



Clearing Permit Decision Report

1. Application details and outcomes

1.1. Permit application details

Permit number:	10001/1
Permit type:	Purpose Permit
Applicant name:	Northern Star Resources Limited
Application received:	8 December 2022
Application area:	260 hectares
Purpose of clearing:	Mineral Production, Solar Farm, and Associated Activities
Method of clearing:	Mechanical Removal
Tenure:	Mining Leases 53/191, 53/412, 53/413, 53/414, 53/552 General Purpose Lease 53/20
Location (LGA area):	Shire of Wiluna
Colloquial name:	Jundee Project

1.2. Description of clearing activities

Northern Star Resources Limited proposes to clear up to 260 hectares of native vegetation within a boundary of approximately 361 hectares, for the purpose of mineral production and associated activities (Northern Star Resources, 2022). The project is located approximately 40 kilometres north-east of Wiluna, within the Shire of Wiluna (GIS Database).

The application is to support the waste rock landform (WRL) as previous clearing was managed utilising a clearing exemption (Northern Star Resources, 2022). The clearing will also allow for the development of the renewable energy regeneration project, core yard and buffer for future (Northern Star Resources, 2022).

1.3. Decision on application and key considerations

Decision:	Grant
Decision date:	18 May 2023
Decision area:	260 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 8 December 2022. 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 E), supporting information provided by the applicant (Appendix A), 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 assessment identified that the proposed clearing may result in:

- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values; and
- the potential land degradation in the form of wind erosion.

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 is unlikely to lead to long-term adverse impacts on environmental values.

The Delegated Officer decided to grant a clearing permit 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
- staged clearing to minimise land degradation.

1.5. Site map

A site map of proposed clearing is provided in Figure 1 below.

