



# Clearing Permit Decision Report

## 1. Application details

### 1.1. Permit application details

Permit application No.: 5257/1  
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: Rio Tinto Gorge Project

### 1.4. Application

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

### 1.5. Decision on application

Decision on Permit Application: Grant  
Decision Date: 17 January 2013

## 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 association is located within the application area (GIS Database):

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

The application area was covered by a flora and vegetation assessment by Rio Tinto Iron Ore (RTIO) (RTIO, 2011). This included a site visit by RTIO and Department of Environment and Conservation (DEC) botanists on 19 and 20 April 2011 and an additional visit by RTIO botanists on 16 June 2011. According to RTIO (2011), the following nine broad vegetation types were identified within the application area:

#### Mesa-top

##### Plateaux

1. *Eucalyptus leucophloia* and *Corymbia hamersleyana* scattered trees, over *Grevillea wickhamii*, *Acacia acradenia* shrubland, over *Triodia wiseana* hummock grassland. On the northern side of the Nanutarra-Munjina road, the flat mesa top structure was slightly different with *Acacia arida* rather than *Acacia acradenia* dominated shrub layer. In addition, there were patches of *Acacia aneura* along the edge of the mesa due to the fire break effect of the breakaway.

##### Shallow Dissecting Valley

2. *Eucalyptus leucophloia* very scattered trees, over *Acacia retivenea* subsp. *clandestina*, *Senna glutinosa* (DC.) Randell subsp. *glutinosa* open shrubland, over *Triodia wiseana* hummock grassland.

##### Drainage

3. *Eucalyptus leucophloia* open woodland, over *Petalostylis labicheoides*, *Acacia tumida*, *Acacia citrinoviridis* tall shrubland, over *Acacia bivenosa* open shrubland, over *Triodia epactia*, *Triodia wiseana* open hummock grassland.

##### Cliff Base/Upper hillslope

4. *Eucalyptus leucophloia* very scattered low trees, over *Grevillea wickhamii*, *Acacia inaequilatera* tall very open shrubland, over *Senna glutinosa* (DC.) Randell subsp. *glutinosa*, *Gomphrena cunninghamii* very open shrubland, over *Eriachne mucronata* tussock grassland plus, over *Triodia brizoides*, *Triodia wiseana* hummock grassland moving downslope.

#### Mid-slope

##### Hillslope

5. *Eucalyptus leucophloia* and *Corymbia hamersleyana* scattered trees, over *Grevillea wickhamii*, over *Triodia wiseana*.

##### Drainage

6. *Eucalyptus leucophloia* scattered trees, over *Petalostylis labicheoides*, *Acacia citrinoviridis*, *Gossypium robinsonii*, over *Acacia maitlandii*, *Indigofera monophylla* shrubland, over *Cymbopogon obtectus* open tussock

grassland, over *Triodia epactia* open tussock grassland.

#### Dissecting Broad Gully

7. *Eucalyptus leucophloia* and *Corymbia hamersleyana* very open woodland, over *Grevillea wickhamii*, *Acacia bivenosa*, over *Acacia maitlandii*, over *Triodia wiseana*.

#### Valley

##### Broad Valley Floor

8. *Corymbia hamersleyana* scattered trees, over *Grevillea wickhamii* shrubland over *Triodia epactia* and *Triodia wiseana* hummock grassland.

#### Creek

9. *Corymbia hamersleyana* scattered tall trees, over *Acacia citrinoviridis*, *Acacia tumida*, *Acacia bivenosa* tall shrubland, over *Corchorus crozophorifolius*, *Tephrosia rosea*, *Indigofera monophylla* low open shrubland, over *Cymbopogon obtectus*, *Themeda triandra* very open tussock grassland, over *Triodia epactia* very open hummock grassland.

