Government of Western Australia
Department of Mines, Industry Regulation and Safety

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 4094/4
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **BHP Billiton Iron Ore Pty Ltd**

1.3. Property details

Property: *Iron Ore (Mount Newman) Agreement Act 1964*, Mineral Lease 244SA (AML70/244)
Local Government Area: Shire of East Pilbara
Colloquial name: Eastern Packsaddles

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
450		Mechanical Removal	Mineral exploration drilling, hydrological investigations, installation of meteorological masts and LiDAR stations and supporting infrastructure

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 1 April 2021

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description

The vegetation of the application area is broadly mapped as the following Beard vegetation associations:
18: Low woodland; mulga (*Acacia aneura*); and
82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana* (GIS Database).

The application area was surveyed by Onshore Environmental Consultants Pty Ltd (Onshore) in November 2009, February 2010 and June 2010 (Onshore, 2014). The extended application area applied for in CPS 4094/2 was subsequently the subject of several biological flora surveys by Onshore (2011; 2012). Onshore (2014) also conducted a consolidated review of the available data. The following vegetation associations have been described and mapped within the application area (BHP, 2021):

- HS AcaoAaApr ScaErllAb TbrTw: Low Open Forest of *Eucalyptus xerothermica*, *Corymbia hamersleyana* and *Eucalyptus leucophloia* subsp. *leucophloia* over Tussock Grassland of *Themeda triandra* and *Cymbopogon ambiguus* with Shrubland of *Petalostylis labicheoides, Acacia monticola* and *Santalum lanceolatum*;
- SP AaApr TmTwTp TtChfAri: Low Open Forest of *Acacia aptaneura* and *Acacia pruinocarpa* over Open Hummock Grassland of *Triodia melvillei*, *Triodia wiseana* and *Triodia pungens* over Tussock Grassland of *Themeda triandra*, *Chrysopogon fallax* and *Aristida inaequiglumis* on red brown loam on stony plains.
- MI AadsAnlDop Tp EllCh: Open Heath of *Acacia adsurgens*, *Androcalva luteiflora* and *Dodonaea pachyneura* over Open Hummock Grassland of *Triodia pungens* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* on brown loamy sand on minor drainage lines.
- MI AtpGrwhApyp TpTb CcCs: Open Scrub of *Acacia tumida* var. *pilbarensis*, *Grevillea wickhamii* subsp. *hispidula* and *Acacia pyrifolia* var. *pyrifolia* over Hummock Grassland of *Triodia pungens* and *Triodia basedowii* over Open Tussock Grassland of **Cenchrus ciliaris* and **Cenchrus setiger* on brown sandy loam on minor drainage lines and floodplains.
- MI AtpPlAm TpTs ChEll: High Shrubland of *Acacia tumida* var. *pilbarensis*, *Petalostylis labicheoides* and *Grevillea wickhamii* over Open Tussock Grassland of *Cymbopogon ambiguus*, *Eriachne tenuiculmis* and *Themeda triandra* with Low Open Woodland of *Corymbia hamersleyana* in minor drainage lines and gorges.
- GG CfEllFib AhDovmAsha CyaErmuThmb: Low Woodland of *Corymbia ferriticola*, *Eucalyptus leucophloia* subsp. *leucophloia* and *Ficus brachypoda* over Open Shrubland of *Acacia hamersleyensis*, *Dodonaea viscosa* subsp. *mucronata* and *Astrotricha hamptonii* over Open Tussock Grassland of *Cymbopogon ambiguus*, *Eriachne mucronata* and *Themeda* sp. Mt Barricade on red brown loam along cliff lines and gorge walls.

- MA EcrEvEx ApypAtpGoro TtEuaCyp: Low Open Forest of *Eucalyptus camaldulensis* subsp. *refulgens*, *Eucalyptus victrix* and *Eucalyptus xerothermica* over High Shrubland of *Acacia pyrifolia* var. *pyrifolia*, *Acacia tumida* var. *pilbarensis* and *Gossypium robinsonii* over Open Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Cymbopogon procerus* on red brown clay loam on major drainage lines.

