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

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 5505/1
Permit type: Purpose Permit

1.2. Proponent details

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

1.3. Property details

Property: Mining Lease 77/545
Mining Lease 77/582
Mining Lease 77/583
Mining Lease 77/584
Mining Lease 77/912
Local Government Area: Shire of Kondinin
Colloquial name: Forrestania Nickel Operation

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
30		Mechanical Removal	Mineral Exploration and Mineral Production

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 16 May 2013

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 and are useful to look at vegetation in a regional context. The following Beard vegetation associations are located within the application area (GIS Database):

511: Medium woodland; salmon gum and morel; and
2048: Shrublands; scrub-heath in the Mallee Region.

Level 1 flora and vegetation surveys have been undertaken over the application area and surrounding areas (total area of 2,169 hectares) by Botanica Consulting (Botanica). This includes several previous surveys undertaken in the Greater Flying Fox area between 2006 and 2008 and in the Greater New Morning/Spotted Quoll area between 2008 and 2011. The most recent survey was undertaken on the 28 August 2012 in the Greater New Morning/Spotted Quoll area and on the 29 August 2012 in the Greater Flying Fox area. The results of the surveys were combined to provide flora and vegetation assessment reports for the Greater Flying Fox area and Greater New Morning/Spotted Quoll area (Botanica, 2013a; Botanica, 2013b). According to Botanica vegetation maps, the following 14 vegetation communities occur within the application area:

Greater Flying Fox Area
1. Open shrub mallee of *Eucalyptus eremophila* and *Eucalyptus pileata* over low heath of mixed *Acacia/Melaleuca*.

2. Heath of mixed *Acacia/Allocasuarina/Melaleuca*.

3. Open shrub mallee of *Eucalyptus eremophila/Eucalyptus calycogona/Eucalyptus celastroides* over low heath of mixed *Melaleuca*.

4. Low scrub of mixed *Allocasuarina* over mixed dwarf scrub.

Greater New Morning/Spotted Quoll area
5. Low woodland of *Eucalyptus flocktoniae/Eucalyptus salubris/Eucalyptus urna* over low scrub of mixed *Acacia* and *Melaleuca.*

6. Open shrub mallee of *Eucalyptus celastroides/Eucalyptus cylindrocarpa*/*Eucalyptus eremophila* over low scrub of mixed *Acacia* and *Melaleuca*.

7. Low woodland of *Eucalyptus salmonophloia* over low scrub of mixed *Melaleuca*.

8. Heath of mixed *Acacia, Allocasuarina* and *Melaleuca*.

9. Mallee of *Eucalyptus eremophila/Eucalyptus steedmanii* (T) over mixed dwarf scrub.

10. Heath of *Acacia steedmanii* subsp. *steedmanii/Melaleuca hamata* over mixed low scrub.

11. Low scrub of mixed *Allocasuarina* over mixed dwarf scrub.

12. Open tree mallee of *Eucalyptus eremophila* over scrub of *Melaleuca hamata* on stony rise.

13. Burnt open low woodland of *Eucalyptus salmonophloia* over shrub mallee of *Eucalyptus cylindrocarpa/Eucalyptus pileata* and mixed low heath.

14. Forest of *Eucalyptus urna* over low scrub of *Melaleuca pauperiflora* subsp. *pauperiflora*.

Clearing Description

Western Areas NL (Western Areas) has applied to clear 30 hectares within an application area of approximately 654 hectares (GIS Database). The application area is located in the existing Forrestania Nickel Project area in the Flying Fox Project area and the Spotted Quoll Project area. Lake King is located approximately 70 kilometres south of the application area (GIS Database).

The purpose of the application is for mineral exploration and mine development. Clearing will be by mechanical means. Vegetation and topsoil will be stockpiled for use in rehabilitation.

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

Vegetation condition was determined by Botanica (2013a, 2013b).

The majority of vegetation within the survey area is in 'very good' condition (Botanica, 2013a; Botanica, 2013b). Parts of the application area have been disturbed by mining and exploration activities with approximately 85 hectares previously cleared for mining activities (Botanica, 2013a; Botanica, 2013b).

