



## 1. Application details

### 1.1. Permit application details

Permit application No.: 1381/1  
Permit type: Area Permit

### 1.2. Proponent details

Proponent's name: Exmouth Quarries & Concrete

### 1.3. Property details

Property: M08/62  
Local Government Area: Shire Of Exmouth  
Colloquial name:

### 1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
1.5		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>The vegetation in the proposed clearing area is broadly mapped as: Beard Vegetation Association 663: Hummock grasslands, shrub steppe; waterwood over soft spinifex (GIS Database).</p> <p>A flora and vegetation survey of Mining Lease 08/62 was undertaken in May 2006 by J. Busniak. Vegetation within the proposed clearing areas was described as perennial tussock grasses and mixed young shrubs. According to Busniak (2006), the proposed clearing area consists mainly of coloniser species.</p> <p><i>Triodia pungens</i> was a dominant understorey species, with a mixture of <i>Acacia</i> and <i>Eremophila</i> species comprising the shrub layer. Some chenopod (samphire and saltbush) species were also recorded, including <i>Atriplex codoncarpa</i>, <i>A. holocarpa</i>, <i>Maireana planifolia</i> and <i>Rhagodia eremaea</i>. Few tree species were recorded during the vegetation survey. Weed species recorded from the site included Buffel Grass (<i>Cenchrus ciliaris</i>) and Birdwood Grass (<i>Cenchrus setiger</i>).</p>	<p>This clearing permit application is for an area permit to clear up to 1.5 hectares of native vegetation, and includes two separate areas within mining lease M08/62. Clearing will allow the proponent to expand existing quarrying operations on Mining Lease 08/62. Limestone will be quarried on three separate mining faces under the proposed expansions. Quarried material will be crushed and used in the production of concrete. The proponent has requested that the area permit be valid for a ten year period, allowing clearing to occur progressively at a rate of 1,500 square metres per annum. However the tenement expiry date is the 29 August 2009 and the clearing permit expiry date has been set to that date.</p> <p>The environmental officer, Minerals Branch (DoIR) has advised that progressive rehabilitation will be a mining tenement condition, managed under the <i>Mining Act 1978</i>. Rehabilitation will include the removal of mining infrastructure, deep ripping, respreading of topsoil, battering and contouring of all quarry faces and seeding local provenance species (DoIR, 2007).</p>	<p>Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery 1994)</p>	<p>The proposed clearing area is located at the foothills on the eastern side of the Cape Range Escarpment (Busniak, 2006). Cyclonic activity has severely impacted the site over the last decade, and a hot fire in 2001 has caused death and influenced the growth pattern of some vegetation (Busniak, 2006). Evidence of access tracks and exploration drilling is also present in the areas applied to clear (Busniak, 2006). Prior to the establishment of the Exmouth townsite, the area was used as a pastoral lease holding. Buffel Grass was introduced to the site during this time and still persists today (Busniak, 2006).</p>

## 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 areas occur at the foothills of the Cape Range, an area that is listed on the Register of the National Estate (GIS Database). The Cape Range and the adjacent coastal plain are of outstanding significance for their geological, palaeontological, cultural and biological features (Australian Heritage Council,

2002). The Cape Range is especially renowned for its subterranean cave fauna (troglifauna), of which 65 species have been recorded to date. This represents a diversity of cave dwelling species higher than larger and more intensively studied caves such as those in Tasmania and Central America (Australian Heritage Council, 2002). According to the Australian Heritage Council (2002), the Cape Range and adjacent coastal plain is thought to be the most diverse karst area in the world for cave fauna.

The Cape Range peninsula is a transitional zone between the tropical and temperate flora of Western Australia. As a result, the area is floristically diverse, with 630 species recorded. At least 12 of these species are believed to be endemic or near endemic to the Cape Range peninsula (Australian Heritage Council, 2002).

