



1. Application details

1.1. Permit application details

Permit application No.: 2030/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Rinker Australia Pty Limited

1.3. Property details

Property: Mining Lease M45/93
Local Government Area: Town of Port Hedland
Colloquial name: Turner River

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
10		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
Vegetation within the application area has been mapped at a 1:250,000 scale as Beard vegetation associations: 589 and 619.	The proposed clearing is for the expansion of a sand extraction pit for Rinker Australia Pty Ltd (hereafter referred to as Rinker). The application area is situated approximately 36 kilometres southwest of Port Hedland.	Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).	The vegetation condition is based on the Keighery (1994) vegetation condition scale, from aerial photography and an assessment provided by Simply Planning (2007).
589: Mosaic: Short bunch grassland - savannah / grass plain (Pilbara) / Hummock grasslands, grass steppe; soft Spinifex.	The proponent has applied to clear a maximum area of 10 hectares within a permit application area totalling 64 hectares, all of which comprises of a sand dune (GIS Database).	To	The application area is located within the Boodarie Pastoral Lease and immediately adjacent to an existing minesite (GIS Database). Vegetation within the application area has been previously disturbed by grazing, exploration and mining activities, and has thus been substantially altered (Simply Planning, 2007).
619: Medium woodland; river gum (<i>Eucalyptus camaldulensis</i>) (Shepherd <i>et al.</i> , 2001).	The proponent has already established a sand extraction pit on the sites, with the access road to the pit across the Turner River (Simply Planning, 2007). Rinker proposes to continue the operation of their sand mining, with the next stage of operation comprising an area approximately 200m wide by 500m long (Bennett Environmental, 2007). This area is situated within the dune, which is over 2km long and 250m wide. Prior to mining the sand, the topsoil will be removed and stored for later use in rehabilitation (Bennett Environmental, 2007).	Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994).	
The application area falls predominantly within Beard vegetation association 589, which is well represented in the bioregion (GIS Database).	Rinker proposes to extract the deposit as an ongoing open pit operation: it will not be a fixed, permanent operation, but operated on an as-needs basis (Simply Planning, 2007). It is proposed that mining be undertaken throughout the year dependent on weather conditions. The duration of each extraction period is anticipated to be for six weeks each year, with the proposed progressive extraction and rehabilitation sequence occurring over a five year period (Simply Planning, 2007).		

3. Assessment of application against clearing principles

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Comments

Proposal is not likely to be at variance to this Principle

The application area is located within the Roebourne Subregion and the Pilbara Bioregion of the Interim Biogeographic Regionalisation of Australia (IBRA) (GIS Database). The biodiversity values of the subregion were assessed by Kendrick & Stanley (2001). The Roebourne Subregion consists of quaternary alluvial and older colluvial coastal and subcoastal plains with a grass savannah of mixed bunch and hummock grasses, and dwarf shrub steppe of *Acacia stellaticeps* or *A. pyrifolia* and *A. inaequilatera* (Kendrick & Stanley, 2001). Uplands are dominated by *Triodia* hummock grasslands, ephemeral drainage lines support *Eucalyptus victrix* or *Corymbia hamersleyana* woodlands and samphire, *Sporobolus* and mangal occur on marine alluvial flats and river deltas (Kendrick & Stanley, 2001). Vegetation within the application area, although degraded, is consistent with vegetation found within the Roebourne Subregion.

Rare features of the Pilbara Bioregion are offshore islands and the Burrup Peninsula, none of which occur within the application area (Bennett Environmental, 2007).

The application area has been used for pastoral grazing purposes for the past century, and the vegetation has generally been heavily grazed and periodically burned (Simply Planning, 2007). The vegetation is impoverished in areas due to grazing, burning and introduced animal species (stock and feral) (Simply Planning, 2007). The Turner River, which is located 250 metres east of the application area, is stated as being invaded with the weed Buffel grass (*Cenchrus ciliaris*) with the permanent and semi-permanent pools being affected adversely by cattle (Bennett Environmental, 2007).

Due to the level of disturbance that has already occurred within the application area as a result of grazing and mining activities (GIS Database; Rinker, 2007), it is unlikely that the proposal will result in the clearing of native vegetation that has higher biodiversity attributes than that of the surrounding undisturbed vegetation.

