



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 2329/3
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Cliffs Asia Pacific Iron Ore Pty Ltd, formally Portman Iron Ore Ltd

1.3. Property details

Property: Mining Lease 77/607
Local Government Area: Shire of Yilgarn
Colloquial name: A-Pit Expansion Project

1.4. Application

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

1.5. Site Information Decision on application

Decision on Permit Application: Grant
Decision Date: 10 May 2012

2.

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 a useful tool to examine the vegetation extent in a regional context. Two Beard vegetation associations are located within the application areas, these were;

520; Shrublands; *Acacia quadrimarginea* thicket; and

141; Medium woodland; York Gum, Salmon Gum, & gimlet.

Western Botanical (2007) conducted vegetation mapping of the application areas from September 2004 to August 2007. The following 11 vegetation types were identified within the application areas:

- 1) *Acacia* sp. Mt Jackson (B Ryan 176) Shrubland; with scattered *Acacia* sp. Narrow Phyllode over a mild shrub stratum of *Dodonaea lobulata*, *Philothea brucei*, *Eremophila clarkei*, *Eremophila serrulata*, *Prostanthera althoferi* subsp. *althoferi*, *Scaevola spinescens* and occasional *Acacia tetragonophylla*;
- 2) a) *Acacia* sp. Mt Jackson (B Ryan 176) Shrubland with *Grevillea zygoloba*, is similar to *Acacia* sp. Mt Jackson Shrubland, but with the inclusion of *Grevillea zygoloba* as the dominant mid shrub;
b) Disturbed *Acacia* sp. Mt Jackson (B Ryan 176) Shrubland;
- 3) *Acacia* sp. Mt Jackson (B Ryan 176) Shrubland with *Hibbertia exasperate*;
- 4) Disturbed *Acacia* sp. Mt Jackson (B Ryan 176) Shrubland with *Grevillea zygoloba*;
- 5) *Dryandra arborea*, *Acacia* sp. Mt Jackson (B Ryan 176) Shrubland;
- 6) *Acacia* sp. Mt Jackson (B Ryan 176) Shrubland; *Eucalyptus corrugata* Woodland mosaic;
- 7) a) *Eucalyptus corrugata*, mallee Woodland with *Atriplex* and *Eremophila* understorey with loamy soils;
b) Disturbed *Eucalyptus corrugata*, mallee Woodland with *Atriplex* and *Eremophila* understorey with loamy soils;
- 8) *Eucalyptus corrugata* with *Atriplex* and *Eremophila* understorey on outcropping Basalt;
- 9) *Eucalyptus salubris* Woodland with Chenopod and occasional *Eremophila* understorey;

10) *Dodoneae viscosa* sp. *angustissima* Shubland; and

11) Disturbed.

Clearing Description Portman Iron Ore have applied to clear 67.04 hectares of native vegetation, within areas totalling approximately 102 hectares. The application areas are located 1.5 kilometres east of the town-site of Koolyanobbing, within Mining Lease 77/607 (Portman Iron Ore, 2007). The proposed clearing is for the mining of iron ore involving the expansion of the 'A-Mining Pit'; the creation of two waste rock dump sites; and a topsoil stockpile site.

Vegetation Condition Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery 1994)
To:
Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery 1994)

Comment The condition of the vegetation surveyed by Western Botanical (2007) varied from very good on the salmon gum plains surrounding much of the higher land to; degraded where historic drill lines and weeds were prolific.

Clearing permit CPS 2329/2 was granted by the Department of Mines and Petroleum on 24 December 2009. The clearing permit authorised the clearing of 51.04 hectares of native vegetation within a broader boundary of approximately 102 hectares. Clearing permit amendment application CPS 2329/3 was received by the Department of Mines and Petroleum on 28 March 2012. The application requested a 16 hectare increase to the permitted clearing area. The permit boundary will remain the same. The rehabilitation condition has been removed from the permit as rehabilitation is covered by *Mining Act 1976* approvals.

