



1. Application details

1.1. Permit application details

Permit application No.: 2819/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: FerrAus Limited (Australian Manganese Proprietary Limited)

1.3. Property details

Property: Mining Lease 52/1034
General Purpose Lease 52/281
Miscellaneous Licence 52/103
Local Government Area: Shire Of Meekatharra
Colloquial name: Robertson Range Iron Ore Project

1.4. Application

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

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description Beard vegetation associations have been mapped at a 1:250,000 scale for the whole of Western Australia and are useful to look at vegetation extent in a regional context. Three Beard vegetation association are located within the application area (GIS Database):

29: Sparse low woodland; mulga, discontinuous in scattered groups. According to the Shared Land Information Platform (Department of Agriculture and Food, 2009), Beard vegetation association 29 is dominated by *Acacia aneura*.

111: Hummock grasslands, shrub steppe; *Eucalyptus gamophylla* over hard spinifex (Shepherd et al, 2001). According to the Shared Land Information Platform (Department of Agriculture and Food, 2009), Beard vegetation association 111 is a hummock grassland of *Triodia basedowii* with emergent *Eucalyptus gamophylla*, *Hakea lorea*, *Acacia aneura*, *Brachychiton gregorii*, *Codonocarpus cotinifolius*, *Grevillea juncifolia*, *A. grasbyi*, *A. ramulosa* var. *linophylla*, *A. pachycarpa*, *A. ligulata* with shrubs including *Leptosperma chambersii*, *Breweria media*, *Senna glutinosa* spp. *luerssenii*, *Dicrastylis ochrotricha*, *Eremophila latrobei*, *Newcastelia cephalantha*, *Prostanthera wilkieana*, *Eremophila spectabilis* and *Eucalyptus oleosa*.

216: Low Woodland; mulga (with spinifex) on rises (Shepherd et al, 2001). According to the Shared Land Information Platform (Department of Agriculture and Food, 2009), Beard vegetation association 216 is a woodland of *Acacia aneura* over *Triodia* spp.

A vegetation survey was conducted over the application area by Ecologia Environment (Ecologia) in April 2007. As a result of this survey, 8 vegetation types were identified within the survey area (Ecologia, 2007). These are:

1a: Scattered outcropping of *Hakea* spp. and other low trees over moderately dense mixed low shrubs and mixed hummock grasses on a red-orange sandy plain. Over-storey species include *Hakea lorea* spp. *lorea*, *H. chordophylla*, *Corymbia deserticola* spp. *deserticola*, *Eucalyptus gamophylla*, over shrub layer including *Acacia dictyophleba*, *Dicrastylis georgei*, *Scaevola parvifolia* spp. *pilbarae* over *Triodia basedowii*, *Triodia schinzii* hummock grasses;

1b: Scattered outcropping *Hakea* spp. and other low trees, over moderately dense mixed hummock grasses, with sparse shrubs. Over-storey species include *Hakea lorea* spp. *lorea*, *Eucalyptus gamophylla*, *Hakea chordophylla*, *Corymbia hamersleyana* over a shrub layer of *Acacia dictyophleba*, *Dicrastylis georgei*, *Scaevola parvifolia* spp. *pilbarae*, *Petalostylis cassioides*, *Leptosema chambersii*, *Santalum lanceolatum* over a hummock grass layer of *Triodia basedowii* and *Triodia schinzii*;

1c: Open *Eucalyptus gamophylla* woodland. *Eucalyptus gamophylla* over shrubs *Eremophila forrestii* spp. *forrestii*, *Acacia ligulata*, *Scaevola spinescens* over low shrubs *Leptosema chambersii*, *Gompholobium polyzygum*, over sparse grass layer *Paraneurachne muelleri*, *Cymbopogon obtectus* over *Triodia basedowii*, *Triodia schinzii*, *Triodia* spp. *Shovellana Hill* hummock grasses;

1d: Moderately dense high *Acacia ancistrocarpa* shrubland. Outcropping *Hakea lorea* spp. *lorea* over moderately dense *A. ancistrocarpa* high shrubs over open to moderately dense mixed low shrubs *Petalostylis cassioides*, *A. dictyophleba*, *Melhaniania oblongifolia*, *Halgania solanacea* var. *Mt Doreen*, with moderately dense to dense *Triodia schinzii*, *Triodia basedowii* hummock grass and scattered mixed soft grasses;

