



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

PERMIT DETAILS

Area Permit Number: 6417/1

File Number: DER 2014/003264-1

Duration of Permit: From 17 December 2016 to 12 April 2025

PERMIT HOLDERS

SAGH Pty Ltd

LAND ON WHICH CLEARING IS TO BE DONE

Lot 810 on Deposited Plan 202726, Hopeland.

AUTHORISED ACTIVITY

The Permit Holder shall not clear more than 13 hectares of native vegetation within the area cross hatched yellow on the attached Plan 6417/1(a).

CONDITIONS

1. 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.

2. Type of clearing authorised

Clearing shall be conducted in a progressive manner from south to north.

3. Period in which clearing is authorised

The Permit Holder shall not clear native vegetation unless undertaking extractive activities within three months of the authorised clearing being undertaken.

4. Dieback and 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* 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 *dieback* or *weed*-affected soil, *mulch*, *fill* or other material is brought into the area to be cleared; and
- (c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

5. Offsets – conservation covenant

Prior to undertaking any clearing authorised under this Permit, and no later than 17 December 2017 the Permit Holder shall:

- (a) give a conservation covenant under section 30B of the *Soil and Land Conservation Act 1945* setting aside the *covenant area* for the protection and management of vegetation in perpetuity; and
- (b) provide to the CEO a copy of the executed conservation covenant.

6. Revegetation and Rehabilitation

- (a) The Permit Holder must implement the document 'Lot 810 Yangedi Road Hopeland-Environmental Offset Plan-October 2016';
- (b) The Permit Holder shall *revegetate* and *rehabilitate* an area of at least 4.9 hectares within the area cross-hatched red on attached Plan 6417/1c;
- (c) *Revegetation* and *rehabilitation* identified under condition 6(b) must commence within 12 months following the beginning of clearing authorised under this permit;

- (d) The Permit Holder shall establish three 10x10 metre quadrats and monitor annually for a period of 10 years areas *revegetated* and *rehabilitated* to determine vegetation cover, density, diversity, structure and weed cover and to assess areas *revegetated* and *rehabilitated* under this Permit against the completion criteria identified at condition 6(e);
- (e) The Permit Holder shall achieve the following completion criteria after the 10 year monitoring period for areas *revegetated* and *rehabilitated* under this Permit; and

Completion criteria	Minimum to be achieved
Species richness	12 native species
Trees with a mature height of >5 metres	50%
Foraging species for <i>Calyptorhynchus baudinii</i> , <i>Calyptorhynchus latirostris</i> and <i>Calyptorhynchus banksii</i> subsp. <i>naso</i>	60%
Overstorey density	1000 stems per hectare
Overstorey species	Known to have the potential to develop suitable nesting hollows for <i>Calyptorhynchus baudinii</i> , <i>Calyptorhynchus latirostris</i> and <i>Calyptorhynchus banksii</i> subsp. <i>naso</i>
Weeds	No introduction of new weed species and existing weed density contained

- (f) The Permit Holder shall undertake the following remedial actions for areas *revegetated* and *rehabilitated* where remedial triggers are met during the 10 year monitoring period.

Contingency trigger	Contingency action
Mean weed foliage cover >20%	<ul style="list-style-type: none"> Map the extent of weed foliage cover; and Implement revised hygiene control measures
Mean number of stems per hectare <1500 Species diversity <8 Structure – overstorey <37.5% Structure – midstorey <15% Structure – understorey <15%	<ul style="list-style-type: none"> Re-treat the area <i>revegetated</i> and <i>rehabilitated</i> with stockpiled topsoil from the area hatched yellow on attached Plan 6417/1 (a); Undertake direct seeding; and Procure or propagate additional seedlings and undertake infill planting

7. 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:
- the vegetation cover, density, diversity, structure and weed cover of the cleared area;
 - the location where the clearing occurred, recorded as a *shapefile*;
 - the date(s) that the area was cleared; and
 - the size of the area cleared (in hectares).
- (b) In relation to the revegetation of areas pursuant to condition 6 of this Permit:
- the location of any area *revegetated* and *rehabilitated* recorded as a *shapefile*;
 - a description of the *revegetation* and *rehabilitation* activities undertaken;
 - the size of the area *revegetated* and *rehabilitated* (in hectares);
 - the date that the area was *revegetated* and *rehabilitated*; and
 - a copy of a report(s), prepared by an *environmental specialist*, detailing the *revegetation* and *rehabilitation* activities undertaken and results for the monitoring of vegetation cover, density, diversity, structure and weed cover.

8. Reporting

- (a) The Permit Holder must provide to the CEO on or before 30 June of each year, a written report:
- of records required under condition 7 of this Permit; and
 - 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 12 January 2025, the Permit Holder must provide to the CEO a written report of records required under condition 6 of this Permit where these records have not already been provided under condition 8(a) of this Permit.

DEFINITIONS

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

covenant area means the area of land shaded red on attached Plan 6417/1(b);

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;

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;

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

regenerate/ed/ion means re-establishment of vegetation from in situ seed banks and propagating material (such as lignotubers, bulbs, rhizomes) contained either within the topsoil or seed-bearing *mulch*;

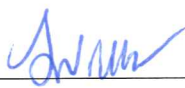
rehabilitate/ed/ion means actively managing an area containing native vegetation in order to improve the ecological function of that area;

revegetate/ed/ion 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.

shapefile means an ESRI shapefile consisting of polygons using the Geocentric Datum of Australia 1994 (GDA94);

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.

