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

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 6071/1
Permit type: Purpose Permit

1.2. Proponent details

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

1.3. Property details

Property: Mining Lease 59/744
Mining Lease 59/747
Miscellaneous Licence 59/144
Local Government Area: Shire of Yalgoo
Colloquial name: Mummaloo Haul Road

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
24.4		Mechanical Removal	Haul Road

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 11 December 2014

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description Beard vegetation associations have been mapped for the whole of Western Australia and are useful to look at vegetation in a regional context. The following Beard vegetation associations are located within the application area (GIS Database):

125: Bare areas; salt lakes;
141: Medium woodland; York gum, salmon gum and gimlet;
356: Succulent steppe with open woodland; eucalypts over saltbush;
437: Shrublands; Mixed acacia thicket on sandplain; and
552: Shrublands; *Casuarina acutivalvus* and *Calothamnus* (also *Melaleuca*) thicket on greenstone hills.

A flora and vegetation survey was undertaken over most of the application area by Enviro Works Consulting (Enviro) on 6 to 11 March 2014 (Enviro, 2014). Enviro (2014) identified the following six vegetation communities within the application area:

1. Community 1 – *Eucalyptus salmonophloia* Woodland: Open sometimes low woodland (to 20 metres) of *Eucalyptus salmonophloia* and *Eucalyptus loxophleba* subsp. *supralaevis* over medium shrubs of *Santalum acuminatum, Exocarpos aphyllus* and *Acacia anthochaera* over low shrubs of *Scaevola spinescens, Acacia tetragonophylla* and *Senna artemisioides* subsp. *filifolia* over a groundlayer of *Zygophyllum aurantiacum, Ptilotus exaltatus, Ptilotus obovatus* and *Sclerolaena cuneata.*

2. Community 2 – *Eucalyptus loxophleba* subsp *supralaevis* Woodland: A low to medium height (to 10 metres) open woodland of *Eucalyptus loxophleba subsp supralaevis* and *Callitris columellaris* over medium shrubs of *Senna artemisioides* subsp. *filifolia, Acacia acuminata* and *Exocarpos aphyllus* over low shrubs of *Dodonaea viscosa* subsp. *angustissima, Acacia assimilis* and *Olearia pimeloides* over a groundlayer of chenopods.

3. Community 3 – *Acacia* Shrubland: An open to dense low woodland of *Callitris columellaris/*shrubland, heathland and thicket of *Acacia acuminata w*ith occasional emergent *Eucalyptus loxophleba subsp supralaevis* over mixed shrubland of *Acacia* spp. over a ground flora of *Austrostipa elegantissima* and chenopods.

4. Community 4 – Casuarina Shrubland: An open to dense heathland, scrubland and thicket of *Allocasuarina tessellata* with low trees of *Melaleuca stereophloia* and *Acacia acuminata* over low shrubs of *Grevillea scabrida*, *Acacia tetragonophylla* and *Hemigenia dielsii* over a ground flora of annual herbs (not present at the time of field studies).

5. Community 5 – Sandplain Shrubland: A tree to shrub mallee of *Eucalyptus kochii* subsp. *plenissima and Eucalyptus leptopoda* subsp. *arctata* and *Eucalyptus loxophleba* subsp *supralaevis* over medium shrubs of *Hakea multilineata, Melaleuca conothamnoides, Melaleuca leiocarpa, Micromyrtus racemosa* over low shrubs of *Borya sphaerocephala* and *Dianella divaricata* over an annual ground flora (not present at the time of field studies).

6. Community 6 – Samphire Herbland/Scrubland: An open low to dwarf scrub of *Frankenia laxiflora*, *Tecticornia disarticulata*, *Gunniopsis calcarea*, *Gunniopsis quadrifidus, Disphyma crassifolium* and *Tecticornia* spp. with

occasional shrubs of *Melaleuca hamata* over an annual ground flora of grasses and daisies *(e.g. Angianthus preissianus).*

Clearing Description

Mummaloo Haul Road.
Top Iron Pty Ltd proposes to clear up to 24.4 hectares of native vegetation within a total boundary of approximately 25 hectares, for the purpose of constructing a haul road. The project is located approximately 70 kilometres north east of Wubin, in the Shire of Yalgoo.

Vegetation Condition

Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994);

To:

Completely Degraded: No longer intact; completely/almost completely without native species (Keighery, 1994).

