GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 6873/1
Permit Holder:	Commissioner of Main Roads Western Australia
Duration of Permit:	1 July 2016 – 1 July 2021

ADVICE NOTE
The funds referred to in condition 8 of this permit are intended for contributing towards the purchase of 99 hectares of native vegetation with similar environmental values including Carnaby's cockatoo habitat within the Avon Wheatbelt Bioregion.

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 purpose of road construction and widening.

2. **Land on which clearing is to be done**
   Lot M1560 on Diagram 7031, Miling
   Lot 505 on Plan 68103, Pithara
   Lot 500 on Plan 68103, Pithara
   Lot 3519 on Plan 161904, Miling
   Lot 3518 on Plan 161904, Miling
   Lot 3211 on Plan 150219, Pithara
   Lot 3092 on Plan 160432, Pithara
   Lot 3091 on Plan 150220, Pithara
   Lot 304 on Plan 68102, Pithara
   Lot 304 on Plan 68102, Miling
   Lot 303 on Plan 68103, Pithara
   Lot 3031 on Plan 148456, Miling
   Lot 302 on Plan 68102, Pithara
   Lot 301 on Plan 68102, Miling
   Lot 2 on Plan 9461, Pithara
   Lot 2 on Diagram 28822, Miling
   Lot 2695 on Plan 229801, Pithara
   Lot 2690 on Plan 229801, Pithara
   Lot 2602 on Plan 88245, Miling
   Lot 2199 on Plan 139661, Miling
   Lot 1 on Diagram 28822, Miling
   Lot 1785 on Plan 132400, Miling
   Lot 1728 on Plan 228266, Miling
   Lot 1695 on Plan 132786, Miling
   Lot 1686 on Plan 132781, Miling
   Lot 1660 on Plan 132402, Miling
   Lot 1487 on Plan 126269, Miling
   Lot 1101 on Plan 202079, Pithara
   Lot 1050 on Plan 202006, Pithara

Lot 102 on Plan 73304, Miling
Road Reserve (PIN 11708954), Pithara
Road Reserve (PIN 11410060), Pithara
Road Reserve (PIN 11410061), Pithara
Road Reserve (PIN 11410059), Pithara
Road Reserve (PIN 11708937), Pithara
Road Reserve (PIN 11410024), Pithara
Road Reserve (PIN 11410027), Pithara
Road Reserve (PIN 11410056), Pithara
Road Reserve (PIN 11707282), Pithara
Road Reserve (PIN 11410006), Pithara
Road Reserve (PIN 11410058), Pithara
Road Reserve (PIN 11708933), Pithara
Road Reserve (PIN 11409995), Miling
Road Reserve (PIN 11410057), Miling
Road Reserve (PIN 11409994), Miling
Road Reserve (PIN 11676090), Miling
Road Reserve (PIN 11676091), Miling
Road Reserve (PIN 11707276), Miling
Road Reserve (PIN 11676092), Miling
Road Reserve (PIN 11669338), Miling
Road Reserve (PIN 11707274), Miling
Road Reserve (PIN 11676093), Miling
Road Reserve (PIN 11708119), Miling
Road Reserve (PIN 11707267), Miling
Road Reserve (PIN 11708118), Miling

3. Area of Clearing

The Permit Holder must not clear more than 19 hectares of native vegetation within the combined areas cross hatched yellow on attached Plan 6873/1a and Plan 6873/1b.

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

PART II –MANAGEMENT CONDITIONS

6. Avoid, minimise etc 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; and
(c) reduce the impact of clearing on any environmental value.

7. Weed control

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

(a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
(b) ensure that no *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.

8. **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 31 December 2016, the Permit Holder shall provide documentary evidence to the CEO that funding of $98,109 has been transferred to the Department of Environment Regulation for the purpose of establishing or maintaining native vegetation.

9. **Flora management**
Where their written locations have been provided to the Department of Environment Regulation in the report 'Great Northern Highway Muchea to Wubin Upgrade Stage 2 - Main Roads Western Australia - Miling Straight Purpose Permit to Clear Native Vegetation – Supporting Information – GNH-WP09-E-EP-AS-004 – November 2015 – Rev0', the Permit Holder shall ensure that, unless otherwise approved by the CEO, no clearing occurs within:
(a) 50 metres of rare flora species *Grevillea bracteosa* subsp. *bracteosa*; and
(b) 10 metres of *priority flora* species *Grevillea pinifolia*; and
(c) 20 metres of *priority flora* species *Dampiera glabrescens and Urodon capitatus*.

10. **Vegetation management**
(a) Prior to undertaking any clearing authorised under this Permit within the areas shaded red on attached Plan 6873/1c and Plan 6873/1d, the Permit Holder shall engage a *botanist* to conduct a *targeted flora survey* of these areas for the presence of rare flora listed in the *Wildlife Conservation (Rare Flora) Notice* and *priority flora* in accordance with *Guidance Statement No. 51*.
(b) Where rare flora or *priority flora* are identified under condition 10(a) of this Permit, the Permit Holder shall ensure that no clearing of *critical habitat* of the identified rare flora or *priority flora* occurs, unless first approved by the CEO.

PART III - RECORD KEEPING AND REPORTING

11. **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; and
(iii) the size of the area cleared (in hectares).

