



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 4666/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Atlas Iron Limited

1.3. Property details

Property: Mining Lease 45/1188
Mining Lease 45/923
General Purpose Lease 45/290
General Purpose Lease 45/291
General Purpose Lease 45/321
Local Government Authority: Town of Port Hedland
Colloquial name: Wodgina DSO Project Stage 2

1.4. Application

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

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 22 December 2011

2. Background

2.1. Existing environment and information

Vegetation Description

The vegetation of the application area is broadly mapped as Beard vegetation association 626: Hummock grasslands, shrub-steppe; kanji over soft spinifex & *Triodia brizoides* (GIS Database).

Outback Ecology (2009a) described the vegetation of the application area as consisting of the following vegetation associations:

Acacia Low Open Woodland

1a. *Acacia inaequilatera* Low Open Woodland over *Acacia acradenia* Open Shrubland over mixed *Triodia* hummock grassland;

Acacia Tall Shrubland

2a. Scattered emergent Eucalyptus Trees over *Acacia tumida* var. *pilbarensis* Tall Shrubland over *Cajanus pubescens* and other mixed Open Shrubland over mixed *Triodia* Hummock Grassland;

2b. *Acacia tumida* var. *pilbarensis* Tall Shrubland over *Acacia acradenia* Shrubland over mixed *Triodia* Hummock Grassland;

2c. *Acacia tumida* var. *pilbarensis* Tall Shrubland over open *A. acradenia* Shrubland over mixed *Triodia* Hummock Grassland;

Acacia Shrubland

3a. *Acacia acradenia* Shrubland over mixed *Triodia* Hummock Grassland;

3b. Scattered *Grevillea wickamii* subsp. *hispidula* over *Acacia acradenia* and other mixed Shrubland over mixed *Triodia* Hummock Grassland;

Acacia Open Shrubland

4a. *Acacia acradenia* Open Shrubland over mixed *Triodia* Hummock Grassland;

Acacia Low Shrubland

5a. *Acacia spondylophylla* Low Shrubland over mixed *Triodia* Hummock Grassland;

Triodia Hummock Grassland

7a. *Triodia wiseana* Hummock Grassland;

7b. *Triodia brizoides* Hummock Grassland; and

Eucalyptus *leucophloia* subsp. *leucophloia* Low Open Woodland

8a. *Eucalyptus leucophloia* subsp. *leucophloia* Open Woodland over *Acacia acradenia* Open Shrubland over

mixed *Triodia* Hummock Grassland.

Clearing Description	Atlas Iron Limited have applied to clear up to 162 hectares of native vegetation for the purpose of expanding mining operations at the Wodgina DSO Project (Coffey Environments, 2011). Stage 2 of the Wodgina DSO Project involves the expansion of the approved Anson open pit and the construction of three new open pits (Avro, Constellation and Dragon). Expansion of the existing waste rock dump and two low-grade ore stockpiles will also be required as part of the Stage 2 operations.
Vegetation Condition	Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994); To Completely Degraded: no longer intact; completely/almost completely without native species (Keighery, 1994).
Comment	The vegetation condition was derived from a description by Outback Ecology (2009a) and aerial photography (GIS Database). The vegetation condition across the majority of the application area was rated as being in excellent condition. A reduction in vegetation condition was observed in previously disturbed areas and across the top of the central ridge / plateau (Coffey Environments, 2011). This project has been referred to the Department of Sustainability, Environment, Water, Population and Communities under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act), due to the presence of EPBC Act listed fauna species within the project area. The project was deemed a 'controlled action' on 22 June 2011 and the assessment approach deemed to be 'Assessment on Referral Information' (EPBC 2011/5975). A draft approval recommendation report was subsequently completed and advertised for public comment (28 July 2011). Final approval for the project was given on 15 September 2011.

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 at variance to this Principle**

The application area is located within the Chichester subregion of the Pilbara Interim Biogeographic Regionalisation for Australia IBRA bioregion (GIS Database). At a broad scale, the vegetation can be described as shrub steppe characterised by *Acacia inaequilatera* over *Triodia wiseana* hummock grasslands on plains, while *Eucalyptus leucophloia* tree steppes occur on ranges (CALM, 2002).

