



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 8573/1
Permit Holder:	Commissioner of Main Roads Western Australia
Duration of Permit:	24 June 2020 to 24 June 2030

ADVICE NOTE

The funds referred to in condition 12 of this permit are intended for contributing towards the purchase of 126 hectares of native vegetation with habitat values for Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*).

The Permit Holder is authorised to clear native vegetation subject to the following conditions of this Permit.

PART I – CLEARING AUTHORISED

1. Purpose for which clearing may be done

Clearing for the purposes of road reconstruction, widening and associated activities.

2. Land on which clearing is to be done

Property Details	Locality
LOT 21 ON PLAN 22601	Wannamal
LOT 2 ON PLAN 6399	Wannamal
LOT 3234 ON PLAN 152709	Wannamal
LOT 3246 ON PLAN 152749	Wannamal
LOT 3 ON PLAN 6398	Wannamal
LOT 4 ON PLAN 6398	Wannamal
LOT 81 ON PLAN 74123	Wannamal
LOT 82 ON PLAN 74123	Wannamal
LOT 102 ON PLAN 156300	Yarawindah
LOT 11 ON PLAN 24201	Yarawindah
LOT 1 ON PLAN 13508	Yarawindah
LOT 321 ON PLAN 63642	Yarawindah
LOT 322 ON PLAN 63643	Yarawindah
LOT 323 ON PLAN 62546	Yarawindah
LOT 322 ON PLAN 63643	Yarawindah
LOT 323 ON PLAN 62546	Yarawindah
LOT 324 ON PLAN 63644	Yarawindah
LOT 3509 ON PLAN 207394	Yarawindah
LOT 4131 ON PLAN 190016	Yarawindah
LOT 539 ON PLAN 246476	Yarawindah
LOT 621 ON PLAN 63642	Yarawindah
LOT 622 ON PLAN 63643	Yarawindah
LOT 623 ON PLAN 62546	Yarawindah
LOT 624 ON PLAN 63644	Yarawindah
LOT 77 ON PLAN 162731	Yarawindah
LOT 8 ON PLAN 9755	Yarawindah
LOT M1903 ON PLAN 5926	Yarawindah
LOT M1991 ON DIAGRAM 14747	Yarawindah

LOT 1 ON PLAN 13508	New Norcia
LOT 354 ON PLAN 245110	New Norcia
LOT 365 ON PLAN 245118	New Norcia
LOT 400 ON PLAN 41111	New Norcia
LOT 401 ON PLAN 41111	New Norcia
LOT 464 ON PLAN 246379	New Norcia
LOT 50 ON DIAGRAM 4980	New Norcia
Road Reserve – PIN 11673195	Wannamal
Road Reserve - PIN 11670477	Wannamal
Road Reserve - PIN 11294578	Wannamal
Road Reserve - PIN 11501211	Wannamal
Road Reserve - PIN 11282935	Wannamal
Road Reserve - PIN 11501210	Wannamal
Road Reserve - PIN 11670535	Yarawindah
Road Reserve - PIN 11670536	Yarawindah
Road Reserve - PIN 11294579	Yarawindah
Road Reserve - PIN 11294580	Yarawindah
Road Reserve - PIN 11294581	Yarawindah
Road Reserve - PIN 11282932	Yarawindah
Road Reserve – PIN 11501345	Yarawindah
Road Reserve - PIN 11501344	Yarawindah
Road Reserve – PIN 11294582	Yarawindah
Road Reserve – PIN 11294583	Yarawindah
Road Reserve – PIN 11501290	Yarawindah
Road Reserve – PIN 11501291	Yarawindah
Road Reserve – PIN 11501207	Yarawindah
Road Reserve – PIN 11501209	Yarawindah
Road Reserve – PIN 11501267	Yarawindah
Road Reserve – PIN 11501289	Yarawindah
Road Reserve – PIN 11501208	Yarawindah
Road Reserve – PIN 11294584	Yarawindah
Road Reserve – PIN 11294586	Yarawindah
Road Reserve – PIN 11282930	Yarawindah
Road Reserve – PIN 11501206	Yarawindah
Road Reserve – PIN 11282931	Yarawindah
Road Reserve – PIN 11501205	New Norcia
Road Reserve – PIN 11294587	New Norcia
Road Reserve – PIN 11501343	New Norcia
Road Reserve – PIN 11501346	New Norcia
Road Reserve – PIN 1382293	New Norcia
Road Reserve – PIN 11294588	New Norcia
Road Reserve – PIN 11294585	New Norcia

3. Area of clearing

The Permit Holder must not clear more than 28 hectares of native vegetation within the areas cross-hatched red on attached Plan 8573/1a and Plan 8573/1b.

4. Application

This Permit allows the Permit Holder to authorise persons, including employees, contractors and agents of the Permit Holder, to clear native vegetation for the purposes of this Permit subject to compliance with the conditions of this Permit and approval from the Permit Holder.

5. Type of clearing authorised

This Permit authorises the Permit Holder to clear native vegetation for the activities described in condition 1 of this Permit to the extent that the Permit Holder has the power to carry out work involving clearing for those activities under the *Main Roads Act 1930* or any other written law.

6. Period in which clearing is authorised

The Permit Holder shall not clear any native vegetation after 24 June 2025.

PART II –MANAGEMENT CONDITIONS

7. Avoid, minimise and reduce the impacts and extent of clearing

In determining the amount of native vegetation to be cleared authorised under this Permit, the Permit Holder must have regard to the following principles, set out in order of preference:

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

8. Dieback and weed control

When undertaking any clearing authorised under this Permit, the Permit Holder must take the following steps to minimise the risk of the introduction and spread of *weeds* and *dieback*:

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

9. Fauna management - direction of clearing

The Permit Holder shall conduct clearing in a slow progressive manner from one direction to the other (e.g. east to west) to allow fauna to move into adjacent native vegetation ahead of the clearing activity.

10. Erosion management

The Permit Holder must ensure that road reconstruction, widening and associated activities commence within three months of the authorised clearing being undertaken.

11. Watercourse management

Where a *watercourse* is to be impacted by clearing, the Permit Holder shall maintain the existing surface water flow.

12. Monetary contributions to a fund maintained for the purpose of establishing or maintaining vegetation (offset)

Prior to undertaking any clearing authorised under this Permit and no later than 24 June 2021, the Permit Holder shall provide documentary evidence to the *CEO* that funding of \$126,000 has been transferred to the Department of Water and Environmental Regulation to purchase land for the purpose of establishing or maintaining native vegetation.

13. Carnaby's Black Cockatoo habitat management

The Permit Holder shall not clear more than 20 hectares of vegetation that provides suitable *foraging habitat* for *Carnaby's Black Cockatoo* (*Calyptorhynchus latirostris*).

