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

Clearing Permit Decision Report

1. Application details and outcomes

1.1. Permit application details

Permit number:	7498/2
Permit type:	Area Permit
Applicant name:	Westralian Iron Pty Ltd
Application received:	10 December 2021
Application area:	0.85 hectares
Purpose of clearing:	Mineral exploration
Method of clearing:	Mechanical Removal
Tenure:	Mining Lease 70/1164
	Mining Lease 70/1190
Location (LGA area/s):	Shire of Morawa
Colloquial name:	Koolanooka South project

1.2. Description of clearing activities

Westralian Iron Pty Ltd proposes to clear up to 0.85 hectares of native vegetation within a boundary of approximately 0.85 hectares, for the purpose of mineral exploration. The project is located approximately 23 kilometres north of Perenjori, within the Shire of Morawa.

Clearing permit CPS 7498/1 was granted by the Department of Mines and Petroleum (now the Department of Mines, Industry Regulation and Safety) on 1 June 2017 and was valid from 24 June 2017 to 30 June 2024. The permit authorised the clearing of up to 0.85 hectares of native vegetation, for the purpose of mineral exploration at the Koolanooka South project.

On 10 December 2021, the Permit Holder applied to amend CPS 7498/1 to extend the period in which additional planting and seeding is required to be undertaken, and to amend the completion criteria for rehabilitation success.

1.3. Decision on application and key considerations

Decision:	Grant
Decision date:	20 December 2022
Decision area:	0.85 hectares of native vegetation

1.4. Reasons for decision

This clearing permit application was made in accordance with section 51E of the *Environmental Protection Act 1986* (EP Act) and was received by the Department of Mines, Industry Regulation and Safety (DMIRS) on 10 December 2021. DMIRS advertised the application for a public comment for a period of 21 days, and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (Appendix B), relevant datasets (Appendix F), supporting information provided by the applicant (Appendix A) including the results of a flora and vegetation survey and monitoring survey (Appendix E), the clearing principles set out in Schedule 5 of the EP Act (Appendix D), proposed avoidance and minimisation measures (Section 3.1), relevant planning instruments and any other matters considered relevant to the assessment (Section 3.3). The Delegated Officer also took into consideration the purpose of the amendment to facilitate further rehabilitation activities within the permit area.

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 amendment is unlikely to lead to result in any significant additional impacts to environmental values.

In amending the conditions of the Permit, the Delegated Officer also considered it appropriate to extend the duration of the permit to 30 June 2026 to allow time for further monitoring of the additional rehabilitation activities as required by Condition 3(d) of the permit.

The assessment has not changed since the assessment for CPS 7498/1, except in the case of principle (e) which has be re-evaluated to be at variance to the principle. The Delegated Officer determined that the proposed clearing and amendment to the rehabilitation condition is not likely to lead to an unacceptable risk to environmental values.

1.5. Site map

A site map of proposed clearing is provided in Figures 1 and 2 below.