1e: Open *Acacia trudgeniana* mixed medium shrubland. Open *A. trudgeniana* tall shrubs over open *Sida cardiophylla*/ *Acacia dictyophleba* mixed medium shrubs over moderately dense *Eragrostis eriopoda*, *Aristida*

holathera var. *holathera* mixed soft grass with open *Triodia schinzii*, *Triodia basedowii* mixed hummock grasses;

2. Open mixed low shrubland with open mixed soft grasses. Sparse *Acacia pruinocarpa*, *Codonocarpus cotinifolius* mixed tall shrubs over open to moderately dense *Sida arenicola* medium shrubs over moderately dense *Scaevola spinescens*, *Halgania solanacea* var. *Mt Doreen* mixed low shrubs with open to moderately dense mixed soft grass species;

3a. Open to moderately dense *Acacia aneura* var. *aneura* woodland. Open to moderately dense *Acacia aneura* var. *aneura* low woodland over sparse to moderately dense *Eremophila latrobei* spp. *filiformis*, *E. exilifolia* medium shrubs over scattered to moderately dense *Ptilotus obovatus* low shrubs with scattered *Solanum lasiophyllum* low shrubs mostly with open *Triodia* sp. *Shovelanna Hill* hummock grass and sparse mixed soft grasses dominated by *Eragrostis eriopoda*;

3b: Sparse *Acacia* spp. medium to high shrubland. Scattered outcropping *Acacia* spp. high shrubs over *A. maitlandii* and scattered to sparse *Eremophila latrobei* spp. *filiformis*, *Calytrix carinata* medium shrubs over sparse mixed low shrubs, dominated by *Gompholobium polyzygum* over mixed open to moderately dense soft grasses and open to moderately dense *Triodia* sp.. *Shovellana Hill* hummock grass.

Clearing Description	FerrAus have applied to clear up to 323.37 hectares for the purpose of establishing an open pit mine, associated infrastructure including waste dumps, ROM pads, Tailings Storage Facility (TSF), camp and roads (Ecologia, 2007). Clearing will be by mechanical means.
Vegetation Condition	Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994). to Pristine: No obvious signs of disturbance (Keighery, 1994).
Comment	Based on photographs supplied by the applicant, the vegetation within the application area appears to be in excellent condition with little evidence of disturbance and no weeds recorded within the application area. Ecologia (2007) have advised that the project area is largely undisturbed and unoccupied.

3. Assessment of application against clearing principles

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

Comments	Proposal may be at variance to this Principle The application area occurs within the Gascoyne Interim Biogeographic Regionalisation of Australia (IBRA) bioregion and the Augustus IBRA sub-bioregion (GIS Database). This sub-bioregion is characterised by extensive areas of alluvial valley-fill deposits. Mulga woodland with <i>Triodia</i> spp. occur on shallow stony loams on rises, while the shallow earthy loams over hardpan on the plains are covered by Mulga parkland (CALM, 2002). The vegetation described within the application area is typical of the bioregion (Ecologia, 2007). A vegetation survey of the application area and surrounding vegetation identified 157 flora species from 37 families (Ecologia, 2007). This is considered to be biologically diverse. <i>Poaceae</i> (23 spp) and <i>Mimosaceae</i> (20 spp) families show highest speciation within the application area. Also of note is that 14 families and 64 genera were represented by a single taxon, which is an indicator of biological diversity (Ecologia, 2007). A desktop fauna assessment concluded that 105 species (11 Families) of reptile could potentially occur within the application area and 123 species of avian fauna (45 families) could potentially occur within the application area (Ecologia, 2007). Whilst habitat types within the application area are not likely to support all of these species, the area appears to be potentially diverse in reptiles and birds. No weed species were identified within the application area (Ecologia, 2007). Weeds have the potential to alter the biodiversity of an area, competing with native vegetation for available resources and making areas more fire prone. This in turn can lead to greater rates of infestation and further loss of biodiversity through repeated fires. All efforts should be made to ensure the area remains weed free. The assessing officer recommends that should a permit be granted, conditions be endorsed on the permit in relation to weed management. Although the application areas are high in flora and faunal diversity, they are not likely to have greater diversity than similar areas within the region. Based on the above, the proposed clearing may be at variance to this Principle.
Methodology	CALM (2002) Ecologia (2007) GIS Database: - Interim Biogeographic Regionalisation of Australia (subregions)

