Department of Industry and Resources

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 2798/1

Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Hamersley Iron Pty Ltd**

1.3. Property details

Property: *Iron Ore (Hamersley Range) Agreement Act 1963*, Mineral Lease 4SA (AML 70/4)

Local Government Area: Shire Of Ashburton

Colloquial name: Mt Tom Price Iron Ore Mine, Section 6.5 and Section 7.

1.4. Application

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

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

567: Hummock grasslands, shrub steppe; mulga & kanji over soft spinifex & *T. basedowii*. According to the Shared Land Information Platform (SLIP, 2007), Beard vegetation association 567 is a shrubland dominated by *Acacia aneura*, with sub-dominants of *Senna sp.*, *A. pruinocarpa*, *A. xiphophylla* and *Eremophila sp*.

82: Hummock Grasslands, low tree steppe; snappygum over *Triodia wiseana* (Shepherd et al, 2001). According to the Shared Land Information Platform (SLIP, 2007), Beard vegetation association 82 is a grassland dominated by *Triodia wiseana*, with emergent trees of Eucalyptus leucophloia and *E. gamophylla*, with various emergent shrubs including *Senna artemisioides ssp. sturtii*, *Dodonaea viscosa*, *Grevillea wickhamii*, *Hakea lorea* and *Senna pleurocarpa var. pleurocarpa*.

A vegetation and flora survey was conducted over the application area between April and May 2008 (Pilbara Flora, 2008). As a result of this flora survey 13 vegetation types were identified within the application area. These are:

ACACIA TYPE CREEKLINES:

Undulating Colluvial Hills Broad Creek > 5m wide - *Eucalyptus vitrix*, *Acacia citrinoviridis* and *Eucalyptus leucophloia ssp. leucophloia* low open forest over *Rulingia luteiflora* and *Petalostylis labicheoides* open scrub over *Triodia epactia* and *Cymbopogon ambiguus* hummock/tussock grassland.

Undulating Colluvial Hills Medium Creek 3-5m wide - *Acacia aneura var. aneura*, *A. citrinoviridis*, *A. pruinocarpa*, *Eucalyptus trivalva* and *Eucalyptus leucophloia ssp. leucophloia* low open forest over *Acacia hamersleyensis*, *A. maitlandii*, *Gossypium robinsonii*, *Petalostylis labicheoides*, *Dodonaea petiolaris*, *Ptilotus obovatus var. obovatus*, *Stylobasium spathulatum* open scrub and *Cenchrus ciliaris*, *Cymbopogon ambiguus*, *Themeda sp.* Mt Barricade, *Triodia epactia*, *Triodia wiseana* tussock/hummock grassland.

GORGES, GULLIES AND BREAKAWAYS:

Breakaway Steep Hillside Shrubland - *Eucalyptus leucophloia ssp. leucophloia* low open woodland over *Acacia hamersleyensis*, *Acacia matilandii* and *Acacia marramamba* open scrub over *Cryptandra monticola* and *Dodonaea petiolaris* open heath over *Eriachne mucronata*, *Triodia epactia* and *Triodia wiseana* tussock/hummock grassland.

Deep Incised Valley Shrubland - *Corymbia ferriticola ssp. ferriticola*, *Eucalyptus leucophloia ssp. leucophloia* and *Acacia pruinocarpa* low open forest over *Acacia hamersleyensis*, *Cymbopogon ambiguus*, *Grevillea berryana* and *Gossypium robinsonii* shrubland over *Themeda sp.* Mt Barricade and *Triodia epactia* tussock/hummock grassland.

MINOR FLOWLINES:

Meadow Buffel Grass - *Acacia citrinoviridis* and *Eucalyptus xerothermica* scattered low trees over

Acacia bivenosa scattered shrubs over *Cenchrus ciliaris* closed tussock grassland.