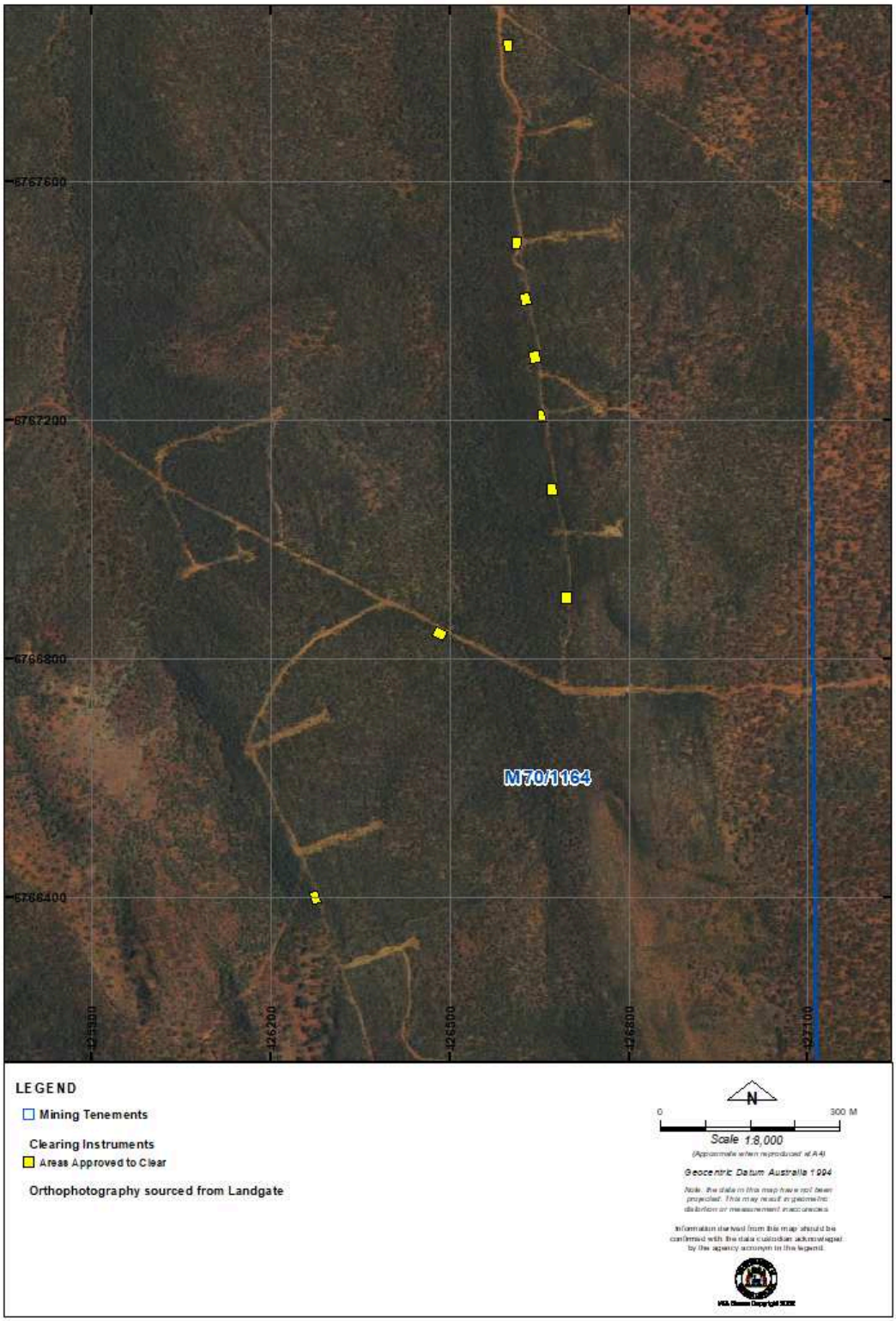

Figure 1. Map of the northern extent of the permit area. The yellow area indicates the area within which conditional authorised clearing can occur under the granted clearing permit.

