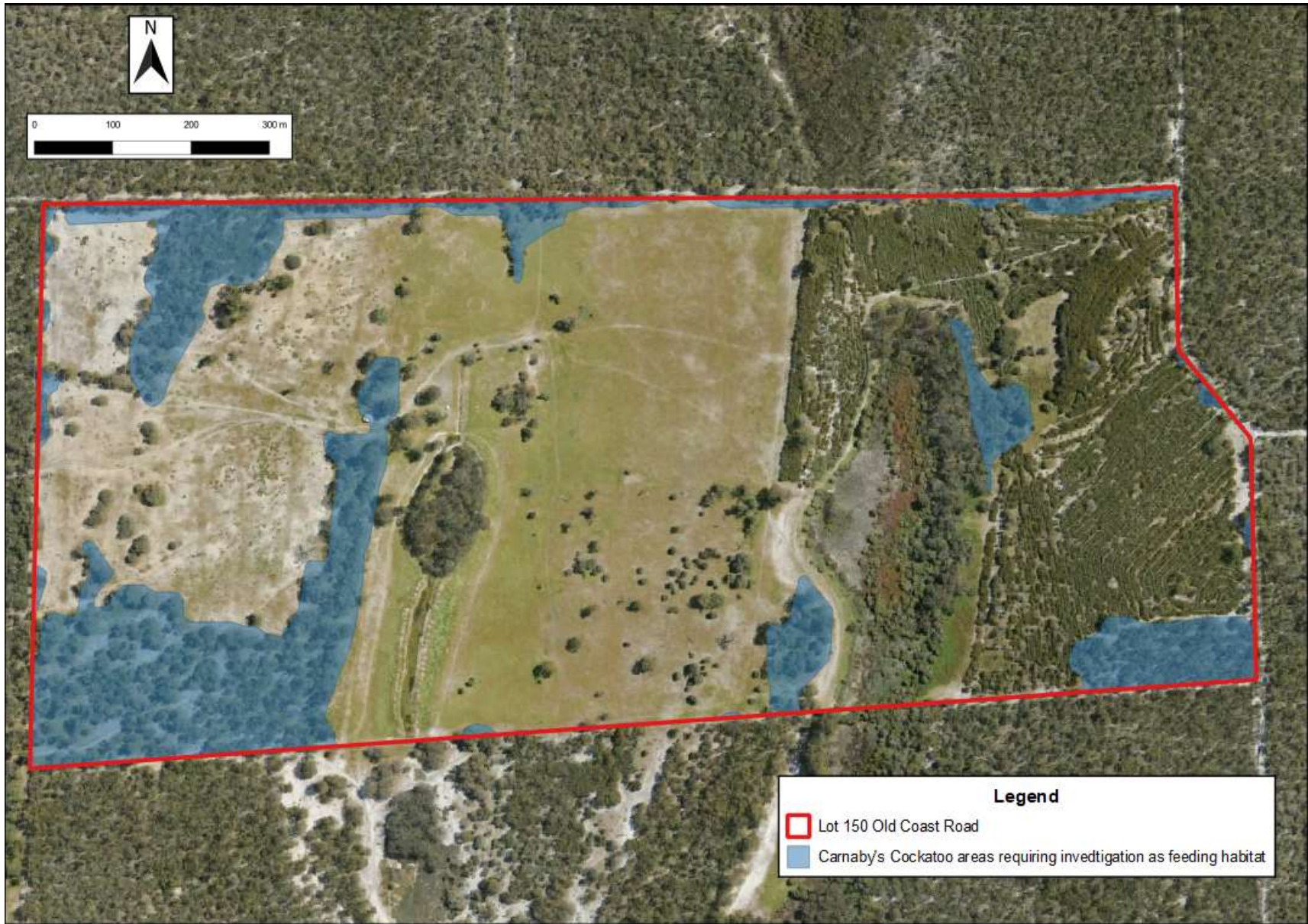


Figure 5: Mapped potential Carnaby's Cockatoo foraging habitat

