



Clearing Permit Decision Report

1. Application details and outcomes

1.1. Permit application details

Permit number:	9982/1
Permit type:	Purpose Permit
Applicant name:	10M Limited
Application received:	25 November 2022
Application area:	70 hectares
Purpose of clearing:	Mineral Production and Associated Activities
Method of clearing:	Mechanical Removal
Tenure:	Mining Lease 59/768 Miscellaneous Licence 59/202
Location (LGA area/s):	Shire of Murchison
Colloquial name:	Woolbung Peak Project

1.2. Description of clearing activities

10M Limited proposes to clear up to 70 hectares of native vegetation within a boundary of approximately 124 hectares, for the purpose of mineral production and associated activities. The project is located approximately 130 kilometres north-northwest of Yalgoo, within the Shire of Murchison.

The application is to allow for the development of an iron ore mine, which includes an open pit, waste rock dump, run-of-mine, a crushing and screening plant, ore stockpile, borefield, borrow pits, turkeys nest dam, topsoil stockpiles, and other associated mine infrastructure (Clark Lindbeck, 2022). Further exploration drilling is expected to be undertaken within the application area (Clark Lindbeck, 2022).

The target resource is high-grade hematite ore that the prospect identified from the surface to a depth of 145 metres (Clark Lindbeck, 2022).

1.3. Decision on application and key considerations

Decision:	Grant
Decision date:	24 March 2023
Decision area:	70 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 25 November 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 G), supporting information provided by the applicant (Appendix A) including the results of flora and vegetation surveys and fauna surveys (Appendix E), the clearing principles set out in Schedule 5 of the EP Act (Appendix C), and 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;
- impacts to a priority ecological community;
- the loss of native vegetation that is suitable habitat for a number of priority flora species;
- the loss of native vegetation that is suitable habitat for a number of conservation significant fauna species; and
- potential land degradation in the form of wind erosion.

After consideration of the available information, the Delegated Officer determined the proposed clearing can managed to be unlikely to lead to an unacceptable risk to 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;
- commence construction no later than three months after undertaking clearing to reduce the risk of erosion;
- restricted clearing of no more than 14.5 hectares of native vegetation within the mulga shrubland over BIF vegetation type; and
- undertake clearance surveys within the rocky mulga shrubland fauna habitat within two weeks of clearing to identify if any western spiny-tailed skink and/or long-tailed dunnart are present, and to relocate any of these species if found.

