Government of Western Australia
Department of Mines and Petroleum

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 1249/1

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 77/584
Mining Lease 77/585
Mining Lease 77/912

Local Government Area: Shire of Kondinin

Colloquial name: Forestania Nickel Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
0.65		Mechanical Removal	Dewatering Infrastructure

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 at a 1:250,000 scale for the whole of Western Australia. Two Beard vegetation associations have been mapped within the application area (GIS Database; Shepherd, 2007).

511: Medium woodland; salmon gum and morrel; and

2048: Shrublands; scrub-heath in the Mallee Region (GIS Database; Shepherd, 2007).

The application area was surveyed by Jims Seeds, Weeds and Trees on 1 to 2 February 2006 (Jims Seeds, Weeds and Trees, 2006). The following vegetation types were identified within the application area:

***Eucalyptus* Mallee Woodland:** The dominant species were *Eucalyptus eremophila, E. flocktoniae* subsp. *flocktoniae* and *Eucalyptus cylindrocarpa.* The mid-storey comprised of *Acacia assimilis*, *Acacia jennerae*, *Acacia lasiocalyx*, *Calothamnus quadrifidus, Leptospermum erubescens, Melaleuca hamata, Hakea multilineata, Santalum acuminatum*, with an understorey of *Angianthus tomentosus*, *Lepidosperma brunonianum, Hibbertia gracilipes, Westringia rigida, Acacia deficiens, Acacia intricata*, *Acacia poliochroa*, *Acacia sphacelata*, *Eremophila racemosa*, *Melaleuca cordata, Microcorys* sp. Forrestania, *Spyridium mucronatum* subsp. r*ecurvum* and *Darwinia inconspicua*;

Sandplain Heath: The dominant species were *Grevillea eriostachya*, *Dryandra cirsioides* and *Hakea cygna* subsp. *cygna*. The mid-storey comprised species such as *Allocasuarina acutivalvis, Callitris canescens, Acacia hemiteles*, *Melaleuca hamata*, *Micromyrtus obovata*, *Banksia laevigata* subsp. *fuscolutea* and *Petrophile divaricata*, while the understorey comprised *Astroloma serratifolium*, *Dampiera eriocephala, Hibbertia gracilipes, Westringia cephalantha, Acacia deficiens, Acacia poliochroa, Acacia sphacelata* subsp. *sphacelata, Darwinia inconspicua*, *Verticordia chrysantha, Verticordia chrysanthella, Verticordia picta* and *Verticordia roei*;

Banded Ironstone Hill Rises (BIHR): The dominant species were *Grevillea eriostachya, Dryandra cirsioides* and *Calothamnus quadrifidus*. The mid-storey was comprised of species such as *Allocasuarina corniculata*, *Eucalyptus leptopoda*, *Leptospermum erubescens, Melaleuca hamata*, *Hakea francisiana*, while the understorey was comprised of species including *Acacia acanthaster, Stenanthemum liberum* and *Phebalium tuberculosum* (Jims Seeds, Weeds and Trees, 2006).

Clearing Description

Western Areas NL is proposing to clear up to 0.65 hectares of native vegetation (Western Areas NL, 2010). The proposed clearing is to allow the operation, maintenance and upgrade of the associated dewatering infrastructure related to the operation of the Flying Fox and Spotted Quoll Mines. The pipeline will be carrying hypersaline water from the Flying Fox mine to the Cosmic Boy mine. The pipeline will be buried where a previous pipeline was laid along an existing track.

Part of the proposed pipeline route is through an area listed on the Register of the National Estate for its natural values, which is classified as an Environmentally Sensitive Area (ESA), and a Schedule 1 Non-permitted area under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*. As a result there is a requirement for a native vegetation clearing permit for this part of the proposed pipeline construction.

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

Comment The application area is located in the Mallee and Coolgardie regions, approximately 77 kilometres east of Hyden. The vegetation condition was derived from a vegetation survey conducted by Jims Seeds, Weeds and Trees (2006).

