



Clearing Permit Decision Report

1. Application details and outcomes

1.1. Permit application details

Permit number:	6915/5
Permit type:	Purpose Permit
Applicant name:	Iluka Resources Limited
Application received:	9 February 2022
Application area:	55.04 hectares
Purpose of clearing:	Construction, Mineral Sands Processing and Rehabilitation Activities
Method of clearing:	Mechanical Removal
Tenure:	<i>Mineral Sands (Eneabba) Agreement Act 1975</i> , Mining Lease 267SA (AM 70/267) Mining Lease 70/821
Location (LGA area/s):	Shire of Carnamah
Colloquial name:	South Tails Project

1.2. Description of clearing activities

Iluka Resources Limited proposes to clear up to 55.04 hectares of native vegetation within a boundary of approximately 56.8 hectares, for the purpose of construction, mineral sands processing and rehabilitation activities.

The application is to allow for the construction of a rare earth refinery on rehabilitated land and natural regrowth of native vegetation. Mining at the Eneabba South Tails Project has ceased since March 2013, and is currently under active rehabilitation (Iluka, 2022).

Clearing permit CPS 6915/1 was granted by the Department of Mines and Petroleum (now the Department of Mines, Industry Regulation and Safety) on 10 March 2016 and was valid from 2 April 2016 to 1 March 2019. The permit authorised the clearing of up to 49.64 hectares of native vegetation within a boundary of approximately 51.34 hectares, for the purpose of rehabilitation.

CPS 6915/2 was granted on 9 June 2016, amending the permit to alter the annual reporting dates of the permit from 31 July to 15 March and alter the reporting period from 1 July to 30 June to 1 January to 31 December. The proposed amendment was to align CPS 6915/1 with other existing permits for the Eneabba site.

CPS 6915/3 was granted on 11 April 2019, amending the permit to extend the period in which clearing is authorised by five years. The area of clearing authorised and the permit boundaries remained unchanged.

CPS 6915/4 was granted on 15 October 2020, amending the permit to change the purpose of clearing to 'construction, mineral sands processing and rehabilitation activities' and updating Condition 9. The area of clearing authorised and the permit boundaries remained unchanged.

On 9 February 2022, the Permit Holder applied to amend CPS 6915/4 to increase the amount of clearing authorised by 5.4 hectares and increase the permit boundary by 5.4 hectares. The proposed increase is to allow Iluka to construct a rare earth refinery (Iluka, 2022). A small amount of the proposed increase is to allow for water flow diversion (Iluka, 2022).

1.3. Decision on application and key considerations

Decision:	Grant
Decision date:	29 June 2022
Decision area:	55.04 hectares of native vegetation

1.4. Reasons for decision

This clearing permit amendment application was made in accordance with section 51KA of the *Environmental Protection Act 1986* (EP Act) and was received by the Department of Mines, Industry Regulation and Safety (DMIRS) on 9 February 2022. DMIRS advertised the application for a public comment for a period of 21 days, and one submission was received (Appendix B).

In making this decision, the Delegated Officer had regard for the site characteristics (Appendix C), relevant datasets (Appendix G), supporting information provided by the applicant (Appendix A) including the results of a flora and vegetation survey, and

fauna survey (Appendix F), the clearing principles set out in Schedule 5 of the EP Act (Glossary), proposed avoidance and minimisation measures (Section 3.1), relevant planning instruments and any other matters considered relevant to the assessment (Section 3.3).

The assessment identified that the proposed clearing may result in:

- the potential introduction and spread of weeds and dieback into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values;
- impacts to conservation significant flora; and
- the loss of native vegetation that is suitable foraging habitat for Carnaby's black cockatoo (*Calyptorhynchus latirostris*).

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing can be minimised and managed to be unlikely to lead to an unacceptable risk to environmental values. The applicant has suitably demonstrated avoidance and minimisation measures.

The Delegated Officer decided to grant a clearing permit amendment subject to conditions to:

- avoid, minimise to reduce the impacts and extent of clearing;
- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback;
- commence construction no later than three months after undertaking clearing to reduce the risk of erosion;
- retain cleared vegetation and topsoil and respread this on a cleared area within the Eneabba Mineral Sands Mine within 24 months of clearing to ensure black cockatoo foraging habitat is not permanently lost.

1.5. Site map





Site maps of the previous version of this permit, and the proposed changes provided in Figure 1 and Figure 2 below.

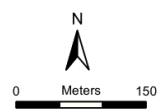


Figure 1. Map of the previous iteration of this permit (CPS 6915/4). The yellow area indicates the permit boundary (Iluka, 2022).



