



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 3012/2
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: BHP Billiton Iron Ore Pty Ltd

1.3. Property details

Property: Iron Ore (Mount Newman) Agreement Act 1964, Mineral Lease 244SA (AML 70/244)
Local Government Area: Shire of East Pilbara
Colloquial name: Eastern Pilbara Accommodation Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
180		Mechanical Removal	Construction of accommodation village, associated infrastructure and conducting geotechnical investigations.

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. Three Beard Vegetation Associations are located within the application area (GIS Database):

Beard Vegetation Association 18 - Low woodland; Mulga (*Acacia aneura*);

Beard Vegetation Association 29 - Sparse low woodland; Mulga, discontinuous in scattered groups; and

Beard Vegetation Association 82 - Hummock grasslands, low tree steppe; Snappy Gum over *Triodia wiseana* (Shepherd, 2007).

Outback Ecology (2009) undertook a flora and vegetation survey of the proposed Eastern Pilbara Accommodation Village project area between 30 October and 4 November 2008. Sixteen vegetation communities were described from five vegetation associations:

Vegetation Association 1: Acacia Shrublands over Triodia spp. on slopes and crests.

1. AiHpTb

Acacia inaequilatera Scattered Tall Shrubs over *Hakea preissii* Low Open Shrubland over *Triodia brizoides* Hummock Grassland;

2. ApGTb

Acacia paraneura, *Grevillea wickhamii* Scattered Tall Shrubs over *Maireana georgii* Scattered Low Shrubs over *Triodia basedowii* Hummock Grassland;

3. AbTb

Acacia bivenosa Low Open Shrubland over *Triodia basedowii* Hummock Grassland;

4. AbAaTb

Acacia tetragonophylla, *A. aneura* var. *tenuis*, *A. bivenosa*, *A. citrinoviridis* Scattered Tall Shrubs over *Eremophila cuneifolia* Open Shrubland over *Triodia basedowii* Open Hummock Grassland; and

5. AmTb

Acacia marramamba Scattered Tall Shrubs over *Triodia brizoides* Closed Hummock Grassland.

Vegetation Association 2: Scattered trees of Corymbia and Eucalyptus spp. over Acacia shrublands on slopes.

6. ChAb

Corymbia hamersleyana Scattered Low Trees over mixed Acacia Tall Open Shrubland over mixed Open Shrubland over *Acacia bivenosa* Low Open Shrubland over Scattered Tussock Grasses; and

7. EgAcTb

Eucalyptus gamophylla Scattered Low Trees over *Acacia hilliana*, *Keraudrinia velutina* Low Closed Shrubland over *Triodia brizoides* Closed/Hummock Grassland.

Vegetation Association 3: Acacia Shrubland on plains.

8. AaAi

Acacia aneura var. *tenuis* Low Woodland over mixed shrubland over *Aristida inaequiglumis*, *Eragrostis eriopoda* Open Tussock Grassland;

9. Ac

Acacia aneura var. *aneura*, *A. citrinoviridis* Tall Open Shrubland over mixed shrubs;

10. AaPTb

Acacia aneura var *aneura*, *Petalostylis labicheoides* Tall Open Shrubland over *Acacia bivenosa*, *A. tetragonophylla*, *Anthobolus leptomeroides* Very Open Shrubland over *Triodia basedowii* Hummock Grassland;

11. AcpTb

Acacia citrinoviridis, *A. pruinocarpa*, *A. pachyachra* Tall Open Shrubland over *Acacia aneura*, *Eremophila forrestii* subsp. *forrestii* Low Open Shrubland over *Triodia basedowii* Open Hummock Grassland; and

12. AaTe

Acacia aneura var *tenuis* Low Woodland/Open Forest over mixed Scattered Shrubs over *Triodia epactia* Scattered Hummock Grasses.

Vegetation Association 4: Corymbia and Eucalyptus spp. over Acacia shrublands in drainage lines.