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 not likely to be at variance to this Principle

The application area occurs within the Western Mallee (MAL2) subregion of the Mallee Interim Biogeographic Regionalisation of Australia (IBRA) bioregion and the Southern Cross (COO2) subregion of the Coolgardie IBRA bioregion (GIS Database). The Southern Cross subregion is characterised by subdued relief, comprised of gently undulating uplands dissected by broad valleys with bands of low greenstone hills (CALM, 2002a). While the Western Mallee subregion is characterised by clays and silts underlain by Kankar, exposed granite, sandplains and laterite pavements. Salt lake systems occur on a granite basement, with occluded drainage systems (CALM, 2002b). Mallee communities can be found on a variety of surfaces while *Eucalyptus* woodlands occur mainly on fine-textured soils, with scrub heath on sands and laterite (CALM, 2002b).

The application area occurs within an Environmentally Sensitive Area (Register of National Estate), which is the Lake Cronin Area (GIS Database). The Lake Cronin Area is listed on the Register of National Estate for its high level of flora and fauna diversity and endemism. According to the Australian Heritage Database (2010), 16 fauna species that are endemic to either the south-west region or to Western Australia occur within the Lake Cronin area. The Lake Cronin area is also described as being an important refuge for rare species due to widespread clearing in the wheatbelt to the west. Rare species include fauna such as the Malleefowl (*Leipoa ocellata*), Carnaby's Cockatoo (*Calyptorhyncus latirostris*) and Chuditch (*Dasyurus geoffroii*) and flora species such as *Eucalyptus steedmanii*. The Lake Cronin area also represents the northern most limit of several fauna species distributions.

DEC (2006a) have advised that although the application area is within the Lake Cronin Red Book area, known for its high level of flora and fauna diversity and endemism, information contained within supporting documentation provides insufficient evidence to conclude that the application area comprises a higher level of biological diversity than surrounding areas. Jims Seeds, Weeds and Trees (2006) determined that the vegetation condition is “disturbed” and notes that the proposed pipeline is to be buried where a previous pipeline has been laid along an existing track.

Lying within the South West Botanical province, the area has high endemism and several priority species are found within the proposed clearing area. The priority species appear to be locally abundant and well represented in the general Forrestania area. A rare species of eucalypt (*Eucalyptus steedmanii*) is known to have occurred 300m south of the application area within 15 metres of the proposed pipeline. However, it could not be located and may have been destroyed by fire. Many young eucalypts were located but their identification is not possible until reaching maturity (fruiting) (Jims Seeds, Weeds and Trees, 2006).

Two weed species were recorded within the application area (Jims Seeds, Weeds and Trees, 2006), namely *Dittrichia graveolens* (Stinkwort) and *Centaurium tenuiflorum.* Weeds have the potential to alter the biodiversity of an area, competing with native vegetation for available resources and making areas more fire prone. This in turn can lead to greater rates of infestation and further loss of biodiversity if the area is subject to repeated fires. Neither of these species are listed as 'Declared Plant' species under the *Agriculture and Related Resources Protection Act 1976* by the Department of Agriculture and Food. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed control condition.

Given the small area (0.65 hectares) and the degraded nature of the area to be cleared (next to a vehicle track, in a ditch previously cleared), it is not likely that there will be a significant effect on the biodiversity value of the area both on a local and on a regional scale.

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

Methodology

Australian Heritage Database (2010)
CALM (2002a)
CALM (2002b)
DEC (2006a)
Jims Seeds, Weeds and Trees (2006)
GIS Database
- Clearing Regulations - Environmentally Sensitive Areas
- IBRA WA (regions - subregions)
- Register of National Estate (Status)

(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

A fauna survey was conducted over the application area between 27 February and 7 March 2005 and 17 to 23 November 2005 by Biota Environmental Sciences staff (Biota, 2006). The surveys were conducted according to the EPA's Position statement No. 3 "Terrestrial Biological Surveys as an Element of Biodiversity Protection" (2002) and Guidance Statement No. 56 "Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia" (2004).

