Government of **Western Australia**
Department of **Mines and Petroleum**

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 2271/3
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Western Areas Limited**

1.3. Property details

Property: Mining Lease 77/545
Mining Lease 77/582
Mining Lease 77/911
Local Government Area: Shire of Kondinin
Colloquial name: Forrestania Nickel Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
15		Mechanical Removal	Mineral Exploration and Mine Infrastructure

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 12 June 2014

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description

Beard vegetation associations have been mapped for the whole of Western Australia. Two Beard vegetation associations have been mapped within the application area (GIS Database).

511 - Medium woodland; salmon gum and morrel. According to the Shared Land Information Platform (SLIP, 2008), Beard vegetation association 511 is a woodland dominated by *Eucalyptus salmonophloia* with co-dominant *E. longicornis* over *E. salubris*, *E. flocktoniae*, *E. eremophila* over *Dodonaea stenozyga*, *Eremophila saligna* and *Daviesia nematophylla*.

2048 - Shrublands; scrub heath in the Mallee Region. According to the Shared Land Information Platform (SLIP, 2008), Beard vegetation association 2048 is a shrubland of *Acacia sp.*, *Allocasuarina acutivalvis*, *Adenanthos argyreus*, *Calothamnus lateralis*, *Allocasuarina campestris*, *Melaleuca* sp., *Hakea* sp. and *Leptopspermum erubescens*, over *Verticordia* sp., *Dryandra* sp., *Melaleuca* sp., *Baeckea* sp., *Leucopogon* sp., *Isopogon buxifolius*, *Petrophile* sp., *Banksia* sp. and *Xanthorrhoea nana*.

A survey conducted by Botanica Consulting (2007) covered the majority of the application area and it identified three vegetation types within the application area:

Eucalyptus Mallee Woodland: Dominated by *Eucalyptus eremophila* and *E. urna* over understorey co-dominants *Melaleuca pauperiflora* ssp. *pauperiflora*, *M. adnata*, *M. uncinata*, *M. elliptica*, *M. pentagona*, *M. cordata*, *M. sapientes*, *M. eleuterostachya*, *M. laxiflora*, *M. pauperiflora* ssp. *fastigiata* and *Acacia sulcata* var. *platyphylla*, over ground cover species *Olearia meulleri*, *Acacia deficiens* and *Grevillea huegelii.*

Sandplain Heath: Dominant species within this vegetation type were *Allocasuarina corniculata*, *Lepidosperma brunonianum*, *Acacia eremophila*, *A. erinacea*, *A. fragilis*, *A. sphacelata*, *A. coolgardiensis*, *A. hemiteles*, *Melaleuca uncinata*, *M. cordata*, *M. sapientes*, *M. sparsiflora*, *M. pauperiflora* ssp. *pauperiflora*, *M. teuthidoides*, *Grevillea shuttleworthiana* ssp. *obovata* and *Isopogon scabriusculus* ssp. *pubifloris.*

Rehabilitation Vegetation: dominant species within this vegetation type were *Acacia sphacelata*, *A. fragilis*, *A. heteroneura var. jutsonii*, *Grevillea oncogyne* and *G. cagiana*.

The remainder of the application area was surveyed by Jims Seeds, Weeds & Trees in February 2006 which described the vegetation within the proposed clearing area as Mallee Woodland and Sandplain Heath. The heath is believed to be the result of recent fire history.

Clearing Description

Forrestania Nickel Project.
Western Areas Limited proposes to clear up to 15 hectares of native vegetation, within a total boundary of approximately 268 hectares, for the purposes of expansion of the Flying Fox mine infrastructure and exploration activities. Flying Fox Mine is located approximately 80 kilometres east of Hyden, in the Shire of Kondinin.

Vegetation Condition

Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994);

To:

Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).