14. Revegetation plan

- (a) Within 24 months of clearing commencing, the Permit Holder must submit a Project Revegetation Plan to the *CEO* for approval for *the revegetation/rehabilitation* of 20 hectares of land within the areas cross-hatched red on Plan 8573/1a and Plan 8573/1b, which shall be developed in accordance with *A Guide to Preparing Revegetation Plans for Clearing Permits* (Department of Water and Environmental Regulation (DWER) 2018).
- (b) The Project Revegetation Plan must be prepared by an *environmental specialist*.
- (c) The Project Revegetation Plan must include the following:
 - (i) *site preparation*
 - (ii) *weed control*

- (iii) *regeneration, direct seeding or planting, at an optimal time*
 - (iv) *a vegetation establishment period*
 - (v) *revegetation success completion criteria* based on selected *reference sites*, including but not limited to target weed cover, target vegetation condition, target density and target structure
 - (vi) remedial actions to be undertaken if *completion criteria* are not met
 - (vii) ongoing maintenance and monitoring of the area to be *revegetated* and *rehabilitated*
 - (viii) timeframes for completion of the activities
 - (ix) management commitments that will be achieved.
- (d) The Permit Holder shall implement the Project Revegetation Plan as approved by the *CEO*.

PART III - RECORD KEEPING AND REPORTING

15. Records must be kept

The Permit Holder must maintain the following records for activities done pursuant to this Permit:

- (a) In relation to the clearing of native vegetation authorised under this Permit:
 - (i) 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
 - (ii) the date that the area was cleared
 - (iii) the size of the area cleared (in hectares)
 - (iv) purpose for which clearing was undertaken.
 - (v) actions taken to avoid, minimise and reduce the impacts and extent of clearing in accordance with condition 7 of this Permit;
 - (vi) actions taken to minimise the risk of the introduction and spread of *weeds* and *dieback* in accordance with condition 8 of this Permit;
 - (vii) activities taken in accordance with condition 9 of this Permit;
 - (viii) activities taken in accordance with condition 10 of this Permit;
 - (ix) actions taken in accordance with condition 11 of this Permit;
 - (x) activities taken in accordance with condition 12 of this Permit;
 - (xi) activities taken in accordance with condition 13 of this Permit.

- (b) In relation to the *revegetation* and *rehabilitation* of areas pursuant to condition 14 of this Permit:
 - (i) a description of the *revegetation* and *rehabilitation* activities undertaken;
 - (ii) the size of the areas *revegetated* and *rehabilitated* (in hectares);
 - (iii) the date that *revegetation* and *rehabilitation* works began;
 - (iv) actions taken in accordance with condition 14 of this Permit.

16. 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 15 of this Permit; and
 - (ii) concerning activities done by the Permit Holder under this Permit between 1 January to 31 December of the preceding calendar year.
- (b) If no clearing authorised under this Permit has been undertaken, a written report confirming that no clearing under this Permit has been undertaken, must be provided to the *CEO* on or before 30 June of each year.
- (c) Prior to 24 March 2030, the Permit Holder must provide to the *CEO* a written report of records required under condition 15 of this Permit where these records have not already been provided under condition 16(a) of this Permit.

DEFINITIONS

The following meanings are given to terms used in this Permit:

CEO means the Chief Executive Officer of the Department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*

completion criteria means a measurable outcome based on suitable *reference sites*, used to determine revegetation/*rehabilitation* success

dieback means the effect of *Phytophthora* species on native vegetation

direct seeding means a method of re-establishing vegetation through the 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 *CEO* as a suitable environmental specialist

fill means material used to increase the ground level, or fill a hollow

foraging habitat for Carnaby's Black Cockatoo means the foraging habitat that was mapped in Arup Jacobs Joint Venture (2019) Great Northern Highway Bindoon Bypass – Northern Section (SLK 94.74 – 112.2) Clearing Permit Supporting Information.

local provenance means native vegetation seeds and propagating material from natural sources within 100 kilometres and the same Interim Biogeographic Regionalisation for Australia (IBRA) subregion of the area cleared

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

optimal time means the optimal time for undertaking *direct seeding* and *planting* in the Avon Wheatbelt

planting means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of the desired species

reference sites 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 values:

- (a) Suitable foraging habitat for Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*)
- (b) Vegetation in a good (Keighery, 1994) or better condition

rehabilitate/ed/ion/ing means actively managing an area containing native vegetation in order to improve the ecological function of that area

revegetate/ed/ion/ing 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

regeneration means revegetation that can be established from in situ seed banks contained either within the topsoil or seed-bearing mulch;

vegetation establishment period 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;

watercourse has the meaning given to it in section 3 of the *Rights in Water and Irrigation Act 1914*

weed/s means any plant -

- (a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*;
or
- (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or
- (c) not indigenous to the area concerned.



Ryan Mincham

2020.05.25

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Ryan Mincham
MANAGER
NATIVE VEGETATION REGULATION

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

25 May 2020

Plan 8573/1a




Legend

- CPS subject to conditions
- Local Government Authorities
- Roads - State Roads
- Cadastre

1.8 0.92 1.8 Kilometers



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Ryan Mincham
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Officer with delegated authority under Section 20 of the Environmental Protection Act 1986.

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Locality Map



Government of Western Australia
Department of Water and Environmental Regulation

Plan 8573/1b



Legend

- CPS subject to conditions
- Local Government Authorities
- Roads - State Roads
- Cadastre

2.0 0.99 2.0 Kilometers



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Officer with delegated authority under Section 20 of the Environmental Protection Act 1986.

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Locality Map



Government of Western Australia
Department of Water and Environmental Regulation



1. Application details

1.1. Permit application details

Permit application No.: 8573/1
Permit type: Purpose Permit

1.2. Applicant details

Applicant's name: Commissioner of Main Roads Western Australia
Application received date: 26 June 2019

1.3. Property details

Property:

ROAD RESERVE - 11673195, WANNAMAL
ROAD RESERVE - 11670477, WANNAMAL
ROAD RESERVE - 11294578, WANNAMAL
ROAD RESERVE - 11670535, YARAWINDAH
ROAD RESERVE - 11670536, YARAWINDAH
ROAD RESERVE - 11501211, WANNAMAL
ROAD RESERVE - 11282935, WANNAMAL
ROAD RESERVE - 11294579, YARAWINDAH
ROAD RESERVE - 11501210, WANNAMAL
ROAD RESERVE - 11294580, YARAWINDAH
ROAD RESERVE - 11294581, YARAWINDAH
ROAD RESERVE - 11282932, YARAWINDAH
ROAD RESERVE - 11501205, NEW NORCIA
ROAD RESERVE - 11501345, YARAWINDAH
ROAD RESERVE - 11501344, YARAWINDAH
ROAD RESERVE - 11294587, NEW NORCIA
ROAD RESERVE - 11501343, NEW NORCIA
ROAD RESERVE - 11294582, YARAWINDAH
ROAD RESERVE - 11294583, YARAWINDAH
ROAD RESERVE - 11501290, YARAWINDAH
ROAD RESERVE - 11501346, NEW NORCIA
ROAD RESERVE - 11501291, YARAWINDAH
ROAD RESERVE - 11501207, YARAWINDAH
ROAD RESERVE - 11501209, YARAWINDAH
ROAD RESERVE - 11501267, YARAWINDAH
ROAD RESERVE - 11501289, YARAWINDAH
ROAD RESERVE - 11501208, YARAWINDAH
ROAD RESERVE - 1382293, NEW NORCIA
ROAD RESERVE - 11294588, NEW NORCIA
ROAD RESERVE - 11294584, YARAWINDAH
ROAD RESERVE - 11294586, YARAWINDAH
ROAD RESERVE - 11282930, YARAWINDAH
ROAD RESERVE - 11501206, YARAWINDAH
ROAD RESERVE - 11282931, YARAWINDAH
ROAD RESERVE - 11294585, NEW NORCIA
LOT 102 ON PLAN 156300, YARAWINDAH
LOT 11 ON PLAN 24201, YARAWINDAH
LOT 1 ON PLAN 13508, YARAWINDAH
LOT 1 ON PLAN 13508, NEW NORCIA
LOT 21 ON PLAN 22601, WANNAMAL
LOT 2 ON PLAN 6399, WANNAMAL
LOT 321 ON PLAN 63642, YARAWINDAH
LOT 322 ON PLAN 63643, YARAWINDAH
LOT 3234 ON PLAN 152709, WANNAMAL
LOT 323 ON PLAN 62546, YARAWINDAH
LOT 3246 ON PLAN 152749, WANNAMAL
LOT 324 ON PLAN 63644, YARAWINDAH
LOT 3509 ON PLAN 207394, YARAWINDAH
LOT 354 ON PLAN 245110, NEW NORCIA
LOT 365 ON PLAN 245118, NEW NORCIA
LOT 3 ON PLAN 6398, WANNAMAL
LOT 400 ON PLAN 41111, NEW NORCIA
LOT 401 ON PLAN 41111, NEW NORCIA
LOT 4131 ON PLAN 190016, YARAWINDAH
LOT 464 ON PLAN 246379, NEW NORCIA
LOT 4 ON PLAN 6398, WANNAMAL
LOT 50 ON DIAGRAM 4980, NEW NORCIA