These two surveys identified a total of 106 fauna species, consisting of 60 bird species, 15 mammals, three introduced mammals and 28 reptile species (Biota, 2006). Of these, eight species are considered to be of conservation significance;

- Carnaby's Black Cockatoo (*Calyptorhyncus latirostris*) listed as Schedule 1 - *Wildlife Conservation (Specially Protected Fauna) Notice, 2010;* and Endangered - *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*;
- Western Quoll (Chuditch) (*Dasyurus geoffroii*) listed as Schedule 1 - *Wildlife Conservation (Specially Protected Fauna) Notice, 2010;* and Vulnerable - *EPBC Act 1999*;
- Western Rosella (*Platycercus icterotis xanthogenys)* listed as Schedule 1 - *Wildlife Conservation (Specially Protected Fauna) Notice, 2010;*
- Carpet Python (*Morelia spilota* subsp. *imbricata*) listed as Schedule 4 - *Wildlife Conservation (Specially Protected Fauna) Notice, 2010;*
- Western Brush Wallaby (*Macropus irma*) listed as P4 - DEC Priority Fauna List;
- Shy Heathwren (*Hylacola cauta* subsp. *whitlocki*) listed as P4 - DEC Priority Fauna List;
- Crested Bellbird (*Oreoica gutturalis* subsp. *gutturalis*) listed as P4 - DEC Priority Fauna List;
- White-browed Babbler (*Pomatostomus superciliosus* subsp. *ashbyi*) listed as P4 - DEC Priority Fauna List;
- Rainbow Bee-eater (*Merops ornatus*) listed as migratory and marine species under the *EPBC Act 1999.*

A flock of six Carnaby's Black Cockatoos were recorded flying over the application area during the fauna survey (Biota, 2006). Carnaby's Black Cockatoos forage in woodland and heath dominated by proteaceous species and nest in large hollows of mature eucalypts, usually Salmon Gum (*Eucalyptus salmonophloia)* and Wandoo (*Eucalyptus wandoo)* (DEC, 2006b). The application area may provide foraging grounds for this species, but is unlikely to provide nesting habitat. Large hollows in the main trunk of mature eucalypts suitable for nesting are not prevalent within the areas surveyed (Biota, 2006; Jims Seeds, Weeds and Trees, 2006; Western Areas NL, 2006a).

A single Chuditch was trapped during the November survey period (Biota, 2006). Western Areas NL were advised by CALM and Environment Australia, that a single record within the study area does not constitiute a matter of environmental significance and the recording of the Chuditch at Flying Fox does not require Federal referral (Western Areas NL, 2006a). The species is likely to be found throughout the area at very low densities in a wide variety of habitats. Western Areas has made a commitment to a feral animal baiting program in partnership with DEC within its tenements and within Lake Cronin Nature Reserve. The aim is to improve the conservation status of the species at a local level (Biota, 2006).

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

DEC (2006a) advised that the habitat types present witin the application area appear to be well represented in the region, and it is unlikely that the 0.65 hectares of vegetation proposed to be cleared would be considered as 'significant' habitiat for fauna. Although the habitat types to be cleared do support fauna species of conservation significance, DEC (2006a) advised that these species do not have restricted ranges. Hence the proposed clearing is unlikely to have any significant impact on the conservation status of these species.

Methodology

Biota (2006)
DEC (2006a)
DEC (2006b)
EPA (2002)
EPA (2004)
Western Areas NL (2006a)

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

Comments

Proposal may be at variance to this Principle

According to available databases, no Declared Rare Flora (DRF) species occur within the application area (GIS Database). However one CALM record (dated 1981) exists for the DRF species *Eucalyptus steedmanii* within 15 metres of the proposed pipeline route approximately 300 metres south of the application area. Despite extensive searches, no specimen could be found in that location (Jims Seeds, Weeds and Trees, 2006). Western Areas NL (2006a) propose that the pipeline would be buried under the road within a 50m radius of the historical location of *Eucalyptus steedmanii* and therefore no young seedlings will be affected by the laying of

the pipeline.