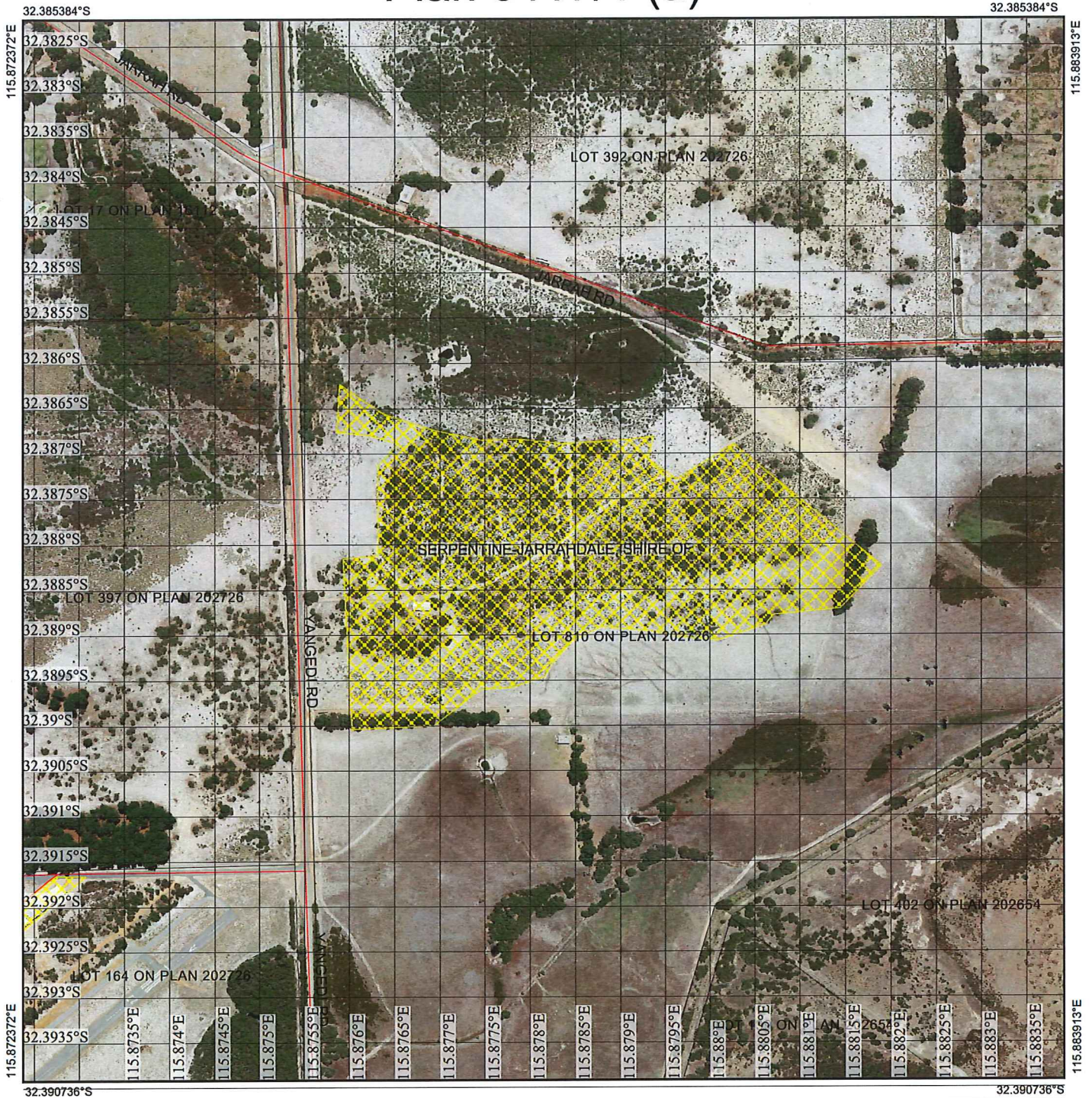


James Widenbar
MANAGER
CLEARING REGULATION



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

17 November 2016

Plan 6417/1 (a)



Legend

-  Roads
-  Imagery
-  Clearing Instruments Activities
-  Local Government Authority