Undulating Colluvial Hills Narrow Creek 2-3m wide - *Acacia citrinoviridis*, *A. aneura var. aneura* and *Eucalyptus leucophloia ssp. leucophloia* low woodland over *Abutilon macrum*, *Acacia bivenosa*, *A. synchronicia*, *Corchorus lasiocarpus ssp. lasiocarpus*, *Petalostylis labicheoides*, *Gossypium robinsonii*, *Hibiscus coatesii*, *Stylobasium spathulatum*, *Sida clementii* open heath over *Enneapogon robustissimus* and *Themeda sp.* Mt Barricade tussock grassland and *Triodia epactia* and *Triodia pungens* hummock grassland.

RIDGES AND RANGES:

Hillside Mulga Grove - *Acacia aneura var. aneura*, *A. aneura var. intermedia* and *A. pruinocarpa* low closed forest over *Dodonaea petiolaris*, *Eremophila phyllopoda*, *Eremophila platycalyx* and *Senna glutinosa ssp. pruinosa* open heath over *Triodia epactia*, *Triodia melvillei* and *Triodia wiseana* open hummock grassland.

Hillside Mallee Woodland - *Eucalyptus leucophloia ssp. leucophloia* and *Acacia aneura var. conifera* open woodland over *Eucalyptus trivalva* low open forest over *Acacia hamerselyensis* and *Ptilotus obovatus var. obovatus* open shrubland over *Triodia epactia* and *Triodia wiseana* hummock grassland.

Steep Hillsides Open Woodland - *Eucalyptus leucophloia ssp. leucophloia* and *Acacia pruinocarpa* low woodland over *Acacia hamersleyensis* shrubland over *Triodia epactia*, *Triodia pungens*, *Triodia wiseana* hummock grassland.

Undulating Colluvial Hills Open Woodland - *Eucalyptus leucophloia ssp. leucophloia*, *A. pruinocarpa* and *A. citrinoviridis* low woodland over *Acacia maitlandii*, *Corchorus crozophorifolius*, *Corchorus lasiocarpus ssp. lasiocarpus*, *Hibiscus sturtii var. campylochlamys* and *Indigofera monophylla* shrubland over *Triodia epactia* and *Triodia wiseana* hummock grassland.

Upland Rocky Plain Open Shrubland - *Eucalyptus leucophloia* and *E. gamophylla* scattered low trees over *Acacia maitlandii* and *A. bivenosa* and *Senna glutinosa ssp. glutinosa* open shrubland over *Triodia wiseana* hummock grassland.

Upland Rocky Plain Shrubland - *Eucalyptus leucophloia ssp. leucophloia*, *Codonocarpus cotinifolius* and *Acacia pruinocarpa* low woodland over *Acacia marramamba*, *Gossypium robinsonii*, *Petalostylis labicheoides* and *Rulingia luteiflora* shrubland over *Triodia epactia* hummock grassland.

SPINIFEX WITH EUCALYPTS:

Stony Plain Open Woodland - *Corymbia hamersleyana* and *Eucalyptus leucophloia ssp. leucophloia* open woodland over *Capparis umbonata*, *Petalostylis labicheoides* and *Sida fibulifera* low open heath over *Triodia epactia*, *Triodia wiseana* and *Enneapogon caerulescens* hummock/tussock open grassland.

Clearing Description

Hamersley Iron Pty Ltd are intending to clear up to 317.2 hectares of native vegetation for a number of pits, pit cutbacks and waste dumps at the Mt Tom Price Mine. Vegetation will be cleared by mechanical means.

Vegetation Condition

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

To

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

Comment

The Mt Tom Price Mine has been operating since 1966 and vegetation surrounding the mine has been subject to multiple disturbances since its inception. Vegetation condition was assessed by Pilbara Flora (2008) using a scale modified by Trudgen for the Pilbara. This scale aligns closely with the Keighery vegetation condition scale and has been adapted for Pilbara conditions.