Jims Seeds, Weeds and Trees (2006) recorded numerous juvenile Mallee plants occurring along the proposed pipeline route. The juvenile eucalypts could not be positively identifed as many of the juvenile eucalypts did not possess fruit required for accurate identification. As *Eucalyptus steedmanii* (DRF) and *Eucalyptus eremophila* are morphologically similar, and the only way to accurately identify the two species is by examination of the fruit, it is possible that some of the juvenile mallee present along the route of the application area may be *Eucalyptus steedmanii*.

A flora survey was conducted over the application area by Jims Seeds, Weeds and Trees on 1 - 2 February 2006 (Jims Seeds, Weeds and Trees, 2006). The survey area encompassed the proposed pipeline corridor from Flying Fox to Cosmic Bay as well as the Sibelius Bore field.

No DRF were recorded during the surveys. The following four species of Priority Flora were recorded within the application area (Jims Seeds, Weeds and Trees, 2006):

P1 - *Stenanthemum liberum;*
P3 - *Spyridium mucronatum* subsp. *recurvum;*
P4 - *Microcorys* sp. Forrestania,
- *Eremophila racemosa.*

Approximately 179 specimens of *Stenanthemum liberum* (P1) were recorded along the pipeline route during the flora survey (Jims Seeds, Weeds and Trees, 2006). Jims Seeds, Weeds and Trees (2006) state that previous surveys have revealed many other populations of this species in the Forrestania area although DEC (2006a) has advised that this species was known from only three populations previously. A large population (~1000) plants was also found adjacent to the pipeline. It is not likely that the proposed clearing would have a significant impact on the conservation of this species.

Approximately 1000 *Spyridium mucronatum* subsp. *recurvum* (P3) plants were located by Jims Seeds, Weeds and Trees (2006) of which 207 occur within the application area. This population is north of its known range. It is likely that this species is widespread throughout its range and the clearing is not likely to have a significant impact on the conservation of this species.

Approximately 1000 plants of the species *Microcorys* sp. Forrestania (P4) were located along the pipeline route in two locations. It is expected that approximately 200 plants will be disturbed in construction of the pipeline (Jims Seeds, Weeds and Trees, 2006). The species is considered to be disturbance opportunistic. The proposed clearing would not have significant impact on the conservation of this species (Jims Seeds, Weeds and Trees, 2006).

Eremophila racemosa (P4) was recorded from four locations within the clearing permit application area. The proposed clearing will result in the removal of 25 plants from the application area (Jims Seeds, Weeds and Trees, 2006). Prior to the survey only one location was recorded on the pipeline route. The vegetation survey has increased the knowledge of the abundance and distribution of this species and given that the species is recorded from other locations within the Forrestania area, it is not likely that the removal of 25 plants will affect the conservation of this species.

Based on the above, the proposed clearing may be at variance to this Principle. DEC (2006c) advised that, as the proposed disturbance will only impact a proportion of the area where *Eucalyptus steedmanii* was previously recorded, if *Eucalyptus steedmanii* is present, it is probable that the level of impact will be minor. DEC (2006c) was of the opinion that Western Areas NL had taken reasonable steps to ensure that rare flora would not be taken, and thus had no objection to the proposed clearing proceeding. Potential impacts to DRF as a result of the proposed clearing may be minimised by the implementation of a flora management condition.

Methodology

DEC (2006a)
DEC (2006c)
Jims Seeds, Weeds and Trees (2006)
Western Areas NL(2006a)
GIS Database
- Declared Rare and Priority Flora List

(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 reveals that there are no Threatened Ecological Communities (TECs) within the application area (GIS Database).

According to a vegetation survey of the area, the vegetation types recorded are not significant ecological communities as listed in the Biodiversity Audit of Western Australia's 53 Biogeographical Subregions (CALM, 2002c; Jims Seeds, Weeds and Trees, 2006).

The application area is located within the buffer zone of two Priority Ecological Communities (PECs) (GIS Database). These are the “North Iron Cap” and “Middle Iron Cap” communities located approximately 8.7 kilometres and 13 kilometres from the application area respectively (GIS Database).

