



1. Application details

1.1. Permit application details

Permit application No.: 2681/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Crescent Gold Limited

1.3. Property details

Property: Mining Lease 38/270
Local Government Area: Shire of Laverton
Colloquial name: Craiggimore Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
30		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
<p>Beard Vegetation Associations have been mapped at a 1:250,000 scale for the whole of Western Australia. One Beard Vegetation Association has been mapped within the application area (GIS Database; Shepherd et al., 2001).</p> <p>18: Low woodland; mulga (<i>Acacia aneura</i>)</p> <p>The application area was surveyed by Western Botanical staff in July 2007 (Western Botanical, 2007). The following vegetation types were identified within the application area.</p> <p>1. Banded Ironstone Formation (BIF): <i>Acacia aneura</i>, <i>Acacia</i> sp. aff. <i>quadrimarginea</i>, <i>A. tetragonophylla</i> open scrub over open low scrub of <i>Eremophila latrobei</i> subsp. <i>brucei</i>, <i>Hibiscus gardneri</i> over <i>Cheilanthes sieberi</i> subsp. <i>sieberi</i>, <i>Isotoma petraea</i>, <i>Ptilotus helipteroides</i> subsp. <i>helipteroides</i> very open herbs and <i>Eriachne mucronata</i>, <i>Enneapogon caeruleus</i>, <i>Cymbopogon ambiguus</i> very open grasses.</p> <p>2. Stony Ironstone Mulga Shrub lands (SIMS): <i>Acacia aneura</i>, <i>Acacia ramulosa</i> var. <i>ramulosa</i>, <i>Acacia</i> spp. aff. <i>quadrimarginea</i> scrub over <i>Eremophila forrestii</i> subsp. <i>forrestii</i>, <i>Scaevola spinescens</i> (narrow leaf form), <i>Senna artemisioides</i> subsp. <i>helmsii</i>, <i>Senna artemisioides</i> subsp. <i>filifolia</i> low scrub.</p> <p>3. Lateritic Hardpan Mulga Shrub land (LHMS): <i>Acacia aneura</i>, <i>Acacia ramulosa</i> var. <i>ramulosa</i> scrub over <i>Ptilotus obovatus</i>, <i>Ptilotus schwartzii</i> var. <i>schwartzii</i>, <i>Solanum lasiophyllum</i> open dwarf scrub over <i>Eragrostis eriopoda</i> open grass.</p> <p>4. Drainage Tract Mulga Shrub land (DRMS): Vegetation composition is highly variable and is largely composed of species common to surrounding vegetation units. Dominated by <i>Acacia aneura</i> low forest over highly variable understorey, reflecting species present in adjacent habitats, consisting of shrubs, grasses and herbs.</p>	<p>Crescent Gold Limited has applied to clear up to 30 hectares of native vegetation for the purposes of mineral production (MBS Environmental, 2008). The areas cleared will be for waste rock stockpile, a pit, ore stockpile, laydown areas, topsoil stockpiles, site office and self banded fuel tanks (MBS Environmental, 2008).</p> <p>Crescent Gold Limited intends to clear using bulldozers and the vegetation is to be stockpiled for use in rehabilitation. The application area is located within the Craiggimore deposit, which has been subject to historical mining activities. Currently the Craiggimore Project consists of an existing pit, three waste rock stockpiles and a haul road (MBS Environmental, 2008).</p>	<p>Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery 1994)</p> <p>To</p> <p>Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery 1994).</p>	<p>The vegetation condition was derived from a vegetation survey conducted by Western Botanical (2007).</p>

Three species of introduced flora were recorded within the application area: Pepper Tree (*Schinus molle*), Wild Watermelon (*Citrullus lanatus*) and Gooseberry Gourd (*Cucumis myriocarpus*) (Western Botanical, 2007).

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 application area occurs within the East Murchison Interim Biogeographic Regionalisation of Australia (IBRA) sub-region (GIS Database). This sub-region is characterised by internal drainage, and extensive areas of elevated red desert sand plains with minimal dune development (CALM, 2002). It contains salt-lake systems associated with the occluded Paleodrainage system (CALM, 2002). This sub-region has broad plains of red-brown soils and breakaway complexes as well as red sand plains (CALM, 2002). The vegetation is dominated by Mulga woodlands often rich in ephemerals, hummock grasslands, saltbush shrub lands and *Halosarcia* shrub lands (CALM, 2002). The vegetation described within the application area (MBS Environmental, 2008) is typical of the bioregion.

