



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 4370/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Dumpna Pty Ltd**

1.3. Property details

Property: Mining Lease 47/1438
Local Government Area: Town of Port Hedland
Colloquial name: Yule River Sand Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
40		Mechanical Removal	Sand mining and associated activities.

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 28 July 2011

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. The following Beard vegetation associations have been mapped within the application area:</p> <ul style="list-style-type: none"> - 619: Medium woodland; River gum (<i>Eucalyptus camaldulensis</i>) covers the application area; and - 589: Mosaic: Short bunch grassland - savanna / grass plain (Pilbara) / Hummock grasslands, grass steppe; soft Spinifex (GIS Database; Shepherd, 2009). <p>A flora and vegetation survey was conducted by Animal, Plant, Mineral Pty Ltd (APM) in March 2011 (APM, 2011). The flora and vegetation survey identified the following four vegetation communities within the application area:</p> <ul style="list-style-type: none"> - Scrub of <i>Acacia dictyophleba</i> over hummock and bunch grasslands of <i>Triodia epactia</i>, <i>Cenchrus ciliaris</i> and <i>Aristida holathera</i> var. <i>holathera</i> with <i>Ptilotus arthrolasius</i>; - Scrub of <i>Acacia trachycarpa</i> over hummock and bunch grasslands of <i>Triodia epactia</i> and <i>Cenchrus ciliaris</i> with <i>Ptilotus arthrolasius</i>, <i>Aerva javanica</i>, <i>Triumfetta chaetocarpa</i> and occasional <i>Eucalyptus camaldulensis</i> subsp. <i>refulgens</i>; - Open scrub of <i>Acacia trachycarpa</i>, <i>Melaleuca argentea</i> and <i>Acacia pyriformis</i> var. <i>morrisonii</i> over open low shrubland of <i>Crotalaria cunninghamii</i>; and - Open Low Woodland of <i>Eucalyptus camaldulensis</i> subsp. <i>refulgens</i> over scrub/open scrub of <i>Melaleuca argentea</i> and <i>Acacia trachycarpa</i> over open low shrubland of <i>Crotalaria cunninghamii</i> and <i>Aerva javanica</i> with scattered <i>Cenchrus ciliaris</i> (APM, 2011). 	<p>The application area is located in the Pilbara region, approximately 52 kilometres south-west of Port Hedland (GIS Database).</p> <p>Dumpna Pty Ltd (Dumpna) is proposing to clear up to 40 hectares of native vegetation within an area of approximately 84.6 hectares.</p> <p>The proposed clearing is for the purpose of sand and shingle mining from the Yule River bed and an access road, stockpile area, and hardstand area for supporting infrastructure.</p>	<p>Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994).</p> <p>To</p> <p>Pristine: No obvious signs of disturbance (Keighery, 1994).</p>	<p>The vegetation condition was derived from a flora and vegetation survey conducted by APM in 2011 (APM, 2011).</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 may be at variance to this Principle

The application area occurs within the Roebourne (PIL4) sub-region of the Interim Biogeographic Regionalisation of Australia (IBRA) (GIS Database). This sub-region is characterised by quaternary alluvial and older colluvial coastal and sub-coastal plains with a grass savannah of mixed bunch and hummock grasses, and dwarf shrub steppe of *Acacia stellaticeps* or *Acacia pyrifolia* and *Acacia inaequilatera*. Uplands are dominated by *Triodia* hummock grasslands. Ephemeral drainage lines support *Eucalyptus victrix* or *Corymbia hamersleyana* woodlands (CALM, 2002).

A flora and vegetation survey of the application area was conducted in March 2011 (APM, 2011). The timing of the survey was considered favourable as the area had experienced heavy rainfall in January and February 2011 and the application area and the surrounds displayed many herbs, grasses and shrubs coming into flower (APM, 2011).

The flora and vegetation survey recorded a total of 78 taxa from 27 families, representing 57 genera (APM, 2011). Of these, no Declared Rare Flora Species or Threatened Ecological Communities were recorded within the application area (APM, 2011; GIS Database).

During the flora and vegetation survey one conservation significant flora species, *Abutilon pritzelianum* (ms) (Priority 1) and one undescribed species *Minuria* sp. nov. whereby the conservation significance is not determined, were recorded within the application area (APM, 2011). Both these species have limited distributions (APM, 2011; Western Australian Herbarium, 1998).