Jims Seeds, Weeds and Trees (2006) mapped several occurrences of vegetation representative of Banded Ironstone hill formations through which the application area passes. A Senior Research Scientist within DEC reviewed the survey information provided with the clearing application and advised that the linear nature of the disturbance along pre-existing tracks is unlikely to have a significant impact on the PECs identified (DEC (2006a).

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

Methodology

CALM (2002c)
DEC (2006a)
Jims Seeds, Weeds and Trees (2006)
GIS Database
- Threatened Ecological Sites
- 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 application area falls within the Coolgardie and Mallee Interim Biogeographic Regionalisation of Australia (IBRA) bioregions (GIS Database). Shepherd (2007) reports that approximately 98.4% and 54.6% of the pre-European vegetation remains within the Coolgardie and Mallee bioregions respectively.

The vegetation within the application area is recorded as the folowing two Beard vegetation associations:
511: Medium woodland; salmon gum & morel;
2048: Shrublands, scrub-heath in the Mallee region (GIS Database; Shepherd, 2007).

The vegetation associations as described by Beard (511 and 2048) remain at 70.6% and 48.4% of their pre-european vegetation cover statewide respectively (Shepherd, 2007).

There is approximately 50.5% of vegetation remaining within the Shire of Kondinin (Shepherd, 2007). Kondinin Shire straddles the divide between the intensive land use zone and the largely uncleared extensive land use zone. Given that remaining vegetation within the intensive landuse zone can range from excellent to degraded as ranked by Keighery (1994), this value should be interpreted as "Depleted" Conservation Status as defined by the "Bioregional Conservation Status of Ecological Vegetation Classes" published by the Department of Natural Resources and Environment, 2002.

	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	12,707,620	~98.4%	Least Concern	~10.9% (~11.0%)
IBRA Subregion -Southern Cross	6,010,834	5,808,065	~96.6%	Least Concern	~16.3% (~16.8%)
IBRA Bioregion - Mallee	7,395,898	4,040,547	~54.6%	Least Concern	~18.0% (~31.2%)
IBRA Subregion - Western Mallee	3,981,721	1,325,703	~33.3%	Depleted	~10.0% (~25.3%)
Local Government - Kondinin	741,927	374,478	~50.5	Least Concern	~3.8% (~6.0%)
Beard vegetation associations - State					
511	700,410	494,148	~70.6%	Least Concern	~14.1% (~18.8%)
2048	322,220	155,845	~48.4%	Depleted	~7.6% (~15.3%)
Beard vegetation associations - Coolgardie Bioregion					
511	464,425	435,798	~93.8%	Least Concern	~17.5% (~18.6%)
Beard vegetation associations - Mallee Bioregion					
511	139,594	46,825	~33.5%	Depleted	~10.5% (~19.3%)
2048	313,728	149,978	~47.8%	Depleted	~7.8% (~15.8%)
Beard vegetation associations - Southern Cross subregion					
511	464,425	435,794	~93.8%	Least Concern	~17.5% (~18.6%)
Beard vegetation associations - Western Mallee subregion					
511	139,594	46,825	~33.5%	Depleted	~10.5% (~19.3%)
2048	313,693	149,943	~47.8%	Least Concern	~7.8% (~15.8%)

* Shepherd (2007)
** Department of Natural Resources and Environment (2002)

Options to select from:	Bioregional Conservation Status of Ecological Vegetation Classes (Department of Natural Resources and Environment 2002)
Presumed extinct	Probably no longer present in the bioregion
Endangered*	<10% of pre-European extent remains
Vulnerable*	10-30% of pre-European extent exists
Depleted*	>30% and up to 50% of pre-European extent exists
Least concern	>50% pre-European extent exists and subject to little or no degradation over a majority of this area

* or a combination of depletion, loss of quality, current threats and rarity gives a comparable status

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)
Keighery (1994)
Shepherd (2007)
GIS Database
- IBRA WA (Regions – Subregions)
- Pre-Europen 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 likely to be at variance to this Principle

According to a search of available databases and supporting documentation provided by Western Areas NL (2006a) there are no watercourses or wetlands within the application area (GIS Database).