13. CaAcAi

Corymbia aspera Woodland/Open Woodland over *Acacia citrinoviridis* Tall Open Shrubland over *Acacia aneura* Closed Heath over *Aristida inaequiglumis*, *Eragrostis eriopoda* Very Open Tussock Grassland; and

14. ExAAiTh

Eucalyptus xerothermica Scattered Low Trees over *Acacia citrinoviridis*, *A. pruinocarpa*, *A. pyrifolia*, *Hakea lorea* subsp. *lorea*, *Petalostylis labicheoides* Tall Open Shrubland over *Psychrax latifolia*, *Eremophila forrestii* subsp. *forrestii* Open Shrubland over *Aristida inaequiglumis*, *Themeda triandra* Open Tussock Grassland.

Vegetation Association 5: Acacia shrublands over Triodia spp. and Tussock grasses in drainage lines.

15. AabTe

Acacia ancistrocarpa, *A. monticola* Tall Open Shrubland over *Triodia epactia* Hummock Grassland; and

16. MaPte

Mixed Acacia shrubs (*A. citrinoviridis*, *A. ancistrocarpa*, *A. bivenosa*), *Petalostylis labicheoides* Closed Shrubland over Scattered Tussock Grasses and *Triodia epactia*.

Clearing Description

BHP Billiton Iron Ore Pty Ltd (hereafter referred to as BHP Billiton) have applied for a Purpose Permit to clear up to 180 hectares of native vegetation within an application area of approximately 493 hectares. The proposed clearing will allow the proponent to construct the Eastern Pilbara Accommodation Village and associated infrastructure, as well as conduct geotechnical investigations.

Vegetation clearing will be undertaken using mechanical means, with cleared topsoil and vegetation to be stockpiled for use in rehabilitation (BHP Billiton, 2009).

Vegetation Condition

Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (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 Outback Ecology (2009).

On 23 April 2009, the Department of Mines and Petroleum (DMP) granted a clearing permit (CPS 3012/1) to BHP Billiton Iron Ore Pty Ltd to clear up to 150 hectares of native vegetation within an application area of 493 hectares. The permit was granted for the purpose of constructing an accommodation camp and associated infrastructure, and conducting geotechnical investigations.

As a result of recent infrastructure design changes, additional geotechnical investigations, additional safety requirements for traffic and a greater volume of fill material needed to complete earthworks, BHP Billiton Iron Ore Pty Ltd has sought an amendment to CPS 3012/1 to increase the clearing allocation from 150 hectares to 180 hectares. All of the proposed additional clearing will be undertaken within the existing approved CPS 3012/1 boundary of 493 hectares.

3. Assessment of application against clearing principles

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Comments

Proposal is not likely to be at variance to this Principle

The proposed clearing area is located approximately 30 kilometres east of Newman, occurring at the junction of the Fortescue Plains and Augustus subregions of the Pilbara and Gascoyne Interim Biogeographic Regionalisation for Australia (IBRA) bioregions respectively (GIS Database). The Fortescue Plains subregion is characterised by alluvial plains and river frontage (CALM, 2002a). Extensive salt marsh, bunch grass and short grass communities on alluvial plains are dominant features in the east of the subregion, whilst deeply incised gorges exist in the lower west (CALM, 2002a). Large permanent wetlands supporting river gum communities are a feature of the central Fortescue (CALM, 2002a).

The Augustus subregion is characterised by extensive areas of alluvial valley-fill deposits. Mulga woodland with *Triodia* spp. occurs on shallow stony loams on rises, while the shallow earthy loams over hardpan on the plains are covered by Mulga parkland (CALM, 2002b).

Outback Ecology (2009) recorded 115 flora taxa from 23 families and 44 genera during a flora and vegetation survey of the proposed clearing area. Eleven specimens could not be identified beyond genus level. The most dominant genera were *Acacia* (23 taxa), *Senna* (12 taxa), *Eremophila* (8 taxa) and *Ptilotus* (6 taxa). No information was provided to allow a comparison to other similar sized surveys elsewhere in the bioregion, however Outback Ecology (2009) note that the vegetation of the proposed clearing area is predominantly *Acacia* shrubland and the ecosystems present in the proposed clearing area are widely represented in the bioregion. Outback Ecology (2009) report that the native vegetation in the proposed clearing area is not likely to contain a higher diversity of terrestrial flora species than other examples of the same vegetation communities elsewhere in the bioregion.

