



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 5089/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Hamersley Iron Pty Ltd

1.3. Property details

Property: Iron Ore (Hamersley Range) Agreement Act 1963, Mineral Lease 4SA (AML 70/4)
Local Government Area: Shire of Ashburton
Colloquial name: Western Turner Syncline Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
30		Mechanical Removal	Mineral Exploration

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 13 September 2012

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description 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 associations are located within the application area (GIS Database):

82: Hummock grasslands, low tree steppe; snappygum over *Triodia wiseana*; and

567: Hummock grasslands, shrub steppe; mulga and kanji over soft spinifex & *Triodia basedowii*.

The application area was covered by a Phase 2 vegetation and flora survey by Biota Environmental Sciences (Biota) (Biota, 2012). Biota (2012) incorporates the results of six surveys undertaken in 2007 and 2011. In total these surveys cover approximately 22,308 hectares over the Western Turner Syncline area (West Turner area). According to Rio Tinto Iron Ore (RTIO) (2012a), the following eight vegetation units identified by Biota occur within the application area:

Vegetation of Creeks, Flowlines, Floodplains and Gullies

1. AanAciT spp: *Acacia aneura*, *A. citrinoviridis* tall open scrub over mixed *Triodia* open hummock grassland. This vegetation unit occurred in gullies, creeklines and floodplains.

2. CfAanAciTbrTeERIm: *Corymbia ferriticola* low open woodland over *Acacia aneura*, *A. citrinoviridis* tall shrubland over *Triodia brizoides*, *T. epactia* open hummock grassland with *Eriachne mucronata* very open tussock grassland.

3. ElChAciApyAmoTe: *Eucalyptus leucophloia*, *Corymbia hamersleyana* low open woodland over *Acacia citrinoviridis*, *A. pyrifolia*, *A. monticola* tall open scrub over *Triodia epactia* open hummock grassland.

Vegetation of Stony Plains and Low Spurs

4. AanApr: *Acacia aneura* (*A. pruinocarpa*) tall shrubland over mixed scattered hummock grasses. This vegetation unit was predominantly recorded from plains.

Vegetation of Stony Hills and Slopes

5. AanAprTbr: *Acacia aneura* (*A. pruinocarpa*) low open forest over *Triodia brizoides* open hummock grassland. This vegetation unit occurred broadly over the south-facing slopes of the range of hills.

6. ElAmTbr: *Eucalyptus leucophloia* scattered low trees over *Acacia maitlandii* tall shrubland over *Triodia brizoides* hummock grassland. This vegetation type occurred on hillslopes.

7. ElEgAsppTbr: *Eucalyptus leucophloia*, *E. gamophylla* low open woodland over mixed *Acacia* open shrubland over *Triodia brizoides* open hummock grassland.

8. ElTbr: *Eucalyptus leucophloia* scattered low trees over *Triodia brizoides* hummock grassland. This vegetation type occurred on broad gullies, on low rises and on the lower slopes of tall hills.

Clearing Description	<p>Hamersley Iron Pty Ltd has applied to clear 30 hectares within an application area of approximately 506 hectares (GIS Database). The application area is located approximately 30 kilometres west of Tom Price and 13 kilometres west, south west of the Rio Tinto Western Turner Syncline iron ore mine (GIS Database; RTIO, 2012a).</p> <p>The purpose of the application is to undertake evaluation and exploration programs for the West Turner Syncline Stage 2 Project and involves the construction of drill holes/lines, drill pads and access tracks (RTIO, 2012a). Clearing will be by bulldozer using a raised blade clearing technique where possible and blade down where required in steep or rough terrain to provide a safe working environment. Vegetation and topsoil will be stockpiled for use in rehabilitation.</p>
Vegetation Condition	<p>Pristine: No obvious signs of disturbance (Keighery, 1994);</p> <p>To</p> <p>Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).</p>
Comment	<p>The condition of each vegetation unit was determined using a scale based on Trudgen (1988). These condition ratings have been converted to the Keighery (1994) scale.</p> <p>Aerial imagery shows numerous tracks in the application area (GIS Database).</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