- ME TtEuaEte ApypAtpPl EvCh: Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Eriachne tenuiculmis* with High Shrubland of *Acacia pyrifolia* var. *pyrifolia*, *Acacia tumida* var. *pilbarensis* and *Petalostylis labicheoides* and Open Woodland of *Eucalyptus victrix* and *Corymbia hamersleyana* on red brown silty loam on medium drainage lines and flood plains.

- MA EcrMaEv AciAcp AbGosnGoro: Open Forest of *Eucalyptus camaldulensis* var. *refulgens*, *Melaleuca argentea* and *Eucalyptus victrix* over Low Open Woodland of *Acacia citrinoviridis* and *Acacia coriacea* subsp. *pendens* over Shrubland of *Acacia bivenosa*, *Gossypium sturtianum* and *Gossypium robinsonii* on brown silty sand and clay along Weeli Wolli Creek.

- MI PlAtpAm ChEll TwTp: Shrubland of *Petalostylis labicheoides*, *Acacia tumida* var. *pilbarensis* and *Acacia monticola* with Low Open Woodland of *Corymbia hamersleyana* and *Eucalyptus leucophloia* subsp. *leucophloia* over Open Hummock Grassland of *Triodia wiseana* and *Triodia pungens* on red brown loam on minor drainage lines.

- ME Tt ExChAa ApaAaAci: Closed Tussock Grassland of *Themeda triandra* with Low Woodland of *Eucalyptus xerothermica*, *Corymbia hamersleyana* and *Acacia aptaneura* over High Open Shrubland of *Acacia pachyacra*, *Acacia aptaneura* and *Acacia citrinoviridis* on red brown clay loam along unincised medium drainage lines.

- GG TtErmuThmb EllChCf AtpGoroPl: Tussock Grassland of *Themeda triandra*, *Eriachne mucronata* and *Themeda* sp. Mt Barricade with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Corymbia ferriticola* over High Shrubland of *Acacia tumida* var. *pilbarensis*, *Gossypium robinsonii* and *Petalostylis labicheoides* on red brown sandy loam on narrowly incised rocky drainage lines.

- ME TtChfEua ExEvCh PlApaApyp: Tussock Grassland of *Themeda triandra*, *Chrysopogon fallax* and *Eulalia aurea* with Low Open Woodland of *Eucalyptus xerothermica*, *Eucalyptus victrix* and *Corymbia hamersleyana* and Shrubland of *Petalostylis labicheoides*, *Acacia pachyacra* and *Acacia pyrifolia* var. *pyrifolia* on red sandy loam on medium drainage lines.

- CP TwTa Ese AbPlApyp: Hummock Grassland of *Triodia wiseana* and *Triodia angusta* with Open Mallee of *Eucalyptus socialis* subsp. *eucentrica* and Open Shrubland of *Acacia bivenosa*, *Petalostylis labicheoides* and *Acacia pyrifolia* var. *pyrifolia* on light brown clay loam on calcrete plains and rises.

- FS Ts CdHc AancAiGrwh: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Low Open Woodland of *Corymbia deserticola* subsp. *deserticola* and *Hakea chordophylla* over Open Shrubland of *Acacia ancistrocarpa*, *Acacia inaequilatera* and *Grevillea wickhamii* subsp. *hispidula* on red brown sandy loam on footslopes and stony plains.

- FS Tw Ell: Hummock Grassland of *Triodia wiseana* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia* on red silty clay on hill slopes and foot slopes.

- HC TpTwTs EllCh AarGooKeve: Hummock Grassland of *Triodia pungens*, *Triodia wiseana* and *Triodia* sp. Shovelanna Hill (S. van Leeeuwin 3835) with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* over Low Shrubland of *Acacia arida, Gompholobium oreophilum* and *Keraudrenia velutina* subsp. *elliptica* on red brown loam on hill crests and upper hill slopes.

- HC Tw Ah EkkEgCh: Hummock Grassland of *Triodia wiseana* with Shrubland of *Acacia hamersleyensis* and Open Mallee of *Eucalyptus kingsmillii* subsp. *kingsmillii*, *Eucalyptus gamophylla* and *Corymbia hamersleyana* (mallee form) on red brown loam and silty loam on hill crests.

- HC Tw AiAb InrSeao: Hummock Grassland of *Triodia wiseana* with High Open Shrubland of *Acacia inaequilatera* and *Acacia bivenosa* over Low Open Shrubland of *Indigofera rugosa* and *Senna artemisioides* subsp. *oligophylla* on red silty loam on dolerite hill crests.