Dumpna proposes to monitor the extent of the *Abutilon pritzelianum* (ms) and *Minuria* sp. nov. populations within and adjacent to the application area (APM, 2011). Monitoring and mapping will be ongoing throughout the vicinity of the application area, making it possible to locate mining and infrastructure areas so as to avoid or minimise any impact to them (APM, 2011). It is recommended that a flora management condition be implemented to prevent impact to *Minuria* sp. nov. and *Abutilon pritzelianum* (ms).

In addition, one single record of the flora species *Fimbristylis ammobia* was collected from the western edge of the application area outside of the proposed clearing (APM, 2011). This record represents a range extension from previous collections of this species in Dampierland and Tanami bioregions (APM, 2011). Dumpna have advised that this flora species will be marked, mapped and avoided during clearing operations (APM, 2011).

Three introduced flora species were recorded during the flora and vegetation survey within the application area. Of these, two have Department of Environment and Conservation (DEC) "High" Priority ratings, *Cenchrus ciliaris* (Buffel Grass) and *Aerva javanica* (Kapok Bush) and were found along the river channel bank within the application area (APM, 2011). Potential impacts from the spread of weeds as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

A fauna desktop assessment was carried out of the application area, based on the flora and vegetation survey of the application area (APM, 2011). As part of the fauna desktop assessment, database searches were carried out within the vicinity of the application area. This included the following database searches:

- APM's in-house database (this contains records from previous other fauna surveys in this region of the Pilbara);
- DEC Threatened and Priority fauna species database search; and
- *Environment Protection, Biodiversity and Conservation Act 1999 (EPBC Act)* Protected Matters database search (APM, 2011).

The *EPBC Act* and DEC database searches identified that 18 and 21 conservation significant fauna species respectively could potentially occur within the application area (APM, 2011). Of these, based on habitat assessment, thirteen *EPBC Act* listed Migratory bird species, the Northern Quoll (*Dasyurus hallucatus*) (*EPBC Act*, Threatened), the Pilbara Olive Python (*Liasis olivaceus barroni*) (*EPBC Act*, Vulnerable), Mulgara (*Dasyercus* sp.) (*EPBC Act*, Threatened), Peregrine Falcon (*Falco peregrinus*) (DEC, Schedule 4), Woma Python (*Aspidites ramsayi*) (DEC, Schedule 4), Spectacled Hare-wallaby (*Largochestes conspicillatus*), (DEC, Priority 3), Grey Falcon (*Falco hypoleucos*) (DEC, Priority 4), Australian Bustard (*Ardeotis australis*) (DEC, Priority 4) and the Bush Stone Curlew (*Burhinus grallarius*) (DEC, Priority 4) could possibly inhabit the application area (APM, 2011).

The application area is likely to support more fauna species when the river is flowing as they would be attracted to the water resource. APM (2011) highlighted that arid adapted frog species could also occur within the application area as they are often not recorded during fauna surveys as they only come to the surface after rain and are often missed. APM (2011), on behalf of Dumpna advised that they intend to mine the sand within the application area during the dry season, which means the area may be utilised by mobile fauna during the wet season. A fauna management condition is recommended to ensure that impacts to potentially significant fauna habitat is minimised.

Given the application area supports two conservation significant flora species and is likely to support numerous fauna species including several conservation significant fauna species, the proposed clearing may be at

variance to this Principle. However the recommended clearing permit conditions will ensure that the proposed clearing does not impact these conservation significant flora and fauna species or the habitats associated with them.

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

Methodology APM (2011)
CALM (2002)
Shepherd (2009)
Western Australian Herbarium (1998)
GIS Database:
- Declared Rare and Priority Flora List
- IBRA WA (Regions–Subregions)
- Threatened Ecological Sites Buffered

(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 may be at variance to this Principle

Based on the desktop fauna assessment carried out of the application area, APM (2011) determined that the following three broad fauna habitat types exist within the application area:

- Hummock Grassland: Hummock and bunch grasslands of *Triodia epactia*, *Cenchrus ciliaris* and *Aristida holathera* var. *holathera* with *Ptilotus arthrolasius*;
- River Bank: Open low woodland of *Eucalyptus camaldulensis* subsp. *refulgens* over scrub/open scrub of *Crotalaria cunninghamii* and *Aerva javanica* with scattered *Cenchrus ciliaris*; and
- River Bed: Open scrub of *Acacia trachycarpa*, *Melaleuca argentea*, *Acacia pyriformis* var. *morrisonii* over open low shrubland of *Crotalaria cunninghamii* (APM, 2011).