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

Methodology Bennett Environmental (2007)
Kendrick & Stanley (2001)
Simply Planning (2007)
GIS Database:
- Interim Biogeographic Regionalisation of Australia (subregions) - EA 18/10/00
- Pastoral Leases -DOLA 10/01

(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

According to databases available to DoIR (GIS Database), there are no known records of fauna of conservation significance within 11 kilometres of the application area.

Based on habitat or distribution, the following threatened fauna may occur in the application area: the Orange-leaf Nosed Bat *Rhinonictus aurantius*, the Black-footed Rock-wallaby *Petrogale lateralis*, the Airlie Island Ctenopus *Ctenopus angusticeps*, the Pilbara Olive Python *Liasis olivaceus barroni*, and the Peregrine Falcon *Falco peregrinus* (Kendrick & Stanley, 2001).

The Orange-leaf Nosed Bats *Rhinonictus aurantius* (Schedule 1, fauna that is rare or likely to become extinct, 'Wildlife Conservation (Specially Protected Fauna) Notice, 2006') known colonies in the Pilbara occupy abandoned, deep and partially flooded mines that trap pockets of warm, humid air in the mine's constant temperature zone, and for at least part of the year, the species is thought to also occupy smaller, less complex mines nearby (Department of the Environment and Water Resources, 2007a). Two natural roosts have been located in the Gascoyne region: one is a cave more than 30m deep, and the other a horizontal fissure beneath an ephemeral waterfall (Department of the Environment and Water Resources, 2007a). None of these habitats are present within or near the application area. It is therefore unlikely that the proposed clearing will impact the conservation status of this species.

The Black-footed Rock-wallaby *Petrogale lateralis* (Schedule 1, fauna that is rare or likely to become extinct, 'Wildlife Conservation (Specially Protected Fauna) Notice, 2006') prefers habitats of granite outcrops, sandstone and quartzite cliffs in ranges, gabbro cliffs and scree slopes with sheltered steep cliffs, caves, rock-piles and/or ledges (Department of the Environment and Water Resources, 2007b). The distribution and abundance of this species has declined over most of its former range, and is no longer located within or around application area (Department of the Environment and Water Resources, 2007b). Given the distribution of the species, and the lack of preferred habitats within the application area, it is unlikely that the proposal will affect the conservation status of the Rock Wallaby.

The Pilbara Olive Python *Liasis olivaceus barroni* (Schedule 1, fauna that is rare or likely to become extinct, 'Wildlife Conservation (Specially Protected Fauna) Notice, 2006') prefers deep gorges and water holes in the ranges of the Pilbara region (Department of the Environment and Water Resources, 2007c). Radio-telemetry has shown that individuals are usually in close proximity to water and rock outcrops (Department of the Environment and Water Resources, 2007c). As the application area consists predominantly of dune sand, it is unlikely that the proposed clearing will be detrimental to this species.

The Airlie Island Ctenopus *Ctenopus angusticeps* (Schedule 1, fauna that is rare or likely to become extinct, 'Wildlife Conservation (Specially Protected Fauna) Notice, 2006') is located almost solely on Airlie Island (north-northeast of Onslow) off the arid northwest coast, in the vicinity of Roebuck Bay (Department of the Environment and Water Resources, 2007d). The lizards are found in all habitat types, but appear to have a preference for the tussock grass on the western end of Airlie Island as tussocks provide shelter and an abundance of invertebrate prey (Department of the Environment and Water Resources, 2007d). Although the habitat within the application area may be suitable for the Ctenopus, the known distribution of the species is unlikely to include the application area.

The Peregrine Falcon *Falco peregrinus* (Schedule 4, other specially protected fauna, 'Wildlife Conservation

(*Specially Protected Fauna*) Notice, 2006'), is a wide ranging bird that has little habitat specificity apart from an affinity with cliffs, tall trees for nesting, and water (Pizzey & Knight, 1997). Given the lack of cliffs, tall trees or perennial watercourses within the project area, the proposal is unlikely to impact on the habitat of this species.