Comment

The vegetation condition was described by Botanica Consulting as 'very good' within the Eucalyptus Mallee Woodland and Sandplain Heath vegetation types and 'degraded' within the rehabilitation vegetation type. Approximately 38% of the Jims Seeds, Weeds and Trees (2006) survey area has undergone previous exploration activities. Much of the vegetation surrounding Flying Fox Mine has been disturbed by previous exploration activities.

Clearing permit CPS 2271/1 was granted by the Department of Mines and Petroleum (DMP) on 17 April 2008 and was valid from 17 May 2008 to 30 June 2013. The clearing permit authorised the clearing of 15 hectares of native vegetation. An amendment application was received by DMP on 30 January 2013 requesting an extension to the expiry date of the permit until 30 June 2018. Amendment CPS 2271/2 was granted by DMP on 11 April 2013. An application to amend clearing permit CPS 2271/2 was submitted on 9 April 2014 to increase the clearing boundary, extend the duration of the permit for an additonal five years to cover future clearing and change the name of the permit holder from Western Areas NL to Western Areas Limited. The amount of clearing authorised will remain the same.

3. Assessment of application against clearing principles

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

Comments

Proposal is at variance to this Principle

The application area intersects the Western Mallee Interim Biogeographic Regionalisation of Australia (IBRA) sub-region of the Mallee bioregion and the Southern Cross IBRA sub-region of the Coolgardie bioregion (GIS Database). The Western Mallee sub-region is characterised by clays and silts underlain by kankar, exposed granite, sandplains, isolated uplands of laterite pavements and salt lake systems (on a granite basement) (CALM, 2002). Mallee communities can be found on a variety of surfaces and *Eucalyptus* woodlands occur mainly on fine-textured soils, with scrub-heath on sands and laterite. Mallee over myrtaceous-proteaceous heaths on duplex (sand over clay) soils are common. *Melaleuca* shrublands characterise alluvia, and *Halosarcia* low shrublands occur on saline alluvium. A mosaic of mixed eucalypt woodlands and mallee occur on calcareous earth plains and sandplains overlying Eocene limestone strata in the east. The subregion shows a very high degree of endemism, particularly in the Proteaceae family (632 spp, 99% endemic; 16 genera, 5 endemic) and in particular in the genera *Grevillea* and *Hakea*. *Eucalyptus*, *Acacia*, *Dryandra* and Asteraceae also contain very high numbers of endemic taxa. The Southern Cross sub-region is characterised by subdued relief, comprising gently undulating uplands dissected by broad valleys with bands of low greenstone hills (CALM, 2002). Diverse Eucalyptus woodlands occur around chains of saline playa-lakes, on the low greenstone hills, valley alluvials and broad plains of calcareous earths. The scrubs are rich in endemic acacias and Myrtaceae (CALM, 2002).

Two flora and vegetation surveys cover the application area. A survey conducted by Botanica Consulting in October 2007 covered the majority of the application area while a survey by Jims Seeds, Weeds & Trees in February 2006 covered the remainder.

The Botanica Consulting survey recorded a total of 106 vascular plant species from 24 families and 47 genera (Botanica Consulting, 2007). This represents a high level of speciation in a small area and reflects the diverse nature of both the eucalypt woodlands and the sandplain heaths that occur within the application area. For instance, within the survey area there are 27 species within the Myrtaceae family and 23 species within the Proteaceae family, reflecting the diversity of these families within the Western Mallee subregion. A population of priority flora, *Microcorys* sp. Forrestania (P4), occurs within the application area. The population of *Microcorys* sp. Forrestania is estimated to be in the 1000's and is located in the *Eucalyptus* Mallee woodland vegetation type (Botanica Consulting, 2007). Western Areas have advised that the population occurs in an area that is unlikely to be cleared for mine infrastructure and have committed to avoiding the population during exploration activities (Western Areas, 2007). Potential impacts to Priority Flora as a result of the proposed clearing may be minimised by the implementation of a flora management condition.

More than 75% of the Western Mallee IBRA subregion has been cleared for agriculture (CALM, 2002). However, the application area occurs within that part of the sub-region that has not been extensively cleared, ie/ not within the intensive land use zone (ILZ). It is an area that is important for maintaining landscape scale ecosystem functions.