Comment

The proposed clearing is for construction of a haul road that will connect the Mummaloo Iron Ore Project to the Great Northern Highway. The application area covers one of two haul road options being considered. The other haul road option is utilising the existing Mount Gibson Road approximately 500 to 1,000 metres north of the application area. A clearing permit (CPS 6007/1) has been granted by the Department of Environment Regulation for the clearing of up to 10.52 hectares for the widening and upgrading of this existing road should this haul road option be selected. Enviro (2014) states that the application area is the preferred location of the haul road as this is likely to have better safety outcomes as it will not be shared with the public.

Vegetation condition was determined by Enviro (2014).

Two alternative routes have been added in the eastern most portion of the application area giving an option of three different routes for this portion of the proposed haul road. The alternative routes were not included in the flora and vegetation survey (approximately 6.8 hectares not included) as these were added after the survey was completed (although the vegetation mapping does cover these areas). However, these areas were included in a Level 2 flora and vegetation survey undertaken by Enviro for the Mummaloo Iron Ore Mine site (survey area of 2,436 hectares) (Enviro, 2013). Fieldwork for this survey was conducted from 16 to 19 July and 24 to 29 October 2011, 12 to 19 August and 2 to 7 October 2012 and 17 to 20 March 2013 (Enviro, 2013).

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

Vegetation within the application area comprises *Eucalyptus loxophleba* var *supralaevis* and *E. salmonophloia* woodlands, shrublands and samphire herbland/scrubland. The woodlands were found on flat areas with surrounding hills covered by an open to dense, tall, multi-species shrubland dominated by *Acacia*, *Casuarina* and *Melaleuca* species (Enviro, 2014). *Acacia* and *Melaleuca* shrublands dominated flat areas lower in the landscape and closer to saline drainage and the samphire herbland/scrubland dominated the lower drainage system (Enviro, 2014).

Vegetation condition ranged from 'good' to 'completely degraded' but was mostly in a 'good' condition. Grazing by feral animals (goats, rabbits) and disturbance associated with tracks, garbage dumps and historical mining/exploration was noted (Enviro, 2014).

Available databases show no Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) are known to occur within the application area (GIS Database). The Mount Gibson Range vegetation complexes (banded ironstone formation (BIF)) PEC is located approximately 3 kilometres to the north of the application area (GIS Database). No TECs or PECs were located during the flora and vegetation survey (Enviro, 2014). Rocky slopes and ridgelines occur in the east of the application area, however, the area does not have any outcropping/exposed BIF rocks and is 100 metres lower in elevation than the BIF to the north (Enviro, 2014).

A total of 117 native plant species from 32 families and 69 genera were recorded by Enviro (2014). Two weed species were recorded within the survey area and were associated with disturbance (roadside, around rabbit warrens and tracks) (Enviro, 2014). The presence of introduced weed species lowers the biodiversity values of the proposed clearing areas. Potential impacts from weeds as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

No Threatened Flora are known to occur or were recorded in the application area (GIS Database; Enviro, 2014). The following four Priority Flora species were recorded within the application area (Enviro, 2014):

- *Allocasuarina tessellata* (Priority 1) – Grows on loam, sand above greenstone and dolerite boulders and is known from the Avon Wheatbelt, Coolgardie and Yalgoo bioregions (Enviro, 2014; Western Australian Herbarium, 2014). Recorded in the *Casuarina*/*Allocasuarina* shrubland in the eastern portion of the application area. According to Enviro (2014), this species is locally extensive and has an estimated population of 183,288 plants within Mining Lease 59/744 that will not be impacted by the Mummaloo mine site. Enviro (2014) estimates that 165 plants or 0.09% of the local population will be cleared.

- *Grevillea scabrida* (Priority 1) - Grows on red clay and stony loams and is known from the Avon Wheatbelt and Yalgoo bioregions (Enviro, 2014; Western Australian Herbarium, 2014). Recorded extensively in the

Casuarina/*Allocasuarina* shrubland in the eastern portion of the application area and is uncommon within other shrublands and the *Eucalyptus* woodlands. According to Enviro (2014), this species is locally extensive and has an estimated population of 390,352 plants within Mining Lease 59/744 that will not be impacted by the Mummaloo mine site. Enviro (2014) estimates that 130 plants or 0.03% of the local population will be cleared. The proposed clearing may also impact on another location recorded during the Enviro (2013) flora and vegetation survey.