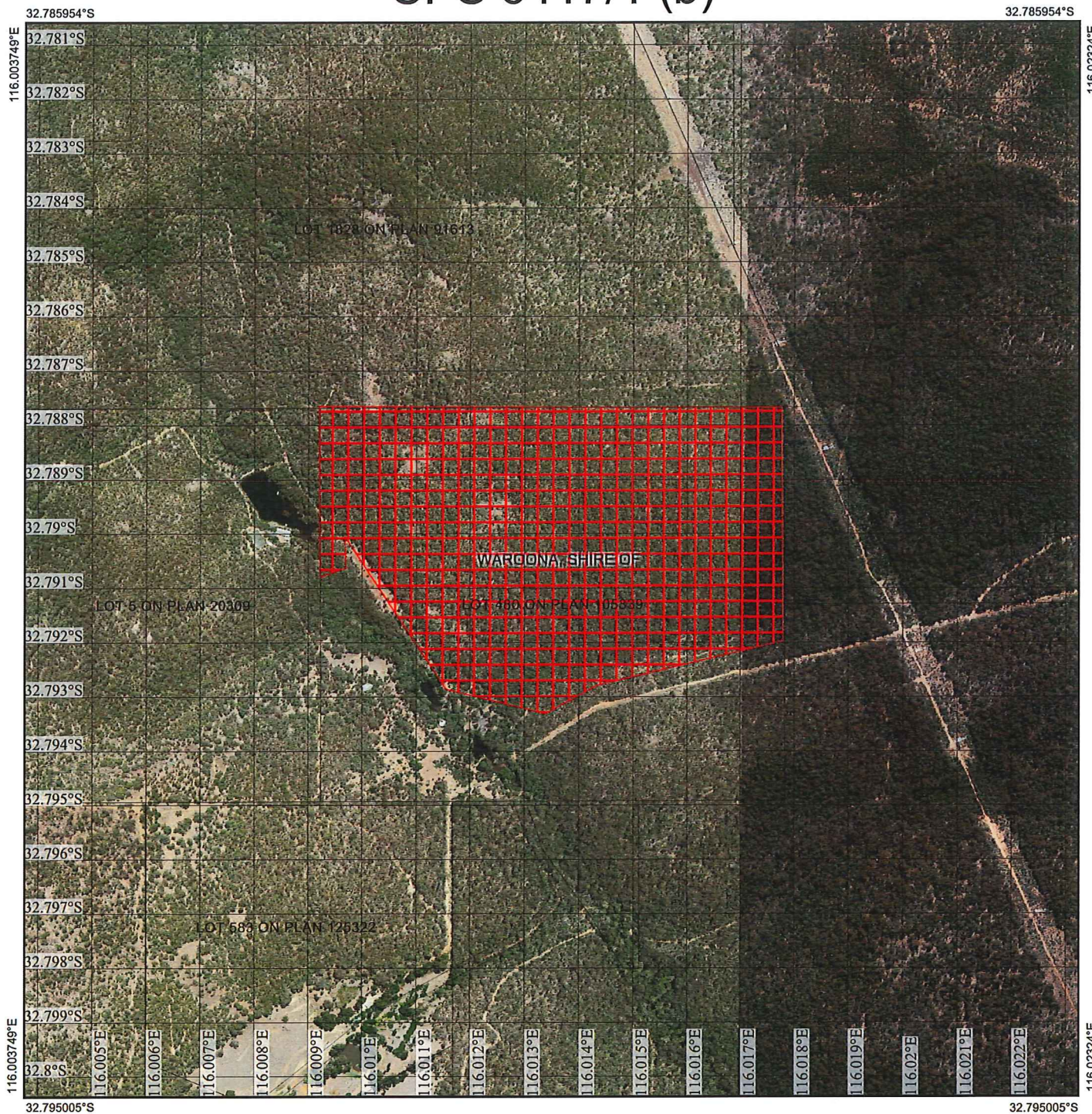


(Approximate when reproduced at A4)
GDA 94 (Lat/Long)
Geocentric Datum of Australia 1994

James Wapenaar Date *17/11/20*
JAMES WAPENAR

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

CPS 6417/1 (b)



Legend

-  Imagery
-  Local Government Authority
-  Clearing Instruments Conditions



1:9,671
 (Approximate when reproduced at A4)
 GDA 94 (Lat/Long)
 Geocentric Datum of Australia 1994

James Widdens
 Date 17/1/2016

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



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 WESTERN AUSTRALIA
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Plan 6417/1 (c)



Legend

-  Imagery
-  Local Government Authority
-  Clearing Instruments Conditions



1:11,504
 (Approximate when reproduced at A4)
 GDA 94 (Lat/Long)
 Geocentric Datum of Australia 1994

J. Widenbar
 Date *12/11/16*
SAMUEL WIDENBAR

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



1. Application details

1.1. Permit application details

Permit application No.: 6417/1
Permit type: Area Permit

1.2. Applicant details

Applicant's name: SAGH Pty Ltd

1.3. Property details

Property: LOT 810 ON PLAN 202726, HOPELAND
Local Government Authority: SERPENTINE-JARRAHDAL, SHIRE OF
DER Region: Greater Swan
DPaW District: SWAN COASTAL
LCDC: SERPENTINE - JARRAHDAL
Localities: HOPELAND

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
13		Mechanical Removal	Extractive industry

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 17 November 2016

Reasons for Decision:

The clearing permit application has been assessed against the clearing principles, planning instruments and other matters in accordance with s51O of the *Environmental Protection Act 1986*, and has concluded that the proposed clearing is at variance to Principles (a), (b) and (f), may be at variance to Principles (g), (h) and (i) and is not likely to be at variance to the remaining clearing principles.

The Delegated Officer determined that the proposed clearing will lead to the loss of 12.6 hectares of native vegetation that forms part of an ecological linkage, provides breeding habitat and significant foraging habitat for Carnaby's cockatoo (*Calyptorhynchus latirostris*), Baudin's cockatoo (*Calyptorhynchus baudinii*), and forest red-tailed black-cockatoo (*Calyptorhynchus banksii* subsp. *naso*) (collectively known as black cockatoos) and provides suitable habitat for chuditch. It has also been determined that the proposed clearing will impact on a small portion of vegetation growing in association with a wetland, and may result in land degradation in the form of wind erosion and sedimentation.

The Delegated Officer noted the results of the hydrological study commissioned by the applicant, which identified that the proposed clearing and end land use is unlikely to significantly alter the hydrological regime of the nearby conservation category wetland (CCW) or surrounding wetlands. The application area retains a 50 metre buffer from the mapped CCW.

The Permit Holder is required to undertake staged clearing, to assist in minimising the risk of wind erosion, and subsequent land degradation and sedimentation.

The Permit Holder is required to clear in a slow progressive manner from north to south to minimise impacts to quenda (*Isoodon obesulus* subsp. *Fusciventer*).