More than 35% and 40% of the Mallee and Coolgardie IBRA bioregion's original mammal fauna is now regionally extinct, respectively (CALM, 2002). This is mainly due to the extensive land clearing that has occurred. The application area is suitable habitat for many conservation significant fauna species, including

Malleefowl (*Leipoa ocellata*) and Chuditch (*Dasyurus geoffroii*) (Biota, 2007).

Based on the above, the proposed clearing is at variance to this principle. However, it is noted that some of the area subject to the application has already been disturbed from previous mining activity, including some rehabilitated areas. As a result of this previous disturbance, biological diversity within the application area may be reduced. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

Methodology

Biota (2007)
Botanica Consulting (2007)
CALM (2002)
GIS Database:
- IBRA WA (Regions – Sub Regions)

(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

Proposal may be at variance to this Principle

Biota Environmental Sciences (hereafter referred to as Biota) have completed four fauna monitoring surveys over the application area in February/March 2005, November 2005 (Phase I and II), May 2006 and November 2006 (Phase III and IV) (Biota, 2007). These four surveys have resulted in a comprehensive list of fauna species that occur within the application area. The fauna surveys and their subsequent reports adequately meet the requirements of EPA Guidance Statement 56 'Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia' (EPA, 2004). Biota has stated that considerable sampling effort would be required to add a small number of extra species to the survey records (Biota, 2007).

As a result of the fauna surveys, the following conservation significant fauna species have been identified within the application area and surrounding vegetation: Carnaby's Cockatoo (*Calyptorhynchus latirostris*), Malleefowl (*Leipoa ocellata*), Chuditch (*Dasyurus geoffroi*), Western Rosella (*Platycercus icterotis xanthogenys*), Peregrine Falcon (*Falco peregrinus*), South West Carpet Python (*Morelia spilota imbricata*), Shy Groundwren (*Hylacola cauta whitlocki*), Rufous Fieldwren (*Calamanthus campestris montanellus*), Crested Bellbird (*Oreoica gutturalis gutturalis*), White Browed Babbler (*Pomatostomus superciliosis ashbyi*), Western Brush Wallaby (*Macropus irma*), Western Mouse (*Pseudomys occidentalis*), Rainbow Bee-eater (*Merops ornatus*).

The Carnaby's Cockatoo (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice 2013*) forage in woodland and heath that is dominated by proteaceous species (DEC, 2006a). They nest in hollows of large eucalypts, usually Salmon Gum and Wandoo. The species has severely declined since the 1970's due mainly to extensive land clearing, shooting and nest robbing. The Lake Cronin - Forrestania area is the eastern-most extent of its distribution and it would occur there occasionally (Biota, 2007). The vegetation within the application area is not likely to be significant habitat for this species unless large, hollow bearing Salmon Gum Trees are present.

The Malleefowl (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice 2013*) is largely confined to arid and semi-arid woodland that is dominated by mallee eucalypts on sandy soils, with less than 430 millimetres of rainfall annually (DEC, 2006b). They may also be found in Mulga (*Acacia aneura*), and other sclerophyllous associations. They require sandy soils with an abundance of leaf litter for breeding. Biota recorded a disused mound at Diggers South mine approximately 30 kilometres south of the application area and an active mound was located near the Flying Fox de-watering pipeline, within 3 km of the application area (Biota, 2007). Western Areas staff regularly record the species within the Flying Fox/Cosmic Boy/Diggers South mine areas (Biota, 2007). The assessing officer observed a bird several kilometres north of the Digger Rocks mine in November 2006. It is likely that the species occurs within the application area at low densities, although it was not recorded by Biota during their 2006 survey efforts. Given the large amount of suitable vegetation that surrounds the application area, it is unlikely that the vegetation within the application area is significant habitat for this species.