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 may be at variance to this Principle

The application area occurs within the Hamersley Iron (PIL3) IBRA Sub-Bioregion (GIS Database). This sub-bioregion is characterised by Mulga low woodland over bunch grasses on fine textured soils in valley floors, and *Eucalyptus leucophloia* over *Triodia brizoides* on skeletal soils of the ranges (CALM, 2002). The vegetation described within the application area (Pilbara Flora, 2008) is typical of the bioregion.

Vegetation surveys of the application area and surrounding vegetation identified 331 flora species from 54 Families (Pilbara Flora, 2008). This is considered to be very biologically diverse. Poacae (44 spp), Malvacae (28 spp), Mimosaceae (37 spp), and Amaranthaceae (22 spp) families show highest speciation within the application area (Pilbara Flora, 2008). This is typical of the floristics of the Pilbara IBRA Region. The survey also recorded one Declared Rare Flora species, and 13 Priority Flora species as occurring within the survey area. The recording of these species within the survey area suggests that the vegetation within the area has a high diversity of vegetation habitat types such as hill crests and ridges, deep gullies and gorges, drainage lines, sloping plains and breakaways. The presence of diverse habitat types is a precursor to high biological

diversity. The assessing officer conducted a site visit of the application area in January 2008 and noted these diverse habitat types, likely to support high biological diversity.

An area search of the Western Australian Museum's Faunabase conducted by the assessing officer suggests that the application area is diverse in reptile species, particularly Skinks and Geckos (Western Australian Museum, 2008). The search found 63 species from 9 Families as potentially occurring within the application area, or within 50 km of the application area. A total of 53 avian fauna species from 23 Families have also been recorded within 50 km of the application area, reflecting the diverse range of habitats available.

Ten alien weed species were recorded within the vegetation survey area (Pilbara Flora, 2008). 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 through repeated fires. No major infestations were observed, except within the Meadow Buffel Grass vegetation type where buffel grass (*Cenchrus ciliaris*) occurs as a monoculture. It is not expected that the clearing of vegetation will lead to an infestation of weeds within the application area or surrounding vegetation.

Although the application areas are high in floral and faunal diversity, they are not likely to have greater diversity than similar areas within the region.

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

Methodology

CALM (2002)
Pilbara Flora (2008)
Western Australian Museum (2008)
GIS Database:
- Interim Biogeographic Regionalisation of Australia (subregions) - EA 18/10/00

(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 is not likely to be at variance to this Principle

The assessing officer has conducted a search of the Western Australian Museum's online fauna database between the coordinates 117.5°, 22.5° and 118.1°, 23.1°, representing a 50 km radius around the application area.

This search identified 6 Amphibian, 53 Avian, 21 Mammalian and 63 Reptilian species (Western Australian Museum, 2008). Of these, the following species of conservation significance have previously been recorded within the search area: Striated Grasswren (*Amytornis striatus striatus*), Night Parrot (*Pezoporus occidentalis*), Long-tailed Dunnart (*Sminthopsis longicaudata*), Orange Leaf-nosed Bat (*Rhinonicteris aurantius*), Lakeland Downs Mouse (*Leggadina lakedownensis*), Western Pebble-mound Mouse (*Pseudomys chapmani*) and Pilbara Olive Python (*Liasis olivaceus barroni*).

Pilbara Flora conducted a desktop search of the DEC's 'Threatened Fauna Database' and the Department of Environment and Water Resources 'Protected Matters Search Tool'. In addition to those species of conservation significance listed above, this search identified the following species within the search area (Pilbara Flora, 2008): Peregrine Falcon (*Falco peregrinus*), Spectacled Hare-Wallaby (*Lagorchestes conspicillatus leichardti*), Ghost Bat (*Macroderma gigas*), Australian Bustard (*Ardeotis australis*), Bush Stone-curlew (*Burhinus grallarius*), a skink (*Notoscincus butleri*) and Northern Quoll (*Dasyurus hallucatus*). The search also identified a range of migratory marine and wetland bird species. However, it is unlikely that the proposed clearing will impact on these migratory species.