(b) In relation to vegetation management pursuant to condition 10 of this Permit:
(i) the location of each rare flora and *priority flora* species 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; and
(ii) a copy of the *botanist's* flora survey report.

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 to 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 1 April 2021, 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
The following meanings are given to terms used in this Permit:

botanist: means a person who holds a tertiary qualification in environmental science or equivalent, and has a minimum of 2 years work experience in identification and surveys of flora native to the bioregion being inspected or surveyed, or who is approved by the CEO as a suitable botanist for the bioregion;

critical habitat: means any part of the Permit Area comprising of the habitat of flora or fauna species and its population, that is critical for the health and long term survival of the flora or fauna species and its population;

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

Guidance Statement No. 51 means the Environmental Protection Authority Guidance Statement No 51, Guidance for the Assessment of Environmental Factors - Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (2004);

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;

priority flora means those plant taxa described as priority flora classes 1, 2, 3, 4 or 5 in the *Department of Parks and Wildlife's Threatened and Priority Flora List for Western Australia* (as amended);

targeted flora survey: means a field-based investigation, including a review of established literature, of the biodiversity of flora and vegetation of the subject area, focusing on habitat suitable for flora species that are being targeted and carried out during the optimal time to identify those species. Where target flora are identified, the survey should also include sufficient surrounding areas to provide local context;

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 Parks and Wildlife Regional Weed Rankings Summary, regardless of ranking; or
(c) not indigenous to the area concerned.

Wildlife Conservation (Rare Flora) Notice means those plant taxa gazetted as rare flora pursuant to section 23F(2) of the *Wildlife Conservation Act 1950* (as amended).

S. Weighell

Simon Weighell
A/Senior Manager
CLEARING REGULATION

Officer delegated under Section 20
of the Environmental Protection Act 1986

8 June 2016

Plan 6783/1a

Legend

- Imagery
- Clearing Instruments Activities
- Roads

N

0 2km

1:70,000

(Approximate when reproduced at A4)

GDA 94 (Lat/Long)

