Department of Industry and Resources

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 686/2

Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Jabiru Metals Limited**

1.3. Property details

Property: M37/44
M37/1153
M37/1132
E37/258
E37/512
M37/636

Local Government Area: Shire Of Leonora

Colloquial name: Jaguar Base Metals Deposit

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
100		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	Clearing Description	Vegetation Condition	Comment
The proposed clearing area has been mapped as Beard Vegetation Association 18: Low woodland; mulga (*Acacia aneura*) and Beard Vegetation Association 28: Open low woodland; mulga. (Shepherd et al, 2001). Jims Seeds, Weeds & Trees (2004) identified the following vegetation communities: Low Mulga Woodlands, Mulga Woodland Plains, Mulga Flats and Open Mulga Woodlands.	Vegetation to be cleared consists primarily of mulga (*Acacia aneura*) associated with flats and rocky outcrops. Some existing disturbed areas occur as a result not only of historical grazing regimes but also as a result of mining activities. (Jims Weeds Seeds & Trees 2004).	Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery 1994)	The desciption was based on the flora survey by Jims Seeds Weeds and Trees (2004) and photographs of the project area. The clearing permit for CPS 686/1 was granted on the 19 October 2006. The proponent has applied for this permit to be amended so the annual reporting date in condition 8 can be changed from the 31 January to the 30 June. This would make the reporting date for 686/1 the same as another clearing permit held by the proponent which is CPS 1576/1. Additionally the proponent would like to remove P37/4326 from the permit and add M37/636 in its place.

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 falls within the East Murchison IBRA Sub-region. In 'A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002' (CALM, 2002), the sub-region is described as being characterised by its internal drainage, and extensive areas of elevated red desert sandplains with minimal dune development. Salt lake systems are associated with the occluded Paleodrainage system. Vegetation is dominated by Mulga Woodlands often rich in ephemerals; hummock grasslands, saltbush shrublands and Halosarcia shrublands. The area experiences an arid climate, with an average yearly rainfall of ~ 200 mm (CALM, 2002). The region remains at 100% of its pre-european vegetation extent (Shepherd et al, 2001a).

The proposed clearing area is part of Tarmoola Station and all habitats are degraded to some degree from sheep and feral goat grazing. Jims Seeds Weeds and Trees (2004) described the proposed clearing area as Mulga Woodlands associated with red loams over siliceous hardpan, rock outcrops and drainage channels. This is consistent with the IBRA description for the subregion. Jims Seeds Weeds and Trees (2004) advise that most vegetation communities are in good condition with the exception of the old camp area which has been

subject to weed invasion. A substantial population of the priority 1 species *Phyllanthus baeckeoides* occurs within the proposed clearing area.

The East Murchison subregion is rich and diverse in fauna species, however most species are wide ranging and usually occur in at least one, and often several, adjoining subregions. Rare species for the subregion include, Great Desert Skink (*Egernia kintorei*), Mallee Fowl (*Leipoa ocellata*), Alexandra's Parrot (*Polytelis alexandrae*) and Mulgara (*Dasycercus cristicauda*) (CALM, 2002). Biota (2005) noted soil and vegetation disturbance and disruption to drainage caused by previous mining activity is evident. Very little micro habitat existed for small reptiles and mammals and most sites had minimal understorey and/or ground cover. The soil was either stony or very hard thus precluding many burrowing species (Biota, 2005).

Given consideration of the above it is unlikely that the biodiversity of the area subject to the clearing proposal is higher than other native vegetation within the local area or within the biogeographical sub-region. The proposal is therefore, not likely to be at variance to this Principle.

Advice has been received from the Biodiversity Coordination Section (BCS) of DEC (2006) which states that 'BCS has reviewed the draft assessment report as requested and finds the conclusions regarding whether the proposal is at variance to any of the relevant clearing principles as acceptable'.