<b>Clearing Description</b>	<p>Hamersley Iron Pty Ltd has applied to clear 11.5 hectares within an application area of approximately 275 hectares (GIS Database). The application area is located approximately 55 kilometres north east of Tom Price (GIS Database).</p> <p>The purpose of the application is to undertake exploration drilling activities (RTIO, 2011). Information from the drilling will be used to support the business position in regards to a proposed railway through the area by Fortescue Metals Group and the proposed expansion of Karijini National Park by the Department of Environment and Conservation. 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>
<b>Vegetation Condition</b>	<p>Pristine: No obvious signs of disturbance (Keighery, 1994).</p>
<b>Comment</b>	<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>

### 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 flora and vegetation assessment identified nine broad vegetation types within the application area. RTIO (2011) described these from three broad landscape positions of mesa top, mid-slope and valley, and from five habitat types of plateaux, valley, slopes, drainage lines and creeks. According to RTIO (2011), the vegetation types are typical of vegetation of the Hamersley sub region within the Pilbara. One of the Hamersley subregion's "ecosystems at risk", "Hill Top Floras, Hamersley Range", potentially occurs within the application area (RTIO, 2011, CALM, 2002). RTIO (2011) notes that almost 50% of the study area is hill top flora that has been well protected with little evidence of fire, animals or weeds.

A total of 249 taxa from 123 genera belonging to 45 families were recorded from the study area with localised species richness occurring along drainage lines (RTIO, 2011). This is within the average expected range for a study area of this size, locality and season (RTIO, 2011).

Six weed species were recorded within the application area including Kapok Bush (*Aerva javanica*), Bipinnate Beggartick (*Bidens bipinnata*), Pie Melon (*Citrullus lanatus*), Spiked Malvastrum (*Malvastrum americanum*), Buffel Grass (*Cenchrus ciliaris*) and Whorled Pigeon Grass (*Setaria verticillata*). These are mainly associated with disturbance from the Nanutarra-Munjina Road and adjacent drainage lines (RTIO, 2011). Potential impacts from weeds as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

No Threatened Flora or Threatened or Priority Ecological Communities have been recorded within the application area (GIS Database; RTIO, 2011). A Priority 2 Flora species (*Gompholobium karijini*) and a Priority 4 Flora species (*Ptilotus mollis*) were recorded within the application area.

*Gompholobium karijini* was recorded at 54 locations within the application area (RTIO, 2011). This species is known from 11 records occurring within the Pilbara bioregion (Western Australian Herbarium, 2012). The application area is an expansion on known locations. However, the same botanical team has recorded this species to the north west of the application area in the Caliwingina and Mt Margaret areas suggesting this species occurs over a greater range than is currently known (RTIO, 2011).

In order to determine proposed impacts to this species RTIO (2012) provided additional information which identified suitable habitat types within the application area and estimated plant numbers within and surrounding the application area. Two suitable habitat types were identified including 'breakaway habitat consisting of breakaway habitats and associated rocky slopes, the top edge of mesas, broadly rocky and rugged upland habitats, and incised gullies/ rocky gullies of the upland areas' and 'mesa top habitat consisting of hill top, mesa top, and broad rolling hill habitats'. RTIO (2012) estimated an average of 10 to 60 plants per hectare within the breakaway habitat and an average of 5 to 30 plants per hectare within the mesa top habitat. Based on approximately 70 hectares of breakaway habitat and approximately 61 hectares of mesa top habitat within the

application area, an estimate of between 1,005 and 6,030 plants occurs within the application area (RTIO, 2012). This method was used over a larger area and estimated between 45,983 to 275,880 plants within 14,000 hectares (includes the application area) (RTIO, 2012). RTIO (2012) adds that Karijini National Park will protect significant populations of this species.

