



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 6630/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **MacPhersons Resources Ltd**

1.3. Property details

Property: Mining Lease 25/355
Mining Lease 26/490
Miscellaneous Licence 25/35
Miscellaneous Licence 25/36
Local Government Area: City of Kalgoorlie-Boulder
Colloquial name: Boorara Prospect

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
70		Mechanical Removal	Mining Infrastructure

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 13 August 2015

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. Two Beard vegetation associations have been mapped within the application area (Government of Western Australia, 2014; GIS Database):

- 468: Medium woodland; salmon gum & goldfields blackbutt
- 1241: Succulent steppe; bluebush.

Two flora and vegetation assessments have been undertaken over the Boorara Prospect project area by Mattiske Consulting Pty Ltd (Mattiske), which includes the application area (Mattiske, 2012; Mattiske 2014). The flora and vegetation assessments recorded a total of 19 broad vegetation community types across the two survey areas, which are:

Eucalypt Woodlands

E1: Very Open Woodland of *Eucalyptus ravida*, *Eucalyptus stricklandii*, *Eucalyptus transcontinentalis* and *Eucalyptus salmonophloia* over mixed *Eremophila* species over *Atriplex nummularia* and mixed shrubs on flats with red/brown clay soils and scattered quartz pebbles.

E2: Dense Low Forest of *Eucalyptus ravida* and *Eucalyptus celastroides* over *Eremophila interstans* subsp. *virgata* and mixed *Eremophila* species, *Exocarpos aphyllus* and occasional mixed shrubs on flats with red/brown clay soils.

E3: Open Woodland of *Eucalyptus stricklandii* with occasional *Eucalyptus ravida* and *Eucalyptus salmonophloia* over *Casuarina pauper* over *Eremophila interstans* subsp. *virgata* and *Exocarpos aphyllus* over *Atriplex nummularia*, *Atriplex vesicaria* and mixed shrubs on flats with rocky red/brown clay soils.

E4: Open Woodland of *Eucalyptus salmonophloia* with occasional *Eucalyptus transcontinentalis* and *Eucalyptus celastroides* subsp. *celastroides* over *Atriplex nummularia*, *Exocarpos aphyllus* and *Eremophila interstans* and mixed shrubs on flats with red/brown clay soils.

E5: Open Low Woodland of *Eucalyptus stricklandii*, *Casuarina pauper* and occasional *Eucalyptus griffithsii* over *Santalum spicatum* and *Acacia burkittii* over *Dodonaea lobulata*, mixed *Eremophila* species.

and other mixed shrubs over occasional *Triodia scariosa* on flats with red/brown clay soils with scattered ironstone and quartz pebbles.

E6: Open Woodland of *Eucalyptus salmonophloia*, *Eucalyptus celastroides*, *Eucalyptus ?yilgarnensis*, *Eucalyptus ravid*, and *Eucalyptus stricklandii* over *Eremophila interstans*, mixed *Atriplex* species, *Exocarpos aphyllus*, and mixed shrubs and Chenopods on flats with red/brown clay soils with scattered ironstone pebbles.

E7: Open Woodland of *Eucalyptus griffithsii* and *Eucalyptus lesouefii* over *Acacia burkittii*, mixed *Eremophila* species, *Dodonaea lobulata* and *Atriplex nummularia* over mixed shrubs with red/brown clay soils.

E8: Open Woodland of *Eucalyptus ravid*, *Eucalyptus stricklandii*, *Eucalyptus transcontinentalis* and *Eucalyptus celastroides* subsp. *celastroides* over *Atriplex nummularia* and mixed shrubs on flats with red/brown clay soils.

E9: Open Woodland of *Eucalyptus griffithsii* over mixed *Acacia* and *Eremophila* species over mixed shrubs on flats with red/brown clay soils.

E10: Thicket of *Eucalyptus griffithsii* over *Acacia* and *Eremophila* species and mixed shrubs on red/brown clay soils with calcrete pebbles.

E11: Low woodland of *Eucalyptus ravid*, *Melaleuca sheathiana* and occasional *Eucalyptus lesouefii* over *Eremophila* and mixed shrubs on flats with red/brown clay soils and scattered ironstone pebbles.

