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

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 3320/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Robe River Ltd**

1.3. Property details

Property: *Iron Ore* (*Cleveland Cliffs*) *Agreement Act 1964*, Mineral Lease 248SA (AML70/248)
Local Government Area: East Pilbara
Colloquial name: West Angelas Project

1.4. Application

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

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 scale of 1:250,000 for the whole of Western Australia. Two Beard Vegetation Associations are located within the application areas (Shepherd, 2007):

- **Beard Vegetation Association 18:** Low woodland; mulga (*Acacia aneura*); and
- **Beard Vegetation Association 82:** Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*.

Biota Environmental Sciences (Biota) conducted a vegetation and flora survey of the application areas and surrounding region in May 2004 (Biota, 2006). Eight vegetation units were identified within the application areas (Biota, 2006):

Vegetation of Stony Hills

H1: *Eucalyptus leucophloia* low open woodland over *Acacia maitlandii, A. hamersleyensis* shrubland over *Triodia pungens* (*T. wiseana*) mid-dense hummock grassland.
This vegetation occurred on the crests and upper slopes of the range of hills in the study area. It was associated with the Newman Land System. The low open woodland also included occasional *Acacia catenulata*, *A. pruinocarpa* and *Corymbia hamersleyana*. The hummock grassland was dominated by *Triodia pungens*, with patches of *T. wiseana* on steeper slopes and on spurs. There was typically an open shrubland to open heath dominated by *Acacia maitlandii* and also including *A. hamersleyensis* and various *Cassia species* over a mixed low open shrubland including *Corchorus lasiocarpus*, *Eremophila jucunda* subsp. *pulcherrima*, *Gompholobium karijini* ms., *Halgania gustafsenii*, *Ptilotus calostachyus* subsp. *calostachyus*, *Sida* sp. Shovellana Hill and *Solanum lasiophyllum*. Other associated species: *Acacia bivenosa*, *A. rhodophloia*, *Dysphania rhadinostachya* subsp. *rhadinostachya*, *Goodenia stobbsiana*, *G. triodiophila*, *Gossypium robinsonii*, *Hakea chordophylla*, *Scaevola browniana* subsp. *browniana*.

H3: *Corymbia ferriticola, Eucalyptus leucophloia* low open woodland over *Triodia* sp. Mt Ella, *T. pungens* hummock grassland and *Eriachne mucronata* open tussock grassland.
This vegetation occurred on exposed ridges on the south face of the range and in narrow, deep gullies. It was associated with the Newman Land System. The overstorey also typically included occasional individuals of *Astrotricha hamptonii* and *Ficus brachypoda* growing from rock faces. Shrub density varied but common species included *Acacia hamersleyensis*, *Cassia glutinosa*, *Dodonaea pachyneura*, *D. viscosa* subsp. *mucronata*, *Gossypium robinsonii*, *Indigofera fractiflexa*, *Petalostylis labicheoides* and *Ptilotus obovatus*. The cover of the hummock grassland and the proportions of the dominant spinifex species varied depending on the terrain. Other associated species: *Acacia aneura* var. aff. *longicarpa*, *A. maitlandii*, *Cymbopogon ambiguus*, *Dysphania rhadinostachya* subsp. *rhadinostachya*, *Eremophila jucunda* subsp. *pulcherrima*, *Eriachne mucronata*, *Goodenia* spp., *Indigofera gilesii* subsp. *gilesii*, *Jasminum didymium* subsp. *lineare*, *Lobelia heterophylla*, *Nicotiana benthamiana*, *Porana commixta*, *Rhodanthe margarethae*, *Sida* sp. Shovellana Hill, *Solanum* spp., *Themeda triandra*.