- *Grevillea subtiliflora* (Priority 3) - Grows on red clay and stony loams and is known from the Avon Wheatbelt and Yalgoo bioregions (Enviro, 2014; Western Australian Herbarium, 2014). Recorded occasionally on hill crests and western slopes in the *Allocasuarina/Casuarina* community in the eastern portion of the application area. According to Enviro (2014), this species is locally extensive and has an estimated population of 41,861 plants within Mining Lease 59/744 that will not be impacted by the Mummaloo mine site. Enviro (2014) estimates that 45 plants or 0.1% of the local population will be cleared.

- *Persoonia pentasticha* (Priority 3) - Grows on loam, sand above greenstone and dolerite boulders and is known from the Avon Wheatbelt, Geraldton Sandplains and Yalgoo bioregions (Enviro, 2014; Western Australian Herbarium, 2014). Recorded sporadically throughout the woodlands and shrublands in the eastern portion of the application area. According to Enviro (2014), this species is locally extensive and has an estimated population of 13,612 plants within Mining Lease 59/744 that will not be impacted by the Mummaloo mine site. Enviro (2014) estimates that 10 plants or 0.07% of the local population will be cleared.

The Level 2 flora and vegetation survey undertaken for the Mummaloo Iron Ore Mine site also recorded the above Priority Flora species (Enviro, 2013). No other conservation significant flora species were recorded during this survey. According to Enviro (2014), the proposed haul road has been aligned at the eastern end to avoid most of the priority flora locations, however, given these species are common within the vegetation types at the eastern end of the proposed haul road it is not possible to completely avoid them. These species appear to be regionally resticted, however, Enviro (2013) notes that all species are locally extensive, covering an area of 900 to 1,400 hectares. Based on this, the proposed clearing of 24.4 hectares along a linear corridor is unlikely to have a significant impact on these species.

A Level 2 fauna survey conducted for the Mummaloo Iron Ore Mine site recorded a total of 80 vertebrate fauna species including 12 reptile, 50 bird and 18 mammal species (five introduced) (Phoenix Environmental Sciences Pty Ltd (Phoenix), 2012). This survey identified mixed open shrubland and open *Eucalyptus* woodland habitat within Mining Lease 59/744. The application area may also comprise habitat types associated with the sandplain shrubland and samphire herbland/scrubland vegetation types as these types do not appear to occur in vegetation mapping of Mining Lease 59/744 (Enviro, 2013; Enviro, 2014). None of these fauna habitats are considered unique in the local area.

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

Methodology

Enviro (2013)
Enviro (2014)
Phoenix (2012)
Western Australian Herbarium (2014)
GIS Database:
- Threatened and Priority Flora
- Threatened Ecological Sites Buffered

(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

Comments

Proposal may be at variance to this Principle

A fauna survey has not been undertaken for the proposed haul road, however, a Level 2 vertebrate fauna survey was undertaken by Phoenix Environmental Sciences Pty Ltd (Phoenix) over Mining Lease 59/744 for the Mummaloo Iron Ore Mine site (Phoenix, 2012). Mining Lease 59/744 contains similar vegetation types to those in the application area (Enviro, 2013; Enviro, 2014) and the eastern end of the application area occurs within Mining Lease 59/744. The Level 2 fauna survey is therefore considered applicable to the application area. The field work for this survey was undertaken from 28 May to 6 June 2012 (Phoenix, 2012). The survey also included Targeted Malleefowl (*Leipoa ocellata*) (Vulnerable; Schedule 1) and Western Spiny-tailed Skink (*Egernia stokesii badia*) (Vulnerable; Schedule 1) searches.

Additional targeted Malleefowl and Western Spiny-tailed Skink searches were also undertaken for the Mummaloo Iron Ore Mine site. This included a targeted Malleefowl survey by Enviro and a targeted fauna assessment focusing on the Malleefowl and Western Spiny-tailed Skink by Bamford Consulting Ecologists (BCE). The Enviro survey was conducted over 290 hectares in the eastern portion of Mining Lease 59/744 from the 13 to 19 August 2012 (Enviro, 2012). The BCE survey was conducted over 330 hectares in areas located within and outside of Mining Lease 59/744 from the 21 to 25 October 2012 (BCE, 2013). The BCE survey also included opportunistic observations of other fauna species.

The Level 2 fauna survey (Phoenix, 2012) identified the following two fauna habitats in Mining Lease 59/744:

- Mixed open-dense shrublands (473.1 hectares): The density and height of shrubs is variable with both dense and open patches. The understorey cover is poor in most areas due to grazing by livestock and introduced herbivores (goats) and a drought period during the previous decade. The substrate is a red/brown loam and clay strewn with stones/pebbles/gravel in some areas.
- Open *Eucalyptus* woodland (420.4 hectares): the vegetation structure is largely open with poor understorey cover over a red/brown loam and clay. Some minor rocky breakaways occur in the south east.