E12: Closed woodland of *Eucalyptus lesouefii* over mixed *Eremophila* species and *Atriplex nummularia* over mixed shrubs on lower-slopes with red/brown soils.

E13: Closed woodland of *Eucalyptus ravid* over mixed *Eremophila* species and mixed shrubs on flats with red/brown clay soils.

E14: Open woodland of *Eucalyptus ?lesouefii*, *Eucalyptus griffithsii* and *Casuarina pauper* over *Melaleuca sheathiana*, *Santalum spicatum* and mixed *Eremophila* species over *Atriplex nummularia* and mixed shrubs on flats with red/brown clay soils.

Mixed Shrublands and Scrubs

A2: Open Shrubland of *Acacia burkittii* and *Acacia tetragonophylla* with occasional *Santalum spicatum* and *Casuarina pauper* over sparse mixed shrubs on upper slopes with gravel soils and numerous lateritic outcrops.

A3: Open Shrubland of *Acacia burkittii* over Chenopod and mixed shrubs on flats with red/brown clay soils.

A4: Open Shrubland of *Acacia ?sibirica* and *Acacia tetragonophylla* over mixed *Eremophila* species over mixed shrubs on flats with red/brown clay soils.

C1: Open Chenopod Shrubland of *Atriplex nummularia*, *Atriplex vesicaria* and *Senna artemisioides* subsp. *filifolia* and *Eremophila scoparia* over *Scaevola spinescens* and mixed *Maireana* species on seasonally inundated drainage lines with red/brown clay soils.

C2: Open Low Chenopod Shrubland of *Cratystylis subspinescens*, *Maireana ?pyramidata*, *Maireana sedifolia*, *Maireana triptera*, *Atriplex nummularia*, *Eremophila scoparia* and *Senna artemisioides* subsp. *filifolia* on flats with red/brown clay loam soils.

Clearing Description

Boorara Prospect

MacPhersons Resources Limited (MacPhersons) proposes to clear 70 hectares of native vegetation within a total boundary of approximately 402 hectares for the purpose of mining infrastructure. The project is located approximately 15 kilometres east of Kalgoorlie, in the City of Kalgoorlie-Boulder.

Vegetation Condition

Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994)

To

Pristine: No obvious signs of disturbance (Keighery, 1994).

Comment

The vegetation condition was determined by botanists from Mattiske (2012; 2014).

The flora and vegetation assessment Mattiske (2014) covers approximately 650 hectares around the Boorara project area, which includes Mining Leases 25/355 and 26/490. Mattiske (2012) covers Miscellaneous Licences 25/35 and 25/36 which forms the bore field corridor.

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 application area occurs within the Eastern Goldfields subregion of the Coolgardie Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). The Eastern Goldfields subregion is characterised by calcareous earths that cover much of the plains and greenstone areas (CALM, 2002). A series of playa lakes in the western half are the remnants of an ancient major drainage line (CALM, 2002). The vegetation is of mallees, Acacia thickets and shrubheaths on sandplains (CALM, 2002). Diverse Eucalypt woodlands occur around salt lakes, on ranges and in valleys (CALM, 2002).

A total of 17 vegetation communities have been mapped across the Boorara project area and borefield corridor, with two additional vegetation communities located exclusively in the borefield corridor (Mattiske, 2012; 2014). The most dominant vegetation communities were the Eucalypt woodland communities E1, E4, E5, E6, E14 and the open low chenopod community C2 (Mattiske, 2012; 2014). None of the vegetation communities mapped within the two survey areas represent Threatened or Priority Ecological Communities (Mattiske, 2012; 2014).

The Boorara flora survey recorded a total of 118 vascular plant taxa which consisted of 54 genera and 25 families while the borefield corridor survey recorded a total of 79 vascular plant taxa consisting of 41 genera and 22 plant families (Mattiske, 2012; 2014). For both surveys, the majority of taxa recorded were representative of the Chenopodiaceae, Myrtaceae, Fabaceae, Asteraceae and Scrophulariaceae families (Mattiske, 2012; 2014). There were no Threatened flora species identified in both survey areas and no Priority flora species were identified within the borefield corridor (Mattiske, 2012; 2014). One Priority one species; *Grevillea phillipsiana* was potentially recorded at two locations in the Boorara Project area; however these records are not located within the application area (Mattiske, 2014).