The dense, well developed and infrequently burnt Spinifex clumps within the *Triodia epactia* hummock grassland are the key fauna resource in this habitat (APM, 2011). Mature and well developed Spinifex clumps provide a secure refuge and high humidity micro-environment for a high diversity of fauna (APM, 2011). Species such as the Jewelled Gecko (*Strophurus elderi*) and the Military Dragon (*Ctenophorus isolepis*) specifically occupy these Spinifex clumps. This niche micro-environment can also include a range of pygopod lizards (legless lizards), the Desert Death Adder (*Acanthophis pyrrhus*), dunnarts, ningauis and numerous rodents.

The dense river bank vegetation provides a good variety of strata for passerine bird species and some arboreal geckos and dragons. More importantly, however, the large riverine trees provide nesting habitat for large birds of prey, such as the Grey Falcon (*Falco hypoleucos*) and refuge for larger reptiles, such as the Pilbara Olive Python (*Liasis olivaceus barroni*). This dense vegetation and the accumulation of litter and detritus from flood wrack provides valuable habitat for fossorial skink species. The Rainbow Bee-eater (*Merops ornatus*), Spectacled Hare Wallaby (*Lagorchestes conspicillatus*), and Australian Bustard (*Ardeotis australis*) may also occur.

Migratory wetland bird species, such as the egrets and sandpipers would occupy the periphery of fresh water pools that remain as the flooded rivers dry up. The lack of ground cover in the unstable river bed would mean the habitat holds little value for the terrestrial fauna such as rodents, dasyurids, skinks, geckos and snakes.

Although the vegetation within the application area potentially supports a rich and diverse array of fauna species, this vegetation is well represented on a regional scale and is unlikely to represent significant habitat to the fauna species in a regional context (Shepherd, 2009). However, APM (2011) highlighted that the potential presence of the conservation significant fauna species, Northern Quoll (*Dasyurus hallucatus*) (*Environment Protection, Biodiversity and Conservation Act 1999*, Threatened) in the vicinity of the application area warrants habitat protection and concluded that no disturbance should occur where standing or fallen vegetation has a trunk diameter exceeding 100 millimetres.

To minimise fauna impacts, Dumpna advised that the sand mining will be conducted by excavating pockets of sand where there is little or no vegetation (APM, 2011). Furthermore, excavation areas will be ramped to allow fauna egress, and a buffer set at a distance (at least two metres) from the drip line of any significant riparian vegetation (APM, 2011). A fauna management condition is recommended to ensure that impacts to potentially significant fauna habitat is minimised.

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

Methodology APM (2011)
Shepherd (2009)

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

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

The database searches of the application area showed that no Declared Rare Flora (DRF) as listed under the *Wildlife Conservation Act, 1950*, were recorded within 40 kilometres of the application area, or Threatened Flora species as listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999 (EPBC Act)* were recorded within the application area (GIS Database; APM, 2011).

In addition, no DRF listed pursuant to the *Wildlife Conservation Act, 1950*, or as Threatened species under the *EPBC Act* were recorded during the flora and vegetation survey (APM, 2011). It is therefore unlikely that the area to be cleared includes, or is necessary for the continued existence of, rare flora.

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

Methodology APM (2011)
GIS Database:
- Declared Rare and Priority Flora List

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

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

There are no known Threatened Ecological Communities (TEC's) which occur within the application area (GIS Database). In addition the vegetation communities within the application area are well represented in the Roebourne sub-region of the Pilbara (APM, 2011).

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

Methodology APM (2011)
GIS Database:
- Threatened Ecological Sites Buffered

(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 Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). Shepherd (2009) reports that approximately 99.89% of the pre-European vegetation still exists in this bioregion.