The application area may also comprise habitat types associated with the sandplain shrubland and samphire herbland/scrubland vegetation types as these types do not appear to occur in vegetation mapping of Mining Lease 59/744 (Enviro, 2013; Enviro, 2014). None of these fauna habitats are considered unique in the local area.

The Level 2 fauna survey recorded a total of 80 vertebrate fauna species including 12 reptile, 50 bird and 18 mammal species (five introduced) (Phoenix, 2012). BCE (2013) recorded a total of 88 fauna species during opportunistic fauna sightings including 11 reptile, 67 bird and 10 mammal (six introducted) species. A total of five conservation significant fauna species were recorded during these surveys including the Malleefowl, Rainbow Bee-eater (*Merops ornatus*) (Migratory; Schedule 3), Major Mitchell's Cockatoo (*Cacatua leadbeateri*) (Schedule 4), Australian Bustard (*Ardeotis australis*) (Priority 4) and the Crested Bellbird (potentially the *Oreoica gutturalis gutturalis* subspecies which is listed as Priority 4). The Western Spiny-tailed Skink is also known from the general area (BCE, 2013) and has been recorded within 10 kilometres of the application area (DEC, 2014).

A total of 17 Malleefowl mounds have been recorded during the Phoenix (2012), Enviro (2012) and BCE (2013) surveys. This includes two active mounds, 4 recently active mounds and 11 inactive mounds. Tracks, feathers and individuals have also been observed. Malleefowl mounds were generally recorded within dense shrublands in sandy-loam, gravelly loam and rocky soils from the crests and slopes of ridges to flat sandplains (BCE, 2013). The Eucalypt woodland on loam and clay appear to be unsuitable for Malleefowl mounds (BCE, 2013). Using high quality aerial photography and site survey observations, BCE (2013) mapped a total of 13,090 hectares of preferred Malleefowl breeding habitat (dense shrubland) within a 15 kilometre radius of the Mummaloo mine site development envelope. This mapping shows the majority of the application area does not comprise preferred Malleefowl breeding habitat, however, there are some areas of preferred breeding habitat in the eastern and western sections of the application area. Impacts to Malleefowl may be minimised by the implementation of a fauna management condition.

Despite extensive searches no records of the Western Spiny-tailed Skink or its obvious scat mounds were identified during the Phoenix (2012), Enviro (2012) and BCE (2013) surveys. BCE (2013) states the skink occurs in eucalypt woodland with “considerable numbers of large fallen logs over 25 centimetres in diameter” (How et al. 2003) (cited in BCE, 2013). BCE (2013) has typically found the skink in York Gum Woodland in the region. BCE (2013) adds that the skink does require an intact understorey as well as log-piles for shelter and it is possible that the grazing history of the site has led to the local extinction of the species. BCE (2013) considered areas observed during the survey as unlikely to be preferred habitat for the skink due to the lack of large piles of logs and the general sparse understorey of the Eucalypt woodlands as well as the dominance of Salmon Gum woodlands as opposed to York Gum woodlands. Salmon Gum and York Gum woodlands have been mapped within the application area, however, these comprise only a small portion of the application area (Enviro, 2014). Given the skink was not detected within Mining Lease 59/744 and the small amount of woodlands present, it is unlikely the application area comprises significant habitat for this species.

Several Major Mitchell's Cockatoo individuals were observed by BCE (2013) within and outside of Mining Lease 59/744. Major Mitchell’s Cockatoo is found in open woodlands with tall eucalyptus in the proximity of water and nests in large tree hollows, usually river gums and Salmon gums (BCE, 2013). Enviro (2014) identified two habitat trees during the flora and vegetation survey, however, these do not occur within the proposed haul road alignment. The two alternative routes added in the eastern most portion of the application area were not included in this survey (6.8 hectares not included) and may, therefore, contain habitat trees. However, most of this additional area is mapped as *Casuarina* shrubland (Enviro, 2014) and given the large amount of Eucalypt woodland in the surrounding area (BCE, 2013), it is unlikely the proposed clearing will have a significant impact on this species.

Several other conservation significant fauna species may also occur in the Mummaloo area (Phoenix, 2012), however, given the local area is largely uncleared these species are unlikely to be reliant on habitat within the application area.