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

Methodology

Biota Environmental Services (2005)
CALM (2002)
DEC (2006)
Jims Seeds, Weeds And Trees (2004)
Shepherd et al (2001a)

(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

A fauna survey was conducted by Biota Environmental Sciences at the Jaguar operation between 29 November and 6 December 2004. The survey assessed the occurrence of vertebrate taxa, invertebrate taxa considered to be short range endemics and stygofauna.

The project area was dominated by mulga vegetation which was further classified into three fauna habitats - drainage lines, flats and stony hills. All three fauna habitats were sampled using a total of six intensive trapping grids (three grids for drainage lines, one for flats and two for Stony Hills) with five trap nights for most sites. In the description of the fauna habitats Biota (2005) stated that the project area is part of Tarmoola Station and all habitats were degraded to some degree from sheep and feral goat grazing. In addition soil and vegetation disturbance and disruption to drainage caused by previous mining activity was evident. Very little micro habitat existed for small reptiles and mammals and most sites had minimal understorey and/or ground cover. The soil was either stony or very hard thus precluding many burrowing species.

One species listed under the *Wildlife Conservation Notice 2005* the Peregrine Falcon Falco peregrinus (S4, fauna that is otherwise specially protected) was recorded during the Biota survey. Two birds were observed hunting over the old mine pit each day of the survey. This species occurs across most of Australia in a wide variety of habitats and has a large home range typically of 20-1500 sq km. The area of disturbance associated with the proposed clearing area should not have an adverse effect on this species considering the large area of its home range.

Other scheduled species that potentially could occur in the Jabiru area are:
The Bilby *Macrotis lagotis* (S1, Fauna that is rare or likely to become extinct) which was sighted at night in 2001 (GIS Database) approximately 20 kilometres to the north west of the camp area. No signs of Bilby activity were found during the Biota survey and Biota (2005) states that it is unlikely to be present given the degraded nature of the site and the presence of herbivorous competitors.

The Malleefowl (*Leipoa ocellate*, S1) has been recorded in 1998 near the project area although DEC have no records of this sighting (pers comms). No Malleefowl mounds were located during the survey. Due to the degraded nature of the area and the lack of nest building material Biota states that nesting is unlikely to occur on the mine site. Home ranges are typically large and the loss of foraging habitat is unlikely to be significant for that species in the area. Biota (2005) judges that the proposal is unlikely to be significant for that species.

There are historical record for the Giant Desert Skink (*Egernia kintorei*) (S1) in the area, however no evidence of that species was found during the Biota Survey. Information provided on the DEH website (2006) states that the Giant Desert Skink generally occurs on red sandplains and sand ridges, habitat not found within the proposed clearing area. Given the degraded nature of the site and the lack fo suitable habitat, it is unlikely to be present in the Jabiru area (Biota 2005).

The Mulgara *Dasysercus cristicaudata* (S1) has been recorded from the general area (Biota 2005). Its

presence at the Jabiru minesite is judged as extremely unlikely because of the lack of suitable Triodia sandplain habitat at the Jabiru site (Biota 2005).

A P1 (Priority 1) Species of Fairy Shrimp (*Branchinella apophysata*) has been recorded at Mt Margaret approximately 100 km east of the proposed clearing area. Nothing is known of its habits or ecological requirements. Biota (2006) tested two bores within the proposed clearing area for the presence of stygofauna but did not find any species. Biota states that more comprehensive access to the aquifer would be required to provide any further comment on stygofauna occurrence in the locality.

Advice has been received from the Biodiversity Coordination Section (BCS) at DEC (2006) which states that 'BCS has reviewed the draft assessment report as requested and finds the conclusions regarding whether the proposal is at variance to any of the relevant clearing principles as acceptable'.