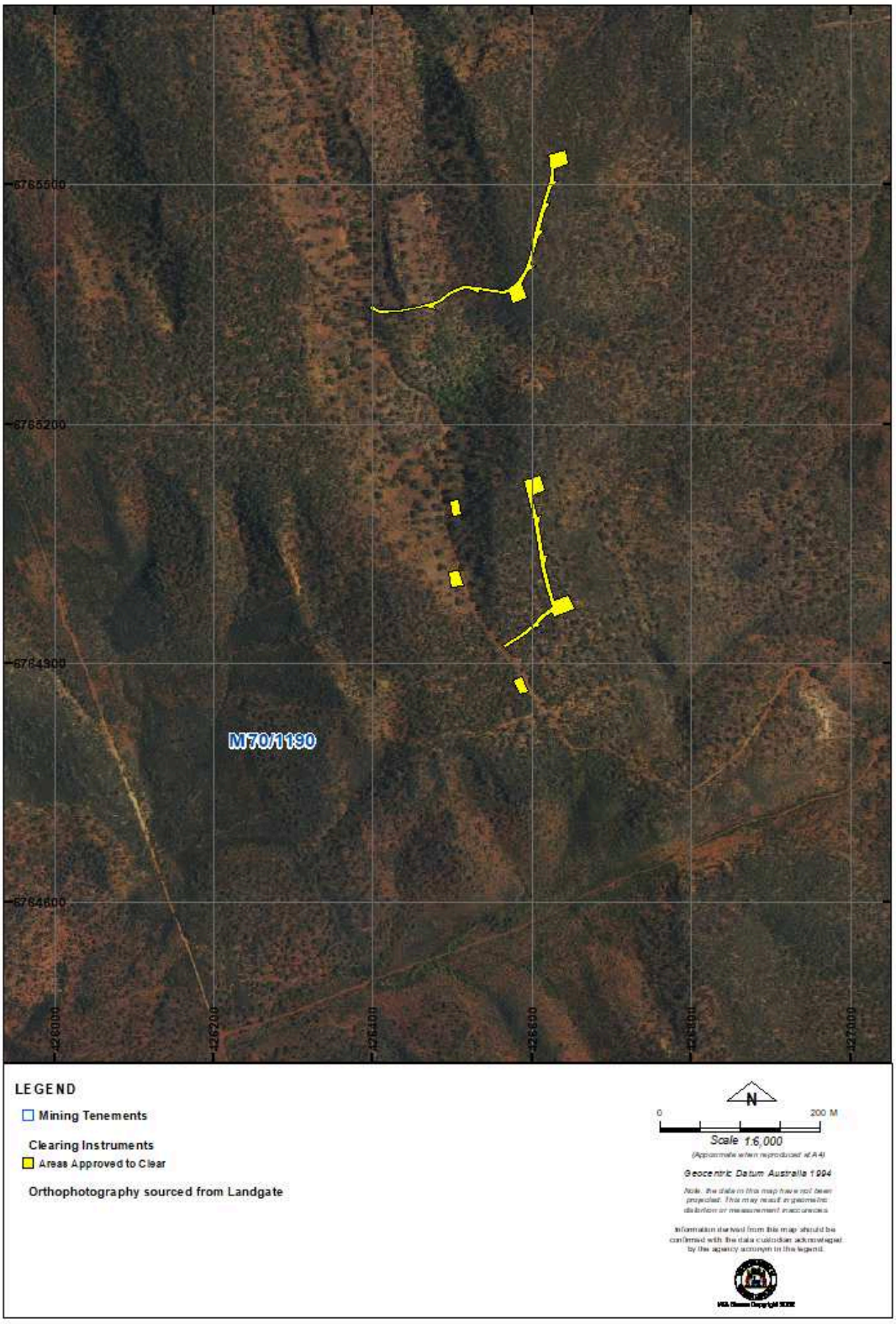

Figure 2. Map of the southern extent of the permit area. The yellow area indicates the area within which conditional authorised clearing can occur under the granted clearing permit.

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)
- *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, 2016)

3. Detailed assessment of application

3.1. Avoidance and mitigation measures

The areas of clearing for exploration were minimised as much as practicable. The majority of the drill pads are located on or adjacent to existing access tracks to minimise the amount of new clearing required. The original clearing permit approved the clearing of 0.85 hectares of which 0.3074 hectares was cleared (Westralian Iron Pty Ltd, 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

Assessment

CPS 7498/1 authorised the clearing of 0.85 hectares with no clearing to be undertaken after 30 June 2019. There was 0.3074 hectares cleared under this permit in August 2017 (Westralian Iron, 2022). Rehabilitation of these areas was undertaken in December 2017 (Westralian Iron Pty Ltd, 2022). Condition 3(c) of the permit requires that:

(c) within 4 years of laying the vegetative material and topsoil on the cleared area in accordance with Condition 3(b) of this Permit:

  (i) engage an *environmental specialist* to determine the species composition, structure and density of the area *revegetated* and *rehabilitated*; and
  (ii) where, in the opinion of an *environmental specialist*, the composition structure and density determined under Condition 3(c)(i) of this Permit will not result in a similar species composition, structure and density to that of pre-clearing vegetation types in that area, *revegetate* the area by deliberately *planting* and/or *direct seeding* native vegetation that will result in a similar species composition, structure and density of native vegetation to pre-clearing vegetation types in that area and ensuring only *local provenance* seeds and propagating material are used.

Monitoring of the rehabilitation was undertaken by Focused Vision Consulting in September 2021. Monitoring data was collected at 19 plots within rehabilitation areas and eight plots in uncleared reference areas of vegetation (Focused Vision Consulting, 2021). The following criteria were assessed to determine whether the area contained a similar composition, structure and density of reference sites (Focused Vision Consulting, 2021):

- Species composition of rehabilitation to be at least 70% similar (suite and richness of species) to that of counterpart reference vegetation.
- Vegetation structure of rehabilitation to match that of counterpart reference vegetation for at least two strata (e.g. upper and mid-strata or upper and ground-strata), one of which shall include the upper-most stratum.
- Vegetation density of rehabilitation to be at least 70% as dense (based on total percentage foliage cover) as in counterpart reference vegetation.