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 occurs within the Lake Cronin Region which has been identified as having significant environmental values. It has high levels of species richness and a concentration of rare and endemic flora and restricted ecological communities, particularly on ironstones (Environmental Protection Authority (EPA), 2009). The Lake Cronin Area is also listed on the Register of National Estate for its high level of floral and faunal diversity and endemism. The region supports extensive shrubland, sandplain and woodland environments including an excellent representation of a range of vegetation types that are now extensively cleared in the Wheatbelt (EPA, 2009). It also has high conservation value due to the transitional nature of the region which represents geological, climatic and biological characteristics of surrounding botanical and biogeographical regions (EPA, 2009). Based on its high biodiversity conservation significance and competing land use interests, various forms of conservation reservation and management are proposed for the area (EPA, 2009). The application area is located within an area proposed to be managed under section 33 (2) of the *Conservation and Land Management Act 1984* (EPA, 2009). It is also located approximately 500 metres west of a proposed 'C' Class Reserve that has been proposed to protect the catchment of Lake Cronin (EPA, 2009).

No Threatened Ecological Communities have been recorded within the application area (GIS Database; Botanica, 2013a; Botanica; 2013b). The application area is located within the North Ironcap region of the Priority 3 Ironcap Hills vegetation complexes (North Ironcap Hill) Priority Ecological Community (PEC) (GIS Database). The Ironcap Hills vegetation complexes PEC's include vegetation on Mt Holland, Middle Ironcap Hill, Nothern Ironcap Hill, Southern Ironcap Hill, Digger Rock and Hatter Hill (DEC, 2012). Newbey and Hnatuik (1988) (cited in Botanica, 2011) recorded that species composition of the three Ironcap hills varied from one another and that flora of these ironstones differ widely from the nearest other banded ironstone formations, including the nearby Parker Range. The North Ironcap Hill is located approximately seven kilometres north of the application area (Western Areas, 2013a) where a small 'A' Class Nature Reserve is proposed to protect the core area of highest conservation priority being the North Ironcap Banded Ironstone Formation (EPA, 2009). Botanica has conducted a Level 1 flora survey that included the proposed 'A' Class Nature Reserve. None of the vegetation communities identified within the proposed 'A' Class Nature Reserve occur within the application area and Western Areas (2013a) has advised there is no banded ironstone formation (BIF) within the application area.

The flora and vegetation surveys identified 14 vegetation communities within the application area. Some of these vegetation communities have a low representation within the application area (Botanica; 2013b). These communities can be broadly described as *Eucalyptus* woodlands, *Eucalyptus* Mallee woodlands and heath and occur in the southern or Greater New Morning/Spotted Quoll portion of the application area. Vegetation mapping from surveys conducted in the local area shows that *Eucalyptus* woodlands, *Eucalyptus* Mallee woodlands and heath occur outside the application area (Western Areas, 2013b). Therefore, in a broad sense these vegetation communities are likely to be similar to vegetation communities found outside the application area. Given the surrounding area is largely uncleared and there is an absence of BIF within the application

area, it is unlikely vegetation within the application area comprises a higher level of biodiversity than surrounding vegetation. Western Areas (2013a) has advised clearing in the south of the application area will likely be for exploration purposes. Clearing for exploration purposes will utilise previously disturbed grid lines where possible and will use a raised blade grader technique (Western Areas, 2013b). Potential impacts to vegetation communities within the Greater New Morning/Spotted Quoll portion of the application area may be minimised by a condition that restricts clearing in this portion of the application area to mineral exploration purposes only.

A total of 278 flora species (including subspecies and variants) from 98 genera and 43 families were recorded from the Greater Flying Fox area (Botanica, 2013a). A total of 198 flora species (including subspecies and variants) from 74 genera and 29 families were recorded from the Greater New Morning/Spotted Quoll area (Botanica, 2013b). No introduced species were recorded within the Greater Flying Fox area. One introduced species, Stinkwort (*Dittrichia graveolens*), was identified within the Greater New Morning/Spotted Quoll area. Western Areas (2013b) state that all vehicles, tools and machinery will be cleaned of all soil and plant material when entering or exiting the area of proposed clearing. Potential impacts from weeds and dieback as a result of the proposed clearing may be minimised by the implementation of a weed and dieback management condition.