According to Shepherd (2009) approximately 100% of Beard vegetation associations: 589 and 619 remain at both a state and bioregional level. Therefore the area proposed to be cleared does not represent a significant remnant of native vegetation within an area that has been extensively cleared.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion - Pilbara	17,804,193	17,785,000	~99.89	Least Concern	~6.32
Beard vegetation association - State					
589	135,000	135,000	~100	Least Concern	0
619	119,159	119,089	~99.94	Least Concern	~0.2
Beard vegetation association - Bioregion					
589	730,718	730,683	~100	Least Concern	~1.77
619	118,705	118,705	~100	Least Concern	~0.2

* Shepherd (2009)

** 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 (2009)

GIS Database:
- IBRA WA (Regions–Subregions)

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

Comments Proposal may be at variance to this Principle

The application area occurs within the Yule River Water Reserve (GIS Database). Dumpna is proposing to clear up to 40 hectares of native vegetation for the purpose of sand extraction from within the application area (APM, 2011). The Yule River is ephemeral, and Dumpna propose to mine the sand in areas that have little or no vegetation over two to three months between June and December when the sand is likely to be at its driest (APM, 2011).

The following vegetation community constitutes riparian vegetation within the application area:

“Open low woodland of *Eucalyptus camaldulensis* subsp. *refulgens* over scrub/open scrub of *Melaleuca argentea* and *Acacia trachycarpa* over open low shrubland of *Crotalaria cunninghamii* and *Aerva javanica* with scattered *Cenchrus ciliaris*” (APM, 2011).

Most of the vegetation within the survey area is growing along either the channel or the banks of the Yule River (APM, 2011). The removal of sand from open ground along the channel should have little effect on the remaining vegetation as flood events would be expected to replace excavated sand with fresh sediments from upstream. However, the clearing of established trees, shrubs and grasslands along the river banks could cause erosion and habitat loss for significant fauna that potentially occur within the application area.

Dumpna have stated that mining operations will be tailored to local situations so that excavation does not destroy or destabilise trees, river banks and grass swards (APM, 2011). Further, little or no clearing along the banks is proposed, with the exception of one access ramp leading down to the river bed (APM, 2011). APM, (2011) advised that the patchy nature of the fringing and channel vegetation along the Yule River should make it possible to locate pits clear of large trees, and between areas of stable shrubland or grassland.

The Department of Water (2011) provided the advice that “no activity shall be undertaken which results in the loss of riverbank or wetland fringing vegetation, in particular vehicular access tracks. Where possible existing tracks are to be used”. Further, the Department of Water state that any interference with the bed and banks of a watercourse in this proclaimed area will require a Bed and Banks Permit from the Department of Water (Department of Water, 2011).

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

Methodology APM (2011)
Department of Water (2011)
GIS Database:
- Public Drinking Water Source Areas

(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 to clear for sand and shingle extraction is located partly within the River land system of the Pilbara region (GIS Database; Van Vreeswyk *et al.*, 2004). This system is relatively poorly represented in the region, occupying approximately 2.3% of the Pilbara region (Van Vreeswyk *et al.*, 2004). The remaining section falls within the Yule River bed (GIS Database).

The River land system is characterised by broad sandy plains and major rivers supporting grassy Eucalypt woodlands, tussock grasslands and soft Spinifex grasslands and susceptibility to erosion is high or very high if vegetative cover is removed (Van Vreeswyk *et al.*, 2004).

APM (2011) informed that the provision of ramps in and out of the river bed is proposed to protect the banks from erosion, and where possible vegetation within the river bed will be avoided. Sand mining of approximately 36 hectares is proposed in areas that have little to no vegetation and will be predominantly regrowth vegetation occurring in the river bed sand (APM, 2011). In addition access tracks and an area of hardstand for associated infrastructure are required and this will comprise clearing of approximately 0.5 hectares and 3.5 hectares respectively.

The excavation will disturb the ground but flooding will refill and rehabilitate these areas with sand deposits and replenish the seed source (APM, 2011). Additionally, rehabilitation of the cleared areas under conditions imposed by the *Mining Act 1978* will minimise the risk of soil erosion in the long term.