The application area has been used for pastoral grazing purposes for the past century and the vegetation has generally been heavily grazed and periodically burned (Simply Planning, 2007). Thus, it is impoverished in areas due to the grazing and burning and introduced species (stock and feral) (Simply Planning, 2007). There is a low level of habitat diversity on the dune with its limited soil structure and water (Simply Planning, 2007), so it is unlikely that the proposal will lead to clearing of any significant habitats for fauna indigenous to Western Australia.

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

Methodology Garnett & Crowley (2000)
Pizzey & Knight (1997)
Simply Planning (2007)
GIS Database:
- Threatened Fauna - CALM 30/9/05

(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

A search was undertaken by Bennett Environmental in 2007 of the Department of Environment and Conservation's Rare Flora database for the coordinates 20°15' - 20°54' S and 117°58' - 119°00' E. No Declared Rare Flora were located within the application area as a result of this search; however, one Priority 1, three Priority 2 and three Priority 3 flora species were recorded for the search area (Bennett Environmental, 2007).

Ptilotus appendiculatus var. *minor* - P1
Gomphrena cucullata - P2
Gomphrena pusilla - P2
Gonocarpus ephemerus - P2
Acacia glaucocaesia - P3
Goodenia pascua - P3
Gymnanthera cunninghamii - P3

The above Priority Flora may potentially occur within the application area, especially *Ptilotus appendiculatus* var. *minor*, a Priority 1 Flora, which has been recorded from the Turner River (Bennett Environmental, 2007). However, the area has been used for pastoral grazing purposes for the past century and the vegetation has generally been heavily grazed and periodically burned (Simply Planning, 2007). Thus, it is generally impoverished due to the grazing and burning and introduced animal species (stock and feral) (Simply Planning, 2007), and unlikely to be necessary for the continued existence of rare or priority flora.

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

Methodology Bennett Environmental (2007)
Simply Planning (2007)
GIS Database:
- Declared Rare and Priority Flora List - CALM 01/07/05

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

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

A search of available databases (GIS Database) reveals that there are no known Threatened Ecological Communities (TECs) within 190 kilometres of the application area. Given the distance from the application area to the nearest TEC, the clearing of 10 hectares of vegetation is unlikely to affect the conservation status of the TEC.

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

Methodology 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

Vegetation within the application area has been classified as Beard vegetation associations 589 (Mosaic: Short bunch grassland - savannah / grass plain (Pilbara) / Hummock grasslands, grass steppe; soft spinifex) and 619 (Medium woodland; river gum (*Eucalyptus camaldulensis*); but almost wholly within vegetation association 589 (GIS database). According to Shepherd *et al.* (2001), approximately 730,690 hectares or 99.99% of Beard vegetation association 589 remains for the Pilbara IBRA Bioregion.

Although the percentage of vegetation association 589 in reserves or DEC managed land is only 1.8% in the Pilbara IBRA Bioregion, the regional extent is approximately 99.99% uncleared (Shepherd *et al.*, 2001), and therefore, the proposed clearing does not pose a threat to the conservation of this vegetation association.

The area proposed to be cleared does not represent a significant remnant of native vegetation in an extensively cleared area.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-european % in IUCN Class I-IV Reserves
IBRA Bioregion – Pilbara	17,804,164	17,794,651	99.9	Least Concern	6.3
Beard veg assoc. – State					
589	809,764	809,647	99.99	Least Concern	1.6
619	119,159	119,038	99.9	Least Concern	0.2
Beard veg assoc. – Bioregion					
589	730,724	730,690	99.99	Least Concern	1.8
619	118,706	118,706	100	Least Concern	0.2

* Shepherd *et al.* (2001) updated 2005

** 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	

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

Methodology Department of Natural Resources and Environment (2002)
Shepherd *et al.* (2001)
GIS Database:
- Pre European Vegetation DA 01/01

(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 application area is located approximately 11 kilometres south of the Western Australian coastline in the Turner River catchment area (GIS Database). According to available database (GIS Database), there are no drainage lines or watercourses within the application area; however, the Turner River, a non perennial watercourse is located approximately 250 metres east of the application area.