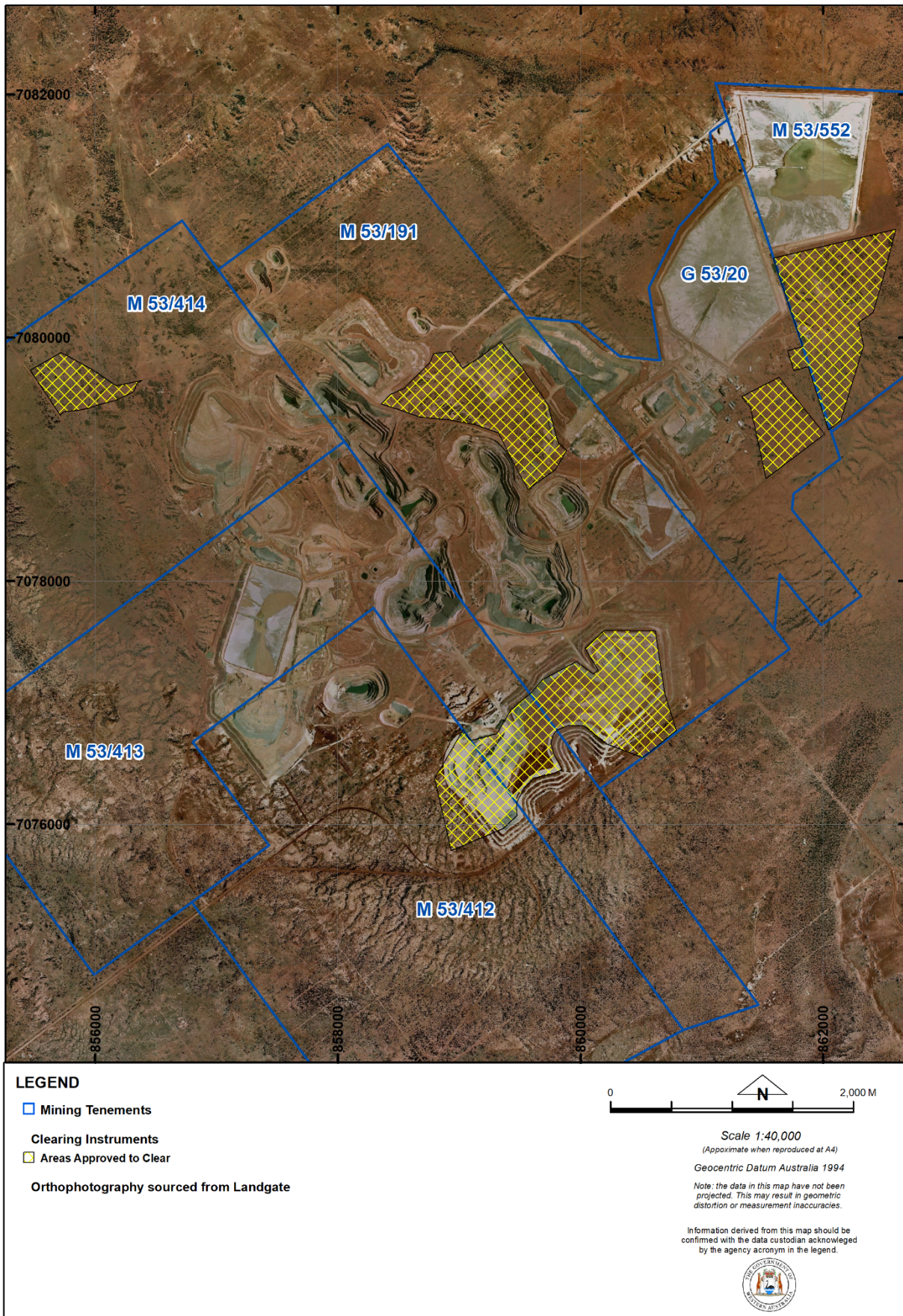


Figure 1. Map of the application area. The yellow area indicates the area within which conditional authorised clearing can occur under the granted clearing permit.

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)
- *Conservation and Land Management Act 1984* (WA) (CALM 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 2014)
- *Procedure: Native vegetation clearing permits* (DWER, October 2021)
- 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 applicant has advised that Northern Star do not intend to clear the total clearing permit footprint and have internal processes to review internal clearing applications to minimise disturbance (Northern Star Resources, 2022). Prior to ground disturbance, design evaluation is conducted to identify areas for avoiding and/or minimising native vegetation disturbance (Northern Star Resources, 2022). In addition, previously disturbed tracks will be utilised where feasible and buffers have been incorporated to ensure clearing will be contained to the permitted area and minimise the likelihood of applying for another clearing permit amendment (Northern Star Resources, 2022).

The applicant has demonstrated that reasonable efforts have been taken to avoid and minimise potential impacts of the clearing on environmental values.

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix B) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

The assessment against the clearing principles identified that the impacts of the proposed clearing present a risk to biological values (fauna and flora). 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 Principles (a)

Assessment

The application area is located within the Eastern Murchison subregion of the Murchison Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). The Eastern Murchison subregion is characterised by internal drainage and extensive areas of elevated red desert sandplains with minimal dune development (CALM, 2002). Vegetation of the subregion is dominated by Mulga woodlands (often rich in ephemerals), hummock grasslands, saltbush shrublands and *Tecticornia* shrublands (CALM, 2002). Pastoral grazing occurs over a vast majority of the subregion, and consequently, much of the subregion has been severely degraded by feral herbivores. Mining for gold and nickel in the region is considerable, with most mining tenements occurring on pastoral land (CALM, 2002).

Two flora and vegetation survey have been conducted over the adjacent areas by Botanica Consulting during March and April, 2020. Five vegetation types were identified within the survey area and can be assumed to occur within the application area, with the major vegetation groups being made up of *Acacia* forests and woodlands (Botanica Consulting, 2020a; 2020b). These vegetation communities are common and widespread in the region (Botanica Consulting, 2020a; 2020b).

No Threatened or Priority flora or Threatened or Priority Ecological Communities have been identified within the application area (Botanica Consulting, 2020a; 2020b). The following two Priority flora species may potentially occur within the application area:

Aristida jerichoensis var. *subspinulifera*, Priority 3, is a compactly tufted perennial, grass-like or herb, 0.3-0.8 metres high which can be found inhabiting hardpan plains (Western Australian Herbarium, 1998-). This species has been recorded from 45 locations within the Central Ranges, Gascoyne, Murchison and Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) regions (Western Australian Herbarium, 1998-). *Aristida jerichoensis* var. *subspinulifera* has been recorded within five kilometres of the application area, however the flora and vegetation survey did not identify any individuals of this species within the survey area (Botanica Consulting, 2020a; 2020b). The survey area did not encompass the entire application area, and therefore this species may potentially occur. The habitat present within the application area are well represented in surrounding areas and the application area is not

considered significant to this species, therefore the proposed clearing will not likely have a significant impact on the species.