Several introduced plant taxa were recorded in both survey areas (Mattiske, 2012; 2014). Weeds have the potential to alter the biodiversity of an area, competing with native vegetation for available resources and making areas more fire prone. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

Mattiske (2014) has undertaken a desktop survey of fauna species over the Boorara project area. A total of 210 taxa including five amphibian, 92 bird, 36 invertebrates, 19 mammals and 58 reptiles have previously been recorded within 20km of the Boorara project area. A fauna survey has not been undertaken over the borefield corridor; however a search of NatureMap (DPaW, 2015) has recorded a similar level of fauna species diversity.

The application area is considered to be within an area of high flora and fauna diversity. This is likely attributed to the excellent to pristine condition of the vegetation. However the application area is not considered to represent an area of relatively higher biodiversity, as the vegetation types within the application area have been recorded across the entire survey area and Mattiske (2012; 2014) notes that the vegetation types are well represented in the region.

The distribution of vegetation communities appears to be uniform across the two survey areas (Mattiske, 2012; 2014) and the Eucalypt woodlands of the Goldfields are widespread (Mattiske, 2014).

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

Methodology CALM (2002)
DPaW (2015)
Mattiske (2012)
Mattiske (2014)
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 not likely to be at variance to this Principle**

Mattiske (2012; 2014) has undertaken desktop fauna assessments over the Boorara project area and borefield corridor. A total of seven conservation significant fauna species have been recorded in the region and may occur within the application area (Mattiske 2012; 2014). These are:

- Malleefowl (*Leipoa ocellata*) – Schedule 1 under *Wildlife Protection Act 1950* (WC Act), Vulnerable under *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- Wood Sandpiper (*Tringa glareola*) – Schedule 3 under WC Act, Migratory under EPBC Act;
- Arid Bronze Azure Butterfly (*Ogyris subterrestris* subsp. *petrina*) – Schedule 1 under WC Act;
- Greater Bilby (*Macrotis lagotis*) – Schedule 1 under WC Act, Vulnerable under EPBC Act;
- Numbat (*Myrmecobius fasciatus*) – Schedule 1 under WC Act, Vulnerable under EPBC Act;
- Western Spiny-tailed skink (*Egernia stokesii* subsp. *badia*) – Schedule 1 under WC Act, Endangered under EPBC Act;

- Carpet Python (*Morelia spilota* subsp. *imbricata*) – Schedule 4 under WC Act.

The Malleefowl occurs in semi-arid and arid zones of temperate Australia, where it occupies shrublands and low woodlands that are dominated by mallee vegetation (Department of the Environment (DotE), 2015a). The breeding habitat of the Malleefowl, within its home range, is characterised by light soil and an abundant leaf litter which is used in the construction of mounds (DotE, 2015a). Matiske (2012; 2014) has mapped the vegetation of the application area as prominently open Eucalypt woodland which is considered unsuitable habitat for Malleefowl.

The Wood Sandpiper has an extensive home range across Australia (DotE, 2015b) and would not be reliant on the vegetation within the application area for habitat.

The Arid Bronze Azure is a species of butterfly which is only known from two localities in Western Australia; one in the Wheatbelt region around Barbalin Nature Reserve and the other in the goldfields region in a recreation reserve around Lake Douglas (Threatened Species Scientific Community, 2014), which is approximately 23 kilometres south-west of the application area (GIS Database). The goldfields population is reported to have become extinct in about 1993 (Threatened Species Scientific Community, 2014). Therefore it is not considered likely that the Arid Bronze Azure would occur within the application area.

Prior to European settlement, populations of Numbat and Bilby were widespread, however their distributions have now become highly restricted due to habitat destruction (Matiske 2014). There is a very low probability that they occur within the application area (Matiske, 2014).

The Western Spiny-tailed Skink is known to occur in a broad semi-arid area in south-west Western Australia, between Shark Bay and Minnivale east of Cue (Matiske, 2014). As the application area falls outside of its known distribution (DotE, 2015c), it is considered unlikely the proposed clearing will impact on this species.