The Chuditch (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice 2013*) occupies a wide range of habitats from woodlands, dry sclerophyll (leafy) forests, riparian vegetation, beaches and deserts (DEC, 2006c). They have large home ranges of up to 15 square kilometres (males). Chuditch make dens in hollow logs and burrows and have also been recorded in tree hollows and cavities. Suitable hollow or burrow entrance diameters are often at least 30 centimetres in diameter. An adult female Chuditch may utilise an estimated 66 logs and 110 burrows within her home range. Two individual Chuditch were recorded west of the application area in 2006 by Biota (Biota, 2007). The species may occur within the application area, particularly given the feral animal control currently conducted by Western Areas NL and the availability of suitable habitat within the application area. The full extent of the Chuditch population in this area cannot be quantified. However, given this population's isolation from other populations in the state's south-west, the vegetation within the application area may be significant habitat for this species.

The wheatbelt subspecies of Western Rosella (Department of Parks and Wildlife (DPaW) - Priority 4) lives in Eucalypt woodland and its persistence is associated with habitat remnants (Garnett et al, 2000). The main food of the western subspecies is the seeds of *Casuarina*, but it also takes seeds from grass, weedy herbs and fruit.

Nesting of this subspecies is in Eucalypt hollows. This species was recorded from within the application area (Biota, 2007). Biota has stated that the species requires small tree hollows to breed (Biota, 2007), suggesting the species is not reliant on mature trees. However, given the extent of suitable habitat surrounding the application area, the vegetation within the application area is not likely to be significant habitat for this species.

Peregrine Falcon (Schedule 4 - Fauna that is in need of special protection, *Wildlife Conservation (Specially Protected Fauna) Notice, 2013*) have a wide home range and utilise tall trees, cliffs, granite outcrops and quarries for nesting. This species was observed over the application area in 2005 (Biota, 2007) and is likely to be present sporadically within the application area. Given the ability of this species to utilise many different habitat types for hunting prey, the vegetation within the application area is not likely to be significant habitat for this species.

The South West Carpet Python (Schedule 4 - Fauna that is in need of special protection, *Wildlife Conservation (Specially Protected Fauna) Notice 2013*) is widespread throughout the south west from Northampton to Kalgoorlie to Esperance (DEC, 2006d). It is able to utilise a wide variety of habitats from semi-arid coastal and inland habitats, Banksia woodland, eucalypt woodlands and grasslands, where it occurs at low densities (DEC, 2006d). This species has been recorded near the Flying Fox mine in 2005 (Biota, 2007). It is likely to be present within the application area at low densities. Given the large amount of vegetation surrounding the application area, the vegetation within the application area is not likely to be significant habitat for this species.

Shy Groundwrens (DPaW - Priority 4) are known to inhabit dense mallee woodland (Garnett et al, 2000). Shy Groundwrens were recorded during the fauna surveys in 2006 and have been recorded previously within the local area (Biota, 2007). They are likely to be widespread within the application area and surrounds. Therefore, the vegetation within the application area is not likely to be significant habitat for this species.

Rufous Fieldwren (DPaW - Priority 4) live in low, sparse heath, saltmarsh or samphire, with or without emergent trees (Garnett et al, 2000). Although declining within the wheatbelt, the species persists in the continuous habitat that surrounds the wheatbelt (Garnett et al., 2000). This species was recorded west of the application area during the 2006 survey and is likely to occur within the application area (Biota, 2007). Given the large amount of suitable vegetation surrounding the application area, the vegetation within the application area is not likely to be significant habitat for this species.

Crested Bellbirds (DEC - Priority 4) live in the shrub-layer of eucalypt woodland, mallee, *Acacia* shrubland, saltbush, spinifex grasslands and heath (Garnett et al., 2000). The species appears to be particularly sensitive to subsequent fragmentation, with areas of apparently suitable habitat as large as 5,000 ha now unoccupied (Garnett et al., 2000). This species was recorded during all four survey phases and is likely to occur within the application area (Biota, 2007). Given the large amount of suitable vegetation surrounding the application area, the vegetation within the application area is not likely to be significant habitat for this species.