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

Methodology Biota (2005)
DEC (2006)
DEH (2006)

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

Comments

Proposal may be at variance to this Principle

A flora survey conducted by Jims Seeds Weeds and Trees (2004), identified three species of priority flora within the survey area - *Phyllanthus baeckeoides* (P1), *Calytrix uncinata* (P3) and *Baeckea* sp. *Melita Station* (P3). This flora survey covered a wider area and was broader in scope than the subsequent Shepherdson (2005) survey which targeted populations of *P. baeckeoides* and attempted to locate new populations.

P. baeckeoides is only known from four locations in Western Australia, the population at Teutonic Bore may be a fifth population.

Shepherdson (2005) surveyed the area now subject to exploration to determine the extent and distribution of the *P. baeckeoides* population within the project area and surrounds. Shepherdson (2005) determined that the species was found almost exclusively on rocky hills extending from the original Teutoinic Bore town site south to the open pit. Another population was identified 2km north of the town site. It was not found at any other site.

Shepherdson (2005) determined that the average density of plants within populations was 2,372 plants per hectare. The population is known to extend over an area encompassing 209 hectares. Jabiru Metals have estimated a theoretical population size of 495,000 plants based on these figures. Despite theoretical nature of the estimate, it would appear that this is a substantial population.

P. baeckeoides appears to be geographically restricted to rocky slopes where it grows in association with *Acacia aneura* and *Acacia quadrimarginea* on suitable soil type. Whilst the exact nature of this association is not known, upon reaching maturity, plants are commonly seen growing indendant of the Acacia species. Shepherdson (2005) noted that the species appears to thrive in most disturbed areas. Its ability to thrive in disturbed conditions suggests the prospects for rehabilitation are good (Shepherdson, 2005).

Jabiru Metals have developed a *P. baeckeoides* management plan (2006) in which strategies for the management of this species are detailed. Jabiru have estimated that 3188 individual plants will be destroyed by the exploration program based on population density and population area. This is a small percentage of the theoretical population size.

Advice has been received from the Biodiversity Coordination Section (BCS) of DEC in regards to the potential impact of the clearing on *P. baeckeoides* which states 'BCS notes that this department}s Environmental Management Branch staff have previously provided informal advice to the proponent specifically regarding the impact assessment and management of Priority flora *Phyllanthus baeckeoides* prior to the permit decision being made by the Department of Industry and Resources Native Vegetation Assessment Branch. Taking this into account BCS concurs with the previous advice that it is unlikely that the proposed exploration activities would have a significant impact on *P. baeckeoides'*.

There is little discussion in Shepherdson's report in regards to *C. uncinata* and *B. sp Melita Station*. Both were found in Jims Seeds, Weeds & Trees flora survey of 2004, however, only *C. uncinata* was found in Shepherdson's survey of 2005.

C. uncinata is known from at least 17 locations according to Florabase (DEC, 2006a). *B. sp Melita Station* is known from 17 locations according to Florabase (DEC, 2006a). Both species distribution is mainly East Murchison IBRA sub-region, but are found in West Murchison IBRA sub-region and Yalgoo IBRA Region. It is possible that the two species are located throughout this range in suitable soil types, topography and habitat. Their conservation is unlikely to be impacted by the proposed clearing.

The proposed clearing may be at variance to this Principle. A condition will be placed on the permit requiring the permit holder to record how many *P. baeckeoides* plants are removed during the clearing. A condition will also be placed on the permit requiring the permit holder to collect seed from *P. baeckeoides* prior to clearing to be used in revegetation.

In regards to this clearing Principle, the Biodiversity Coordination Section (BCS) of DEC (2006) advised that 'BCS has reviewed the draft assessment report as requested and finds the conclusions regarding whether the proposal is at variance to any of the relevant clearing principles as acceptable'.

Methodology DEC (2006)
DEC - Florabase (2006a)
Jabiru Metals (2006)
Jims Seeds Weeds and Trees (2004)
Shepherdson (2005)

(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 records of Threatened Ecological Communities (TECs) within 60km of this proposal. Two flora surveys in 2004 by Jims Seeds, Weeds & Trees did not identify any TECs within the survey area.