LOT 539 ON PLAN 246476, YARAWINDAH
LOT 621 ON PLAN 63642, YARAWINDAH
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LOT 82 ON PLAN 74123, WANNAMAL
LOT 8 ON PLAN 9755, YARAWINDAH
LOT M1903 ON PLAN 5926, YARAWINDAH
LOT M1991 ON DIAGRAM 14747, YARAWINDAH

Local Government Authority:
Localities:

Shire of Chittering and Shire of Victoria Plains
New Norcia, Wannamal and Yarawindah

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	Purpose category:
28		Mechanical Removal	Road widening

1.5. Decision on application

Decision on Permit Application:

Grant

Decision Date:

25 May 2020

Reasons for Decision:

The clearing permit application has been assessed against the clearing Principles, planning instruments and other matters in accordance with section 51O of the *Environmental Protection Act 1986* (EP Act). It has been concluded that the proposed clearing is at variance with Principle (a), (b), (e) and (f), may be at variance with Principle (h) and is not likely to be at variance with the remaining Principles.

The applicant has implemented or committed to a number of minimisation and mitigation measures, including the following:

- avoiding a significant amount of native vegetation in the design of the realignment of Great Northern Highway (GNH) by utilising existing cleared land;
- designing the alignment to avoid clearing of trees with hollows suitable for use, or showing signs of previous use, by Carnaby's Black Cockatoo;
- changing the design of the realignment to avoid a number of conservation significant flora habitats identified during surveys;
- changing the design of the realignment to avoid Julimar Shield-backed Trapdoor Spider burrows recorded during surveys;
- revegetating at least 20 hectares of land with flora species which provide known foraging and breeding habitat for Carnaby's Black Cockatoo.

Taking into account the above measures, the Delegated Officer considers that the following significant residual impacts remain:

- Loss of up to 20 hectares of native vegetation that provides foraging habitat for black cockatoos; and
- Loss of up to 28 hectares of native vegetation that is a significant remnant within an extensively cleared landscape.

The Delegated Officer considers that the acquisition and conservation of 126 hectares of native vegetation, within the general vicinity of the application area, containing the following values is sufficient to counterbalance the significant residual impacts:

- 20 hectares of foraging habitat for Carnaby's Black Cockatoo;
- 28 hectares of significant remnant vegetation within a highly cleared area.

As a condition of the clearing permit, the applicant is required to provide a monetary offset contribution, which will be used to acquire 126 hectares of native vegetation that includes the above values.

To minimise other potential impacts, as a condition of the clearing permit the applicant will be required to undertake the following measures:

- undertake slow, progressive one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity;
- implement weed and dieback management measures to reduce the risk of spread, particularly to Seven Mile Well Nature Reserve, including:
 - cleaning machines of soil and vegetation before entering and leaving the application area;
 - prohibiting the movement of machines between dieback infested and non-infested areas until those machines have been cleaned of soil and vegetation;
 - ensuring that no known dieback or weed-affected soil, mulch, fill or other material is brought into the application area;

- restricting the movement of machines and other vehicles to the limits of the areas to be cleared.

The Delegated Officer took into consideration that the road upgrades are required to improve road safety for passenger and heavy-haulage vehicles. The applicant has advised that there have been serious crashes within the project area over the years and with the proposed use of 53.5 metre (m) road trains to travel between Muchea and Wubin, it was identified that the current geometry and standard of road condition along the GNH between Hay Flat Road and New Norcia was likely to negatively impact driver safety, and constrain the safe and efficient movement of all vehicles. The applicant further advised that without road upgrades, crash susceptibility would persist.

In granting a clearing permit subject to the above requirements, the Delegated Officer determined that the proposed clearing is unlikely to lead to an unacceptable risk to the environment.

2. Site Information

Clearing Description

The application is for the proposed clearing of 28 hectares of native vegetation for the purpose of upgrading GNH between Straight Line Kilometre (SLK) 94.74 (near Calingiri Road) and SLK 112.3 (near southern end of New Norcia Bypass) for the northern section of the Bindoon Bypass.

Clearing of native vegetation is proposed for the following activities:

- construction of approximately 14.7 kilometres (km) of new carriageway with a 10 m wide seal on a 12 m wide formation;
- additional overtaking lanes;
- widening and an overtaking lane extension of approximately 3.4 km of the existing GNH;
- provision of new intersections to link the existing GNH (retained as a local access road) to the new sections of the GNH;
- construction and realignment of private driveways;
- upgrade and installation of culverts;
- installation of signage and line markings and removal of redundant signage;
- installation of safety barriers;
- installation of road reserve fencing; and
- potential installation of road lighting.

Vegetation Description

Flora and vegetation surveys of the application area were conducted over seven seasonal periods between Spring 2014 and Autumn 2018. All of the survey information was collected and consolidated into a single report titled 'Flora and fauna assessment for Calingiri survey area' (Phoenix, 2019).

Phoenix (2019) mapped the following Beard Vegetation Associations within the application area, with the majority comprising of medium woodlands of Wandoo, York Gum, Flooded Gum and/or Marri:

- 4: Medium woodland; Marri & Wandoo;
- 7: Medium woodland; York Gum (*Eucalyptus loxophleba*) and Wandoo;
- 352: Medium woodland; York Gum;
- 946: Medium woodland; Wandoo;
- 950: Medium woodland; *Casuarina obesa*;
- 973: Low forest; paperbark (*Melaleuca raphiophylla*);
- 999: Medium woodland; Marri;
- 1034: Medium woodland; Marri, Wandoo and Powderbark;
- 1132: Medium forest; Marri; and
- 1182: Medium woodland; *Eucalyptus rudis* and *Melaleuca raphiophylla*.