Outback Ecology (2009a) conducted a Level 2 flora survey of the vegetation within the broader study area which incorporates the application area. Outback Ecology (2009a) identified 12 vegetation associations within the study area of which 11 occur within the application area. The vegetation condition across the majority of the application area was rated as being in excellent condition. A reduction in vegetation condition was observed in previously disturbed areas and across the top of the central ridge / plateau (Coffey Environments, 2011).

A total of 122 flora taxa (including subspecies and variants) from 38 families and 67 genera were recorded by Outback Ecology (2009a). The family best represented was *Poaceae* with 15 taxa of which the genus *Triodia* made up 8 taxa.

There were no Threatened Ecological Communities, Priority Ecological Communities or Declared Rare Flora species located within the application area however one Priority Flora species, *Terminalia supranitifolia* (P3), was located at several locations across the study area, including within the proposed application area (Outback Ecology, 2009a). This species has not been previously recorded within 50 kilometres of the study area and resulted in an extension of its known distribution (Coffey Environments, 2011). Forty-six individuals were recorded at 34 locations within the Wodgina footprint and surrounding area, predominantly on rocky outcrops within the ironstone ridges. The project is likely to directly impact on four of these known locations. It is considered that the loss of these four locations will not have a significant impact on the viability of this local population or the species generally (Coffey Environments, 2011).

Outback Ecology (2010) recorded 90 vertebrate fauna species within the study area which potentially also occur within the application area. These are comprised of 18 mammals (16 native), 45 birds, 25 reptiles and two amphibian species. Six conservation significant fauna species were recorded during the Outback Ecology (2010) fauna survey:

- Northern Quoll (*Dasyurus hallucatus* - Endangered, DEC Schedule 1);
- Pilbara Leaf-nosed Bat (*Rhinonictis aurantia* - Vulnerable, DEC Schedule 1);
- Three DEC listed Priority 4 species, the Western Pebble-mound Mouse (*Pseudomys chapmani*), Ghost Bat (*Macroderma gigas*) and the Long-tailed Dunnart (*Smithopsis longicaudata*); and
- Rainbow Bee-eater (*Merops ornatus* - Migratory).

The development of the Project will result in the loss of Northern Quoll (*Dasyurus hallucatus*) habitat and potential roost habitat for the Pilbara Leaf-nosed Bat (*Rhinonictis aurantia*). Individuals of both these conservation significant species may be lost during the development and operation of the Wodgina DSO Project Stage 2, which could potentially result in a permanent decline of the local population of these species (Outback Ecology, 2010).

However, Coffey Environments (2011) have identified that the extent of clearing to and fragmentation of core breeding and foraging habitat within the application area, particularly ironstone ridges and minor gorges, will be minimal (0.5% of potential Northern Quoll habitat in immediate surrounding area and 4% of potential Pilbara Leaf-nosed Bat habitat in immediate surrounding area).

This project has been referred to the Department of Sustainability, Environment, Water, Population and Communities under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), due to the presence of the above mentioned EPBC Act listed fauna species within the project area. The project was deemed a 'controlled action' on 22 June 2011 and final approval for the project was given on 15 September 2011. This approval is subject to the implementation of a condition which requires the development and implementation of a Fauna Management Plan which maximises the ongoing protection and long-term conservation of EPBC Act listed threatened fauna species in consultation with the Western Australian Department for Environment and Conservation. A further condition of the approval requires a \$400,000 contribution for research which will contribute to the better protection and long term conservation of EPBC Act listed threatened fauna species in the Pilbara. The implementation of these conditions will minimise and mitigate the impact of the clearing on EPBC Act listed threatened fauna species.

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

Methodology CALM (2002)
Coffey Environments (2011)
Outback Ecology (2009a)
Outback Ecology (2010)
GIS Database:
- IBRA WA (Regions - Sub Regions)

(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 at variance to this Principle

In 2010, Outback Ecology conducted a Level 2 fauna survey and habitat mapping which includes the application area and also covers a broader study area.

Seven major fauna habitat types were mapped over the study area:

- Hillcrests and open mixed shrubland;
- Scree slope and gullies;
- Minor gorges with steep ironstone walls containing humid caves and crevices;
- Low stony rises/hills;
- Ironstone ridges containing microhabitats such as crevices, caves and overhangs;
- Minor drainage lines; and
- Disturbed and cleared land.