The Permit Holder is required to undertake weed and dieback management measures to minimise the spread of weeds and dieback into adjacent vegetated areas.

On 2 March 2015 the project was determined to be a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for the following controlling provision: Listed Threatened Species and Communities. The controlled action is likely to have a significant impact on Carnaby's cockatoo, Baudin's cockatoo, and forest red-tailed black-cockatoo, which are listed under the EPBC Act.

Consistent with the WA Environmental Offset Policy (2011) and WA Environmental Offsets Guidelines (2014), and pursuant to section 51I(2)(b) of the EP Act, in order to mitigate the significant environment impacts described above the Permit Holder is required to place a conservation covenant, issued under section 30B of the Soil and Land Conservation Act (SLC Act), over 41 hectares of native vegetation that is in a better condition than the application area and provides suitable breeding and foraging habitat for black cockatoos.

The applicant will also be required to rehabilitate a linear area of 4.9 hectares within Lot 810 immediately west of the application area. The rehabilitated area will be set aside for the protection and management of vegetation in perpetuity under a conservation covenant, also to be issued under the SLC Act and will help to maintain an ecological linkage.

The proposed offset described above is consistent with the EPBC Act Environmental Offsets Policy (October 2012) and Offsets Assessment Guide.

The Delegated Officer notes that the Shire of Serpentine Jarrahdale granted conditional Development Approval for the proposed extractive industry. The Delegated Officer considers that the requirement to prepare a wetland management plan, dust management plan and water and drainage management plan for approval prior to the commencement of pre-excavation works will assist to minimise impacts from wind erosion and sedimentation.

The Delegated Officer took into consideration the Development Approval and offset proposal requirements in the decision to grant a 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
<p>The vegetation under application is mapped as Beard vegetation association 1000 which is described as mosaic; medium forest; jarrah-marri / low woodland; <i>Banksia</i> / low forest; teatree (<i>Melaleuca</i> spp.)(Shepherd et al., 2001).</p> <p>The vegetation under application is mapped as Heddle vegetation Southern River complex which is described as open woodland of <i>Corymbia calophylla</i> (marri) - <i>Eucalyptus marginata</i> (jarrah) - <i>Banksia</i> species with fringing woodland of <i>Eucalyptus rudis</i> (flooded gum) and <i>Melaleuca</i> (Heddle et al., 1980).</p> <p>A flora survey undertaken by PGV Environmental (2014a) described three vegetation types within the application area:</p> <p>EmBi (approximately three hectares): <i>Eucalyptus marginata/Banksia ilicifolia</i> low open forest over <i>Hibbertia hypericoides</i> open low heath.</p> <p>BmBaEm (approximately 9.5 hectares): <i>Banksia menziesii/Banksia attenuata/Eucalyptus marginata</i> low open woodland over <i>Hibbertia hypericoides/Allocasuarina humilis</i> open low heath.</p> <p>Kg (approximately 0.5 hectares): <i>Kunzea glabrescens</i> tall open scrub over bare ground.</p>	<p>The applicant proposes clear 13 hectares of native vegetation within Lot 810 on Deposited Plan 202726, Hopeland, for the purposes of sand extraction prior to cropping and grazing.</p>	<p>Very Good; Vegetation structure altered; obvious signs of disturbance (Keighery, 1994).</p> <p>To</p> <p>Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994)</p>	<p>The condition of the application area was determined via a flora and vegetation survey undertaken by PGV Environmental (2014a) and a site inspection undertaken by the Department of Environment Regulation (DER) on 23 February 2015.</p> <p>Approximately six hectares of the application area is in a very good (Keighery, 1994) condition, approximately 4.5 hectares is in a good to degraded (Keighery, 1994) condition and approximately 2.5 hectares is in a degraded (Keighery, 1994) condition (PGV Environmental, 2014a; DER, 2015).</p>

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
	<p>The applicant proposes to clear 13 hectares of native vegetation within Lot 810 on Deposited Plan 202726, Hopeland, for the purpose of sand extraction prior to cropping and grazing.</p> <p>A flora and vegetation survey of Lot 810 undertaken by PGV Environmental (2014a) recorded 80 native flora species and identified three vegetation types within the application area, these being:</p> <ul style="list-style-type: none"> EmBi (approximately three hectares) which comprises <i>Eucalyptus marginata/Banksia ilicifolia</i> low open forest over <i>Hibbertia hypericoides</i> open low heath; BmBaEm (approximately 9.5 hectares) which comprises <i>Banksia menziesii/Banksia attenuata/Eucalyptus marginata</i> low open woodland over <i>Hibbertia hypericoides/Allocasuarina humilis</i> open low heath; and

- Kg (approximately 0.5 hectares) which comprises *Kunzea glabrescens* tall open scrub over bare ground.

The flora and vegetation survey identified that approximately six hectares of the application area is in a very good (Keighery, 1994) condition, approximately 4.5 hectares is in a good to degraded (Keighery, 1994) condition and approximately 2.5 hectares is in a degraded (Keighery, 1994) condition (PGV Environmental, 2014a).

The flora and vegetation survey of Lot 810 did not identify any threatened or priority ecological communities, rare flora or priority flora (PGV Environmental, 2014a).

The local area (10 kilometre radius surrounding the application area) retains approximately 15 per cent native vegetation.