Four South West vegetation complexes have been mapped within the application area (Mattiske and Havel, 1998):

- Ck: Woodland of *Eucalyptus wandoo* with mixtures of *Eucalyptus patens*, *Eucalyptus marginata* subsp. *thalassica* and *Corymbia calophylla* on the valley slopes in arid and perarid zones;
- No: Mosaic of low open forest of *Casuarina obesa* and open scrub of *Casuarina obesa* - *Acacia* spp., *Melaleuca* spp. and woodland of *Eucalyptus rudis* - *Melaleuca raphiophylla* on major valley systems in the perarid zone;
- Mi: Open woodland of *Eucalyptus wandoo* over *Acacia acuminata* with some *Eucalyptus loxophleba* on valley slopes, with low woodland of *Allocasuarina huegeliana* on or near shallow granite outcrops in arid and perarid zones; and
- Y6: Woodland of *Eucalyptus wandoo* - *Eucalyptus accedens*, less consistently open forest of *Eucalyptus marginata* subsp. *thalassica* - *Corymbia calophylla* on lateritic uplands and breakaway landscapes in arid and perarid zones

Vegetation Condition

Degraded; Basic vegetation structure severely impacted by disturbance, scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing;

to

Excellent; Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species (Keighery, 1994).

Vegetation condition was determined by surveys undertaken by Phoenix (2019):

- Degraded (13.56 ha);
- Good (9.65 ha);
- Very Good (4.14 ha); and
- Excellent (0.37 ha).

Table 1: Condition of vegetation association mapped within the application area (Arup Jacobs Joint Venture, 2019).

Vegetation Association	Total (ha)				Total (ha)
	Degraded	Good	Very Good	Excellent	
4	1.21	0.89	1.15	0.00	3.25
7	4.62	0.58	0.00	0.00	5.20
352	1.01	1.80	0.66	0.00	3.47
946	2.88	3.47	0.87	0.00	7.22
950	0.90	1.87	0.00	0.00	2.77
973	0.00	0.07	0.66	0.23	0.96
999	0.47	0.14	0.32	0.03	0.96
1034	0.53	0.76	0.48	0.11	1.88
1132	0.00	0.04	0.00	0.00	0.04
1182	1.94	0.03	0.00	0.00	1.97
Total (ha)	13.56	9.65	4.14	0.37	27.72

Soil type

Six land sub- systems have been mapped within the application area (Purdie et. al, 2004):

- Udamong System: Northern Darling Range near New Norcia. Partially stripped lateritic plateau with undulating low hills to gently undulating rises. Loamy gravel, minor pale sand and clay; deep weathered granitic gneiss, gneiss and schist;
- Wannamal System: Alluvial plain and fans, brown and red loamy earths, yellow brown sandy duplexes, loamy duplexes;
- Yarawindah System: dissected lateritic plateau with rolling to undulating low hills and undulating rises; loamy gravel, loamy earth, loamy duplex, some rock; weathered schist and some gneiss;
- Glentrome System: stripped, weathered plateau with undulating low hills and rises; loamy earths, loam, loamy gravel and some clay and rock; weathered granite and migmatite;
- Julimar System: Moderately dissected areas with gravelly slopes and ridges and minor rock outcrop on the eastern side of the Darling Plateau over weathered granite and granitic gneiss, loamy gravel, shallow duplexes and pale deep sand common; and
- Ranfurly System: level to gently undulating plain being a relict flood plain, partially rejuvenated; loamy earths and clay, some duplex; from alluvium.

Local area

The local area considered in the assessment of this application is defined as a 10 km radius measured from the perimeter of the application area.

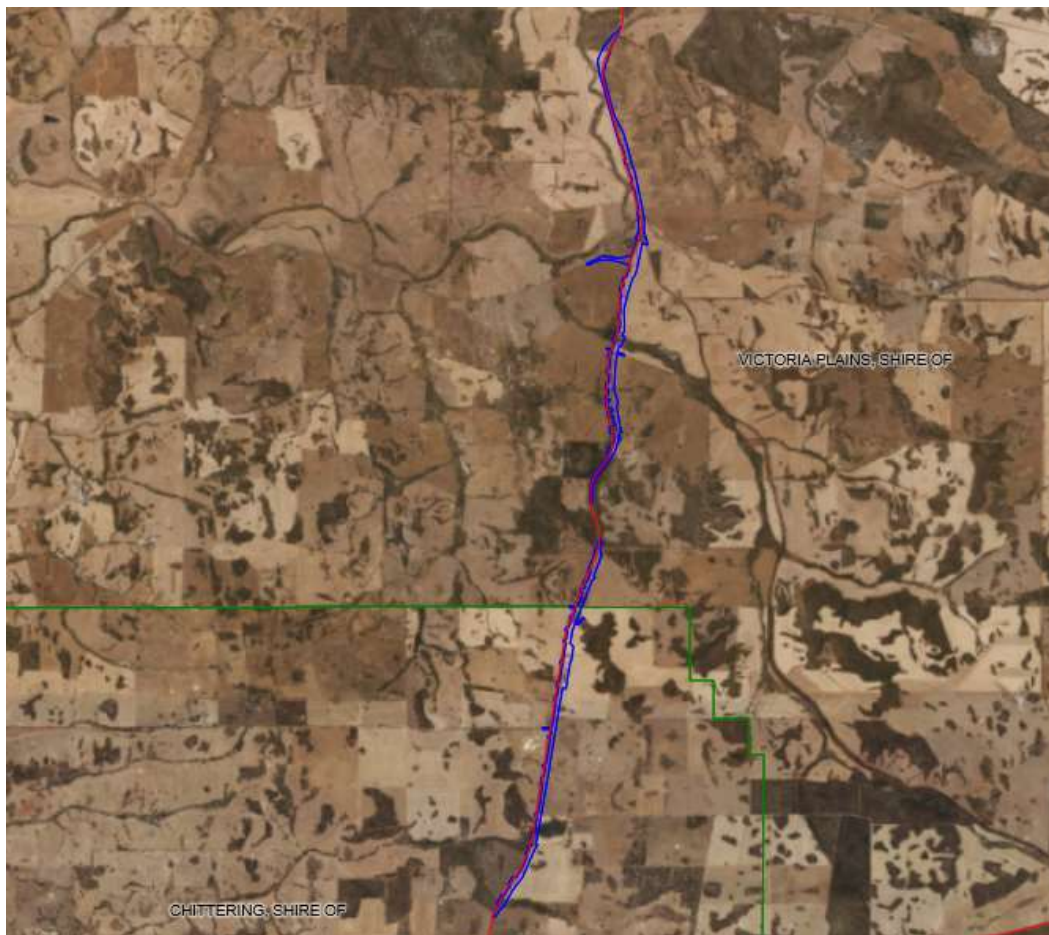


Figure 1: Application area for CPS 8573/1 outlined in blue.

3. Minimisation and mitigation measures

The applicant has advised that the following mitigation hierarchy was applied during the design phase for Bindoon Bypass – Northern Section (Arup Jacobs Joint Venture, 2019):

- Avoid: realignment of the GNH has allowed for avoidance of a significant amount of native vegetation, conservation significant flora and habitat for Carnaby's Black Cockatoo. The proposed realignment involves both upgrades to existing portions of highway (online) and construction of new road (offline). Offline construction has been adopted where there are significant environmental and safety benefits. Impacts to native vegetation, conservation significant flora and habitat for Carnaby's Black Cockatoo have been minimised through the areas of offline works and avoided where possible;
- Minimise: the alignment has been designed to avoid clearing of trees with hollows suitable for use, or showing signs of previous use, by Carnaby's Black Cockatoo. Only one tree with an unused potentially suitable hollow is proposed to be cleared (this tree does not present any evidence of having been used for nesting);
- Rehabilitate: cleared areas beyond the final road formation will be revegetated and landscaped, in line with the landscape design for Bindoon Bypass – Northern Section. This will likely result in areas of wider vegetated corridors than currently exists in this predominantly agricultural area.