3. Assessment of application against clearing principles

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

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

The application areas are situated approximately 1.5 kilometres south-east of the town-site of Koolyanobbing, within the Southern Cross sub-region of the Coolgardie Interim Biographic Regionalisation for Australia (IBRA) bioregion (GIS Database). The Banded Ironstone Formations of the Mid West and Goldfields are believed to have evolved in isolation from the rest of the landscape and thus support a high concentration of rare and geographically restricted plant species and communities (Government of Western Australia, 2007).

The Koolyanobbing Range has been classified as having the highest classification for biodiversity as well as prospectivity for mining, however most conservation potential has been lost through past mining operations (Government of Western Australia, 2007). Approximately one third of the application area has been highly degraded through past mining and exploration activities which has led to a reduction in biodiversity. The southern regions of the Koolyanobbing Range which have not been impacted by mining operations are far more likely to support a biologically diverse assemblage of flora and fauna species than the application areas (Western Botanical, 2007).

Western Botanical (2007) conducted a species richness survey of the application areas and reported an average species richness varying from 20-24 species of flora per vegetation association, which is not regarded as high. However, there were 11 vegetation associations recognised in the application area and 26 vegetation associations mapped in total during the survey (Western Botanical, 2007). This would indicate that although each vegetation association does not contain a high number of flora species, the high number of vegetation associations shows the area is highly biologically diverse. Furthermore, it is certainly more diverse than the surrounding plains.

Whilst no Threatened Flora species were recorded within the application areas, one Priority Flora species, *Lepidosperma ferricola* (Priority 3), was recorded during the flora survey conducted by Western Botanical (2007) (West Australian Herbarium, 1998-2012). This species are well represented in other locations on the Koolyanobbing Range and on other surrounding Banded Ironstone Formations such as Windarling Range and Mt Jackson Range. Advice received from the Department of Environment and Conservation (DEC) (2008) states; "impact to significant flora, ecological communities and vegetation types by this proposal are not likely to have significant impacts to their conservation status".

Although there are no Threatened Ecological Communities (TEC's) within the application areas, the application areas encompass a portion of the Koolyanobbing Vegetation Complex, a Priority One Ecological Community (GIS Database; Western Botanical, 2007). Priority One Ecological Communities are defined as poorly known ecological communities with apparently few small occurrences, of which most are not actively managed for conservation (DEC, 2008b). These communities are typically under threat from known threatening processes across their range but have not been adequately surveyed for classification as TEC's (DEC, 2008b). Priority Ecological Communities (PEC's) are not formally protected under the *Environment Protection and Biodiversity*

Conservation Act 1999 or the *Wildlife Conservation Act 1950* (DEC, 2008b).

The PEC within the application areas was delineated on the basis of the vegetation community described by Beard (1978) as *Acacia quadrimarginea* (now *Acacia* sp. Mt Jackson (B Ryan 176)) Thicket. This PEC occupies 1,354 hectares on the Koolyanobbing Range (Western Botanical, 2008), with the PEC occupying approximately 30 hectares of the total 102 hectares found within the application areas. Although the application areas contain approximately 30 hectares of this PEC within its boundary, most of this vegetation complex has been highly disturbed by previous mining activity (Western Botanical, 2007).

Bamford Consulting Ecologists (2007) reported that the proposed clearing may have an impact on the Malleefowl (*Schedule 1 - Wildlife Conservation (Specially Protected Fauna) Notice 2008*). The Malleefowl was not recorded within the application area, therefore, it is unlikely the proposed clearing will have a significant impact on habitat for this species.

Bamford & Turpin (2007) report that feral cats, foxes, rabbits and goats were present in the application areas and may have adverse impacts upon native species. In particular, several mammal species expected in the area are sensitive to predation by cats and foxes. Rabbits and feral goats have also been implicated in placing increased grazing pressure on native vegetation and have contributed to the degradation of fauna habitats within the application area (Bamford & Turpin, 2007). Advice from the Environmental Management Branch of the DEC states; "in general terms the mining proposal does not pose unacceptable impacts to the biodiversity of the project area" (DEC, 2008). This advice was based on the knowledge that the application areas are highly degraded from past mining and exploration activities reducing the biodiversity of the areas.