No introduced flora species were recorded within the proposed clearing area (Outback Ecology, 2009). Weeds can threaten biodiversity in a number of ways, including competition with native plant taxa for resources and increasing the fire risk of the area. Care must be taken to ensure that the proposed clearing activities do not introduce weed species to the project area. Cleaning earth moving machinery of soil and vegetation prior to entering the project area is one way to prevent the introduction of weed species. It is recommended that appropriate hygiene conditions be imposed, should a clearing permit be granted.

From a faunal perspective, the proposed clearing area is expected to support a similar vertebrate fauna assemblage to other areas of native vegetation in the bioregion (Outback Ecology, 2009). Four broad habitat types are present within the proposed clearing area, all of which are well represented throughout the Pilbara bioregion (Outback Ecology, 2009).

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

Methodology

CALM (2002a).
CALM (2002b).
Outback Ecology (2009).
GIS Database:
- IBRA WA (Regions – Sub Regions).

(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

Outback Ecology (2009) undertook a desktop vertebrate fauna assessment of the proposed clearing area. The desktop fauna assessment involved searching databases and consulting relevant literature to generate a potential vertebrate fauna species inventory for the proposed clearing area. Databases and publications consulted included:

- DEC's NatureMap database;
- DEC's Threatened and Priority Fauna Database;
- The Protected Matters Search Tool;
- The Birds Australia database;
- The Department of Environment, Water, Heritage and the Arts (DEWHA) Australian Faunal Directory

- Database;
- DEWHA's Species Profile and Threats Database;
- The Australian Wetlands Database;
- The Australian Natural Resources Atlas;
- The International Union for the Conservation of Nature (IUCN) Red List of Threatened Species;
- Field guides for birds, mammals, reptiles and amphibians; and
- Fifteen previous fauna surveys conducted in the surrounding Jimblebar area.

Desktop studies identified 297 vertebrate fauna species as potentially occurring in the Jimblebar region. A total of 251 species have previously been recorded in studies from Jimblebar to Ophthalmia Dam, including 121 bird species, 81 reptile species, 37 mammal species, 10 amphibian species and 2 species of fish. Only a portion of these would be expected to utilise habitat in the proposed clearing area (Outback Ecology, 2009).

Previous fauna surveys, aerial photography, broad habitat maps and the findings of the flora and vegetation survey conducted between 30 October and 4 November 2008 were used to describe the broad fauna habitats of the proposed clearing area (Outback Ecology, 2009).

On the basis of the desktop study, four broad habitats were identified within the proposed clearing area:

1. Mulga Woodland;
2. Open Shrub Plain;
3. Low Hill Crest; and
4. Drainage Line.

Mulga and mixed Acacia woodlands are often rich in bird species, and this habitat type is used for shelter, breeding and foraging. Mulga woodlands typically support soft substrates that are suitable for digging for many mammal and reptile species (Outback Ecology, 2009).

Open Shrub Plain comprises the greater part of the proposed clearing area. This habitat type provides important feeding and breeding grounds for reptiles and ground dwelling mammals (Outback Ecology, 2009). The Open Shrub Plain within the proposed clearing area supports soft sandy substrates that may be used for burrowing by various mammal and reptile species (Outback Ecology, 2009).

Low Hill Crest habitat covers a smaller portion of the proposed clearing area (approximately 15%). Spinifex vegetation of this habitat type provides shelter and foraging opportunities for small mammals and reptiles. The Western Pebble-mound Mouse is found in this habitat (Outback Ecology, 2009).

Drainage lines potentially support a high number of fauna species, providing important microhabitats for birds, reptiles and mammals. Drainage lines can also act as corridors for fauna movement and dispersal (Outback Ecology, 2009). Sandy substrates and leaf litter are characteristics of drainage line habitat that are important for feeding, breeding and shelter.

The proposed clearing will inevitably have some impact upon fauna species, and Outback Ecology (2009) lists direct mortality of animals and habitat loss as the main impacts. However, none of the habitats identified within the proposed clearing area are of significance, and habitats are well represented throughout the region. The vertebrate fauna assemblage likely to be present in the proposed clearing area is similar to other regional sites (Outback Ecology, 2009).