The supporting documentation submitted with the application states that landscape design for the project includes revegetating cleared areas with flora species identified as providing known foraging and breeding habitat for Carnaby's Black Cockatoo. Further information on revegetation measures provided by the applicant are found in **Appendix 1**, specifying an outcome of revegetating at least 20 hectares of land with Carnaby's Black Cockatoo habitat (MRWA, 2020b). Laydown areas, vehicle turnaround bays and other ancillary areas required for construction of the permanent works will be located in previously cleared areas, where practicable (Arup Jacobs Joint Venture, 2019).

4. Assessment of application against clearing Principles

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

Proposed clearing is at variance with this Principle

Flora surveys undertaken by Phoenix of the application area and surrounds between October 2014 and March 2018 recorded a total of 244 native species and 52 weed species within the application area and immediate surrounds (Phoenix, 2019). Approximately 50.6 per cent of the application area was determined to be in good or better condition using the Keighery (1994) scale (Arup Jacobs Joint Venture, 2019).

The surveys recorded two priority flora species within the application area, with impacts to these species summarised in Table 1 below.

Table 1: Priority flora species recorded from surveys (Arup Jacobs Joint Venture, 2019)

Flora species	Conservation Category	Individuals within the survey area	Individuals in the application area
<i>Grevillea drummondii</i>	Priority 4	76	11
<i>Synaphea rangiferops</i>	Priority 2	9	0
<i>Acacia drummondii</i> subsp. <i>affinis</i>	Priority 3	72	12
<i>Calothamnus pachystachyus</i>	Priority 4	178	0
<i>Hibbertia miniata</i>	Priority 4	15	0

Two species of priority flora listed by the Department of Biodiversity, Conservation and Attractions (DBCA) were recorded within the application area; *Acacia drummondii* subsp. *affinis* (Priority 3) and *Grevillea drummondii* (Priority 4) (Arup Jacobs Joint Venture, 2019). The proposed clearing will impact 12 individuals from a population of 72 recorded within the survey area for *Acacia drummondii* subsp. *affinis*. As the proposed clearing will impact on 16 per cent of this population, the proposed clearing is unlikely to significantly impact this species at a local or regional scale (DBCA, 2019). This species was indicated to be locally common at populations in Julimar State Forest and Udumung Nature Reserve (DBCA, 2019).

The proposed clearing will impact 11 individuals from a population of 76 recorded within the survey area for *Grevillea drummondii*. The proposed clearing will impact 14 per cent of this population. The recorded locations appear to extend further from the application area, with continuous remnant vegetation and potential habitat extending onto adjoining private properties (DBCA, 2019). This population is within the known range and it is expected that a viable population will remain, therefore impacts to the conservation status of the species are not expected to be significant (DBCA, 2019).

DBCA provided further comment on the impact of the proposed clearing to *Synaphea rangiferops* (Priority 2), which has been recorded from a restricted range and the application area is within the known range of the species. This species occurs in proximity to the application area on the eastern side of the current alignment of GNH. Nine plants were recorded in this location by Phoenix (2019). The supporting information (Arup Jacobs Joint Venture, 2019) indicates that none will be impacted by the proposed clearing. Map 3 of 5 Conservation significant Flora and Weeds from the Supporting Information (Arup Jacobs Joint Venture, 2019) appears to show individuals within the application area, but comparison with the shapefile polygon of the application area provided shows that a hole and an indentation that have been excised from the application area, which may exclude *S. rangiferops*. The maximum diameter of this hole within the application area is approximately 30m and the indentation 20m, which would suggest that application area is in close proximity to these species and would fragment the habitat and isolate some individuals within a very small 'island' of remnant vegetation. Further information provided by the applicant suggests that the proposed works may still result in fragmentation of this area, and clarification on the location of the proposed clearing was required to assess potential impacts to this species (DBCA, 2020). Upon DWER's request for further information, the applicant advised that the application area will be modified to further exclude the areas of habitat for *S. rangiferops* and to avoid potential fragmentation of the local populations (MRWA, 2020). A revised boundary of the application area was provided to reflect this (MRWA, 2020). Noting this, the proposed clearing is unlikely to significantly impact this species.

Leucopogon darlingensis subsp. *rectus* (Priority 2) was recorded in close proximity to the application area at the southern end (Phoenix, 2019). Any impacts to the population in proximity to the application area have the potential to be significant at both the local and regional scale. However, further information provided by the applicant has confirmed that only one plant was located, over 100 m from the application area. This individual plant is therefore unlikely to be significantly impacted by the proposed clearing (DBCA, 2020b).

Areas where priority flora species have been recorded in close proximity to the application area that are not to be cleared will be marked on construction drawings as 'no-go' or 'avoidance areas' (Arup Jacobs Joint Venture, 2019).

As discussed under Principle (b), the proposed clearing will result in the loss of up to 20 hectares of Carnaby's Black Cockatoo foraging habitat and one tree with suitable nest hollows. The proposed clearing is not likely to have a significant impact on ecological linkage function as native vegetation that remains along the Great Northern Highway will facilitate fauna movement and the proposed revegetation works will contribute to improving the value of the linkage.

As discussed under Principle (c), the proposed clearing is not likely to impact habitat for three threatened flora species.

As discussed under Principle (d), the proposed clearing is not likely to impact state listed threatened ecological communities (TECs).

Available DBCA databases indicate the northern portion of the application area is mapped as the Commonwealth listed TEC and State listed priority ecological community (PEC) 'Eucalypt woodlands of the Western Australian Wheatbelt'. The Commonwealth listing for the TEC focusses on patches mostly confined to the Avon Wheatbelt and Mallee bioregions that remain in relatively good condition, and retain their natural composition and ecological function to a large degree (Threatened Species Scientific Committee, 2015). An assessment to determine the presence of the TEC within the application area was undertaken, which concluded that the patches of eucalypt woodland within the application area are not representative of the TEC due to either diagnostic characteristics not being met or being in degraded condition (Phoenix, 2019).

According to available datasets, no other PECs listed by DBCA are mapped within or adjacent to the application area. No PECs were identified within the application area in the flora and vegetation surveys commissioned by the applicant (Phoenix, 2019). Therefore no significant impacts to PECs is expected.

As discussed under Principle (e), the application area is considered to represent highly cleared vegetation communities and comprise a significant remnant of native vegetation in an area that has been extensively cleared.

It is considered that the application area comprises a high level of biological diversity as it contains the following values:

- Two priority flora species;
- 20 hectares of significant foraging habitat for Carnaby's cockatoo within a highly cleared landscape.

Given the above, the proposed clearing is at variance with this Principle.

(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna.

Proposed clearing is at variance with this Principle

Fauna surveys commissioned by the applicant recorded two fauna species listed as conservation significant occurring within the application area and immediate surrounds; Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) listed as endangered under the *Biodiversity Conservation Act 2016* (BC Act) and the Julimar Shield-backed trapdoor spider (*Idiosoma mcclennenstorum*) listed as Priority 2 by the Department of Biodiversity Conservation and Attractions (DBCA).

