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.: 8396/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **EII Gas Transmission Service WA (Operations) Pty Ltd**

1.3. Property details

Property: Pipeline Licence PL68
Local Government Area: Shire of East Pilbara
Colloquial name: Nifty Gas Pipeline

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
26.905		Mechanical Removal	Gas Pipeline Maintenance

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 12 September 2019

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 association:
134: Mosaic: Hummock grasslands, open low tree steppe; desert bloodwood and feathertop spinifex on sandhills / Hummock grasslands, shrub steppe; mixed shrubs over spinifex between sandhills (GIS Database).

A flora and vegetation survey was conducted over the application area by MBS Environmental during March, 2004. The following four broad vegetation associations, and 19 vegetation types, were recorded within the application area (MBS Environmental, 2004):

Sand dunes

- *Triodia schinzii* sandy rises
- *Triodia schinzii / Triodia basedowii* sandplain and sandy rises
- *Calytrix carinata* low rises

Sandplains

- *Triodia basedowii / Triodia schinzii* sandplain
- *Triodia basedowii / Acacia translucens* sandplain and low sandy rises
- *Triodia basedowii / Melaleuca glomerata* sandplain and low sandy rises
- *Triodia schinzii / Gompholobium simplicifolium* plain
- *Acacia translucens* shrublands
- Shrublands dominated by *Jacksonia aculeata*
- Grassy sandplain dominated by *Eragrostis eriopoda* and *Triodia basedowii*
- *Acacia translucens* and *Jacksonia aculeata* plain
- *Triodia basedowii / Androcalva loxophylla* sandplain
- *Triodia basedowii / Jacksonia aculeata* sandplain
- *Triodia basedowii / Sida* affin *cardiophylla* sandplain
- *Jacksonia aculeata / Acacia ancistrocarpa* plain

Shallow sand/laterite plains

- Grassland dominated by *Eragrostis eriopoda*
- Grassy herbland dominated by *Eragrostis eriopoda* and *Aristida holathera*
- Herbland dominated by *Seringia nephrosperma* and *Gompholobium simplicifolium*

Plains of shallow sand over exposed calcrete

- *Triodia basedowii* calcrete plains

Clearing Description

Nifty Gas Pipeline.
EII Gas Transmission Service WA (Operations) Pty Ltd proposes to clear up to 26.905 hectares of native vegetation, for the purpose of gas pipeline maintenance. The project is located approximately 350 kilometres

south-east of Port Hedland, within the Shire of East Pilbara. The pipeline extends from the Telfer Gas Pipeline to the Nifty copper mine.

Vegetation Condition

The vegetation condition of the application area was not derived (APA, 2019; MBS Environmental 2004). The pipeline was previously cleared for construction in 2004/2005 and has since been rehabilitated. It is expected that the majority of the vegetation would be in excellent to pristine condition, where the pipeline is surrounded by intact remnant vegetation and regrowth after the initial clearing has progressed to a stable state. There are also likely to be areas in good or degraded condition adjacent to disturbed areas such as existing mine structures or where there is the presence of declared pest species.

Comment

The proposed clearing is for the maintenance of line of sight between pipeline markers, maintenance of access tracks and for integrity dig requirements along the Nifty Gas Pipeline, constructed in 2005. The pre-existing pipeline is 45 kilometres long, within a 20 metre wide pipeline corridor. Clearing will be restricted to areas previously cleared for pipeline construction and is to be a total width of six metres to maintain line of sight. Vegetation management along the pipeline is a requirement of the *Petroleum Pipeline Act 1969* through the Pipeline Licence and AS2885 for pipeline safety and integrity.

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 clearing permit application area is located within the Mackay subregion of the Interim Biogeographic Regionalisation for Australia (IBRA) Great Sandy Desert Bioregion (GIS Database). The vegetation within Mackay sub-region is characterised as having mainly tree steppe grading to shrub steppe; comprising open hummock grassland of *Triodia pungens* and *Triodia schinzii* with scattered trees of *Owenia reticulata* and bloodwood (*Corymbia* species), and shrubs of *Acacia* species, *Grevillea wickhamii* and *Grevillea refracta*, on Quaternary red longitudinal sand dune fields overlying Jurassic and Cretaceous sandstones of the Canning and Armadeus Basins (CALM, 2002). Gently undulating lateritised uplands support shrub steppe such as *Acacia pachycarpa* shrublands over *Triodia pungens* hummock grass (CALM, 2002).