DEC (2012) reviewed the additional information provided by RTIO (2012) stating that 'based on the additional information provided it appears that the likely risk to and potential impact on the Priority 2 species, *Gompholobium Karijini* is likely to be relatively low, if the proposed activities are appropriately managed'. DEC (2012) recommended that 'the proponent commits to align and integrate tracks and drill pads to minimise potential risk to and impacts on conservation significant species, particularly the Priority 2 species, *Gompholobium Karijini* and that proposed activities are managed in line with RTIO's latest *Environmental Management Plan – Evaluation/Exploration Drilling within Conservation and Water Reserves (May 2010)*'. RTIO (2011) states that environmental restriction zones have been placed around the *Gompholobium Karijini* populations and will be avoided as far as practicable.

*Ptilotus mollis* was recorded at two locations within the application area including 10 plants at one location and 20 at the other location. However, not all visible populations were recorded due to inaccessible terrain (RTIO, 2011). This species is known from 13 records and has a widespread distribution across the Pilbara (Western Australian Herbarium, 2012). RTIO (2012) states that environmental restriction zones have been placed around these populations and will be avoided as far as practicable. The proposed clearing is not expected to have a significant impact on this species.

According to RTIO (2011), 18 mammal, 155 avian, 99 reptile and three amphibian species could potentially occur within the application area. RTIO (2011) notes the species listed are largely typical of those expected to occur within the habitat types identified and the Hamersley subregion. RTIO (2011) identified two broad habitat types that are considered widespread in the Hamersley subregion. Based on this, the application area is unlikely to comprise a higher level of faunal diversity than surrounding areas.

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

**Methodology** CALM (2002)  
DEC (2012)  
RTIO (2011)  
RTIO (2012)  
Western Australian Herbarium (2012)  
GIS Database:  
- Threatened Ecological Sites Buffered  
- Threatened and Priority Flora

**(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.**

**Comments Proposal may be at variance to this Principle**

No targeted fauna surveys have been conducted within the application area. Database searches were undertaken as part of desktop investigations and incidental sightings and fauna habitat observations were noted during the vegetation survey (RTIO, 2011).

The following two broad habitat types were identified during the vegetation survey (RTIO, 2011):

1. Stony slope and plateaux – Tree steppe or low open woodland of *Acacia* and *Eucalyptus* / *Acacia* shrubland / hummock grassland.
2. Minor drainage lines and gullies – Dense shrubland of *Acacia* and *Eucalyptus* / *Acacia* shrubland / hummock grassland.

No gorges, waterholes, sandy banks or significant tree hollows were observed within the application area (RTIO, 2011; RTIO, 2012). According to RTIO (2011), the broad habitat types are common throughout the Pilbara.

The application area also contains rocky breakaway, rocky ridges, mesa edge and rocky incised gullies (RTIO, 2011; RTIO, 2012). Caves or shallow overhangs were noticed in some of the breakaway and mesa edge habitats, however, in most cases such features only represented shallow overhangs, and therefore would not provide habitat for any local bat species (RTIO, 2012). RTIO (2012) has classified the rocky habitat into good and marginal to good rocky habitat. The features of the good rocky habitat are more extensive in the provision of habitat niches due to increased three dimensional complexities (RTIO, 2012). Whilst the marginal to good rocky habitat includes rocky ridges, cliff faces/breakaways and rocky formations, the rocky features are more marginal and lack the complexity of rocky habitat niches associated with the good rocky habitat (RTIO, 2012). RTIO (2012) states that very minimal disturbance (if any) is proposed to be undertaken in these areas due to the nature of the proposed activities and the terrain of these areas.

The rocky habitat may be utilised by conservation significant species Northern Quoll (*Dasyurus hallucatus*) (Endangered; Schedule 1), Pilbara Olive Python (*Liasis olivaceus barroni*) (Vulnerable; Schedule 1) and Peregrine Falcon (*Falco peregrinus*) (Vulnerable; Schedule 4) (RTIO, 2011). Rocky habitat niches may provide potential denning habitat for the Northern Quoll, particularly within the good rocky habitat type where more

complex rocky habitat niches are present. Potential impacts to the Northern Quoll may be minimised by the implementation of a fauna management condition in those areas of good rocky habitat.