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

Comments	Proposal is not likely to be at variance to this Principle The application area was subject to a fauna survey by Ecologia in April 2007 (Ecologia, 2007). This survey involved a desktop literature review of available literature relevant to the project area and a search of available
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databases to identify the potential fauna that may occur within the application area. This was followed by a field based survey utilising opportunistic bird surveys, targeted searches for fauna of conservation significance and acoustic surveying for bats (Ecologia, 2007). The survey adequately meets the requirements of Guidance Statement 56 'Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia' (EPA, 2004a).

There were two main fauna habitats identified within the application area. There is a small rocky ridge in the northern section of the application area and sandy spinifex plains over the remainder of the application area (Ecologia, 2007). The small rocky ridge supports a number of mixed vegetation types on either rocky or loamy clay (Ecologia, 2007). The flat sandy plains supported *Triodia* hummock grassland and scattered trees and shrubs (Ecologia, 2007). These habitat types are not restricted to the application area and are common and widespread throughout the Pilbara and Gascoyne regions (Ecologia, 2007).

The desktop survey identified 42 mammal, 123 avian, 105 reptile and 7 amphibian fauna species that may occur within the application area (Ecologia, 2007). Of these potentially occurring species 19 are considered to be of conservation significance. Based on preferred habitat type, the following conservation significant species may occur within the application area: Mulgara (*Dasyercus cristicauda*), Bilby (*Macrotis lagotis*), Western Pebble-mound Mouse (*Pseudomys chapmani*), Peregrine Falcon (*Falco peregrinus*), Bush Stone-curlew (*Burhinus grallarius*), Australian Bustard (*Ardeotis australis*), Rainbow Bee-eater (*Merops ornatus*), and Unpatterned Robust Lerista (*Lerista macropisthropus remota*).

The Mulgara (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice 2008*) prefers habitat comprising largely immature hummock grassland, particularly where this coincides with better watered areas such as drainage lines in sandplain or sand-dune habitat. Ecologia (2007) state that suitable habitat occurs within the application area when unburnt. A targeted search within suitable habitat located possible Mulgara burrows within the application area, near areas to be used for mine infrastructure. These burrows were inactive and identification as Mulgara burrows could not be confirmed (Ecologia, 2007). It is known that Mulgara utilise marginal habitat following good breeding years and then retract to core habitat in poor seasons. This may be the case in this area. Given these burrows appear to be inactive and large amounts of suitable habitat occurs within the Mulgara's potential range, the vegetation within the application area is not likely to represent significant habitat for this species.

The Bilby (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice 2008*) was formerly known to occupy habitat ranging from *Eucalyptus* and *Acacia* woodlands in the wheatbelt of Western Australia to *Triodia* grasslands in the desert regions (DEC, 2009). They require sandy or loamy soil in which to burrow. Bilbies are now only found in areas where foxes do not occur or are not abundant; these include the driest and least fertile parts of their former range (DEC, 2009). The major habitats they now occupy within WA include mulga scrub and hummock grasslands on sandplains or along drainage or salt lake systems (DEC, 2009). Whilst suitable habitat occurs within the application area, a lack of predator control in this area suggests the species no longer occurs there. The vegetation within the application area is therefore unlikely to represent significant habitat for this species.

The Western Pebble-mound Mouse (DEC Priority 4 listing) is described as constructing pebble mounds on slopes composed of stony soils, near sharply incised drainage lines (Start et al, 2000). Mounds are built in vegetation dominated by hard spinifex (*Triodia basedowii* or *T. wiseana*) (Start et al, 2000). This species is widespread throughout the Hamersley Ranges. No mounds were located within the application area. The vegetation within the application area is not likely to be significant habitat for the Western Pebble-mound Mouse.