H5: *Eucalyptus gamophylla* low woodland over *Triodia* aff. *basedowii* (*T. pungens*) mid-dense hummock grassland.
This vegetation occurred on the base of slopes fringing the range, and was associated with the Boolgeeda Land System. Other scattered overstorey species included various forms of *Acacia aneura*, along with *A. pruinocarpa*, *Corymbia deserticola* and *Eucalyptus trivalis*. There were frequently scattered shrubs to an open shrubland of *Acacia bivenosa*, *A. maitlandii*, *A. steedmanii*, *A. tenuissimam*, *Cassia glutinosa*, *Cassia*

luerssenii and *Cassia pruinosa* over a low open shrubland of *Indigofera monophylla* (small leaflet form), *Keraudrenia* spp., *Ptilotus calostachyus* var. *calostachyus*, *P. obovatus*, *P. rotundifolius*, *Scaevola parvifolia* subsp. *pilbarae*, *Sida* aff. c*ardiophylla*, *Solanum centrale* and *S. lasiophyllum*. The hummock grassland was dominated by *Triodia* aff. *basedowii*, with patches of *T. pungens* in drainage areas. Other associated species: *Amphipogon sericeus*, *Aristida holathera* var. *holathera*, *Corchorus lasiocarpus*, *Dysphania rhadinostachya* subsp. *rhadinostachya*, *Eragrostis eriopoda*, *Goodenia stobbsiana*, *G. triodiophila*, *Paraneurachne muelleri*, *Porana commixta*.

Vegetation of Valleys

M1: ***Acacia aneura* low open woodland over *Acacia bivenosa*, *Gossypium robinsonii*, *Sida* aff. *cardiophylla*, *Scaevola parvifolia* shrubland to low open shrubland over *Triodia pungens*, *T. schinzii* mid-dense hummock grassland.**
This vegetation occurred in the broad valley through the southern half of the study area, and was associated with the Boolgeeda Land System. Much of this Mulga vegetation type was burnt 1-2 years prior to the survey. The overstorey included various forms of *Acacia aneura*, as well as *A. ayersiana* and *A. catenulata*. Other associated species: *Acacia pruinocarpa*, *Aristida contorta*, *A. holathera* var. *holathera*, *Corymbia deserticola*, *Cymbopogon obtectus*, *Dysphania rhadinostachya* subsp. *rhadinostachya*, *Enneapogon caerulescens* var. *caerulescens*, *A. polyphyllus*, *Eriachne pulchella*, *Paraneurachne muelleri*, various *Ptilotus* spp., *Solanum lasiophyllum*, *Trichodesma zeylanicum* var. *zeylanicum*.

M2: *Acacia aneura* low open woodland over *Triodia pungens*, *T.* aff. *basedowii* mid-dense hummock grassland.
This vegetation type occurred on low stony undulating plains within the broad valley, and was associated with the Boolgeeda Land System. The overstorey included various forms of Mulga, and *Acacia pruinocarpa*. Other associated species: *Enneapogon polyphyllus*, *Eremophila forrestii* subsp. *forrestii*, *E. fraseri*, *Eriachne pulchella*, *Maireana villosa*, *Sida atrovirens*, *Solanum centrale*, *S. lasiophyllum*, *Themeda triandra*.

M4: *Acacia aneura*, *A. pruinocarpa* low closed forest to low woodland over *Eremophila forrestii*, *E. longifolia*, *Ptilotus obovatus*, *Rhagodia* sp. Hamersley low open shrubland to open shrubland over *Triodia pungens* open hummock grassland.
This continuous mid-dense to dense Mulga vegetation occurred through the western and central sections of the valley, south of the range of hills. It was associated with the Boolgeeda Land System. The overstorey was dominated by various forms of *Acacia aneura*, along with *A. ayersiana* and *A. catenulata*, and also typically included occasional trees of *Eucalyptus leucophloia* or *E. xerothermica*. Other associated species: *Abutilon otocarpum* (acute leaf form), *Aristida contorta*, *Brunonia australis*, *Cheilanthes sieberi* subsp. *sieberi*, *Chrysopogon fallax*, *Digitaria brownie*, *Dysphania kalpari*, *D. rhadinostachya* subsp. *rhadinostachya*, *Enneapogon polyphyllus*, *Evolvulus alsinoides* var. *cillosicalyx*, *Helichrysum gilesii*, *Hibiscus burtonii*, *Maireana villosa*, *Paspalidium clementii*, *Porana commixta*, various annual *Ptilotus* spp., *Salsola tragus*, *Sida* sp. unisexual, *Solanum lasiophyllum*, *Themeda triandra*, *Xerochrysum bracteatum*. This vegetation was in very good condition, with scattered weeds including widespread Beggars Ticks *Bidens bipinnata*.