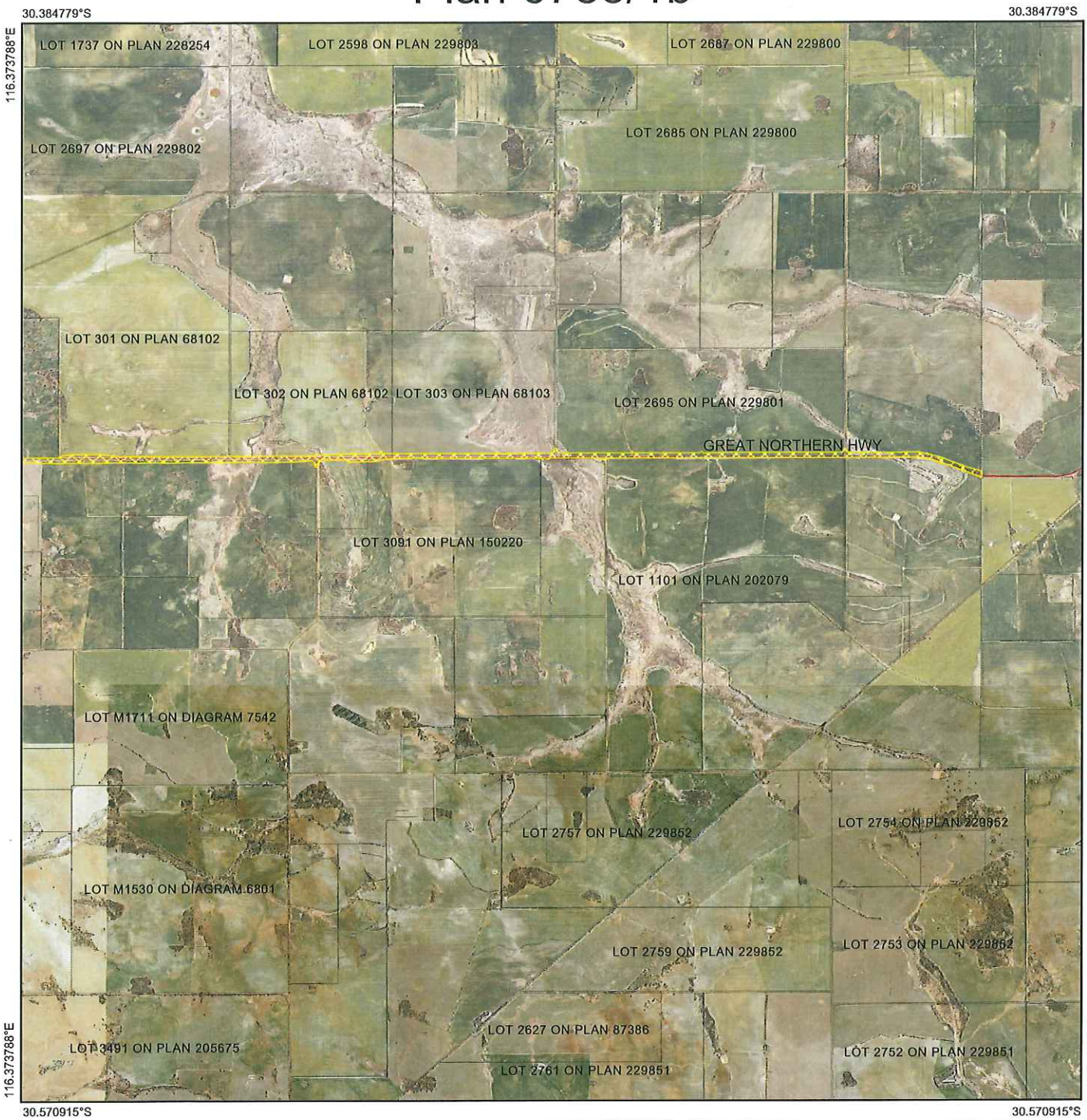
Geocentric Datum of Australia 1994

S. Weightman Date 8/6/16

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

GOVERNMENT OF WESTERN AUSTRALIA

Plan 6783/1b



Legend

- Imagery
- Clearing Instruments Activities
- Roads

N

0 2km

1:70,000

(Approximate when reproduced at A4)

GDA 94 (Lat/Long)

Geocentric Datum of Australia 1994

S. Weigbell ..... Date 8/6/16

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

GOVERNMENT OF WESTERN AUSTRALIA

Plan 6873/1c

30.461589°S 30.461589°S

116.405306°E 116.416016°E

116.405306°E 116.416016°E

30.467124°S 30.467124°S

Legend

- Cadastre
- Imagery
- Roads
- Clearing Instruments Conditions

N

0 100m

1:2,000

(Approximate when reproduced at A4)

GDA 94 (Lat/Long)

Geocentric Datum of Australia 1994

S. Weightell Date 8/6/16

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

GOVERNMENT OF WESTERN AUSTRALIA

Plan 6873/1d

Legend

- Cadastre
- Imagery
- Roads
- Clearing Instruments Conditions

N

0 100m

1:2,000

(Approximate when reproduced at A4)

GDA 94 (Lat/Long)

Geocentric Datum of Australia 1994

S. Weigall ..... Date 8/6/16

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

GOVERNMENT OF WESTERN AUSTRALIA

Government of Western Australia
Department of Environment Regulation

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 6873/1
Permit type: Purpose Permit

1.2. Applicant details

Applicant's name: Commissioner of Main Roads Western Australia

1.3. Property details

Property:
LOT M1560 ON DIAGRAM 7031, MILING
LOT 505 ON PLAN 68103, PITHARA
LOT 500 ON PLAN 68103, PITHARA
LOT 3519 ON PLAN 161904, MILING
LOT 3518 ON PLAN 161904, MILING
LOT 3092 ON PLAN 160432, PITHARA
LOT 3091 ON PLAN 150220, PITHARA
LOT 304 ON PLAN 68102, PITHARA
LOT 304 ON PLAN 68102, MILING
LOT 303 ON PLAN 68103, PITHARA
LOT 3031 ON PLAN 148456, MILING
LOT 302 ON PLAN 68102, PITHARA
LOT 301 ON PLAN 68102, MILING
LOT 2 ON DIAGRAM 28822, MILING
LOT 2695 ON PLAN 229801, PITHARA
LOT 2690 ON PLAN 229801, PITHARA
LOT 2602 ON PLAN 88245, MILING
LOT 2199 ON PLAN 139661, MILING
LOT 1 ON DIAGRAM 28822, MILING
LOT 1785 ON PLAN 132400, MILING
LOT 1728 ON PLAN 228266, MILING
LOT 1695 ON PLAN 132786, MILING
LOT 1686 ON PLAN 132781, MILING
LOT 1660 ON PLAN 132402, MILING
LOT 1487 ON PLAN 126269, MILING
LOT 102 ON PLAN 73304, MILING
ROAD RESERVE - 11410061, PITHARA
ROAD RESERVE - 11410059, PITHARA
ROAD RESERVE - 11708937, PITHARA
ROAD RESERVE - 11410024, PITHARA
ROAD RESERVE - 11410027, PITHARA
ROAD RESERVE - 11410056, PITHARA
ROAD RESERVE - 11707282, PITHARA
ROAD RESERVE - 11410006, PITHARA
ROAD RESERVE - 11410058, PITHARA
ROAD RESERVE - 11708933, PITHARA
ROAD RESERVE - 11409995, MILING
ROAD RESERVE - 11410057, MILING
ROAD RESERVE - 11409994, MILING
ROAD RESERVE - 11676090, MILING
ROAD RESERVE - 11676091, MILING
ROAD RESERVE - 11707276, MILING
ROAD RESERVE - 11676092, MILING
ROAD RESERVE - 11669338, MILING
ROAD RESERVE - 11707274, MILING
ROAD RESERVE - 11676093, MILING
ROAD RESERVE - 11708119, MILING
ROAD RESERVE - 11707267, MILING
ROAD RESERVE - 11708118, MILING

Local Government Authority: DALWALLINU, SHIRE OF and MOORA, SHIRE OF
DER Region: Greater Swan and Midwest
DPaW District: CENTRAL WHEATBELT and MOORA
Localities: PITHARA and MILING

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
19		Mechanical Removal	Road construction and widening

1.5. Decision on application

Decision on Permit Application: Grant

Decision Date: 8 June 2016

Reasons for Decision: The clearing application has been assessed against the clearing principles, planning instruments and other matters in accordance with s51O of the Environmental Protection Act 1986 (EP Act), and it has been concluded that the proposed clearing is at variance to clearing principles (a), (b), (e) and (f), may be at variance to principles (c), (g) and (i), and is not likely to be at variance to the remaining clearing principles.