The White-browed Babbler (DPaW - Priority 4) utilises Eucalypt forest and woodlands within the wheatbelt and Southern Goldfields/Great Southern region. It has declined severely in the agricultural region but persists in the uncleared continuous habitat surrounding the wheatbelt (Garnett et al., 2000). This species was recorded during phase I, II an IV of the fauna survey (Biota, 2007). Given the large amount of suitable vegetation surrounding the application area, the vegetation within the application area is not likely to be significant habitat for this species.

The Western Brush Wallaby (DEC - Priority 4) prefers open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets. It is also found in some areas of mallee and heathland (DEC, 2006e). Tracks of this species were recorded in the 2006 survey and during phase I and II of the fauna survey (Biota, 2007). Given the large amount of suitable vegetation surrounding the application area, the vegetation within the application area is not likely to be significant habitat for this species.

The Rainbow Bee-eater (Migratory species under the *Environment Protection and Biodiversity Conservation Act 1999*) is able to utilise a wide range of habitat types and nests in sandy soils. It was recorded during the phase II survey (Biota, 2007). It is likely that this species occurs within the application area whilst feeding. Given the large amount of suitable vegetation surrounding the application area, the vegetation within the application area is not likely to be significant habitat for this species.

Based on the above, the proposed clearing may be at variance to this principle (due to presence of Chuditch). However, the clearing for the purpose of exploration is low impact and has the capacity to avoid large habitat trees, reducing the potential impact on conservation significant fauna.

Methodology

Biota (2007)
DEC (2006a)
DEC (2006b)
DEC (2006c)
DEC (2006d)
DEC (2006e)
EPA (2004)
Garnett et al. (2000)

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

Comments

Proposal is not likely to be at variance to this Principle

According to available databases there are no known records of Threatened Flora within the application area (GIS Database).

Two flora and vegetation surveys cover the application area. A survey conducted by Botanica Consulting in October 2007 covers the majority of the application area while a survey by Jims Seeds, Weeds & Trees in February 2006 covers the remainder. No Threatened Flora were recorded within the application area (Botanica Consulting, 2006; Jims Seeds, Weeds & Trees, 2006).

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology

Botanica Consulting (2007)
Jims Seeds, Weeds & Trees (2006)
GIS Database:
- Threatened and Priority Flora

(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

Proposal is not likely to be at variance to this Principle

A search of available databases revealed there are no known Threatened Ecological Communities (TECs) within the application area (GIS Database). The nearest recorded TEC is located approximately 120 kilometres south-west of the application area (GIS Database).

No TECs were identified during the flora and vegetation surveys conducted by botanists from Botanica Consulting (2007) or Jims Seeds, Weeds & Trees (2006).

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology

Botanica Consulting (2007)
Jims Seeds, Weeds & Trees (2006)
GIS Database:
- Threatened Ecological Sites Buffered

(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

Proposal is not likely to be at variance to this Principle

The clearing application area intersects the Coolgardie and Mallee Interim Biogeographic Regionalisation for Australia (IBRA) bioregions in which approximately 98.0% and 56.6% of their pre-European vegetation remains, respectively (see table) (Government of Western Australia, 2013; GIS Database). This gives both bioregions a conservation status of 'Least Concern' according to the Bioregional Conservation Status of Ecological Vegetation Classes (Department of Natural Resources and Environment, 2002).

The Mallee bioregion straddles that area of the state subject to intensive land clearing (Intensive Landuse Zone - ILZ) and that area of the state that is largely uncleared (Extensive Landuse Zone - ELZ). The Western Mallee IBRA sub-bioregion falls largely within the ILZ and remains at 37.1% of its pre-European vegetation extent (Government of Western Australia, 2013). This gives the Western Mallee IBRA sub-bioregion a conservation status of ‘depleted’ (Department of Natural Resources, 2002). However, the application area falls within the ELZ. The proposed clearing will not cause the vegetation extent to fall below threshold levels within either the bioregion or sub-bioregion.