Vegetation of Creeklines

C1: *Eucalyptus* spp. scattered low trees over *Acacia maitlandii*, *Gossypium robinsonii*, *Petalostylis labicheoides* shrubland over *Triodia pungens* open hummock grassland and *Eriachne mucronata*, *Themeda triandra* open tussock grassland.
This vegetation occurred in minor gullies and creeks in the range of hills, and was associated mainly with the Newman Land System. Only larger occurrences have been mapped. The scattered low tree overstorey included *Corymbia hamersleyana* in larger creeks, *Eucalyptus leucophloia* higher in the landscape, and *E. trivalvis* and *E. gamophylla* lower in the landscape. Various forms of *Acacia aneura* were also typically present. The open hummock grassland was dominated by *Triodia pungens*, with some *T.* aff. *basedowii* encroaching from surrounding communities where creeks are narrow, and some *T. wiseana* on creek banks higher in the landscape. Other associated species: *Acacia bivenosa*, *A. dictyophleba*, *A. pyrifolia*, *A. steedmanii*, *Cassia glutinosa*, *Dodonaea lanceolata* var. *lanceolata*, *Dysphania rhadinostachya* subsp. *rhadinostachya*, *Evolvulus alsinoides* var. *villosicalyx*, *Indigofera monophylla* (small leaflet form), *Jasminum didymium* subsp. *lineare*, *Paraneurachne muelleri*, *Paspalidium clementii*, *Porana lasiophyllum*, *Trichodesma zeylanicum* var. *zeylanicum*.

C2: ***Eucalyptus xerothermica* low open woodland over *Acacia maitlandii*, *Petalostylis labicheoides*, *Rulingia luteiflora* shrubland to tall shrubland over *Triodia pungens* open hummock grassland.**
This vegetation occurred on the banks of minor but well-defined creeks through the valleys and was relatively more species rich than vegetation type C1. It was associated with the Boolgeeda Land System. The overstorey also included occasional trees of various forms of *Acacia aneura*, along with *Corymbia hamersleyana* and *C. semiclara*. Other associated species: *Abutilon fraseri*, *Cassia* spp., *Chrysopogon fallax*, *Cleome viscosa*, *Corchorus tridens*, *Crotalaria medicaginea*, *Cymbopogon obtectus*, *Dysphania rhadinostachya* subsp. *rhadinostachya*, *Enneapogon caerulescens* var. *caerulescens*, *E. polyphyllus*, *E. robustissimus*, *Eragrostis cumingii*, *E. tenellula*, *Eremophila forrestii* subsp. *forrestii*, *Eriachne mucronata*, *E. pulchella*, *Euphorbia coghlanii*, *Evolvulus alsinoides* var. *villosicalyx*, *Goodenia microptera*, *G. stellata* (Priority 4), *Gossypium robinsonii*, *Helichrysum gilesii*, *Iseilema membranaceum*, *Jasminum didymium* subsp. *lineare*, *Keraudrenia velutina* subsp. *elliptica*, *Paraneurachne muelleri*, *Paspalidium clementii*, *Perotis rara*, *Porana commixta*, various *Ptilotus* spp., *Santalum lanceolatum*, *Scaevola parvifolia* subsp. *pilbarae*, *Sporobolus australasicus*, *Themeda triandra*, *Trichodesma zeylanicum* var. *zeylanicum*.