- HS TbrTw Ell: Hummock Grassland of *Triodia brizoides* and/or *Triodia wiseana* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* on brown sandy loam on steep hill slopes.

- HS TbrTw Ell AbPoSegg: Hummock Grassland of *Triodia brizoides* and *Triodia wiseana* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia* over Scattered Low Shrubs of *Acacia bivenosa*, *Ptilotus obovatus* and *Senna glutinosa* subsp. *glutinosa* on brown silty loam on scree slopes.

- HS Ts EllCddCh AancAadsAb: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia deserticola* subsp. *deserticola* and *Corymbia hamersleyana* and Open Shrubland of *Acacia ancistrocarpa*, *Acacia adsurgens* and *Acacia bivenosa* on footslopes and hillslopes with brown sandy loam.

- HS TsTwTp EllCh AhiAaa: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia wiseana* and *Triodia pungens* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* over Low Open Shrubland of *Acacia hilliana* and *Acacia adoxa* var. *adoxa* on red brown sandy loam on hill slopes.

- HS TwTpTs Ell AprAaAanc: Hummock Grassland of *Triodia wiseana*, *Triodia pungens* and *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* over Open Shrubland of *Acacia pruinocarpa*, *Acacia aptaneura* and *Acacia ancistrocarpa* on red brown loam on plains and low hills.

- ME TpTlo ExAciCh PlApypGoro: Hummock Grassland of *Triodia pungens* and *Triodia longiceps* with Low Woodland of *Eucalyptus xerothermica*, *Acacia citrinoviridis* and *Corymbia hamersleyana* over High Shrubland of *Petalostylis labicheoides*, *Acacia pyrifolia* var. *pyrifolia* and *Gossypium robinsonii* on red brown clay loam on medium drainage lines and surrounding floodplains.

- SP TsTwTp EgEt AbApaApr: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia wiseana* and *Triodia* pungens with Very Open Mallee of *Eucalyptus gamophylla* and *Eucalyptus trivalva* over Open Shrubland of *Acacia bivenosa*, *Acacia pachyacra* and *Acacia pruinocarpa* on red brown sandy loam and clay loam on stony plains.

- HS Tp Ell SeggGrwhErll: Hummock Grassland of *Triodia pungens* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia* and Scattered Shrubs of *Senna glutinosa* subsp. *glutinosa*, *Grevillea wickhamii* subsp. *hispidula* and *Eremophila latrobei* subsp. *latrobei* on skeletal orange brown loam on stony hill slopes.

  * Denotes weed species.

Clearing Description

Eastern Packsaddles
BHP Billiton Iron Ore Pty Ltd (BHP) proposes to clear up to 450 hectares of native vegetation within a boundary of approximately 8,044 hectares, for the purpose of mineral exploration drilling, hydrological investigations, installation of meteorological masts and LiDAR stations and supporting infrastructure. The project is located approximately 74 kilometres north-west of Newman, within the Shire of East Pilbara.

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 vegetation surveys completed by Onshore (2011; 2012).

The proposed clearing is for BHP to undertake infill drilling within the East Packsaddle exploration project area which is currently covered by Native Vegetation Clearing Permit CPS 4094/3. BHP is also seeking to install a LiDAR and weather masts within the area to determine the suitability of the area for future wind generation projects.

Clearing permit CPS 4094/1 was granted by the Department of Mines and Petroleum (now the Department of Mines, Industry Regulation and Safety) on 20 January 2011 and was valid from 12 February 2011 to 12 February 2016. The permit authorised the clearing of up to 75 hectares of native vegetation within a boundary of approximately 1,705 hectares, for the purposes of exploration drilling, hydrological investigations and supporting infrastructure.

CPS 4094/2 was granted on 22 August 2013, amending the permit to increase the amount of clearing authorised to 150 hectares, increase the permit boundary to 8,050 hectares, and extend the permit duration from 2016 to 2026.

CPS 4094/3 was granted on 10 December 2020, extending the period in which clearing is authorised to 12 February 2031 and the permit duration to 12 February 2036. A permit condition which had been fulfilled was also removed. The amount of clearing authorised and the permit boundaries remained unchanged.