Despite the troglobitic and floristic diversity of the Cape Range peninsula, the proposed clearing areas are not representative of places of outstanding biodiversity, nor is the proposed clearing likely to impact upon biodiversity. Any troglobitic fauna beneath the proposed clearing areas is unlikely to be affected by vegetation clearing. According to Busniak (2006) the vegetation on Mining Lease M08/62 consists mainly of coloniser species. Disturbances exist in the form of mineral exploration drilling and associated mining infrastructure, weeds (Buffel Grass), a hot fire in 2001 which has impacted upon vegetation, and historic pastoral grazing (Busniak, 2006). Such disturbances suggest that the proposed clearing areas are less likely to support a diverse assemblage of indigenous flora and fauna species.

Due to previous disturbance nearby the small areas of vegetation applied to clear are unlikely to be of a higher biodiversity value than undisturbed areas conserved within the Cape Range National Park, located approximately 5.2km to the west.

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

**Methodology** GIS Database - Clearing Regulations: Environmentally Sensitive Areas -DOE 30/05/05.  
Australian Heritage Council (2002).

**(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**

Fauna records held by the Department of Environment and Conservation (DEC) reveal that a majority of the Priority and Threatened fauna species recorded in the vicinity of the proposed clearing areas are cave dwelling (GIS Database; DEC, 2007). Records show numerous fish, millipedes, arachnids and crustaceans of conservation significance within a 10km radius of the proposed quarry expansion (GIS Database). The proposed vegetation clearing is not likely to impact any of these cave dwelling fauna species.

The proposed clearing areas are located within the Exmouth townsite boundary, and have been subject to previous disturbances such as pastoralism, quarrying and fire (Busniak, 2006). According to Busniak (2006), the majority of the vegetation in the proposed clearing areas consists of coloniser species, with few trees recorded. Site and aerial photography substantiates these findings (GIS Database; Busniak 2006). Based on this information, the proposed clearing areas are less likely to provide important fauna habitats than undisturbed areas of vegetation in the region.

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

**Methodology** GIS Database:  
- Exmouth Townsite - 20cm Orthomosaic - DLI 03 (Image).  
- Threatened Fauna - CALM 30/09/05.  
Busniak (2006).  
DEC (2007).

**(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 the Department of Environment and Conservation records, there are no known Declared Rare Flora (DRF) or Priority Flora species in the proposed clearing area (GIS Database). The flora survey undertaken by Busniak (2006) did not find any DRF species in the proposed clearing area, however one solitary plant of the Priority 4 species *Brachychiton obtusilobus* was identified.

Priority 4 species are defined as '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' (Atkins, 2006).

The proposed clearing of one individual plant of this Priority 4 species is unlikely to have a significant impact upon the species conservation status. According to the Western Australian Herbarium (2006), *Brachychiton obtusilobus* shows a preference for rocky limestone ranges and gorges. Such habitats are well represented on the Cape Range peninsula, and as such there is no evidence to suggest that the small area proposed to clear

represents significant habitat for this species.

The vegetation of the proposed clearing areas (Beard Vegetation Association 663) is well represented on the Cape Range peninsula (GIS Database). Furthermore, the proposed clearing areas have been subject to historical mining and pastoral disturbances (Busniak, 2006). It is therefore unlikely that the small area subject of this clearing permit application is representative of significant habitat for any Rare or Priority Flora.

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

**Methodology** GIS Database:  
- Declared Rare and Priority Flora List- CALM 01/07/05.  
- Pre-European Vegetation - DA 01/01.  
Atkins (2006).  
Busniak (2006).  
Western Australian Herbarium (2006).

**(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**

The 'Camerons Cave Troglitic Community' is located approximately 1.2km north east of the proposed clearing areas (GIS Database). This Threatened Ecological Community (TEC) contains a rich assemblage of terrestrial cave dwelling fauna (troglifauna) and aquatic cave dwelling fauna (stygo fauna). According to the Australian Heritage Council (2002), the Cape Range is believed to be the most diverse karst area in the world for cave fauna. The 'Camerons Cave Troglitic Community' is comprised of a range of classes, orders, families and genera which are restricted to a few caves worldwide (Australian Heritage Council, 2002). Numerous fish, crustaceans, insects and arachnids are known from the 'Camerons Cave Troglitic Community'. Much of the fauna within this TEC is uncommon and vulnerable to extinction as a result of low numbers, and a limited geographical range (Australian Heritage Council, 2002). A considerable amount of research is still required to identify and describe new troglitic fauna in the area.