Coffey Environments (2011) identify that most of the habitat that occurs within the project area is widespread throughout the Pilbara, with the exception of the ironstone ridges and minor gorges, which are considered to be limited, although not uncommon, within the regional landscape (Coffey Environments, 2011).

Outback Ecology (2010) recorded 90 vertebrate fauna species within the study area which potentially also occur within the application area. These are comprised of 18 mammals (16 native), 45 birds, 25 reptiles and two amphibian species. Coffey Environments (2011) indicate that there are 29 vertebrate fauna species which have potential to occur within the vicinity of the minesite. Outback Ecology have confirmed the presence of six conservation significant fauna species (Outback Ecology, 2010):

- Northern Quoll (*Dasyurus hallucatus* - Endangered, DEC Schedule 1);
- Pilbara Leaf-nosed Bat (*Rhinionictis aurantia* - Vulnerable, DEC Schedule 1);
- Three DEC listed Priority 4 species, the Western Pebble-mound Mouse (*Pseudomys chapmani*), Ghost Bat (*Macroderma gigas*) and the Long-tailed Dunnart (*Smithopsis longicaudata*); and
- Rainbow Bee-eater (*Merops ornatus* - Migratory).

The greatest area of habitat to be cleared will be from low stony rises (101.36 hectares) and ironstone ridge habitat (43.13 hectares). Low stony rises are well represented within the wider Pilbara region (Coffey Environments, 2011). Low stony rises may provide suitable habitat for the Western Pebble-mound Mouse; however, no other species of conservation significance were recorded in this habitat during the vertebrate fauna survey. Coffey Environments (2011) identify that the clearing of approximately 101 hectares of this habitat is not likely to affect the conservation status of the Western Pebble-mound Mouse and is considered to be a low impact from a regional perspective.

Ironstone ridges are relatively limited, although not uncommon, habitat within a regional context, as they are comprised specifically of those hills featuring outcropping ironstone, fallen boulders, caves, overhangs and crevices (Coffey Environments, 2011). This habitat type is considered important for fauna and supports a number of species of conservation significance including the Ghost bat, Pilbara Leaf-nosed Bat and Northern

Quoll, which were recorded in the study area (Coffey Environments, 2011). However, none of these recorded species relies solely on this habitat. The clearing of approximately 43 hectares of ironstone ridge habitat is not likely to affect the conservation status of these species (Coffey Environments, 2011). This habitat is well represented in the immediate vicinity of the project, with the ironstone ridge system extending continuously at least 75 kilometres to the east and 30 kilometres to the west.

In addition, 4.54 hectares of minor gorge habitat will be cleared as a result of the project (Coffey Environments, 2011). This habitat is relatively limited, although not uncommon, from a regional perspective with a total of 15.1 hectares recorded within the study area. Minor gorge habitat provides a moist microclimate with caves and foraging habitat suitable for bat species such as the Ghost Bat and the Pilbara Leaf-nosed Bat (Coffey Environments, 2011).

The development of the Project will result in the loss of Northern Quoll habitat and potential roost habitat for the Pilbara Leaf-nosed Bat. Individuals of both these conservation significant species may be lost during the development and operation of the Wodgina DSO Project Stage 2, which could potentially result in a permanent decline of the local population of these species (Outback Ecology, 2010).

Two short-range endemic (SRE) invertebrate surveys were conducted in May and July 2009 in accordance with EPA Guidance Statement No. 20, Sampling of Short Range Endemic Invertebrate Fauna for Environmental Impact Assessment in Western Australia (Coffey Environments, 2011). An undescribed species of terrestrial snail from the family *Camaenidae* was determined to be an SRE species (Coffey Environments, 2011). A targeted survey was conducted in July 2010 to determine the distribution of this species and identify and describe potential habitat in the area surrounding the project. This survey demonstrated that the species of camaenid snail occurs in at least 19 locations up to 20 kilometres outside the project area and therefore it appears the species is distributed widely in the surrounding area (Coffey Environments, 2011).

This project has been referred to the Department of Sustainability, Environment, Water, Population and Communities under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), due to the presence of the above mentioned EPBC Act listed fauna species within the project area. The project was deemed a 'controlled action' on 22 June 2011 and final approval for the project was given on 15 September 2011. This approval is subject to the implementation of a condition which requires the development and implementation of a Fauna Management Plan which maximises the ongoing protection and long-term conservation of EPBC Act listed threatened fauna species in consultation with the Western Australian Department for Environment and Conservation. A further condition of the approval requires a \$400,000 donation to research which will contribute to the better protection and long term conservation of EPBC Act listed threatened fauna species in the Pilbara. The implementation of these conditions will minimise and mitigate potential impacts of the clearing on EPBC Act listed threatened fauna species.