On 27 January 2021, the Permit Holder applied to amend CPS 4094/3 and add the installation of meteorological masts and LiDAR stations to the permit purpose. The Permit Holder also applied to modify the clearing period, extend the permit expiry date and final reporting dates, increase the amount of clearing authorised by 300 hectares and reduce the permit boundaries by approximately 6.276 hectares, to approximately 8,044 hectares.

3. Assessment of application against Clearing Principles

Comments

The Permit Holder has applied to amend the clearing permit in order to undertake infill drilling within the East Packsaddle Project area. BHP is also seeking to install a LiDAR and weather masts within the area to determine the suitability of the area for future wind generation projects (BHP, 2021). For this purpose, the Permit Holder seeks to increase the area approved to clear by 300 hectares, whilst the permit boundary is being reduced by 6.276 hectares (BHP, 2021).

BHP consolidated findings from environmental reports associated with the project area (BHP, 2021). As the permit boundary is not proposed to be increased, it has already been subject to a number of biological studies and evaluated as part of the previous assessment for 4094/3 (BHP, 2021; Biologic, 2014; Onshore, 2011; Onshore, 2012; Onshore, 2014).

The application area falls within the Pilbara Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Approximately 99.5% of the pre-European vegetation still exists in the IBRA Pilbara Bioregion (Government of Western Australia, 2019). The application area is broadly mapped as Beard vegetation associations 18: Low woodland; mulga (*Acacia aneura*); and 82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana* (GIS Database). Approximately 99.5% of the pre-European extent of each of these vegetation associations remains uncleared at the State level and bioregional level (Government of Western Australia, 2019). Therefore, the application area does not represent a significant remnant of native vegetation in an area that has been extensively cleared. Based on the above, the proposed clearing is not at variance to Principle (e).

The following species of conservation significance have been identified within the footprint of the project area. Available information was reviewed and the conservation status and known distribution of these species has been updated as required (BHP, 2021; DBCA, 2007-; Onshore, 2014; Western Australian Herbarium; 1998-):

- *Acacia subtiliformis* (Priority 3);
- *Aristida jerichoensis* var. *subspinulifera* (Priority 3);
- *Fimbristylis sieberiana* (Priority 3);
- *Goodenia nuda* (Priority 4);
- *Goodenia* sp. East Pilbara (A.A. Mitchell PRP 727) (Priority 3);
- *Grevillea saxicola* (Priority 3);
- *Isotropis parviflora* (Priority 2);
- *Lepidium catapycnon* (Priority 4);
- *Rhagodia sp.* Hamersley (M. Trudgen 17794) (Priority 3);
- *Rostellularia adscendens* var. *latifolia* (Priority 3);
- *Sida* sp. Barlee Range (S. van Leeuwen 1642) (Priority 3); and
- *Stylidium weeliwolli* (Priority 3).

The vegetation associations described within the application area are common and widespread within the region (BHP, 2021; Onshore, 2014). The above Priority Flora, along with other flora species of conservation significance likely to occur within the amendment application area (Onshore, 2014), have distributions that are well outside of the application area and are regionally well represented (BHP, 2021; Onshore, 2014; Western Australian Herbarium, 1998-). However, the proposed clearing may still be at variance to Principle (a) and the continual implementation of the existing flora management condition on the permit may minimise impacts of clearing on the conservation status of these species.

Weeds have the potential to out-compete native vegetation and reduce biodiversity. Continued implementation of the existing weed management condition may minimise the risk of spread of weeds into the area.

The seven fauna habitat types described for the amendment application area, are common both locally and regionally, and consistent with the previous clearing permit decision reports (BHP, 2021; Biologic, 2014). This clearing permit amendment application proposes to reduce the permit boundary by 6.276 hectares, in order to exclude seven caves that may represent habitat for the Ghost Bat (*Macroderma gigas*, P4) known to occur in the area, and reduce the risk of clearing activities of impacting on the species (BHP, 2021).

The Western Pebble-mound Mouse (*Pseudomys chapmani*, P4) has been recorded from a number of locations within the amendment application area (BHP, 2021; Biologic 2014). However there is a large area of suitable habitat adjacent to the amendment application area, and the Permit Holder has committed to implement a 10 metre avoidance buffer around active mounds of the Western Pebble-mound Mouse when practicable, as part of the operational procedures associated with the project (BHP, 2021).