A short range endemic (SRE) survey was undertaken by Bennelongia Pty Ltd (Bennelongia) for the Mummaloo Iron Ore Mine site (Bennelongia, 2012). The field survey was undertaken from 30 April to 3 May, 2 to 4 July and 7 August to 16 August 2012 and included survey sites within and outside of Mining Lease 59/744. It also included a targeted Shield-backed Trapdoor Spider (*Idiosoma nigrum*) (Vulnerable; Schedule 1) survey. The survey did not identify any definite or highly likely SRE species, however, 14 possible Rank 1 SREs were recorded (Bennelongia, 2012). Possible Rank 1 SRE assignments are precautionary and there is considerable doubt that such species meet SRE criteria as it usually reflects the fact that the species is known from very few specimens and is probably an artefact of lack of sufficient information about the species range (Bennelongia, 2012). On the basis of habitat connectivity extending outside Mummaloo, Bennelongia (2012) considered it unlikely that any of these species would be restricted to Mummaloo.

A total of 159 Shield-backed Trapdoor Spider burrows were recorded over a range of 22 kilometres by Bennelongia (2012). One record of the spider appears to be in close proximity to the application area. The spider was recorded in 15 of the 52 quadrats surveyed with the species mostly recorded in mixed species shrubland, although it was more abundant in the three records within eucalypt woodlands (Bennelongia, 2012). Anecdotal evidence suggests the species prefers areas of vegetation heterogeneity where eucalypt woodlands and mixed species shrubland mix (Brad Durrant, Biologic, pers. comm.) (cited in Bennelongia, 2012). As these habitats are present within the application area, it is likely the species will be present and impacted by the proposed clearing. However, the eucalypt woodlands and mixed species shrubland are widespread and well connected and extensive beyond Mummaloo (Bennelongia, 2012). The potential habitat within the application area is, therefore, likely to represent a small proportion of potential habitat within the local area. Based on this, it is unlikely the proposed clearing of 24.4 hectares for a haul road will impact on the species conservation status.

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

Methodology
BCE (2013)
Bennelongia (2012)
DEC (2014)
Enviro (2012)
Enviro (2013)
Enviro (2014)
Phoenix (2012)
Top Iron Pty Ltd (2014)

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

Comments

Proposal is not likely to be at variance to this Principle

According to available databases, there are no known records of Threatened Flora within the application area (GIS Database). There is one record of Threatened Flora species *Eucalyptus synandra* approximately 680 metres north of the application area (Enviro, 2014; DEC, 2014; GIS Database). Enviro (2014) could not locate this record despite searching the area thoroughly and believes the location was reported incorrectly as the habitat is atypical for the species.

No Threatened Flora species were recorded during the Enviro (2013) and Enviro (2014) flora and vegetation surveys.

Clearing permit CPS 6007/1 covers the other haul road option of utilising the existing Mount Gibson Road approximately 500 to 1,000 metres north of the application area. The decision report for this permit (Department of Environment Regulation (DER), 2014) is considered applicable to the application area as the Enviro (2014) survey was conducted for both haul road options and mapped the same vegetation types in the CPS 6007/1 permit area as in the application area. The decision report (DER, 2014) states that several rare flora species have been mapped within the local area, however, all except two species are located within different vegetation community types to those of the permit area and that had these two species been present within the survey area, they should have been identifiable, especially given the rainfall during the two months prior to the survey period (Department of Parks and Wildlife, 2014) (cited in DER, 2014).

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

Methodology
DEC (2014)
DER (2014)
Enviro (2013)
Enviro (2014)
GIS Database:
- Threatened and Priority Flora

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

Comments

Proposal is not likely to be at variance to this Principle

According to available databases, there are no known Threatened Ecological Communities (TECs) within the application area (GIS Database). The nearest known TEC is approximately 75 kilometres north west of the application area (GIS Database).

No TECs were recorded during the Enviro (2013) and Enviro (2014) flora and vegetation surveys.

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

Methodology
Enviro (2013)
Enviro (2014)
GIS Database:

- Threatened Ecological Sites Buffered

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Comments

Proposal is not likely to be at variance to this Principle

The application area falls within the Avon Wheatbelt Biogeographic Regionalisation of Australia (IBRA) bioregion in which approximately 18.7% of the pre-European vegetation remains (see table below) (GIS Database, Government of Western Australia, 2013). According to the 'Bioregional Conservation Status of Ecological Vegetation Classes' (Department of Natural Resources and Environment, 2002), this value gives the region a Conservation Status of 'Vulnerable'.