One Threatened Flora species, *Eucalyptus steedmanii*, and three Priority Flora species, *Boronia westringioides* (Priority 2), *Microcorys* sp. Forrestania (V. English 2004) (Priority 4) and *Eremophila racemosa* (Priority 4), were recorded by Botanica within the application area (Botanica, 2013a; Botanica; 2013b). Seven other Priority Flora species were recorded outside the application area within the Greater Flying Fox area and Greater New Morning/Spotted Quoll area. These were *Stylidium sejunctum* (Priority 2), *Baeckea* sp. North Ironcap (R.J. Cranfield 10580) (Priority 2), *Baeckea* sp. Parker Range (M. Hislop & F. Hort MH 2968) (Priority 3), *Daviesia elongata* subsp. *implexa* (Priority 3)*, Dillwynia acerosa* (Priority 3), *Eutaxia acanthoclada* (Priority 3) and *Verticordia mitodes* (Priority 3). According to DEC (2013), the three Priority 3 Flora species *Comesperma calcicola*, *Cryptandra polyclada* subsp. *polyclada* and *Pityrodia* sp. Yilgarn (A.P. Brown 2679) have also been recorded within the application area. However, Botanica (2013a, 2013b) were unable to relocate these records.

Boronia westringioides has been recorded at three locations, one of which occurs within the application area. This species was recorded within the 'Heath of mixed *Acacia/Allocasuarina/ Melaleuca*' and 'Low scrub of mixed *Allocasuarina* over mixed dwarf scrub' vegetation communities (Botanica, 2013a).

Microcorys sp. Forrestania (V. English 2004) has been recorded at approximately 90 locations with approximately 77 of these locations occurring within the application area. This species was recorded in several of the vegetation communities identified within the Greater Flying Fox area and Greater New Morning/Spotted Quoll area (Botanica, 2013a; Botanica; 2013b).

Eremophila racemosa has been recorded at 12 locations, one of which occurs within the application area. This species was recorded within the 'Low woodland of *E. flocktoniae/E. salubris/E. urna* over low scrub of mixed *Acacia* and *Melaleuca*', 'Open shrub mallee of *E. celastroides/E. cylindrocarpa*/*E. eremophila* over low scrub of mixed *Acacia* and *Melaleuca*' and 'Low woodland of *E. salmonophloia* over low scrub of mixed *Melaleuca*' (Botanica, 2013b).

Several Threatened Flora and Priority Flora species have been recorded within 10 kilometres of the survey area. According to Botanica (2013a, 2013b), three Threatened Flora species and 51 Priority Flora species have the potential to occur within the survey area as they occur in similar habitats and vegetation communities to those identified within the survey area.

Western Areas (2013a) has advised that the location of the proposed clearing within the application area is currently unknown as the purpose of the proposed clearing is for long term exploration and expansion activities. Based on the high number of Threatened and Priority Flora species in the area, further populations of conservation significant flora species could occur within the application area. Western Areas (2013b) has committed to liaising with DEC prior to removing any Priority Flora species. DEC (2013) recommended that targeted surveys for conservation significant flora be undertaken. Potential impacts to conservation significant flora as a result of the proposed clearing may be minimised by the implementation of flora management conditions.

Biota Environmental Services (Biota) conducted a four phase fauna survey in the vicinity of the Flying Fox mine during February/March 2005, November 2005, May 2006 and November 2006. Six of the fauna trapping sites are located in close proximity to the application area. The four phase fauna survey recorded a total of 125 fauna species comprising 71 bird, 20 native mammals and 34 herpetofauna species (Biota, 2006; Biota, 2007). Several habitat types including mallee, woodland, shrubland, tall heath and heath were identified (Biota, 2007). The Lake Cronin Region is known to have high faunal diversity.

Based on the above, the proposed clearing is at variance to this Principle.

Methodology

Biota (2006)
Biota (2007)
Botanica (2011)
Botanica (2013a)
Botanica (2013b)
DEC (2012)

DEC (2013)
EPA (2009)
Western Areas (2013a)
Western Areas (2013b)
GIS Database:
- Threatened and Priority Flora
- Threatened Ecological Sites Buffered

(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

Western Areas commissioned Biota to undertake an ongoing fauna assemblage monitoring survey within the Forrestania project area, specifically surrounding the Flying Fox Mine. A four phase fauna survey was undertaken by Biota during February/March 2005, November 2005, May 2006 and November 2006 (Biota, 2006; Biota, 2007). While no fauna trapping sites were located within the application area, six are located in close proximity to the application area indicating the results are applicable to the application area.