A vegetation and habitat assessment of the application area was conducted by MBS Environmental (2004) between 12 and 19 March 2004. Four broad vegetation associations, and 18 vegetation types, were recorded within the application area (MBS Environmental, 2004). In general, the vegetation consisted of broad communities of common arid zone plants. These communities were characterised by hummock grassland vegetation dominated by *Triodia basedowii* in swales and *Triodia schinzii* on dunes. The mid storey was sparse, commonly including *Eucalyptus pachyphylla*, *Grevillea stenobotrya*, *Grevillea wickhamii* and *Grevillea eriostachya*. The very sparse upper storey consisted primarily of *Corymbia chippendalei* and *Eucalyptus victrix*. Areas prone to inundation were dominated by *Melaleuca lasiandra* (APA, 2019; MBS Environmental, 2004). No Threatened or Priority Ecological Communities were identified as potentially occurring in the application area and none were recorded during the field assessment of the application area (Kingfisher Environmental, 2019a; MBS Environmental, 2004).

A total of 89 flora species from 27 families and 57 genera were recorded during the field assessment of the application area (MBS Environmental, 2004). A desktop assessment of the application area identified 11 Priority flora species with the potential to occur in the application area based on known distributions (Kingfisher Environmental, 2019a). Three of these were identified as having a high likelihood of occurring; *Goodenia hartiana* (P2), *Thysanotus* sp. Desert East of Newman (R.P. Hart 964) (P2), *Indigofera ammobia* (P3), and one as having a medium likelihood of occuring; *Comesperma sabulosum* (P3), due to the presence of suitable habitat (Kingfisher Environmental, 2019a). All conservation significant flora species identified as likely to occur within the application area are present in in IBRA regions outside of the Great Sandy Desert Bioregion (Western Australian Herbarium, 1998-). No Threatened flora were identified as potentially occurring within the application area and none were recorded during the field assessment (APA, 2019; Kingfisher Environmental, 2019a; MBS Environmental, 2004). One Priority flora species, *Goodenia hartiana* (P2), was recorded within the application area in four of the 18 vegetation types, predominately in disturbed areas (APA, 2019; MBS Environmental, 2004). Although the application area contains *Goodenia hartiana* (P2) and is likely to contain additional conservation significant flora species, the clearing of a six metre corridor is unlikely to have significant impacts on the local populations.

A number of weeds were recorded during the flora and vegetation assessments of the application area, including five declared pest species: mexican poppy, *Argemone mexicana*; *Calotropis*, *Calotropis procera*; bathurst burr, *Xanthium spinosum*; *Parkinsonia*, *Parkinsonia aculeata*; and prickly pear, *Opuntia* species (APA, 2019). Weeds have the potential to out-compete native flora and reduce the biodiversity of an area. Potential impacts to biodiversity as a result of the introduction of weeds may be minimised by the implementation of a weed management condition.

Three fauna habitat types were identified as occurring within the application area (APA, 2019). A desktop assessment of the application area identified 356 fauna species with the potential to occur, including seven frogs, 112 reptiles, 187 birds, 40 native mammal and ten introduced mammal species (Kingfisher Environmental, 2019b). Surveys across the Nifty area have identified 94 species of birds, 52 reptiles, 11 mammals and five amphibians (APA, 2019; MBS Environmental, 2004). A desktop assessment of the application area identified twenty-seven conservation significant fauna species, listed at State and/or Federal level, potentially occurring within the application area due to their known distribution (Kingfisher Environmental,

2019b). These include: greater bilby, *Macrotis lagotis* (VU at both State and Federal level); great desert skink, *Liopholis kintorei* (VU at both State and Federal level); mulgara, *Dasycercus* species (P4); northern marsupial mole, *Notoryctes caurinus* (P4); northern quoll, *Dasyurus hallucatus* (EN at both State and Federal level); spectacled hare-wallaby, *Lagorchestes conspicillatus leichardti* (P4); dampierland plain slider, *Lerista separanda* (P2); and a number of species likely to be seasonal or transient visitors (Kingfisher Environmental, 2019b). Four species; greater bilby, mulgara, northern quoll and northern marsupial mole, were previously recorded along, or in close proximity to the Nifty Gas Pipeline (GIS Database; Kingfisher Environmental, 2019b). No conservation significant fauna species were recorded during the field assessment of the application area, however a possible great desert skink burrow was identified but unable to be confirmed (MBS Environmental, 2004). Advice received from DBCA (2019) indicated that pre-clearance, targeted survey(s) for active burrows of conservation significant fauna species should be conducted by suitably qualified personnel (experienced in surveying for these species) in areas identified as suitable habitat for these species. Clearing should be performed as a staged approach to accommodate pre-clearance surveys (DBCA, 2019). Potential impacts to conservation significant fauna species as a result of clearing may be minimised by the implementation of a fauna management condition requiring pre-clearance surveys.