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

125: Bare areas; salt lakes;
141: Medium woodland; York gum, salmon gum and gimlet;
356: Succulent steppe with open woodland; eucalypts over saltbush;
437: Shrublands; Mixed acacia thicket on sandplain; and
552: Shrublands; *Casuarina acutivalvus* and *Calothamnus* (also *Melaleuca*) thicket on greenstone hills.

With the exception of vegetation association 125, over 30% of these vegetation associations remain at a state, bioregional and subregional level (see table below) (Government of Western Australia, 2013). Approximately 90.2%, 9.8% and 9.2% of Beard vegetation association 125 remains at a state, bioregional and subregional level, respectively. The bioregional and subregional levels for Beard vegetation association 125 are below the 30% threshold level recommended in the National Objectives Targets for Biodiversity Conservation below which, species loss appears to accelerate exponentially at an ecosystem level (EPA, 2000).

Beard vegetation association 125 is described as bare areas; salt lakes. Enviro (2014) mapped two areas of salt lakes, however, these occurred outside the application area. These salt lakes were surrounded by samphire herbland/scrubland which were mapped within the application area. This indicates that the regional vegetation description is not representative of vegetation mapped over the application area during the flora and vegetation surveys.

A review of aerial imagery shows that the surrounding local area is largely uncleared and that the application area occurs approximately 30 kilometres from the extensively cleared portion of the Avon Wheatbelt (GIS Database). The application area is, therefore, not considered to be located within an area that has been extensively cleared.

Whilst the representation of some Beard vegetation associations is poor, the application area is not considered a remnant within an area that has been extensively cleared.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Extent in DPaW Managed Lands %* (and post clearing %)
IBRA bioregion – Avon Wheatbelt	9,517,110	1,778,407	~18.69	Vulnerable	~2.37 (~9.62)
IBRA Subregion - Merredin	6,524,180	1,368,789	~20.98	Vulnerable	~2.50 (~9.12)
Local Government - Yalgoo	2,794,952	2,733,274	~97.79	Least Concern	~22.51 (~23.01)
Beard vegetation associations - State					
125	3,485,787	3,146,091	~90.25	Least Concern	~8.95 (~8.07)
141	1,158,760	960,758	~82.91	Least Concern	~32.67 (~39.37)
356	4,330	2,113	~48.81	Depleted	~3.67 (~4.77)
437	505,362	475,025	~94.00	Least Concern	~15.23 (~16.20)
552	33,909	31,669	~93.40	Least Concern	~0.90 (~0.95)
Beard vegetation associations - Bioregion					
125	167,448	16,356	~9.77	Endangered	~20.04 (~20.25)
141	250,615	77,323	~30.85	Depleted	~0.49 (~1.47)
356	4,330	2,113	~48.81	Depleted	~3.67 (~4.77)
437	174,686	144,375	~82.65	Least Concern	~1.80 (~2.17)
552	11,348	11,264	~99.26	Least Concern	0 (0)
Beard vegetation associations - Subregion					

125	148,564	13,695	~9.22	Endangered	~ 16.48 (~12.78)
141	250,615	77,323	~30.85	Depleted	~0.49 (~1.47)
356	4,330	2,113	~48.81	Depleted	~3.67 (~4.77)
437	174,686	144,375	~82.65	Least Concern	~1.80 (~2.17)
552	11,348	11,264	~99.26	Least Concern	0 (0)

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

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)
Enviro (2014)
EPA (2000)
Government of Western Australia (2013)
GIS Database:
- IBRA WA (Regions - Sub Regions)
- Mount Gibson 80cm Orthomosaic - Landgate 2005
- Pre-European Vegetation

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

Comments **Proposal is not likely to be at variance to this Principle**
According to available databases, there are no watercourses or wetlands within the application area (GIS Database). There are two small non-perennial salt lakes approximately 150 and 250 metres from the application area (Enviro, 2014; GIS Database). One vegetation community type (Community 6 – samphire herbland/scrubland) was mapped on flats, drainage lines and floodplain, however, Enviro (2014) states that no mapped drainage lines cross the proposed haul road.