Legend

-  Proposal Amendment Area (5.4 ha)
-  Surface Water Diversion
-  ERER Plant Location
-  Approved Clearing Permit (CPS6915_4)



**ENEABBA RARE EARTH REFINERY
CPS6915/4 Amendment Application
Proposed Amendment Area**



ORIG: B Kraft

DRAWN: B Kraft

SCALE (A3): 1:5,292

DATE: 7/01/2022

DWG No: Drawing No.

FIGURE:3

GDA 1994 MGA Zone 50

L:\Data\Users\Environmental Regulation\Projects\Eneabba\Eneabba Phase 3\ERER Clearing Permit Amendment\Figure 3_Proposed Amendment Area.mxd

Figure 2. Zoomed in map of the proposed increase of the amount of clearing authorised and increase to the permit boundary in pink. The light blue indicates where the rare earth refinery is proposed to be constructed (Iluka, 2022).

2. Legislative context

The clearing of native vegetation in Western Australia is regulated under the EP Act and the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (Clearing Regulations).

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 1.4), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

- the precautionary principle
- the principle of intergenerational equity
- the principle of the conservation of biological diversity and ecological integrity.

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Mineral Sands (Eneabba) Agreement Act 1975*
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Mining Act 1978* (WA)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2020)

3. Detailed assessment of application

3.1. Avoidance and mitigation measures

The design of the rare earth refinery focused on minimising impacts to flora, vegetation, and fauna habitat to the greatest extent possible (Iluka, 2022). No remnant vegetation will be disturbed, all vegetation that will be cleared is either rehabilitated areas or regrowth on topsoil stockpiles (Iluka, 2022). A small additional area (5.4 hectares) that has been applied for under this amendment will be cleared to construct the rare earth refinery (Iluka, 2022).

The permit holder has a dieback management plan to minimise the spread of dieback (Iluka, 2022). There is ongoing monitoring and assessment of the greater Eneabba mine site for dieback (Iluka, 2022).

The Delegated Officer was satisfied that the applicant has made a reasonable effort to avoid and minimise potential impacts of the proposed clearing on environmental values.

3.2. Assessment of impacts on environmental values

A recent biological survey and supporting documentation were submitted as part of this amendment application. This new information has required a full review of the proposed clearing. The reassessment against the clearing principles identified that the impacts of the proposed clearing present a risk to biological values (flora and fauna), in particular significant impacts to Carnaby's black cockatoo habitat. The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

3.2.1. Biological values (flora) - Clearing Principle (a)

Assessment

The vegetation within the proposed amendment area is described as rehabilitated shrub and heathlands, with areas of regrowth native vegetation established on topsoil stockpiles (Iluka, 2022). The area proposed to be cleared to construct the rare earth refinery is primarily vegetation regrowth on stockpiles, and is approximately 21 years in age (Iluka, 2021).

There are two Priority flora species located within the area proposed to be cleared: *Eucalyptus macrocarpa* subsp. *elachantha* (P4) and *Verticordia aurea* (P4) (Iluka, 2022; Woodman, 2016). There will be direct impacts to these species, with 30 *Eucalyptus macrocarpa* subsp. *elachantha* and 14 *Verticordia aurea* individuals proposed to be cleared (Iluka, 2022; Woodman, 2016). Both species occur within regrowth on a topsoil stockpile, indicating that this species can be effectively established through rehabilitation efforts (Iluka, 2022). There are 218 locations of *Eucalyptus macrocarpa* (not surveyed to subspecies) and 257 locations of *Verticordia aurea* recorded in approximately 2,000 ha of rehabilitation across the greater Eneabba mine site (Appendix A). The proposed clearing of these individuals is unlikely to lead a significant impact to the conservation status of this species. These species are known across multiple locations within the Geraldton Sandplains bioregion, with a number of *Eucalyptus macrocarpa* subsp. *elachantha* records within the Swan Coastal Plain (Western Australian Herbarium, 1998-).

There are areas within the much larger Eneabba Mineral Sands Mine site that are infested with *Phytophthora* dieback however, no dieback has been identified within the application area (Umwelt, 2021). Dieback and weeds have the potential to out-compete native flora and reduce the biodiversity of an area.

Conclusion

Based on the above assessment, the proposed clearing has the potential to introduce and spread weeds and dieback within the application area. The proposed clearing of Priority flora is not likely to have a significant impact on the local populations of these species.

Conditions

To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback.

3.2.2. Biological values (fauna) - Clearing Principles (b)

Assessment

The fauna habitat within the proposed amendment area is described as rehabilitated shrublands and heathlands and vegetation regrowth on topsoil (Iluka, 2022; Western Wildlife, 2021). Rehabilitation at the Eneabba mine site consists of rehabilitation in various ages from 1981 to 2021 (Western Wildlife, 2021). The vegetation proposed to be cleared to construct the rare earth refinery is regrowth on topsoil and is approximately 21 years in age (Iluka, 2021).