Other fauna species of conservation significance that may occur within the amendment application area are either transitory, migratory, or known from broader distribution ranges (BHP, 2021; Biologic, 2014; DAWE, 2021). Based on the above, the proposed clearing of 450 hectares within a permit boundary of approximately 8,044 hectares is unlikely to significantly impact habitat comprising or necessary for the maintenance of a significant habitat for fauna indigenous to Western Australia. Hence, the proposed clearing is not likely to be at variance to Principle (b).

There are no known records of Threatened flora within the application area (GIS Database). Flora surveys of the application area did not record any species currently listed as Threatened flora (BHP, 2021; Onshore, 2014). Therefore, the proposed clearing is not likely to be at variance to Principle (c).

The amendment application area lies within the buffer of the Weeli Wolli Spring Community, a Priority 1 PEC. The boundary of this PEC has been excluded from the amendment application area however, and the amendment proposal is not likely to be at variance with Principle (d). A number of ephemeral creeks and drainage lines occur within the amendment application area (GIS Database).

The Permit Holder has committed to minimising impact of their activities on vegetation growing in association with these watercourses through exclusion of the more important drainage areas (a majority of Weeli Wolli Creek), use of existing tracks as much as possible and maintaining natural water flows at any required creek crossings (BHP, 2021). Given the low density of disturbance required for the proposed activities, it is unlikely that the clearing will significantly impact on vegetation growing in association with ephemeral watercourse found within the application area. The proposed clearing is at variance to Principle (f), and potential impacts to vegetation growing in, or in association with watercourses contained in the application area may be minimised through the implementation of a watercourse management condition on the permit.

The vegetation associations, habitat types and landforms found within the amendment area are the same as the original permit area, and are well represented in surrounding areas (BHP, 2021; GIS Database). The amendment application proposes to increase the amount of authorised clearing to 450 hectares within a permit boundary of approximately 8,044 hectares. Given the low intensity nature of the proposed clearing activities and the control measures proposed by the Permit Holder (BHP, 2021), this amendment is unlikely to result in a significant change to the environmental impacts of the proposed clearing.

The amendment application has been assessed against the clearing principles, planning instruments and other matters in accordance with s.51O of the *Environmental Protection Act 1986*, and the proposed clearing is at variance with Principle (f), may be at variance to Principle (a), is not likely to be at variance to Principles (b), (c), (d), (g), (h) and (j) and is not at variance to Principle (e).

Methodology

BHP (2021)
Biologic (2014)
DAWE (2021)
DBCA (2007-)
Government of Western Australia (2019)
Onshore (2011)
Onshore (2012)
Onshore (2014)
West Australian Herbarium (1998-)

GIS Database:
- DPaW Tenure
- Hydrography, Lakes
- Hydrography, Linear
- IBRA Australia
- Imagery
- Landsystem Rangelands
- Pre-European Vegetation
- Public Drinking Water Source Areas
- Soils, Statewide
- Threatened and Priority Ecological Communities boundaries
- Threatened and Priority Ecological Communities buffers
- Threatened and Priority Flora
- Threatened Fauna

Planning Instrument, Native Title, previous EPA decision or other matter.

Comments

There are two native title claims (WC2011/006 and WC2005/006) over the area under application (DPLH, 2021). These claims have been determined by the Federal Court on behalf of the claimant groups. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are several registered Aboriginal Sites of Significance within the application area (DPLH, 2021). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

It is the proponent's responsibility to liaise with the Department of Water and Environmental Regulation and the Department of Biodiversity, Conservation and Attractions, 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 amendment application was advertised on 15 January 2021 by the Department of Mines, Industry Regulation and Safety inviting submissions from the public. No submissions were received in relation to this application.

Methodology DPLH (2021)

4. References

BHP (2021) Application to Amend NVCP CPS 4094/3 East Packsaddle Exploration - Native Vegetation Clearing Permit Application Supporting Document. BHP Billiton Iron Ore Pty Ltd, January 2021.

Biologic (2014) Consolidation of Regional Fauna Habitat Mapping – BHP Billiton Iron Ore Pilbara Tenure. Report prepared for BHP Billiton Iron Ore Pty Ltd, by Biologic Environmental Survey Pty Ltd, January 2011.