A total of 125 fauna species comprising 71 bird, 20 native mammals and 34 herpetofauna species were recorded across the four phases (Biota, 2007). Several habitat types including *Eucalyptus* mallee, *Eucalyptus* woodland, shrubland, tall heath and heath were identified (Biota, 2007). Vegetation communities corresponding to these fauna habitat types have been identified within the application area (Botanica, 2013a; Botanica, 2013b). The *Eucalyptus* mallee and woodland habitats recorded the highest herpetofauna diversity (Biota, 2007). These habitats contain an abundance of leaf litter providing microhabitats for litter inhabiting species, as well as habitat for arboreal species (Biota, 2007). Salmon Gum woodland exhibited the highest avifauna diversity with *Eucalyptus* mallee also displaying high diversity (Biota, 2007). These habitats offer significant vertical stratification providing a variety of habitat niches (Biota, 2007). The broad range of habitat types also provided a variety of roosting and foraging niches for bats (Biota, 2006). While the application area may provide important fauna habitat, the surrounding area is largely vegetated (Government of Western Australia, 2013) and also provides suitable fauna habitat.

Several Schedule or Priority fauna species were recorded across the four phases of the fauna survey. One active and one inactive Malleefowl (*Leipoa ocellata*) mound were recorded within the application area during the flora and vegetation surveys (Botanica, 2013a; Botanica, 2013b). The Schedule or Priority fauna species recorded during the four phases of the fauna survey include Carnaby's Cockatoo (*Calyptorhynchus latirostris*), Western Quoll (Chuditch) (*Dasyurus geoffroii*), Rainbow Bee-eater (*Merops ornatus*), Western Rosella (*Platycercus icterotis*), Carpet Python (*Morelia spilota* subsp. *imbricata*), Peregrine Falcon (*Falco peregrines*), Western Brush Wallaby (*Macropus Irma*), Crested Bellbird (*Oreoica gutturalis*), White-browed Babbler (*Pomatostomus superciliosus ashbyi*), Shy Heathwren (*Hylacola cauta* subsp. *whitlocki*) and Rufous Fieldwren (*Calamanthus campestris montanellus*). A further nine Schedule or Priority fauna species were also identified as having the potential to occur within the area including the Numbat (*Myrmecobious fasciatus*), Malleefowl, Red-tailed Phascogale (*Phascogale calura*), Heath Mouse (*Pseudomys shortridgei*), Western Whipbird (*Psophodes nigrogularis*), Western Mouse (*Pseudomys occidentalis*), Australian Bustard (*Ardeotis australis*), Western Shrike-tit (*Falcunculus frontatus leucogaster*) and Fork-tailed Swift (*Apus pacificus*) (Biota, 2006; Biota 2007).

Carnaby's Cockatoos (Schedule 1) forage in woodland and heath that is dominated by proteaceous species and nest in hollows of large eucalypts, usually Salmon Gum and Wandoo (DEC, 2006a). Two vegetation communities within the application area consist of open low woodland of Salmon Gum (Botanica, 2013a; Botanica, 2013b) and large trees may provide hollows of a suitable size (Biota, 2007).

The Chuditch (Schedule 1) occupies a wide range of habitats from woodlands, dry sclerophyll (leafy) forests, riparian vegetation, beaches and deserts (DEC, 2006b). According to Biota (2007), this species has a large home range occurring at very low densities and probably utilises all habitats within the survey 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.

Potential impacts to the Carnaby's Cockatoo, Chuditch and other Schedule fauna species may be minimised by the implementation of a fauna management condition.

Malleefowl (Schedule 1) are 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, 2006c). An active Malleefowl mound occurs in the application area in the 'Open tree mallee of *Eucalyptus eremophila* over scrub of *Melaleuca hamata* on stony rise' vegetation community (Botanica, 2013b). An inactive Malleefowl mound also occurs in the application area in the 'Heath of mixed *Acacia/Allocasuarina/Melaleuca*' vegetation community (Botanica, 2013a). Western Areas (2013b) states that these mounds will be avoided. Potential impacts to Malleefowl as a result of the proposed clearing may be minimised by the implementation of fauna management conditions.