An assessment determined that the proposed clearing will lead to the loss of 19 hectares of native vegetation that contains:

- high biological diversity;
- 15 hectares of significant foraging and potential nesting habitat for Carnaby's cockatoo (Calyptorhynchus latirostris) including 22 potential breeding trees; and
- 19 hectares considered to be a significant remnant of native vegetation in an area that has been extensively cleared.

Consistent with the WA Environmental Offsets Policy (2011) and WA Environmental Offsets Guidelines (2014), and pursuant to section 51I(2)(b) of the EP Act, in order to counterbalance the significant residual impacts described above, the Permit Holder is required to provide an offset in the form of a monetary contribution for the purchase of 99 hectares of remnant vegetation that includes similar environmental values to that being cleared. The size of the offset was determined using the Commonwealth Department of the Environment's (DotE) Offsets Assessment Guide.

Flora and vegetation management conditions have been included on the permit requiring clearing to not occur within specified distances/habitat of rare and priority flora without prior approval from the CEO to prevent significant impacts to these species. CEO approval will be subject to the provision of information demonstrating impacts from clearing within these areas are unlikely to be significant.

Given the above the Delegated Officer has decided to grant the clearing permit.

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
Beard vegetation association 551 is described as shrublands; Allocasuarina campestris thicket (Shepherd et al. 2001). Beard vegetation association 1024 is described as shrublands; mallee & casuarina thicket (Shepherd et al. 2001). Beard vegetation association 631 is described as succulent steppe with woodland and thicket; York gum over Melaleuca thyoides & samphire (Shepherd et al. 2001). Beard vegetation association 142 is described as medium woodland; York gum & salmon gum (Shepherd et al. 2001).	The proposed clearing of 19 hectares is for the purpose of upgrading Great Northern Highway.	Completely Degraded: No longer intact; completely/almost completely without native species (Keighery 1994) To Very Good; Vegetation structure altered; obvious signs of disturbance (Keighery 1994).	The vegetation description and condition was determined from a site visit conducted by Department of Environment Regulation (DER) officers on 4 February 2016 (DER 2016) and from field surveys by Phoenix Environmental Services Pty Ltd (Phoenix 2015) in October 2014, May 2015 and June 2015.

3. Assessment of application against clearing principles

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

Comments **Proposed clearing is at variance to this Principle**

The application is for the proposed clearing of 19 hectares for the purpose of upgrading Great Northern Highway.

Phoenix (2015) undertook an initial spring flora and vegetation field survey in October 2014. A second field survey was undertaken in May 2015 and included additional areas that had not been surveyed in October 2014. A third field survey was undertaken in June 2015 and covered further additional areas. A total of 253 flora taxa representing 46 families and 110 genera were recorded in the study area and comprised 198 native species and 37 weeds. These surveys identified the presence of seven conservation significant flora species being:

One rare flora species

Two Priority 1 species
- Dampiera glabrescens
- Grevillea pinifolia

Four Priority 3 species
- Urodon capitatus
- Chamelaucium sp. Wongan Hills
- Frankenia glomerata
- Grevillea asparagoides

Two intersections within the application area, Richardson road and Arkells road, contain areas of vegetation that have not been surveyed which may contain significant individuals/populations of rare or priority flora. The applicant has committed to undertaking surveys within these areas prior to clearing.

One single plant of the rare flora species was recorded within the application area. A considerably larger population comprising of 64 individuals is recorded in adjacent vegetation to the application area. This species is an erect, rounded, spreading shrub one to two metres high. There are scattered occurrences from the Dalwallinu, Miling, Moora and Toodyay areas in the Avon Wheatbelt, Geraldton Sandplains and Jarrah Forest IBRA regions. It grows in yellow or brown sandy loam over laterite in shrubland and heath with Allocasuarina campestris, A. humilis, Hakea undulata, H. incrassata, Grevillea bipinnatifida, G. petrophiloides, Calothamnus ascedens and Ecdeiocolea monostachya (DEC 2009). The applicant has committed to avoiding clearing contiguous vegetation within 50 metres of the identified plant to limit potential impacts.

Single plants of (P1) Grevillea pinifolia, (P1) Dampiera glabrescens and (P3) Urodon capitatus occur within the application area. Any clearing of plants or populations of these species is likely to have a significant impact on the conservation status of all of these species (Parks and Wildlife 2016). The applicant has committed to avoiding clearing contiguous vegetation within 10 metres of the identified plants of Grevillea pinifolia, and 20 metres of the identified plants of Dampiera glabrescens and Urodon capitatus to limit potential impacts.

The proposed clearing is not likely to result in significant impacts to the recorded individuals/populations of Chamelaucium sp. Wongan Hills, Frankenia glomerata and Grevillea asparagoides.

No threatened or priority ecological communities were recoded within the application area.

A search of NatureMap recorded five fauna species listed as rare or likely to become extinct under the Wildlife Conservation Act 1950 (WC Act) within a 10 kilometre radius of the application area, being; Carnaby's cockatoo (Calyptorhynchus latirostris), western spiny-tailed skink (interior WA & Shark Bay) (Egernia stokesii subsp. badia), shield-backed trapdoor spider (Idiosoma nigrum), malleefowl (Leipoa ocellata) and western whipbird (western heath) (Psophodes nigrogularis subsp. nigrogularis) (Parks and Wildlife 2007-). The rainbow bee-eater (Merops ornatus) is protected under international agreement and has also been recorded within a 10 kilometre radius of the application area (Parks and Wildlife 2007-).