With respect to conservation significant vertebrate fauna, it is noted that a number of species may potentially occur in the proposed clearing area. This includes:

1. Rainbow Bee-eater (*Merops ornatus*), listed as 'Migratory' under the *Environment Protection and Biodiversity Conservation Act 1999*;
2. Peregrine Falcon (*Falco peregrinus*), listed as Schedule 4 – 'Other specially protected fauna', *Wildlife Conservation (Specially Protected Fauna) Notice 2008*;
3. Australian Bustard (*Ardeotis australis*), listed as Priority 4 on the Department of Environment and Conservation's (DEC's) Threatened and Priority Fauna list;
4. Bush Stone-curlew (*Burhinus grallarius*), listed as Priority 4 on the DEC's Threatened and Priority Fauna list; and
5. Western Pebble-mound Mouse (*Pseudomys chapmani*), listed as Priority 4 on the DEC's Threatened and Priority Fauna list.

None of these species are likely to be dependent on habitat types within the proposed clearing area for their survival due to the abundance of similar habitat in close proximity, their widespread distributions throughout the Pilbara and their ease of mobility (Outback Ecology, 2009).

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

(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

Outback Ecology (2009) were commissioned by BHP Billiton to undertake a level 1 flora and vegetation survey of the proposed clearing area. Prior to undertaking field reconnaissance, Outback Ecology (2009) undertook desktop database searches and literature reviews in order to compile an inventory of conservation significant flora taxa potentially occurring within the proposed clearing area. The following databases and references were consulted as part of the desktop review:

- The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters database;
- The Department of Environment and Conservation's (DEC's) Threatened (Declared Rare) Flora database and Western Australian Herbarium database;
- The International Union for the Conservation of Nature (IUCN) Red List of Threatened Species; and
- Seventeen flora survey reports undertaken in the vicinity of the proposed clearing area.

Desktop studies revealed that no Declared Rare Flora (DRF) or Priority Flora species had previously been recorded from the proposed clearing area. However, two DRF and 20 Priority Flora species could potentially occur in the proposed clearing area, based on habitat preferences and known distributions (Outback Ecology, 2009).

Between 30 October and 4 November 2008, Outback Ecology undertook a flora and vegetation survey of the proposed clearing area. Fifteen quadrats, each 50 metres x 50 metres (the standard size used for flora surveys in the Pilbara bioregion) were surveyed within the proposed clearing area. Quadrat location was determined by analysis of aerial photography and on-ground observations (Outback Ecology, 2009). At least two quadrats were searched within each of the perceived vegetation types (Outback Ecology, 2009).

The 22 conservation significant flora taxa identified as having the potential to occur within the proposed clearing area were specifically targeted by Outback Ecology (2009) during the field survey. Prior to conducting the field survey, botanists visited the WA Herbarium to familiarise themselves with these species. The field survey involved searching for these species at each quadrat, whilst walking between and around quadrats, and searching all habitats known or likely to contain conservation significant flora taxa. Despite the searches, none of these 22 conservation significant flora taxa, or any other DRF or Priority Flora taxa were identified during the search.

The following survey limitations were noted by Outback Ecology (2009):

- The survey was conducted in October during a low rainfall period, and rainfall had been below average prior to the survey. This is likely to have affected the number of annual and ephemeral species present;
- Recent fires are likely to have affected the number of annual and ephemeral species recorded;
- Eleven specimens were unable to be identified beyond genus level; and
- Analysis of aerial photography is not always reliable in determining quadrat location as similar vegetation units may differ following analysis of survey data.

Outback Ecology (2009) considers the survey constraints to be 'negligible', with the exception of the survey timing, which is considered a 'moderate' constraint. It is acknowledged that all flora surveys are limited to some extent (often by time and seasonal factors). Ideally, a number of flora surveys would be undertaken over a number of years during the main rainfall seasons (Outback Ecology, 2009). The Assessing Officer, DMP, acknowledges that this would be an unrealistic expectation for the purposes of assessing this clearing permit application.

Given that the habitats within the proposed clearing area are considered regionally common and no DRF or Priority Flora species were identified during the flora survey (Outback Ecology, 2009), it is unlikely that the proposed clearing area is necessary for the continued existence of DRF or Priority Flora species.