The proposed clearing of vegetation is unlikely to have any significant impacts upon 'Camerons Cave Troglitic Community' given that this community is approximately 1.2 km north east of the proposed clearing and is cave dwelling in nature (DEC, 2007). The proposed quarrying operations are more likely to pose a risk to this TEC, however a member of the Western Australian Speleological Society, who is very familiar with the Cape Range area, has advised that there are no records of caves in mining tenement M08/62 (Exmouth Quarries and Concrete, 2006). Caves are unlikely to be encountered given that quarrying operations will be at a relatively shallow depth above the water table (Appeals Convenor, 2006). The proposed quarrying extensions are unlikely to impact upon 'Camerons Cave Troglitic Community' given that this TEC is located approximately 1.2km to the north.

As a precaution, the following *Mining Act 1978* tenement condition will be attached to Mining Lease M08/62 :

- 'The proponent shall prepare and implement, to the satisfaction of the Department of Industry and Resources on advice from the Environmental Protection Authority Service Unit, an Environmental Management Programme (EMP) within three months of approval of the Low Impact Mining Operation Proforma. This programme shall include but not be limited to the following:
- ' In the event that a cave is encountered, the proponent commits to halt operations until the cave has been assessed by the WA Speleological Group and is found to not be of any significance. If the cave is found to be significant, the proponent will ensure that the cave is protected by diverting operations around the cave site' (DoIR, 2007).

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

**Methodology** Appeals Convenor (2006).  
Australian Heritage Council (2002).  
DEC (2007).  
DoIR (2007).  
Exmouth Quarries and Concrete (2006).  
MiTiS (2006).  
GIS Database - Threatened Ecological Communities - CALM 12/04/05.

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

**Comments Proposal is not at variance to this Principle**

The area applied to clear falls within the Interim Biogeographic Regionalisation for Australia (IBRA) Carnarvon Bioregion (GIS Database). According to Shepherd et al (2001), there is approximately 99.8% of the pre-European vegetation remaining in this Bioregion. The vegetation of the application area has been classified as

Beard Vegetation Association 663: Hummock grasslands, shrub steppe; waterwood over soft spinifex (GIS Database). According to Shepherd et al (2001), there is approximately 95.25% of this vegetation type remaining in the Carnarvon Bioregion. The benchmark of 15% representation in conservation reserves (JANIS Forests Criteria, 1997) has been met for Beard Vegetation Association 663, with approximately 22.5% of this vegetation type within the Carnarvon Bioregion in conservation reserves (Shepherd et al, 2001). The area proposed to clear does not represent a significant remnant of vegetation in an area that has been extensively cleared.

	Pre-European Area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	% in IUCN Class I-IV Reserves*
IBRA Bioregion - Carnarvon Shire of Exmouth	8,382,975	8,369,554	99.8%	Least concern	3.6%
Beard Vegetation Associations - 663	No Information Available	No Information Available	No Information Available	No Information Available	No Information Available
	29,021	27,642	95.25%	Least concern	22.5%

\* Shepherd et al. (2001)

\*\* 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).  
 JANIS Forests Criteria (1997).  
 Shepherd et al (2001).  
 GIS Database:  
 - Pre-European Vegetation - DA 01/01.  
 - Interim Biogeographic Regionalisation for Australia - EA 18/10/00.

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

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

The proposed clearing areas are located either side of a deeply incised ephemeral creekline (GIS Database). Mining has previously taken place within this creekline, and haul roads exist within part of the creek bed (Exmouth Quarries and Concrete, 2006). It is therefore unlikely that this creek has significant environmental values.