Clearing Description

Robe River (2009) proposes to clear up to 20 hectares of native vegetation, within a larger area equalling approximately 385 hectares. The proposed clearing is located approximately 95 kilometres west of Newman (GIS Database).

The purpose of the proposed clearing is for mineral exploration (Robe River, 2009). This includes clearing for maintaining and establishing tracks, clearing of drill lines, clearing for a 26 kilometre by 3 kilometre access track, creation of 200 drill pads (20 metres by 30 metres) and the drilling of 200 holes (Robe River, 2009).

Vegetation will be cleared by bulldozer using raised blade technique where practicable or scrub rake on level terrain (Robe River, 2009). Robe River (2009) report that where already cleared tracks require maintenance the track may be graded using blade down technique.

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

To

Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery 1994)

Comment The vegetation condition rating is derived from information provided by Biota (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 may be at variance to this Principle

The application areas are located within the Hamersley subregion of the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). The Pilbara region is one of the centres of biodiversity in Western Australia (Biota, 2006). Biota (2006) report that this is related to the diversity of geological, altitudinal and climatic elements in the region. The Pilbara is located in a transitional zone between the floras of the Bassian (south-west), Eyrean (central desert) and southern Torresian (tropical) bioclimatic regions, and contains elements of all these floras (Biota, 2006).

A vegetation and flora survey of the application areas and surrounding region was conducted by Biota Environmental Sciences in May 2004 (Biota, 2006). Biota (2006) recorded a total of 429 native vascular flora taxa from 143 genera representing 53 families within approximately a 1,500 hectare survey area. The most common families were the grass family (*Poaceae*), Wattle family (*Mimosaceae*), Hibiscus family (*Malvaceae*), Daisy family (*Asteraceae*) and the Cassia family (*Caesalpiniaceae*) (Biota, 2006). In comparison to other surveys conducted around the Newman area, these results indicate a relatively high species richness, which can be partially attributed to the diversity of habitats within the survey area (Biota, 2006).

Biota (2006) identified eight weed species within the survey area; Buffel Grass (*Cenchrus ciliaris*), Whorled Pigeon Grass (*Setaria verticillata*), Spiked Malvastrum (*Malvastrum americanum*), Beggars Ticks (*Bidens bipinnata*), Flaxleaf Fleabane (*Conyza bonariensis*), Prickly Lettuce (*Lactuca serriola*), Indian Weed (*Sigesbeckia orientalis*) and Common Sowthistle (*Sonchus oleraceus*). The presence of these introduced weed species lowers the biodiversity value of the proposed clearing areas. Care must be taken to ensure that the proposed clearing activities do not spread or introduce weed species to non-infested areas. Should a clearing permit be granted, it is recommended that a condition be imposed for the purpose of weed management.

Biota (2005) conducted a fauna survey of the application areas and surrounding region in May 2004. This survey recorded 98 taxa of terrestrial vertebrate fauna, comprised of 37 reptiles, 47 birds, 1 bat and 11 non-volant mammals (Biota, 2005). Biota (2005) reports that these results are typical of the region at this time of year.

Based on the above, the proposed clearing may be at variance to this Principle. However, the clearing of 20 hectares of native vegetation, within a larger clearing envelope of approximately 385 hectares, is not likely to have a significant impact upon biological diversity within the application area or within the Pilbara region generally.

Methodology

Biota (2005)
Biota (2006)
GIS Database
- Interim Biological Regionalisation for Australia

(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

Biota (2005) conducted a fauna survey of the application areas and surrounding region in May 2004. Biota (2005) identified the following four primary habitat types within the survey area:

1. Broad colluvial valleys dominated by *Acacia aneura*;
2. Lower stony footslopes at the interface between *Acacia* dominated and eucalypt dominated communities;
3. Stony hilltops and upper slopes dominated by eucalypts over *Triodia*;
4. Incised gullies and creeks.