Based on preferred habitat type, the following species may occur within the application area:

The Northern Quoll (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice, 2008*) is known to occur in a range of habitats, including *Eucalyptus* open forest, monsoon rainforest and savannah woodland, but is most abundant (and apparently with less fluctuation) in rocky environments close to free water in creekline areas (Braithwaite et al, 1994). It has undergone substantial decline in the Pilbara and is now known to occur in geographically isolated populations (Firestone, 1999). Whilst rocky outcrops exist within the application area, the absence of available water suggests that the vegetation within the application area is not significant habitat for this species.

The Orange Leaf-nosed Bat (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice, 2008*) is described as preferring warm humid caves for roosting, although some have been found in tree hollows (Australian Museum Online, 2007a). They are known to hunt flying prey close to roosts, and glean from foliage and the ground in riparian vegetation in gorges, and in open hummock grasslands and sparse tree and shrub savannah (Department of Environment, Water, Heritage and the Arts, 2008). Known colonies in the Pilbara occupy abandoned, deep and partially flooded mines that trap pockets of warm, humid air in the mine's constant temperature zone. For at least part of the year, the species is thought to also occupy smaller, less complex mines nearby. There are no known natural roosting sites in the Pilbara (Department of Environment, Water Heritage and the Arts, 2008). There are no abandoned mine shafts or substantial caves within the application area, although shallow caves within the breakaway areas may provide short term roosting sites for this species. Therefore, the vegetation within the application area is not significant

habitat for this species.

The Night Parrot (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice, 2008*) is a very seldom seen bird that occupies dense, low vegetation, which provides them shelter during the day (Australian Museum Online, 2007b). Most records come from hummock grasslands with spinifex (*Triodia sp.*), or from areas dominated by samphire. It has been suggested that birds move into the grasslands when *Triodia* is seeding (Australian Museum Online, 2007b). They have also been reported in low chenopod shrublands comprising saltbush and bluebush, and from areas of Mitchell grass (*Astrebla sp.*) with scattered chenopods (Australian Museum Online, 2007b). Many records have come from waterholes, and almost all reports from areas of *Triodia* have noted the presence of nearby water (Australian Museum Online, 2007b). As this species is very rare, and little is known of its distribution, it is difficult for the assessing officer to determine what impact, if any, the proposed clearing will have on this species. However, given the lack of permanent water in the application areas, it is unlikely that the vegetation to be cleared represents significant habitat for this species.

The Peregrine Falcon (Schedule 4 - Other specially protected fauna, *Wildlife Conservation (Specially Protected Fauna) Notice, 2008*) is known to inhabit most areas in Australia and utilise cliffs, tall trees and granite outcrops for nesting (Australian Museum Online, 2007c). The Peregrine Falcon is likely to occur sporadically within the application area, but is not likely to nest in the area due to an absence of tall trees or rocky outcrops. Therefore, the vegetation within the application area is not significant habitat for this species.

The Western Pebble-mound Mouse (DEC - Priority 4) is described as constructing pebble mounds on slopes composed of stony soils, near sharply incised drainage lines (Start et al, 2000). Mounds are built in vegetation dominated by hard spinifex (*Triodia basedowii* or *T. wiseana*) (Start et al, 2000). No active Pebble mounds were observed within the survey area (Pilbara Flora, 2008). Given the close proximity of the application area to active mining areas, and the large amount of pebble scree slopes in the Pilbara Region, the vegetation within the application area is not likely to be significant habitat for this species.

The Long-tailed Dunnart (DEC Priority 4) occur in rugged rocky landscapes that support a low open woodland or shrubland of Acacia's (especially Mulga) with an understorey of spinifex hummocks, and (occasionally) also perennial grasses and Cassia's from the Pilbara and upper Gascoyne region in the West (Department of Natural Resources, Environment and the Arts, 2007). They have also more recently been recorded from plateaus near breakaways and screes and rugged boulder strewn screes in the Goldfields region. The habitat types found within the application area may support populations of Long-tailed Dunnart. However, it is unlikely that the vegetation to be cleared represents significant habitat for this species, given its widespread distribution.