The Peregrine Falcon (Schedule 4 - Other specially protected fauna, *Wildlife Conservation (Specially Protected Fauna) Notice, 2008*) is known to inhabit most areas in Australia and utilise cliffs, tall trees and granite outcrops for nesting (Australian Museum Online, 2007). The Peregrine Falcon has been recorded within the area in previous biological surveys (Ecologia, 2007). The Peregrine Falcon may occur within the application area occasionally for feeding. However, the vegetation within the application area is not likely to be significant habitat for this species due to a lack of suitable nesting sites.

The Bush Stone Curlew (DEC Priority 4 listing) prefers sparsely grassed, lightly timbered, open forest or woodland. In southern Australia, they persist most often where there is a well-structured litter layer and fallen timber debris (Garnett et al, 2000). Suitable habitat for this species occurs within the application area and the species may occur there. However, this species occurs across much of the semi-arid areas of Western Australia in suitable habitat. Therefore, the vegetation within the application area is not likely to be significant habitat for this species.

The Australian Bustard (DEC Priority 4 listing) prefers tussock grassland, *Triodia* hummock grassland, grassy woodland and low shrublands (Garnett et al, 2000). This species was observed during the biological survey (Ecologia, 2007). Given the widespread distribution of this species and the abundant amount of suitable habitat within the Hamersley Ranges, the vegetation within the application area is not significant habitat for this species.

The Rainbow Bee-eater (listed as a migratory bird by the Japan-Australia Migratory Bird Agreement (JAMBA) and is protected under the *EPBC Act 1999*) is able to utilise a wide range of habitat types and nests in sandy soils. It was observed during the biological survey within the application area and is likely to utilise the application areas for feeding and nesting if sandy soils are present. Given the large amounts of potential

habitat within the Pilbara region, it is unlikely that the vegetation within the application areas is significant habitat for this species.

The Unpatterned Robust *Leuridan* (DEC Priority 2 listing) prefers leaf litter beneath a wide variety of shrubs and trees on a wide variety of soils (Storr et al, 1999). This species occurs as several geographically separate subspecies. *L. m. robusta* appears to be restricted to the eastern Pilbara/eastern Gascoyne region. Ecologia state that this species has previously been recorded from the general area (Ecologia, 2007). Suitable habitat for this species exists within the application area and the species may occur there. However, there is large amounts of suitable vegetation this species can utilise within its range. Therefore, the vegetation within the application area is not likely to be significant habitat for this species.

The landforms and vegetation types within the application area are common throughout the Pilbara and Gascoyne regions. The vegetation within the application area is therefore not likely to be significant habitat for fauna on a local or regional scale.

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

Methodology Australian Museum Online (2007)
DEC (2009)
Ecologia (2007)
EPA (2004a)
Garnett et al (2000)
Start et al (2000)
Storr et al (1999)

(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

The application area was subject to a flora survey by Ecologia in April 2007. This survey involved a desktop review of available literature relevant to the project area and a search of available databases to identify the conservation significant flora species that may potentially occur within the application area. This was followed by a field based survey utilising quadrants to identify vegetation types, compile a flora inventory, and a targeted search for rare or priority flora species in suitable habitat (Ecologia, 2007). The surveys adequately meet the requirements of Guidance Statement 51 ' Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia' (EPA, 2004).

As a result of these surveys no Declared Rare or Priority flora species were identified within the application area (Ecologia, 2007).

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

Methodology Ecologia (2007)
EPA (2004b)

(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, no Threatened Ecological Communities (TEC's) occur within the application area (GIS Database). The nearest TEC occurs approximately 34 kilometres west of the application area (Ethel Gorge Stygobiont Community) (GIS Database). At this distance, the proposed clearing will have no impact on this TEC.

None of the vegetation types identified by Ecologia (2007) are considered to be at risk.

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

Methodology Ecologia (2007)
GIS Database:
- Threatened Ecological Communities

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

Comments Proposal is not at variance to this Principle

According to available databases, the application area falls within the Gascoyne IBRA bioregion (GIS Database). This bioregion's vegetation extent remains at approximately 100% of its Pre-European extent (see table).