No clearing will take place within the creekline under this clearing permit application (Exmouth Quarries and Concrete, 2006). The three active quarry faces which are proposed for expansion will be mined 2 - 5 metres above the creek bed (Exmouth Quarries and Concrete, 2006). The proponent has applied for a Bed and Banks permit for the proposed works, in accordance with Section 17 of the *Rights in Water and Irrigation (RIWI) Act 1914*. The Department of Water is responsible for the administration of Bed and Banks permits.

Some *Eucalyptus* trees are present within the creek, however these will not be cleared under this proposal (Exmouth Quarries and Concrete, 2006) The proposed clearing consists largely of tussock grasses and some shrub species (Busniak, 2006). Vegetation will be cleared progressively at a rate of approximately 1,500 square metres per annum over a ten year period (Exmouth Quarries and Concrete, 2006). Progressive rehabilitation of mined areas will also take place throughout the life of the clearing permit. A progressive approach to clearing and rehabilitation will minimise any adverse effects upon the creekline.

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

**Methodology** GIS Database - Exmouth Townsite - 20cm Orthomosaic - DLI 03 (Image).  
 Busniak (2006).  
 Exmouth Quarries and Concrete (2006).

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

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

According to Busniak (2006) the areas applied to clear are characterised by Trealla limestone outcrops with limonite clay. Topography was described as gently undulating with some minor drainage lines and ridgelines (Busniak, 2006). The proposed clearing areas are located above a deeply incised creekline.

The management of erosion, sedimentation and other land degradation issues will be addressed in the Mining Proposal approval process, managed under the *Mining Act 1978*. The assessing officer is satisfied that the following tenement conditions which apply on Mining Lease M08/62 will adequately address land degradation issues:

- The proponent shall ensure that sediment does not enter the creek bed through the construction of erosion banks along the creek bed' (DoIR, 2007);
- Pit walls being recontoured to blend with the surrounding environment and final batter slopes not to exceed 3 Horizontal: 1 Vertical' (DoIR, 2007);
- The development and operation of the project being carried out in such a manner so as to create the minimum practicable disturbance to the existing vegetation and natural landform' (MiTiS, 2006);
- The creek bed and embankment being progressively reshaped to original contours and rehabilitated' (MiTiS, 2006);
- All topsoil being removed ahead of all mining operations from sites such as pit areas, waste disposal areas, ore stockpile areas, pipeline, haul roads and new access roads and being stockpiled for later respreading or immediately respread as rehabilitation progresses' (MiTiS, 2006); and
- At the completion of operations, or progressively where possible, all access roads and other disturbed areas being covered with topsoil, deep ripped and revegetated with local native grasses, shrubs and trees to the satisfaction of the State Mining Engineer' (MiTiS, 2006).

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

**Methodology** Busniak (2006).  
DoIR (2007).  
MiTiS (2006).

**(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.**

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

The proposed clearing areas are located at the foothills on the eastern side of the Cape Range escarpment, an area listed on the the Register of the National Estate for its geological and palaeontological features, biological attributes and cultural values (Australian Heritage Council, 2002). The proposed clearing of 1.5 hectares of degraded vegetation within an existing quarrying operation is unlikely to compromise the important features, attributes or values of this National Estate.

The Cape Range National Park is located approximately 5.2 km west of the areas applied to clear (GIS Database). The proposed clearing areas are not likely to act as significant remnants, buffers, or ecological linkages to the Cape Range National Park given that they have been historically disturbed by quarrying activities, fire and pastoral use; and the surrounding landscape has not been extensively cleared. Given that the Cape Range National Park covers an area of approximately 50,000 hectares it is unlikely that the 1.5 hectares applied to clear would contribute significantly to the conservation values of this National Park.

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 - CALM 01/07/05.  
Australian Heritage Council (2002).

**(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**

One of the proposed clearing areas is partially located within the Exmouth Water Reserve (Public Drinking Water Source Area), which is proclaimed under the *Country Areas Water Supply Act 1947* (GIS Database). Given that the vegetation applied to clear consists mainly of coloniser species and contains few trees, the removal of such vegetation is not likely to have any significant impact upon groundwater levels or quality. Similarly, the proposed quarrying operations are unlikely to affect groundwater levels or quality (Appeals Convenor, 2006). The Department of Water considers limestone quarrying activities to be a compatible land use within Priority 1 Public Drinking Water Source Protection Areas, subject to certain conditions (DoW, 2006a). Furthermore, the quarrying operations are to a relatively shallow depth and will not intercept the water table (Appeals Convenor, 2006).