The Ghost Bat (DEC Priority 4) has been recorded from a number of sites across the Pilbara Region, mainly from abandoned mine shafts close to permanent water. Shallow caves found within the breakaway areas within the application area may provide temporary roosting habitat for this species. However, it is not likely to constitute significant habitat for this species.

The Australian Bustard (DEC Priority 4) prefers tussock grassland, *Triodia* hummock grassland, grassy woodland and low shrublands (Garnett et al, 2000). This species may occur within the application area, however, given the widespread distribution of this species and the degraded nature of the vegetation to be cleared, the habitat within the application area is not significant habitat for this species.

Striated Grasswrens (DEC Priority 4) live on sandplains dominated by mature *Triodia* hummock grassland with an over-storey of shrubs, usually mallee eucalypts (Garnett et al, 2000). Currently the major threat throughout the subspecies' range is fire, especially extensive fires that destroy mature hummock grassland over large areas (Garnett et al, 2000). There are vast amounts of *Triodia* hummock grassland within the Pilbara IBRA region that this species can utilise. It is not likely that the vegetation within the application area is significant habitat for this species.

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

Methodology

Australian Musuem Online (2007a)
Australian Museum Online (2007b)
Australian Musuem Online (2007c)
Braithwaite et al (1994)
Department of Natural Resources, Environment and the Arts (2007)
Department of Environment, Water, Heritage and the Arts (2008)
Firestone (1999)
Garnett et al (2000)
Pilbara Flora (2008)
Start et al (2000)
Western Australian Museum (2008)

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

Comments

Proposal is not likely to be at variance to this Principle

According to available databases, no Declared Rare or Priority Flora species occur within the application area (GIS Database).

A flora survey was conducted over the application area and surrounding areas (the survey area) in April and May 2008 by Pilbara Flora. This involved a database search of both the Department of Environment and Conservation's Threatened Flora Database and Pilbara Iron's Rare and Priority Flora Database to identify those species which had previously been recorded either within or in close proximity to the survey area. A field survey was then completed to describe vegetation types present and search for conservation significant flora identified as potentially occurring within the vegetation types present. This survey and the subsequent report adequately meets the requirements of EPA Guidance Statement 51 'Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia' (EPA, 2004).

As a result of this survey one Declared Rare flora species and 13 Priority flora species have either been previously identified within the survey area or were identified during Pilbara Flora's 2008 survey. Of these, six occur within the application area (Pilbara Flora, 2008). These are: *Indigofera ixocarpa* (P2), *Olearia mucronata* (P2), *Geijera salicifolia* (P3), *Tephrosia sp.* Cathedral Gorge (P3), *Triumfetta leptacantha* (P3) and *Eremophila magnifica ssp. magnifica* (P4).

Indigofera ixocarpa occurs on rocky ironstone slopes (Western Australian Herbarium, 1998-2008) that have previously been burnt (Pilbara Flora, 2008). The species has been found within a 30-40 kilometre radius of Tom Price with another population located between Nullagine and Marble Bar (Western Australian Herbarium, 1998-2008). *I. ixocarpa* has been located from at least 60 locations by Pilbara Iron botanists with a total population of over 2500 plants and was found often within the survey area (Pilbara Flora, 2008). It is likely that the species may have a restricted range but is common where it is found, responding well to disturbance. The vegetation within the application area is not likely to be significant for the maintenance of this Priority Flora species.

Olearia mucronata was recorded on rocky hillsides within the survey area (Pilbara Flora, 2008). It is also recorded along drainage channels (Western Australian Herbarium 1998-2008). This species has been recorded from the Tom Price area, Paraburdoo, Wittenoom, Newman, Laverton and Cue (Pilbara Flora, 2008). Pilbara Iron have located at least 30 populations within Rio Tinto's lease areas, 22 of which occur at Tom Price. 120 plants have been recorded in total (Pilbara Flora, 2008). Given the extensive range from which this species has been recorded and the amount of potential habitat available within its range the vegetation within the application area is not likely to be significant for the maintenance of this Priority Flora species.