Weeds were also recorded within Koolyanobbing area. The weed species of greatest concern was Wards Weed (*Carrichtera annua*) which was the most common weed within the application areas (Western Botanical, 2007). Wards Weed is a serious weed in Victoria and is becoming of higher concern to the semi-arid rangelands of Australia (rangelands with average annual rainfall between 250 millimetres and 350 millimetres) (Department of Primary Industries, 2008). Weed species pose a major threat to biodiversity, and their control is necessary for the maintenance of biological function on the Koolyanobbing Range. Potential impacts to biodiversity 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 is not likely to be at variance to this Principle.

Methodology Bamford Consulting Ecologists (2008)
Bamford and Turpin (2007)
DEC (2008)
DEC (2008b)
Department of Primary Industries (2008)
Government of Western Australia (2007)
Western Botanical (2007)
West Australian Herbarium (1998-2012)
GIS Database
- IBRA WA (regions – subregions)

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

Comments **Proposal is not likely to be at variance to this Principle**
Portman Iron Ore commissioned Bamford Consulting Ecologists to conduct two separate fauna studies of the application areas.

Study-A involved a site inspection and literature review of the application areas and surrounds (Bamford & Turpin, 2007). The aims of this study were to:

- Review the list of fauna expected to occur within the application area, with a focus on investigating the likelihood of significant species occurring based on the habitats present;
- Identify significant or fragile fauna habitats within the study area;
- Identify any ecological processes in the study area upon which fauna may depend;
- Identify general patterns of biodiversity within or adjacent to the study area; and
- Identify potential impacts upon fauna and propose recommendations to minimise impacts.

Study-B involved a comprehensive investigation into the distribution and abundance of the Tree-stem Trapdoor Spider (*Aganippe Castellum*) within the northern half of the Koolyanobbing range (Bamford Consulting Ecologists, 2008). This study was requested by the assessing officer in order to build on information revealed in study-A regarding the Tree-stem Trapdoor spider.

The site inspection and target survey conducted under study-A recorded 51 vertebrate species in the study area and the review of databases, literature and habitats present indicated that a total of 217 vertebrate fauna species may occur in the study area (Bamford & Turpin, 2007).

Of the vertebrate fauna species recorded, there are 6 species of conservation significance that are likely to occur in the application areas, based on distribution, observations and available habitat types (Bamford & Turpin, 2007). These species are listed below, along with their conservation status in accordance with the *Wildlife Conservation (Specially Protected Fauna) Notice 2012*;

- Schedule 1 species – Carpet Python (*Morelia spilota imbricate*) and Malleefowl (*Leipoa ocellata*);
- Schedule 3 species – Fork Tailed Swift (*Apus pacificus*) and Rainbow Bee-eater (*Merops ornatus*);
- Schedule 4 species - Major Mitchell's Cockatoo (*Cacatua leadbeateri*) and Peregrine Falcon (*Falco peregrinus*).

One of these species, Malleefowl (*Leipoa ocellata*), has been identified as possibly being significantly impacted by the proposed clearing. This species is largely confined to arid and semi-arid woodland that are dominated by mallee Eucalypts on sandy soils, with less than 430 millimetres of rainfall annually (Garnett et al., 2000). During transect surveys for Tree-stem Trapdoor spiders, Bamford Consulting Ecologists (2008) recorded three Malleefowl mounds. These are the first mounds found during fauna investigations at Koolyanobbing and indicate that while the species has not been observed, it is present in low numbers, or has been until recently. Two of the mounds appear to have been active within the last 10 years, with the nearest of the three mounds occurring approximately 1.5 kilometres south-east of the application areas. It is possible that the Malleefowl may use the vegetation in the application areas periodically, however, these areas are not suitable nesting locations. Given that the vegetation within the application area is degraded and far less dense than the vegetation further south along the Koolyanobbing Range where the Malleefowl mounds were located the application areas are not considered significant habitat for this species.

