



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 4961/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Adelaide Brighton Cement Ltd

1.3. Property details

Property: Mining Lease 70/136
Local Government Area: Shire of Dalwallinu
Colloquial name:

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
11.16		Mechanical Removal	Gypsum Mining

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 19 July 2012

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 for the whole of Western Australia and are useful to look at vegetation in a regional context. The following Beard vegetation association is located within the application area (GIS Database):</p> <p>125: Bare areas; salt lakes.</p> <p>Site inspections are undertaken once or twice per year by Landform Research. These inspections are conducted for annual reporting and due diligence and have been undertaken for at least 10 years (Landform Research, 2012). More detailed assessment of the vegetation was undertaken on 8 November 2007, 19 June 2008 and 3 April 2009 (Landform Research, 2011). Based on these dates and another inspection on 6 July 2012, the following vegetation type has been identified within the application area (Landform Research, 2011 and 2012):</p> <p>Scattered <i>Casuarina obesa</i> with occasional <i>Eucalyptus salicola</i> over sparse chenopod shrubs and groundcovers.</p>	<p>Adelaide Brighton Cement Limited has applied to clear 11.16 hectares within an application area of approximately 11.17 hectares (GIS Database). The application area is located approximately eight kilometres north east of Kalannie (GIS Database).</p> <p>The purpose of the application is to continue gypsum extraction on Mining Lease 70/136. This lease is located on a ridge or dune in the central part of Lake Hillman. Approximately 80% of the ridge has already been excavated with this application covering the remainder of the ridge (Landform Research, 2011). Clearing will involve pushing the soil and overburden to the edges of the lease, with vegetation stored separately. Where possible vegetation and topsoils will be spread directly onto an area to be rehabilitated as has been completed in the past (Landform Research, 2011).</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>Vegetation condition is based on the flora and vegetation assessment which reported vegetation condition as good to degraded (Landform Research, 2011). Landform Research (2011) notes that it is difficult to rate the condition of the vegetation as regular changes due to wind erosion, deaths, drought and other factors occur on the ridge.</p> <p>The vegetation has been disturbed by adverse weather conditions and drought (Landform Research, 2011).</p> <p>According to Landform Research (2011), 33.9 hectares has been excavated and progressively rehabilitated on Mining Lease 70/136.</p> <p>The site is extensively walked during each inspection and any observable species are noted (Landform Research, 2012). A species list has been developed from species recorded during the site inspections. The site inspections are often conducted between June and November but have occurred at variable times including after summer and winter rains (Landform Research, 2012). No significant limitations were identified for the flora and vegetation assessment (Landform Research, 2012). Landform Research (2012) notes that based on the inspection frequency there is a high confidence that the plant species on site have been detected.</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 application area occurs within the AW1 - Ancient Drainage subregion of the Avon Wheatbelt bioregion of the Interim Biogeographic Regionalisation of Australia (IBRA) (GIS Database). This subregion is characterised by proteaceous scrubheaths, rich in endemics, on residual lateritic uplands and derived sandplains; mixed eucalypt, *Allocasuarina huegeliana* and Jam-York Gum woodlands on Quaternary alluvials and eluvials. (CALM, 2002). There is no connected drainage; salt lake chains occur as remnants of ancient drainage systems that now only function in very wet years (CALM, 2002). CALM (2002) notes that gypsum dunes have special value as plant species are generally unique to each IBRA region and often smaller scales (Mattiske Consulting, 1995). Several Threatened Flora and Priority Flora species are restricted to gypsiferous habitats, and at least 80 species are likely to be gypsiphyllic (Mattiske Consulting, 1995).

A regional survey report by Anne (Coates) Rick (Rick, 2011) also recognised plant communities growing on gypsum as potentially conservation significant and states these communities are under threat from altered hydrology and mining. This included a survey of plant communities growing on gypsum in the wheatbelt and an analysis of data collected during several previous surveys across the wheatbelt. A total of 446 plant species were identified with ten considered as possible gypsophiles (none of which were recorded in the vegetation survey of the application area). Rick (2011) states that most of the 446 species occur widely on other soil types and are probable refuges from adjacent plant communities. Statistical analysis indicated that differences in species composition of vegetation groups across the wheatbelt were most strongly related to geological distribution (reflects changes in rainfall and temperature) and elevation, with only slight differences observed for gypsum content (Rick, 2011). Rare species combinations were found on several of the gypsum dunes studied, however, the rarity of these combinations has not been confirmed by comparison with data from non-gypsum dunes (Rick, 2011). Although Lake Hillman was not included in the study, no significant differences were found between the species composition of the lakes studied in the northern section of the study area (Damboring, Gunyiddi-Latham, Lake Moore and Cowcowing Lake Systems) where Lake Hillman is located.