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

Methodology

Western Areas NL (2006a)
GIS Database
- Hydrography, linear
- Geodata – Lakes

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

Comments

Proposal is not likely to be at variance to this Principle

The application area is low relief with a gentle slope of 1.5% to the south (Western Areas NL, 2006a; Western Areas NL, 2006b). Beard (1979) described the soils of the Forrestania greenstone belt as largely red sandy soils with mottled yellow clayey subsoils, with minor areas of calcareous loamy soil and brown calcareous earth.

Shallow and deep sands have a moderate to high risk of wind erodibility and seasonal water logging may occur over the sandy topsoil and clays, whilst loamy earths have a low risk of wind erodibility (Schoknecht, 2002).

The groundwater table is 40-60 metres below the surface, reflecting previous dewatering efforts associated with mining (Western Areas NL, 2006b). Waterlogging is not likely to be increased by the proposed clearing. The groundwater is hypersaline, and at such depths the clearing of 0.65 hectares of native vegetation is not likely to lead to a rise in groundwater, causing salinisation.

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

Methodology

Beard (1979)
Schoknecht (2002)
Western Areas NL (2006b)
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 an Environmentally Sensitive Area (Register of National Estate), which is the Lake Cronin Area (GIS Database). At its closest point, the application area is approximately 7.5 kilometres south-west from Lake Cronin and 4.6 kilometres south-west of the Lake Cronin Nature Reserve boundary (GIS Database).

According to the Australian Heritage Database (2010) the Lake Cronin Area is one of a number of areas in the south-west which has provided excellent conditions for the persistence of a range of primitive and relict species. 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, 2010). The Lake Cronin Region study area is situated across the boundary of the Mallee and Coolgardie IBRA regions (EPA, 2009). This area is described as the interzone between the South West and Eremaean Botanical Provinces (Thackway and Cresswell, 1995; EPA, 2009). The transitional rainfall zone between the South Western Australian Floristic Region and Eremaean Botanical Province contains the limits of distribution patterns for many plants and plant communities of the Goldfields and Wheatbelt Regions (EPA, 2009).

The Lake Cronin area has been formally recognised for conservation since 1975 when the EPA recommended "that Lake Cronin and an adequate area around the lake should be made a Class A reserve for the Conservation of Flora and Fauna" (EPA 1975). However, due to competing interests, only a small area consisting of 1015 hectares around the lake was gazetted as a formal Nature Reserve in 1980 (EPA, 2009).

The EPA (2009) conducted a review of the current proposals for reserves in the Lake Cronin area and provided the following recommendations on establishing conservation reserves which adequately protect the nature conservation values of the area;

- A small "A" Class Nature Reserve be established to protect core area of highest conservation priority being the North Ironcap Banded Ironstone Formation;
- The majority of the mineralised greenstone belt be managed by DEC under Section 33(2) of the *Conservation and Land Management Act 1984* (CALM Act) but not formally reserved;

- A “C” Class Nature Reserve to protect the drainage catchment that feeds into Lake Cronin;
- The remaining low prospectivity portions of the area proposed by Henry-Hall be reserved in a “C” Class Nature Reserve (EPA, 2009).

The clearing permit application area is not located within the above areas proposed for “A” or “C” Class Nature Reserves but is located within the area proposed to be managed under Section 33(2) of the CALM Act. The proposed clearing covers a relatively small linear area and includes widening of an existing access track and clearing regrowth from a drain. Lake Cronin Nature Reserve is sufficiently distanced from the application area that its conservation values are unlikely to be impacted by this work.

Based on the above the proposed clearing may be at variance to this Principle. However, the proposed clearing of 0.65 hectares is unlikely to have any significant impact on the environmental values of the Lake Cronin Area and Nature Reserve, or any other conservation area.