A basic vertebrate fauna survey and targeted Carnaby's black cockatoo (*Calyptorhynchus latirostris*) habitat survey was conducted over the whole Eneabba mine site and surrounds on 12-13 July 2021 (Western Wildlife, 2021). The targeted survey focused on the identification of potential foraging, roosting or breeding habitat for Carnaby's black cockatoo (Western Wildlife, 2021). The survey recorded evidence of black cockatoo foraging and one night roost (Western Wildlife, 2021).

One species of conservation significance was recorded during the field assessment of the larger survey area: Carnaby's black cockatoo (*Calyptorhynchus latirostris*, EN) (Western Wildlife, 2021).

Carnaby's cockatoo is listed as endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the *Biodiversity Conservation Act 2016* (BC Act).

They are known to forage on the seeds and flowers of a large variety of plants including banksias, hakeas, eucalypt trees, acacias and Woody Pears (*Xylomelum*) (Valentine & Stock, 2008). Suitable habitat can be considered in terms of breeding habitat, night roosting habitat, and foraging habitat. They will generally forage up to 12 kilometres from an active breeding site (DSEWPac, 2012; DoEE, 2016; DPaW, 2013). Following breeding, they will flock in search of food, usually within six kilometres of a night roost (DSEWPac, 2012; DoEE, 2016; DPaW 2013), but may range up to 20 kilometres (Commonwealth of Australia, 2017).

Food resources within the range of breeding sites and roost sites are important to sustain populations, and foraging resources are therefore viewed in the context of known breeding and night roosting sites, particularly within 12 kilometres of an impact area (Commonwealth of Australia, 2017). The Carnaby's Cockatoo recovery plan (DPaW, 2013) summarises habitat critical to the survival for Carnaby's cockatoos as:

- The eucalypt woodlands that provides nest hollows used for breeding, together with nearby vegetation that provides feeding, roosting and watering habitat that supports successful breeding;
- Woodland sites known to have supported breeding in the past and which could be used in the future, provided adequate nearby food and/or water resources are available or are re-established; and
- In the non-breeding season the vegetation that provides food resources as well as the sites for nearby watering and night roosting that enable the cockatoos to effectively utilise the available food resource.

The Carnaby's Cockatoo Recovery Plan states that there are multiple reasons for the decline of Carnaby's Cockatoos, however the decline to date has primarily been through the extensive clearing of nesting and feeding habitat (DPaW, 2013). The long-term survival of Carnaby's Cockatoos depends on the availability of suitable breeding habitat and hollows, as well as foraging habitat capable of providing enough food to sustain the population (DPaW, 2013).

The targeted survey recorded 30 Carnaby's cockatoos roosting overnight in exotic eucalypts and pines planted approximately 1.7 kilometres northwest of the areas proposed to be cleared, near mine site offices (Figure 4) (Western Wildlife, 2021). Other nearest known roost sites have been recorded 10 kilometres south and 5 kilometres north of the amendment area (Western Wildlife, 2021). No suitable roosting habitat was identified within the amendment area, however the roosting site recorded during the survey is situated between multiple areas of the proposed amendment (Western Wildlife, 2021).

The vegetation within the amendment area is considered moderate to high value foraging habitat, with evidence of foraging observed within the areas proposed to be cleared (Western Wildlife, 2021). Evidence of foraging mostly occurred on *Banksia sessilis*, but also on *Banksia attenuata*, *Banksia kippistiana*, *Lambertia multiflora*, and other species of *Banksia* and *Hakea* (Western Wildlife, 2021). Evidence of foraging activity was also recorded across the greater survey area (Western Wildlife, 2021). The survey identified 939.82 hectares of foraging habitat for Carnaby's cockatoo, of which 226 hectares is low value, 144.75 hectares is of moderate value and 569.08 hectares is of moderate-high value (Western Wildlife, 2021). The majority of the 56.8 hectare amendment area is considered moderate-high value foraging habitat (Western Wildlife, 2021).

While the proposed clearing will result in a loss of 5.4 hectares of significant foraging habitat for black cockatoos, it is unlikely to result in a significant residual impact. There are large areas of foraging habitat in the local area and within the greater Eneabba mine site which has been established through rehabilitation efforts (Western Wildlife, 2021). The available foraging habitat in the surrounds will provide a food source whilst additional rehabilitated areas regrow vegetation (Western Wildlife, 2021). Foraging evidence observed within rehabilitated vegetation shows that suitable foraging habitat can be re-established as moderate-high value foraging habitat (Western Wildlife, 2021).