The flora and vegetation assessment identified one vegetation type within the application area consisting of scattered *Casuarina obesa* with occasional *Eucalyptus salicola* over sparse chenopod shrubs and groundcovers (Landform Research, 2012). According to Landform Research (2012), the vegetation around Lake Hillman is similar to vegetation within the application area and consists of *Eucalyptus loxophleba* (York Gum) joined by *Eucalyptus salicola* over samphire grading to *Melaleuca* and samphire. Landform Research has also recorded a similar vegetation type (described as *Casuarina obesa* low open woodland over an understorey of chenopod open low shrubland) on a gypsum dune located in Lake Cowcowing (approximately 70 kilometres south of the application area). Of the 13 species recorded within the application area, nine are reported in Rick (2011) (including *Casuarina obesa*) with five species on the frequently recorded species list (Rick, 2011).

A total of 13 native species from eight families were recorded within the application area with a species richness of 4 – 5 per 100 m² (Landform Research, 2012). Plant cover was found to be low (10.3 – 11.5%) indicating the large proportion of bare ground. According to Landform Research (2011 and 2012), the species recorded are common and none have been determined to be restricted to gypsum rich soils. The vegetation was found to have a low level of diversity and has been disturbed by adverse weather conditions and drought (Landform Research, 2011). Gypsum mining has been undertaken on the adjacent area of the ridge and on another central ridge located approximately one kilometre north west of the application area. Aerial imagery shows the lake and surrounding areas have been historically disturbed by agricultural and mining purposes (GIS Database).

One introduced species, Iceplant (*Mesembryanthemum crystallinum*), has been recorded within the application area (Landform Research, 2011). Potential impacts from weeds as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

No Threatened or Priority Flora or Threatened or Priority Ecological Communities have been recorded within the application area (GIS Database; Landform Research, 2011).

According to the online Department of Environment and Conservation (DEC) database, Naturemap, one mammal, 52 bird, 40 invertebrate and 9 reptile species have been recorded within a 20 kilometre radius of the application area (DEC, 2012a). These levels indicate low to moderate faunal diversity reflecting the highly cleared landscape in which the application area is located. According to Landform Research (2011), the number of species in the application area is likely to be restricted by the sparseness of the vegetation.

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

Methodology

CALM (2002)
DEC (2012a)
Landform Research (2011)
Landform Research (2012)
Mattiske Consulting (1995)
Rick (2011)
GIS Database:

- IBRA WA (Regions - Sub Regions)
- Kalannie 50cm Orthomosaic – Landgate 2006 (Image)
- Threatened Ecological Sites Buffered
- Threatened and Priority Flora

(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 not conducted over the application area, however, observations were made during the vegetation survey. Landform Research (2011) notes that the vegetation provides some habitat for birds and other small fauna and states water birds such as Avocets have been recorded nesting at Lake Hillman and on the ridge within previously rehabilitated areas. Landform Research (2011) states the number of species is likely to be restricted due to the sparseness of the vegetation. The application area also has habitat value as a remnant within a highly cleared agricultural landscape. However, given its location within a salt lake and the sparseness of the vegetation, it is unlikely to comprise a significant ecological linkage.

According to the online Department of Environment and Conservation (DEC) database, Naturemap, one mammal, 52 bird, 40 invertebrate and 9 reptile species have been recorded within a 20 kilometre radius of the application area (DEC, 2012a). Of these, the following conservation significant species have been recorded:

- Western Spiny-tailed Skink (*Egernia stokesii* subsp. *badia*) – Schedule 1; Endangered;
- Woma (*Aspidites ramsayi*) – Schedule 4;
- Major Mitchell's Cockatoo (*Cacatua leadbeateri*) – Schedule 4;
- Carpet Python (*Morelia spilota* subsp. *imbricata*) – Schedule 4; and
- Bush Stone-curlew (*Burhinus grallarius*) – Priority 4.