An invertebrate species, Tree-stem Trapdoor Spider (*Aganippe castellum*), was listed under the *Wildlife Conservation (Specially Protected Fauna) Notice 2008* when the original permit (CPS 2329/1) was granted. This species has since been removed from the *Wildlife Conservation (Specially Protected Fauna) Notice 2012*. Clearing permit CPS 2329/1 had a condition requiring a Management Plan for this species be submitted to the Department of Industry and Resources within 12 months of the permit being granted. This Management Plan was submitted and therefore this condition is no longer required.

Several other invertebrate specimens belonging to groups known to exhibit short-range endemism were also collected during the Koolyanobbing site inspection (Bamford & Turpin, 2007). These included two millipede species (*Atelomastix sp. Nov "Koolyanobbing"* and *Antichiropus sp. Nov "Koolyanobbing"*) and a snail (*Brothriembryon sp.*). These specimens from Koolyanobbing were found to be distinctive and previously uncollected when identified by the West Australian Museum (Bamford & Turpin, 2007).

Although these species were recorded during the fauna surveys by Bamford and Turpin (2007), specimens were collected from high in the landscape, amongst fractured rocks embedded in shallow soil (Bamford & Turpin, 2007). These collections were from regions outside the application areas and habitats of this type do not occur within the application areas. Therefore, it is unlikely that the application areas would represent significant habitat for these species.

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

Methodology Bamford Consulting Ecologists (2008)
Bamford and Turpin (2007)
DEC (2008)
Garnett et al. (2000)

(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

Portman Iron Ore commissioned Western Botanical (2007) to conduct vegetation mapping of the application areas and surrounds from late 2004 to late 2007, involving three surveys. The first survey was a preliminary mapping project of the central and northern Koolyanobbing Range in November 2004. The second survey specifically focused on the 'A-Pit Expansion Project' associated with this clearing permit application. This survey was conducted from on 30 and 31 of August 2007. The third survey was to map and quantify the distribution of the significant flora within the central and northern Koolyanobbing Range. This was conducted between 17 and 27 September 2007. Western Botanical recorded no Threatened Flora whilst undertaking these surveys.

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

Methodology Western Botanical (2007)

(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 Threatened Ecological Communities (TEC's) in the application areas (GIS Database). The nearest known TEC is located approximately 268 kilometres south west of the application area (GIS Database). At this distance there is little likelihood of any impact to the TEC as a result of the proposed clearing.

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

Methodology GIS Database
-Threatened Ecological Communities

(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 likely to be at variance to this Principle

The application areas are within the Coolgardie Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). According to Shepherd (2009) there is approximately 98.4 percent of the pre-European vegetation remaining in the Coogardie bioregion.

The vegetation of the application areas are classified as Beard Vegetation Associations (GIS Database):

520: Shrublands; *Acacia quadrimarginea* thicket; and
141: medium woodland; York Gum, salmon Gum & gimlet.

Approximately 100 percent of Beard Vegetation Association 520 and 82.8 percent of Beard Vegetation Association 141 remains. The application areas do not represent a significant remnant of vegetation in the wider regional area. The proposed clearing is unlikely to reduce the extent of Beard Vegetation Associations 141 and 520 below current recognised threshold levels, below which species loss increases significantly. Figures discussed above are represented in the table below.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	% of Pre-European area in IUCN Class I-IV Reserves (and current %)
IBRA Bioregion – Coolgardie	12,912,204	12,707,873	~98.4	Least concern	~10.87 (~11.04)
Beard veg assoc. – State					
141	1,158,760	953,760	~82.8	Least concern	~12 (~14.5)
520	37,923	37,906	~100	Least concern	~26.6 (~26.6)
Beard veg assoc. – Bioregion					
141	883,086	859,069	~97.3	Least concern	~15.6 (~16)
520	37,129	37,113	~100	Least concern	~27.1 (~27.1)