Carnaby's cockatoo feeds on seeds, nuts and flowers of a large variety of plants including Proteaceous species (e.g. Banksia, Dryandra and Grevillea), Corymbia callophylla nuts, and a range of introduced species and nests in large hollows in tall, living or dead eucalypts (Shah 2006).

Main Roads Western Australia (MRWA) (2015b) advised that the application area contains an estimated 15 hectares of foraging and potential breeding habitat for Carnaby's cockatoo, which includes eucalypt woodlands and scattered roadside Eucalypt trees. The application area also contains potential breeding trees (trees of species known to support breeding within the range of the species which either have a suitable nest hollow or are of a suitable diameter at breast height (DBH) to develop a nest hollow – for most tree species, suitable DBH is 500 millimetres; for salmon gum and wandoo, suitable DBH is 300 millimetres). Phoenix (2015) advised that an estimated 127 potential breeding trees were observed, of which at least 24 have hollows that provide nesting opportunities for Carnaby's cockatoo with four of these showing signs of use by the species (Elvidge and Boulden 2015). MRWA (2015b) has advised that only 20 potential breeding trees will be cleared, however, additional Carnaby's cockatoo habitat assessments have identified another two potential breeding trees that require clearing. Therefore 22 potential breeding trees are proposed to be cleared.

Shield-backed trapdoor spider is primarily a terrestrial burrowing spider which occasionally makes tubular silk nests on tree trunks. The shield-backed trapdoor spider typically inhabits clay soils of eucalypt woodlands and acacia vegetation, and relies heavily on leaf-litter and twigs to build its burrow (DotE 2013). The species is currently known from 28 populations from Shark Bay in the north to Narembeen in the south. Suitable habitat for this species is present in the application area (Phoenix 2015), however these habitats were often completely degraded.

The local area (10 kilometre radius) has been highly cleared, retaining approximately 10 per cent pre-European vegetation. Three of the four mapped Beard vegetation associations (142, 551 and 1024) retain less than the recommended 30 per cent threshold level, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia 2001).

The area under application contains rare and priority flora, habitat for Carnaby's cockatoo, and occurs within an

area that has been extensively cleared. Therefore, the application area contains a high level of biodiversity and the proposed clearing is at variance to this principle. Flora and Vegetation management conditions requiring no clearing to occur within specified distances/habitat of rare and priority flora species, unless approved by the CEO, shall reduce the risk of significant impacts to conservation significant flora species.

To counterbalance the significant residual impacts of the proposed clearing, the applicant has committed to providing a monetary contribution towards the purchase of remnant native vegetation for conservation. Based on a calculation undertaken using the DotE's Offsets Assessment Guide, it has been determined that the acquisition of 99 hectares of native vegetation in a very good (Keighery 1994) condition with similar environmental values to the vegetation being clearing is required.

Methodology

References:
Commonwealth of Australia (2001)
DEC (2009)
DotE (2013)
Elvidge and Boulden (2015)
MRWA (2015b)
MRWA (2016)
Parks and Wildlife (2007-)
Parks and Wildlife (2016)
Phoenix (2015)
Shah (2006)

GIS Datasets:
SAC Bio Datasets - accessed January 2016

(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 indigenous to Western Australia.

Comments

Proposed clearing is at variance to this Principle

A search of NatureMap recorded five fauna species listed as rare or likely to become extinct under the WC Act within a 10 kilometre radius of the application area, being; Carnaby's cockatoo (Calyptorhynchus latirostris), western spiny-tailed skink (interior WA & Shark Bay) (Egernia stokesii subsp. badia), shield-backed trapdoor spider (Idiosoma nigrum), malleefowl (Leipoa ocellata) and western whipbird (western heath) (Psophodes nigrogularis subsp. nigrogularis) (Parks and Wildlife 2007-). The rainbow bee-eater (Merops ornatus) is protected under international agreement and has also been recorded within a 10 kilometre radius of the application area (Parks and Wildlife 2007-).

Phoenix (2015) conducted an initial fauna habitat assessment in November 2014, a level 1 fauna survey in March 2015, and a third field survey in May 2015 in additional areas not covered in previous surveys. Five fauna habitats were recorded in the application area. These habitats are:
- Woodlands (york gum, wandoo, salmon gum and/or gimlet);
- Shrubland (mallee and Casuarina thickets);
- Samphire flat or samphire flat with low shrubland or woodland;
- Cleared and revegetated mosaic; and
- Pasture and cleared

Carnaby's cockatoo preferred habitat is remnant native eucalypt woodlands, especially salmon gum (Eucalyptus salmonophloia) and wandoo (Eucalyptus wandoo), and in shrubland or kwongan heathland dominated by plants of the Proteaceae family. It also occurs in forests containing marri, jarrah, karri (Eucalyptus diversicolor) and tuart (Eucalyptus gomphocephala) (Parks and Wildlife 2013).