The Carpet Python is a large snake found in the southern regions of Western Australia and western South Australia (Matiske, 2014). Its preferred habitat consists of coastal areas, woodland, heathland and semi-arid areas (DPaW, 2012). Although the application area may represent suitable habitat for the Carpet Python, the vegetation types recorded by Matiske (2012; 2014) are not restricted to the application area and are well represented in the region. Therefore the proposed clearing is not likely to significantly impact on the Carpet Python.

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

Methodology DotE (2015a)
DotE (2015b)
DotE (2015c)
DPaW (2012)
Matiske 2012
Matiske 2014
Threatened Species Scientific Community (2014)

(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 datasets, there are no known records of Threatened flora within the application area (GIS Database). The nearest record of Threatened flora is located approximately 50 kilometres south-west of the application area (GIS Database).

The flora assessment undertaken by Matiske (2012; 2014) did not identify any Threatened flora within the application area.

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

Methodology Matiske (2012)
Matiske (2014)
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 located approximately 325 kilometres south-east of the application area.

Matiske (2012; 2014) did not identify any TECs in the flora assessment of the application area.

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

Methodology Mattiske (2012)
 Mattiske (2014)
 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 Coolgardie Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database) in which approximately 97.96% of pre-European vegetation remains (Government of Western Australia, 2013). This gives it a conservation status of 'Least Concern' according to the Bioregional Conservation Status of Ecological Vegetation Classes (Department of Natural Resources and Environment, 2002).

The vegetation within the application area is recorded as Beard vegetation associations:

- 468: Medium woodland; salmon gum & goldfields blackbutt; and
- 1241: Succulent steppe; bluebush.

Beard vegetation associations 468 and 1241 both retain approximately 99% of their pre-European extent at the state level and the bio-region level (Government of Western Australia, 2014).

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in DPaW Managed Land
IBRA Bioregion - Coolgardie	593,837	585,749	~98	Least Concern	22.43
Beard vegetation associations - State					
468	592,022	583,903	~99	Least Concern	22.85
1241	10,479	10,389	~99	Least Concern	0.00
Beard vegetation associations - Bioregion					
468	583,358	575,361	~99	Least Concern	7.82
1241	10,479	10,389	~99	Least Concern	0.00

* Government of Western Australia (2014)

** 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 (2014)
 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 not likely to be at variance to this Principle

According to available databases, the application area intersects multiple minor non-perennial watercourses (GIS Database).

Mattiske (2012; 2014) also noted several minor creek channels within the project area but described them as only flowing after sporadic rainfall events, particularly cyclonic rainfall. These channels remain dry most of the year (Mattiske, 2014). One vegetation type was identified within the Boorara and borefield project areas as growing in association with drainage lines, however this vegetation type did not occur within the application area (Mattiske, 2012; 2014).

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

Methodology Matiske (2012)
Matiske (2014)
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 may be at variance to this Principle

The application area is located within the Kambalda Soil-Landscape Zone (Tille, 2006). This zone is characterised by flat to undulating plains (with hills, ranges and some salt lakes and stony plains) on greenstone and granitic rocks of the Yilgarn Craton (Tille, 2006). Soils comprise calcareous loamy earths and red loamy earths with salt lakes soils and some red/brown hardpan shallow loams and red sandy duplexes (Tille, 2006).

The application area is part of a flat, undulating landscape where flooding occurs following intermittent heavy rainfall, typically from cyclonic systems (Matiske, 2014). The vegetation proposed to be cleared is in excellent to pristine condition (Matiske, 2012; 2014). Considering the application area is relatively undisturbed, the removal of any vegetation is likely to cause soil erosion, which may be exacerbated by high rainfall events. Potential impacts from erosion as a result of the proposed clearing may be minimised by the implementation of a staged clearing condition.

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

Methodology Matiske (2012)
Matiske (2014)
Tille (2006)

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

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

The application area is not located within any conservation areas. The nearest conservation area is Lakeside Timber Reserve, which is located approximately 3.5 kilometres south-west of the application area (GIS Database). With the exception of some mining activities, aerial imagery shows continuous vegetation around the reserve. Therefore the proposed clearing is not likely to disrupt any linkages to the reserve (GIS Database). Given the distance between the application area and Lakeside Timber Reserve, the proposed clearing is not likely to impact on the conservation area.