Rinker is proposing to clear approximately 10 hectares of dunal vegetation for the mining of dune sand (Simply Planning, 2007). Although the application area runs parallel to the Turner River (GIS Database), it is unlikely that vegetation growing in association with the Turner River will be removed as a result of the proposed

clearing, as the application area is located 250 metres east of the river (GIS Database).

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

- Methodology** Simply Planning (2007)
GIS Database:
- Evaporation Isopleths - BOM 09/98
 - Geodata, Lakes - GA 28/06/02
 - Hydrography, Linear - DoE 1/2/04
 - Mean Annual Rainfall Surface (1975 - 2003) DoW
 - Potential Groundwater Dependant Ecosystems - DOE 2004
 - Rivers 250K - GA

(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

A survey of the land resources of the Pilbara Bioregion was undertaken between 1995 and 1999 (Van Vreeswyk *et al.*, 2004). The application area is mapped as the River Land System and described as active floodplains and major rivers supporting grassy eucalypt woodlands, tussock grasslands and soft Spinifex grasslands (Van Vreeswyk *et al.*, 2004). The geomorphology is river floodplains and river terraces subject to over bank flooding from major channels and watercourses (Van Vreeswyk *et al.*, 2004). The banks, levees and slightly higher upper terraces receive less regular flooding than the lower areas (Van Vreeswyk *et al.*, 2004). The system is stabilised by Buffel Grass and Spinifex and accelerated erosion is uncommon; however, if the cover is removed, the susceptibility to erosion is high (Van Vreeswyk *et al.*, 2004).

The River Land System is divided into 5 units:

1. Sandy levee and sand sheet
2. Upper terrace
3. Flood plain and lower terrace
4. Stony plain
5. Minor and major channels

The location of the application area is likely to be included in units 1 and 2 (Bennett Environmental, 2007) and is therefore less susceptible to erosion than other areas. Both of the units are deep red sands with a vegetation cover of hummock grasslands of *Triodia pungens* with very scattered shrubs of *Acacia* species (Bennett Environmental, 2007).

Commitments to ongoing rehabilitation of the application area aim to have parts of the application area rehabilitated each year, re-instated on finalisation of use. However, the areas to be rehabilitated exclude the ongoing working area and access road (Simply Planning, 2007). Post-extraction, the batters will be re-profiled, where possible into the pre-extraction contours and stored topsoil will be used to rehabilitate the slopes wherever practicable (Simply Planning, 2007). These strategies will assist in the management and reduction of erosion.

Based on the above, the proposed clearing may be at variance to this Principle. However, given the above rehabilitation commitments, potential land degradation will be minimised.

- Methodology** Bennett Environmental (2007)
Simply Planning (2007)
Van Vreeswyk *et al.* (2004)
GIS Database:
- Evaporation Isopleths - BOM 09/98
 - Mean Annual Rainfall Surface (1975 - 2003) DoW
 - Topographic Contours, Statewide DOLA 19/09/02

(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 nearest recorded conservation reserve to the application area is the North Turtle Island Nature Reserve, which is located approximately 76 kilometres north-northeast of the application area, and 19 kilometres offshore (GIS Database). At this distance, and the fact that the conservation reserve is an offshore island, the clearing of 10 hectares on the mainland is unlikely to affect the environmental values of the reserve.

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 1/7/05

(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 (GIS Database), groundwater within the application area is brackish at between 1000 - 3000 milligrams per litre of Total Dissolved Solids: the removal of 10 hectares of vegetation is unlikely to cause ground water levels to rise or increase in salinity.

The application area occurs within the Turner River catchment area, which is a Public Drinking Water Source Area (PDWSA) (GIS Database). The application area experiences approximately 400 millimetres annual rainfall and average annual evaporation rates of 3,400 millimetres (GIS Database). Due to relatively low rainfall, high evaporation rates, and the dunal nature of the application area, there is likely to be little surface water within the application area. Therefore, the proposed clearing is not likely to reduce the quality of surface water.

Where practicable, clean water run-off will be diverted around operation areas and any run-off water from the operating areas will be directed into the pit floor to allow any sediment to settle (Simply Planning, 2007). It is unlikely that the proposal will deteriorate the quality of the surface water or the Turner River.