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

Methodology Enviro (2014)
GIS Database:
- Hydrography, linear

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

Comments **Proposal may be at variance to this Principle**
The application area has been mapped as occurring on the Doney, Gabanintha, Joseph and Moriarty land systems (GIS Database). The Doney and Joseph land systems are generally not prone to erosion (Payne et al., 1998). Slopes of low rises without protective stone mantles, alluvial plains and narrow drainage tracts within the Moriarty land system are moderately susceptible to water erosion, particularly if perennial shrub cover is substantially reduced or the soil surface is disturbed (Payne et al., 1998). Stone mantles afford protection against soil erosion in the Gabanintha land system, however, narrow drainage tracts are mildly susceptible to water erosion (Payne et al., 1998). Based on the above, there is a potential for erosion to occur. Potential impacts from erosion as a result of the proposed clearing may be minimised by the implementation of a staged clearing condition.

Enviro (2014) states that the proposed haul road will be designed with appropriate culverts to allow stormwater to pass underneath the road in areas where stormwater may pond.

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

Methodology Enviro (2014)
Payne et al. (1998)
GIS Database:
- Rangeland Land 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 application area does not lie within any Department of Parks and Wildlife managed lands or formal conservation reserve system (GIS Database). However, a part of the application area is within the Mount Gibson Pastoral Lease which was purchased by the Australian Wildlife Conservancy (AWC) in 2001 and is now being privately managed for conservation purposes (EPA, 2013). According to the AWC (2014), Mount Gibson

occupies approximately 132,500 hectares.

The Environmental Protection Authority (EPA) assessed the Mummaloo Iron Ore Mine site proposal under Part IV of the *Environmental Protection Act 1986* (EPA, 2013). The EPA identified terrestrial fauna as a key environmental factor and considered that the clearing of 300 hectares of terrestrial fauna habitat for the proposal would have significant adverse impacts on the representation of fauna as it would involve the loss of an area being privately managed for conservation purposes (EPA, 2013). The EPA (2013) concluded that an offset would be required to counterbalance the significant residual impacts to terrestrial fauna and habitat. The proposal has been approved subject to funds being provided to the AWC for use in projects related to conservation of terrestrial fauna habitat (EPA, 2013).

The size of the application area (25 hectares) is small compared to the size of Mount Gibson (approximately 132,500 hectares) and there is existing disturbance in the area including a public road that runs parallel to the application area (from approximately 500 metres north of the application area). The proposed clearing will involve further loss of terrestrial fauna habitat in the Mummaloo area. However, the addition of up to 24.4 hectares of clearing to the 300 hectares of clearing approved for the Mummaloo Iron Ore Mine site is unlikely to result in significant additional environmental impacts. Considering the above, the proposed clearing is not expected to have a significant impact on the environmental values of the Mount Gibson Pastoral Lease.

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

Methodology
AWC (2014)
EPA (2013)
GIS Database:
- DEC Tenure

(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).

There are no waterbodies or watercourses within the application area, although there are two small non-perennial salt lakes approximately 150 and 250 metres from the application area (GIS Database). The annual average rainfall for Dalwallinu (80 kilometres south west) is 283.7 millimetres and the average annual evaporation rate for the application area is between 2,800 and 2,900 millimetres (BoM, 2014; GIS Database). Based on these averages, any surface water within the application area is likely to only remain for short periods following significant rainfall events.

Enviro (2014) states no mapped drainage lines cross the proposed haul road. The proposed haul road will be designed with appropriate culverts to allow stormwater to pass underneath the road in areas where stormwater may pond (Enviro, 2014).

According to available databases, groundwater salinity within the application area is between 7,000 and 14,000 milligrams/Litre Total Dissolved Solids (TDS) (GIS Database). This is considered saline. The proposed clearing is not expected to cause groundwater salinity levels within the application area to alter.

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

Methodology
BoM (2014)
Enviro (2014)
GIS Database:
- Evaporation Isopleths
- Groundwater Salinity, Statewide
- Hydrography, linear
- Public Drinking Water Source Areas (PDWSAs)

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

Comments

Proposal is not likely to be at variance to this Principle

The application area is located within the Yarra Monger catchment area (GIS Database). Given the size of the area to be cleared (24.4 hectares) in relation to the size of the catchment area (4,182,476 hectares) (GIS Database), the proposed clearing is not likely to increase the potential of flooding on a local or catchment scale.

With an average annual rainfall of 283.7 millimetres at Dalwallinu and an average annual evaporation rate of between 2,800 and 2,900 millimetres for the application area there is likely to be little surface flow during normal seasonal rains (BoM, 2014; GIS Database). Whilst large rainfall events may result in flooding of the area, the proposed clearing is not likely to lead to an increase in incidence or intensity of flooding.