Geijera salicifolia occurs on massive rock scree and in gorges (Western Australian Herbarium, 1998-2008) between Tom Price and Karijini National Park and has been recorded five times from within the application area. Whilst the species appears to have a restricted range, the species has been found at least 120 occasions by Pilbara Iron botanists (Pilbara Flora, 2008) and is also located in secure conservation estate. Therefore, the vegetation within the application area is not likely to be necessary for the continued in-situ existence of significant habitat for this species.

Tephrosia sp. Cathedral Gorge has been recorded from 10 locations within the Pilbara (Western Australian Herbarium, 1998-2008) mainly from drainage lines or rocky slopes and crests. Within the application area a single population was found in open woodland with a stony mantle. It has a distribution between Tom Price and Newman. Given the large range in which this species has been found, and the potential habitat that occurs within this area, the vegetation within the application area is not likely to be necessary for the continued in-situ existence of significant habitat for this species.

Triumfetta leptacantha has been recorded in drainage lines and at the base of breakaways in loamy soil, but has been located on stony crests and hilltops (Western Australian Herbarium, 1998-2008). It has been recorded four times within the application area. Pilbara Iron have 120 records of this species in its Rare and Priority Flora database (Pilbara Flora, 2008). The species has a distribution between Tom Price to Roy Hill Station. Given its broad distribution and the amount of potential habitat within its range, the vegetation within the application area is not likely to be significant for the maintenance of this Priority Flora species.

Eremophila magnifica ssp. magnifica occurs on skeletal soils over ironstone formations (Western Australian Herbarium, 1998-2008). This species was recorded five times within the application area. It has been recorded over 70 times by Pilbara Iron botanists within Rio Tinto's lease areas (Pilbara Flora, 2008) and has a distribution between Newman, Karijini National Park and Tom Price. Given the species broad distribution and the amount of potential habitat within its range, the vegetation within the application area is not likely to be significant for the maintenance of this Priority Flora species.

The vegetation types described within the application area are common and widespread within the greater Pilbara region.

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

Methodology EPA (2004)

Pilbara Flora (2008)
Western Australian Herbarium (1998-2008)
GIS Database:
- Declared Rare and Priority Flora List - CALM 01/07/05

(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

There are no known Threatened Ecological Communities (TEC) located within the application area (GIS Database). The nearest TEC is located approximately 40 km to the east. At this remote distance there is little likelihood of any impact to this TEC from the proposed clearing.

None of the vegetation communities identified during a flora survey over the application area are considered to be threatened ecological communities, or ecological communities at risk (Pilbara Flora, 2008).

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

Methodology

Pilbara Flora (2008)
GIS Database:
- Threatened Ecological Communities - CALM

(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

According to available databases, the application area falls within the Pilbara IBRA Bioregion (GIS Database). This bioregion's vegetation extent remains at approximately 100% of its Pre-European extent (see table). Beard Vegetation Association's 567 and 82 occur within the application area (GIS Database). According to Shepherd et al (2001), these vegetation associations remain at approximately 100% of their Pre-European extent (see table). Both Beard vegetation associations are well represented in conservation estate (see table).

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-european % in IUCN Class I-IV Reserves*
IBRA Bioregion – Pilbara	17,804,164	17,794,651	~100	Least Concern	6.3
Beard veg assoc. – State					
82	2,565,929	2,565,929	~100	Least Concern	10.2
567	777,517	777,517	~100	Least Concern	22.3
Beard veg assoc. - bioregion					
82	2,563,609	2,563,609	~100	Least Concern	10.2
567	776,833	776,833	~100	Least Concern	22.3

* Shepherd et al. (2001)
** 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

Therefore, the application area is not part of a remnant of native vegetation in an area that has been extensively cleared.