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

Methodology Simply Planning (2007)

GIS Database:

- Groundwater Salinity, Statewide - DoW Properties
- Hydrography, Linear - DoE 1/2/04
- Public Drinking Water Source Areas DoE 7/2/06
- Rivers 250K - GA

(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

There are no watercourses or drainage lines within the application area; however, a non perennial watercourse is located approximately 250 metres east of the application area - Turner River (GIS Database).

The climate of the bioregion is arid (semi-desert) tropical with highly variable rainfall, falling mainly in summer (Bennett Environmental, 2007). The application area receives an average annual rainfall of 400 millimetres, and average annual evaporation rates of 3,400 millimetres (GIS Database). Therefore, there is likely to be little surface water flow within the application area.

Additionally, the application area covers a sand dune (Simply Planning, 2007) where the soil is free draining sand, so it is unlikely that water would remain on the surface. Therefore, there is little chance of the application area being subject to flooding due to the removal of native vegetation.

The clearing of 10 hectares within the Turner River catchment, which has a total area of more than 480,000 hectares (GIS Database), is unlikely to result in an increase in flooding incidence or intensity.

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

Methodology Bennett (2007)

Simply Planning (2007)

GIS Database:

- Evaporation Isopleths - BOM 09/98
- Hydrographic Catchments - Catchments - DoE 23/3/05
- Hydrography, Linear - DoE 1/2/04
- Rainfall, Mean Annual - BOM 30/09/01
- Rivers 250K - GA

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

Comments

The clearing permit application was advertised by DoIR, inviting submissions from the public. Two public submissions were received:

A submission was received from the Town of Port Hedland on 7 September 2007, stating that they had no objections to the proposed clearing (Town of Port Hedland, 2007).

A submission was received on 20 September 2007 raising concerns about the potential impacts of the proposed vegetation clearing on Sites of Aboriginal Significance and Native Title rights.

There are no known sites of Aboriginal significance within the area applied to clear (GIS Database). The proposed clearing occurs in an area that is within two kilometres of the following Registered Indigenous

Heritage Site - (ID 6653). Advice received from the Department of Indigenous Affairs (DIA) on 20 September 2007 to the Assessing Officer indicates that the proposed works will not impact the Aboriginal Heritage Site, DIA 6653 (DIA, 2007). The DIA further advised that if Rinker Australia Pty Ltd is unable to avoid impacting Aboriginal sites, the proponent would need to submit a notice under Section 18 of the *Aboriginal Heritage Act 1972* to obtain the Minister of Indigenous Affairs's consent to use the land on which this site is located (DIA, 2007). 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.

There is one Native Title claim over the area under application; WC99_003. This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. 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 (ie. 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*.

The proposed extension to the pit for Rinker Australia Pty Ltd is subject to the *Mining Act 1978* approval process. A mining proposal must be approved by DoIR prior to the commencement of the proposed works.

The proposed clearing area is located wholly within the Turner River Water Reserve, a Public Drinking Water Source Area (PDWSA) (GIS Database; DoW, 2007). Advice received from the Department of Water (DoW) indicates that any interference with the bed or banks of a watercourse or within the riparian zone in the proclaimed area will require a permit from the DoW (DoW, 2007). 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.

Methodology DIA (2007)
DoW (2007)
Town of Port Hedland (2007)
GIS Database:
- Native Title Claims - DLI 7/11/05
- Sites of Aboriginal Significance DIA

4. Assessor's comments

Purpose	Method	Applied area (ha)/ trees	Comment
Mineral Production	Mechanical Removal	10	<p>The proposal has been assessed against the Clearing Principles and the proposal has been found not at variance to Principle e, not likely to be at variance to Principles a, b, c, d, f, g, h, i and j, and may be at variance to Principle g.</p> <p>It is recommended that the following conditions are imposed on the permit:</p> <ol style="list-style-type: none"> 1. The Permit Holder must record the following for each instance of clearing: <ol style="list-style-type: none"> (a) the location where clearing occurred, expressed as grid coordinates using the Geocentric Datum of Australia 1994 coordinate system; (b) the area cleared in hectares; (c) the dates cleared; (d) the method of clearing; (e) the purpose of clearing; and (f) the area rehabilitated in hectares. 2. The Permit Holder shall provide a report to the Director, Environment Division, Department of Industry and Resources by 31 October each year, setting out the records required under Condition 1 of this permit in relation to clearing carried out between 1st November and 31st October of the previous year. This report can be included as part of the Annual Environmental Report submitted to DoIR.