Vegetation within the Shire of Kondinin remains at approximately 53.6% of its pre-European extent. The majority of the remaining vegetation is located within the ELZ. The assessing officer suggests that the conservation status of the remaining vegetation should be given a rating of "depleted" as much of the vegetation remaining within the ILZ is of varying condition and occurs in small isolated remnants whose condition is likely to be in decline.

Within the Mallee bioregion, Beard vegetation association 2048 has a conservation status of "depleted" according to "Bioregional Conservation Status of Ecological Vegetation Classes" (Department of Natural Resources, 2002). This is largely due to the bioregion extending into the ILZ. However, it is not likely that the clearing of 15 hectares of vegetation will significantly impact the conservation status of this vegetation association.

	Pre-European Area (ha)*	Current Extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves (and post clearing %)
IBRA Bioregion – Coolgardie	12,912,204	12,648,491	~98.0	Least Concern	10.9 (11.1)
IBRA Bioregion – Mallee	7,395,894	4,185,989	~56.6	Least Concern	17.4 (30.7)
IBRA Sub-region – Western Mallee	3,981,718	1,476,100	~37.1	Depleted	9.0 (24.4)
Local Government Shire of Kondinin	741,936	398,044	~53.6	Least Concern	3.4 (6.3)
Beard Veg Assoc. – State					
511	700,693	520,668	~74.3	Least Concern	13.8 (18.5)
2048	322,220	160,966	~50.0	Least Concern	7.6 (15.3)
Beard Veg Assoc. – Coolgardie Bioregion					
511	464,424	435,177	~93.7	Least Concern	17.5
2048	4,379	4,356	~99.5	Least Concern	3.5 (3.5)
Beard Veg Assoc. – Mallee Bioregion					
2048	313,728	154,944	~49.4	Depleted	7.8 (15.8)
Beard Veg Assoc. – Western Mallee Sub-region					
2048	313,693	154,909	~49.4	Depleted	7.8 (15.8)

* Government of Western Australia (2013)
** Department of Natural Resources and Environment (2002)

Analysis of aerial photography provided by the applicant (Western Areas, 2007) suggests much of the application area appears to be previously disturbed and surrounded by largely undisturbed vegetation. Therefore the application area is not likely to be a significant remnant of vegetation in an area that is extensively cleared.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology Department of Natural Resources and Environment (2002)
Government of Western Australia (2013)
Western Areas (2007)
GIS Database:
- IBRA WA (Regions - Subregions)
- Pre-European 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 **Proposal is not at variance to this Principle**
According to available databases, there are no watercourses or wetlands within the application area (GIS Database).

The vegetation types identified by Botanica Consulting (2007) are not examples of riparian vegetation.

Based on the above, the proposed clearing is not at variance to this Principle.

Methodology Botanica Consulting (2007)
GIS Database:
- Hydrography, Linear

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

Comments **Proposal may be at variance to this Principle**
Soil types within the application are either brown/red clay loams in areas of lower elevation or light sand over

lateritic soil in areas of higher elevation (Western Areas, 2007). The brown/red clay loam soils located in the lower undulating plains within the application area have a low wind erodability (Schoknecht, 2002). The light sands over laterite in the elevated areas within the application are may be prone to wind erosion and may become seasonally waterlogged.

Ground water levels at the existing Flying Fox mine are in the order of 50 - 200 metres below ground level (Western Areas, 2007). At these depths, the clearing of native vegetation is not likely to lead to a rise in groundwater, causing salinisation. Furthermore, groundwater pumping associated with the Flying Fox mine is likely to maintain groundwater levels in this area.

Based on the above, the proposed clearing may be at variance to this principle.

Western Areas has advised that they intend to utilise previously disturbed ground if possible and will be installing surface water management earthworks to prevent accelerated erosion (Western Areas, 2007).