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

Methodology GIS Database:
- DPaW 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 (GIS Database). There are no permanent waterbodies or watercourses within the application area; however, there are several minor non perennial watercourses (GIS Database). Clearing in the vicinity of these may result in localised erosion and sedimentation, particularly following heavy seasonal rainfall. Potential impacts to the surface water quality as a result of the proposed clearing may be minimised by the implementation of a staged clearing condition.

The climate of the area is arid to semi-arid with rainfall that usually occurs in winter but sometimes occurs in summer (CALM, 2002). The application area receives an average annual rainfall of approximately 267.6 millimetres with an average annual evaporation rate of between 2,600 and 2,800 millimetres (BoM, 2015; GIS Database). Any surface flows are therefore likely to be short lived.

Groundwater salinity in the local area is estimated to be between 14,000 – 35,000 milligrams/Litre Total Dissolved Solids (TDS), which is considered saline (GIS Database). The proposed clearing is not likely to significantly alter groundwater salinity levels within the application area.

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

Methodology BoM (2015)
CALM (2002)
GIS Database:

- Evaporation Isoleths
- PDWSAs
- Salinity - Statewide

(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

With an average annual rainfall of 267.6 millimetres and an average annual evaporation rate of between 2,600 and 2,800 millimetres there is likely to be little surface flow during normal seasonal rains (BoM, 2015; GIS Database). Whilst large rainfall events may result in flooding of the area, the proposed clearing is not likely to lead to an increase in incidence or intensity of flooding.

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

Methodology BoM (2015a)
BoM (2015b)
CALM (2002)
GIS Database:
- Hydrography, Linear

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

Comments

There are two native title claims (WC2013/009 and WC2014002) over the application area (Department of Aboriginal Affairs, 2015). 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*.

There are no registered Sites of Aboriginal Significance located in the area applied to clear (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 Regulation, the Department of Parks and Wildlife 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 6 July 2015 by the Department of Mines and Petroleum inviting submissions from the public. There were no submissions received.

Methodology Department of Aboriginal Affairs (2015)
GIS Database:
- Aboriginal Sites of Significance

4. References

- BoM (2015) Climate Statistics for Australian Locations. A Search for Climate Statistics for Kalgoorlie, Australian Government Bureau of Meteorology. <http://www.bom.gov.au>.
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions. Department of Conservation and Land Management, Western Australia.
- Department of Aboriginal Affairs (2015) Aboriginal Heritage Enquiry System. Government of Western Australia. <http://maps.dia.wa.gov.au>.
- 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.
- DotE (2015a). *Leipoa ocellata* (Malleefowl) in Species Profile and Threats Database. Department of the Environment. Canberra. <http://www.environment.gov.au/sprat>. Accessed 3 August 2015.
- DotE (2015b). *Tringa glareola* (Wood Sandpiper) in Species Profile and Threats Database. Department of the Environment. Canberra. <http://www.environment.gov.au/sprat>. Accessed 3 August 2015.
- DotE (2015c). *Egernia stokesii badia* in Species Profile and Threats Database. Department of the Environment. Canberra. <http://www.environment.gov.au/sprat>. Accessed 3 August 2015.
- DPaW (2012) Carpet Python Species Profile. Department of Parks and Wildlife. Western Australia. <http://www.dpaw.wa.gov.au>. Accessed 3 August 2015.
- DPaW (2015) NatureMap - Mapping Western Australia Biodiversity. Department of Parks and Wildlife. Western Australia. <http://naturemap.dec.wa.gov.au/default.aspx>. Accessed 3 August 2015.
- Government of Western Australia (2014) 2014 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of June 2014. Department of Parks and Wildlife, 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.
- Mattiske (2012) Flora and Vegetation Survey – Proposed Borefield Corridor. Unpublished report prepared for MacPhersons Resources.
- Mattiske (2014) Flora and Vegetation Values on the Boorara Project Area including Desktop Fauna Assessment. Unpublished report prepared for MacPhersons Resources.
- Threatened Species Scientific Committee (2014). Commonwealth Conservation Advice on *Ogyris subterrestris petrina* (Arid bronze azure). Department of the Environment. Canberra, Australian Capital Territory <http://www.environment.gov.au>.
- Tille. P. (2006) Soil-landscapes of Western Australia's Rangelands and Arid Interior. Technical Report 313. Department of Agriculture and Food, Western Australia. ISSN 1039-7205.