Some of the remaining conservation significant species listed above are considered highly mobile, have a wide distribution and/or are able to utilise a wide range of habitat types so the clearing is unlikely to significantly

impact on the species (Biota, 2007). Other species are known mostly from historical records and based on their current distribution these species are not expected to be found in the surrounding area (Biota, 2007).

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

Methodology Biota (2006)
Biota (2007)
Botanica (2013a)
Botanica (2013b)
DEC (2006a)
DEC (2006b)
DEC (2006c)
Government of Western Australia (2013)
Western Areas (2013b)

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

Comments

Proposal is at variance to this Principle

One Threatened Flora species, *Eucalyptus steedmanii,* has been recorded within the southern portion of the application area (Botanica, 2013b). This species is known from 36 records within the Coolgardie, Esperance Plains and Mallee bioregions (Western Australian Herbarium, 2013). It grows in gravelly loam over ironstone and sand, and it can be found on low hills and undulating plains (Botanica, 2013b). The populations identified during the flora and vegetation survey are previously recorded populations/Department of Environment and Conservation known locations referred to as Populations 1, 3, 7 and 8 (Western Areas, 2013b). The majority of Populations 1 and 8 occur in the southern half of the application area and Populations 3 and 7 are located outside the application area from approximately one kilometre to the south (Western Areas, 2013b). These populations occur within eight vegetation communities within the application area and larger survey area.

Western Areas (2013b) states that the proposed clearing in the vicinity of *Eucalyptus steedmanii* will be for exploration purposes and that clearing of this species will be avoided. Clearing for exploration purposes will utilise previously disturbed grid lines where possible and will use a raised blade grader technique (Western Areas, 2013b). Western Areas (2013b) will also be applying for a 'Permit to Take' Threatened Flora to cover any incidental destruction of individual Threatened Flora and will liaise with DEC if Threatened Flora are to be taken under the permit.

Potential impacts to *Eucalyptus steedmanii* may be minimised by the implementation of flora management conditions and a condition that restricts clearing in the southern portion of the application area to mineral exploration purposes only.

Based on the above, the proposed clearing is at variance to this Principle.

Methodology Botanica (2013b)
Western Areas (2013b)
Western Australian Herbarium (2013)
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

According to available databases, there are no known Threatened Ecological Communities (TECs) within the application area (GIS Database). The nearest known TEC is located approximately 120 kilometres south west of the application area (GIS Database).

According to Botanica (2013a, 2013b), no TECs have been recorded during the flora and vegetation surveys.

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

Methodology Botanica (2013a)
Botanica (2013b)
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 at variance to this Principle

The majority of the application area falls within the Coolgardie Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). Approximately 190 hectares falls within the Mallee IBRA bioregion

(GIS Database). Approximately 97.96% of the pre-European vegetation remains in the Coolgardie bioregion and approximately 56.60% of the pre-European vegetation remains in the Mallee bioregion (see table) (GIS Database, Government of Western Australia, 2013). This gives it a conservation status of 'Least Concern' according to the Bioregional Conservation Status of Ecological Vegetation Classes (Department of Natural Resources and Environment, 2002).

The vegetation of the application area has been mapped as the following Beard vegetation associations (GIS Database):

511: Medium woodland; salmon gum and morel; and
2048: Shrublands; scrub-heath in the Mallee Region.