Conclusion

Based on the above assessment, the proposed clearing will result in the clearing of 5.4 hectares of significant foraging habitat for black cockatoos. The vegetation proposed to be cleared to construct the rare earth refinery is regrowth on topsoil stockpiles, which will require clearing to be utilised. It is likely that the loss of 5.4 hectares of foraging habitat can be successfully re-established through rehabilitation efforts.

The applicant may have notification responsibilities under the EPBC Act for impacts to Carnaby's black cockatoo and their habitats, as set out in the EPBC Act referral guidelines for these species. The applicant has been advised to contact the federal Department of Water, Agriculture and the Environment (DAWE) to discuss EPBC Act referral requirements.

Conditions

To address the above impacts, the following management measures will be required as conditions of the permit:

- retain cleared vegetation and topsoil and respread this on a cleared area within the Eneabba Mineral Sands Mine within 24 months of clearing to ensure black cockatoo foraging habitat is not permanently lost.

3.3. Relevant planning instruments and other matters

There is one native title claim (WC2019/008) over the area under application (DPLH, 2022). This claim has been determined by the Federal Court on behalf of the claimant group. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (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, 2022). 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.

Other relevant authorisations that may be required for the proposed land use include:

- A Programme of Work approved under the *Mining Act 1978*.
- A Mining Proposal / Mine Closure Plan approved under the *Mining Act 1978*.

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.

It is noted that the proposed clearing may impact on Carnaby's black cockatoo (*Calyptorhynchus latirostris*), which is a protected matter under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). The proponent may be required to refer the project to the (Federal) Department of Agriculture, Water and the Environment for environmental impact assessment under the EPBC Act. The proponent is advised to contact the Department of Agriculture, Water and the Environment for further information regarding notification and referral responsibilities under the EPBC Act.

End

Appendix A. Additional information provided by applicant

Summary of comments	Consideration of comment
<p>DMIRS reviewed information provided and required clarification regarding:</p> <ul style="list-style-type: none"> - age of the rehabilitation within the amended permit boundary; and - which Priority flora species are located within the additional area and number of individuals that may be impacted 	<p>Iluka Resources provided additional information which informed DMIRS that the additional area proposed to be cleared for the rare earth refinery is native vegetation regrowth on a topsoil stockpile.</p> <p>Iluka Resources also provided how many Priority flora individuals will be impacted through the proposed amendment based on numbers recorded within approximately 2,000 hectares of rehabilitation.</p>

Appendix B. Details of public submissions

Summary of comments
One submission was received raising no objections to the proposed amendment.

Appendix C. Site characteristics

C.1. Site characteristics

Characteristic	Details
Local context	The area proposed to be cleared is located approximately 30 kilometres east-northeast of Leeman, within the Shire of Carnamah. The amendment area is part of a much larger mining operation, situated within an area of remnant vegetation. The amendment area is located within the intensive land use zone of Western Australia. The dominant land use in the Lesueur Sandplains subregion is dry-land agriculture, with less areas of conservation. The application area is part of a larger area of uncleared native vegetation.
Conservation areas and ecological linkage	The application area is not located within any conservation areas. The South Eneabba Nature Reserve is located approximately 100 metres south and 1.3 kilometres west of the application area. The amendment area is part of a much larger mining operation and is representative of an ecological linkage.
Vegetation description	<p>The vegetation of the application area is broadly mapped as the following Beard vegetation associations:</p> <p>49: Shrublands; mixed heath; and</p> <p>379: Shrublands; scrub-heath on lateritic sandplain in the central Geraldton Sandplains Region (GIS Database).</p> <p>There vegetation within the amendment area is described as 'rehabilitated shrubland and heathland' (Iluka, 2022).</p>
Vegetation condition	<p>The aerial imagery indicates the vegetation within the proposed clearing area is in good (Keighery, 1994) condition, described as:</p> <ul style="list-style-type: none"> • Good – Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and/or grazing. <p>The full Keighery (1994) condition rating scale is provided in Appendix E.</p>
Climate and landform	The application area is mapped within elevations of 120.5-123 metres AHD. The climate of the region is Mediterranean, with an average rainfall of approximately 545.1 millimetres per year (BoM, 2022; CALM, 2002).
Soil description and land degradation risk	Undisturbed soils within the amendment area and surrounds typically comprise an upper profile of sands and gravelly sandy clays at depth. The undisturbed sands include surface topsoil sands with organic matter accumulation, grading down to yellow or pale, bleached sands. Gravelly sandy clays are present in gradational, duplex profiles containing 20 to 30% gravel. Based on the soil type, there may be a potential for wind erosion.