Four fauna habitat types were identified within the application area (Phoenix, 2019):

- Woodland (Jarrah, Marri, Wandoo and/ or Banksia) (13.01 hectares),
- Woodland (York Gum, Wandoo, Salmon Gum and/or Gimlet) (8.98 hectares)
- Woodland (paperbark or sheoak (5.70 hectares) and
- Forest (Jarrah and/or Marri) (0.04 hectares).

Up to twelve individuals of Carnaby's Black Cockatoo were observed foraging within the survey area. Foraging evidence was observed extensively throughout the study area and hollows were observed with signs of recent use (Phoenix, 2019).

A total of 357 trees with visible hollows were observed within the study area and 83 of these were confirmed as having hollows suitable for breeding by the Carnaby's Black Cockatoo. Up to 44 of these showed signs of past or current use by the species and were of Wandoo (Phoenix, 2019). The application area avoids all of the 44 trees showing signs of use by Carnaby's Black Cockatoo, however does include one tree with hollows suitable for breeding by the Carnaby's Black Cockatoo but with no signs of use (Arup Jacobs Joint Venture, 2019).

The application area includes 4.5 hectares of quality Carnaby's cockatoo foraging habitat and 15.5 hectares of low value foraging habitat (Arup Jacobs Joint Venture, 2019).

The Recovery Plan for Carnaby's Black Cockatoo states that breeding habitat, in particular known nesting trees, are critical habitat for this species (DPAW, 2013). Success in breeding is dependent on the quality and proximity of feeding habitat within 6 km of nesting sites (DPAW, 2013). Along with the trees that provide nest hollows, the protection, management, and increase of the available foraging habitat that supports the breeding of Carnaby's Black Cockatoo is a critical requirement for the conservation of the species (DPAW, 2013).

It is considered that the application area contains significant habitat for the Carnaby's Black Cockatoo as the application area comprises 20 hectares of foraging habitat and is in close proximity to hollows suitable for breeding.

The application area occurs on the edge of the modelled distribution of forest red-tailed black cockatoo (*Calyptorhynchus banksii* subsp. *naso*) listed as vulnerable under the BC Act (Commonwealth of Australia, 2012). Historical but infrequent records of the species occur in the vicinity of the application area but no observations of the species (visual, heard calls or foraging evidence) were recorded in surveys commissioned by the applicant (Arup Jacobs Joint Venture, 2019). Suitable foraging, roosting and breeding habitat is present but it is considered unlikely that the species would breed in the area given that the application area occurs at the northern edge of its distribution. Given this, and that the species is only likely to be an infrequent visitor to the area, no significant impacts are expected.

Eight burrows of the Julimar Shield-backed trapdoor spider have been recorded within the application area. A further four burrows have been recorded in an adjacent area (Phoenix, 2019). DBCA (2019) advice has stated that this species is highly restricted in distribution in the northern Jarrah Forest bioregion and is known from less than 10 occurrences, with the application area being one of them. The proposed clearing would impact this species significantly at an immediate local scale, as the proposed clearing would cause a 50 per cent reduction of the known spiders in that sub-population. The sub-population recorded during the survey is significant and comprises an important group of records of this highly restricted species (Dr Harvey, 2020). The applicant's proposed mitigation in the form of relocation was noted, however, there has not been demonstration of long-term survival of trapdoor spiders post-relocation (DBCA, 2020; Dr Harvey, 2020). The loss of individuals, either through mortality during vegetation clearing activities or from relocated individuals not surviving or breeding, may result in the species meeting a higher category of listing (DBCA, 2020). Additionally, most trapdoor spider populations are highly genetically structured and the effects of translocating individuals into new areas may result in unforeseen population genetic effects into the future (Dr Harvey, 2020). Due to the advice received, DWER requested avoidance strategies for the Julimar Shield-backed trapdoor spider burrows from the applicant. As a response, the applicant modified the alignment of GNH to avoid the Julimar Shield-backed trapdoor spider burrows. Burrows have been marked and will be identified as 'No-Go' areas during the proposed activities (MRWA, 2020). A revised boundary reflecting the avoidance of these burrows was provided by the applicant (MRWA, 2020). Given the

avoidance of the Julimar Shield-backed trapdoor spider burrows recorded during the survey, no significant impacts to this species is expected.

The application area falls within a highly cleared landscape with approximately 21 per cent of the pre-European extent of native vegetation remaining within a 10 kilometre radius. The application area runs parallel to the Great Northern Highway road reserve which contains native vegetation adjacent to the existing road for most of the length of the application area. The application area crosses the road reserve in numerous locations. While the north to south ecological linkage that runs along the Great Northern Highway provides a linkage for local fauna between numerous patches of native vegetation, the proposed clearing is not likely to have a significant impact on ecological linkage function as native vegetation that remains along the Great Northern Highway will facilitate fauna movement and the proposed revegetation works will contribute to improving the value of the linkage.

Given the proposed clearing will result in the loss of significant habitat for Carnaby's Black Cockatoo, the proposed clearing is at variance with this Principle. The applicant has provided an offset to address the impact of clearing significant habitat for Carnaby's Black Cockatoo, which is outlined in Section 5.

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

Proposed clearing is not likely to be at variance with this Principle

The flora survey of the application area and surrounds identified two threatened flora species including *Conospermum densiflorum* subsp. *unicephalatum* and *Banksia serratuloides* subsp. *serratuloides* in close proximity to the proposed clearing.

One population of the threatened flora *Conospermum densiflorum* subsp. *unicephalatum* was recorded 100 metres from the proposed clearing. The interim recovery plan for this species identifies that vegetation within 200 metres of known occurrences may be considered critical habitat for this species (Pattern and Broun, 2014). Clearing within 200 metres of this species will occur on the eastern side of Great Northern Highway and the occurrence of this species occurs on the western side of the road. It is considered for the critical habitat for this species to already be truncated by the current alignment of Great Northern Highway and the additional clearing is not expected to significantly impact this species (DBCA, 2019).

Banksia serratuloides subsp. *serratuloides* has a very restricted range of approximately 25 km and is only known from nine small populations, 70% of which occur on road and rail reserves, with two populations within conservation estate. One population of 22 individuals of the threatened flora species *Banksia serratuloides* subsp. *serratuloides* was recorded in very close proximity of the application area during the flora survey (Phoenix, 2019). DBCA databases have recorded this species in very close proximity to the application area at two locations. DBCA (2019) advised that the proposed clearing will likely bisect the habitat extent of these two records, therefore impacting on habitat for this species. Clearing in suitable habitat within the existing population would result in fragmentation and a reduction in the area of occupancy of the already small linear population, thereby removing the potential for the species to regenerate in this area after an appropriate recruitment event and maintain habitat connectivity (DBCA, 2020b). While the applicant has advised that the proposed works in this area is expected to be minor, with the installation of culverts or driveways, DWER requested further information from the applicant in relation to the exact location of the proposed clearing to demonstrate minimisation of impacts to conservation significant flora. Upon DWER's request for further information, the applicant advised that the application area can be modified to further exclude the areas of habitat for *Banksia serratuloides* subsp. *serratuloides* and to avoid potential fragmentation of the local population (MRWA, 2020a). The applicant advised that "as the existing GNH will be revegetated when no longer required for road users and surface water flow paths are not expected to change, it is considered unlikely that there will be any increase in erosion either within the permit area or within the area of the local *Banksia serratuloides* subsp. *serratuloides* population" (MRWA, 2020a). A revised boundary reflecting the exclusion of areas of habitat for this species (MRWA, 2020). Noting the exclusion of areas for habitat for this species, the proposed clearing is unlikely to significantly impact this species.