As part of the Mining Proposal approval process, managed under the *Mining Act 1978*, a mining tenement condition on Mining Lease 08/62 will require the proponent to construct erosion banks along the creek bed during and on completion of mining (DoIR, 2007). This condition will minimise the amount of sediment that enters the creek. Given this tenement condition, the proposed clearing is not likely to impact upon surface water quality.

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

**Methodology** GIS Database - Public Drinking Water Source Areas (PDWSAs) - DOE 28/04/05.  
Appeals Convenor (2006)  
DoIR (2007).  
DoW (2006a).

**(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 average annual rainfall of Exmouth is 267mm. Annual evaporation rates are in the range of 2,800mm (Bureau of Meteorology, 2007). It is therefore expected that there would be little surface water flow during normal seasonal rains.

The proposed clearing areas are located either side of a seasonal creekline. Mining has previously taken place within this creekline, and haul roads exist within part of the creek bed (Exmouth Quarries and Concrete, 2006). No clearing will take place within the creekline under this clearing permit application (Exmouth Quarries and Concrete, 2006). The proponent has applied for a Bed and Banks permit for the proposed works, in accordance with Section 17 of the *RIWI Act 1914* (Exmouth Quarries and Concrete, 2006).

Natural flood events occasionally occur in the Exmouth area as a result of heavy rains associated with tropical cyclones (Bureau of Meteorology, 2007). There is no evidence to suggest that the small amount of clearing proposed (1.5 hectares) will exacerbate the incidence or intensity of natural flood events. The Department of Water (DoW) have advised that the proposal will not impact upon the incidence or intensity of flooding (2006b).

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

**Methodology** Bureau of Meteorology (2007).  
DoW (2006b).  
Exmouth Quarries and Concrete (2006).

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

**Comments**

There is one native title claim over the areas under application. This claim (WC97/028) has been registered with the National Native Title Tribunal (GIS Database). However, the mining tenement has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*. There are no known sites of Aboriginal significance within the areas applied to clear (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Sites of Aboriginal Significance are damaged through the clearing process.

The mining proposal was referred to the Environmental Protection Authority (EPA) by DoIR on the 7th April 2006, based on the following criteria:

- It is within the Exmouth townsite boundary;
- It is entirely within 2km (less than 1km) of the Exmouth Water Reserve (Water Reserve 13);
- It is within 2km of the coastline and a coastal waterline.

On the 8 May 2006, the EPA advised that the assessment level that had been set for this proposal was 'not assessed - public advice given'. Appeals were received against the setting of this level of assessment. All appeals were later dismissed by the Minister for the Environment on the grounds that the concerns raised could be managed under existing legislation, including: *Environmental Protection (Concrete Batching and Cement Product Manufacturing) Regulations 1998*, *Environmental Protection (Noise) Regulations 1997*, *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*, conditions on mining tenements issued by the DoIR under the *Mining Act 1978*, and the *Aboriginal Heritage Act 1972* (Appeals Convenor, 2006).

The proponent has applied for a Bed and Banks permit for the proposed works, in accordance with Section 17 of the *RIWI Act 1914* (Exmouth Quarries and Concrete, 2006). The Department of Water is responsible for the administration of Bed and Banks permits.

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 or any other licences or approvals are required for the proposed works.

**Methodology** GIS Database:  
- Aboriginal Sites of Significance - DIA 04/07/02.  
- Native Title Claims - DLI 19/12/04.  
Appeals Convenor (2006).  
Exmouth Quarries and Concrete (2006).

#### 4. Assessor's recommendations

Purpose	Method	Applied area (ha)/ trees	Decision	Comment / recommendation
Mineral Production	Mechanical Removal	1.5	Grant	The clearing principles have been addressed and the proposal is not at variance to principle (e) and not likely to be at variance to principles (a), (b), (c), (d), (f), (g), (h), (i) and (j). The assessing officer therefore recommends that the permit should be granted.