Characteristic	Details
Waterbodies	The desktop assessment and aerial imagery indicated that no permanent or ephemeral waterbodies intersect the amendment area.
Hydrogeography	The application area is not within any legislated surface water area. The application area is located within the Arrowsmith Ground Water Area proclaimed under the <i>Rights in Water and Irrigation Act 1914</i> . The mapped groundwater salinity is 500-1000 milligrams per litre total dissolved solids which is described as marginal water quality.
Flora	There are records of 16 priority flora within the greater Eneabba mine site. Several of these species have been established within the amendment area through rehabilitation efforts.
Ecological communities	The Ferricrete floristic community (Rocky Springs type) TEC (VU) buffer intersects the amendment area. This TEC is located approximately 3.8 kilometres west of the application area.
Fauna	There are records of one fauna species of conservation significance within the local area and two species with records within 30 kilometres. There is a known black cockatoo roost site 1.7 kilometres away from the proposed clearing required for the construction of the rare earth refinery.

C.2. Vegetation extent

	Pre-European area (ha)	Current extent (ha)	Extent Remaining %	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA Managed Lands
IBRA Bioregion - Geraldton Sandplains	3,136,037	1,404,424	44.78	568,255	18.24
IBRA Subregion - Lesueur Sandplain	1,171,775	502,977	42.92	212,497	18.36
Local Government - Carnamah	287,231.20	118,658.74	41.31	49,792.85	21.81
Beard vegetation associations - State					
49	52,491	26,112	49.75	11,610	22.38
379	547,736	129,736	23.69	28,918	5.38
Beard vegetation associations - Geraldton Sandplains Bioregion					
49	39,718	14,489	36.48	3,484	8.79
379	546,507	129,495	23.70	28,902	5.39
Beard vegetation associations - Lesueur Sandplain subregion					
49	33,139	13,618	41.10	3,484	10.54
379	370,029	111,632	30.17	21,505	5.95

Government of Western Australia (2019)

Appendix D. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
<p><u>Principle (a):</u> <i>“Native vegetation should not be cleared if it comprises a high level of biodiversity.”</i></p> <p><u>Assessment:</u> The amendment area contains multiple Priority flora species, however the majority of these individuals will not be impacted. The area proposed to be clear to construct the rare earth refinery contains two Priority flora species.</p>	<p>May be at variance as per CPS 6915/4</p>	<p>Yes</p> <p><i>Refer to Section 3.2.1, above.</i></p>
<p><u>Principle (b):</u> <i>“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.”</i></p> <p><u>Assessment:</u> The area proposed to be cleared contains moderate to high value foraging habitat for Carnaby’s black cockatoo (<i>Calyptorhynchus latirostris</i>, EN).</p>	<p>At variance changed from CPS 6915/4</p>	<p>Yes</p> <p><i>Refer to Section 3.2.2, above.</i></p>
<p><u>Principle (c):</u> <i>“Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</i></p> <p><u>Assessment:</u> There are no known records of Threatened flora within the amendment area (GIS Database). A 2015 flora survey of the amendment area did not record any species of Threatened flora and the vegetation is not expected to support any species of Threatened flora (Woodman, 2016).</p> <p>The vegetation proposed to be cleared is unlikely to be necessary for the continued existence of any species of Threatened flora.</p>	<p>Not likely to be at variance as per CPS 6915/4</p>	<p>No</p>
<p><u>Principle (d):</u> <i>“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.”</i></p> <p><u>Assessment:</u> There are no known Threatened Ecological Communities (TECs) located within the amendment area (GIS Database).</p> <p>Part of the amendment area intersects the buffer for the Ferricrete floristic community (Rocky Springs type) TEC (VU) (GIS Database). This TEC is located approximately 3.8 kilometres west of the amendment area. It is unlikely that the vegetation proposed to be cleared is representative of this ecological community.</p>	<p>Not likely to be at variance as per CPS 6915/4</p>	<p>No</p>
Environmental value: significant remnant vegetation and conservation areas		
<p><u>Principle (e):</u> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u></p> <p>The application area falls within the Geraldton Sandplains Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Approximately 44% of the pre-European vegetation still exists in the IBRA Geraldton Sandplains Bioregion (Government of Western Australia, 2019).</p> <p>The application area is broadly mapped as Beard vegetation association 379: Shrublands; scrub-heath on lateritic sandplain in the central Geraldton Sandplains Region (GIS Database). Approximately 23.7% of the pre-European extent of this vegetation association remains uncleared at both the state and bioregional level (Government of Western Australia, 2019).</p> <p>A very small portion of the amendment area is mapped as Beard vegetation association 49: Shrublands; mixed heath (GIS Database). This vegetation association does not intersect the area proposed to be cleared to construct the rare earth refinery and will not be impacted.</p> <p>Based on the above, the proposed amendment area is considered a significant remnant in an area that has been extensively cleared. However, the vegetation proposed to be cleared is highly disturbed, consisting of rehabilitated or regrowth on topsoil stockpiles (Iluka, 2022). The proposed clearing is unlikely to further reduce the extent of vegetation association 379.</p>	<p>Not likely to be at variance as per CPS 6915/4</p>	<p>No</p>