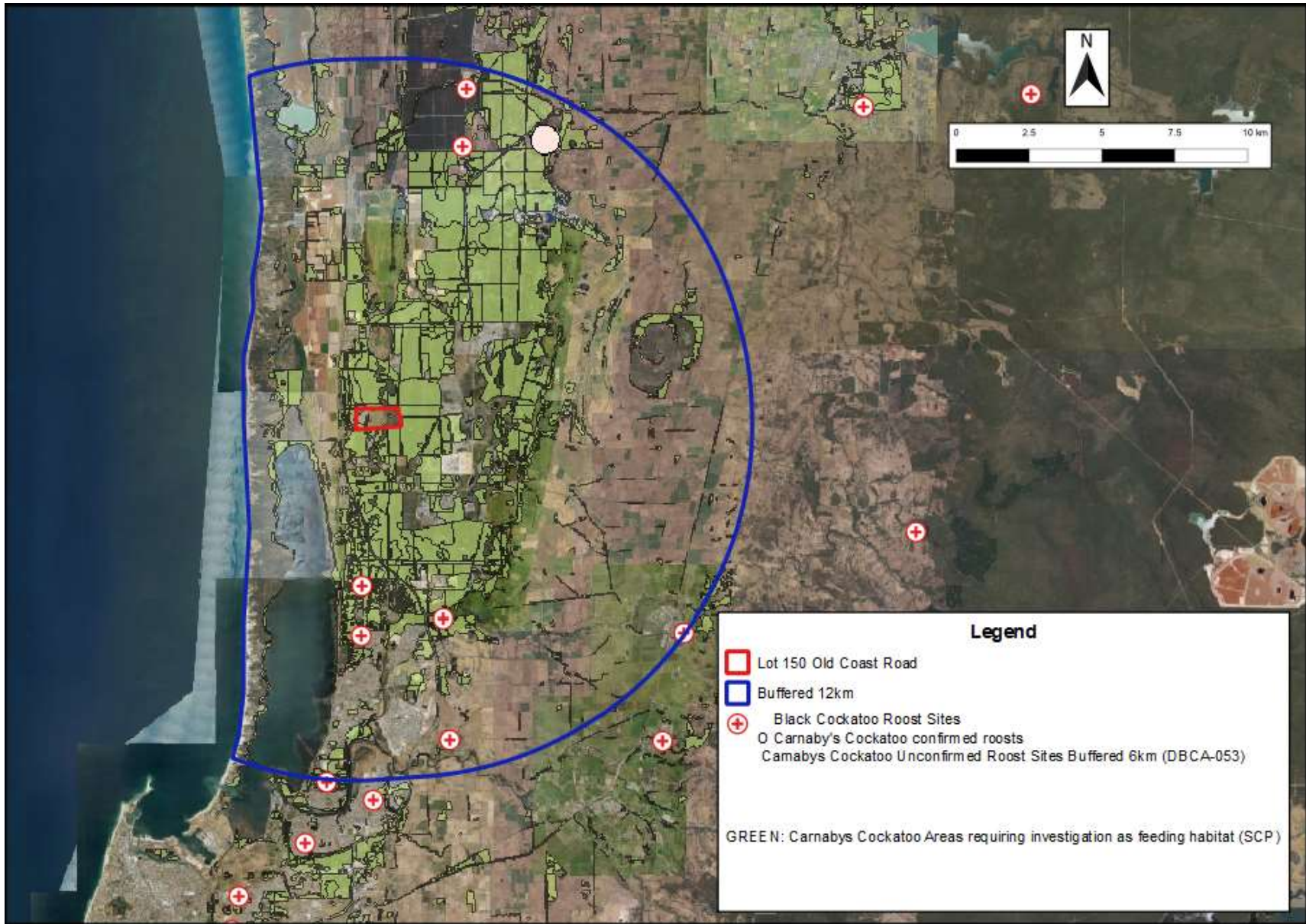


Figure 6: Mapped black cockatoo attributes within 12 kilometres of the proposed offset site