However, given the application area is relatively small and sparsely vegetated with a high proportion of bare ground, it is unlikely the application area represents significant habitat for these species. The application area has also been disturbed by adverse weather conditions and drought and is adjacent to mining operations (Landform Research, 2011).

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

Methodology DEC (2012a)
Landform Research (2011)

(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, there are no records of Threatened Flora within the application area (GIS Database). One population of the Threatened Flora species, *Frankenia conferta*, has been recorded approximately 2.5 kilometres south, south east of the application area (GIS Database).

No Threatened Flora have been recorded during the vegetation survey undertaken by Landform Research (2011). Specimens of the genus *Frankenia* were identified within the application area (Landform Research, 2011). As *Frankenia conferta* has been identified within close proximity to the application area, the *Frankenia* identified on site was examined extensively under microscope and found to compare to the species *Frankenia pauciflora* that occurs widely on salt lakes throughout the wheatbelt (Landform Research, 2011). The species was subsequently confirmed as *Frankenia pauciflora* (Landform Research, 2011).

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

Methodology Landform Research (2011)
GIS Database:
- Threatened 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

According to available databases, there are no known Threatened Ecological Communities (TECs) within the application area (GIS Database). The nearest known TEC is approximately 100 kilometres west, south west of the application area (GIS Database).

The vegetation survey did not record any TECs (Landform Research, 2011).

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

Methodology Landform Research (2011)
GIS Database:

(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 may be at variance to this Principle

The application area falls within the Avon Wheatbelt Biogeographic Regionalisation of Australia (IBRA) bioregion in which approximately 18.2% of the pre-European vegetation remains (see table) (GIS Database, Government of Western Australia, 2011). According to the 'Bioregional Conservation Status of Ecological Vegetation Classes' (Department of Natural Resources and Environment, 2002), this value gives the region a Conservation Status of 'Vulnerable'.

The vegetation of the application area has been mapped as the following Beard vegetation association (GIS Database):

125: Bare areas; salt lakes.

Approximately 94% and 39% of this Beard vegetation association remains at both a state and bioregional level, respectively (Government of Western Australia, 2011) (see table). This is above the 30% threshold level recommended in the National Objectives Targets for Biodiversity Conservation below which, species loss appears to accelerate exponentially at an ecosystem level (EPA, 2000). The Department of Environment and Conservation (DEC) notes that this Beard vegetation association is significantly under-represented within DEC managed conservation estate (see table) and that the recommended national guideline is 15% representation within the subregion IBRA conservation estate (DEC, 2012b).

The description of this Beard vegetation association is not consistent with vegetation identified within the application area (scattered *Casuarina obesa* with occasional *Eucalyptus salicola* over sparse chenopod shrubs and groundcovers). Based on this, it is difficult to determine the regional vegetation representation. However, given the vegetation mapping has been undertaken on a regional scale, it is likely Beard vegetation association 125 would include other areas of vegetation occurring on gypsum dunes. Regional statistics for the vegetation mapped around the perimeter of Lake Hillman may also provide an indication of remnant vegetation amounts on a regional scale. The perimeter is predominantly mapped as Beard vegetation association 631 which is described as succulent steppe with woodland and thicket; York gum over *Melaleuca thyoides* and samphire (GIS Database). Approximately 45% and 44% of this Beard vegetation association remains at both a state and bioregional level (Government of Western Australia, 2011). Landform Research (2012) found that elements of Beard vegetation association 631 occur within the application area and notes the flora species recorded within the application area are common species.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves (and post clearing %)
IBRA bioregion – Avon Wheatbelt	9,517,110	1,732,027	~18.20	Vulnerable	~1.80 (~7.23)
IBRA Subregion - Avon Wheatbelt P1	6,524,180	1,322,408	~20.27	Vulnerable	~1.87 (~6.74)
Local Government - Dalwallinu	722,880	205,288	~28.40	Vulnerable	~1.06 (~3.71)
Beard vegetation associations - State					
125	3,492,381	3,269,266	~93.61	Least Concern	~7.20 (~5.35)
Beard vegetation associations - Bioregion					
125	167,448	65,842	~39.32	Depleted	~18.96 (~4.17)
Beard vegetation associations - Subregion					
125	148,564	63,181	~42.53	Depleted	~ 15.26 (~1.88)

* Shepherd (2009)

** 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

Aerial imagery shows the application area is located within an area that has been extensively cleared (GIS Database). Salt lakes comprise a majority of the uncleared land in the Shire of Dalwallinu, and are significant remnants within the Shire and local area. The lakes are important for fauna as they provide refuge and an ecological linkage between remaining vegetated areas.