In terms of species richness, the monitoring found that 14 of the 19 rehabilitation plots were greater than the mean number of species recorded within reference sites from the corresponding vegetation unit (Focused Vision Consulting, 2021). There was a correlation between lower numbers of species recorded and areas which were not ripped. Whilst the majority of the plots were achieving high levels of species richness, when the species similarity was compared the results were much lower. The greatest average similarity for a vegetation type was 31.6% and the lowest average was 8.9%. This indicates that the rehabilitated areas are likely to be colonised by species which favour disturbed areas before being replaced in the community by other species as the vegetation matures over time.

The majority of the rehabilitation plots were not meeting the requirement for vegetation structure, with only 9 of the plots somewhat meeting the criterion (two strata comparable to reference plots). There was one plot which was found to have upper, mid and ground strata with heights and densities comparable to reference plots. Success for achieving density targets was also low with only two of the plots exceeding 70% of the density of reference plots (Focused Vision Consulting, 2021).

Westralian Iron has developed a rehabilitation plan to meet the required targets and undertake additional measures as required by Condition 3(c)(ii). Seed collection commenced in November 2021 and is scheduled to continue until December 2022 (Focused Vision Consulting, 2022). If seed is available, propagation of some species (such and Eucalypt and Melaleuca species) will be undertaken (Focused Vision Consulting, 2022). Given the poor results in unripped areas, ripping of these areas

to loosen soil compaction is planned for Autumn 2023. Planting and direct seeding is also proposed following the first substantial rains in Autumn 2023 (Focused Vision Consulting, 2022).

As the original rehabilitation activities were undertaken in December 2017, the proposed additional rehabilitation activities would not be completed within 4 years (December 2021) as required by Condition 3(c). Westralian Iron have requested that the permit is amended to extend this date to allow time for the additional works to be completed. Based on the proposed schedule in the rehabilitation plan, the condition will be amended to be 6 years (December 2023) to allow for the completion of the rehabilitation activities. The duration of the permit will also subsequently be amended to 30 June 2026 to allow for further monitoring of the rehabilitation to be undertaken as required by Condition 3(d).

Based on the current monitoring results, Westralian Iron considers that it is not practically achievable to meet the outcome stated in Condition 3(c)(ii) of rehabilitation resulting in vegetation that has a similar species composition, density and structure to areas of uncleared vegetation. Westralian Iron are proposing to use a target of 70% of the values for uncleared areas of vegetation. This is consistent with target set in the conditions of Ministerial Statement 811 which also impacts the 'Plant Assemblages of the Koolanooka System' Threatened Ecological Community (TEC) (EPA, 2009).

As part of rehabilitation works associated with Ministerial Statement 811, Kings Park Science and the University of Western Australia were engaged to assist in rehabilitation trials. Amongst other aims, the trials proposed to determine the optimal method to return individual plants to the landscape and develop an assessment protocol to compare restoration achievements against expected regulatory outcomes (Elliott et al., 2022). Trials were undertaken to investigate the most cost-effective method of returning species (natural dispersal versus direct seeding or planted tubestock) and methods for optimising topsoil (Elliot et al., 2022). A trial area of 0.86 hectares was installed in a previously cleared area of the TEC (Elliot et al., 2022). Monitoring of the trial site 20 months after installation found that the rehabilitation achieved 60% of the total species and <52% of composition similarity (Elliott et al., 2022). Although the trial may potentially meet targets in the future, it does highlight the difficulty in achieving successful rehabilitation within the TEC. The study also highlighted that differences in composition between rehabilitation and control sites was driven by the presence of cryptic species of annual and perennial herbs which are more generally associated with colonising areas of disturbance but are generally not present in more mature communities (Elliott et al., 2022). Therefore, longer timeframes may be needed when measuring the success of rehabilitation returning to a similar composition of species to natural vegetation.

Conclusion

Based on the results of monitoring undertaken in September 2021, the rehabilitation of the cleared areas is not likely to result in similar vegetation to surrounding uncleared areas. Westralian Iron has commenced activities collecting seed and propagating seedlings for additional planting. Given further rehabilitation activities are being progressed, it is not considered unreasonable to extend the duration of the additional rehabilitation requirements to December 2023.

Rehabilitation activities within the 'Plant Assemblages of the Koolanooka System' TEC for both this permit and other mining projects have shown that it is difficult to recreate diverse ecological communities in this area. Whilst it is preferable to have a greater level of success that 70%, even this target may not be achievable within the timeframes conditioned on the permit (DBCA, 2022). However, it is hoped that additional ripping, planting and seeding along with natural recruitment will be able to improve the current rehabilitation success and achieve this target.