Based on the vegetation descriptions provided by Biota (2006) it is possible that all four of these habitat types occur within the 385 hectare application area. Biota (2005) reports that the following fauna habitat is of moderate conservation significance:

- Broad colluvial valleys dominated by *Acacia aneura* (vegetation units M1, M2, M4) comprise ecosystems of grove/intergrove and valley floor mulga that are at risk from grazing and trampling by introduced animals (mainly cattle), weed invasion (particularly Ruby Dock Acetosa vesicaria), large fires, frequent fires preventing regeneration and from water shadow from linear infrastructure (roads, rails etc).

Although this habitat is of moderate conservation significance, the clearing of 20 hectares of native vegetation within a 385 hectare application area for the purpose of mineral exploration is not likely to significantly impact this fauna habitat. In addition, based on vegetation maps provided by Robe River (2009) the occurrence of this habitat type within the application areas is fairly minimal.

The fauna survey conducted by Biota (2005) recorded the following two Priority fauna species within the survey area:

- Australian Bustard (*Ardeotis australis*) – Priority 4 on the Department of Environment and Conservation (DEC) Threatened and Priority Fauna list; and
- Western Pebble-mound Mouse (*Pseudomys chapmani*) – Priority 4 on the DEC Threatened and Priority Fauna list.

The habitat types found within the application areas are likely to provide suitable habitat for fauna species indigenous to Western Australia, including those conservation significant fauna listed above. However, most of the habitats within the application areas are widely distributed and relatively well represented in the Hamersley subregion of the Pilbara bioregion (Biota, 2005). The clearing of 20 hectares of native vegetation within a 385 hectare application area for the purpose of mineral exploration is not likely to significantly impact the availability of fauna habitats in the local or regional area.

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

Methodology Biota (2005)
Biota (2006)
Robe River (2009)

(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

Biota Environmental Sciences conducted a vegetation and flora survey of the application areas and surrounding region in May 2004 (Biota, 2006). No Declared Rare Flora (DRF) were recorded within the survey area, however, the following six Priority Flora species were recorded within the survey area (Biota, 2006):

- *Josephinia* sp. Marandoo (Priority 1);
- *Acacia effusa* (Priority 2);
- *Spartothamnella puberula* (Priority 2);
- *Indigofera gilesii* subsp. *gilesii* ms. (Priority 3);
- *Themeda* sp. Hamersley Station (Priority 3); and
- *Triodia* sp. Mt. Ella (Priority 3).

Acacia effusa, Spartothamnella puberula and *Themeda* sp. Hamersley Station were recorded during the flora and vegetation survey, however, they were not recorded within the application areas (Biota, 2006).

Josephinia sp. Marandoo is a small upright shrub that grows in gritty soil and granite (Western Australian Herbarium, 1998). It is generally found on plains in mixed shrubland of *Senna* and *Acacia* (Western Australian Herbarium, 1998). According to Biota (2006) this plant is known from four locations in the Pilbara. Two specimens were recorded during the flora and vegetation survey with one of these specimens recorded within the application areas (Biota, 2006). It is recommended that should a clearing permit be granted, a condition be imposed for the purpose of Priority Flora management for this species.

Indigofera gilesii subsp. *gilesii* is a shrub that grows on pebbly loam amongst boulders and outcrops and on hills (Western Australian Herbarium, 1998). Biota (2006) reports that this taxon is known from several locations in the Hamersley Range. This species has been recorded 24 times within the survey area, however, only several of these recordings occurred within the application areas (Biota, 2006). Based on the number of specimens in areas outside of the application areas, the removal of 20 hectares of native vegetation, within an application area of approximately 385 hectares, is not likely to affect the conservation status of this species.