Assessment against the clearing principles	Variance level	Is further consideration required?
<p>Principle (h): <i>“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></p> <p>Assessment: The amendment area is not located within any conservation areas. The South Eneabba Nature Reserve is located approximately 100 metres south and 1.3 kilometres west of the application area. The proposed clearing may have an impact on the environmental values of this conservation area. Impacts may be mitigated by a weed and dieback condition and the management plan implemented by Iluka (2022).</p>	<p>May be at variance</p> <p>changed from CPS 6915/4</p>	No
Environmental value: land and water resources		
<p>Principle (f): <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p>Assessment: Given no permanent or ephemeral water courses or wetlands are recorded within the amendment area, the proposed clearing is unlikely to impact any vegetation growing within association with a watercourse or wetland.</p>	<p>Not at variance</p> <p>as per CPS 6915/4</p>	No
<p>Principle (g): <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p>Assessment: The additional clearing is for the construction of a rare earth refinery and a water run off diversion channel (Iluka, 2022). The additional clearing may introduce additional impacts from sediment deposition or erosion via surface water runoff (Iluka, 2022). However, this additional clearing is relatively small to the extent of the greater Eneabba mine site, and any bare areas will be rehabilitated. The proposed clearing is unlikely to cause appreciable land degradation.</p>	<p>Not likely to be at variance</p> <p>as per CPS 6915/4</p>	No
<p>Principle (i): <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.”</i></p> <p>Assessment: There are no watercourses or wetlands within the area proposed to clear (GIS Database). The proposed clearing is unlikely to result in significant changes to surface water flows.</p> <p>There are no Public Drinking Water Source Areas within or in close proximity to the application area (GIS Database). The proposed clearing is unlikely to cause deterioration in the quality of underground water.</p>	<p>Not likely to be at variance</p> <p>as per CPS 6915/4</p>	No
<p>Principle (j): <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</i></p> <p>Assessment: Rehabilitating and ground contouring the amendment area is part of the proposed clearing. This amendment will allow for the development of a water diversion channel to avoid water erosion of rehabilitated areas (Iluka, 2022).</p> <p>Given no water courses or wetlands are recorded within the amendment area, the proposed clearing is unlikely to contribute to waterlogging.</p>	<p>Not likely to be at variance</p> <p>as per CPS 6915/4</p>	No

Appendix E. Vegetation condition rating scale

Vegetation condition is a rating given to a defined area of vegetation to categorise and rank disturbance related to human activities. The rating refers to the degree of change in the vegetation structure, density and species present in relation to undisturbed vegetation of the same type. The degree of disturbance impacts upon the vegetation’s ability to regenerate. Disturbance at a site can be a cumulative effect from a number of interacting disturbance types.

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

Measuring vegetation condition for the South West and Interzone Botanical Province (Keighery, 1994)

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species.

Condition	Description
Very good	Vegetation structure altered, with obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and/or grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and/or grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and/or grazing.
Completely degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