Conditions

As requested, the following conditions will be amended on the clearing permit:

- Condition 3(c)(ii) to extend the timeframe to complete all rehabilitation activities to 6 years; and
- Condition 3(c)(ii) to amend the measure of success to 70% similarity of the species composition, structure and density to that of pre-clearing vegetation types in the area.

3.3. Relevant planning instruments and other matters

The clearing permit amendment application was advertised on 21 December 2021 by the Department of Mines, Industry Regulation and Safety inviting submissions from the public. No submissions were received in relation to this application.

There is one native title claim 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 is one registered Aboriginal Site 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.

Part of the application area falls within an area related to EPA assessment 1953 which was being assessed at a Public Environmental Review level. This assessment was terminated by the EPA on 22 March 2017 at the request of Westralian Iron (EPA, 2017).

Other relevant authorisations required for the proposed land use include:

- A Programme of Work 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.

End

Appendix A. Additional information provided by applicant

Summary of comments	Consideration of comment
The applicant provided a copy of the environmental specialists report in relation to monitoring undertaken of the rehabilitation as per condition 3(c)(ii) of the permit.	The data and analysis of how successful the rehabilitation has been was considered in the assessment of amending the completion criteria stated in the conditions of the permit.
The applicant provided a copy of a rehabilitation plan for additional rehabilitation works within the permit area.	The proposed activities and scheduling of these activities was considered in the assessment of amending the permit conditions.

Appendix B. Site characteristics

B.1. Site characteristics

Characteristic	Details
Local context	The area proposed to be cleared is part of a large (approximately 3,324 hectares) patch of native vegetation in the intensive land use zone of Western Australia. It is located within the centre of the remnant and is surrounded by vegetation. Spatial data indicates the local area (10 kilometre radius from the centre of the area proposed to be cleared) retains approximately 50.4 per cent of the original native vegetation cover (GIS Database).
Ecological linkage	The larger remnant which the application area is located within is likely to act as an ecological linkage at a landscape level.
Conservation areas	The closest conservation area to the application area is the former Kadji Kadji pastoral lease which is located approximately 9.2 kilometres north of the application area (GIS Database).
Vegetation description	The vegetation of the application area is broadly mapped as the following Beard vegetation association (GIS Database): 693: Mosaic: Low woodland: *Allocasuarina huegeliana* over mallee and Acacia scrub / *Allocasuarina campestris* thicket. The greater Koolanooka South Magnetite Project was surveyed by Ecologia in September 2013 and October 2014. The following vegetation units were identified within the application area (Ecologia, 2015): AaAaAnn: *Acacia acuminata* open shrubland; AaPoAe: Acacia sparse shrubland; AaGpHe: *Allocasuarina acutivalvis* open woodland; AcAahAcc: *Aluta aspera* subsp. *hesperia* open shrubland; EeAaEc: *Eucalyptus ebbanoensis* sparse woodland; ElsAaPo: *Eucalyptus loxophleba* subsp. *supralaevis* open woodland; and AaAaMn: Melaleuca sparse shrubland.
Vegetation condition	The vegetation survey (Ecologia, 2015) indicates the vegetation within the proposed clearing area is in pristine to very good condition (Keighery, 1994). The full Keighery (1994) condition rating scale is provided in Appendix D.
Climate and landform	The application area is located on a banded ironstone range and varies in elevation from 350 to 430 metres AHD (GIS Database). The annual average rainfall (Morawa Airport) is 286.6 millimetres (BoM, 2022).
Soil description	The soils within the application area have been mapped as 270Ko_1 which is described as crests and slopes of steep low hills; rock and rocky soils with sandy loam matrix with loamy earths and duplexes on lower slopes (DPRID, 2022).
Land degradation risk	The application area does not have a high risk of flooding, water erosion, wind erosion or phosphorus export (DPIRD, 2022).

Characteristic	Details
Waterbodies	There are no watercourses or wetlands within the application area (GIS Database).
Hydrogeography	The application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The groundwater salinity within the application area is between 7,000 and 14,000 milligrams per litre of Total Dissolved Solids (TDS) (GIS Database). This is considered to be saline.
Flora	There are records of three threatened flora and 29 priority flora species within 20 kilometres of the application area (GIS Database). A flora survey which cover the application and surrounding area recorded 15 species of priority flora, two of which are found within the application area; *Acacia muriculata* and *Dodonaea scurra* (Ecologia, 2015)
Ecological communities	The application area is located within the 'Plant Assemblages of the Koolanooka System' Threatened Ecological Community (GIS Database).
Fauna	There are records of eight fauna of conservation significance within the local area (surrounding 20 kilometres) (GIS Database). The records in the area are dominated by two species with over 70% of the records are of malleefowl (*Leipoa ocellata*) with another 15% of the records being western-spiny tailed skink (*Egernia stokesii badia*).