* Shepherd (2009)

** Department of Natural Resources and Environment (2002)

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

Methodology Department of Natural Resources and Environment (2002)
Shepherd (2009)
GIS Database
- Interim Biogeographic Regionalisation for Australia
- 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 not at variance to this Principle

There are no permanent watercourses or wetlands within, or in close proximity to the application areas (GIS Database). The nearest hydrological features are a series of ephemeral lakes which are positioned approximately two kilometres to the west-north-west of the application areas.

The vegetation within the application areas are predominantly growing in a rocky environment on an elevated banded ironstone ridge (Western Botanical, 2007). The proposed clearing is unlikely to have any impacts on nearby ephemeral lakes which are located in lower parts of the landscape.

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

Methodology Western Botanical (2007)
GIS Database
- Hydrology 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

The Koolyanobbing Range is similar to most Banded Ironstone Formations (BIF's) of the Yilgarn Craton which are characterised by a stony surface mantle which provides effective protection against soil erosion (Government of Western Australia, 2007). The disturbance or removal of this stony mantle may initiate soil erosion. However, given the poor soil coverage on BIF's there is likely to be a minimal amount of erodible material in the application areas (Government of Western Australia, 2007).

Given that the proposed clearing will allow for the development of an open pit mining void which will result in a fundamental alteration of the land structure and topography, soil erosion within the application area is not considered a major concern. To prevent erosion occurring outside of the clearance areas, Portman Iron Ore will implement appropriate management strategies as per the Notice of Intent to mine, managed under the *Mining Act 1978* and approved by the Department of Industry and Resources in 2003. This includes the implementation of erosion control structures such as spur drains or contour banks at appropriate intervals to manage surface water flows on and off site (Portman Iron Ore, 2008).

The application areas receive a low average annual rainfall of approximately 300 millimetres (Western Botanical, 2007), and a high average annual evaporation of approximately 3000 millimetres (GIS Database). Based on this information, recharge to groundwater would be low, thereby reducing the likelihood of salinity increasing as a result of the proposed clearing. Similarly, the risk of water logging as a result of the proposed clearing is marginal considering that rainfall is infrequent and site topography facilitates surface water runoff as opposed to ponding.

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

Methodology Government of Western Australia (2007)
Portman Iron Ore (2008)
Western Botanical (2007)
GIS Database
-Evaporation Isopleths

(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 proposed clearing is not located within a conservation reserve (GIS Database). The nearest conservation reserve is an un-named Nature Reserve approximately 10 kilometres west of the application area (GIS Database). At this distance it is unlikely that the proposed clearing will impact on the environmental values of any conservation areas.

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

Groundwater within the application area is saline, between 14,000 – 35,000 milligrams per litre of Total Dissolved Salts (GIS Database). Given that the application areas are situated on raised land on the Koolyanobbing Banded Iron Formation, any clearing is unlikely to alter existing ground water quality.

Furthermore, there are no watercourses within the immediate vicinity of the application areas, which reduces the likelihood of sedimentation of nearby lakes or watercourses. Lake Deborah is the closest wetland to the application areas, located approximately 4 kilometres to the west. Due to the low annual rainfall in the area (300 millimetres), it is unlikely the project would have a significant impact on the nearby water systems.

The application areas are not situated within a Public Drinking Water Source Area and there are no known Groundwater Dependent Ecosystems (GIS Database).

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

Methodology GIS Database
- Groundwater Dependent Ecosystems
- Ground Water Salinity
- Public Drinking Water Source Area

(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 areas are located on the northern extreme of the Koolyanobbing Banded Iron Formation. The topography of the site naturally facilitates run off and prevents the ponding of water. The proposed clearing of native vegetation is unlikely to alter this natural surface water flow regime (Western Botanical, 2007).