Core habitat is also present for the Peregrine Falcon, however, this species is highly mobile and can utilise a variety of habitats (RTIO, 2012). Foraging and nesting habitat is also present in the nearby Karijini National Park (RTIO, 2011). Given the absence of permanent or semi-permanent water, it is unlikely the application area represents core habitat for the Pilbara Olive Python (RTIO, 2012). The application area is, therefore, unlikely to represent significant habitat for these species.

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

**Methodology** RTIO (2011)  
RTIO (2012)

**(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 were recorded during the vegetation survey undertaken on 19 and 20 April and 16 June 2011 (RTIO, 2011).

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

**Methodology** RTIO (2011)  
GIS Database:  
- Threatened and Priority Flora

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

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

According to available databases, there are no known Threatened Ecological Communities (TECs) within the application area (GIS Database). The nearest known TEC is the Themeda Grasslands TEC, located approximately 4 kilometres west, south west of the application area (GIS Database).

No TECs were recorded during the vegetation survey undertaken on 19 and 20 April and 16 June 2011 (RTIO, 2011).

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

**Methodology** RTIO (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 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 association (GIS Database):

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

Approximately 99.5% of Beard vegetation association 82 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 DEC Managed Lands *
IBRA Bioregion – Pilbara	17,804,427	17,729,352	~99.6	Least Concern	8.35
Beard veg assoc. – State					
82	2,565,901	2,553,217	~99.5	Least Concern	10.49
Beard veg assoc. – Bioregion					
82	2,563,583	2,550,899	~99.5	Least Concern	10.50

\* 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). These occur across the top of mesas, down the faces and across the valley floor. RTIO (2011) notes most drainage lines flow towards the Nanutarra-Munjina Road, while some flow south towards Karijini National Park. It is expected that the drainage lines would only flow after or during significant seasonal rainfall events, or substantial localised falls. The South Fortescue River, a non-perennial river, is located approximately 100 metres from the southernmost tip of the application area (GIS Database). RTIO (2011) states that the South Fortescue River will not be significantly impacted by any minor alterations in drainage.

Three vegetation types were found to be growing in association with watercourses including vegetation associated with drainage on mesa tops, drainage lines through mid-slopes and creeks in valleys (RTIO, 2011). No vegetation was identified in association with the South Fortescue River. According to RTIO (2011), the landforms, vegetation and flora of the application area are well represented within the area and Hamersley subregion. Given the abundance of these drainage lines within the Pilbara, it is unlikely the clearing of vegetation from these areas will have any significant environmental impacts on a local or regional context.

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

**Methodology** RTIO (2011)  
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 Boolgeeda, Newman and Robe land systems (GIS Database). The Boolgeeda land system consists of stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands and mulga shrubland (Van Vreeswyk et al., 2004). The Newman land system consists of rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands. The Robe land system consists of low limonite mesas and buttes supporting soft Spinifex (and occasionally hard spinifex) grasslands. These land systems are generally not prone to erosion (Van Vreeswyk et al., 2004). Based on this and given the low impact, non contiguous nature of the proposed activities, it is unlikely the proposed clearing will cause appreciable land degradation.

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

**Methodology** 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 may be at variance to this Principle**

Approximately half of the application area lies within the former Mt Florence leasehold (GIS Database). This lease area was identified in 2000 for 2015 exclusion from its respective lease and future addition to the conservation reserve system for management by the Department of Environment and Conservation (DEC) (DEC, 2012). Karijini National Park is located approximately 560 metres south of the application area at its closest point (GIS Database).

DEC (2012) has reviewed the application and made the following recommendations:

- the proponent commits to align and integrate tracks and drill pads to minimise potential risk to and impacts on conservation significant species, particularly the Priority 2 species, *Gompholobium Karijini*;
- the proponent implements strict weed hygiene and control measures to prevent new infestations of weeds and the spread of existing weeds;
- the proposed activities are managed in line with RTIO's latest *Environmental Management Plan – Evaluation/Exploration Drilling within Conservation and Water Reserves (May 2010)*; and
- the proponent undertakes early communication and consultation with the DEC Pilbara region in relation to proposed activities on or in close proximity to DEC managed land.