Carnaby's cockatoo nests in large hollows in tall, living or dead eucalypts. It nests most commonly in smooth-barked wandoo and salmon gum, but birds have also been recorded breeding in red morrell (Eucalyptus longicornis), york gum (Eucalyptus loxophleba), tuart, flooded gum (Eucalyptus rudis), swamp yate (Eucalyptus occidentalis), gimlet (Eucalyptus salubris) and marri, and are said to nest in any species of eucalypt with a suitable hollow (Parks and Wildlife 2013).

Carnaby's cockatoo feed on seeds, nuts and flowers of a large variety of plants including Proteaceous species (e.g. Banksia, Dryandra and Grevillea), Corymbia callophylla nuts, and a range of introduced species, notably seeds from cones of Pinus spp (Shah 2006).

MRWA (2015b) advised that the application area contains an estimated 15 hectares of foraging and potential breeding habitat for Carnaby's cockatoo, which includes eucalypt woodlands and scattered roadside Eucalypt trees. An assessment by Phoenix (2015) of the foraging habitat for Carnaby's cockatoo determined that the habitat present was degraded and did not represent quality foraging habitat. While the foraging habitat may be considered degraded, vegetation that provides food resources for Carnaby's cockatoo is deemed significant habitat (Parks and Wildlife 2013).

The application area also contains potential breeding trees (trees of species known to support breeding within the range of the species which either have a suitable nest hollow or are of a suitable diameter at breast height (DBH) to develop a nest hollow – for most tree species, suitable DBH is 500 millimetres; for salmon gum and wandoo, suitable DBH is 300 millimetres). Phoenix (2015) advised that an estimated 127 potential breeding

trees were observed, of which at least 24 have hollows that provide nesting opportunities for Carnaby's cockatoo with four of these showing signs of use by the species (Elvidge and Boulden 2015). In addition, the majority of the application area is mapped within a Carnaby's cockatoo confirmed breeding area.

MRWA (2015b) advised that only 20 potential breeding trees will be cleared, however, additional Carnaby's cockatoo habitat assessments have identified another two potential breeding trees that require clearing. Therefore 22 potential breeding trees are proposed to be cleared.

A site visit of the application area conducted by DER officers in February 2016 observed potential breeding trees (DER 2016).

The Recovery Plan for the Carnaby's cockatoo notes that there are multiple reasons for the decline of Carnaby's cockatoo, however the decline to-date has primarily been brought about by the extensive clearing of nesting and feeding habitat. Loss of breeding habitat, together with feeding areas and watering sites within 12 kilometres of breeding sites is one of the key threatening processes contributing towards the decline of the species. In particular, the loss or degradation of feeding habitat adjacent to breeding sites is considered to pose the greatest risk to Carnaby's cockatoos (Parks and Wildlife 2013). The Recovery Plan also states that the Eucalypt woodlands that provide nest hollows used for breeding, together with nearby vegetation that provides feeding, and roosting is habitat critical to the survival for Carnaby's cockatoo (Parks and Wildlife 2013).

Given the application area is located within a confirmed breeding area and contains trees with signs of use by Carnaby's cockatoo, the foraging and breeding habitat within the application area is considered significant and important for the long term protection of Carnaby's cockatoo.

The western spiny-tailed skink occurs in open eucalypt woodlands and Acacia-dominated shrublands in semi-arid to arid areas of south-western WA (Geraldton Sandplains and Yalgoo IBRA bioregions) and, depending on taxonomic clarification, around Shark Bay including Peron Peninsula, Edel Land and Dirk Hartog Island (Geraldton Sandplains and Carnarvon IBRA bioregions). It tends to shelter in logs, in cavities in the trunks and branches of shrubs, as well as in houses and ruins, especially in accumulations of old corrugated iron (DEC 2012). Phoenix (2015) advised that woodland habitat within the study area is heavily degraded and was often lacking hollow logs or branches and that the species is unlikely to occur within the application area.

Shield-backed trapdoor spider is primarily a terrestrial burrowing spider which occasionally makes tubular silk nests on tree trunks. The shield-backed trapdoor spider typically inhabits clay soils of eucalypt woodlands and acacia vegetation, and relies heavily on leaf-litter and twigs to build its burrow (DotE 2013). The species is currently known from 28 populations from Shark Bay in the north to Narembeen in the south. Suitable habitat for this species is present in shrubland and woodland habitat present within the application area (Phoenix 2015), however these habitats were often completely degraded.

The malleefowl is found in semi-arid to arid shrublands and low woodlands, especially those dominated by mallee and/or acacias. A sandy substrate and abundance of leaf litter are required for breeding. Densities of the birds are generally greatest in areas of higher rainfall and on more fertile soils where habitats tend to be thicker and there is an abundance of food plants (DotE 2015a). The fauna survey conducted by Phoenix (2015) determined that this species is unlikely to occur within the application area due to the lack of large connected remnant woodland areas, and a lack of understorey. Although this species may not nest within the application area it may use it to facilitate movement across the landscape.

Western whipbird inhabits dense mallee heath. The fauna assessment (Phoenix 2015) and a DER (2016) site visit deemed it was unlikely that this species would occur within the application area due to the lack of suitable habitat.

The rainbow bee-eater occurs in numerous habitats including open forests and woodlands, shrublands, in cleared or semi-cleared habitats such as areas of human habitation and farmland. It prefers open, cleared or lightly-timbered areas that are often, but not always in close proximity to permanent water (DotE 2015b). The area under application may provide suitable habitat for this species given the vegetation type and its close proximity to watercourses. However, the proposed clearing is unlikely to significantly impact upon the conservation status of this species given the highly mobile nature of this species.