DAWE (2021) EPBC Act Protected Matters Search Tool. Department of Agriculture, Water and the Environment. https://www.environment.gov.au/epbc/protected-matters-search-tool (Accessed 23 March 2021).

DBCA (2007-) NatureMap: Mapping Western Australia's Biodiversity. Department of Biodiversity, Conservation and Attractions. https://naturemap.dbca.wa.gov.au/ (Accessed 22 March 2021).

DPLH (2021) Aboriginal Heritage Inquiry System. Department of Planning, Lands and Heritage. https://espatial.dplh.wa.gov.au/AHIS/index.html?viewer=AHIS (Accessed 22 March 2021).

Government of Western Australia (2019) 2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions, Perth. https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics

Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.

Onshore (2011) Flora and Vegetation Survey - Area C and Surrounds. Prepared for BHP Billiton Iron Ore Pty Ltd, by Onshore Environmental Consultants Pty Ltd, July 2011.

Onshore (2012) Flora and Vegetation Review Jindi Iron Ore Project. Prepared for BHP Billiton Iron Ore Pty Ltd, by Onshore Environmental Consultants Pty Ltd, July 2012.

Onshore (2014) Consolidation of Regional Vegetation Mapping BHP Billiton Iron Ore Pilbara Tenure. Prepared for BHP Billiton Iron Ore Pty Ltd, by Onshore Environmental.

Western Australian Herbarium (1998-) FloraBase - the Western Australian Flora. Department of Biodiversity, Conservation and Attractions. https://florabase.dpaw.wa.gov.au/ (Accessed 23 March 2021).

5. Glossary

Acronyms:

BC Act	*Biodiversity Conservation Act 2016,* Western Australia
BoM	Bureau of Meteorology, Australian Government
DAA	Department of Aboriginal Affairs, Western Australia (now DPLH)
DAFWA	Department of Agriculture and Food, Western Australia (now DPIRD)
DAWE	Department of Agriculture, Water and the Environment, Australian Government
DBCA	Department of Biodiversity, Conservation and Attractions, Western Australia
DER	Department of Environment Regulation, Western Australia (now DWER)
DMIRS	Department of Mines, Industry Regulation and Safety, Western Australia
DMP	Department of Mines and Petroleum, Western Australia (now DMIRS)
DoEE	Department of the Environment and Energy (now DAWE)
DoW	Department of Water, Western Australia (now DWER)
DPaW	Department of Parks and Wildlife, Western Australia (now DBCA)
DPIRD	Department of Primary Industries and Regional Development, Western Australia
DPLH	Department of Planning, Lands and Heritage, Western Australia
DRF	Declared Rare Flora (now known as Threatened Flora)
DWER	Department of Water and Environmental Regulation, Western Australia
EP Act	*Environmental Protection Act 1986*, Western Australia
EPA	Environmental Protection Authority, 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
PEC	Priority Ecological Community, Western Australia
RIWI Act	*Rights in Water and Irrigation Act 1914*, Western Australia
TEC	Threatened Ecological Community

Definitions:

{DBCA (2019) Conservation Codes for Western Australian Flora and Fauna. Department of Biodiversity, Conservation and Attractions, Western Australia}:-

T **Threatened species:**

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

Threatened fauna is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the

Wildlife Conservation (Specially Protected Fauna) Notice 2018 for Threatened Fauna.

Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

CR **Critically endangered species**
Threatened species considered to be "*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

EN **Endangered species**
Threatened species considered to be "*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

VU **Vulnerable species**
Threatened species considered to be "*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

Extinct Species:

EX **Extinct species**
Species where "*there is no reasonable doubt that the last member of the species has died*", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

EW **Extinct in the wild species**
Species that *"is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species:

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI **Migratory species**
Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory

species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

CD **Species of special conservation interest (conservation dependent fauna)**
Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

OS **Other specially protected species**
Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

P **Priority species:**

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

P1 **Priority One - Poorly-known species**
Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

P2 **Priority Two - Poorly-known species**
Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

P3 **Priority Three - Poorly-known species**
Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations 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 locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

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 are close to qualifying for vulnerable but are not listed as Conservation Dependent.
(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

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.