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

Methodology Coffey Environments (2011)
Outback Ecology (2010)

(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

Outback Ecology (2009a) conducted a Level 2 flora survey of the vegetation within the broader study area which incorporates the application area. There have been a number of flora and vegetation surveys conducted at, or in the vicinity of the application area (Outback Ecology, 2009a).

No Declared Rare Flora was identified in the application area (Outback Ecology, 2009a).

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

Methodology Outback Ecology (2009a)

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

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

There are no known Threatened Ecological Communities (TEC's) within the application area (GIS Database). The nearest known TEC is located approximately 100 kilometres south of the application area (GIS Database).

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

Methodology 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 is located within the Pilbara bioregion of the Interim Biogeographic Regionalisation for Australia IBRA (GIS Database). Shepherd (2009) reports that approximately 99.9% of the pre-European vegetation still exists in the Pilbara bioregion. The vegetation in the application area is broadly mapped as Beard vegetation association 626: hummock grasslands, shrub-steppe; kanji over soft spinifex & *Triodia brizoides* (GIS Database). According to Shepherd (2009) there is approximately 100% of this vegetation type remaining (see table below).

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	% of Pre-European area in IUCN Class I-IV Reserves
IBRA Bioregion - Pilbara	17,785,193	17,785,000	~99.9	Least Concern	6.3
Beard vegetation associations - WA					
626	117,724	117,724	~100	Least Concern	15.6
Beard vegetation associations - Pilbara Bioregion					
626	117,724	117,724	~100	Least Concern	15.6

* Shepherd (2009)

** Department of Natural Resources and Environment (2002)

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

Methodology Department of Natural Resources and Environment (2002)
Shepherd (2009)
GIS Database:
- IBRA WA (Regions - 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

The application area is located within 10 kilometres of the Turner and Yule rivers which are major non-perennial watercourses (GIS Database). There are no permanent watercourses or wetlands mapped within the application area, however, the application area crosses a number of minor ephemeral drainage lines (Coffey Environments, 2011; GIS Database).

Coffey Environments (2011) identify that mixed woodlands of *Eucalyptus camaldulensis*, *E. victrix*, *Melaleuca argentea* and *M. Glomerata* over low scrub and spinifex dominate these watercourses. None of this riparian vegetation is rare or threatened in the region (Coffey Environments, 2011; GIS Database).

The application area is located within land systems which contain hills and ridges with dissected slopes and valleys containing ephemeral drainage lines (Van Vreeswyk et al., 2004). Although these drainage lines comprise a relatively small total area, their distribution is quite widespread throughout the Pilbara. The riparian vegetation of the application area is typical of vegetation previously described for the Pilbara area (Outback Ecology, 2009a), and therefore, the loss of a small percentage of vegetation associated with drainage lines is not expected to have any significant environmental impacts.

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

Methodology Coffey Environments (2011)
Outback Ecology (2009a)
Van Vreeswyk et al. (2004)
GIS Database:
- Hydrography Linear

(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

In 2010, Outback Ecology conducted a baseline assessment of soils in the Stage 2 project area, which was based on a soils and landform survey conducted in 2009 for Stage 1 of the Wodgina DSO Project (Outback

Ecology, 2009b).

Five distinct soil-landform associations were identified within the application area: namely the ridge/plateau, midslopes, steep scree slopes, low hills and drainage line soil-landform associations (Outback Ecology, 2009b). The surface soils within the application area were generally shallow, stony sandy loams to sandy clay loams with varying amounts of coarse fragments and outcropping rock (Outback Ecology, 2009b).

The majority of the surface soils are structurally stable, however the low hills and drainage line soils exhibit some tendency for clay dispersion upon severe disturbance of the less than 2 millimetre soil fraction (Outback Ecology, 2009b). However, it is anticipated that the high amount of coarse material present within all soils sampled is likely to mitigate against erosion of the soil surface (Outback Ecology, 2009b).

Soils sampled throughout the study area exhibit a consistent range of pH values (between pH 5.5 and pH 7.3). All surface soils have been classed as non-saline (Outback Ecology, 2009b).