There is the potential for terrestrial migratory bird species such as the fork-tailed swift (Apus pacificus) to transit the area. The great eastern egret (Ardea modesta) and cattle egret (Ardea ibis) may occur in the samphire habitats following rainfall (MRWA 2015b).

Given the above, the application area contains significant habitat for Carnaby's cockatoo and may contain significant habitat for shield-backed trapdoor spider. In addition, the area under application provides an important ecological linkage, particularly for avian fauna, facilitating landscape connectivity and contributing to fauna dispersal between larger isolated bushland fragments in an extensively cleared area.

Given the above, the proposed clearing is at variance to this principle.

To counterbalance the significant residual impacts of the proposed clearing, the applicant has committed to providing a monetary contribution towards the purchase of remnant native vegetation for conservation. Based on a calculation undertaken using the DotE's Offsets Assessment Guide, it has been determined that the acquisition of 99 hectares of native vegetation in a very good (Keighery 1994) condition with similar

environmental values to the vegetation being clearing is required.

Methodology

References:
DEC (2012)
DER (2016)
DotE (2013)
DotE (2015a)
DotE (2015b)
Elvidge and Boulden (2015)
MRWA (2015b)
Parks and Wildlife (2007-)
Parks and Wildlife (2013)
Phoenix (2015)
Shah (2006)

GIS Databases
-SAC Bio datasets (February 2016)

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

Comments

Proposed clearing may be at variance to this Principle
One single plant of a rare flora species was recorded within the application area. The applicant has committed to avoiding clearing contiguous vegetation within 50 metres of this plant to limit potential impacts.

This species is listed as Endangered under the WC Act. A larger population comprising of 64 individuals was recorded in adjacent vegetation within 120 metres of the application area (Phoenix 2015).

The rare flora species is an erect, rounded, spreading shrub one to two metres high. There are scattered occurrences from the Dalwallinu, Miling, Moora and Toodyay areas in the Avon Wheatbelt, Geraldton Sandplains and Jarrah Forest IBRA regions. It grows in yellow or brown sandy loam over laterite in shrubland and heath with Allocasuarina campestris, A. humilis, Hakea undulata, H. incrassate, Grevillea bipinnatifida, G. petrophiloides, Calothamnus ascedens and Ecdeiocolea monostachya (DEC 2009).

Two intersections within the application area, Richardson road and Arkells road, contain areas of vegetation that have not been surveyed which may contain significant individuals/populations of rare flora. The applicant has committed to undertaking surveys within these areas prior to clearing.

Given potential habitat for rare flora species occurs within the application area, the proposed clearing may be at variance to this principle. Flora and Vegetation management conditions requiring surveys and no clearing within specified distances/habitat of rare flora species, unless approved by the CEO, shall reduce the risk of significant impacts.

Methodology

References:
DEC (2009)
Phoenix (2015)

GIS Datasets:
SAC Bio Datasets - accessed January 2016

(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.

Comments

Proposed clearing is not likely to be at variance to this Principle
No threatened ecological communities have been mapped within the area under application or within the local area (10 kilometre radius).

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

Methodology

GIS Datasets:
SAC Bio Datasets - accessed January 2016

(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.

Comments

Proposed clearing is at variance to this Principle
The mapped Beard vegetation associations 142, 551, 631 and 1024 have 13 per cent, 20 per cent, 46 per cent and 12 per cent of their pre-European vegetation extent remaining, respectively in the Avon Wheatbelt IBRA Bioregion (Government of Western Australia 2014). The Avon Wheatbelt IBRA Bioregion has 19 per cent pre-European vegetation remaining.

The local area (10 kilometre radius) retains approximately 10 per cent vegetation, whilst the Shire of Dalwallinu and the Shire of Moora retain 23 per cent and 15 per cent of their pre-European vegetation, respectively (Government of Western Australia 2014).

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

The Beard vegetation associations 142, 551 and 1024 mapped within the application area, the IBRA Bioregion and the vegetation in the local area are all less than the threshold of 30 per cent. The proposed clearing will impact on extensively cleared vegetation communities.

The application area is a significant remnant as it contains a high level of biological diversity and significant habitat for Carnaby's cockatoo.

The proposed clearing is at variance to this principle.

	Pre-European (ha)	Current Extent (ha)	Remaining (%)	Extent in Parks and Wildlife Managed Lands (%)
IBRA Bioregion*				
Avon Wheatbelt	9,517,110	1,765,881	19	10
Shire*				
Shire of Dalwallinu	722, 663	167, 559	23	5
Shire of Moora	375, 696	56, 294	15	24
Beard Vegetation Association in Bioregion*				
142	637, 707	79, 306	13	3
551	257, 692	50, 760	20	7
631	104, 051	47, 875	46	12
1024	738, 926	84, 626	12	7

Methodology References:
Commonwealth of Australia (2001)
*Government of Western Australia (2014)

GIS Databases
-Pre-European vegetation
-NLWRA, Current Extent of Native Vegetation

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

Comments **Proposed clearing is at variance to this Principle**
The application area currently intersects a number of minor, non perennial watercourses; drainage channels, a geomorphic wetland and areas subject to inundation. The Moore River North is located approximately two kilometres west of the application area (Elvidge and Boulden 2015).