The application area has been identified as part of an ecological linkage under the Perth Greenways Plan and the Shire of Serpentine-Jarrahdale Local Biodiversity Strategy (Del Marco and Penna, 2007). Ecological linkages have been defined as "a series of (both contiguous and non-contiguous) patches of native vegetation which, by virtue of their proximity to each other, act as stepping stones of habitat which facilitate the maintenance of ecological processes and the movement of organisms within, and across, a landscape" (Molloy et al, 2009). The application area forms part of a chain of remnants linking conservation areas to the north and south of the application area.

Sixteen fauna species of conservation significance have been recorded within the local area (Department of Parks and Wildlife (Parks and Wildlife), 2007-). Of these species, the application area provides suitable habitat for Baudin's cockatoo (*Calyptorhynchus baudinii*), Carnaby's cockatoo (*Calyptorhynchus latirostris*), forest red-tailed black-cockatoo (*Calyptorhynchus banksii* subsp. *naso*) (collectively known as black cockatoos), chuditch (*Dasyurus geoffroii*) and quenda (*Isodon obesulus* subsp. *fusciventer*).

A black cockatoo habitat assessment identified that 12.58 hectares of the application area provides good to very good foraging habitat for black cockatoos (PGV Environmental, 2014b). The assessment recorded 28 potential nesting trees (diameter at breast height of greater than 500 millimetres) within the application area. Of these, six trees were observed to have hollows suitable for Carnaby's cockatoo or forest red-tailed black cockatoo breeding (PGV Environmental, 2014b). Although the application area is outside of the modelled breeding distribution of Baudin's cockatoo, the application area contains suitable foraging and roosting habitat for this species.

While the application area contains suitable habitat for quenda, it is not likely to provide significant habitat for this species as quenda are more likely to inhabit the denser understorey vegetation within the conservation category wetland located 50 metres north of the application area. However, there is the potential for quenda deaths should any individuals occur within the application area at the time of clearing. To prevent quenda deaths, the applicant will be required to clear in a slow progressive manner from the southern portion of the site to the northern portion, to allow quenda to distribute into the wetland vegetation to the north.

The application area provides suitable habitat for chuditch (DER, 2015). The retention of vegetation corridors is an important requirement of this species, whereby this requirement is considered to be critical for the conservation of this species (DEC, 2012b). Given that the application area forms part of an ecological linkage, it may contain significant habitat for this species

The application area contains vegetation in a very good (Keighery, 1994) condition that provides significant habitat for conservation significant fauna and forms part of an ecological linkage, therefore, the proposed clearing is at variance to this Principle.

Methodology

References:

Del Marco and Penna (2007)
 DEC (2012b)
 DER (2015)
 Keighery (1994)
 Molloy et al., (2009)
 Parks and Wildlife (2007-)
 PGV Environmental (2014a)
 PGV Environmental (2014b)
 Strategen (2016)

GIS Databases:

SAC Bio Datasets (Accessed October 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 flora and vegetation survey of Lot 810 undertaken by PGV Environmental (2014a) recorded 80 native species and identified three vegetation types within the application area, these being:

- EmBi (approximately three hectares) which comprises *Eucalyptus marginata*/*Banksia ilicifolia* low open forest over *Hibbertia hypericoides* open low heath;

- BmBaEm (approximately 9.5 hectares) which comprises *Banksia menziesii*/*Banksia attenuata*/*Eucalyptus marginata* low open woodland over *Hibbertia hypericoides*/*Allocasuarina humilis* open low heath; and
- Kg (approximately 0.5 hectares) which comprises *Kunzea glabrescens* tall open scrub over bare ground.

According to available datasets, 16 fauna species of conservation significance have been recorded within the local area (Parks and Wildlife, 2007-). Based on the habitat preferences of these species, the application area provides suitable habitat for the forest red-tailed black-cockatoo, Baudin's cockatoo, Carnaby's cockatoo, chuditch and quenda (DER, 2015).

The application area has been identified as part of an ecological linkage under the Perth Greenways Plan and the Shire of Serpentine-Jarrahdale Local Biodiversity Strategy (Del Marco and Penna, 2007). Ecological linkages have been defined as "a series of (both contiguous and non-contiguous) patches of native vegetation which, by virtue of their proximity to each other, act as stepping stones of habitat which facilitate the maintenance of ecological processes and the movement of organisms within, and across, a landscape" (Molloy et al, 2009). The application area forms part of a chain of remnants linking conservation areas to the north and south. Given this, the application area is considered significant in the movement of local fauna within the local landscape.

The chuditch is listed as rare or likely to become extinct under the *Wildlife Conservation Act 1950* (WC Act). This species has a preference for eucalypt forest (especially *Eucalyptus marginata*), dry woodland and shrublands and utilise horizontal hollow logs or earth burrows as dens or refuge (DotE, 2014).

There are nine records of this species within the local area and a site inspection of the application area identified suitable habitat for this species (DER, 2015). This species has a large home range and the retention of vegetation corridors is an important requirement of this species and is considered to be critical for the conservation of this species (DEC, 2012b).

Carnaby's cockatoo, Baudin's cockatoo and forest red-tailed black-cockatoo's are all listed as rare or likely to become extinct under the WC Act. These species nest in large hollows of *Eucalyptus* trees and forage on the seeds, nuts and flowers of a large variety of plants including Proteaceous species (*Banksia*, *Hakea*, *Grevillea*), *Eucalyptus* species, *Corymbia* species and a range of introduced species, especially seeds from cones of *Pinus* species (Shah, 2006; Valentine and Stock, 2008). Clearing of feeding habitat on the Swan Coastal Plain poses a significant threat to the long term survival of Carnaby's cockatoos (Shah, 2006).