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

Methodology Outback Ecology (2009).

(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's) within the proposed clearing area (GIS Database). The nearest known TEC is the Ethel Gorge aquifer stygiobiont community, located some 6 kilometres to the west (GIS Database). It is unlikely that the proposed vegetation clearing will cause significant

changes to groundwater levels or quality that may affect this TEC.

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

Methodology GIS Database:
- Threatened Ecological Sites.

(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 area applied to clear occurs within the Interim Biogeographic Regionalisation for Australia (IBRA) Pilbara and Gascoyne bioregion boundaries (GIS Database). According to Shepherd (2007) there is approximately 99.9% and 100% of the pre-European vegetation remaining in the Pilbara and Gascoyne bioregions respectively.

The vegetation of the application area is classified as:

Beard Vegetation Association 18 - Low woodland; Mulga (*Acacia aneura*);

Beard Vegetation Association 29 - Sparse low woodland; Mulga, discontinuous in scattered groups; and

Beard Vegetation Association 82 - Hummock grasslands, low tree steppe; Snappy Gum over *Triodia wiseana*.

There is approximately 100% of the pre-European vegetation remaining of Beard Vegetation Associations 18, 29 and 82 at the state and bioregional level (Shepherd, 2007). The area proposed to clear does not represent a significant remnant of vegetation in the wider regional area. Apart from some infrastructure corridors (roads and railways) and various iron ore mines, the landscape surrounding the proposed clearing area is largely uncleared (BHP Billiton, 2009). The proposed clearing will not reduce the extent of Beard Vegetation Associations 18, 29 or 82 below current recognised threshold levels, below which species loss increases significantly.

It is acknowledged that iron ore mining activities in the Pilbara have resulted in an increase of native vegetation clearing at the bioregional scale in recent years. This trend is expected to continue with proposed BHP Billiton and Rio Tinto expansion projects. It will therefore become increasingly important in the future to consider the cumulative impacts of native vegetation clearing both locally and regionally.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion – Pilbara	17,804,187	17,794,646	~99.9	Least concern	6.3
Gascoyne	18,075,218	18,075,218	~100	Least concern	1.9
Beard veg assoc. – State					
18	19,892,305	19,890,195	~100	Least concern	2.1
29	7,903,991	7,903,991	~100	Least concern	0.3
82	2,565,901	2,565,901	~100	Least concern	10.2
Beard veg assoc. Pilbara Bioregion					
18	676,557	676,557	~100	Least concern	16.8
82	2,563,583	2,563,583	~100	Least concern	10.2
Beard veg assoc. Gascoyne Bioregion					
29	3,802,459	3,802,459	~100	Least concern	0

* Shepherd (2007)

** Department of Natural Resources and Environment (2002)

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

Methodology BHP Billiton (2009).
Department of Natural Resources and Environment (2002).
Shepherd (2007).
GIS Databases:
- IBRA WA (Regions – Sub Regions).
- Pre-European Vegetation.

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

Comments

Proposal is at variance to this Principle

No named watercourses or wetlands occur within the proposed clearing area (BHP Billiton, 2009; GIS Database). A number of minor ephemeral watercourses occur in the proposed clearing area which flow into Shovelanna Creek and then the Fortescue River, located approximately 4 kilometres to the west (BHP Billiton, 2009). Given the high evaporation rates in the Pilbara bioregion, drainage lines are dry for a majority of the year, with surface water flows only persisting following significant rainfall events (usually associated with tropical cyclones) (BHP Billiton, 2009).

Outback Ecology (2009) described the following two 'watercourse- associated' native vegetation associations within the proposed clearing area:

Vegetation Association 4: *Corymbia* and *Eucalyptus* spp. over *Acacia* shrublands in drainage lines, consisting of the following vegetation communities:

CaAcAi

Corymbia aspera Woodland/Open Woodland over *Acacia citrinoviridis* Tall Open Shrubland over *Acacia aneura* Closed Heath over *Aristida inaequiglumis*, *Eragrostis eriopoda* Very Open Tussock Grassland; and

ExAAiTh

Eucalyptus xerothermica Scattered Low Trees over *Acacia citrinoviridis*, *A. pruinocarpa*, *A. pyrifolia*, *Hakea lorea* subsp. *lorea*, *Petalostylis labicheoides* Tall Open Shrubland over *Psyrax latifolia*, *Eremophila forrestii* subsp. *forrestii* Open Shrubland over *Aristida inaequiglumis*, *Themeda triandra* Open Tussock Grassland.