The average annual rainfall of the application areas is approximately 300 millimetres, with annual evaporation rates of approximately 3000 millimetres (GIS Database). It is therefore expected that there would be little surface water flow during normal seasonal rains.

The clearing of 67.04 hectares in this proposal is not expected to increase the incidence or intensity of natural flood events which may occasionally occur in the local area.

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

Methodology Western Botanical (2007)
GIS Database
- Evaporation Isopleths
- Rainfall isohyets

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

Comments

There are no native title claims over the area under application (GIS Database). The mining tenure has been granted in accordance with the future act regime of the Native Title Act 1993 and the nature of the act (i.e.) the proposed clearing activity) has been provided for in that process, therefore the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are no Sites of Aboriginal Significance within the application areas (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.

Advice was requested from the Department of Environment and Conservation regarding the potential impacts of the proposal on the biodiversity of the application areas. Advice was received on the 23 June 2008. This advice has been incorporated into this assessment.

Clearing permit CPS 2329/2 was granted by the Department of Mines and Petroleum on 24 December 2009. The clearing permit authorised the clearing of 51.04 hectares of native vegetation within a broader boundary of approximately 102 hectares. Clearing permit amendment application CPS 2329/3 was received by the Department of Mines and Petroleum on 28 March 2012. The application requested a 16 hectare increase to the permitted clearing area. The permit boundary will remain the same. The rehabilitation condition has been removed from the permit as rehabilitation is covered by *Mining Act 1976* approvals.

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

4. References

Bamford Consulting Ecologists (2008). 'Portman Iron Ore - Investigation into the Distribution and Abundance of the Tree-stem

- Trapdoor Spider in the Koolyanobbing Area', unpublished report, May 2008.
- Bamford M and Turpin J (2007) Portman Iron Ore Fauna Assessment of the Koolyanobbing Area, unpublished report, December 2007.
- Cowan M, Graham G & McKenzie N (2001). 'Coolgardie 2 (COO2 - Southern Cross subregion)' in A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002, Published by the Department of Environment and Conservation, Perth, Western Australia.
- Department of Environment and Conservation (2008), Environmental Management Branch advice for biological impacts of the Clearing Permit Application. Received 23-6-2008.
- Department of Environment and Conservation (2008b), Naturebase Database, Viewed 10-3-2008 at <http://www.naturebase.net/index.php>.
- Department of Natural Resources and Environment (2002) Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local. Department of Natural Resources and Environment, Victoria.
- Department of Primary Industries (2008), website 'Wards Weed (*Carrichtera annua*) viewed, 21-6-2008 at http://www.dpi.vic.gov.au/dpi/vro/vrosite.nsf/pages/weeds_herbs_annual_wards_weed
- Garnett ST & Crowley GM (2000). Action Plan for Australian Birds 2000. Environment Australia, Canberra.
- Government of Western Australia, (2007). 'Strategic Review of the Conservation and Resource Values of the Banded Iron Formations of the Yilgarn Craton', Published jointly by the Department of Environment and Conservation and the Department of Industry and Resources, Perth, Western Australia.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Portman Iron Ore Ltd (2008). "Koolyanobbing 'A Pit' Expansion Project - Clearing permit application supporting document", unpublished report January 2008.
- 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.
- Western Australian Herbarium (1998-2012). FloraBase — The Western Australian Flora. Department of Environment and Conservation. www.florabase.dec.wa.gov.au
- Western Botanical (2007), 'Flora and Vegetation of the Proposed Cut Back and Waste Dump at A Pit', Koolyanobbing, August 2007.

5. Glossary

Acronyms:

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

Definitions:

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

P1	Priority One - Poorly Known taxa: taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
-----------	---

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

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

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

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

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

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

- EX Extinct:** A native species for which there is no reasonable doubt that the last member of the species has died.
- EX(W) Extinct in the wild:** A native species which:
- is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
 - 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:
- is not critically endangered; and
 - 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.