A vegetation survey of the application area and surrounding vegetation identified 109 species of native flora belonging to 53 genera from 33 families (MBS Environmental, 2008). This is considered to be biologically diverse. Mimosaceae (15), Chenopodiaceae (14) and Myoporaceae (13) families were the most diverse within the survey area (MBS Environmental, 2008). This is typical of the floristics of the Murchison IBRA Region.

Three introduced weed species were recorded during the vegetation survey (Western Botanical, 2007). None of these species are listed as a 'Declared Plant' species under the *Agriculture and Related Resources Protection Act 1976* by the Department of Agriculture and Food (DAFWA). 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 if the area is subject to repeated fires. It is not expected that the clearing of vegetation will increase the incidence of these weed species within the application area or surrounding vegetation, but should a clearing permit be granted, it is recommended that a condition be imposed for the purposes of weed management.

An area search of the Western Australian Museum's Faunabase conducted by the assessing officer suggests that the application area is diverse in reptile species, particularly Skinks (28) and Geckos (16) (Western Australian Museum, 2008). The database search found 76 reptile species from 7 families as potentially occurring within the application area, or within a 50 kilometre radius of the application area.

Although the application area is high in floral and faunal diversity, it is not likely to have greater diversity than similar areas within the region, particularly as parts of the application area have been degraded by previous disturbance from mining and pastoral activities. The landforms, vegetation types and fauna habitats in the application area are well represented in the Murchison Region (MBS Environmental, 2008; GIS Database). It is not likely that the application area comprises a higher level of biological diversity than other undisturbed areas within the sub-region.

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

Methodology

CALM (2002)
MBS Environmental (2008)
Western Australian Museum (2008)
Western Botanical (2007)
GIS Database
- Pre-European Vegetation
- Interim Biogeographic Regionalisation of Australia

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

Comments

Proposal is not likely to be at variance to this Principle

The assessing officer has conducted a search of the Western Australian Museum's online fauna database between the coordinates 122.9050°E, 28.1965°S and 121.8637°E, 29.1174°S, representing a 50 kilometre radius around the application area.

This search identified 5 Amphibian, 13 Avian, 20 Mammalian and 76 Reptilian species that may occur within the application area (Western Australian Museum, 2008). Of these, the following species of conservation significance has previously been recorded within the search area: Crested Bell Bird (*Oreoica gutturalis*).

A ten day fauna trapping survey conducted in 2005 in an area of Mulga woodland located north of Laverton recorded 16 Mammal species including 6 species of bat and 2 introduced species (Coffey Environments, 2008). Although no specific short range endemic (SRE) investigations were undertaken, none of the habitats within the application area are unique or locally uncommon and are therefore unlikely to support SRE fauna that are not found elsewhere within the immediate vicinity (Coffey Environments, 2008).

Coffey Environments (2008) conducted a fauna survey of the application area in May 2008. MBS Environmental (2008) conducted a desktop search of the DEC threatened fauna database to identify species of conservation significance that had been recorded within the area specified. The co-ordinates used were similar to those used

by the assessing officer above. In addition to those species listed above, the following fauna species of conservation significance were identified through this database search:

Mulgara (*Dasyercus cristicauda*), Numbat (*Myrmecobius fasciatus*), Malleefowl (*Leipoa ocellata*), Giant Desert Skink (*Egernia kintorei*), Peregrine Falcon (*Falco peregrinus*), Australian Bustard (*Ardeotis australis*), Slender Billed Thornbill (*Acanthiza iredalei iredalei*), Princess Parrot (*Polytelis alexandrae*), Rainbow Bee-eater (*Merops ornatus*), Great Egret (*Ardea alba*), Oriental Plover (*Charadrius veredus*) and the Fork Tailed Swift (*Apus pacificus*).

Mulgara (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice, 2008*) inhabit arid regions of Australia and are commonly found on sandy soils vegetated with spinifex (Coffey Environments, 2008). There is also evidence to suggest that colonies of Mulgara coincide with watered areas such as paleo-drainage lines (HGM, 1997). It is unlikely that the application area would provide significant habitat for this species.