Vegetation Association 5: *Acacia* shrublands over *Triodia* spp. and Tussock grasses in drainage lines, consisting of the following vegetation communities:

AabTe

Acacia ancistrocarpa, *A. monticola* Tall Open Shrubland over *Triodia epactia* Hummock Grassland; and

MaPTe

Mixed *Acacia* shrubs (*A. citrinoviridis*, *A. ancistrocarpa*, *A. bivenosa*), *Petalostylis labicheoides* Closed Shrubland over Scattered Tussock Grasses and *Triodia epactia*.

Project planning by BHP considered impacts to watercourses and native vegetation, and the proposed development has been designed to keep disturbance to a minimum (BHP Billiton, 2009). It is estimated that the proposed clearing will impact upon a combined total of approximately 25 hectares of vegetation associations 4 and 5 (BHP Billiton, 2009).

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

However, Outback Ecology (2009) notes that vegetation associations 4 and 5 are well represented to the south and east of the application area. It is therefore unlikely that the proposed clearing will significantly impact riparian vegetation. It is also noted that impacts will be restricted to minor, non-perennial watercourses. No conservation category wetlands will be impacted by the proposal (GIS Database).

Methodology

BHP Billiton (2009).
Outback Ecology (2009).
GIS Database:
- ANCA Wetlands.
- Hydrography, linear.
- RAMSAR Wetlands.
- Wild Rivers (Priority).

(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

Land system mapping by the Department of Agriculture Western Australia has mapped a variety of land systems for the Pilbara bioregion. Land systems are mapped based on biophysical features such as soil and landform type, geology, geomorphology and vegetation type (Van Vreeswyk et al, 2004). The proposed clearing area includes three different land systems (GIS Database). A broad description of each land system is given below:

Newman - the Newman land system is characterised by hills and ranges, supporting hard spinifex grasslands.

Relief can be up to 450 metres. The Newman land system is generally not prone to erosion (Van Vreeswyk et al, 2004). The central portion of the proposed clearing area has been mapped as the Newman land system (GIS Database).

Boolgeeda - the Boolgeeda land system is characterised by stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands and Mulga shrublands. Vegetation is generally not prone to degradation and this land system is not susceptible to erosion (Van Vreeswyk et al, 2004). The Boolgeeda land system has been mapped as occurring in the north and south-western sections of the proposed clearing area (GIS Database).

Washplain - the Washplain land system is characterised by alluvial hardplains subject to overland sheet flow. Some parts of the alluvial plains, groves and tract receiving more concentrated flow are moderately susceptible to erosion (Van Vreeswyk et al., 2004). A small section in the south of the proposed clearing area has been mapped as the Washplain land system (GIS Database).

To minimise the risk of land degradation, BHP Billiton (2009) will:

- minimise the clearing of native vegetation;
- ensure that topsoil is not stripped or stockpiled during wet conditions;
- direct return topsoil to areas requiring rehabilitation (if possible);
- stockpile topsoil for use in rehabilitation (where direct return is not possible);
- ensure that topsoil stockpiles are no higher than 1.5 metres;
- ensure that any cleared vegetation is placed directly on disturbed areas to reduce erosion, or stockpiled for use in rehabilitation;
- progressively rehabilitate areas no longer required for ongoing operations (BHP Billiton, 2009). Approximately 45 hectares (25% of the proposed clearing area) will be rehabilitated within 12 months of completion of construction activities; and
- use appropriate methods for erosion control where the potential for erosion is high (for example, reno mattresses and rip rap rock protection) (BHP Billiton, 2009).

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

Methodology BHP Billiton (2009).
Van Vreeswyk et al (2004).
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 proposed clearing area is not located within, or in close proximity to, any conservation areas (GIS Database). According to available databases, the nearest conservation reserve is the Collier Range National Park, located approximately 125 kilometres south (GIS Database).