The gypsum dune on which the application area is located has already been mostly disturbed as a remnant by adjacent mining operations (approximately 33.9 hectares have been cleared and 11.16 hectares remains) (Landform Research, 2011). Considering the application area is located in the centre of Lake Hillman, has sparse vegetation cover and is adjacent to mining operations it is considered unlikely to represent a significant ecological linkage or provide a significant buffer or refuge role. Given the above it is unlikely the application area represents a significant remnant of native vegetation.

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

Methodology DEC (2012b)
Department of Natural Resources and Environment (2002)
EPA (2000)
Government of Western Australia (2011)
Landform Research (2011)
Landform Research (2012)
GIS Database:
- IBRA WA (Regions – Sub Regions)
- Kalannie 50cm Orthomosaic – Landgate 2006 (Image)
- Pre-European Vegetation

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

Comments Proposal is at variance to this Principle

According to available databases, the application area forms part of a ridge or dune located in a non-perennial lake known as Lake Hillman (GIS Database; Landform Research, 2011). This ridge rises approximately four metres above the surrounding lake bed, which is saline and only fills with water occasionally as a result of cyclonic rainfall events (Landform Research, 2011). Generally only small areas of water will occur as a result of local winter rainfall and the ridges are never flooded (Landform Research, 2011).

Lake Hillman is a saline lake with a covering of fine gypsum clays overlain by a salt crust (Landform Research, 2011). It is located in the Yarra Monger Catchment within the Yarra Yarra Drainage Basin and is part of a chain of several thousand ephemeral saltlakes, playas and samphire-covered claypans, that stretch for approximately 300 kilometres and cover an area of 250,000 hectares (DEC, 2008). The major lakes in the system include Nullewa Lake, Wheelhamby Lake, Mengers Lake, Lake DeCourey, Lake Goorly, Lake Hillman and Yarra Yarra Lake, which is the terminal point of the system (Fordyce, 2005). Due to the flat terrain of the Yarra Yarra system, drainage is generally uncoordinated and each lake has its own internal drainage system, however, in wet years, the lakes overflow along a broad drainage line, ending in Yarra Yarra Lake (Fordyce, 2005; NACC 2005).

Given the application area occurs on a ridge located on a lake bed, vegetation within the application area is growing in association with a waterbody. According to Landform Research (2011), the species identified are common species. Given the size of the lake (approximately 3,500 hectares) and the adjacent mining operations, the proposed clearing is not expected to have any significant additional impacts on the environmental values of Lake Hillman.

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

Methodology DEC (2008)
Fordyce (2005)
Landform Research (2011)
NACC (2005)
GIS Database:
- Geodata, Lakes
- 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 soil type within the application area is described as saline valleys and salt lakes – salt lake channels, mostly devoid of true soils, and their fringing areas: commons soils are gypseous and saline loams on riverine wash and usually underlain by clayey or sandy strata by about 12 inches (GIS Database, Schoknecht, 2002).

A land degradation assessment of the application area was undertaken by the Department of Agriculture and Food (DAFWA) on 10 May 2012. DAFWA (2012) notes that the application area is within an area of primary salinity and states that no significant change in salinity is expected as a result of the proposed clearing. Both water erosion and waterlogging are considered unlikely to occur due to the soil types present and as a result no significant change is expected (DAFWA, 2012). The potential for land degradation from salinity, eutrophication, water erosion, flooding and waterlogging as a result of the proposed clearing was assessed to be low (DAFWA, 2012). However, the risk of wind erosion was assessed to be very high once the protective vegetation is removed. DAFWA (2012) advised that this risk can be managed by careful management of topsoil and vegetation residue during the clearing operation for the progressive rehabilitation of disturbed cells after mining. Potential impacts from wind erosion as a result of the proposed clearing may be minimised by the implementation of a staged clearing condition.

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

Methodology DAFWA (2012)
Schoknecht (2002)
GIS Database:
- Soils, Statewide

(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 does not lie within any conservation areas or Department of Environment and Conservation managed lands (GIS Database). The nearest conservation area is the Old Store Nature Reserve, located approximately 8.5 kilometres south, south west of the application area (GIS Database). Based on the distance between the application area and the Old Store Nature Reserve, the proposed clearing is not likely to impact the environmental values of any conservation area.