Ptilotus luteolus, Priority 3, is a shrub or perennial herb that can be found inhabiting rocky slopes, screes, and ridges (Western Australian Herbarium, 1998-). The species has been recorded from 18 locations from the Carnarvon, Gascoyne and Murchison IBRA regions (Western Australian Herbarium, 1998-). This species has been recorded within 40 kilometres of the application area, however the flora and vegetation survey did not identify any individuals of this species within the survey area (Botanica Consulting, 2020a; 202b). The survey area did not encompass the entire application area, and therefore this species may potentially occur. The habitat present within the application area are well represented in surrounding areas and the application area is not considered significant to this species, therefore the proposed clearing will not likely have a significant impact on the species.

Two introduced flora species were recorded within the survey area (Botanica Consulting, 2020a; 2020b). Weeds have the potential to alter the biodiversity of an area, competing with native vegetation for available resources and making areas more fire prone. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

From a faunal perspective, four habitat types common to the region were recorded from the proposed clearing area (Botanica Consulting, 2020a; 202b). Species richness and abundance is likely to be similar (or potentially worse due to the disturbed nature of the local area) to other areas in the region (Botanica Consulting, 2020a; 202b; GIS Database).

The vegetation associations, fauna habitats and landform types present within the application area, are well represented in surrounding areas (Botanica Consulting, 2020a; 202b; GIS Database). Much of the surrounding area has been impacted by previous pastoral and current mining activities (Botanica Consulting, 2020a; 202b; GIS Database). The application area is unlikely to represent an area of higher biodiversity than surrounding areas, in either a local or regional context.

Conclusion

For the reasons set out above, it is considered that the impacts of the proposed clearing of priority flora can be managed by taking the steps to avoid and minimise the extent of the clearing.

Conditions

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

- avoid, minimise to reduce the impacts and extent of clearing; and
- take hygiene steps to minimise the risk of the introduction and spread of weeds.

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

Assessment

Two field surveys were carried out during March and April in 2020 (Botanica Consulting, 2020a; 2020b). The following four broad habitat types were identified within the application area:

- Clay-Loam Plain: Acacia Woodland;
- Quartz-Rocky Plain: Acacia Open Woodland/Woodland;
- Rocky Slope: Acacia Woodland; and
- Sand-Loam Plain: Acacia Woodland.

These fauna habitats are common and widespread in the local area and region (Botanica Consulting, 2020a; 2020b; GIS Database).

During the fauna survey, no species of conservation significance were observed (Botanica Consulting, 2020a; 2020b). However, two species of conservation significance have been identified as potentially utilising the application area:

Falco hypoleucos (grey falcon), Vulnerable, is an elusive species endemic to mainland Australia, occurring in arid and semi-arid Australia (DCCEEW, 2023). The species has been recorded in timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined water courses (DCCEEW, 2023). The species has been recorded within 10 kilometres from the application area and may forage within the area, however no suitable breeding habitat was identified within the application area and it is considered unlikely that the proposed clearing would result in a significant impact to this species or its habitat (Botanica Consulting, 2020a; 2020b).

Falco peregrinus (peregrine falcon), Other Specially Protected Species, is one of the most widespread birds in the world and occurs across most of Australia (DCCEEW, 2023). The species inhabits cliffs, coastal habitats, rivers, wooded water courses, lakes and urban environments (DCCEEW, 2023). No individuals were recorded during the survey, however, this species has been recorded within 40 kilometres from the application area, suggesting that they may use the application area as part of a larger home range, however no suitable breeding habitat was identified within the application area and it is considered unlikely that the proposed clearing would result in a significant impact to this species or its habitat (Botanica Consulting, 2020a; 2020b).