Beard Vegetation Association's 29, 111 and 216 occur within the application area (GIS Database). According to Shepherd et al (2001), these vegetation associations remain at approximately 100% of their Pre-European extent (see table). Whilst only vegetation association 111 is represented within conservation estate at a bioregional level, the conservation status of each association is under no threat from extensive clearing (see table).

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves (and post clearing %)*
IBRA Bioregion – Gascoyne	18,075,253	18,075,253	~100	Least Concern	1.9
Beard veg assoc. – State					
29	7,904,064	7,904,064	~100	Least Concern	0.3
111	762,966	762,966	~100	Least Concern	5.5
216	280,760	280,760	~100	Least Concern	0
Beard veg assoc. – Bioregion					
29	3,802,497	3,802,497	~100	Least Concern	0
111	212,467	212,467	~100	Least Concern	16.3
216	254,090	254,090	~100	Least Concern	0

* Shepherd et al. (2001)

** Department of Natural Resources and Environment (2002)

Options to select from: Bioregional Conservation Status of Ecological Vegetation Classes (Department of Natural Resources and Environment 2002)

Presumed extinct+	Probably no longer present in the bioregion
Endangered+	<10% of pre-European extent remains
Vulnerable+	10-30% of pre-European extent exists
Depleted+	>30% and up to 50% of pre-European extent exists
Least concern+	>50% pre-European extent exists and subject to little or no degradation over a majority of this area

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

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

Methodology Department of Natural Resources and Environment (2002)
Shepherd et al (2001)
GIS Database:
- Interim Biogeographic Regionalisation of Australia
- 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

The application area occurs within the Savory Creek Wild River area (GIS Database). However, the clearing is not likely to significantly alter the environmental values of any watercourse.

Wild Rivers are defined as those rivers which are undisturbed by the impacts of modern technological society (Water and Rivers Commission, 1999 in DoW, 2009a). They remain undammed, and exist in catchments where biological and hydrological processes continue without significant disturbance. They occur in a variety of landscapes, and may be permanent, seasonal or dry watercourses that flow or only flow occasionally, (Water and Rivers Commission, 1999 in DoW, 2009a). This area has been given a Priority 1 status (GIS Database). Priority 1 rivers are those with no or minor impact from clearing, altering the landscape, loss of vegetation due to grazing, road or track construction, introduced exotic animals, plants or plant diseases, increased fire frequency, unnatural erosion and sedimentation or alterations to waterway and riparian ecosystem (DoW, 2009a). Wild Rivers are recognised by the DoW and the Australian Heritage Commission as important representatives of large unchanged systems. The DoW (2009b) has advised that "in order to protect the Savory Creek Wild River area from further degradation, the following measures are recommended":

- all mineral exploration and mining activities in wild river catchments should adhere to established codes of practice. Best management practices should be followed;

- disturbance to riparian vegetation should be avoided to maintain foreshore stability and protect important riparian habitats;

- there should be no significant alteration of the natural hydrological regime and geomorphology of the Wild River and its catchment.

The application area occurs in the very margins of the Savory Creek Wild Rivers area, which delineates the boundary of the Wild River area. The clearing of 323.37 hectares of vegetation in this area is not likely to significantly alter the surface water regimes in the Wild Rivers area (2,061,987 hectares) (GIS Database). Furthermore, the watercourses that occur within the application area are ephemeral (GIS Database), and only likely to carry water during times of intense rainfall, usually following cyclonic activity or localised storms. The vegetation within these ephemeral watercourses is not riparian in nature (Ecologia, 2007). The proponent is required to obtain a Beds and Banks Permit in order to disturb any water course (DoW, 2009b). Mining activities are managed under the *Mining Act, 1978*. However, it is understood that mining will not go below the watertable, and as such there will be little discharge of groundwater as a result of mining.

Given the application area is within a Wild Rivers area, the proposed clearing is at variance to this Principle.

Methodology DoW (2009a)
DoW (2009b)
Ecologia (2007)
GIS Database:
- Hydrography, Linear
- Wild Rivers

(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 surveyed by the Department of Agriculture and Food (Van Vreeswyk et al 2004).