Methodology Schoknecht (2002)
Western Areas (2007)

(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

Proposal is not likely to be at variance to this Principle

The proposed clearing area occurs within an Environmentally Sensitive Area (Red Book area) which is a buffer zone surrounding Lake Cronin. At its closest point, the clearing is approximately 2.7 kilometres from the Lake Cronin Nature Reserve boundary.

According to the Australian Heritage Database (DEWR, 2008) the Lake Cronin Nature Reserve is dominated by mallee and woodland associations. This is one of the three vegetation types described by Botanica Consulting in their 2007 vegetation survey as occuring within the proposed clearing area (Botanica Consulting, 2007). This vegetation type was also described by Jims Seeds, Weeds & Trees in their 2006 vegetation survey as occuring within the proposed clearing area. The habitat to be cleared is therefore represented within conservation estate. The other, sandplain heath, is very common in the Mallee bioregion east of the Intensive Land Use Zone (that part of the state extensively cleared for agriculture) and is likely to also occur within Lake Cronin Nature Reserve.

Lake Cronin Nature Reserve is surrounded by extensive vegetation and the clearing of up to 15 hectares of vegetation approximately 2.7 kilometres from the reserve will not effect ecological linkage to the reserve.

Therefore, despite the area being on the Register of National Estate for natural values it is considered that the clearing to take place will not significantly impact on the environmental values of a conservation area, or its buffer.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology Botanica Consulting (2007)
DEWR (2008)
Jims Seeds, Weeds & Trees (2006)

(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

Proposal is not likely to be at variance to this Principle

The application area occurs within an area which receives rainfall of approximately 344.6 millimetres per year (BoM, 2007) and experiences a pan evaporation rate of 2,200 millimetres per year (Luke et al., 1987). Therefore, there is likely to be little surface water flow during normal seasonal rains. Sedimentation or turbidity of waterbodies is not likely as there are no permanent water bodies in the application area or near vicinity. The drainage line that runs through the application area is not likely to carry run-off unless there are very intense rainfall events.

Groundwater in the area has been measured at between 30,000- 50,000 Total Dissolved Solids (TDS) (Western Areas, 2007). This groundwater is located 50 metres below the surface (Western Areas, 2007). Vegetation is not dependant on groundwater at this depth and at such hypersaline levels.

The low rainfall and high evaporation rates mentioned above suggest that the clearing of 15 hectares of vegetation is not likely to increase groundwater levels in the area.

It is noted by the assessing officer that Western Areas pump saline groundwater from the Flying Fox pit. Therefore, groundwater levels in the application area are likely to be lower than normal levels.

The Department of Water have advised that the area is not within the Avon River System Proclaimed Surface

Water Management Area and therefore there is no requirement under the *Rights in Water and Irrigation Act 1914 Act* (RIWI Act) for a license to take surface water or for the requirement for a permit to interfere with the bed or bank of a watercourse (DoW, 2008). The area is proclaimed under the RIWI Act as a groundwater management area and therefore a license is required to take groundwater (DoW, 2008).

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology BoM (2008)
DoW (2008)
Luke et al. (1987)
Western Areas (2007)

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

Comments

Proposal is not likely to be at variance to this Principle

The application area occurs within both the Swan/Avon - Yilgarn, and Swan/Avon - Lockhart catchments (GIS Database). The Swan/Avon - Yilgarn catchment has an area of 28392.6 square kilometres and the Swan/Avon - Lockhart catchment has an area of 58360.5 square kilometres. The removal of 15 hectares within either of these catchments is not likely to lead to a increase in flood height or duration.

Average rainfall in the vicinity of the application area is approximately 344.6 millimetres per year (BoM, 2007). Rain falls mostly in winter with some summer falls associated with tropical depressions. The application area experiences an evaporation rate of 2200 millimetres per year (Luke et al, 1987). This suggests that water that pools on the ground is likely to evaporate quickly.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology BoM (2007)
Luke et al (2007)
GIS Database:
- Hydrographic Catchments - Catchments

Planning instrument, Native Title, Previous EPA decision or other matter.