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

Methodology

Department of Natural Resources and Environment (2002)

Shepherd et al (2001)

(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

According to available databases there are several minor, non-perennial drainage lines within the application area (GIS Database).

According to a vegetation survey conducted over the application area, several vegetation types are described for drainage lines (Pilbara Flora, 2008). These are:

- Undulating Colluvial Hills, Narrow Creek 2-3 m width
- Undulating Colluvial Hills, Medium Creek 3-5 m width
- Undulating Colluvial Hills, Broad Creek Line 3-5 m width
- Meadow Buffel Grass

These vegetation types occur in minor drainage lines that carry surface run-off during times of intense rainfall and are likely to be dry for most of the year. None of the species listed within the above vegetation types are limited to drainage lines or creek lines.

The most significant of these drainage lines occurs in the southern portion of the application area. Analysis of aerial photography suggests this is an incised drainage line receiving run-off from upslope areas, with a sandy, pebbly substrate. There is no evidence of any additional silt load despite the drainage line occurring downstream of an active mining area.

Based on the above, the proposed clearing is at variance to this Principle. However, the clearing of vegetation and subsequent construction of mine landforms is not likely to significantly alter hydrology downstream of the application area.

Methodology

Pilbara Flora (2008)
GIS Database:
- Hydrography, Linear

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

Comments

Proposal is not likely to be at variance to this Principle

The application area has been surveyed by the Department of Agriculture and Food (Van Vreeswyk et al 2004).

The application area is composed of the following land systems (GIS Database):

1) Newman
2) Boolgeeda

The Newman Land System is described as rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands (Van Vreeswyk et al, 2004). The system is not prone to erosion and has evolved to cope with vegetation loss following frequent fires. An analysis of aerial photography reveals the application area is most likely to consist of the 'Plateau, ridge, mountain and hill', 'Lower slope', 'Stony plain' and 'Narrow drainage floor with channel' land units within this land system. None of these land units are susceptible to erosion due to abundant pebble or cobble mantle.

The Boolgeeda Land System is described as stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands and mulga shrublands (Van Vreeswyk et al, 2004). The vegetation within the system is not prone to degradation and the system is not susceptible to erosion (Van Vreeswyk et al, 2004). An analysis of aerial photography for the area reveals the application area is most likely to consist of the "stony slope and upper plain" land unit within this land system. The stony mantle on the slopes and plains within this land unit prevent erosion.

The application area experiences low rainfall (311 mm/year) (BOM, 2008), and very high pan evaporation rates (~3400 mm/year) (Luke et al, 1987). Most rainfall will be either utilised by vegetation or lost through evaporation. Subsequently, there is little recharge of groundwater as a result of rain. As a result, the removal of 43 hectares of vegetation is not likely to lead to a rise in water table, which can lead to waterlogging or salinisation.

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

Methodology

BoM (2008)
Luke et al (1987)
Van Vreeswyk et al (2004)

GIS Database:
- Rangeland Land System Mapping - DA

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

Comments

Proposal is not likely to be at variance to this Principle

The application area is located approximately 12 km to the west of Karijini National Park (GIS Database). At this distance it is not likely that the vegetation within the application area provides a buffer to a conservation area, or is important as an ecological link to a conservation area. The vegetation types within the application areas are well replicated in other land systems within the Pilbara region. Subsequently, their conservation status is under no threat.

It is noted by the assessing officer that large areas of vegetation between the application area and Karijini National Park were burnt around late December to early January 2008.

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

Methodology

GIS Database:
- CALM Managed Lands and Waters - CALM 1/7/05

(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 area is located within a *Rights in Water Irrigation Act, 1914* (RIWI Act) Surface Water Management Area (DoW, 2008). The proponent is required to obtain a Beds and Banks Permit in order to disturb any water course (DoW, 2008). The area is located in a RIWI Act Groundwater area. The proponent is required to obtain permits to extract groundwater in this area (DoW, 2008).