Approximately 74.31% and 49.96% of Beard vegetation association 511 and Beard vegetation association 2048 remains at a state level, respectively (Government of Western Australia, 2013). Within the Coolgardie bioregion and Southern Cross subregion over 90% of these Beard vegetation associations remain (Government of Western Australia, 2013). Within the Mallee bioregion and Western Mallee subregion approximately 49.4% of Beard vegetation association 2048 remains (Government of Western Australia, 2013). A value over 30% and up to 50% gives it a conservation status of 'Depleted' according to the Bioregional Conservation Status of Ecological Vegetation Classes (Department of Natural Resources and Environment, 2002). Although Beard vegetation association 2048 is 'Depleted' in the Mallee bioregion and Western Mallee subregion it is above the 30% threshold level recommended in the National Objectives Targets for Biodiversity Conservation (EPA, 2000). Below this threshold species loss appears to accelerate exponentially at an ecosystem level (EPA, 2000). Based on these values and given the surrounding area is largely uncleared (GIS Database), the vegetation under application is not considered a remnant of vegetation in an area that has been extensively cleared.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in DEC Managed Lands (and post clearing %)
IBRA bioregion – Coolgardie	12,912,204	12,648,491	~97.96	Least Concern	~15.53 (~15.84)
IBRA bioregion – Mallee	7,395,894	4,185,989	~56.60	Least Concern	~18.00 (~30.70)
Coolgardie IBRA Subregion - Southern Cross	6,010,833	5,773,838	~96.06	Least Concern	~22.46 (~23.36)
Mallee IBRA Subregion - Western Mallee	3,981,718	1,476,100	~37.07	Depleted	~10.00 (~24.46)
Local Government – Shire of Kondinin	741,936	398,044	~53.65	Least Concern	~3.91 (~6.36)
Beard vegetation associations - State					
511	700,693	520,668	~74.31	Least Concern	~14.57 (~19.11)
2048	322,220	160,966	~49.96	Depleted	~7.75 (~15.31)
Beard vegetation associations – Coolgardie Bioregion					
511	464,424	435,177	~93.70	Least Concern	~18.14 (~19.34)
2048	4,379	4,356	~99.81	Least Concern	~3.52 (~3.54)
Beard vegetation associations – Mallee Bioregion					
2048	313,728	154,944	~49.39	Depleted	~7.90 (~15.80)
Beard vegetation associations – Southern Cross Subregion					
511	464,424	435,177	~93.70	Least Concern	~18.14 (~19.34)
2048	4,379	4,356	~99.48	Least Concern	~3.52 (~3.54)
Beard vegetation associations – Western Mallee Subregion					
2048	313,692	154,909	~49.38	Depleted	~7.90 (~15.80)

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

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

Methodology Department of Natural Resources and Environment (2002)
EPA (2000)
Government of Western Australia (2013)

GIS Database:
- Holland 2833 Mar 2011 Mosaic
- IBRA WA (Regions – Sub Regions)
- 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 at variance to this Principle

Available databases show there is one minor, non-perennial watercourse that intersects the application area and flows into a major tributary approximately nine kilometres west of the application area (GIS Database). These watercourses can be seen on aerial imagery (GIS Database). Vegetation mapping does not show any of the vegetation communities as being associated with watercourses (Botanica, 2013a; Botanica, 2013b). Potential impacts to this watercourse as a result of the proposed clearing may be minimised by the implementation of a watercourse management condition.

Based on the above, the proposed clearing is at variance to this Principle.

Methodology

Botanica (2013a)
Botanica (2013b)
GIS Database:
- Holland 2833 Mar 2011 Mosaic
- Hydrography, linear
- Rivers

(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

There are three soil types (Ms8, X17 and Ya28) that are mapped within the application area (GIS Database). These soil types are described as:

Ms8
(i) on depositional slopes, sandy yellow earths containing some ironstone gravels at depths below 6-7 feet;
(ii) on erosional ridges and slopes, ironstone gravels all underlain by hardened mottled-zone material by depths of 12-24 inches;

X17
Slopes and valleys with chief soils being sandy neutral and alkaline yellow mottled soils; and

Ya28
Sandy plains with some clay pans and small salt lakes, dunes and lunettes, with the chief soils being sandy alkaline yellow mottled soils (Bureau of Rural Sciences, 1992).

Sandy earths have a moderate to high risk of wind erosion while ironstone gravels have a low to moderate risk of wind erosion (Schoknecht, 2002). There may also be the potential for water erosion during and following periods of rainfall. Potential impacts from erosion as a result of the proposed clearing may be minimised by the implementation of a staged clearing condition.

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

Methodology

Bureau of Rural Sciences (1992)
Schoknecht (2002)
GIS Database:
- Soils, Statewide

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

Comments

Proposal may be at variance to this Principle

The application area occurs within the Lake Cronin Area which is listed on the Register of National Estate (GIS Database). At over 31,000 hectares, the Lake Cronin Area is a significant area in maintaining existing processes at a regional scale and therefore is a potentially important contemporary refugia for many species (Australian Heritage Database, 2013). At its closest point, the application area is approximately 7.5 kilometres south west of Lake Cronin and approximately 4.5 kilometres south west of the Lake Cronin Nature Reserve boundary (GIS Database). Lake Cronin Nature Reserve is surrounded by extensive vegetation and the clearing of up to 30 hectares of vegetation at a distance of approximately 4.5 kilometres or greater from the reserve will not significantly affect ecological linkages to the reserve.