Numbats (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice, 2008*) were once spread across southern semi-arid and arid Australia (DEC, 2008a). They are currently only known from a few populations in the south-west of Western Australia (DEC, 2008a). Current populations occupy several different habitat types including upland Jarrah forest, open eucalypt woodland, banksia woodland and tall closed shrubland (DEC, 2008a). There are no recent records of this species from within the general location of the application area and so it is unlikely that the application area contains significant habitat for this species.

Malleefowl (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice, 2008*) are largely confined to arid and semi-arid woodland that is dominated by mallee eucalypts on sandy soils, with less than 430 millimetres of rainfall annually (DEC, 2008b). However, they can also occur in habitats of acacia, paperbark, she-oak and other scrubs as well as eucalypt woodland and coastal heaths with an abundant layer of leaf litter for use in nest mounds (Garnett & Crowley, 2000). It is unlikely that the application area would provide significant habitat for this species given the vegetation types are well represented within the bioregion and the area proposed to clear is small (30 hectares) in relation to the size of the sub-region (7,847,996 hectares).

The Giant Desert Skink (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice, 2008*) is a burrowing species of skink, found in a variety of desert habitats, on sandy, clay and loamy soils (DEWHA, 2008). Its preferred habitat is sand flats and clay-based or loamy soils vegetated with spinifex (Coffey Environments, 2008). There have been previous records of the Giant Desert skink in Laverton in 1967 so it is possible that the vegetation within the application area provides suitable habitat for this species. Given that the vegetation types are well represented throughout the bioregion and the small area proposed to clear (30 hectares) in relation to the size of the sub-region (7,847,996 hectares) it is unlikely that the application area contains significant habitat for this species.

The Peregrine Falcon (Schedule 4, other specially protected fauna, *Wildlife Conservation (Specially Protected Fauna) Notice, 2006*), is a wide ranging bird that has little habitat specificity apart from an affinity with cliffs, tall trees for nesting, and water (Pizzey & Knight, 1997). The application area may contain vegetation that provides suitable habitat for this species, however given that this species does not have a restricted range and the vegetation types that comprise its habitat are well represented throughout the bioregion, and the small area proposed to clear (30 hectares) in relation to the size of the sub-region (7,847,996 hectares) it is unlikely that the application area contains significant habitat for this species.

The Australian Bustard (P4 - DEC Priority Fauna List) The Australian Bustard prefers tussock grassland, Triodia hummock grassland, grassy woodland and low shrub lands (Garnett & Crowley, 2000). This species has previously been recorded within the bioregion and so it is likely that the application area contains suitable habitat for this species. Given that the vegetation types are well represented throughout the bioregion and the small area proposed to clear (30 hectares) in relation to the size of the sub-region (7,847,996 hectares) it is unlikely that the application area contains significant habitat for this species.

The Crested Bellbird (P4 - DEC Priority Fauna List) favours the shrub-layer of eucalypt woodland, mallee, acacia shrubland, Triodia hummock grassland, saltbush and heath (Garnett & Crowley, 2000). The Crested Bellbird is relatively widespread over most of inland Australia (Garnett & Crowley, 2000). The vegetation within the application area provides suitable habitat for this species, however given that the vegetation types are well represented throughout the bioregion and the small area proposed to clear (30 hectares) in relation to the size of the sub-region (7,847,996 hectares) it is unlikely that the application area contains significant habitat for this species.

The Princess Parrot (P4 - DEC Priority Fauna List) is highly nomadic and has a sporadic occurrence throughout the arid interior of Australia. This species occupies arid shrub lands, particularly favouring those dominated by Mulga over Spinifex, Casuarina and *Eucalyptus camaldulensis* (Cowan 2001; Coffey Environments, 2008). The Princess Parrot has previously been sighted within the application area, however given that the vegetation types are well represented throughout the bioregion and the nomadic nature of this species it is unlikely that the application area contains significant habitat for this species.

The Rainbow Bee-Eater (migratory - JAMBA International Agreement) occurs mainly in open forests,

woodlands and shrub lands but also occurs in inland and coastal sand dune systems and mangroves in Northern Australia (Western Australian Museum, 2008). This species is an opportunist and is known to inhabit a wide range of habitats (Pizzey and Knight, 1997). This species is likely to occur within the application area, however given that this species does not have a restricted range and the vegetation types that comprise its habitat are well represented throughout the bioregion it is unlikely that the application area contains significant habitat for this species.