B.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 – Avon Wheatbelt	9,517,109	1,761,187	18.51	174,981	1.84
IBRA Subregion – Merriden	6,524,180	1,367,565	20.96	126,805	1.94
Local Government – Shire of Morawa	351,034	110,786	31.56	46,296	13.19
Beard vegetation associations - State					
693	4,396	3,157	~71.8	0	0
Beard vegetation associations - Bioregion					
693	4,396	3,157	~71.8	0	0
Beard vegetation associations - subregion					
693	4,396	3,157	~71.8	0	0

Government of Western Australia (2019)

Appendix C. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment: The vegetation survey of the application area identified seven different vegetation associations within the application area (Ecologia, 2015). Part of the application area is located in areas on and adjacent to existing tracks (GIS Database). The remainder	May be at variance (as per CPS 7498/1)	No

Assessment against the clearing principles	Variance level	Is further consideration required?
of the clearing is within previously uncleared areas that are in 'Pristine' and 'Excellent' condition (Keighery, 1994; Westralian Iron, 2017; GIS Database). All of the vegetation units within the application area are representative of the 'Plant Assemblages of the Koolanooka System' Threatened Ecological Community (TEC) (Ecologia, 2015; GIS Database). The TEC supports a large number of endemic or near endemic flora species. Whilst the proposed clearing of 0.85 hectares is only a small portion of the TEC, the proposed clearing is located within the centre of the TEC and contributes to the cumulative impacts on the TEC that result in the continued decline in condition as a result of weed introduction and spread, altered hydrology and soil degradation (DPaW, 2017). The flora survey of the greater Koolanooka South Magnetite Project recorded a total of 325 plant taxa from 164 families and 59 genera (Ecologia, 2015). The species richness of quadrats varied across the survey from nine to 43 species, with an average of 15 species across all quadrats (Ecologia, 2015). There were 15 species of Priority flora recorded within the larger flora survey, of which two species are located within the application area; *Acacia muriculata* and *Dodonaea scurra* (Ecologia, 2015). Both of these flora species are listed as Priority 1 (Western Australian Herbarium, 1998-). The survey recorded approximately 4,475 *Acacia muriculata* individuals and approximately 28,655 *Dodonaea scurra* individuals (Ecologia, 2015). There were three and 12 individuals recorded within the application area respectively (Westralian Iron, 2017). Both of these species are considered endemic to the Koolanooka and Perenjori Hills, however, the proposed clearing is not likely to have a significant impact on the conservation of these species (DPaW, 2017). Given the small size of the proposed clearing (0.85 hectares), the application area is not likely to support a high level of faunal species diversity.		
Principle (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."* Assessment: A fauna survey of the greater Koolanooka South project area identified the following three fauna habitats within the application area (Biologic, 2014): - Acacia shrublands on undulating plains - Crest/slope - Rocky gully The vegetation in the Acacia shrublands on undulating plains habitat is sparse and open (Biologic, 2014). This habitat was present in the north of the application area. The Crest/slope habitat is topographically complex and contains scattered small rocky outcrops and shallow drainage lines that traverse the habitat (Biologic, 2014). This was the most common habitat within the application area. The rocky gullies have the potential to contain caves and rock pools. The vegetation can be dense and complex in areas of soil deposition or sparse and simple where erosion has occurred (Biologic, 2014). There is a small portion of this habitat in the south of the application area. This habitat was considered to be of importance as it provides potential habitat for several conservation significant fauna species (Biologic, 2014). Whilst this habitat may be significant, the small amount of clearing within this habitat is not likely to have a significant impact on fauna species. The Malleefowl (*Leipoa ocellata* – Vulnerable) is known to occur in the surrounding areas with numerous records of Malleefowl within close proximity of the application area (GIS Database). The fauna survey recorded a total of 44 Malleefowl mounds (Biologic, 2014). Of these mounds, eight were considered to be recently active and the others ranged in age from moderately old to ancient (Biologic, 2014). None of the mounds were located within the application area, however, the majority of the mounds are located within 200 metres of the application area (Biologic, 2014). The application area does contain habitat suitable for breeding and foraging (Biologic, 2014). The application area is situated within a large remnant of vegetation (over 3,000 hectares) that is surrounded by cleared agricultural land which is therefore important in the landscape (GIS Database). Habitat fragmentation plays a significant factor in the decline of this species as they are particularly sensitive to grazing by sheep and other introduced herbivores (Benshemesh, 2007). Whilst there is only a small amount	May be at variance (as per CPS 7498/1)	No