Local and short-term land degradation caused by clearing within the Stage 2 project area is unavoidable (for instance, soil compaction at laydown areas). However, land degradation will be confined to the project area and standard road and mine management measures will mitigate potential land-degradation impacts during construction, operations, closure and rehabilitation phases (Coffey Environments, 2010).

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

Methodology Coffey Environments (2011)
Outback Ecology (2009b)

(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

There are no conservation areas located within close proximity of the application area. The nearest DEC managed land is the Mungaroo Nature reserve approximately 50 kilometres north-west of the application area (GIS Database).

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

MWH (2009a; 2009b) conducted two hydrological assessments of the application area; a ground water investigation; and a surface water assessment. Results indicate that the local water table varies from approximately 210 metres (Australian Height Datum (AHD)) to 290 metres AHD (MWH, 2009a). Given the depth of the water table, it is unlikely the proposed clearing will interact with or cause deterioration in the quality of local ground water (MWH, 2009a).

It is believed the proposed clearing will have an insignificant impact on the downstream surface water regime due to the small upstream catchment area, the relatively small disturbance area and the implementation of surface water diversion (MWH, 2009b).

The application area contains topography of steep sided ridges and hills, with undulating slope surfaces in valley areas and river floodplains (MWH, 2009a). Well developed drainage lines are incised into the ridge areas, forming gullies of significant depth (MWH, 2009a). Light rainfall events over extended periods in the area produce small volumes of runoff generally of low velocity that have a minor sediment load. Heavier intense rainfall events usually produce higher velocity flows, resulting in the transport of sediments (MWH, 2009a). Given that sedimentation occurs naturally during rainfall events it is unlikely that the proposed clearing will result in significant increased deterioration in the quality of surface water in the local area (MWH, 2009a).

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

Methodology MWH (2009a)
MWH (2009b)

(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

MWH (2009b) conducted a surface water assessment to quantify flood flows and volumes around the Wodgina DSO Project area.

The Pilbara Bioregion experiences major rainfall events associated with tropical cyclones during the summer months annually (MWH, 2009b). The application area is located on an escarpment encompassing the headwaters of local catchments that contribute to the Yule and Turner River systems (MWH, 2009b). Due to the small upstream catchment area there is no risk of severe riverine flooding within the application area (MWH, 2009b).

MWH (2009b) have indicated that there will be insignificant impacts on the downstream surface water regimes due to the small upstream catchment area, the small disturbance area and the implementation of surface water diversion infrastructure. For this reason, it is unlikely that the proposed clearing will cause, or exacerbate, the incidence or intensity of downstream flooding.

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

Methodology MWH (2009b)

Planning instrument, Native Title, RIWI Act Licence, EP Act Licence, Works Approval, Previous EPA decision or other matter.

Comments

There is one native title claim (WC99-003) over the application area (GIS Database). This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (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*.

There are two 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 Sites of Aboriginal 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 October 2011 by the Department of Mines and Petroleum inviting submissions from the public. No submissions were received in relation to this application.

Methodology GIS Databases:
- 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 in 2002. 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.
- Coffey Environments (2011) Native Vegetation Clearing Permit Application: Supporting Information Wodgina DSO Project Stage 2, unpublished report for Atlas Iron Limited.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Outback Ecology (2009a) Wodgina DSO Project, Flora and Vegetation Assessment, unpublished report for Atlas Iron Limited.
- Outback Ecology (2009b) Baseline assessment of surface soils, waste materials and landforms. August 2009, unpublished report for Atlas Iron Limited.
- Outback Ecology (2010) Wodgina DSO Project Stage 2, Vertebrate Fauna Cumulative Impact Assessment, unpublished Report for Atlas Iron Limited, September 2010.
- MWH (2009a) Wodgina DSO Project, Stage 1 Groundwater Investigation, unpublished report for Atlas Iron Limited.
- MWH (2009b) Wodgina DSO Project, Stage 2 Surface Water Assessment, unpublished report for Atlas Iron Limited.
- Shepherd, D.P. (2009) Adapted from: Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth.
- Van Vreeswyk, A.M, Payne, A.L, Leighton, K.A and Hennig, P (2004) Technical Bulletin No. 92: An inventory and condition survey of the Pilbara region, Western Australia. Department of Agriculture, South Perth, 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.