The threatened flora *Spirogardnera rubescens* has previously been recorded within the application area but this species was not recorded in the Phoenix (2019) flora survey (DBCA, 2019). The number of plants recorded was 21-50 plants in 2001 and 34 plants in 2002. Although this species was not recorded during Phoenix (2019) survey, the habitat would appear to be present and the species is likely to occur. DBCA (2020b) advised that the conservation of the historical seed bank is crucial for the potential for this species to regenerate and persist at this location long term. DWER requested further information from the applicant on minimisation measures for this species. Upon DWER's request for further information, the applicant advised that the application area will be modified to further exclude the areas of habitat for *Spirogardnera rubescens* (MRWA, 2020). A revised boundary reflecting the exclusion of areas of habitat for this species (MRWA, 2020a). Noting the exclusion of areas for habitat for this species, the proposed clearing is unlikely to significantly impact this species.

Given the above, the proposed clearing is not likely to be at variance with this Principle.

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

Proposed clearing is not likely to be at variance with this Principle

No state listed TECs have been recorded within the local area of the proposed clearing. The closest state listed TEC is 'Herb rich saline shrublands in clay pans' recorded 15 kilometres west of the application area.

The flora surveys did not identify any state listed TECs within the application area (Phoenix, 2019). Therefore, the proposed clearing is not likely to be part of, or necessary for the maintenance of a state listed TEC.

The proposed clearing is not likely to be at variance with this Principle.

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Proposed clearing is at variance with this Principle

The application area falls within the Avon Wheatbelt and Jarrah Forest IBRA Bioregions. Approximately 18 and 53 per cent of the pre-European vegetation still exists in the Avon Wheatbelt and Jarrah Forest IBRA Bioregions, respectively (Government of Western Australia, 2019; Table 1).

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

As indicated in Table 2, majority of the vegetation associations within the Avon Wheatbelt bioregion and several of the vegetation associations and complexes within the Jarrah Forest bioregion retain less than 30 per cent of their pre-European extents.

The local area retains approximately 21 per cent native vegetation cover (10,940 hectares). The application area represents approximately 0.26 per cent of the remaining native vegetation within the local area and the proposed clearing would reduce the extent of native vegetation within the local area to 10,912 hectares.

The vegetation within the application area is a significant remnant as it contains significant foraging habitat for Carnaby's cockatoo and a high level of biodiversity (including conservation significant flora). Noting this, the pre-European extent of the mapped vegetation associations within the application area, the extent of native vegetation within the local area (21 per cent), the proposed clearing is considered to be within an extensively cleared area.

The applicant has provided an offset to address the impact of clearing significant remnant vegetation within a highly cleared landscape, which is outlined in Section 5.

The proposed clearing is at variance with this Principle.

Table 2: Vegetation extents (Government of Western Australia, 2019)

	Pre-European (ha)	Current Extent (ha)	Remaining (%)	Extent in DBCA Managed Lands (%)
IBRA Bioregion*				
Avon Wheatbelt	9,517,110	1,761,187	18	10
Jarrah Forest	4,506,660	2,399,838	53	69
Beard vegetation association in Avon Wheatbelt Bioregion				
4	10,333	1,855	17	4
7	144,189	15,279	10	1
352	630,577	108,887	17	9
946	43,308	8,372	19	13
950	496	287	57	8
Beard vegetation association in Jarrah Forest Bioregion				
4	1,022,712	277,087	27	23
7	30,999	6,078	19	15
352	31,606	6,467	20	22
946	6,149	4,138	67	89
973	2,448	1,474	60	5
999	11,531	2,895	25	60
1034	59	37	63	-
1132	151	150	99	98
1182	11,127	4,732	42	69
South West vegetation complex within the Jarrah Forest Bioregion				
Ck:	163,991	64,204	39	20
No	6,467	1,156	17	2
Mi	168,040	42,996	25	5
Y6	197,849	92,080	46	21

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

Proposed clearing is at variance with this Principle

Numerous minor non-perennial watercourses cross the application area as well as two significant streams, Yarawindah Brook and an un-named stream which are tributaries of Moore River. The application area also abuts the Moore River in one location.

The flora survey identified riparian vegetation within the application area (Phoenix, 2019). The applicant has advised that the proposed clearing will require the removal of riparian vegetation to complete earthworks associated with the new road alignment, including watercourse embankment protection.

Given the above, the proposed clearing will include vegetation growing in association within a wetland or watercourse and is at variance with this Principle. However, given the application is for upgrading Great Northern Highway, clearing will be limited to relatively narrow water crossings which is considered unlikely to result in significant impacts to the overall environmental values of those watercourses.

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

Proposed clearing is not likely to be at variance with this Principle

The application area is linear, approximately 17 kilometres in length with an average width of approximately 100 metres. The application area is situated within a landscape primarily cleared for agricultural use. The application area has been mapped as the following land unit subsystems:

- **Udamong System:** Northern Darling Range near New Norcia. Partially stripped lateritic plateau with undulating low hills to gently undulating rises. Loamy gravel, minor pale sand and clay; deep weathered granitic gneiss, gneiss and schist;
- **Wannamal System:** Alluvial plain and fans, brown and red loamy earths, yellow brown sandy duplexes, loamy duplexes;
- **Yarawindah System:** dissected lateritic plateau with rolling to undulating low hills and undulating rises; loamy gravel, loamy earth, loamy duplex, some rock; weathered schist and some gneiss;
- **Glentrome System:** stripped, weathered plateau with undulating low hills and rises; loamy earths, loam, loamy gravel and some clay and rock; weathered granite and migmatite;
- **Julimar System:** Moderately dissected areas with gravelly slopes and ridges and minor rock outcrop on the eastern side of the Darling Plateau over weathered granite and granitic gneiss, loamy gravel, shallow duplexes and pale deep sand common; and
- **Ranfurlly System:** level to gently undulating plain being a relict flood plain, partially rejuvenated; loamy earths and clay, some duplex; from alluvium.

The majority of the application area is mapped as the Udamong system.

Given the linear nature of the application area, the risk of appreciable land degradation as a result of the proposed clearing is substantially reduced. Gentle slopes are present along the preferred alignment, reducing the likelihood of erosion, particularly water erosion. Additionally, the applicant will be required to commence road upgrade activities within three months of clearing.

Given that clearing will occur over a distance of approximately 17 kilometres, no significant salinity impacts are expected.

The proposed clearing is not likely to be at variance with this Principle.

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

Proposed clearing may be at variance with this Principle

A section of the application area is adjacent to the Seven Mile Well Nature Reserve. The proposed clearing adjacent to Seven Mile Well Nature Reserve will remove the buffer between the Reserve and Great Northern Highway, resulting in increased edge effects to the conservation area. Given the close proximity of the application area to the Seven Mile Well Nature Reserve, the proposed clearing may have an impact on its environmental values if insufficient weed and dieback controls are in place. The applicant has acknowledged the potential for indirect impacts to Seven Mile Well Nature Reserve, however, has advised that effective weed and disease hygiene controls will be implemented to manage this risk (Arup Jacobs Joint Venture, 2019). A condition requiring the applicant to implement weed and dieback management measures to reduce the risk of spread will also be imposed on the clearing permit, therefore the risk of significant impact to the conservation area is low.