There are no permanent waterbodies or watercourses within, or in association with the application area (GIS Database). Rainfall in this area is mainly restricted to a wet summer season, where precipitation can be variable. Rain can be either intense falls associated with cyclonic events, or scattered falls associated with local thunderstorms. The application area receives rainfall of approximately 311 mm/year (BoM, 2008), and experiences a pan evaporation rate of approximately 3400 mm/year (Luke et al, 1987). Therefore, during normal rainfall events, surface water within the application area is likely to evaporate or be utilised by vegetation quickly. However, substantial rainfall events create surface sheet flow which is likely to be high in sediments.

During normal rainfall events, the proposed clearing would not likely lead to an increase in sedimentation of waterbodies on or off site.

The application area is located within the Pilbara Groundwater Area (DoW, 2008). Any extraction of groundwater in this area will require a groundwater licence (DoW, 2008). The groundwater salinity within the application area is approximately 500 - 1000 mg/L Total Dissolved Solids (TDS) (GIS Database). This is considered to be potable water. Given the size of the area to be cleared compared to the size of the Hamersley groundwater province (101,668 sq km) (GIS Database), the proposed clearing is not likely to cause salinity levels within the application area to alter significantly.

There are no known Groundwater Dependant Ecosystems within the application area (GIS Database).

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

Methodology

BoM (2008)
DoW (2008)
Luke et al (1987)
GIS Database:
- Groundwater, Statewide - DoW
- Public Drinking Water Source Areas (PDWSA's) - DoW
- Hydrography, Linear - DOE 1/2/04
- Potential Groundwater Dependent Ecosystems - DoE 2004

(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 an arid, tropical climate with a wet summer season and a dry winter season (BoM, 2008). Most rainfall is received during the wet season, but falls can be variable (BoM, 2008). Rain can

either be sporadic (local thunderstorms) or heavy and intense (cyclonic events). It is likely that during times of intense rainfall there may be some localised flooding in adjacent areas. However, the method of clearing and the small area to be cleared are not likely to lead to an increase in flood height or duration. Flooding is not expected within the application areas as they are located higher in the landscape.

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

Methodology BoM (2008)

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

Comments

There is a native title claim over the area under application (GIS Database). The claim has been registered with the National Native Title Tribunal. However, the mining tenement 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*.

Seven Aboriginal Sites of Significance (Site ID's 17259, 17260, 17722, 17724, 17725, 17726, 21584) intersect with the application area. Hamersley Iron have advised that they will be applying for approval under Section 18 of the Aboriginal Heritage Act to disturb sites impacted by their proposal (Hamersley Iron, 2008). The Department of Indigenous Affairs (DIA) has advised that the application does not need to be referred to the EPA. It is the proponent's responsibility to comply with the *Aboriginal Heritage Act, 1972* and ensure that no sites of aboriginal significance are damaged though 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 application area is located within a *Rights in Water Irrigation Act, 1914* (RIWI Act) Surface Water Management Area (GIS Database). The proponent is required to obtain a Beds and Banks Permit in order to disturb any water course (DoW, 2008). The application area is located in a RIWI Act Groundwater area. The proponent is required to obtain permits to extract groundwater in this area (DoW, 2008).

Methodology
DIA (2008)
DoW (2008)
Hamersley Iron (2008)
GIS Database:
- Native Title Claims - DLI
- Aboriginal Sites of Significance - DIA
- Groundwater, Statewide - DoW

4. Assessor's comments

Comment

The proposal has been assessed against the Clearing Principles and has been found to be at variance to Principle (f), may be at variance to Principle (a), is not likely to be at variance to Principle (b), (c), (d), (g), (h), (i) and (j) and is not at variance to Principle (e).

It is recommended that should a permit be granted, conditions be endorsed on the permit with regards to recording the areas cleared and reporting the areas so cleared.

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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.
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.