The Fork-tailed Swift (Migratory – *Environmental Protection and Biodiversity Conservation Act 1999*) is reported to roost on cliffs and large trees, but it prefers open country where it is an aerial feeder rarely landing and is known to spend nights without landing (Pizzey and Knight, 1997). This species may occur within the application area however given that the vegetation types are well represented throughout the bioregion and the small area proposed to clear (30 hectares) in relation to the size of the sub-region (7,847,996 hectares) it is unlikely that the application area contains significant habitat for this species.

The Slender Billed Thornbill (Migratory - *EPBC Act 1999*) occurs in arid and semi-arid regions of southern Western Australia occupying chenopod shrub lands that are dominated by samphires or *Maireana* and *Atriplex* associations (Department of Environment and Water Resources, 2008). This species has not been recorded from any previous surveys undertaken in the region and so it is unlikely that the application area contains significant habitat for this species.

The Oriental Plover (Migratory - *EPBC Act 1999*) is most common in coastal areas and northern Australia. It is generally found inland in open grasslands in arid and semi-arid zones (Birds in Backyards, 2008a). It prefers flat inland plains, sparsely vegetated short grass with hard bare ground including claypans, playing fields, lawns and cattle camps (Birds in Backyards, 2008a). It is unlikely that the application area contains suitable habitat for this species.

The Great Egret (Migratory - *EPBC Act 1999*) is common throughout Australia, with the exception of most arid areas (Birds in Backyards, 2008b). Great Egrets prefer shallow water, particularly when flowing, but may be seen on any watered area, including damp grasslands. It is unlikely that the application area provides significant habitat for this species due to the lack of ephemeral lakes within the application area.

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

Methodology Birds in Backyards (2008a)
Birds in Backyards (2008b)
Coffey Environments (2008)
Cowan (2001)
DEC (2008a)
DEC (2008b)
DEWHA (2008)
Department of Environment and Water Resources (2008)
Garnett and Crowley (2000)
HGM (1997)
MBS Environmental (2008)
Pizzey and Knight (1997)
Western Australian Museum (2008)

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

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

According to available databases, no Declared Rare or Priority flora species occur within the application area (GIS Database).

A flora survey was conducted over the application area by Western Botanical in July 2007 (Western Botanical, 2007). This survey involved the area being traversed by one team of two people via a four wheel drive and on foot where appropriate. Different vegetation groups encountered during the survey were described and the vegetation associations were examined for the presence or absence of any Declared Rare Flora and Priority Flora species (Western Botanical, 2007). No species of Declared Rare or Priority flora were recorded during the flora survey.

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

Methodology Western Botanical (2007)
GIS Database
- Declared Rare and Priority Flora

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

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

A search of available databases reveals that there are no Threatened Ecological Communities (TECs) within the application area (GIS Database). There are no TEC's located within the East Murchison IBRA sub-region (CALM, 2002). MBS Environmental (2008) reported that no Threatened Ecological Communities were identified during the flora survey of the application area.

The application area is located approximately 7 kilometres south-west of Mount Jumbo, which is listed as an 'ecosystem at risk' in 'A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002' (CALM, 2002). The Mount Jumbo Range Vegetation Complex has been given a status of vulnerable, with threatening processes being listed as grazing pressure, feral animals (goats and rabbits) and changed fire regimes (CALM, 2002). The vegetation types according to the National Vegetation Inventory System (NVIS), listed as occurring in this area are mixed species arid Acacia woodlands and shrub lands. The Mount Jumbo Range Vegetation Complex is listed as being in good condition although vulnerable (CALM, 2002).

The Banded Ironstone Hills are another 'ecosystem at risk' within close proximity to the application area (ANRA, 2008). There are Banded Ironstone Formation (BIF) communities restricted to three small areas within the Craiggie more locality, totalling 17 hectares (Western Botanical, 2007). The nearest of these is located approximately 1 kilometre north-east of the application area (MBS Environmental, 2008). The Banded Ironstone Formation (BIF) communities have been given a status of vulnerable, with threatening processes being listed as grazing pressure, feral animals (goats and rabbits) and changed fire regimes (ANRA, 2008).