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

Methodology

APA (2019)
DBCA (2019)
CALM (2002)
Kingfisher Environmental (2019a)
Kingfisher Environmental (2019b)
MBS Environmental (2004)
Western Australian Herbarium (1998-)

GIS Database:
- IBRA Australia
- Pre-European Vegetation
- Threatened and Priority Flora
- Threatened and Priority Ecological Communities Boundaries
- Threatened and Priority Ecological Communities Buffers
- Threatened Fauna

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

Comments

Proposal may be at variance to this Principle

The following four fauna habitats have been recorded within the application area; sand dunes, sandplains, shallow sand/laterite plains and plains of shallow sand over exposed calcrete (APA, 2019; MBS Environmental, 2004). In the 15 years since initial clearing for pipeline construction, extensive rehabilitation has occurred and the pipeline corridor supports native vegetation, such as extensive *Triodia* hummock grasslands and *Acacia* shrublands, suitable to support a diverse fauna assemblage (Kingfisher Environmental, 2019b).

The most commonly recorded fauna species within the sand dunes habitat type were reptiles such as burrowing species and sand swimmers including skinks and snakes, and mammals including rodents and dasyurids (APA, 2019; MBS Environmental, 2004). The sand plains habitat type provides *Triodia* hummocks, deep sand, tree hollows and bark, which are the primary habitat for many reptile and mammal species including geckos, dragons, monitors, rodents and bats (APA, 2019; MBS Environmental, 2004). Following rain, species of honeyeaters are commonly observed foraging flowering *Grevillia wickhamii* plants in the sand plains habitat type (APA, 2019; MBS Environmental, 2004). Shallow sand/laterite plains support geckos, bats and bilbies, with primary habitat for reptiles and mammals consisting of grass tussocks, sands under light laterite, tree hollows and bark (APA, 2019; MBS Environmental, 2004). The plains of shallow sand over exposed calcrete habitat type is rare along the pipeline route, recorded only once during surveys (APA, 2019; MBS Environmental, 2004). The calcrete surface is likely to deter burrowing species, and non-burrowing species are likely to be present. Similarly to the sand plain habitat, honeyeaters are often attracted to flowering *Grevillia wickhamii* plants in this habitat type (APA, 2019; MBS Environmental, 2004).

A number of conservation significant fauna species were identified as potentially occurring within the application area (APA, 2019; Kingfisher Environmental, 2019b; MBS Environmental, 2004). These include: greater bilby, *Macrotis lagotis* (VU at both State and Federal level); great desert skink, *Liopholis kintorei* (VU at both State and Federal level); mulgara, *Dasycercus* species (P4); northern marsupial mole, *Notoryctes caurinus* (P4); northern quoll, *Dasyurus hallucatus* (EN at both State and Federal level); spectacled hare-wallaby, *Lagorchestes conspicillatus leichardti* (P4); dampierland plain slider, *Lerista separanda* (P2); and a number of species likely to be seasonal or transient visitors (Kingfisher Environmental, 2019b). Suitable habitat for greater bilby, mulgara, northern marsupial mole, great desert skink and dampierland plain slider were identified within the application area, however it is unlikely that the northern quoll and spectacled hare-wallaby will be significantly impacted by the proposed clearing due to a lack of preferred sheltering and denning habitat (Kingfisher Environmental, 2019b). A number of additional species were identified as potentially occurring within the application area, however are unlikely to be significantly impacted by the proposed clearing

due to the seasonal and transient nature of their occurrence within the application area, with many being highly mobile avian species (Kingfisher Environmental, 2019b).

The mulgara requires clayey sand and sandy loam soils with hummock grasses (i.e. *Triodia basedowii*) under the influence of paleodrainage or surface drainage systems (MBS Environmental, 2004). Within the application area, the grassy herbland and grassland vegetation units, with low to medium *Triodia basedowii* cover, were considered to be suitable mulgara habitat (MBS Environmental, 2004). Mulgara has been previously recorded in *Triodia* swales and could inhabit the small swales that occur in between the dunes that the gas pipeline traverses, within the sand dunes habitat type (APA, 2019; MBS Environmental, 2004). One record exists within the application area (GIS Database), however none were recorded during the opportunistic survey (MBS Environmental, 2004). Due to the presence of suitable habitat it is likely that mulgara may forage and burrow within the application area.

Suitable habitat for the greater bilby was recorded within the application and the species has been recorded in surrounding areas, however none were recorded during the opportunistic survey of the application area (MBS Environmental, 2004). Evidence of the greater bilby (tracks, scratchings, scats and burrows) has been recorded in the Nifty project area within two of the four habitat types present; in swales predominantly vegetated by *Triodia* and *Melaleuca* species and in shallow sand/laterite plains (APA, 2019). Due to the presence of suitable habitat it is likely that greater bilby may forage and burrow within the application area.