Figure 7: DBCA provided map detailing broad vegetation units over the proposed offset site (DBCA 2022)

Appendix F – Offset calculator values justification

Justification of values used – Western Ringtail Possum habitat		
Field Name	Description	Justification for value used
<i>IUCN Criteria</i>	The IUCN criteria for the value being impacted	(6.8%) Afforded to Western Ringtail Possum habitat as this species is listed as Critically Endangered under the <i>Biodiversity Conservation Act 2016</i> (WA) and the <i>Environment Protection and Biodiversity Conservation Act 1999</i> .
<i>Area of impact (habitat/community) or Quantum of impact (features/individuals)</i>	The area of habitat/community impacted or number of features/individuals impacted	(1.18ha) Comprises the portion of the application area that provides habitat for WRT
<i>Quality of impacted area (habitat/community)</i>	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	(5) Habitat is in good to very good condition
<i>Time over which loss is averted (habitat/community)</i>	This describes the timeframe over which changes in the level of risk to the proposed offset site can be considered and quantified	(20yr) The revegetation site would be conserved in perpetuity under conservation estate. 20 years is the maximum value associated with this field.
<i>Time until ecological benefit (habitat/community) or Time horizon (features/individuals)</i>	This describes the estimated time (in years) that it will take for the main benefit of the quality (habitat/community) or value (features/individuals) improvement of the proposed offset to be realised	(5yr) - To allow for species to grow to a suitable size to provide habitat.
<i>Start area (habitat/community) or Start value (features/individuals)</i>	The area of habitat/community or number of features/individuals proposed to offset the impacts	(5.69ha) Required to offset 100% of the significant residual impact.
<i>Start quality (habitat/community)</i>	The quality score for the area of habitat/community proposed as an offset - a measure of how well a particular site supports a particular threatened species or ecological community and contributes to its ongoing viability	(2) Assumed that the area selected for rehabilitation would be in a degraded condition.
<i>Future quality without offset (habitat/community) or Future value without offset (features/individuals)</i>	The predicted future quality score (habitat/community) or value (features/individuals) of the proposed offset site without the offset	(2) Assumed that the potential rehabilitation area would remain in a degraded condition should no ongoing management occur.
<i>Future quality with offset (habitat/community) or Future value with offset (features/individuals)</i>	The predicted future quality score (habitat/community) or value (features/individuals) of the proposed offset site with the offset	(4) Assumed that management intervention of fencing, weed control, and infill planting if undertaken successfully, could improve the habitat condition to 4 (good).
<i>Risk of loss (%) without offset (habitat/community)</i>	This describes the chance that the habitat/community on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter of concern) over the foreseeable future without an offset	(10%) Assuming that the offset area incorporates 34A freehold land under the CALM Act and managed by the DBCA

Justification of values used – Western Ringtail Possum habitat

Field Name	Description	Justification for value used
<i>Risk of loss (%) with offset (habitat/community)</i>	This describes the chance that the habitat/community on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter of concern) over the foreseeable future with an offset	(10%) Assuming that the offset area incorporates 34A freehold land under the CALM Act and managed by the DBCA
<i>Confidence in result (%) – risk of loss (habitat/community)</i>	The capacity of measures to mitigate risk of loss of the proposed offset site	(90%) There is a high level of confidence that the tenure will provide a low level risk of loss
<i>Confidence in result (%) – Change in quality (habitat/community) or Change in value (features/individuals)</i>	The level of certainty about the successful achievement of the proposed change in quality (habitat/community) or value (features/individuals)	(80%) There is a high level of confidence that with a revegetation plan consistent with a <i>Guide to Preparing Revegetation Plans for Clearing Permits</i> (DWER 2018), and ongoing management measures in place, the offset site would improve habitat from a degraded condition (2) to at least a good condition (4).
<i>% of impact offset</i>	% of the significant residual impact that would be offset by the proposed offset (note: the offset calculations combined should equate to 100% for each residual impact)	(100%) Obtained through the input of the variables explained above.