Triodia sp. Mt Ella is a perennial spinifex species that grows in light orange-brown, pebbly loam amongst rocks and outcrops and on gully slopes (Western Australian Herbarium, 1998). Biota (2006) reports that this species is only known from a small area of the Hamersley Range in the vicinity of Mt Ella. This species has been recorded numerous times from stony hill habitat in the West Angelas area, and is considered to be

geographically restricted and uncommon, but unlikely to be rare (Trudgen and Casson 1998 as cited in Biota, 2006). This species was recorded numerous times from the application areas as well as within the surrounding region (Biota, 2006). Biota (2006) reports that this species was mainly recorded from rocky areas of the stony range of hills in the northern section of the study area, where it was typically intermixed with *Triodia wiseana*, with occasional records from the plains in the southern section of the study area. There were 46 occurrences of this species within the survey area, however, only a few of these occurred within the application areas (Biota, 2006). Based on the number of specimens in areas outside of the application areas, the removal of 20 hectares of native vegetation, within an application area of approximately 385 hectares, is not likely to affect the conservation status of this species.

Based on the above, the proposed clearing may be at variance to this Principle. It is recommended that should a clearing permit be granted, a condition be imposed regarding Priority Flora management for *Josephinia* sp. Marandoo.

Methodology Biota (2006)
Western Australian Herbarium (1998)

(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

Biota (2006) report that no Threatened Ecological Communities (TEC's) were identified within the application areas. However, Biota (2006) report that the following three 'ecosystems at risk' occur within the 1,500 hectare area surveyed during the 2006 flora and vegetation survey and could potentially occur within the application areas:

- Valley floor mulga: this vegetation type is considered to be under threat from grazing and trampling by introduced animals (mainly cattle), weed invasion (particularly Ruby Dock *Acetosa vesicaria*), water shadow from linear infrastructure (roads, rails etc.) and from large fires;
- Lower slope mulga: this vegetation is considered to be under threat from frequent fires preventing regeneration; and
- West Angelas cracking-clays: this ecosystem is classed as a Priority Ecological Community (PEC) and is considered to be under threat from vegetation clearing and introduced animals. The actual PEC is located approximately three kilometres north of the application area and will not be impacted on by the proposed clearing (GIS Database). Biota (2006) report that while no significant areas of cracking clays were recorded from the survey area, small pockets would occur through the alluvial valley in the southern section of the survey area and therefore, potentially within the application areas.

Based on the vegetation maps provided by Robe River (2009) the occurrence of these 'ecosystems at risk' within the 385 hectare application areas is fairly minimal. Only 20 hectares of native vegetation within the 385 hectare application areas will be cleared, therefore, the impact of the clearing on any 'ecosystem at risk' is likely to be minimal.

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

Methodology Biota (2006)
Robe River (2009)
GIS Database
- Threatened Ecological Communities (TECs)

(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 application areas fall within the Hamersley Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). Shepherd (2007) report that approximately 99.5% of the pre-European vegetation still exists in this Bioregion (see table below). The vegetation within the application areas is recorded as the following Beard Vegetation Associations (Shepherd, 2007):

Beard Vegetation Association 18: low woodland; mulga (*Acacia aneura*); and

Beard Vegetation Association 82: hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*.

According to Shepherd (2007) approximately 100% of both these vegetation associations remain within the bioregion (see table below).

Therefore, the vegetation within the application areas is not a significant remnant of native vegetation within an area that has been extensively cleared.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion - Pilbara	17,804,188	17,794,647	~99.5	Least Concern	6.32
Beard vegetation associations - State					
18	19,892,305	19,890,195	~100	Least Concern	2.1
82	2,565,901	2,565,901	~100	Least Concern	10.2
Beard vegetation associations - Bioregion					
18	676,557	676,557	~100	Least Concern	16.8
82	2,563,583	2,563,583	~100	Least Concern	10.2

* Shepherd (2007)
** 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)
Shepherd (2007)
GIS Database
- Interim Biogeographic Regionalisation for Australia

(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 numerous minor ephemeral drainage lines within the application areas (GIS Database). The application areas are located within an arid region with an average annual rainfall of approximately 413.3 millimetres (BoM, 2009) and an average annual evaporation rate of approximately 2,500 millimetres (ANRA, 2007). Based on the climate of the region these drainage lines are expected to be dry except following significant rain events which are typically associated with tropical cyclones.