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

- 1) Newman
- 2) Divide
- 3) Jamindie
- 4) Prairie

Jamindie and Prairie Land Systems form very minor parts of the application area therefore, the application area is less likely to exhibit the characteristics of these Land Systems. As a result, only the Newman and Divide Land Systems are described below.

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

The Divide Land System is described as sandplains and occasional dunes supporting shrubby hard spinifex grasslands (Van Vreeswyk et al, 2004). The system is generally not susceptible to erosion except immediately after fire when wind erosion can occur. Analysis of aerial photography reveals the application are to consist of the 'sandplains', 'plains with thin sand cover', 'stony plains' and 'tracts receiving run-on' land units. The soils within these land units are generally stable, but may be subject to wind erosion if vegetation is depleted (Van Vreeswyk et al, 2004).

Vegetation removed during clearing will quickly be replaced by mining infrastructure and it is not expected that areas denuded of vegetation will remain bare for extended periods. The assessing officer recommends that should a permit be granted, conditions be endorsed on the permit in relation to staged clearing and vegetative material and topsoil retention.

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

Methodology 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 application area occurs approximately 80 kilometres south-west of Rudall River National Park and approximately 80 kilometres north-east of Collier Range National Park (GIS Database). At these remote distances it is highly unlikely that the proposed clearing will impact on the environmental values of these conservation areas.

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

Methodology GIS Database:
- CALM Managed Lands and Waters

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

Comments Proposal is not likely to be at variance to this Principle

According to available databases, the application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database).

The application area is located within a *Rights in Water and Irrigation Act, 1914 (RIWI Act)* Surface Water Management Area (DoW, 2009b). Given the size of the clearing (323.37 hectares) compared with the size of the Lake Disappointment Catchment (14,475,483 hectares), the proposed clearing is not likely to reduce the quality of surface water or groundwater in the catchment.

The application area is located within the Pilbara Groundwater Area (DoW, 2009b). Any extraction of groundwater in this area will require a groundwater licence (DoW, 2009b). The groundwater salinity within the application area is approximately 1000 - 3000 milligrams/Litre Total Dissolved Solids (TDS) (GIS Database). This is considered to be brackish water. The application area straddles two groundwater provinces (Sylvania and Bangemil) Given the size of the area to be cleared (323.37 hectares) compared to the size of the Sylvania groundwater province (489,527 hectares) and the Bangemil Groundwater Province (6,903,067 hectares) (GIS Database), the proposed clearing is not likely to cause salinity levels within the application area to alter significantly.

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

Methodology DoW (2009b)
GIS Database:
- Groundwater Provinces
- Groundwater, Statewide
- Hydrographic Catchments - Catchments
- Public Drinking Water Source Areas (PDWSA's)

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

Comments Proposal is not likely to be at variance to this Principle

The application area experiences an arid, tropical climate with a wet summer season and a dry winter season (BoM, 2009). Most rainfall is received during the wet season, but falls can be variable (BoM, 2009). Rain can either be sporadic (local thunderstorms) or heavy and intense (cyclonic events). It is likely that during times of intense rainfall there may be some localised flooding in adjacent areas, particularly the Savory Creek. However, given the amount of vegetation to be cleared (323.37 hectares) in relation to the size of the Lake Disappointment catchment area (14,475,483 hectares), the proposed clearing is not likely to lead to an increase in flood height or duration.

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

Methodology BoM (2009)
GIS Database:
- 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 (WC99/044 - GIS Database). The claim has been registered with the National Native Title Tribunal. However, the tenements have been granted in accordance with the future act regime of the *Native Title Act, 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore the granting of a clearing permit is not a future act under the *Native Title Act, 1993*.

The application area is located within the Jigalong Aboriginal Reserve. The Jigalong Aboriginal Community and the Nyiyaparli People were consulted prior to exploration activities at Robertson Range (Ecologia, 2007).

There are no Aboriginal sites of significance within the application area. 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.