Justification of values used – Black cockatoo foraging habitat		
Field Name	Description	Justification for value used
<i>IUCN Criteria</i>	The IUCN criteria for the value being impacted	(1.2%) Afforded to black cockatoo habitat as this species is listed as Endangered under the <i>Biodiversity Conservation Act 2016 (WA)</i> and the <i>Environment Protection and Biodiversity Conservation Act 1999</i> .
<i>Area of impact (habitat/community) or Quantum of impact (features/individuals)</i>	The area of habitat/community impacted or number of features/individuals impacted	(1.60ha) Comprises the portion of the application area that provides significant foraging habitat for Carnaby's Cockatoo
<i>Quality of impacted area (habitat/community)</i>	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	(5) Habitat is in good to very good condition
<i>Time over which loss is averted (habitat/community)</i>	This describes the timeframe over which changes in the level of risk to the proposed offset site can be considered and quantified	(20yr) The revegetation site would be conserved in perpetuity under conservation estate. 20 years is the maximum value associated with this field.
<i>Time until ecological benefit (habitat/community) or Time horizon (features/individuals)</i>	This describes the estimated time (in years) that it will take for the main benefit of the quality (habitat/community) or value (features/individuals) improvement of the proposed offset to be realised	(5yr) To allow for species to grow to a suitable size to provide foraging habitat.
<i>Start area (habitat/community) or Start value (features/individuals)</i>	The area of habitat/community or number of features/individuals proposed to offset the impacts	(5.89ha) Required to offset 100% of the significant residual impact.
<i>Start quality (habitat/community)</i>	The quality score for the area of habitat/community proposed as an offset - a measure of how well a particular site supports a particular threatened species or ecological community and contributes to its ongoing viability	(2) Assumed that the area selected for rehabilitation would be in a degraded condition.
<i>Future quality without offset (habitat/community) or Future value without offset (features/individuals)</i>	The predicted future quality score (habitat/community) or value (features/individuals) of the proposed offset site without the offset	(2) Assumed that the potential rehabilitation area would remain in a degraded condition should no ongoing management occur.
<i>Future quality with offset (habitat/community) or Future value with offset (features/individuals)</i>	The predicted future quality score (habitat/community) or value (features/individuals) of the proposed offset site with the offset	(4) Assumed that management intervention of fencing, weed control, and infill planting if undertaken successfully, could improve the habitat condition to 4 (good).
<i>Risk of loss (%) without offset (habitat/community)</i>	This describes the chance that the habitat/community on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter of concern) over the foreseeable future without an offset	(10%) Assuming that the offset area incorporates 34A freehold land under the CALM Act and managed by the DBCA

Justification of values used – Black cockatoo foraging habitat

Field Name	Description	Justification for value used
<i>Risk of loss (%) with offset (habitat/community)</i>	This describes the chance that the habitat/community on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter of concern) over the foreseeable future with an offset	(10%) Assuming that the offset area incorporates 34A freehold land under the CALM Act and managed by the DBCA
<i>Confidence in result (%) – risk of loss (habitat/community)</i>	The capacity of measures to mitigate risk of loss of the proposed offset site	(90%) There is a high level of confidence that the tenure will provide a low level risk of loss
<i>Confidence in result (%) – Change in quality (habitat/community) or Change in value (features/individuals)</i>	The level of certainty about the successful achievement of the proposed change in quality (habitat/community) or value (features/individuals)	(80%) There is a high level of confidence that with a revegetation plan consistent with a <i>Guide to Preparing Revegetation Plans for Clearing Permits</i> (DWER 2018), and ongoing management measures in place, the offset site would improve habitat from a degraded condition (2) to at least a good condition (4).
<i>% of impact offset</i>	% of the significant residual impact that would be offset by the proposed offset (note: the offset calculations combined should equate to 100% for each residual impact)	(100%) Obtained through the input of the variables explained above.