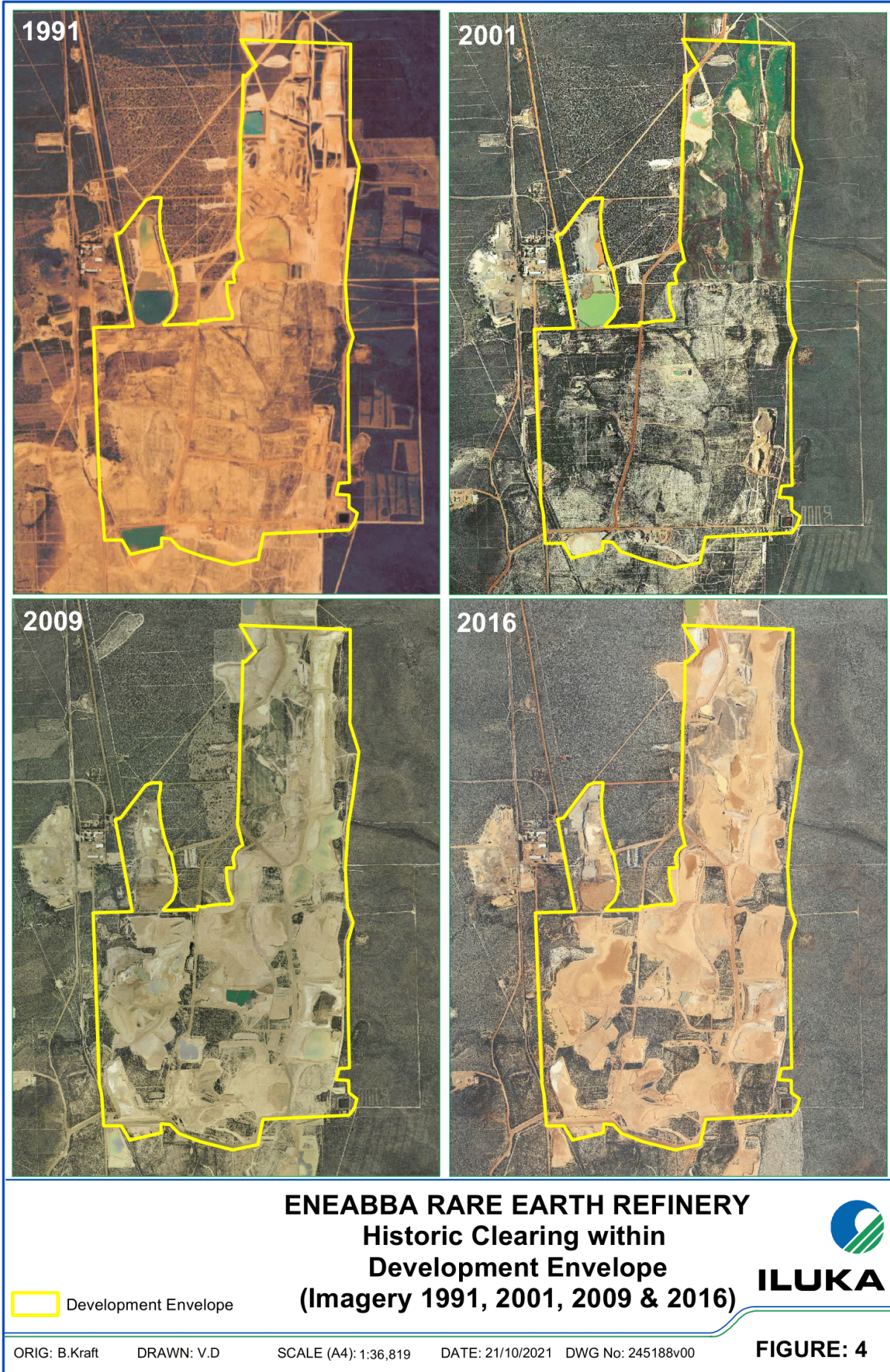


Figure 3. Historical clearing within the greater Eneabba mine site (Iluka, 2021)