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

Methodology BoM (2014)
GIS Database:
- Evaporation Isopleths
- Hydrographic Catchments - Catchments

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

Comments

There is one native title claim over the area under application: WC2012/005 (GIS Database). This claim has been filed and registered with the Native Title Tribunal on behalf of the claimant groups. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore the granting of a clearing permit is not a future act under the *Native Title Act 1993.*

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

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

The clearing permit application was advertised on 28 April 2014 by the Department of Mines and Petroleum inviting submissions from the public. The application was readvertised for seven days on 19 May 2014 following an increase in the area and amount of clearing being applied for. No submissions were received during either advertising periods.

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

4. References

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Enviro (2012) Targeted Malleefowl Survey - Mummaloo. Unpublished report prepared by EnviroWorks Consulting for Top Iron Pty Ltd. Dated 7 September 2012.

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Phoenix (2012) Vertebrate fauna survey of the Mummaloo Project. Unpublished report prepared by Phoenix Environmental Sciences for Top Iron Pty Ltd. Dated August 2012.

Top Iron Pty Ltd (2014) Further Information provided by Top Iron Pty Ltd for clearing permit application CPS 6071/1 on 9 and 13 June and 21 July 2014.

Western Australian Herbarium (2014) FloraBase - the Western Australian Flora. Department of Parks and Wildlife. http://florabase.dpaw.wa.gov.au/.

5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
DAA	Department of Aboriginal Affairs, Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia (now DPaW and DER)
DER	Department of Environment Regulation, Western Australia
DMP	Department of Mines and Petroleum, Western Australia
DRF	Declared Rare Flora
DotE	Department of the Environment, Australian Government
DoW	Department of Water, Western Australia
DPaW	Department of Parks and Wildlife, Western Australia
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities (now DotE)
EPA	Environmental Protection Authority, Western Australia
EP Act	*Environmental Protection Act 1986*, Western Australia
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
PEC	Priority Ecological Community, Western Australia
RIWI Act	*Rights in Water and Irrigation Act 1914*, Western Australia
s.17	Section 17 of *the Environment Protection Act 1986*, Western Australia
TEC	Threatened Ecological Community

Definitions:

{DPaW (2013) Conservation Codes for Western Australian Flora and Fauna. Department of Parks and Wildlife, Western Australia}:-

T — **Threatened species:**
Specially protected under the *Wildlife Conservation Act 1950,* listed under Schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna or the Wildlife Conservation (Rare Flora) Notice for Threatened Flora (which may also be referred to as Declared Rare Flora).

Threatened Fauna and Flora are further recognised by the Department according to their level of threat using IUCN Red List criteria. For example Carnaby's Cockatoo *Calyptorynchus latirostris* is specially protected under the *Wildlife Conservation Act 1950* as a threatened species with a ranking of Endangered.

Rankings:
CR: Critically Endangered - considered to be facing an extremely high risk of extinction in the wild.
EN: Endangered - considered to be facing a very high risk of extinction in the wild.
VU: Vulnerable - considered to be facing a high risk of extinction in the wild.

X — **Presumed Extinct species:**
Specially protected under the *Wildlife Conservation Act 1950,* listed under Schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice for Presumed Extinct Fauna and Wildlife Conservation (Rare Flora) Notice for Presumed Extinct Flora (which may also be referred to as Declared Rare Flora).

IA — **Migratory birds protected under an international agreement:**
Specially protected under the *Wildlife Conservation Act 1950,* listed under Schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice.
Birds that are subject to an agreement between governments of Australia and Japan, China and The Republic of Korea relating to the protection of migratory birds and birds in danger of extinction.

S — **Other specially protected fauna:**
Specially protected under the *Wildlife Conservation Act 1950,* listed under Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice.

P1 — **Priority One - Poorly-known species:**
Species that are known from one or a few collections or sight records (generally less than five), all on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, Shire, rail reserves and Main Roads WA road, gravel and soil reserves, and active mineral leases and under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under immediate threat from known

threatening processes.

P2 **Priority Two - Poorly-known species:**
Species that are known from one or a few collections or sight records, some of which are on lands not under imminent threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, unallocated Crown land, water reserves, etc. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes.

P3 **Priority Three - Poorly-known species:**
Species that are known from collections or sight records from several localities not under imminent threat, or from few but widespread localities with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and known threatening processes exist that could affect them.

P4 **Priority Four - Rare, Near Threatened and other species in need of monitoring:**
(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands.
(b) Near Threatened. Species that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.
(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

P5 **Priority Five - Conservation Dependent species:**
Species that are not threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.