Based on the above, the proposed clearing is at variance to this Principle. However, the vegetation units within the application area associated with watercourses are well represented locally and within the Pilbara region generally. Consequently, the proposed clearing is unlikely to have a significant impact at a regional scale given the widespread distribution of these vegetation units.

Methodology ANRA (2007)
BoM (2009)
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 areas are mapped as occurring within the Boolgeeda and Newman land systems (GIS Database).

The Boolgeeda Land System is described by Van Vreeswyk et al. (2004) as consisting of stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands and mulga shrublands. Van Vreeswyk et al. (2004) report that the vegetation of this system is generally not prone to degradation and the land system is not susceptible to erosion.

The Newman Land System consists of rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands. Van Vreeswyk et al. (2004) reports that 99% of this land system is not susceptible to soil erosion.

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

Methodology Van Vreeswyk et al. (2004)
GIS Database
- Rangelands System Mapping

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

Comments

Proposal is not likely to be at variance to this Principle

The proposed clearing is not located within any conservation areas (GIS Database). The nearest Department of Environment and Conservation (DEC) managed land is Karijini National Park located approximately 20 kilometres west of the application areas (GIS Database). The vegetation communities of the application areas are well represented throughout the region and have not been significantly cleared, therefore, the vegetation within the application areas is unlikely to act as a significant ecological linkage to the National Park.

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

Methodology

GIS Database
- CALM Managed Land and Waters

(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 there are numerous ephemeral watercourses within the areas applied to be cleared. The application areas are located within an arid region with an average annual rainfall of approximately 413.3 millimetres falling mainly during the summer months (BoM, 2009). Based on an average annual evaporation rate of approximately 2,500 millimetres, any surface water resulting from rain events is expected to be short-lived (ANRA, 2007).

The southern Pilbara region consists of sedimentary and volcanic rocks of the Hamersley basin (DoF, 2009). In this basin large amounts of groundwater are used for mining related purposes, principally from calcrete and pisolite valley fill aquifers (DoF, 2009). The clearing of 20 hectares, is not likely to have a significant impact upon surface or groundwater quality or groundwater quantity.

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

Methodology

ANRA (2007)
BoM (2009)
DoF (2009)

(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 areas are located within an arid region where the average annual evaporation rate greatly exceeds the average annual rainfall (BoM, 2009). Natural flood events do occur in the Pilbara region following cyclonic activity, however, based on the above, the proposed clearing of 20 hectares of native vegetation is not expected to increase the incidence or intensity of flood events particularly in comparison to the Ashburton River catchment area (7,877, 700 hectares) (GIS Database).

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

Methodology

BoM (2009)
GIS Database
- Hydrographic Catchments - catchments
- Hydrography, linear

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

Comments

There is one Native Title claim (WC 97/043) over the areas under application (GIS Database). This claim has been registered with the Native Title Tribunal on behalf of the claimant group. However, the 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*.

According to available databases there are numerous Aboriginal Sites of Significance within the application areas (site ID's: 18558, 20444, 20445, 20447, 20448 and 20449) (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.

There were no submissions received during the public comments period.

Methodology GIS Database
- Aboriginal Sites of Significance
- Native Title Claims

4. Assessor's comments

Comment

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

Should a permit be granted it is recommended that conditions be imposed for the purposes of weed management, rehabilitation, Priority flora management, record keeping and permit reporting.

5. References

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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.