#### 5. References

- Appeals Convenor (2006) Appeals Report - Exmouth Quarries and Concrete Pty Ltd, Perth, Western Australia.
- Atkins, K (2006). Declared Rare and Priority Flora list for Western Australia, 30 June 2006. Department of Conservation and Land Management, Como, Western Australia.
- Australian Heritage Council (2002) Cape Range and Adjacent Coastal Plain, Exmouth, WA. <http://www.ahc.gov.au/register/index.html>
- Bureau of Meteorology (2007) Climate of Learmonth. <http://www.bom.gov.au/weather/wa/learmonth/climate.shtml>
- Busniak, J.J. (2006) Flora Survey and Vegetation Assessment of Mining Lease 08/62 Exmouth, Ashburton Mineral Field, Western Australia, for Exmouth Quarries and Concrete. Unpublished report, 29 May, 2006.
- DEC (2007) Biodiversity advice for land clearing application. Advice to Assessing Officer, Native Vegetation Assessment Branch, Department of Industry and Resources (DoIR), received 12 February 2007. Biodiversity Coordination Section, Department of Environment and Conservation, Western Australia.
- Department of Natural Resources and Environment (2002) Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local. Department of Natural Resources and Environment, Victoria.
- DoIR (2007) Advice for land clearing application. Advice to Assessing Officer, Native Vegetation Assessment Branch, Department of Industry and Resources (DoIR), received 1 March 2007 from Environmental Officer, Minerals Branch, DoIR, Western Australia.
- DoW (2006a) Email correspondence with DoIR Environmental Officer, Minerals Branch. 16 October 2006, Western Australia.
- DoW (2006b) Email correspondence with DoIR Environmental Officer, Minerals Branch. 10 October 2006, Western Australia.
- Exmouth Quarries and Concrete (2006) Mining Proposal - Murat Rd Limestone - Expansion to Quarrying on M08/62. Mining Proposal # 5294. Perth, Western Australia.
- JANIS Forests Criteria (1997) Nationally agreed criteria for the establishment of a comprehensive, Adequate and Representative reserve System for Forests in Australia. A report by the Joint ANZECC/MCFFA National Forest Policy Statement Implementation Sub-committee. Regional Forests Agreement process. Commonwealth of Australia, Canberra.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- MiTIS (2006) Mineral Title System. MiTiS version 5.0 PROD. Department of Industry and Resources.
- 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 (updated 2005).
- Western Australian Herbarium (2006). Florabase - The Western Australian Flora. Department of Environment and Conservation. <http://florabase.calm.wa.gov.au/>.

#### 6. Glossary

##### Acronyms:

<b>BoM</b>	Bureau of Meteorology, Australian Government.
<b>CALM</b>	Department of Conservation and Land Management, Western Australia.
<b>DAFWA</b>	Department of Agriculture and Food, Western Australia.
<b>DA</b>	Department of Agriculture, Western Australia.
<b>DEC</b>	Department of Environment and Conservation
<b>DEH</b>	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
<b>DEP</b>	Department of Environment Protection (now DoE), Western Australia.
<b>DIA</b>	Department of Indigenous Affairs
<b>DLI</b>	Department of Land Information, Western Australia.
<b>DoE</b>	Department of Environment, Western Australia.
<b>DoIR</b>	Department of Industry and Resources, Western Australia.
<b>DOLA</b>	Department of Land Administration, Western Australia.
<b>DoW</b>	Department of Water
<b>EP Act</b>	Environment Protection Act 1986, Western Australia.
<b>EPBC Act</b>	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
<b>GIS</b>	Geographical Information System.

<b>IBRA</b>	Interim Biogeographic Regionalisation for Australia.
<b>IUCN</b>	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
<b>RIWI</b>	Rights in Water and Irrigation Act 1914, Western Australia.
<b>s.17</b>	Section 17 of the Environment Protection Act 1986, Western Australia.
<b>TECs</b>	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.