Advice has been received from the Biodiversity Coordination Section (BCS) of DEC (2006) which states 'BCS has reviewed the draft assessment report as requested and finds the conclusions regarding whether the proposal is at variance to any of the relevant clearing principles as acceptable'.

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

Methodology DEC (2006)
GIS Databases:
- Threatened Ecological Community Database - CALM 15/07/03.
[The comprehensiveness of the database is dependent on the amount of survey carried out in the area and does not necessarily represent a comprehensive listing].
Jims Seeds, Weeds & Trees (2004)

(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**

	Pre-European area (ha)	Current extent (ha)	Remaining %	Conservation Status	Pre-european % in IUCN Class I-IV Reserves (and current %)
IBRA Bioregion – Murchison	28120557*	28120557*	100*	Least Concern**	1.1 (1.1)*
Shire of Leonora	3291565	Not known	N/A	N/A	N/A
Beard veg assoc. (state extent)					
- 18	19892436*	19892436*	100*	Least Concern**	2.1 (2.1)*
- 28	395898*	395898*	100*	Least Concern**	0 (0)*

* Shepherd et al. (2001a)
** Department of Natural Resources and Environment (2002)

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

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

* or a combination of depletion, loss of quality, current threats and rarity gives a comparable status

Explanation:

At a regional level, the Murchison IBRA Region remains at 100% of its pre-european vegetation extent. According to the 'Bioregional Conservation Status of Ecological Vegetation Classes' published by the Department of Natural Resources and Environment, 2002, these values give the region a Conservation Status of 'Least Concern'.

The proposed clearing area falls within the Leonora Shire. Given that the bioregion is 100% uncleared it could be concluded that the Shire remains at 100% of its pre-european vegetation extent. However, there is no data as to the Shire's current vegetation extent.

Statewide, the vegetation associations as described by Beard (18 and 28) both remain at 100% of their pre-european vegetation extent. According to the 'Bioregional Conservation Status of Ecological Vegetation Classes' published by the Department of Natural Resources and Environment, 2002, these values give both vegetation associations a Conservation Status of 'Least Concern'.

As vegetation has remained largely uncleared within the Murchison IBRA region, the percentage of vegetation within IUCN reserves has not changed since European settlement.

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).
GIS Databases:
- Pre-European Vegetation - DA 01/01;
- Interim Biogeographic Regionalisation of Australia - EA 18/10/00
Shepherd et al. (2001a).

(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 may be at variance to this Principle**
Orthophotos supplied by Jabiru Metals (2006) show many drainage lines within the proposed clearing area beginning higher in the landscape and then joining lower in the landscape. GIS databases describe the drainage lines as "Watercourses - minor, non perennial". Jims Seeds, Weeds & Trees (2004) describe the drainage lines as two metres deep and ten metres wide higher in the landscape and narrow and shallow lower in the landscape.

Jims Seeds, Weeds & Trees (2004) stated that the vegetation in the lower, shallow drainage lines was similar to the surrounding vegetation but supported a rich and diverse ephemeral community and *Eucalyptus camaldulensis*, commonly known as 'river gum' described on Florabase (DEC, 2006a) as occuring in association with watercourses and billabongs.

Jims Seeds, Weeds & Trees (2004) stated that the vegetation in the higher, deeper drainage lines supported dense vegetation, with large red river gums (*E. camaldulensis*) and a diverse ephemeral community.

These descriptions would suggest that the watercourses support riparian vegetation despite the area experiencing an average rainfall of ~ 230 mm/year (BOM, 2006). Information from the Bureau of Meteorology website would suggest most rainfall is experienced in late summer and autumn when weather patterns are subject to tropical influences, although the area can experience limited rainfall at any time.

The proposed clearing may be at variance to this Principle. A buffer zone around the drainage lines will be negotiated with the proponent.