5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
DAA	Department of Aboriginal Affairs, Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia (now DPaW and DER)
DER	Department of Environment Regulation, Western Australia
DMP	Department of Mines and Petroleum, Western Australia
DRF	Declared Rare Flora
DotE	Department of the Environment, Australian Government
DoW	Department of Water, Western Australia
DPaW	Department of Parks and Wildlife, Western Australia
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities (now DotE)
EPA	Environmental Protection Authority, Western Australia
EP Act	<i>Environmental Protection Act 1986</i> , Western Australia
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (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
PEC	Priority Ecological Community, Western Australia
RIWI Act	<i>Rights in Water and Irrigation Act 1914</i> , Western Australia
s.17	Section 17 of <i>the Environment Protection Act 1986</i> , Western Australia
TEC	Threatened Ecological Community

Definitions:

{DPaW (2013) Conservation Codes for Western Australian Flora and Fauna. Department of Parks and Wildlife, Western Australia}:-

T	<p>Threatened species: Specially protected under the <i>Wildlife Conservation Act 1950</i>, listed under Schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna or the Wildlife Conservation (Rare Flora) Notice for Threatened Flora (which may also be referred to as Declared Rare Flora).</p> <p>Threatened Fauna and Flora are further recognised by DPaW according to their level of threat using IUCN Red List criteria. For example Carnaby's Cockatoo <i>Calyptorhynchus latirostris</i> is specially protected under the <i>Wildlife Conservation Act 1950</i> as a threatened species with a ranking of Endangered.</p> <p><u>Rankings:</u> CR: Critically Endangered - considered to be facing an extremely high risk of extinction in the wild. EN: Endangered - considered to be facing a very high risk of extinction in the wild. VU: Vulnerable - considered to be facing a high risk of extinction in the wild.</p>
X	<p>Presumed Extinct species: Specially protected under the <i>Wildlife Conservation Act 1950</i>, listed under Schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice for Presumed Extinct Fauna and Wildlife Conservation (Rare Flora) Notice for Presumed Extinct Flora (which may also be referred to as Declared Rare Flora).</p>
IA	<p>Migratory birds protected under an international agreement: Specially protected under the <i>Wildlife Conservation Act 1950</i>, listed under Schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice. Birds that are subject to an agreement between governments of Australia and Japan, China and The Republic of Korea relating to the protection of migratory birds and birds in danger of extinction.</p>
S	<p>Other specially protected fauna: Specially protected under the <i>Wildlife Conservation Act 1950</i>, listed under Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice.</p>
P1	<p>Priority One - Poorly-known species: Species that are known from one or a few collections or sight records (generally less than five), all on lands</p>

not managed for conservation, e.g. agricultural or pastoral lands, urban areas, Shire, rail reserves and Main Roads WA road, gravel and soil reserves, and active mineral leases and under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes.

P2 Priority Two - Poorly-known species:

Species that are known from one or a few collections or sight records, some of which are on lands not under imminent threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, unallocated Crown land, water reserves, etc. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes.

P3 Priority Three - Poorly-known species:

Species that are known from collections or sight records from several localities not under imminent threat, or from few but widespread localities with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and known threatening processes exist that could affect them.

P4 Priority Four - Rare, Near Threatened and other species in need of monitoring:

- a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands.
- b) Near Threatened. Species that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.
- c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

P5 Priority Five - Conservation Dependent species:

Species that are not threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

Principles for clearing native vegetation:

- (a) Native vegetation should not be cleared if it comprises a high level of biological diversity.
- (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.
- (c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare 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.
- (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.
- (f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.
- (g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.
- (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.
- (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.
- (j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.