Assessment against the clearing principles	Variance level	Is further consideration required?
of clearing proposed (0.85 hectares), the location of the clearing within the centre of the remnant will contribute to further cumulative impacts to the fauna habitat values of this remnant.		
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: According to available databases, there are no records of any Threatened flora species within the application area (GIS Database). There are several Threatened flora species that are known to occur within 20 kilometres of the application area (GIS Database). The flora survey did not record any Threatened flora species within the application area (Ecologia, 2015).	Not likely to be at variance (as per CPS 7498/1)	No
Principle (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."* Assessment: The application area is located within the 'Plant Assemblages of the Koolanooka System' Threatened Ecological Community (TEC) (Ecologia, 2015; GIS Database). The TEC is comprised of a series of plant communities found on the Koolanooka Hills, its footslopes and the Perenjori Hills (CALM, 2000). All of the vegetation units within the application area are considered to represent elements of this TEC (Ecologia, 2015). The impact to each vegetation unit ranges from 0.198 hectares of the EeAaEc unit to 0.027 hectares of the AaAaMn unit (Westralian Iron Pty Ltd, 2017). Threats to this TEC include mining activities, grazing, clearing, weed invasion and inappropriate fire regimes (CALM, 2000). Cumulative impacts from these threatening processes are causing a decline in the condition of the TEC. The proposed clearing will use existing tracks where possible however, the majority of the application area is located in previously uncleared areas (GIS Database). Whilst the proposed clearing will impact on a small percentage of the TEC, this should not be considered in isolation, as cumulative impacts on the TEC all contribute towards the continued decline of the condition of the TEC (DPaW, 2017). Given the location of the application area within the centre of the TEC, the proposed clearing has the potential to increase threatening processes within areas of the TEC that are in 'Pristine' and 'Excellent' condition (Ecologia, 2015; GIS Database). The proposed clearing is likely to impact on the long term conservation of the Plant Assemblages of the Koolanooka System TEC through the increase in cumulative impacts (DPaW, 2017; EPA, 2017). Potential impacts from the clearing may be minimised through the implementation of weed management and rehabilitation conditions.	At variance (as per CPS 7498/1)	No
Environmental value: significant remnant vegetation and conservation areas		
Principle (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."* Assessment: The application area falls within the Avon Wheatbelt Biogeographic Regionalisation of Australia bioregion in which approximately 18.51% of the pre-European vegetation remains (see table) (Government of Western Australia, 2019; GIS Database). The vegetation of the application area has been mapped as Beard vegetation association 693. Beard vegetation association 693 is still well represented with over 70% remaining at a state and bioregional level (Government of Western Australia, 2019). Whilst this vegetation association has over 70% remaining, there is only approximately 3,000 hectares remaining (see table) and it is restricted to the Koolanooka Hills area (GIS Database). There is none of this vegetation association within conservation reserves (Government of Western Australia, 2019). The Avon Wheatbelt Bioregion and Merriden subregion are both below 25% of their pre-European vegetation extent and have been extensively cleared. Aerial imagery indicates that the local area has been extensively cleared for agriculture and the application area lies within a large remnant of vegetation (over 3,000 hectares) (GIS	At variance (changed from CPS 7498/1)	No