Methodology

Australian Heritage Database (2010)
DEC (2006a)
EPA (2009)
EPA (1975)
Thackway and Cresswell (1995)
GIS Database
- Clearing Regulations - Environmentally Sensitive Areas
- DEC Tenure
- Geodata, Lakes
- Register of National Estate (Status)

(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 groundwater salinity within the application area is approximately 14,000 - 35,000 milligrams/Litre Total Dissolved Solids (TDS) (GIS Database; Western Areas NL, 2006a). This is considered to be hyper saline. Given the size of the area to be cleared (0.65 hectares) compared to the size of the Yilgarn_Southwest Groundwater Province (24,601,261 hectares) (GIS Database), the proposed clearing is not likely to cause salinity levels within the application area to alter significantly.

The application area is located within a *Rights in Water Irrigation Act 1914* (RIWI Act) Groundwater Management Area (GIS Database). The proponent is required to obtain permits to abstract groundwater in this area.

The application area experiences an average annual rainfall of 343.6 millimetres and a pan evaporation rate of approximately 2,200 millimetres/year recorded from the nearest weather station at Hyden approximately 77 kilometres west of the application area (BoM, 2010). Surface water flow is likely to be low during normal seasonal rains. Sedimentation or turbidity of waterbodies is not likely as there are no permanent water bodies within the application area.

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

Methodology

BoM (2010)
Western Areas NL (2006a)
GIS Database
- Groundwater Provinces
- Groundwater Salinity, Statewide (TDS_MG_L)
- Public Drinking Water Source Areas (PDWSAS)
- RIWI Act, Groundwater Areas (P_Status)

(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 experiences a semi arid, warm Mediterranean climate with an average annual rainfall of 343.6 millimetres recorded from the nearest weather station at Hyden approximately 77 kilometres west of the application area (BoM, 2010; CALM, 2002a; CALM, 2002b). Rainfall is usually experienced during winter months and it is likely that during times of intense rainfall there may be some localised flooding in adjacent areas (CALM, 2002a). However, the high evaporation rate (approximately 2,200 millimetres/year) (BoM, 2010), lack of waterbodies or watercourses in the area and a gentle slope (1.5%) to the south (Western Areas NL, 2006a) would suggest that the application area is not subject to flooding.

The application area is located within the Swan-Avon Lockhart and Swan-Avon Yilgarn catchment areas (GIS Database). The small area to be cleared (0.65 hectares) in relation to the size of the Swan-Avon Lockhart and Swan-Avon Yilgarn catchment areas (2,839,268 and 5,836,045 hectares respectively) (GIS Database) is not likely to increase the potential for flooding within the application area, local area or within the catchment (GIS Database).

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

Methodology BoM (2010)
CALM (2002a)
CALM (2002b)
Western Areas NL (2006a)
GIS Database
- Hydrographic Catchments - Catchments

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

Comments

There are no native title claims over the application area (GIS Database). The mining tenements have 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 known Aboriginal Sites of Significance located within the clearing permit 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 proposal was referred to the EPA by the proponent in March 2006. The level of assessment was set by the EPA as 'not assessed, managed under Part V of the *Environmental Protection Act, 1986'*. This decision was subject to appeal, however no appeals were received.

Methodology EPA (2006)
GIS Database
- Aboriginal Sites of Significance
- Native Title Claims

4. Assessor's comments

Comment

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

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6. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government.
CALM	Department of Conservation and Land Management, Western Australia.
DAFWA	Department of Agriculture and Food, Western Australia.
DA	Department of Agriculture, Western Australia.
DEC	Department of Environment and Conservation
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DoE), 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, Western Australia.
DoIR	Department of Industry and Resources, Western Australia.
DOLA	Department of Land Administration, Western Australia.
DoW	Department of Water
EP Act	Environment Protection Act 1986, Western Australia.
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System.
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	Rights in Water and Irrigation Act 1914, Western Australia.
s.17	Section 17 of the Environment Protection Act 1986, Western Australia.
TECs	Threatened Ecological Communities.

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.