Justification of values used – Significant remnant of native vegetation		
Field Name	Description	Justification for value used
<i>IUCN Criteria</i>	The IUCN criteria for the value being impacted	(0%) Afforded to significant remnant of native vegetation as the native vegetation is not listed under the <i>Biodiversity Conservation Act 2016</i> (WA) or the <i>Environment Protection and Biodiversity Conservation Act 1999</i> .
<i>Area of impact (habitat/community) or Quantum of impact (features/individuals)</i>	The area of habitat/community impacted or number of features/individuals impacted	(1.60ha) Comprises the portion of the application area that provides a significant remnant of native vegetation
<i>Quality of impacted area (habitat/community)</i>	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	(5) Vegetation is in good to very good condition
<i>Time over which loss is averted (habitat/community)</i>	This describes the timeframe over which changes in the level of risk to the proposed offset site can be considered and quantified	(20yr) The revegetation site would be conserved in perpetuity under conservation estate. 20 years is the maximum value associated with this field.
<i>Time until ecological benefit (habitat/community) or Time horizon (features/individuals)</i>	This describes the estimated time (in years) that it will take for the main benefit of the quality (habitat/community) or value (features/individuals) improvement of the proposed offset to be realised	(5r) To allow for native vegetation to grow to a suitable size to demonstrate sustainability.
<i>Start area (habitat/community) or Start value (features/individuals)</i>	The area of habitat/community or number of features/individuals proposed to offset the impacts	(5.56ha) Required to offset 100% of the significant residual impact.
<i>Start quality (habitat/community)</i>	The quality score for the area of habitat/community proposed as an offset - a measure of how well a particular site supports a particular threatened species or ecological community and contributes to its ongoing viability	(2) Assumed that the area selected for rehabilitation would be in a degraded condition.
<i>Future quality without offset (habitat/community) or Future value without offset (features/individuals)</i>	The predicted future quality score (habitat/community) or value (features/individuals) of the proposed offset site without the offset	(2) Assumed that the potential rehabilitation area would remain in a degraded condition should no ongoing management occur.
<i>Future quality with offset (habitat/community) or Future value with offset (features/individuals)</i>	The predicted future quality score (habitat/community) or value (features/individuals) of the proposed offset site with the offset	(4) Assumed that management intervention of fencing, weed control, and infill planting if undertaken successfully, could improve vegetation condition to 4 (good).
<i>Risk of loss (%) without offset (habitat/community)</i>	This describes the chance that the habitat/community on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter of concern) over the foreseeable future without an offset	(10%) Assuming that the offset area incorporates 34A freehold land under the CALM Act and managed by the DBCA

Justification of values used – Significant remnant of native vegetation

Field Name	Description	Justification for value used
<i>Risk of loss (%) with offset (habitat/community)</i>	This describes the chance that the habitat/community on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter of concern) over the foreseeable future with an offset	(10%) Assuming that the offset area incorporates 34A freehold land under the CALM Act and managed by the DBCA
<i>Confidence in result (%) – risk of loss (habitat/community)</i>	The capacity of measures to mitigate risk of loss of the proposed offset site	(90%) There is a high level of confidence that the tenure will provide a low level risk of loss
<i>Confidence in result (%) – Change in quality (habitat/community) or Change in value (features/individuals)</i>	The level of certainty about the successful achievement of the proposed change in quality (habitat/community) or value (features/individuals)	(80%) There is a high level of confidence that with a revegetation plan consistent with a <i>Guide to Preparing Revegetation Plans for Clearing Permits</i> (DWER 2018), and ongoing management measures in place, the offset site would improve habitat from a degraded condition (2) to at least a good condition (4).
<i>% of impact offset</i>	% of the significant residual impact that would be offset by the proposed offset (note: the offset calculations combined should equate to 100% for each residual impact)	(100%) Obtained through the input of the variables explained above.