According to RTIO (2012a), eight of the 52 vegetation units identified by Biota (2012) occur within the application area. Four were associated with stony hills and slopes, three were associated with creeks, flowlines, floodplains and gullies and one was associated with stony plains and low spurs. Two of the vegetation units were considered to have elevated conservation significance as they could be classified as the "Lower Slope Mulga" or "Valley Floor Mulga" "ecosystem at risk" within the Hamersley subregion (CALM, 2002, RTIO, 2012a). The vegetation unit associated with gullies and gorges (CfAanAciTbrTeERIm) was also considered to be conservation significant as the landforms and vegetation they support have value as refugia for fire sensitive species and other species which prefer rocky, mesic habitats (Biota, 2012). This vegetation unit comprises 12.2 hectares or 2.4% of the application area and has been mapped in four locations within the application area (RTIO, 2012a). Potential impacts to this vegetation unit as a result of the proposed clearing may be minimised by the implementation of a condition that prevents clearing of this vegetation unit.

A total of 635 native vascular flora taxa from 185 genera belonging to 57 families were recorded from the larger Biota survey area (RTIO, 2012a). This survey recorded the highest number of species when compared to surveys of a similar size in the locality indicating high species richness. This is likely due to the variety of habitats present and while individual habitats may not be unusually biodiverse (in terms of flora species diversity), the survey area as a whole represents an area of biodiversity (Biota, 2012). The proposed clearing of 30 hectares within the larger survey area of 22,308 hectares is unlikely to significantly impact on the biodiversity of the larger survey area.

A total of 21 introduced flora taxa have been recorded in the larger survey area (Biota, 2012). According to Biota (2012), none of these species are listed as a 'Declared Plant' for the Pilbara region under the *Agriculture and Related Resources Protection Act 1976*, however, Ruby Dock (*Acetosa vesicaria*), Kapok Bush (*Aerva javanica*), Argemone ochroleuca subsp. *Ochroleuca*, Buffel Grass (*Cenchrus ciliaris*) and Mimosa Bush (*Vachellia famesiana*) are considered to be serious environmental weeds in Western Australia (Biota, 2012, CALM, 1999). Potential impacts from weeds as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

No Threatened Flora or Threatened or Priority Ecological Communities have been recorded within the application area (GIS Database; RTIO, 2012a).

According to RTIO (2012a), two of the priority flora species recorded in the larger Biota survey were recorded within the application area. This included three populations comprising 30 to 57 individuals of *Ptilotus subspinescens* (Priority 3) and 21 populations of *Eremophila magnifica* subsp. *magnifica* (Priority 4) (RTIO, 2012b). Biota (2012) reported *Ptilotus subspinescens* from 79 locations and that approximately 959 individuals were observed on the low stony undulating plains within the West Turner study area. Biota (2012) adds that its presence is well documented in the vicinity and 239 locations of this species have been previously recorded within 50 kilometres of the West Turner area. Biota (2012) reported *Eremophila magnifica* subsp. *magnifica* from 49 locations on the scree slopes of Mount Turner and hills to the east of Mount Turner. Approximately 541 individuals were located in the larger survey area (Biota, 2012).

RTIO (2012a) state that an environmental restriction zone will be placed around the *Ptilotus subspinescens* and *Eremophila magnifica* subsp. *magnifica* populations and disturbance to these areas should be avoided where possible. Based on this and given populations and suitable habitat have been recorded outside the application area, the proposed clearing is not expected to have a significant impact on these species.

Biota (2012) also reported the occurrence of other Priority 3 and Priority 4 Flora species within the West Turner

study area. According to Biota (2012), none of these are thought to be highly restricted.

The application area was covered by a two phase fauna survey undertaken by Biota in 2007 and 2008 over approximately 11,575 hectares in the West Turner area (Biota, 2009). This survey recorded one amphibian, 47 reptile, 58 bird and 20 mammal species within the West Turner study area and noted that the species recorded were generally representative of the taxa commonly recorded in this part of the bioregion (Biota, 2009). According to RTIO (2012a), five broad habitat types occur within the application area, all of which are considered reasonably widespread in this section of the Hamersley sub region. Biota (2009) identified six primary habitat types within the larger survey area and found that available habitat data indicated that no restricted or uncommon geological units or land systems occur within the West Turner area.