Fourteen migratory shorebirds have been recorded within 40 kilometres of the application area (GIS Database). These species prefer muddy edges of shallow fresh or brackish wetlands (Botanica Consulting, 2020a; 2020b; DCCEEW, 2023). As no suitable habitat exists within the application area, these migratory birds are not likely to occur and therefore the proposed clearing will not impact these species.

Conclusion

Based on the above assessment, the proposed clearing will not result in the loss of potential habitat for conservation significant fauna species. For the reasons set out above, it is considered that a fauna management condition is not required.

3.3. Relevant planning instruments and other matters

The clearing permit application was advertised on 6 January 2023 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 (Wiluna (WAD6164/1998) over the area under application (DPLH, 2023). This claim has been registered with the National Native Title Tribunal / 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, 2023). 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 required for the proposed land use include:

- 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.

End

Appendix A. Additional information provided by applicant

Summary of comments	Consideration of comment
IBSA numbers were provided following the permit application submission.	The biological surveys were considered in assessing this clearing permit application.

Appendix B. Site characteristics

B.1. Site characteristics

Characteristic	Details
Local context	The area proposed to be cleared is located approximately 40 kilometres north-east of Wiluna, within the Shire of Wiluna (GIS Database). The area proposed to be cleared is part of expansive tract of native vegetation in the extensive land use zone of Western Australia (GIS Database). The dominant land use within the area includes grazing native pastures, unallocated crown reserves, conservation and mining (Botanica Consulting, 2020a; 2020b).
Ecological linkage	According to available databases, the application area does not contain any known or mapped ecological linkages (GIS Database).
Conservation areas	The application area is not located within a conservation area (GIS Database). The nearest conservation area (Wanjarri Nature Reserve) is located approximately 96 kilometres from the application area (GIS Database).
Vegetation description	<p>The vegetation of the application area is broadly mapped as the following Beard vegetation association: 18: Low woodland; mulga (<i>Acacia aneura</i>) (GIS Database).</p> <p>Two flora and vegetation surveys have been conducted over the adjacent areas by Botanica Consulting during March and April, 2020. The following five vegetation types were recorded within the survey area and can be assumed to occur within the application area based on aerial imagery (Botanica Consulting, 2020a; 2020b; GIS Database):</p> <ul style="list-style-type: none"> • CLP-AFW1: Acacia Forests and Woodland (MVG 6). Low woodland of <i>Acacia incurvaneura</i> over low shrubland of <i>Eremophila forrestii</i> <i>E. margarethae</i> and low tussock grassland of <i>Eragrostis eriopoda</i> on clay-loam plain; • QRP-AOW1: Acacia Open Woodland (MVG 13). Low open woodland of <i>Acacia incurvaneura</i> <i>Hakea lorea</i> over mid open shrubland of <i>Eremophila fraseri</i> and low shrubland of <i>Eremophila margarethae</i> on quartz-rocky plain; • QRP-AFW1: Acacia Forests and Woodland (MVG 6). Low woodland of <i>Acacia incurvaneura</i> over mid open shrubland of <i>Psyrax suaveolens</i> and low open tussock grassland of <i>Eragrostis eriopoda</i> on quartz-rocky plain; • RS-AFW1: Acacia Forests and Woodland (MVG 6). Low woodland of <i>Acacia ayersiana</i> <i>A. incurvaneura</i> over mid open shrubland of <i>Eremophila fraseri</i> <i>E. latrobei</i> and low tussock grassland of <i>Eriachne mucronata</i> on rocky slope; and • SLP-AFW1: Acacia Forests and Woodland (MVG 6). Low woodland of <i>Acacia caesaneura</i> <i>A. incurvaneura</i> over mid open shrubland of <i>Eremophila forrestii</i> and low hummock grassland of <i>Triodia basedowii</i> on sand-loam plain.
Vegetation condition	<p>The vegetation survey (Botanica Consulting, 2020a; 2020b) and aerial imagery indicate the vegetation within the proposed clearing area is in 'Completely Degraded' to 'Very Good' (Trudgen, 1991) condition, described as:</p> <ul style="list-style-type: none"> • Very Good: Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks; • Good: More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds; and • Completely degraded: Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs. <p>The full Trudgen (1991) condition rating scale is provided in Appendix D.</p>
Climate and landform	The climate of the region (Murchison) is arid and experiences an average annual rain fall of 260.4 millilitres (BoM, 2023).
Soil description	The soils of the application area are broadly mapped as the following soil types:

Characteristic	Details
	<ul style="list-style-type: none"> 279Wi: Wiluna system. Low greenstone hills with occasional lateritic breakaways and broad stony slopes, lower saline stony plains and broad drainage tracts; supporting sparse mulga and other acacia shrublands with patches of halophytic shrubs; 279Vi: Violet system. Gently undulating gravelly plains on greenstone, laterite and hardpan, with low stony rises and minor saline plains; supporting groved mulga and bowgada shrublands and occasionally chenopod shrublands; and 279Ju: Jundee system. Hardpan plains with variable gravelly mantles and minor sandy banks supporting weakly groved mulga shrublands (DPIRD, 2023).
Land degradation risk	The application area lies within the Jundee, Violet and Wiluna land systems (GIS Database). These three land systems are not generally susceptible to erosion (Curry et al., 1994).
Waterbodies	The desktop assessment and aerial imagery indicated that there are no watercourses within the application area (GIS Database). There are no Ramsar wetlands or wetlands of national importance (ANCA Wetlands), permanent or ephemeral drainage lines occur within the application area (GIS Database).
Hydrogeography	The application area is not mapped within a proclaimed groundwater area (GIS Database). The proposed area is located within the Murchison Groundwater Area (GIS Database).
Flora	Two flora and vegetation surveys have been conducted over the adjacent areas by Botanica Consulting during March and April, 2020. No threatened or priority flora have been identified within the survey areas (Botanica Consulting, 2020a; 2020b). According to available databases, no threatened flora have been recorded within 40 kilometres of the application area and 10 Priority flora species have been recorded within 40 kilometres (GIS Database).
Ecological communities	The application area is not located within a Threatened Ecological Community (GIS Database). The north-eastern areas of the proposed clearing are located within the buffer zone of the Priority 1 Ecological Community, Jundee Homestead calccrete groundwater assemblage type on Carnegie palaeo drainage on Jundee Station (GIS Database). This community is a unique assemblages of invertebrates that have been identified in the groundwater calcrites (GIS Database).
Fauna	The flora, vegetation and fauna survey that was undertaken across the adjacent areas by Botanica Consulting during March and April 2020 identified four broad scale fauna habitats: <ul style="list-style-type: none"> Clay-Loam Plain: Acacia Woodland; Quartz-Rocky Plain: Acacia Open Woodland/Woodland; Rocky Slope: Acacia Woodland; and Sand-Loam Plain: Acacia Woodland (Botanica Consulting, 2020a; 2020b).

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 -Murchison	28,120,586.77	28,044,823.42	99.73	2,185,987.96	7.77
Beard vegetation associations - State					
Veg Assoc No. 18	19,892,306.46	19,843,148.07	99.75	1,317,179.00	6.62
Beard vegetation associations - Bioregion					
Veg Assoc No. 18	12,403,172.30	12,363,252.47	99.68	614,964.13	4.96

Government of Western Australia (2019)

B.3. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix E.1), and biological survey information, impacts to the following conservation significant flora required further consideration.

Species name	Conservation status	Distance of closest record to application area (km)	Suitable habitat features? [Y/N]	Number of known records (total)
<i>Aristida jerichoensis</i> var. <i>subspinulifera</i>	3	<5	Y	45
<i>Eremophila arguta</i>	1	<40	N	7
<i>Eremophila congesta</i>	1	<40	N	18
<i>Eremophila jamesiorum</i>	2	<40	N	15
<i>Eremophila pungens</i>	4	<40	N	45
<i>Hemigenia exilis</i>	4	<40	N	43
<i>Ptilotus luteolus</i>	3	<40	Y	18
<i>Stackhousia clementii</i>	3	<40	N	21
<i>Tribulus adelacanthus</i>	3	<5	N	18
<i>Xanthoparmelia nashii</i>	3	<40	N	17