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

Methodology GIS Database:
- DEC Tenure

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

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

According to available databases, the application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The application area is part of a ridge located on the bed of an ephemeral lake known as Lake Hillman (GIS Database). Generally only small areas of water occur in the lake following local winter rainfall, however, the lake can fill as a result of cyclonic rainfall events (Landform Research, 2011). In wet years the lake may overflow and connect with other salt lakes in the Yarra Monger Catchment (Fordyce, 2005; NACC, 2005).

According to available databases, groundwater salinity within the application area is in excess of 35,000 milligrams/Litre Total Dissolved Solids (TDS) (GIS Database). According to DAFWA (2012) extensive salinity occurs in the area and no significant change in salinity is expected as a result of the proposed clearing. The land degradation assessment also found that the potential for land degradation from eutrophication, flooding, water erosion and waterlogging as a result of the proposed clearing to be low (DAFWA, 2012). However, the risk of wind erosion was assessed to be very high and this may result in increased sedimentation in surface water. DAFWA (2012) advised that this risk can be managed by careful management of topsoil and vegetation residue during the clearing operation for the progressive rehabilitation of disturbed cells after mining. Potential impacts from wind erosion as a result of the proposed clearing may be minimised by the implementation of a staged clearing condition.

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

Methodology DAFWA (2012)
Fordyce (2005)
Landform Research (2011)
NACC (2005)
GIS Database:
- Groundwater Salinity, Statewide
- Hydrography, linear
- Public Drinking Water Source Areas (PDWSAs)

(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 is located within the Yarra Monger catchment area (GIS Database). Given the size of the area to be cleared (11.16 hectares) in relation to the size of the catchment area (4,182,476 hectares) (GIS Database), the proposed clearing is not likely to increase the potential of flooding on a local or catchment scale.

Lake Hillman is an ephemeral saline lake that only fills after cyclonic rainfall events (Landform Research, 2011). The scale of the proposed clearing (11.16 hectares) in relation to the size of Lake Hillman (approximately 3,500 hectares) is unlikely to increase the potential for flooding (GIS Database).

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

Methodology Landform Research (2011)
GIS Database:
- Geodata, Lakes
- Hydrographic Catchments – Catchments

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

Comments

There are no native title claims over the area under application (GIS Database). The mining tenure 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*.

According to available databases, there is one registered Aboriginal Site of Significance within 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.

This project was referred to the Environmental Protection Authority (EPA) for environmental assessment under the *Environmental Protection Act 1986* (EP Act). On 21 May 2012, the EPA published its referral decision 'Not Assessed – Managed under Part V Division 2 of the EP Act (Clearing)'.

It is the proponent's responsibility to liaise with the Department of Environment and Conservation and the Department of Water, to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

The clearing permit application was advertised on 2 April 2012 by the Department of Mines and Petroleum inviting submissions from the public. One submission was received in relation to the engagement and consultation with the Traditional Owners of the area.

Methodology GIS Database:
- Aboriginal Sites of Significance
- Native Title Claims – Determined by the Federal Court
- Native Title Claims – Filed at the Federal Court
- Native Title Claims – Registered with the NNTT

4. References

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- 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.
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Landform Research (2012) Further Information provided by Landform Research in email correspondence dated 6 July to 15 July 2012.

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Rick (2011) Survey and Analysis Of Plant Communities Growing On Gypsum In The Western Australian Wheatbelt. Botanical Consultants Report for the Wheatbelt NRM Region and the Department of Environment and Conservation Western Australia by Anne (Coates) Rick. Dated 2011.

Schoknecht (2002) Soil Groups of Western Australia. A simple guide to the main soils of Western Australia. Resource Management Technical Report 246. Edition 3.

5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
CALM	Department of Conservation and Land Management (now DEC), Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DEC), Western Australia
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia
DMP	Department of Mines and Petroleum, Western Australia
DoE	Department of Environment (now DEC), Western Australia
DoIR	Department of Industry and Resources (now DMP), Western Australia
DOLA	Department of Land Administration, Western Australia
DoW	Department of Water
EP Act	Environmental Protection Act 1986, Western Australia
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
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 Act	Rights in Water and Irrigation Act 1914, Western Australia
s.17	Section 17 of the Environment Protection Act 1986, Western Australia
TEC	Threatened Ecological Community

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.