Vegetation associated with the drainage channels and watercourses will be cleared to facilitate the widening of the Great Northern Highway at the Miling straight but it is unlikely the proposed impacts will be significant.

The proposed clearing is at variance to this principle.

Methodology References
Elvidge and Boulden (2015)

GIS Datasets:
Hydrography linear
Geomorphic Wetlands (Classification), Wheatbelt
Topographic contours statewide

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

Comments **Proposed clearing may be at variance to this Principle**
The soils within the application area have been mapped by Northcote et al (1960-68) as soil types Xd2, Ms8, Qb29 and Oc31. These soil types are described as:

Xd2: Gently rolling terrain of smooth ridges and spurs separated by valleys showing recently developed salinity; breakaways occur infrequently. Chief soils are sandy neutral yellow mottled soils containing some ironstone gravels.

Ms8: Gently sloping to gently undulating plateau areas or uplands with long and very gentle slopes and, in places, abrupt erosional scarps: chief soils are sandy yellow earths containing some ironstone gravels, and yellow earthy sands.

Qb29: Rolling to hilly with some steep slopes; gneissic rock outcrops common. The chief soils are hard neutral red soils.

Oc31: Broad flat valleys: chief soils are hard alkaline red soils with acid clay strata below about 5-6ft depth. Associated are small areas of other soils including gilgai formations along drainage-ways.

Given the soil types present and the linear nature of the application area, the proposed clearing is not likely to cause appreciable land degradation in the form of wind erosion. However the soil types listed above are prone to water erosion.

The clearing of native vegetation in the Whealtbelt region and its replacement with shallow rooted, annual cropping species has resulted in a rise in salinity and associated land degradation (DoW 2005). The local area has been highly cleared (approximately 90 per cent) and therefore additional clearing has the potential to increase land degradation in the form of salinity. Areas affected by salinity were identified within the application area (DER 2016).

Given the above, the proposed clearing may cause appreciable land degradation in the form of water erosion and salinisation and therefore may be at variance to this principle.

Methodology References
DER (2016)
DoW (2005)
Northcote et al. (1960-68)

GIS Datasets:
Soils, Statewide

(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.

Comments **Proposed clearing is not likely to be at variance to this Principle**
No conservation areas are located within ten kilometres of the application area.

Therefore the proposed clearing is not likely to be at variance to this principle.

Methodology GIS Datasets:
Parks and Wildlife Tenure

(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.

Comments **Proposed clearing may be at variance to this Principle**
The application area currently intersects a number of minor, non perennial watercourses; drainage channels, a geomorphic wetland and areas subject to inundation. Therefore the proposed clearing may cause sedimentation of these watercourses. However impacts are likely to be short term and minimal. Culverts are already in place to ensure that surface water flow is not disrupted.

The clearing of native vegetation in the Whealtbelt region and its replacement with shallow rooted, annual cropping species has resulted in a reduction in water use by vegetation (evapotranspiration) (DoW 2005). This has in turn caused a rise in water tables and mobilisation of salt previously stored deep within the soil profile (DoW 2005).

The topography of the site (broad flat valleys) is such that the groundwater would be expected to be close to the surface and evidence of this occurring is noted within the survey area where vegetation shows signs of stress and decline in areas adjacent to salt lakes.

Land degradation mapping indicates a moderate to high salinity risk or presently saline (DAFWA 2016) within the majority of the area under application. Given this and that the local area is extensively cleared (90 per cent), additional clearing has the potential to increase land degradation in the form of salinity.

The proposed clearing may cause deterioration in surface and/or ground water quality in the form of salinisation and therefore may be at variance to this principle.

Methodology References:
DAFWA (2016)
DoW (2005)
Elvidge and Boulden (2015)

GIS Datasets:
Hydrography linear
Geomorphic Wetlands (Classification), Wheatbelt
Groundwater Salinity, Statewide
Topographic contours, Statewide

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

Comments

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

Given the application area is located in a low rainfall area, where the average rainfall is 400 milimetres per year, and the linear nature of the clearing, the proposed clearing is not likley to cause, or exacerbate the incidence or intensity of flooding.

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

Methodology

GIS Datasets:
Rainfall, Statewide

Planning instruments and other relevant matters.

Comments

The application for the proposed clearing of 19 hectares is for the purpose of upgrading Great Northern Highway. Main Roads Western Australia proposes to upgrade the Great Northern Highway from Muchea to Wubin as part of a strategy of improving safety in a section of road referred to as 'Miling Straight' (MRWA 2015a).

The proposed action was referred to the DotE. On 12 November 2015 DotE deemed the proposed action not a controlled action.

The area under application is located within the Avon River Surface Water Area which is an area proclaimed under the Rights in Water and Irrigation Act 1914. Department of Water (DoW) advised that a permit to interfere with bed and banks and a licence to take surface water is required for this application (DoW 2016).

The application area does not intersect any Aboriginal Sites of Significance.

If any of the road widening activities have the potential to directly or indirectly impact rare flora a permit to take will be required from the Department of Parks and Wildlife.

Methodology

References:
DoW (2016)
MRWA (2015a)

GIS Datasets:
Aboriginal Sites of Significance
RIWI, Surface Water Area

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