Suitable habitat for the northern marsupial mole was recorded within the application and the species has been recorded in surrounding areas, however none were recorded during the opportunistic survey of the application area (MBS Environmental, 2004). Although likely to occur within the application area, the northern marsupial mole spends most of its time under ground and is unlikely to be significantly impacted by the clearing confined to the soil surface, leaving root systems intact.

The great desert skink utilises sandplain habitats supporting *Triodia* species (MBS Envrionmental, 2004). Although suitable habitat was located within the application area, only one potential burrow was recorded and unable to be confirmed (APA, 2019; MBS Environmental, 2004). Due to the presence of suitable habitat it is possible that the great desert skink and dampierland plain slider may forage and burrow within the application area.

Although the application area may possibly contain conservation significant fauna, the majority of species potentially present are considered to be mobile and transient, and the six metre corridor is unlikely represent critical feeding or breeding habitat for any of these species. However, as habitat within the corridor may contain burrows for conservation significant fauna such as greater bilby, mulgara, dampierland plain slider and great desert skink, potential impacts as a result of clearing may be minimised by the implementation of a fauna management condition requiring pre-clearance surveys.

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

Methodology

APA (2019)
Kingfisher Environmental (2019b)
MBS Environmental (2004)

GIS Database:
- Imagery
- Pre-European Vegetation
- Threatened Fauna

(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

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 of Threatened flora (APA, 2019; MBS Environmental, 2004).

The vegetation associations within the application area are common and widespread within the region (APA, 2019; MBS Environmental, 2004; GIS Database), and the vegetation proposed to be cleared is unlikely to be necessary for the continued existence of any species of Threatened (rare) flora.

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

Methodology

APA (2019)
MBS Environmental (2004)
GIS Database:
- Pre-European Vegetation
- 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

There are no known Threatened Ecological Communities (TECs) located within or in close proximity to the application area (GIS Database).

A flora and vegetation survey of the application area did not identify any TECs (MBS Environmental, 2004).

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

Methodology

MBS Environmental (2004)

GIS Database:
- Threatened and Priority Ecological Communities Boundaries
- Threatened and Priority Ecological Communities Buffers

(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 Great Sandy Desert Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Approximately 99% of the pre-European vegetation still exists in the IBRA Great Sandy Desert Bioregion (Government of Western Australia, 2019). The application area is broadly mapped as Beard vegetation association 134: Mosaic: Hummock grasslands, open low tree steppe; desert bloodwood and feathertop spinifex on sandhills / Hummock grasslands, shrub steppe; mixed shrubs over spinifex between sandhills (GIS Database). Approximately 99% of the pre-European extent of this vegetation association remains uncleared at both the state 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.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in DBCA managed lands
IBRA Bioregion – Great Sandy Desert	29,538,799	29,535,810	~99	Least Concern	3
Beard vegetation associations – WA					
134	26,026,864	26,022,995	~99	Least Concern	3
Beard vegetation associations – Great Sandy Desert Bioregion					
134	13,595,888	13,593,950	~99	Least Concern	4

* Government of Western Australia (2019)
** 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 (2019)

GIS Database:
- IBRA 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 at variance to this Principle

There are no permanent watercourses or wetlands within the area proposed to clear (APA, 2019; GIS Database). A number of seasonal creek lines pass through the application area (APA, 2019). Creek lines in the region are dry for most of the year, only flowing briefly immediately following significant rainfall (APA, 2019).

Based on the above, the proposed clearing is at variance to this Principle. Potential impacts to vegetation growing in association with the watercourse may be minimised by the implementation of a watercourse management condition.

Methodology APA (2019)

GIS Database:
- Hydrography, Lakes
- Hydrography, linear

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

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

The application area lies within the Little Sandy land system (DPIRD, 2019). The Little Sandy land system is described as sandplains and swales; minor gravelly plains with thin sand cover over calcrete and isolated low hills (DPIRD, 2019). The sandplain and swales show some susceptibility to erosion after any disturbance which removes the vegetation (DPIRD, 2019).

The proposed clearing of up to 26.905 hectares of native vegetation, along a narrow six metre wide pipeline easement, is unlikely to cause appreciable land degradation due to the majority of clearing being raised blade and rootstocks primarily being maintained (APA, 2019).