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

B.4. Fauna analysis table

Species name	Common Name	Conservation status	Distance of closest record to application area (km)	Suitable habitat features? [Y/N]
<i>Actitis hypoleucos</i>	common sandpiper	MI	<20	N
<i>Apus pacificus</i>	fork-tailed swift	MI	<20	N
<i>Calidris acuminata</i>	sharp-tailed sandpiper	MI	<20	N
<i>Calidris alba</i>	sanderling	MI	<20	N
<i>Calidris melanotos</i>	pectoral sandpiper	MI	<20	N
<i>Calidris ruficollis</i>	red-necked stint	MI	<20	N
<i>Calidris subminuta</i>	long-toed stint	MI	<20	N
<i>Charadrius veredus</i>	oriental plover	MI	<20	N
<i>Falco hypoleucos</i>	grey falcon	VU	<10	Y
<i>Falco peregrinus</i>	peregrine falcon	OS	<40	Y
<i>Gelochelidon nilotica</i>	gull-billed tern	MI	<20	N
<i>Glareola maldivarum</i>	oriental pratincole	MI	<20	N
<i>Plegadis falcinellus</i>	glossy ibis	MI	<20	N
<i>Pluvialis fulva</i>	Pacific golden plover	MI	<20	N
<i>Tringa glareola</i>	wood sandpiper	MI	<20	N
<i>Tringa nebularia</i>	common greenshank, greenshank	MI	<20	N

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

Appendix C. 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> "Native vegetation should not be cleared if it comprises a high level of biodiversity."</p> <p><u>Assessment:</u></p> <p>The vegetation associations, fauna habitats and landform types present within the application area, are well represented in surrounding areas (Botanica, 2020a; 2020b; GIS Database). Much of the surrounding area has been impacted by previous</p>	Not likely to be at variance	Yes Refer to Section 3.2.1, above.

Assessment against the clearing principles	Variance level	Is further consideration required?
pastoral and current mining activities (Botanica, 2020a; 2020b; GIS Database). The application area is unlikely to represent an area of higher biodiversity than surrounding areas, in either a local or regional context.		
<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></p> <p>No significant fauna habitats have been recorded within the application area (GIS Database). Two fauna species of conservation significance may potentially utilise the habitat within the application area, however, the application area is not likely to represent significant habitat for the species (GIS Database).</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.2, above.</i>
<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></p> <p>No threatened or priority flora have been identified within the adjacent survey areas and no threatened flora species have been recorded within 40 kilometres of the application area (Botanica Consulting, 2020a; 2020b; GIS Database). The area proposed to be cleared may contain priority flora species (GIS Database).</p>	Not likely to be at variance	No
<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></p> <p>There are no known Threatened Ecological Communities (TECs) located within the application area (GIS Database).</p>	Not likely to be at variance	No
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 Murchison Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Approximately 99% of the pre-European vegetation still exists in the IBRA Murchison Bioregion (Government of Western Australia, 2019). The application area is broadly mapped as Beard vegetation association 18: Low woodland; mulga (<i>Acacia aneura</i>) (GIS Database). Approximately 99% of the pre-European extent of this vegetation association remains uncleared at both the state and bioregional level (Government of Western Australia, 2019). Therefore, the application area does not represent a significant remnant of native vegetation in an area that has been extensively cleared and is not at variance to this principle.</p>	Not at variance	No
<p><u>Principle (h):</u> <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><u>Assessment:</u></p> <p>Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of nearby conservation areas.</p>	Not likely to be at variance	No
Environmental value: land and water resources		
<p><u>Principle (f):</u> <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><u>Assessment:</u></p> <p>Given no water courses or wetlands are recorded within the application area, the proposed clearing is unlikely to impact on- or off-site hydrology and water quality.</p>	Not at variance	No
<p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u></p> <p>The mapped soils and land systems within the application area are not generally susceptible to erosion, however native vegetation clearing should be staged where</p>	May be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
possible to minimise the area of land exposed to land degradation at any one time and may be minimised by the implementation of a staged clearing condition.		
<p><u>Principle (i):</u> "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."</p> <p><u>Assessment:</u></p> <p>Given no water courses / wetlands / Public Drinking Water Sources Areas are recorded within the application area, the proposed clearing is unlikely to impact surface or ground water quality.</p>	Not likely to be at variance	No
<p><u>Principle (j):</u> "Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding."</p> <p><u>Assessment:</u></p> <p>There are no permanent water courses or waterbodies within the application area (GIS Database). Seasonal drainage lines are common in the region and temporary localised flooding may occur briefly following heavy rainfall events. However, the proposed clearing is unlikely to increase the incidence or intensity of natural flooding events.</p>	Not likely to be at variance	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 Trudgen, M.E. (1991) *Vegetation condition scale* in National Trust (WA) 1993 Urban Bushland Policy. National Trust of Australia (WA), Wildflower Society of WA (Inc.), and the Tree Society (Inc.), Perth.