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

Methodology Biota (2009)
Biota (2012)
CALM (1999)
CALM (2002)
RTIO (2012a)
RTIO (2012b)
GIS Database:
- Threatened and Priority Flora
- 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

According to RTIO (2012a), the following five broad habitat types occur within the application area:

- Eucalypt woodland over *Acacia* spp. shrubland over *Triodia* hummock grassland on stony plains and slopes;
- *Eucalyptus leucophloia* woodland over *Acacia* spp. shrubland over *Triodia* hummock grassland on spurs and hill slopes;
- *Corymbia* spp. and Eucalypt open woodland over mixed *Acacia* spp. shrubland over tussock grasslands in gullies and gorges;
- Mulga (*Acacia aneura*) and *Acacia* spp. shrublands over *Triodia* hummock grasslands on rocky hill slopes; and
- Mixed *Acacia* spp. shrublands over *Triodia* hummock grasslands on stony plains and low hills.

Biota (2009) identified six primary habitat types within the larger survey area and found that available habitat data indicated that no restricted or uncommon geological units or land systems occur within the West Turner area. Biota (2012) considered one vegetation unit associated with gullies and gorges (CfAanAcITbrTeERIm) as conservation significant as the landforms and vegetation they support have value as refugia for fire sensitive species and other species which prefer rocky, mesic habitats. Potential impacts to this vegetation unit as a result of the proposed clearing may be minimised by the implementation of a condition that prevents clearing of this vegetation unit.

Biota (2009) recorded four conservation significant fauna species within the larger survey area including Western Pebble-mound Mouse (*Pseudomys chapmani*) (Priority 4), Australian Bustard (*Ardeotis australis*) (Priority 4), *Notoscincus butleri* (Priority 4) and Rainbow Bee-eater (*Merops ornatus*) (Marine; Migratory under EPBC Act; Schedule 3). According to RTIO (2012a), one record of a Western Pebble-mound Mouse mound is located within the application area. This species occurs on gentle slopes with suitable sized stones for constructing pebble mounds and is relatively widespread in the Pilbara. RTIO (2012a) state that an environmental restriction zone will be placed around the Western Pebble-mound Mouse mound. The Australian Bustard and Rainbow Bee-eater have widespread distributions and are mobile species that are able to utilise a variety of habitats. *Notoscincus butleri* occurs within the north west of the Pilbara bioregion and is associated with spinifex dominated areas near creek and river margins (Biota, 2009).

Local impacts to the above mentioned species may occur; however, given suitable habitat for these species is considered well represented in the Pilbara, the proposed clearing is not expected to have a significant impact on these species.

The Northern Quoll (*Dasyurus hallucatus*) (Endangered; Schedule 1) and Pilbara Olive Python (*Liasis olivaceus barroni*) (Vulnerable; Schedule 1) may also occur within the application area. The Northern Quoll is most abundant in open, rocky habitat and is also commonly found in gorges and near creek lines and may occur within the West Turner study area where breakaways and prominent creek lines occur (Biota, 2009). However, Biota (2012) notes that no Northern Quolls were recorded during three fauna surveys undertaken in the West Turner area, despite targeted sampling effort. A single specimen of the Pilbara Olive Python was recorded in a gorge during one of the West Turner fauna surveys (Biota, 2009). This species occurs in rocky areas within the Pilbara, showing a preference for habitats near water, particularly rock pools (Biota, 2009). Biota (2009) recommends that impact to scree slopes, breakaways and escarpments should be avoided where possible as these landforms offer potential habitat for the Northern Quoll, Pilbara Olive Python and Peregrine

Falcon (*Falco peregrinus*) (Schedule 4). Gorge/gully habitat (vegetation unit CfAanAciTbrTeERIm) may therefore represent significant habitat for these species. Potential impacts to this vegetation unit as a result of the proposed clearing may be minimised by the implementation of a condition that prevents clearing of this vegetation unit.

Several other conservation significant species may also utilise the application area. However, based on factors such as species mobility, distribution and core or preferred habitat requirements and given the availability of similar habitat in surrounding areas and the avoidance of gorge/gullies, these species are unlikely to be significantly impacted by the proposed clearing.