5. 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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- Garnett, S.T. and Crowley, G.M. (2000) The Action Plan for Australian Birds 2000. Department of the Environment and Water Resources, Canberra.
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- Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) Native Vegetation in Western Australia, Extent, Type and Status. Resource Management Technical Report 249. Department of Agriculture, Western Australia, updated 2005.
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- Town of Port Headland (2007) Direct Interest Submission Letter. Sent 7 September, 2007.
- Van Vreeswyk, A.M.E. *et al.* (1994) An Inventory and Condition Survey of Rangelands in the Pilbara, Western Australia, Rep. No. 92. Department of Agriculture, South Perth, Western Australia.

6. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government.
CALM	Department of Conservation and Land Management, Western Australia.
DAFWA	Department of Agriculture and Food, Western Australia.
DA	Department of Agriculture, Western Australia.
DEC	Department of Environment and Conservation
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DoE), Western Australia.
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia.
DoE	Department of Environment, Western Australia.
DoIR	Department of Industry and Resources, Western Australia.
DOLA	Department of Land Administration, Western Australia.
DoW	Department of Water
EP Act	Environment Protection Act 1986, Western Australia.
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System.
IBRA	Interim Biogeographic Regionalisation for Australia.
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
RIWI	Rights in Water and Irrigation Act 1914, Western Australia.
s.17	Section 17 of the Environment Protection Act 1986, Western Australia.
TECs	Threatened Ecological Communities.

Definitions:

{Atkins, K (2005). *Declared rare and priority flora list for Western Australia, 22 February 2005. Department of Conservation and Land Management, Como, Western Australia*} :-

- P1** **Priority One - Poorly Known taxa:** taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
- P2** **Priority Two - Poorly Known taxa:** taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
- P3** **Priority Three - Poorly Known taxa:** taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.
- P4** **Priority Four – Rare taxa:** taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.
- R** **Declared Rare Flora – Extant taxa (= Threatened Flora = Endangered + Vulnerable):** taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.
- X** **Declared Rare Flora - Presumed Extinct taxa:** taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

{Wildlife Conservation (Specially Protected Fauna) Notice 2005} [Wildlife Conservation Act 1950] :-

- Schedule 1** **Schedule 1 – Fauna that is rare or likely to become extinct:** being fauna that is rare or likely to become extinct, are declared to be fauna that is need of special protection.
- Schedule 2** **Schedule 2 – Fauna that is presumed to be extinct:** being fauna that is presumed to be extinct, are declared to be fauna that is need of special protection.
- Schedule 3** **Schedule 3 – Birds protected under an international agreement:** being birds that are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is need of special protection.
- Schedule 4** **Schedule 4 – Other specially protected fauna:** being fauna that is declared to be fauna that is in need of special protection, otherwise than for the reasons mentioned in Schedules 1, 2 or 3.

{CALM (2005). *Priority Codes for Fauna*. Department of Conservation and Land Management, Como, Western Australia} :-

- P1** **Priority One: Taxa with few, poorly known populations on threatened lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P2** **Priority Two: Taxa with few, poorly known populations on conservation lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P3** **Priority Three: Taxa with several, poorly known populations, some on conservation lands:** Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P4** **Priority Four: Taxa in need of monitoring:** Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.
- P5** **Priority Five: Taxa in need of monitoring:** Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

Categories of threatened species (*Environment Protection and Biodiversity Conservation Act 1999*)

- EX** **Extinct:** A native species for which there is no reasonable doubt that the last member of the species has died.
- EX(W)** **Extinct in the wild:** A native species which:
(a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
(b) has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
- CR** **Critically Endangered:** A native species which is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
- EN** **Endangered:** A native species which:
(a) is not critically endangered; and
(b) is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
- VU** **Vulnerable:** A native species which:
(a) is not critically endangered or endangered; and
(b) is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
- CD** **Conservation Dependent:** A native species which is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.