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

Methodology APA (2019)
DPIRD (2019)

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

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

There are no conservation areas in the vicinity of the application area. The nearest DBCA (formerly DPaW) managed land is the Karlamilyi National Park which is located approximately 70 kilometres south of the application area (GIS Database). The proposed clearing is unlikely to impact on the environmental values of any 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**

There are no Public Drinking Water Source Areas within or in close proximity to the application area (GIS Database). There are no permanent watercourses or wetlands within the area proposed to clear (APA, 2019; GIS Database). Creek lines in the region are dry for most of the year, only flowing briefly immediately following significant rainfall. The proposed clearing is unlikely to result in significant changes to surface water flows.

The proposed clearing is unlikely to cause deterioration in the quality of underground water.

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

Methodology APA (2019)

GIS Database:
- Hydrography, Linear
- Public Drinking Water Source Areas

(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 climate of the region is arid tropical, with summer rainfall (CALM, 2002). The nearest weather station is Telfer Aero, approximately 40 kilometres east south-east of the application area, with an average rainfall of approximately 370.9 millimetres per year (BoM, 2019).

There are no permanent water courses or waterbodies within the application area (GIS Database). Seasonal drainage lines are common in the region and temporary localised flooding may occur briefly following heavy rainfall events. However, the proposed clearing is unlikely to increase the incidence or intensity of natural flooding events.

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

Methodology

BoM (2019)
CALM (2002)

GIS Database:
- Hydrography, linear

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

Comments

The clearing permit application was advertised on 6 May 2019 by the Department of Mines, Industry Regulation and Safety (DMIRS), inviting submissions from the public. No submissions were received in relation to this application.

There is one native title claim (WC1996/078) over the area under application (DPLH, 2019). This claim has been determined by the Federal Court on behalf of the claimant group. However, the 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 Aboriginal Sites of Significance within the application area (DPLH, 2019). 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.

Methodology

DPLH (2019)

4. References

APA (2019) Clearing Permit Application Supporting Documentation: Nifty Gas Pipeline PL68. Report prepared by APA Group, February 2019.

BoM (2019) Bureau of Meteorology Website – Climate Data Online, Telfer Aero. Bureau of Meteorology. http://www.bom.gov.au/climate/data/ (Accessed 7 May 2019).

CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002. Department of Conservation and Land Management, Western Australia.

DBCA (2019) Advice received in relation to Clearing Permit Application CPS 8396/1. Species and Communities Branch, Department of Biodiversity, Conservation and Attractions, Western Australia, May 2019.

DPIRD (2019) Advice received in relation to Clearing Permit Application CPS 8396/1. Deputy Commissioner of Soil and Land Conservation, Department of Primary Industries and Regional Development, Western Australia, May 2019.

DPLH (2019) Aboriginal Heritage Enquiry System. Department of Planning, Lands and Heritage. http://maps.daa.wa.gov.au/AHIS/ (Accessed 7 May 2019).

Department of Natural Resources and Environment (2002) Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local. Department of Natural Resources and Environment, Victoria.

Government of Western Australia (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.

Kingfisher Environmental (2019a) Desktop Assessment of Flora and Ecological Communities of the Nifty Gas Pipeline. Report prepared for APA Group, by Kelby Kennings on behalf of Kingfisher Environmental, July 2019.

Kingfisher Environmental (2019b) Nifty Gas Lateral – Desktop Fauna Assessment. Report prepared for APA Group, by Kingfisher Environmental, July 2019.
MBS Environmental (2004) Nifty Copper Operation: Power Supply and Infrastructure Corridor – Vegetation and Habitat Assessment. Report prepared for Birla (Nifty) Pty Ltd, by Martinick Bosch Sell Pty Ltd, July 2004.
Western Australian Herbarium (1998-) FloraBase - the Western Australian Flora. Department of Biodiversity, Conservation and Attractions. https://florabase.dpaw.wa.gov.au/ (Accessed 9 September 2019).

5. Glossary

Acronyms:

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)
DBCA	Department of Biodiversity, Conservation and Attractions, Western Australia
DEC	Department of Environment and Conservation, Western Australia (now DBCA and DWER)
DEE	Department of the Environment and Energy, Australian Government
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)
DPIRD	Department of Primary Industries and Regional Development, Western Australia
DPLH	Department of Planning, Lands and Heritage, Western Australia
DRF	Declared Rare Flora
DoE	Department of the Environment, Australian Government (now DEE)
DoW	Department of Water, Western Australia (now DWER)
DPaW	Department of Parks and Wildlife, Western Australia (now DBCA)
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities (now DEE)
DWER	Department of Water and Environmental Regulation, Western Australia
EPA	Environmental Protection Authority, Western Australia
EP Act	*Environmental Protection Act 1986*, Western Australia
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
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.