1.5. Site map

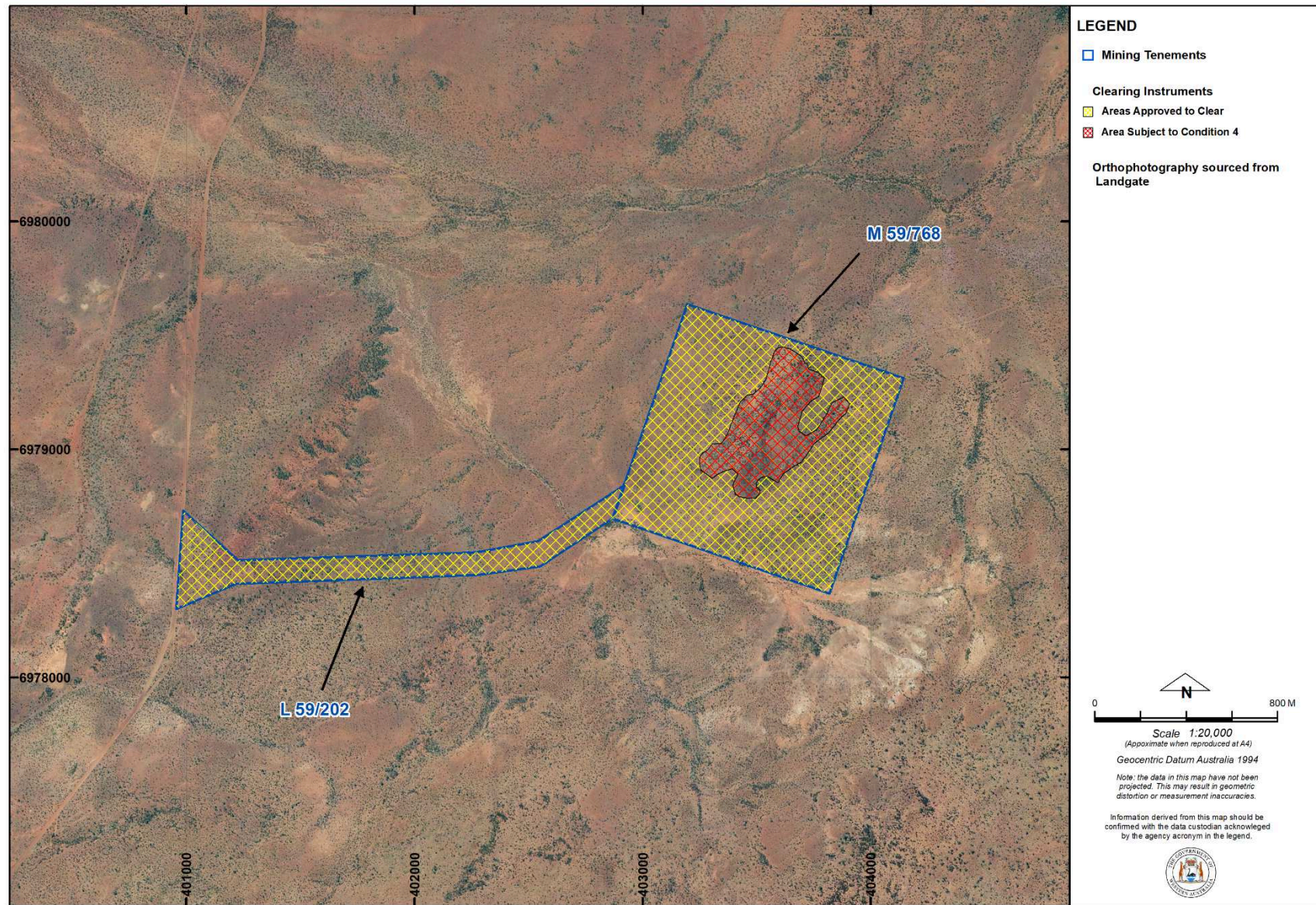


Figure 1. Map of the permit boundary with restricted clearing condition area in re. This area is the 'mulga shrubland over BIF' vegetation type mapped by NVS (2022a).