RTIO (2012a) also reports that a survey conducted in 2007 within the West Turner area (not including the application area) identified four potential short range endemic (SRE) taxa with one mygalomorph spider species (*Aname* sp.) only recorded within the West Turner area. RTIO (2012a) notes that a Mygalomorph Spider Habitat Analysis undertaken by Biota in 2011 identified four additional areas of suitable vegetation within a 50 kilometre radius of the *Aname* sp. record, however, none were in the vicinity of the application area and no suitable habitats were found within the application area.

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

Methodology Biota (2009)
Biota (2012)
RTIO (2012a)

(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). No Threatened Flora has been recorded within the application area (Biota, 2012).

The Threatened Flora species, *Lepidium catapycnon*, has been recorded in the vicinity of the application area, with the closest record 22 kilometres to the north (RTIO, 2012a). According to Biota (2012), this species is known to occur on scree slopes and stony plains, and suitable habitat is located within the survey area. However, despite extensive surveying efforts, this species has not been recorded from within the Western Turner Syncline locality and given its perennial growth form and distinctive zig zag stem it is unlikely to have been overlooked (RTIO, 2012a). Based on this, it is unlikely to occur within the application area.

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

Methodology Biota (2012)
RTIO (2012a)
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 17 kilometres north east of the application area (GIS Database).

No TECs have been recorded within the application area (RTIO, 2012a).

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

Methodology RTIO (2012a)
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 Biogeographic Regionalisation of Australia (IBRA) bioregion in which approximately 99.6% of the pre-European vegetation remains (see table) (GIS Database, Government of Western Australia, 2011).

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

82: Hummock grasslands, low tree steppe; snappygum over *Triodia wiseana*; and

567: Hummock grasslands, shrub steppe; mulga and kanji over soft spinifex and *Triodia basedowii*.

Approximately 99.5% of Beard vegetation association 82 and approximately 99.7% of Beard vegetation association 567 remains at both a state and bioregional level (Government of Western Australia, 2011). 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	17,804,427	17,729,352	~99.6	Least Concern	6.3
Beard veg assoc. – State					
82	2,565,901	2,553,217	~99.5	Least Concern	10.2
567	777,507	774,896	~99.7	Least Concern	22.3
Beard veg assoc. – Bioregion					
82	2,563,583	2,550,899	~99.5	Least Concern	10.2
567	776,824	774,213	~99.7	Least Concern	22.4

* Government of Western Australia (2011)

** 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)
Government of Western Australia (2011)
GIS Database:
- IBRA WA (Regions – Sub Regions)
- 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

There are numerous minor, non-perennial watercourses within the application area (GIS Database). It is expected that these would only flow after or during significant seasonal rainfall events, or substantial localised falls. Available databases show there are numerous minor, non-perennial watercourses within the vicinity of the application area (GIS Database).

Vegetation mapping of the larger survey area indicates at least one of the vegetation units mapped within the application area grows in association with drainage lines (Biota, 2012, RTIO, 2012a). This unit (EiChAciApyAmoTe) was found to be widespread and occurring in all survey areas (Biota, 2012). A second vegetation unit (AanAciT spp) occurred in gullies, creeklines and floodplains within the survey area and is mapped within the application area (Biota, 2012, RTIO, 2012a). Neither of these vegetation units were reported by Biota (2012) as having conservation significance. Additionally, none of the vegetation units associated with major or moderate creeks within the survey area were mapped within the application area (RTIO, 2012a).

Based on the abovementioned vegetation mapping and the widespread occurrence of minor non-perennial watercourses, it is unlikely the proposed clearing will have a significant impact on watercourses within the area.

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

Methodology Biota (2012)
RTIO (2012a)
GIS Database:
- Hydrography, linear
- Rivers

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

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

The application area has been mapped as occurring on the Newman and Table land systems (GIS Database). The Newman land system consists of rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands. The Table land system consists of low calccrete plateaux, mesas and lower plains supporting mulga and cassia shrublands and minor spinifex grasslands. These land systems are generally not prone to erosion

(Van Vreeswyk et al., 2004).

The average annual evaporation rate is over 10 times the average annual rainfall, so it is unlikely the proposed clearing will result in increased groundwater recharge causing raised saline water tables (GIS Database; BoM, 2012).