Carnaby's cockatoo was once abundant in Western Australia. Since the late 1940s the species has suffered a 30 percent contraction in range, a 50 percent decline in population, and between 1968 and 1990 disappeared from more than a third of its breeding range. Basic ecological theory, expert opinion and recent evidence, suggests that the remaining native and pine plantation foraging habitat on the Swan Coastal Plain is just sufficient to support the current population of Carnaby's cockatoo. Therefore any reduction in the amount of food source will result in a reduction in the carrying capacity of the region and therefore a decline in the population of the species (Saunders 1990; Johnstone and Storr 1998; Saunders and Ingram 1998; Garnett et al. 2011).

A black cockatoo habitat assessment identified that 12.58 hectares of the application area provides good to very good foraging habitat for black cockatoos (PGV Environmental, 2014b). The assessment identified six trees with hollows, two of which were classified as current potential nesting sites for Carnaby's cockatoo or red-tailed black cockatoo. Twenty eight trees with a diameter at breast height of 500 millimetres or greater were recorded within the application area, indicating that these may develop suitable hollows within the foreseeable future (PGV Environmental, 2014b).

The vegetation under application provides suitable habitat for quenda, which is listed as a Priority 4 species by Parks and Wildlife. Quenda have a preference for wet or dry sclerophyll forest through to open woodland and scrubby vegetation on sandy soils. Dense undergrowth and low ground cover are particularly important in providing cover for quenda (DEC, 2010). A site inspection of the application area identified suitable habitat for this species (DER, 2015).

While the application area contains suitable habitat for quenda, it is not likely to provide significant habitat for this species as quenda are more likely to inhabit the denser understorey vegetation within the conservation category wetland located 50 metres north of the application area. However, quenda deaths may occur as a result of clearing. To prevent quenda deaths, the applicant will be required to clear in a slow progressive manner from the southern portion of the site to the northern portion to allow quenda to distribute into the wetland vegetation to the north.

As the application area is significant in the movement of fauna through the landscape, contains habitat critical to the survival of Carnaby's cockatoo, contains habitat for Baudin's cockatoo, forest red-tailed black-cockatoo and chuditch, the proposed clearing is at variance to this clearing Principle.

Methodology

References:

Del Marco and Penna (2007)
 DEC (2010)
 DEC (2012a)
 DEC (2012b)

DER (2015)
DotE (2014)
EPA (2006)
Garnett et al. (2011)
Johnstone and Storr (1998)
Molloy et al. (2009)
PGV Environmental (2014b)
Saunders (1990)
Saunders and Ingram (1998)
Shah (2006)
Strategen (2016)
Valentine and Stock (2008)

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

Comments **Proposed clearing is not likely to be at variance to this Principle**
According to available datasets, seven rare flora species have been recorded within the local area. The closest of these is located approximately 2.3 kilometres north of the application area.

A spring flora and vegetation survey of the application area undertaken in 2014 (PGV Environmental, 2014a) did not record any rare flora species. The site was surveyed through quadrats and by traversing the application area on foot. No constraints to the survey were identified (PGV Environmental, 2014a).

Given the above, the application area is not likely to contain rare flora and the proposed clearing is not likely to be at variance to this Principle.

Methodology References:
PGV Environmental (2014a)

GIS Databases:
SAC Bio Datasets (Accessed October 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**
According to available datasets, ten threatened ecological communities (TEC) have been recorded within the local area. The closest TEC to the application area is the shrublands on dry clay flats, located approximately 6.7 kilometres north east.

A spring flora and vegetation survey of the application area undertaken in 2014 did not record any vegetation consistent with a TEC (PGV Environmental, 2014a). The site was surveyed through quadrats and be traversing the application area on foot.

Given the above, the application area is not likely to comprise the whole or part of, or be necessary for the maintenance of a threatened ecological community. Therefore, the proposed clearing is not likely to be at variance to this Principle.

Methodology References:
PGV Environmental (2014a)

GIS Databases:
SAC Bio Datasets (Accessed October 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 not likely to be at variance to this Principle**
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).

There is approximately 15 per cent native vegetation remaining within the local area.

Within constrained areas (areas of urban development in cities and major towns) on the Swan Coastal Plain, the threshold for representation of the pre-clearing extent of a particular native vegetation complex is 10 per cent (EPA, 2006). The area under application is classified as a constrained area.

The Swan Coastal Plain Interim Biogeographic Regionalisation of Australia (IBRA) bioregion and Shire of Serpentine Jarrahdale retain approximately 38.5 and 52 per cent of their pre-European vegetation extents respectively (Government of Western Australia, 2015).

The application area is mapped as Beard vegetation association 1000 and Heddle vegetation Southern River complex, which retain 25 and 18 per cent of their pre-European vegetation extents within the Swan Coastal Plain respectively (Government of Western Australia, 2015). The application area is considered to be representative of these two vegetation types.

The application area has been identified as part of an ecological linkage under the Perth Greenways Plan and the Shire of Serpentine-Jarrahdale Local Biodiversity Strategy (Del Marco and Penna, 2007). Ecological linkages have been defined as "a series of (both contiguous and non-contiguous) patches of native vegetation which, by virtue of their proximity to each other, act as stepping stones of habitat which facilitate the maintenance of ecological processes and the movement of organisms within, and across, a landscape" (Molloy et al, 2009). The application area forms part of a chain of remnants linking conservation areas to the north and south.