Comments

There is one Native Title Claim (WC2000/007) over the area under application (GIS Database). This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are no registered Aboriginal Sites of Significance within the application area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

It is the proponent's responsibility to liaise with the Department of Environment Regulation, Department of Parks and Wildlife and the Department of Water, to determine whether a Works Approval, Water Licence, Bed and Banks permit, or any other licences or approvals are required for the proposed works.

The clearing permit amendment application was advertised on 28 April 2014 by the Department of Mines and Petroleum inviting submission from the public. No submissions were received.

Methodology GIS Database:
- Aboriginal Sites of Significance
- Native Title Claims - Filed at the Federal Court
- Native Title Claims - Registered with the NNTT

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5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
CALM	Department of Conservation and Land Management (now DEC), Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DEC), Western Australia
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia
DMP	Department of Mines and Petroleum, Western Australia
DoE	Department of Environment (now DEC), Western Australia
DoIR	Department of Industry and Resources (now DMP), Western Australia
DOLA	Department of Land Administration, Western Australia
DoW	Department of Water
EP Act	Environmental Protection Act 1986, Western Australia
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
RIWI Act	Rights in Water and Irrigation Act 1914, Western Australia
s.17	Section 17 of the Environment Protection Act 1986, Western Australia
TEC	Threatened Ecological Community

Definitions:

{Atkins, K (2005). ***Declared rare and priority flora list for Western Australia, 22 February 2005*****. Department of Conservation and**

Land Management, Como, Western Australia} :-

P1 **Priority One - Poorly Known taxa**: taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

P2 **Priority Two - Poorly Known taxa**: taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

P3 **Priority Three - Poorly Known taxa**: taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.

P4 **Priority Four – Rare taxa**: taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.

R **Declared Rare Flora – Extant taxa** *(= Threatened Flora = Endangered + Vulnerable)*: taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

X **Declared Rare Flora - Presumed Extinct taxa**: taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

{Wildlife Conservation (Specially Protected Fauna) Notice 2005} [Wildlife Conservation Act 1950] :-

Schedule 1 **Schedule 1 – Fauna that is rare or likely to become extinct:** being fauna that is rare or likely to become extinct, are declared to be fauna that is need of special protection.

Schedule 2 **Schedule 2 – Fauna that is presumed to be extinct:** being fauna that is presumed to be extinct, are declared to be fauna that is need of special protection.

Schedule 3 **Schedule 3 – Birds protected under an international agreement:** being birds that are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is need of special protection.

Schedule 4 **Schedule 4 – Other specially protected fauna:** being fauna that is declared to be fauna that is in need of special protection, otherwise than for the reasons mentioned in Schedules 1, 2 or 3.

{CALM (2005). *Priority Codes for Fauna*. Department of Conservation and Land Management, Como, Western Australia} :-

P1 **Priority One: Taxa with few, poorly known populations on threatened lands**: Taxa which are known from few specimens or sight records from one or a few localities on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.

P2 **Priority Two: Taxa with few, poorly known populations on conservation lands**: Taxa which are known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.

P3 **Priority Three: Taxa with several, poorly known populations, some on conservation lands**: Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.

P4 **Priority Four: Taxa in need of monitoring**: Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.

P5 **Priority Five: Taxa in need of monitoring**: Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

Categories of threatened species (*Environment Protection and Biodiversity Conservation Act 1999)*

EX **Extinct:** A native species for which there is no reasonable doubt that the last member of the species has died.

EX(W) **Extinct in the wild:** A native species which:

(a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or

(b) has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.

CR **Critically Endangered:** A native species which is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.

EN **Endangered:** A native species which:
(a) is not critically endangered; and
(b) is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.

VU **Vulnerable:** A native species which:
(a) is not critically endangered or endangered; and
(b) is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.

CD **Conservation Dependent:** A native species which is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.

Principles for clearing native vegetation:

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

(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.

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

(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.

(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.

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

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

(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.

(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.

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