Justification of values used – Banksia Woodland significant ecological community

Field Name	Description	Justification for value used
<i>IUCN Criteria</i>	The IUCN criteria for the value being impacted	(1.2%) Afforded to the Banksia TEC listed as Endangered under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> .
<i>Area of impact (habitat/community) or Quantum of impact (features/individuals)</i>	The area of habitat/community impacted or number of features/individuals impacted	(0.98ha) Comprises the portion of the application area representing the Banksia TEC
<i>Quality of impacted area (habitat/community)</i>	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	(5) Banksia TEC is in good to very good condition
<i>Time over which loss is averted (habitat/community)</i>	This describes the timeframe over which changes in the level of risk to the proposed offset site can be considered and quantified	(20yr) The rehabilitation site would be conserved in perpetuity under conservation estate. 20 years is the maximum value associated with this field.
<i>Time until ecological benefit (habitat/community) or Time horizon (features/individuals)</i>	This describes the estimated time (in years) that it will take for the main benefit of the quality (habitat/community) or value (features/individuals) improvement of the proposed offset to be realised	(5yr) Benefits of management actions to improve the Banksia TEC from degraded condition (2) to good condition (4) will be realised within 5 years
<i>Start area (habitat/community) or Start value (features/individuals)</i>	The area of habitat/community or number of features/individuals proposed to offset the impacts	(4.13ha) Required to offset 100% of the significant residual impact.
<i>Start quality (habitat/community)</i>	The quality score for the area of habitat/community proposed as an offset - a measure of how well a particular site supports a particular threatened species or ecological community and contributes to its ongoing viability	(2) Assumed that the area selected for rehabilitation would be in a degraded condition.
<i>Future quality without offset (habitat/community) or Future value without offset (features/individuals)</i>	The predicted future quality score (habitat/community) or value (features/individuals) of the proposed offset site without the offset	(2) Assumed that the attributes of the TEC would remain in a degraded condition should no ongoing management occur.
<i>Future quality with offset (habitat/community) or Future value with offset (features/individuals)</i>	The predicted future quality score (habitat/community) or value (features/individuals) of the proposed offset site with the offset	(4) Assumed that management intervention of fencing, weed control, and infill planting if undertaken successfully, could improve vegetation condition to 4 (good).
<i>Risk of loss (%) without offset (habitat/community)</i>	This describes the chance that the habitat/community on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter of concern) over the foreseeable future without an offset	(10%) Assuming that the offset area incorporates 34A freehold land under the CALM Act and managed by the DBCA
<i>Risk of loss (%) with offset (habitat/community)</i>	This describes the chance that the habitat/community on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter of concern) over the foreseeable future with an offset	(10%) Assuming that the offset area incorporates 34A freehold land under the CALM Act and managed by the DBCA

Justification of values used – Banksia Woodland significant ecological community

Field Name	Description	Justification for value used
<i>Confidence in result (%) – risk of loss (habitat/community)</i>	The capacity of measures to mitigate risk of loss of the proposed offset site	(90%) There is a high level of confidence that the tenure will provide a low level risk of loss
<i>Confidence in result (%) – Change in quality (habitat/community) or Change in value (features/individuals)</i>	The level of certainty about the successful achievement of the proposed change in quality (habitat/community) or value (features/individuals)	(70%) There is a reasonable to high level of confidence that with a rehabilitation plan and ongoing management measures in place the offset site would improve the TEC condition from degraded (2) to at least a good condition (4).
<i>% of impact offset</i>	% of the significant residual impact that would be offset by the proposed offset (note: the offset calculations combined should equate to 100% for each residual impact)	(100%) Obtained through the input of the variables explained above.

Appendix G – References and databases

1. References

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2. GIS datasets

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)