RTIO (2011) has advised that environmental restriction zones have been placed around the *Gompholobium Karijini* populations and will be avoided as far as practicable. This is consistent with the abovementioned environmental management plan provided by RTIO. The potential introduction and spread of weeds as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

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

**Methodology** DEC (2012)  
RTIO (2011)  
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. The South Fortescue River, a non-perennial river, is located approximately 100 metres from the southernmost tip of the application area (GIS Database). RTIO (2011) states that the South Fortescue River will not be significantly impacted by any minor alterations in drainage.

According to available databases, groundwater salinity within the application area is between 500 and 1,000 milligrams/Litre Total Dissolved Solids (TDS) (GIS Database). The annual average rainfall for Hamersley station is 410 millimetres and the average annual evaporation rate for the application area is 3,400 millimetres (RTIO, 2011; GIS Database). Based on these values, surface water is likely to evaporate quickly with surface sheet flow and higher sediment levels generally occurring during larger rainfall events. It is therefore unlikely that the proposed clearing will cause deterioration in the quality of surface or underground water.

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

**Methodology** RTIO (2011)  
GIS Database:  
- Evaporation Isopleths  
- Groundwater Salinity, Statewide  
- Hydrography, linear  
- Public Drinking Water Source Areas (PDWSAs)  
- Rivers

**(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 Fortescue River catchment area (GIS Database). Given the size of the area to be cleared (11.5 hectares) in relation to the size of the catchment area (1,860,784 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 410 millimetres and an average annual evaporation rate of approximately

3,400 millimetres there is likely to be little surface flow during normal seasonal rains (RTIO, 2011, 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** RTIO (2011)  
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: WC03/3 (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 no 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 24 September 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**

- 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.
- DEC (2012) Advice to the assessing officer for clearing permit application CPS 5257/1. Received on 22 October and 19 November 2012.
- 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 (2011) Flora and Vegetation of Rio Tinto Gorge Including Supporting Documentation for a Native Vegetation Clearing Permit. Unpublished report prepared by Rio Tinto dated July 2011.
- RTIO (2012) Further Information provided by Rio Tinto in email correspondence dated 2 October to 21 December 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., 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 (2012) Florabase - The Western Australian Flora. Department of Environment and Conservation. Available online at <http://florabase.dec.wa.gov.au/>, viewed November 2012.

#### **5. Glossary**

##### **Acronyms:**

<b>BoM</b>	Bureau of Meteorology, Australian Government
<b>CALM</b>	Department of Conservation and Land Management (now DEC), Western Australia
<b>DAFWA</b>	Department of Agriculture and Food, Western Australia
<b>DEC</b>	Department of Environment and Conservation, Western Australia
<b>DEH</b>	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
<b>DEP</b>	Department of Environment Protection (now DEC), Western Australia
<b>DIA</b>	Department of Indigenous Affairs

<b>DLI</b>	Department of Land Information, Western Australia
<b>DMP</b>	Department of Mines and Petroleum, Western Australia
<b>DoE</b>	Department of Environment (now DEC), Western Australia
<b>DoIR</b>	Department of Industry and Resources (now DMP), Western Australia
<b>DOLA</b>	Department of Land Administration, Western Australia
<b>DoW</b>	Department of Water
<b>EP Act</b>	Environmental Protection Act 1986, Western Australia
<b>EPBC Act</b>	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
<b>GIS</b>	Geographical Information System
<b>ha</b>	Hectare (10,000 square metres)
<b>IBRA</b>	Interim Biogeographic Regionalisation for Australia
<b>IUCN</b>	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
<b>RIWI Act</b>	Rights in Water and Irrigation Act 1914, Western Australia
<b>s.17</b>	Section 17 of the Environment Protection Act 1986, Western Australia
<b>TEC</b>	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.