Measuring vegetation condition for the Eremaean and Northern Botanical Provinces (Trudgen, 1991)

Condition	Description
Excellent	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very good	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor	Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Very poor	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely degraded	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.

Appendix E. Sources of information

E.1. GIS databases

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

- Aboriginal Heritage Places (DPLH-001)
- 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
- Native Title (ILUA) (LGATE-067)
- Pre-European Vegetation Statistics
- Remnant Vegetation, All Areas
- 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)

E.2. References

- Bureau of Meteorology (BoM) (2023) Bureau of Meteorology Website – Climate Data Online, Wiluna Weather Station (#13044). Bureau of Meteorology. <http://www.bom.gov.au/climate/data/> (Accessed 5 April 2023).
- Botanica Consulting (2020a) Reconnaissance Flora/ Vegetation & Fauna Survey Jundee TSF alternative locations. Unpublished report prepared for Northern Star Resources Limited, April 2020.
- Botanica Consulting (2020b) Reconnaissance Flora/ Vegetation & Fauna Survey within M53/191. Unpublished report prepared for Northern Star Resources Limited, June 2020.
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002. Department of Conservation and Land Management, Western Australia.
- Curry, P.J., Payne, A.L., Leighton, K.A., Hennig, P. & Blood, D.A (1994) Technical Bulletin No. 84: An inventory and condition survey of the Murchison River catchment and surrounds, Western Australia. Department of Agriculture Western Australia, South Perth, Western Australia.
- Department of Climate Change, Energy, the Environment and Water (DCCEEW) (2023) Species Profile and Threats Database (SPRAT). Available from <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl> (Accessed 16 May 2023).
- Department of Environment Regulation (DER) (2014) *A guide to the assessment of applications to clear native vegetation*. Perth. Available from: https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Guidelines/Guide2_assessment_native_veg.pdf
- Department of Planning, Lands and Heritage (DPLH) (2023) Aboriginal Heritage Inquiry System. Department of Planning, Lands and Heritage. <https://espatial.dplh.wa.gov.au/AHIS/index.html?viewer=AHIS> (Accessed 5 April 2023).
- Department of Primary Industries and Regional Development (DPIRD) (2023) NRInfo Digital Mapping. Department of Primary Industries and Regional Development. Government of Western Australia. URL: <https://dpiird.maps.arcgis.com/apps/webappviewer/index.html?id=662e8cbf2def492381fc915aaf3c6a0f> (Accessed 5 April 2023).
- Department of Water and Environmental Regulation (DWER) (2021) Procedure: Native vegetation clearing permits. Joondalup. Available from: https://dwer.wa.gov.au/sites/default/files/Procedure_Native_vegetation_clearing_permits_v1.pdf
- 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) (2016) Technical Guidance – Terrestrial Fauna Surveys. Available from: https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/Tech%20guidance-%20Terrestrial%20Fauna%20Surveys-Dec-2016.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. <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics>
- Northern Star Resources Limited (2022) Application for a New Purpose Clearing Permit Context. Northern Star Resources Limited, December 2022.
- Trudgen, M.E. (1991) Vegetation condition scale in National Trust (WA) 1993 Urban Bushland Policy. National Trust of Australia (WA), Wildflower Society of WA (Inc.), and the Tree Society (Inc.), Perth.
- Western Australian Herbarium (1998-) FloraBase - the Western Australian Flora. Department of Biodiversity, Conservation and Attractions, Western Australia. <https://florabase.dpaw.wa.gov.au/> (Accessed 16 May 2023).

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)
DCCEEW	Department of Climate Change, Energy, the Environment and Water, 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 DCCEEW)
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).

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.