Assessment against the clearing principles	Variance level	Is further consideration required?
Database). Given the restricted nature of vegetation association 693, it is more vulnerable to impacts from clearing. Whilst the clearing of 0.85 hectares of vegetation will not significantly reduce remaining extent of the remnant vegetation, its location within the centre of the remnant within previously uncleared areas may contribute to the continued decline of the condition of the remnant. Impacts to the remnant may be minimised by the use of existing tracks where possible and rehabilitation of areas following clearing.		
Principle (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."* Assessment: The closest conservation area to the application area is the former Kadji Kadji pastoral lease which is located approximately 9.2 kilometres north of the application area and is managed by DPaW (GIS Database). Given the distance to this area and the small scale of the proposed clearing (0.85 hectares), it is not likely that the proposed clearing will impact on this conservation area or any ecological linkages between conservation areas in the local area (GIS Database).	Not likely to be at variance (as per CPS 7498/1)	No
Environmental value: land and water resources		
Principle (f): *"Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."* Assessment: There are no watercourses or wetlands within the application area (GIS Database). None of the vegetation units identified during the flora survey are associated with a watercourse (Ecologia, 2015).	Not at variance (as per CPS 7498/1)	No
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: The soils within the application area have been described as ranges and their slopes on granites, gneisses, and allied rocks: chief soils seem to be ironstone gravels with earthy and sandy matrices (Northcote et al., 1960-68; GIS Database). These soil types are said to be moderately permeable and have a low to moderate wind erodability (Schoknecht, 2002). Therefore, the likelihood of erosion during normal rainfall events is low. Given the small scale of the proposed clearing (0.85 hectares), it is not likely to contribute to appreciable land degradation.	Not likely to be at variance (as per CPS 7498/1)	No
Principle (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."* Assessment: There are no watercourses or wetlands within the application area (GIS Database). The average annual rainfall is 286.6 millimetres and the average annual evaporation rate is 2,800 millimetres (BoM, 2022). During normal rainfall events it would be expected that any surface water would evaporate quickly. The application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The groundwater salinity within the application area is between 7,000 and 14,000 milligrams per litre of Total Dissolved Solids (TDS) (GIS Database). This is considered to be saline. Given the small scale of the clearing (0.85 hectares), the proposed clearing is not likely to cause the groundwater quality to deteriorate any further.	Not likely to be at variance (as per CPS 7498/1)	No

Assessment against the clearing principles	Variance level	Is further consideration required?
Principle (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."* Assessment: There are no watercourses within the application area (GIS Database). Given the proposed clearing is for a number of small areas (no greater than 0.26 hectares) surrounded by existing vegetation, the proposed clearing is unlikely to increase or exacerbate flooding in the local area.	Not likely to be at variance (as per CPS 7498/1)	No

Appendix D. 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.
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.

Appendix E. Vegetation monitoring survey excerpts

Plate 1: Example of rehabilitation within Acacia/Grevillea sparse shrubland community.

Plate 2: Example of rehabilitation within the Acacia sparse shrubland community.

Plate 3: Example of rehabilitation within Eucalyptus open woodland community.

Appendix F. Sources of information

F.1. GIS databases

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

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Aboriginal Heritage Places (DPLH-001)
- Contours (DPIRD-073)
- 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)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography, Linear (DWER-031)
- IBRA Vegetation Statistics
- Native Title (ILUA) (LGATE-067)
- Pre-European Vegetation Statistics
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- 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)

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4. Glossary

Acronyms:

BC Act	*Biodiversity Conservation Act 2016,* Western Australia
BoM	Bureau of Meteorology, Australian Government

DAA	Department of Aboriginal Affairs, Western Australia (now DPLH)
DAFWA	Department of Agriculture and Food, Western Australia (now DPIRD)
DAWE	Department of Agriculture, Water and the Environment, Australian Government
DBCA	Department of Biodiversity, Conservation and Attractions, Western Australia
DER	Department of Environment Regulation, Western Australia (now DWER)
DMIRS	Department of Mines, Industry Regulation and Safety, Western Australia
DMP	Department of Mines and Petroleum, Western Australia (now DMIRS)
DoEE	Department of the Environment and Energy (now DAWE)
DoW	Department of Water, Western Australia (now DWER)
DPaW	Department of Parks and Wildlife, Western Australia (now DBCA)
DPIRD	Department of Primary Industries and Regional Development, Western Australia
DPLH	Department of Planning, Lands and Heritage, Western Australia
DRF	Declared Rare Flora (now known as Threatened Flora)
DWER	Department of Water and Environmental Regulation, Western Australia
EP Act	*Environmental Protection Act 1986*, Western Australia
EPA	Environmental Protection Authority, Western Australia
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
PEC	Priority Ecological Community, Western Australia
RIWI Act	*Rights in Water and Irrigation Act 1914*, Western Australia
TEC	Threatened Ecological Community

Definitions:

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

T **Threatened species:**

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

Threatened fauna is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.

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

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

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

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

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

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

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

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

Extinct Species:

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

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

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

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

Specially protected species:

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

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

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

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

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

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

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

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

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

P **Priority species:**

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

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

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

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

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

P3 **Priority Three - Poorly-known species**
Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

P4 **Priority Four - Rare, Near Threatened and other species in need of monitoring**
(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.
(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.
(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

Principles for clearing native vegetation:

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

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

(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.