The application area contains significant habitat for black cockatoos, provides suitable habitat for ground dwelling indigenous fauna, and contributes towards a north south regional ecological linkage. Therefore the application area is considered to be a significant remnant. However, given that the local area, Shire, bioregion and two represented vegetation types retain greater than the abovementioned 10 per cent vegetation threshold, the proposed clearing is not likely to be at variance to this Principle.

	Pre-European (ha)	Current Extent (ha)	Remaining (%)	Extent in Parks and Wildlife Managed Lands (%)
IBRA Bioregion Swan Coastal Plain	1,501,222	579,162	38.5	38
Shire Shire of Serpentine Jarrahdale	90,048	47,052	52	85
Beard Vegetation Association within Bioregion 1000	94,175	23,768	25	19
Heddle Vegetation Complex Southern River Complex	57,970	10,698	18	1.5

Methodology

References:
Commonwealth of Australia (2001)
EPA (2006)
Government of Western Australia (2015)
Parks and Wildlife (2015)

GIS Databases:
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 mapped boundary of a multiple use wetland overlaps approximately 0.17 hectares of the application area. The application area is 50 metres from a mapped conservation category wetland (sumpland). The application area is also 100 metres from a resource enhancement wetland. The application area occurs on a low ridge/dune surrounded by wetland environments of the Bennett Brook wetland group.

The conservation category wetland within Lot 810 forms part of a larger sumpland extending across the adjacent Yangedi Road and is 2.76 hectares in size. A wetland hydrological review of the application area determined that the proposed clearing and sand extraction is unlikely to significantly alter the hydrological regime of the conservation category sumpland. This is due to the system being driven by groundwater recharge and lack of observed surface water inputs from the dune in which the application area occurs (PGV Environmental, 2015).

A condition of the development approval issued by the Shire of Serpentine Jarrahdale for the proposed extractive industry requires the applicant to prepare a wetland management plan for approval prior to the commencement of pre-excavation works (Shire of Serpentine Jarrahdale, 2015). This will assist to minimise potential impacts to the hydrological regime of the aforementioned conservation category sumpland.

While a 50 metre buffer has been maintained to the conservation category sumpland, site inspections of the application area recorded a small portion of vegetation growing in association with wetland environments, largely in the form of *Kunzea glabrescens* tall open scrub (PGV Environmental, 2014a; DER, 2015).

Given the above, the proposed clearing will impact on a small portion of vegetation growing in association with a multiple use wetland and the proposed clearing is at variance to this Principle. Given the extent of clearing proposed within the multiple use wetland, the proposed clearing is not likely to significantly impact on the mapped wetland.

Methodology References:
DER (2015)
PGV Environmental (2014a)
PGV Environmental (2015)
Shire of Serpentine Jarrahdale (2015)

GIS Databases:
Geomorphologic Wetlands, Swan Coastal Plain

(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**
Landform and soil mapping indicates that the application area largely comprises Bassendean B1 map unit 212Bs_B1, described as extremely low to very low relief dunes, undulating sandplain and discrete sand rises with deep bleached grey sands sometimes with a pale yellow B horizon or a weak iron-organic hardpan at depths generally greater than two metres.

Sandy soils are prone to wind erosion and given that the application area occurs on a low ridge/dune, wind erosion has the potential to occur post clearing. The applicant will be required to undertake staged clearing to minimise the potential for land degradation in the form of wind erosion. Further, a condition of the development approval issued by the Shire of Serpentine Jarrahdale for the proposed extractive industry requires the applicant to implement a dust management plan to stabilise soils and minimise dust emissions (Shire of Serpentine Jarrahdale, 2015). This will also assist to minimise the potential for land degradation in the form of wind erosion.

The application area occurs on a low dune surrounded by wetland environments of the Bennett Brook wetland group. While there is some potential for water erosion to occur as a result of dune run-off during high rainfall events, a hydrological study of the application area identified a lack of observed surface water inputs from the dune (application area) to the surrounding wetlands (PGV Environmental, 2015), therefore water erosion is not likely to result in appreciable land degradation.

A condition of the development approval issued by the Shire of Serpentine Jarrahdale for the proposed extractive industry requires the applicant to implement a water and drainage management plan that addresses surface and groundwater quality and quantity (Shire of Serpentine Jarrahdale, 2015). The implementation of this plan will help to minimise the potential for water erosion.

Given the above, the proposed clearing may be at variance to this clearing Principle. However the requirement to implement dust management and water and drainage management plans will assist in mitigating the potential for land degradation.

Methodology References:
PGV Environmental (2015)
Shire of Serpentine Jarrahdale (2015)

GIS Databases:
DAFWA Subsystems

(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 may be at variance to this Principle**
The application area is located approximately 300 metres (south west) from Bush Forever site 378 and approximately four kilometres from Bush Forever sites 372 (north), 959 (north-east), 971 (north-east), 985 (south), 394/277 (south-west) and 976/376 (west).

The application area has been identified as part of an ecological linkage under the Perth Greenways Plan and the Shire of Serpentine Jarrahdale Local Biodiversity Strategy (Del Marco and Penna, 2007). Ecological linkages have been defined as "a series of (both contiguous and non-contiguous) patches of native vegetation which, by virtue of their proximity to each other, act as stepping stones of habitat which facilitate the maintenance of ecological processes and the movement of organisms within, and across, a landscape" (Molloy et al, 2009). Given this, and the size and condition of the application area, it is considered to be significant in facilitating the movement of local fauna and biological material across the landscape and potentially between conservation areas, including the Bush Forever Sites referred to above. The degradation of this linkage may impact on the environmental values of these conservation areas and on the viability of the species that utilise these areas.