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

Methodology 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**
There are no named watercourses within the proposed clearing area (BHP Billiton, 2009). A number of ephemeral creeks that drain into Shovelanna Creek and then the Fortescue River occur in the proposed clearing area (BHP Billiton, 2009). If uncontrolled, vegetation clearing could potentially lead to increased sediment loads of local surface water features. However, BHP Billiton will implement the following management practices to minimise the impact of vegetation clearing on surface water:

- cleared vegetation and topsoil will be stockpiled away from drainage lines;
- surface water run-off from work areas will be contained in lined sumps;
- contain and treat contaminated and turbid water from work areas prior to any discharge offsite. All treated water must meet legal requirements and discharge limits; and

- ensure civil designs include appropriate drainage requirements and erosion controls (BHP Billiton, 2009).

The proposed clearing area is located entirely within the Newman Water Reserve, a Public Drinking Water Source Area (PDWSA) gazetted under the *Country Areas Water Supply Act 1974* on 21 August 1983. This PDWSA is defined as 'Policy Use - Not Assigned' under the Priority Source Classification Scheme. The Department of Water (DoW) has advised that the proposed clearing is unlikely to have a significant impact upon the quality or quantity of groundwater (DoW, 2009).

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

Methodology BHP Billiton (2009).
DoW (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 proposed clearing area is characterised by an arid-tropical climate, with hot, wet summers between October and April and mild, dry winters between May and September. Average annual rainfall is approximately 310 millimetres (Outback Ecology, 2009). Average annual evaporation is approximately 3,600 millimetres (GIS Database). Based on average annual rainfall and average annual evaporation, surface water is unlikely to persist in the proposed clearing area for extended lengths of time (with the exception of heavy rainfall events following cyclonic activity).

Natural flood events do occur in the Pilbara bioregion on occasion, however the proposed clearing of 180 hectares of native vegetation within the Fortescue River Catchment (2,975,192 hectares) is not likely to lead to an incremental increase in peak flood height or duration.

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

Methodology Outback Ecology (2009).
GIS Database:
- Evaporation Isoleths.

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

Comments

There is one native title claim over the area under application (GIS Database). This claim (WC99/004) has been registered with the National Native Title Tribunal on behalf of the claimant group (GIS Database). 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*.

There are no registered Sites of Aboriginal Significance within 2 kilometres of the proposed clearing area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Sites of Aboriginal 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.

On 23 April 2009, the Department of Mines and Petroleum (DMP) granted a clearing permit (CPS 3012/1) to BHP Billiton Iron Ore Pty Ltd to clear up to 150 hectares of native vegetation within an application area of 493 hectares. The permit was granted for the purpose of constructing an accommodation camp and associated infrastructure, and conducting geotechnical investigations.

As a result of recent infrastructure design changes, additional geotechnical investigations, additional safety requirements for traffic and a greater volume of fill material needed to complete earthworks, BHP Billiton Iron Ore Pty Ltd has sought an amendment to CPS 3012/1 to increase the clearing allocation from 150 hectares to 180 hectares. All of the proposed additional clearing will be undertaken within the existing approved CPS 3012/1 boundary of 493 hectares.

The clearing permit amendment application was advertised on 22 March 2010 by the Department of Mines and Petroleum, inviting submissions from the public. There were no submissions received.

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

4. Assessor's comments

Comment

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

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

5. References

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- DoW (2009) Public Drinking Water Source Area (PDWSA) Advice. Advice to Assessing Officer, Native Vegetation Assessment Branch, Department of Mines and Petroleum (DMP), 30 March 2009. Department of Water, Western Australia.
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- Outback Ecology (2009) Eastern Pilbara Accommodation Camp - Flora and Fauna Assessment. February 2009. Prepared for BHP Billiton Iron Ore Pty Ltd.
- Shepherd, D.P. (2007) Adapted from: Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth. Includes subsequent updates for 2006 from Vegetation Extent dataset ANZWA1050000124.
- Van Vreeswyk, A.M, Payne, A.L, Leighton, K.A & Hennig, P (2004) Technical Bulletin No. 92: An inventory and condition survey of the Pilbara region, Western Australia. Department of Agriculture, South Perth, Western Australia.

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.
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- 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.