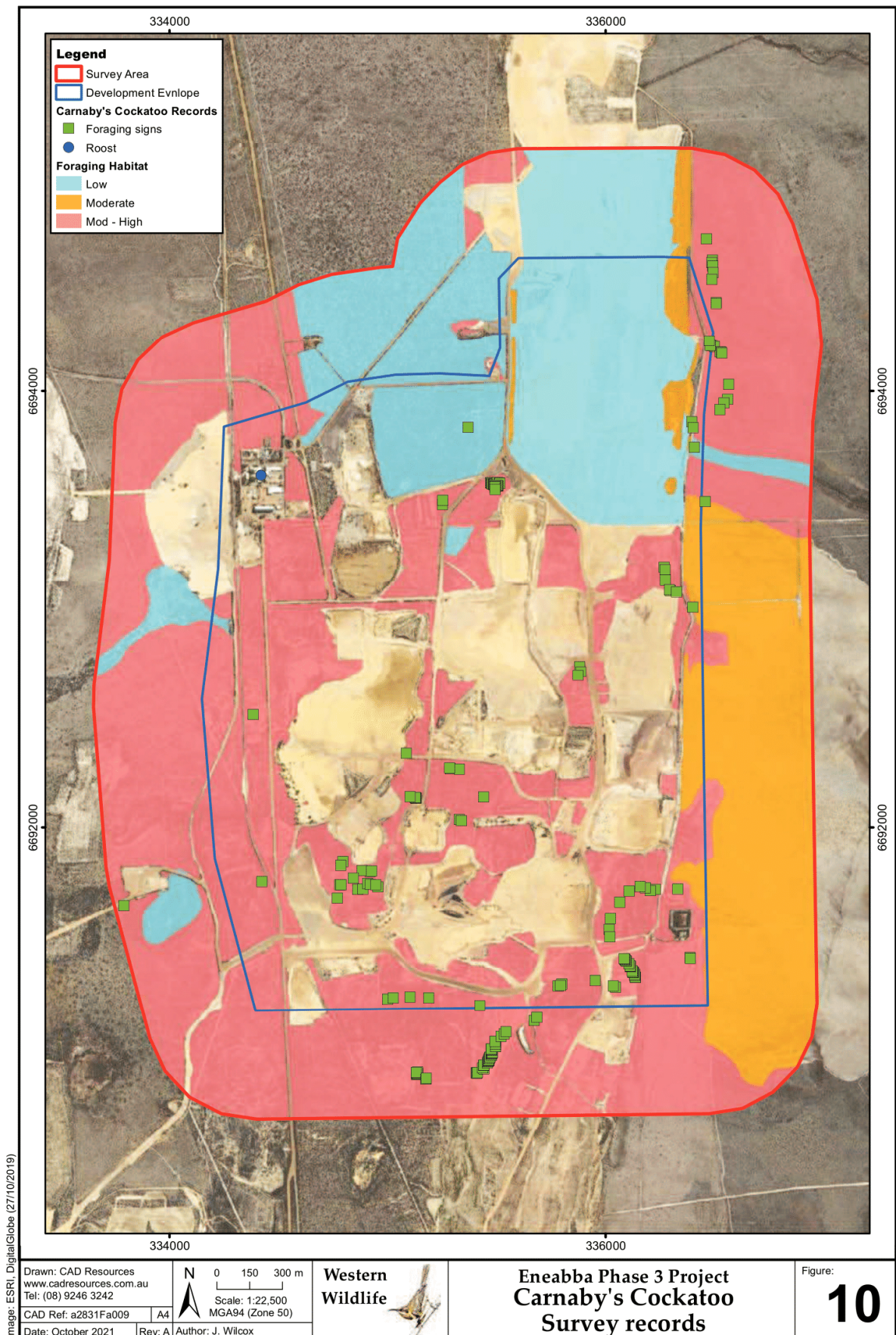


Figure 4. Carnaby's cockatoo records within the survey area (Western Wildlife, 2021).

Appendix G. Sources of information

G.1. GIS databases

Publicly available GIS Databases used (sourced from www.data.wa.gov.au):

- Clearing Regulations – Schedule One Areas (DWER-057)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Environmentally Sensitive Areas (DWER-046)
- Groundwater Salinity Statewide (DWER-026)
- Hydrographic Catchments – Catchments (DWER-028)
- Hydrography – Inland Waters – Waterlines
- Hydrography, Linear (DWER-031)
- IBRA Vegetation Statistics
- Pre-European Vegetation Statistics
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Mapping – Best Available (DPIRD-027)
- Soil Landscape Mapping – Rangelands (DPIRD-064)
- WA Now Aerial Imagery

Restricted GIS Databases used:

- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

G.2. References

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- DPaW (2013) Carnaby's Cockatoo (*Calyptorhynchus latirostris*) Recovery Plan. Department of Parks and Wildlife, October 2013.
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- Environmental Protection Authority (EPA) (2016) Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment. Available from: http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey_Dec13.pdf
- Environmental Protection Authority (EPA) (2020) Technical Guidance – Terrestrial Fauna Surveys. Available from: https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/2020.09.17%20-%20EPA%20Technical%20Guidance%20-%20Vertebrate%20Fauna%20Surveys%20-%20Final.pdf
- 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>
- Iluka (2021) Eneabba Rare Earth Refinery. Referral Supporting Document. Prepared for Iluka Midwest Ltd, by MBS Environmental Consultants, October 2021.
- Iluka (2022) Eneabba Mineral Sands Mine. Application to Amend Native Vegetation Clearing Permit CPS 6915/4 - Supporting Document. Prepared by Iluka Resources Limited, February 2022.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Umwelt (2021) EP3 Study Area – Eneabba. Flora and Vegetation Desktop Assessment. Prepared for MBS Environmental (for Iluka Resources Limited), by Umwelt (Australia) Pty Ltd, August 2021.

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- Western Wildlife (2021) Eneabba Phase 3 Project: Basic Vertebrate Fauna Survey and Cockatoo Habitat Survey 2021. Prepared for Iluka Resources Limited, by Western Wildlife, October 2021.
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- Woodman (2016) Significant Flora Survey. South Mine Rehabilitation Clearing for Final Landform and Drainage. Prepared for Iluka Resources Pty Ltd, by Woodman Environmental, January 2016.

4. Glossary

Acronyms:

BC Act	<i>Biodiversity Conservation Act 2016</i> , 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	<i>Environmental Protection Act 1986</i> , Western Australia
EPA	Environmental Protection Authority, 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
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).

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.
- (c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened 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 the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.