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

Methodology References:
Del Marco and Penna (2007)
Molloy et al. (2009)

GIS Databases:
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

Groundwater salinity mapped within the application area is between 500 and 1000 milligrams total dissolved solids per litre (marginal). Given this low salinity level it is considered that the proposed clearing is unlikely to lead to a perceptible rise in the watertable and thus an increase in ground or surface water salinity levels.

The mapped boundary of a multiple use wetland partially overlaps the application area. The application area is 50 metres from a conservation category wetland and 100 metres from a resource enhancement wetland. The application area occurs on a low ridge/dune surrounded by wetland environments of the Bennett Brook wetland group.

While there is the potential for some increased sedimentation post rainfall, a hydrological study of the application area identified a lack of observed surface water inputs from the dune (application area) to the surrounding wetlands (PGV Environmental, 2015). Therefore while minor sedimentation may occur, this is not expected to significantly impact water quality of the nearby wetlands.

Sandy soils are prone to wind erosion and given that the application area occurs on a low ridge/dune, wind erosion has the potential to occur post clearing, which may cause increased sedimentation of the adjoining wetlands, particularly immediately post clearing. The applicant will be required to undertake staged clearing to minimise the potential for wind erosion and subsequent sedimentation.

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

A condition of the development approval requires the applicant to prepare a wetland management plan, dust management plan and Water and drainage management plan for approval prior to the commencement of pre-excavation works (Shire of Serpentine Jarrahdale, 2015). The implementation of these plans should assist to minimise the impact of surface water sedimentation on the aforementioned wetlands.

Methodology

References:
PGV Environmental (2015)
Shire of Serpentine Jarrahdale (2015)

GIS Databases:
DAFWA Subsystems
Geomorphic Wetlands, Swan Coastal Plain

(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

Landform and soil mapping indicates that the application area largely comprises Bassendean B1 map unit 212Bs_B1, described as extremely low to very low relief dunes, undulating sandplain and discrete sand rises with deep bleached grey sands sometimes with a pale yellow B horizon or a weak iron-organic hardpan at depths generally greater than 2 metres.

Given the highly permeable nature of the soil type mapped within the application area, the proposed clearing is not likely to cause or exacerbate flooding and is not likely to be at variance to this clearing Principle.

Methodology

GIS Databases:
DAFWA Subsystems

Planning instruments and other relevant matters.

Comments

The primary purpose of the clearing permit application is resource extraction, however grazing is proposed at the completion of extraction operations.

The application was referred to the Environmental Protection Authority (EPA) for assessment. On 2 February 2015 the EPA determined to not assess the proposal under Part IV of the *Environmental Protection Act 1986* (EP Act) and recommended that the proposal be dealt with under Part V Division 2 of the EP Act. The corresponding public advice recommended:

- The development of a wetland management plan in consultation with the Department of Parks and Wildlife and developed in accordance with EPA Guidance statement Number 33 – Environmental Guidance for Planning and Development and Position Statement 4 – Environmental Protection of Wetlands;
- Maintaining a minimum 50 metre buffer surrounding wetlands of conservation significance; and
- Restricting extraction to two metres above the groundwater table.

On 31 March 2015 a Delegated Officer of DER wrote to the applicant advising that the preliminary assessment had identified a number of environmental impacts associated with the proposed clearing and invited the applicant to provide further information in respect of these matters. The applicant responded to the Delegated Officer's letter on 3 April 2015 and 23 September 2016, providing hydrological information to address concerns relating to nearby wetlands and providing an Environmental Offset Plan to address the environmental impacts of the proposed clearing, specifically impacts to conservation significant fauna and an ecological linkage.

The Environmental Offset Plan includes a commitment to placing a conservation covenant, issued under section 30B of the *Soil and Land Conservation Act 1945* (SLC Act), over 41 hectares of native vegetation in a better condition than the application area and provides suitable breeding and foraging habitat for black cockatoos. As part of the Environmental Offset Plan, the applicant will also rehabilitate a linear area of 4.9 hectares within Lot 810 immediately west of the application area. The rehabilitated area will be set aside for the protection and management of vegetation in perpetuity under a conservation covenant, also to be issued under the SLC Act and will help to maintain an ecological linkage.

The applicant has received Development Approval for the proposed extractive industry from the Shire of Serpentine-Jarrahdale. The approval is subject to a number of conditions, including the requirement to prepare a wetland management plan, dust management plan and water and drainage management plan for approval prior to the commencement of pre-excavation works (Shire of Serpentine Jarrahdale, 2015).

The application was referred to the former Department of the Environment (DotE) (now Department of the Environment and Energy (DotEE)) due to its potential impacts to black cockatoos. DotEE assessed the impact of the proposed development and granted approval (EPBC 2015/7429) with conditions on 9 November 2015. The approval was for the clearing of 12.6 hectares of black cockatoo habitat and required that an offset be provided. DotEE approved the applicants 'Lot 810 Yangedi Road, Hopeland, Environmental Offset Plan' on 19 September 2016.

No Aboriginal Sites of Significance are mapped within the application area.

The application was advertised in *The West Australian* newspaper on 19 January 2015 for a 21 day submission period. No public submissions have been received in relation to this application.

Methodology

References:

Shire of Serpentine Jarrahdale (2015)
Strategen (2016)

GIS Databases:

Aboriginal Sites of Significance

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