Given that the River land system and river bed areas proposed to be cleared have a high susceptibility to erosion and a very high susceptibility when vegetation is removed there may be an increased risk of wind and water erosion associated with mining during heavy rainfall events. Impacts from erosion 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 APM (2011)
Van Vreeswyk et al. (2004)
GIS Database:
- Rangeland Land System Mapping

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

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

The application area is not located within any conservation areas or Department of Environment and Conservation (DEC) managed lands (GIS Database). The nearest conservation area, the Mungaroon Range Nature Reserve is located 67 kilometres south-west of the application area. At this distance the proposed clearing is not likely to act as an ecological linkage or impact this 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 may be at variance to this Principle

The area under application is located within the Yule River Water Reserve, which was gazetted under the *Country Areas Water Supply Act 1947 (CAWS)* (GIS Database). This area has been assigned a "Priority 1" (P1) under the Water Source Protection Classification System (Department of Water, 2011). P1 classified areas are managed to ensure that there is no degradation of the drinking water source by preventing the development of potentially harmful activities in these areas (Department of Water, 2011).

The area under application is located within the Pilbara Groundwater Area as proclaimed under the *Rights in Water and Irrigation Act 1914* (GIS Database). The Department of Water (2011) advised that any taking or diversion of surface water in this proclaimed area for purposes other than domestic and/or stock watering will require a licence from the Department of Water. Further, where the clearing area intersects a waterway not within the proponent's tenement, the normal regulatory instruments under the *Rights in Water and Irrigation Act 1914* may apply (Department of Water, 2011). Any interference with the bed or banks of a watercourse in this proclaimed area will require a permit from the Department of Water (Department of Water, 2011). Similarly, any groundwater abstraction in this proclaimed area will require a licence from the Department of Water which if issued will contain a number of conditions that are binding upon the landowners (Department of Water, 2011).

The Department of Water (2011) highlights that the proposed clearing for sand extraction is unlikely to have a significant impact on the quality or quantity of groundwater, provided activities are carried out in accordance with Department of Water (2011) advice.

APM (2011) advised that Dumpna will not excavate below a three metre zone above the water table or below the clay riverbed layer. Contamination of the groundwater will be prevented via best practice hydrocarbon management techniques as specified within the clearing application supporting documentation (APM, 2011).

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

Methodology Department of Water (2011)
APM (2011)
GIS Database:
- Public Drinking Water Source Areas
- RIWI Act, Groundwater Areas

(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 area under application is located within and adjacent to the ephemeral Yule River (GIS Database). The Yule River is a relatively large watercourse that flows during flood events into the Indian Ocean approximately 38 kilometres downstream (GIS Database).

Local flooding occurs during the summer months (November to April) in the Pilbara region as a result of cyclonic activity and sporadic thunderstorms and it is likely that the Yule River may experience seasonal flooding during high rainfall periods (APM, 2011). However it is not likely that the proposed clearing will increase the incidence or intensity of this flooding.

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

Methodology APM (2011)
GIS Database:
- River

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

Comments

There is one Native Title Claim (WC99/3) over the area under application (GIS Database). This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. However, 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*.

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.

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 6 June 2011 by the Department of Mines and Petroleum inviting submissions from the public. No submissions were received in relation to this application; however the Department of Water provided comments on the application (Department of Water, 2011).

Methodology Department of Water (2011)
GIS Database
- Aboriginal Sites of Significance
- Native Title Claims

4. References

- APM (2011) Application for a clearing permit (Purpose Permit) for the Yule River Sand project M47/1438 Pilbara, Western Australia, May 2011. Prepared for Dumpna Pty Ltd by Animal Plant Mineral Pty Ltd.
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002 (PIL4 - Roebourne subregion) Department of Conservation and Land Management, 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.
- Department of Water (2011) Advice provided to the Department of Mines and Petroleum for Clearing Permit Application CPS 4370/1 on 14 July 2011.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Shepherd, D.P. (2009) Adapted from: Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth.
- Van Vreeswyk, A.M.E., Payne, A.L., Hennig, P., and Leighton, K.A. (2004) An Inventory and Condition Survey of the Pilbara Region, Western Australia, Department of Agriculture, Western Australia.
- Western Australian Herbarium (1998) Florabase - The Western Australian Flora. Department of Environment and Conservation. <http://florabase.calm.wa.gov.au/> (Accessed 1 July 2011).

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.