Given the above, the proposed clearing may be at variance with this Principle.

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

Proposed clearing is not likely to be at variance with this Principle

The application area is linear, approximately 17 kilometres in length, and according to available datasets intersects numerous minor non-perennial watercourses.

As discussed under Principle (f), the proposed clearing is for upgrading Great Northern Highway and as a result direct impacts to watercourses are expected to be limited to the clearing of relatively narrow watercourse crossings. Significant impacts to surface water quality are considered unlikely.

Noting the linear application area, the proposed clearing is considered unlikely to result in significant changes to groundwater quality.

The proposed clearing is not likely to be at variance with this Principle.

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

Proposed clearing is not likely to be at variance with this Principle

The application area is linear, approximately 17 kilometres in length. Considering the linearity of the application area and that the proposed clearing is adjacent to existing roads with culverts and drainage infrastructure, the proposed clearing is unlikely to be in a location or of a scale that would result in an increase in the incidence or intensity of flooding.

The proposed clearing is not likely to be at variance with this Principle.

Planning instruments and other relevant matters.

The application area is not within any surface water areas proclaimed under the *Rights in Water and Irrigation Act 1914*.

The application area is mapped within a registered Aboriginal Heritage site, Gingin Brook Waggy Site, which is associated with historical, mythological, camp, hunting place, plant resource and water resource. The applicant is advised to consult with the Department of Planning, Lands and Heritage to ensure their obligations under the *Aboriginal Heritage Act 1972* are met prior to undertaking the proposed clearing. It is the applicant's responsibility to obtain any other licences or approvals that may be required for the proposed works.

The clearing permit application was advertised on the DWER website on 17 July 2019 with a 21 day submission period. One public submission has been received in relation to this application. The submission raised concerns over the residual impacts of the proposed clearing, the clearing of conservation significant flora species, adequacy of proposed revegetation and the need for offsets (Submission, 2019). Considering the comments made in the submission, the Delegated Officer noted that the applicant has demonstrated efforts to avoid and minimise environmental impacts, has committed to undertaking 20 hectares of revegetation/rehabilitation, and has committed to providing an offset to address impacts to Carnaby's Black Cockatoo and clearing significant remnant vegetation within an extensively cleared landscape.

The proposed clearing was referred to the Commonwealth Department of Agriculture, Water and the Environment for assessment under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC reference 2019/8477); it was determined that the proposed clearing was not a controlled action.

5. Offset consideration

Offset proposal

After consideration of the proposed avoidance and minimisation measures, the proposed clearing will result in the following significant residual impacts:

- Loss of 20 hectares of foraging habitat for Carnaby's Black cockatoo (*Calyptorhynchus latirostris*)
- Loss of 28 hectares of native vegetation that is a significant remnant within a highly cleared area.

To counterbalance the above impacts, the applicant has committed to the following offset/mitigation measures:

- revegetation/rehabilitation of 20 hectares of land within the boundary of the application area with flora species identified as providing known foraging and breeding habitat for Carnaby's Black Cockatoo; and
- providing a monetary offset contribution of \$126,000 for the purchase of 126 hectares of land with native vegetation containing habitat for Carnaby's Black Cockatoo.

Offset adequacy

In assessing whether the proposed offset is adequately proportionate to the significance of the habitat values being impacted, DWER undertook a calculation using the Commonwealth Offsets Assessment Guide.

Revegetation

It was determined that the proposed revegetation/rehabilitation would mitigate 23.44 per cent of the total residual impacts to Carnaby's Black Cockatoo habitat and 27.86 per cent of the impact to significant remnant vegetation within a highly cleared area.

Monetary contribution for land acquisition

The calculation determined that the allocation of the following areas of native vegetation to be put to conservation estate is adequate to counterbalance the significant residual impacts (taking into account the above revegetation measures):

- 126 hectares of native vegetation in a very good condition that provides suitable foraging habitat for Carnaby's Black Cockatoo
- 93.5 hectares of native vegetation in a very good condition that is a significant remnant within a highly cleared area.

The cost of acquiring a 126 hectare land parcel of land equates to a monetary contribution of \$126,000, determined based on the estimated value per hectare of a 200 hectare vegetated parcel of land in the Shire of Victoria Plains. This figure was obtained using the values determined by Western Australia's Valuer-General.

Given the above, a monetary contribution of \$126,000 for the acquisition of 126 hectares of native vegetation for conservation, and the revegetation/rehabilitation of 20 hectares is considered adequate to counterbalance the significant residual impacts of the proposed clearing, consistent with the *WA Environmental Offsets Policy September 2011*.

6. References

- Arup Jacobs Joint Venture (2019). Great Northern Highway Bindoon Bypass – Northern Section (SLK 94.74 – 112.2) Purpose Permit to Clear Native Vegetation – Supporting Information. Unpublished report prepared for Main Roads Western Australia. GNH-CN09-EN01-RPT-0003 Revision 4, 24 June 2019.
- Commonwealth of Australia (2001). National Objectives and Targets for Biodiversity Conservation 2001-2005, Canberra.
- Commonwealth of Australia (2012). EPBC Act referral guidelines for three threatened black cockatoo species. Department of Sustainability, Environment, Water, Populations and Communities, Canberra.
- Department of Biodiversity, Conservation and Attractions (DBCA) (2019). Species and Communities Branch flora and fauna advice received in relation to CPS 8573/1. Received 11 September 2019 (DWER Ref: A1822623).
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7. Appendix 1

Bindoon Bypass – Northern Section Revegetation Measures

Outcome	Management Measures	Timing	Monitoring	Corrective Action Trigger(s)	Corrective Action
To revegetate at least 20 ha of land with Carnaby's Black Cockatoo habitat	<p>Revegetation will include plant species suitable as Carnaby's Cockatoo and include:</p> <ul style="list-style-type: none"> • Wandoo (<i>Eucalyptus wandoo</i>) • York Gum (<i>Eucalyptus loxophleba</i>) • Marri (<i>Corymbia calophylla</i>) • Banksia spp. (including <i>Banksia fraseri</i>, <i>Banksia kippistiana</i> and <i>Banksia sessilis</i>) • Hakea spp. • Grevillea spp. <p>Revegetation will meet the following completion criteria within five years of installation, as verified by a suitably qualified person:</p> <ul style="list-style-type: none"> • minimum of 50% projected foliage cover (excluding any weeds) over any treated area of 100 m², with no bare soil areas >2 m² • minimum 15 species of native plants within any 100 m² area • weed cover will not exceed 30%. 	Revegetation will commence within 1 year following the completion of construction and at the optimum time of the year (following winter rains).	<p>Weekly site inspections during revegetation works</p> <p>Annual site inspections for 5 years or until completion criteria have been achieved</p>	Site inspections show revegetation is not trending towards achievement of completion criteria	<p>Review results of site inspections to identify areas that are deficient and formulate action plan.</p> <p>Identify if supplementary planting/seeding is required and develop species list for planting/seeding</p> <p>Undertake supplementary planting/seeding if required</p> <p>Undertake weed treatment(s) if required</p>