Due to the distance from the application area, these ecosystems are unlikely to be affected by the proposed clearing.

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

Methodology ANRA (2008)
CALM (2002)
MBS Environmental (2008)
Western Botanical (2008)
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

The application area falls within the IBRA Murchison Bioregion. Shepherd et al. (2001) report that approximately 100% of the pre-European vegetation still exists in this Bioregion. The vegetation in the application area is recorded as Beard Vegetation Association 18: Low woodland; mulga (*Acacia aneura*) (GIS Database; Shepherd et al., 2001). According to Shepherd et al., (2001) there is approximately 100% of this vegetation type remaining (see table below).

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

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	% of Pre-European area in IUCN Class I-IV Reserves
IBRA Bioregion – Murchison	28,120,558	28,120,558	~100.0	Least Concern	~1.1
Beard veg assoc. – State					
18	19,892,437	19,890,348	~100.0	Least Concern	~2.1
Beard veg assoc. – Bioregion					
18	12,406,248	12,403,248	~100.0	Least Concern	~0.4

* Shepherd et al. (2001) updated 2005

** Department of Natural Resources and Environment (2002)

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

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

GIS Database
- Pre-European Vegetation
- Interim Biogeographic Regionalisation of Australia

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

Comments Proposal is at variance to this Principle

There is one minor non-perennial watercourse running through the northern section of the application area (GIS Database). Another minor non-perennial watercourse also runs parallel to the southern section of the application area (GIS Database). The native vegetation recorded within the application area is not riparian vegetation (MBS Environmental, 2008).

The application area experiences a rainfall of approximately 232.5 mm/year according to the nearest recording station at Laverton (BOM, 2008). The application area also experiences a pan evaporation rate of approximately 3200 mm/year (Luke et al., 1987).

Based on the above, the proposed clearing is at variance to this Principle. However, as the minor watercourse located within the application area is only likely to flow following significant rainfall, the proposed clearing is unlikely to result in any significant impact to any watercourse or wetland.

Methodology BOM (2008)
Luke et al. (1987)
MBS Environmental (2008)
GIS Database
- Hydrography - Linear

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

Comments Proposal may be at variance to this Principle

The application area has been surveyed by the Department of Agriculture and Food (Van Vreeswyk et al., 1994). The application area is composed of the following land systems (GIS Database);

- Brooking Land System
- Violet Land System

The Brooking Land System is described as prominent ridges of banded iron formation, supporting mulga shrub lands; occasional minor halophytic communities in the south-east (Van Vreeswyk et al., 1994). An analysis of aerial photography for the application area reveals the application area is most likely to fall within the 'Narrow drainage tracts' and 'stony plains' land units of the Brooking Land System. The stone mantles of these land units provide effective protection against soil erosion but the disturbance or removal of stone mantles may initiate soil erosion (Van Vreeswyk et al., 1994). The vegetation described by Van Vreeswyk et al. (1994) accurately reflects the vegetation types described in the vegetation surveys conducted over the area (MBS Environmental, 2008).

The Violet Land System is described as undulating stony and gravelly plains and low rises, supporting mulga shrub lands (Van Vreeswyk et al., 1994). An analysis of aerial photography for the application area reveals the application area is most likely to fall within the 'Narrow drainage tracts', 'lateritic sandy plains', 'stony plains' and 'hardpan plains' land units of the Violet Land System. The soils of these land units are not susceptible to erosion due to abundant stony mantles except in the narrow drainage tracts land unit which are mildly susceptible to water erosion (Van Vreeswyk et al., 1994). In circumstances where the mantle is removed or disturbed, the soil can become moderately susceptible to water erosion. The vegetation described by Van Vreeswyk et al. (1994) accurately reflects the vegetation types described in vegetation surveys conducted over the area (MBS Environmental, 2008).

Based on the above the proposed clearing may be at variance to this Principle. Should a clearing permit be granted, it is recommended that a condition be imposed for the purposes of rehabilitation to minimise erosion and land degradation.

Methodology MBS Environmental (2008)
Van Vreeswyk et al. (1994)
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 is located approximately 123 kilometres to the south south-west of the De La Poer Range Nature Reserve (GIS Database). At this distance it is not likely that the vegetation within the application area provides a buffer to a conservation area, or is important as an ecological linkage to a conservation area. The vegetation types within the application area are well replicated in other land systems within the Murchison region. Consequently, their conservation status is under no threat.