Various forms of conservation reservation and management are also proposed for the Lake Cronin Region as

detailed in the Environmental Protection Authority's (EPA's) report 'Advice on Conservation Values and Review of Nature Reserve Proposals in the Lake Cronin Region' (Report 1329). The application area is located within an area proposed to be managed under section 33 (2) of the *Conservation and Land Management Act 1984* and is approximately 500 metres west of the proposed 'C' Class Reserve which is proposed to protect the catchment of Lake Cronin (EPA, 2009). According to Western Areas (2013b), the application area is outside of the Lake Cronin catchment boundary.

For exploration activities, Western Areas (2013b) will utilise previously disturbed grid lines where possible and will also use a raised blade grader technique. Western Area's environmental management of exploration activities is detailed in the 'Western Areas NL Exploration Environmental Management Plan (Western Australia) Rev-2 January 2012'. This details environmental management and procedures including management of conservation significant flora, fauna, vehicle hygiene and weeds, ground disturbance, rehabilitation, auditing and induction and awareness. For mining activities, the principal guidance document for environmental management at the Flying Fox mine and other Forrestania Nickel operations is the February 2010 'Draft Forrestania Nickel Project – Environmental Management Plan' (Western Areas, 2013a). Western Areas also has a management plan for Threatened Flora species *Eucalyptus steedmanii*.

Potential impacts from the proposed clearing may be minimised by the implementation of vegetation, flora, fauna and dieback and weed management conditions.

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

Methodology

Australian Heritage Database (2013)
EPA (2009)
Western Areas (2013a)
Western Areas (2013b)
GIS Database:
- DEC Tenure
- Geodata, Lakes
- Holland 2833 Mar 2011 Mosaic
- Register of National Estate

(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

According to available databases, the application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The nearest PDWSA is Ravensthorpe Catchment Area, which is approximately 130 kilometres to the south, south east (GIS Database).

The application area is located within a semi arid, warm Mediterranean environment with an average annual rainfall of 342 millimetres recorded at Hyden approximately 75 kilometres west of the application area (CALM, 2002; BoM, 2013). The small size of the proposed clearing area within this climate is unlikely to result in significant changes to surface water flows.

According to available databases, groundwater salinity within the application area is between 14,000 and 35,000 milligrams/Litre Total Dissolved Solids (TDS) (GIS Database). This is considered to be hyper saline. Given the size of the area to be cleared (30 hectares) compared to the size of the Yilgarn-Southwest Groundwater Province (24,601,260 hectares) (GIS Database), the proposed clearing is not likely to cause salinity levels within the application area to alter significantly.

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

Methodology

BoM (2013)
CALM (2002)
GIS Database:
- Groundwater Provinces
- Groundwater Salinity, Statewide
- Public Drinking Water Source Areas (PDWSAs)

(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 is located within the Swan-Avon Lockhart catchment area and the Swan-Avon Yilgarn catchment area (GIS Database). Given the size of the area to be cleared (30 hectares) in relation to the size of the Swan-Avon Lockhart catchment area (2,839,268 hectares) and the Swan-Avon Yilgarn catchment area (5,836,045 hectares) (GIS Database), the proposed clearing is not likely to increase the potential of flooding on a local or catchment scale.

The application area experiences a semi arid, warm Mediterranean climate with an average annual rainfall of

342 millimetres recorded at Hyden located approximately 75 kilometres west of the application area (CALM, 2002; BoM, 2013). Rainfall is usually experienced during winter months and it is likely that during times of intense rainfall there may be some localised flooding in the area (CALM, 2002; GIS Database).

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

Methodology BoM (2013)
CALM (2002)
GIS Database:
- Hydrographic Catchments - Catchments

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

Comments

There are two native title claims over the area under application: WC03/6 and WC00/7 (GIS Database). One claim has been filed at the federal court and the other claim has been registered with the Native Title Tribunal on behalf of the claimant groups. 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*.

According to available databases, 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 and Conservation 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 application was advertised on 11 March 2013 by the Department of Mines and Petroleum inviting submissions 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

4. References

Australian Heritage Database (2013) Register of National Estate: Lake Cronin Area, viewed 18 March 2013, http://www.environment.gov.au/cgi-bin/ahdb/search.pl?mode=place_detail;place_id=9929.