The application area is located within a *Rights in Water and Irrigation Act, 1914 (RIWI Act)* Surface Water Management Area (GIS Database). The application area is located in a *RIWI Act* Groundwater area. The proponent is required to obtain permits to extract groundwater in this area (DoW, 2009b).

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.

No submissions were received during the advertised public comments period.

Methodology DoW (2009b)
Ecologia (2007)
GIS Database:
- Native Title Claims
- Aboriginal Sites of Significance
- Groundwater, Statewide

4. Assessor's comments

Comment

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

Should the permit be granted it is recommended that conditions be imposed on the permit for the purposes of weed management, retention of vegetative material and topsoil, staged clearing, record keeping and reporting.

5. References

- Australian Museum Online (2007) Birds, Peregrine Falcon. http://www.austmus.gov.au/wild_kids/birds/perigrine_falcon.htm Accessed 9/8/07.
- BoM (2009) Climate Averages - Mundiwindi. http://www.bom.gov.au/climate/averages/tables/cw_007062.shtml Accessed 9/2/09. Bureau of Meteorology
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6. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government.
CALM	Department of Conservation and Land Management, Western Australia.
DAFWA	Department of Agriculture and Food, Western Australia.
DA	Department of Agriculture, Western Australia.
DEC	Department of Environment and Conservation
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DoE), Western Australia.
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia.
DoE	Department of Environment, Western Australia.
DoIR	Department of Industry and Resources, Western Australia.
DOLA	Department of Land Administration, Western Australia.
DoW	Department of Water
EP Act	Environment Protection Act 1986, Western Australia.
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System.
IBRA	Interim Biogeographic Regionalisation for Australia.
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
RIWI	Rights in Water and Irrigation Act 1914, Western Australia.
s.17	Section 17 of the Environment Protection Act 1986, Western Australia.
TECs	Threatened Ecological Communities.

Definitions:

{Atkins, K (2005). *Declared rare and priority flora list for Western Australia, 22 February 2005*. Department of Conservation and Land Management, Como, Western Australia} :-

P1	Priority One - Poorly Known taxa: taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
P2	Priority Two - Poorly Known taxa: taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
P3	Priority Three - Poorly Known taxa: taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.
P4	Priority Four – Rare taxa: taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.
R	Declared Rare Flora – Extant taxa (= Threatened Flora = Endangered + Vulnerable): taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.
X	Declared Rare Flora - Presumed Extinct taxa: taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

{Wildlife Conservation (Specially Protected Fauna) Notice 2005} [Wildlife Conservation Act 1950] :-

Schedule 1	Schedule 1 – Fauna that is rare or likely to become extinct: being fauna that is rare or likely to become extinct, are declared to be fauna that is need of special protection.
Schedule 2	Schedule 2 – Fauna that is presumed to be extinct: being fauna that is presumed to be extinct, are declared to be fauna that is need of special protection.
Schedule 3	Schedule 3 – Birds protected under an international agreement: being birds that are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is need of special protection.

Schedule 4 **Schedule 4 – Other specially protected fauna:** being fauna that is declared to be fauna that is in need of special protection, otherwise than for the reasons mentioned in Schedules 1, 2 or 3.

{CALM (2005). *Priority Codes for Fauna*. Department of Conservation and Land Management, Como, Western Australia} :-

- P1** **Priority One: Taxa with few, poorly known populations on threatened lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P2** **Priority Two: Taxa with few, poorly known populations on conservation lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P3** **Priority Three: Taxa with several, poorly known populations, some on conservation lands:** Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P4** **Priority Four: Taxa in need of monitoring:** Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.
- P5** **Priority Five: Taxa in need of monitoring:** Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

Categories of threatened species (*Environment Protection and Biodiversity Conservation Act 1999*)

- EX** **Extinct:** A native species for which there is no reasonable doubt that the last member of the species has died.
- EX(W)** **Extinct in the wild:** A native species which:
(a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
(b) has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
- CR** **Critically Endangered:** A native species which is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
- EN** **Endangered:** A native species which:
(a) is not critically endangered; and
(b) is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
- VU** **Vulnerable:** A native species which:
(a) is not critically endangered or endangered; and
(b) is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
- CD** **Conservation Dependent:** A native species which is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.