Methodology DEC - Florabase (2006a)
GIS Databases: - Hydrography, linear - DOE 01/02/04
Jabiru Metals (2006)

(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 purpose permit area includes the Jundee and Violet land systems as well as small areas of Bevon and Teutonic (DAWA 2005). Based on the characteristics of those four land systems the Commissioner for Soil and land Conservation advises that the clearing may be at variance to Principle g (DAWA 2005). The Commissioner advises that conditions be imposed on any permit granted to avoid sensitive areas and mitgate and prevent soil erosion and loss of vegetation.

Methodology DAWA (2005)

(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

No conservation areas have been identified within 10km of the proposal.

The benchmark of 15% representation in conservation reserves (JANIS Forests Criteria 1997) has not been met for Beard Vegetation Types 18 and 28. However because of the largely uncleared state of these vegetation types, this is not considered to be a serious conservation issue.

Advice has been received from the Biodiversity Coordination Section (BCS) of DEC (2006) which states 'BCS has reviewed the draft assessment report as requested and finds the conclusions regarding whether the proposal is at variance to any of the relevant clearing principles as acceptable'.

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

Methodology

JANIS Forests Criteria (1997).
GIS Databases:
- CALM Managed Lands and Water - CALM 01/08/04.

(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

With an average annual rainfall of ~230mm (BOM, 2006) and an annual evaporation rate of 3,400mm (Luke et al, 1987) there is little surface flow during normal seasonal rains. It is only during major rainfall events (summer and autumn) that there is any significant surface flow. Surface flow during these events tends to be relatively fresh. The saline lake system of the Salt Lake Basin of the Western Plateau becomes a medium for the collection and transportation of major flows.

With high annual evaporation rates and low annual rainfall there is little recharge into regional groundwater that at this site is considered brackish (between 1,000 mg/l and 3,000 mg/l) (GIS database) . The proposed clearing of native vegetation for this proposal is unlikely to have an impact on regional groundwater considering the magnitude of the Yilgarn-Goldfields Groundwater Province (~300,000 sq km) and the extent of native vegetation remaining in the Murchison Bioregion (~100%).

The proposed clearing is not likely to be at variance to this principle.

Methodology

BOM (2006)
GIS database: Groundwater Salinity, Statewide - 22/02/00
Luke et al (1987)

(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

With an average annual rainfall of ~230mm (BOM, 2006) and an annual evaporation rate of 3,400mm (Luke et al, 1987) there is little surface flow during normal seasonal rains. It is only during major rainfall events that there is a likelihood of flooding which would occur within the broad valleys and lake systems of the region, most likely Lake Raeside to the south of the proposed clearing area.

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

Methodology

BOM (2006)
Luke et al (1987)

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

Comments

There is a Native Title Claim over the area under application by the Wongatha and Wutha People (Native Title Claims-DLI 19/12/04). However, the mining lease has been granted, and the clearing is for a purpose that is consistent with the existing exploration lease, therefore the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

The proposed clearing occurs in an area that is covered by the following Registered Indigenous Heritage Sites: Sullivan Creek, Teutonic Bore, Teutonic Bore 1, Teutonic Bore 2, Teutonic Bore Quarry 2, Teutonic Bore Quarry 3 and Townsite 2 (DIA 28/02/03). It is the proponent's responsibility to ensure that no Aboriginal Sites of Significance are damaged through the clearing process. In implementing this permit please liaise with the Department of Indigenous Affairs regarding your obligations under the *Aboriginal Heritage Act 1972*.

A submission was received during the public advertisement period. The submission asked that flora and fauna surveys be completed to identify biodiversity, fauna habitat and rare flora. The submission also requested that the assessment should consider topography, surface hydrology, soil type, vegetation type, condition and relative commonality in the surrounding environment, management of remaining vegetaiton and management of environmental and cultural issues such as weeds, run-off and Aboriginal heritage. The proponent has conducted the required surveys and the assessor has addressed the points raised in the submission in the decision report.