Biota (2006) Forrestania Fauna Survey - Fauna and Faunal Assemblages Report. Unpublished Report Prepared by Biota Environmental Sciences Pty Ltd for Western Areas NL, February 2006.

Biota (2007) Forrestania Fauna Monitoring Survey - Flying Fox Phases III and IV. Unpublished Report Prepared by Biota Environmental Sciences Pty Ltd for Western Areas NL, July 2007.

BoM (2013) Climate Statistics for Australian Locations. A Search for Climate Statistics for Hyden, Australian Government Bureau of Meteorology, viewed 18 March 2013, < http://www.bom.gov.au/climate/averages/tables/cw_010568.shtml >.

Botanica (2011) Level 1 Flora and Vegetation Survey of Crossroads. Unpublished Report Prepared by Botanica Consulting for Western Areas NL, November 2011.

Botanica (2013a) Flora and Vegetation Survey of the Greater Flying Fox Area Tenements: M77/582, M77/911 and M77/545. Unpublished Report Prepared by Botanica Consulting for Western Areas NL, January 2013.

Botanica (2013b) Flora and Vegetation Survey of the Greater New Morning/Spotted Quoll Area Tenements: E77/1568, M77/912, E77/1866, M77/584, M77/583 & E77/1865. Unpublished Report Prepared by Botanica Consulting for Western Areas NL, January 2013.

Bureau of Rural Sciences (1992) Interpretations of the Digital Atlas of Australian Soils Mapping Units (ARC/INFO format). http://www.daff.gov.au/brs/data-tools/daas-download (Accessed 25 February 2010).

CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions - Coolgardie 2 (COO2 - Southern Cross Subregion). Department of Conservation and Land Management, Western Australia.

DEC (2006a) Carnaby's Black Cockatoo in Fauna Species Profiles, Department of Environment and Conservation, Perth. http://www.dec.wa.gov.au/management-and-protection/animals/fauna-species-profiles.html?showall=&start=1 (Accessed May 2013).

DEC (2006b) Chuditch in Fauna Species Profiles, Department of Environment and Conservation, Perth. http://www.dec.wa.gov.au/management-and-protection/animals/fauna-species-profiles.html?showall=&start=2 (Accessed May 2013).

DEC (2006c) Malleefowl in Fauna Species Profiles, Department of Environment and Conservation, Perth. http://www.dec.wa.gov.au/management-and-protection/animals/fauna-species-profiles.html?showall=&start=1 (Accessed May 2013).

DEC (2012) Priority Ecological Communities for Western Australia Version 17. Species and Communities Branch, Department of Environment and Conservation. 13 April 2012.

DEC (2013) Advice to the assessing officer for clearing permit application CPS 5505/1. Received on 18 and 19 April 2013.
Department of Natural Resources and Environment (2002) Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local. Department of Natural Resources and Environment, Victoria.
EPA (2000) Environmental Protection of Native Vegetation in Western Australia. Clearing of Native Vegetation, with Particular Reference to the Agricultural Area. Position Statement No. 2. December 2000. Environmental Protection Authority, Western Australia.
EPA (2009) Advice on Conservation Values and Review of Nature Reserve Proposals in the Lake Cronin Region. Advice of the Environmental Protection Authority to the Minister for Environment under Section 16(e) of the *Environmental Protection Act 1986*. Report Number 1329. Published Report Prepared by the Environmental Protection Authority, June 2009.
Government of Western Australia (2013) 2012 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of October 2012. WA Department of Environment and Conservation, Perth.
Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
Schoknecht N. (2002) Soil Groups of Western Australia. A simple guide to the main soils of Western Australia. Resource Management Technical Report 246. Edition 3.
Western Areas (2013a) Further Information provided to the assessing officer by Western Areas NL on 15 March and 7 May 2013.
Western Areas (2013b) Supporting Document for Clearing Permit (Purpose) Application Mining Tenements M77/582, M77/545, M77/583, M77/912, M77/584. Unpublished Report Prepared by Western Areas NL, 2013.
Western Australian Herbarium (2013) Florabase - The Western Australian Flora. Department of Environment and Conservation. Available online at http://florabase.dec.wa.gov.au/, viewed May 2013.

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.