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

Methodology BoM (2012)
Van Vreeswyk et al. (2004)
GIS Database:
- Evaporation Isopleths
- 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 does not lie within any conservation areas or Department of Environment and Conservation (DEC) managed lands (GIS Database). The nearest conservation reserve is Karijini National Park, located approximately 40 kilometres east of the application area (GIS Database). Based on the distance between the application area and Karijini National Park, 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). There are no permanent waterbodies or watercourses within the application area, however, there are numerous minor, non-perennial watercourses that occur within the application area (GIS Database). It is expected that these would only flow after or during significant seasonal rainfall events, or substantial localised falls (RTIO, 2012a).

The annual average rainfall for Paraburdoo is 309.9 millimetres and the average annual evaporation rate for the application area is approximately 3,400 millimetres (BoM, 2012; GIS Database). Based on these averages, surface water is likely to evaporate quickly with surface sheet flow and higher sediment levels generally occurring during larger rainfall events. Therefore, during normal rainfall events, the proposed clearing would not likely lead to an increase in sedimentation of watercourses within the application area.

According to available databases, groundwater salinity within the application area is between 500 and 1,000 milligrams/Litre Total Dissolved Solids (TDS) (GIS Database). This is considered fresh to marginal. The proposed clearing is not likely to cause salinity levels within the application area to alter significantly.

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

Methodology BoM (2012)
RTIO (2012a)
GIS Database:
- Evaporation Isopleths
- 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 Ashburton River catchment area (GIS Database). Given the size of the area to be cleared (30 hectares) in relation to the size of the catchment area (7,877,743 hectares) (GIS Database), the proposed clearing is not likely to increase the potential of flooding on a local or catchment scale.

With an average annual rainfall of 309.9 millimetres and an average evaporation rate of approximately 3,400 millimetres there is likely to be little surface flow during normal seasonal rains (BoM, 2012; GIS Database). Whilst large rainfall events may result in flooding of the area, the proposed clearing is not likely to lead to an

increase in incidence or intensity of flooding.

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

Methodology BoM (2012)
GIS Database:
- Evaporation Isopleths
- Hydrographic Catchments – Catchments

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

Comments

There is one native title claim over the area under application: WC10/16 (GIS Database). This claim has been registered with the Native Title Tribunal on behalf of the claimant groups. 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*.

According to available databases, there are two registered Aboriginal Sites 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 18 June 2012 by the Department of Mines and Petroleum inviting submissions from the public. There were no submissions received.

Methodology GIS Database:
- Aboriginal Sites of Significance
- Native Title Claims – Registered with the NNTT

4. References

- Biota (2009) A Two-Phase Fauna Survey of the West Turner Syncline Area. Unpublished report prepared for Pilbara Iron Company dated May 2009.
- Biota (2012) West Turner Syncline Phase 2 Vegetation and Flora Report. Unpublished report prepared for Rio Tinto dated January 2012.
- BoM (2012) Climate Statistics for Australian Locations. A Search for Climate Statistics for Paraburdoo Aero, Australian Government Bureau of Meteorology, viewed 20 July 2012, <
http://www.bom.gov.au/climate/averages/tables/cw_007185.shtml >.
- CALM (1999) Draft Environmental Weed Strategy for Western Australia. Department of Conservation and Land Management (now Department of Environment and Conservation).
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions. Pilbara 3 (PIL3 - Hamersley 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.
- Government of Western Australia (2011) 2011 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). WA Department of Environment and Conservation, Perth.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- RTIO (2012a) Statement Addressing the 10 Clearing Principles Western Turner Syncline Evaluation and Exploration Programs June 2012. Unpublished report dated June 2012.
- RTIO (2012b) Further Information provided by RTIO in email correspondence dated 31 August 2012.
- Trudgen, M.E. (1988) A Report on the Flora and Vegetation of the Port Kennedy Area. Unpublished Report Prepared for Bowman Bishaw and Associates, West Perth.
- Van Vreeswyk, A.M.E., & Payne, A.L. & Leighton, K.A. & Hennig, P (2004) An inventory and condition survey of the Pilbara region, Western Australia. Department of Agriculture, Western Australia.

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.