The clearing permit for CPS 686/1 was granted on the 19 October 2006. The proponent has applied for this permit to be amended so the annual reporting date in condition 8 can be changed from the 31 January to the 30 June. This would make the reporting date for 686/1 the same as another clearing permit held by the proponent which is CPS 1576/1. Additionally the proponent would like to remove P37/4326 from the permit and add M37/636 in its place.

Methodology Native Title Claims-DLI 19/12/04
Sites of Aboriginal Significance DIA 28/02/03

4. Assessor's comments

Purpose	Method	Applied area (ha)/ trees	Comment
Mineral Production	Mechanical Removal	100	The amended proposal has been assessed against the clearing principles and the proposed clearing is found to be not at variance to principle e and h, not likely to be at variance to principles a, b, d, i and j , and may be at variance to principles c, f and g. The assessing officer recommends that the permit be granted subject to the following conditions: 1. Where there is no alternative pre-existing access route, clearing for access tracks within 10 metres of an incised drainage channel shall not remove any specimens of Red River Gum (Eucalyptus camaldulensis). 2. The Permit Holder shall not clear vegetation for exploration drill pads or associated sump areas within 10 metres of an incised drainage channel. 3. When undertaking any clearing, revegetation and rehabilitation, or other activity pursuant to this Permit the Permit Holder must take the following steps to minimise the risk of the introduction and spread of weeds: a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared; b) ensure that no weed-affected road building materials, mulch, fill or other material is brought into the area to be cleared; and c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared. 4. The Permit Holder shall stockpile the vegetative material and topsoil removed by clearing in accordance with this permit and use in rehabilitation under condition 5. 5. The Permit Holder shall rehabilitate each area cleared under this permit within 12 months after the Permit Holder completes exploration activities on that area. 6. Where clearing results in the loss of Phyllanthus baeckeoides specimens, and regrowth following rehabilitation required under condition 5 of this permit, does not result in the population having similar density in that area as existed prior to clearing, the Permit Holder must revegetate the area cleared under this permit by deliberately planting or seeding Phyllanthus baeckeoides to achieve a similar population density in that area as existed prior to clearing. 7. The Permit Holder shall record the following for each instance of clearing: a) the location of where the clearing occurred, expressed as grid coordinates using the Geocentric Datum of Australia 1994 coordinate system; b) the size of the area cleared in hectares; c) the dates on which the area was cleared, and d) the number of specimens of Phyllanthus baeckeoides cleared. 8. The Permit Holder shall provide a report to the Director, Environment, Department of Industry and Resources by 30 June each year for the life of the permit, setting out the records required under condition 7 of this permit in relation to clearing carried out between 1st January and 31st December the previous year.

5. References

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Bureau of Meteorology, (2006). BOM Website - Climate Averages by Number, Averages for LEONORA. www.bom.gov.au/climate/averages/tables/cw_012046.shtml. Accessed 15/8/06

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DAFWA Land degradation assessment report. Office of the Commissioner of Soil and Land Conservation, Department of Agriculture and Food Western Australia. DoE TRIM ref XXXXX.

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Department of the Environment and Heritage (2006). Egernia kintorei in Species Profile and Threats Database, Department of the Environment and Heritage, Canberra. Available from: http://www.deh.gov.au/sprat. Accessed 15/8/2006.

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Jims Seeds, Weeds & Trees, (2004). Flora Survey - Jaguar/Teutonic Bore For Pilbara Mines Limited, September 2004. Unpublished report prepared for Pilbara Mines Limited. Kalgoorlie, Western Australia.

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Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) Native Vegetation in Western Australia, Extent, Type and Status. Resource Management Technical Report 249. Department of Agriculture, Western Australia.

Shepherdson, J, (2005). Jabiru Metals Limited, Teutonic Bore/Jaguar Mine Site Rare Flora Survey. Unpublished report prepared for Jabiru Metals. West 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.
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.