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 located within an unassigned Public Drinking Water Source Area (PDWSA) (GIS Database).

There are no permanent water bodies or watercourses within the application area (GIS Database). The application area is located in an arid region, with mainly winter rainfall (CALM, 2002). With an average rainfall of approximately 232.2 mm/year (BOM, 2008) and an annual pan evaporation rate of 3200 mm/year (Luke et al., 1987), there is little surface flow during normal seasonal rains. The proposed clearing is not likely to cause the quality of surface water to deteriorate.

The application area is located within the Yilgarn Goldfields Groundwater Province (GIS Database). The groundwater salinity within the application area is approximately 1,000 - 3,000 milligrams/Litre Total Dissolved solids (TDS) (GIS Database). Given the size of the area to be cleared (30 hectares) compared to the size of the Yilgarn Goldfields Groundwater Province (29,644,595 hectares) (GIS Database), the proposed clearing is not likely to cause salinity levels within the application area to alter significantly.

Groundwater has been measured at depths of 66m and was found to be alkaline and highly saline (MBS Environmental, 2008). The proposed clearing is not likely to cause groundwater quality to deteriorate.

There are no known Groundwater Dependent Ecosystems within the application area (GIS Database).

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

Methodology BOM (2008)
CALM (2002)
Luke et al. (1987)
MBS Environmental (2008)
GIS Database
- Public Drinking Water Source Area (PDWSA)
- Hydrography - Linear
- Potential Groundwater Dependent Ecosystems
- Groundwater Provinces
- Groundwater Salinity, Statewide

(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 receives low rainfall (approximately 232.2 mm/year), usually experienced during the winter months (CALM, 2002) and is located on a rise in the landscape (MBS Environmental, 2008). The water systems located within and in close proximity to the application area are dry for the majority of the year and only flow during and immediately after significant rainfall (MBS Environmental, 2008). It is likely that during times of intense rainfall there may be some localised flooding in adjacent areas.

The application area drains into the Lake Carey catchment area (GIS Database). The relatively small area to be cleared (30 hectares) in relation to the size of the catchment area (11,378,213 hectares) (GIS Database) is not likely to lead to an increase in flood height or duration.

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

Methodology CALM (2002)
MBS Environmental (2008)

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

Comments

There is one Native Title Claim (WC99-001) over the area under application. This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. However, the tenement has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are no known Aboriginal sites of significance within the application area (GIS Database). The nearest known Aboriginal site of significance is located approximately 2.2 kilometres north-east of the application area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal sites of significance are damaged through the clearing process.

The application area is located within an unassigned Public Drinking Water Source Area and is situated outside of the Laverton Water Reserve (MBS Environmental, 2008; GIS Database). The Department of Water (DoW) considered the proposal and provided no comment (DoW, 2008).

It is the proponent's responsibility to liaise with the Department of Environment and Conservation and the DoW, 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 public submissions were received during the public notification period regarding this application.

Methodology DoW (2008)
MBS Environmental (2008)
GIS Database
- Aboriginal Sites of Significance
- Native Title Claims
- Public Drinking Water Source Area (PDWSA)

4. Assessor's comments

Comment

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

It is recommended that should a permit be granted, conditions be imposed on the permit with regards to weed management, rehabilitation, recording the areas cleared and reporting.

5. References

- ANRA (2008) Australian Natural Resources Atlas - Murchison. <http://www.anra.gov.au/topics/vegetation/assessment/wa/ibra-mur-ecosystem-threats.html> (Accessed September 28 2008).
- Birds in Backyards (2008a). Birds in Backyards - Oriental Plover. <http://www.birdsinbackyards.net/finder/display.cfm?id=353> (Accessed 26 September 2008).
- Birds in Backyards (2008b). Birds in Backyards - Great Egret. <http://www.birdsinbackyards.net/finder/display.cfm?id=84> (Accessed 26 September 2008).
- Bureau of Meteorology (2008) BOM Website - Climate Averages by Number, Averages for LAVERTON. www.bom.gov.au/climate/averages/tables/cw_012045.shtml (Accessed 8 September 2008).
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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.