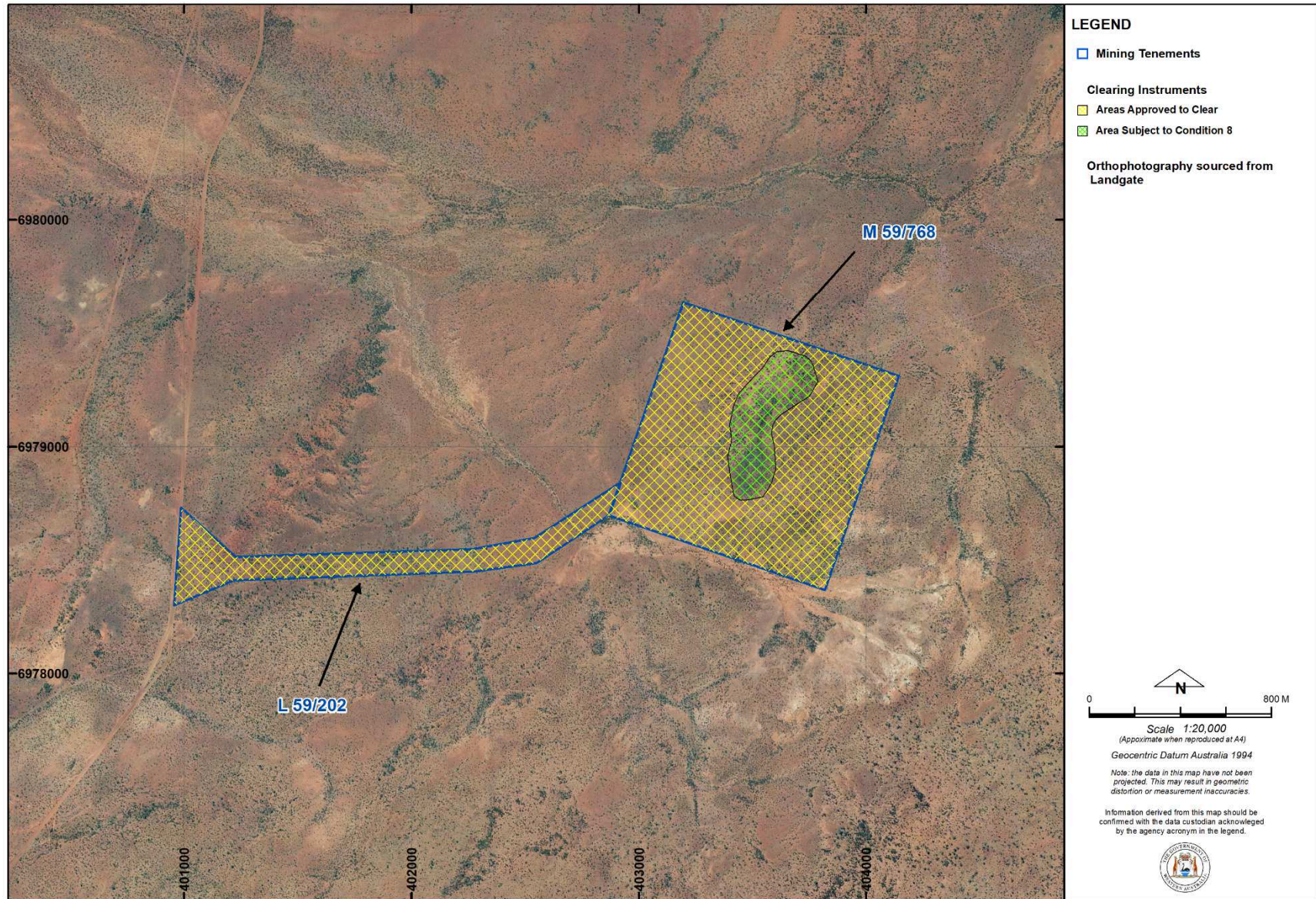


Figure 2. Map of the permit boundary in yellow with the fauna management condition area in green. The green area is the 'rocky mulga shrubland' fauna habitat mapped by Western Ecological (2022).

End

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 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)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2020)

3. Detailed assessment of application

3.1. Avoidance and mitigation measures

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. The location of the project was selected with much consideration and the mine site has been planned carefully to minimise as much disturbance to native vegetation, particularly impacts to significant vegetation assemblages (Clark Lindbeck, 2022).

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 (vegetation of a PEC, fauna, 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 and vegetation) - Clearing Principle (a)

Assessment

A detailed flora and vegetation survey was conducted by Native Vegetation Solutions over two field trips between 14-17 November 2021, and 29 April 2022 (NVS, 2022a). The detailed survey encompassed three areas, a northern area named Pleiades, and two southern areas named Woolbung Peak and Woolbung South (NVS, 2022a). The survey covered approximately 522 hectares, totalling approximately 46 hours spent traversing the survey area (NVS, 2022a).

The application area (Woolbung Peak) was surveyed on 29 April 2022, where 35 relevés and four 20 metre x 20 metre quadrats were established across approximately 124 hectares (NVS, 2022a). The vegetation within the application area was considered to range from 'very good' to 'degraded' condition (NVS, 2022a). There were six vegetation types recorded within the broader survey, however four vegetation types were mapped within the application area (NVS, 2022a).

VEGETATION

Below details all vegetation types recorded during the field survey, and those identified within the application area (NVS, 2022a). The proportion of each vegetation type extent within the application area is relative to the total recorded within the survey area.

Vegetation types	Extent in survey area (ha)	Extent in survey area (%)	Extent in application area (ha)	Proportion of extent in application area to survey area (%)
**Mulga shrubland	311.72	59.71	88.88	17.03
**Mulga creekline vegetation	36.63	7.02	2.71	0.52

**Mulga shrubland over laterite breakaways	77.60	14.86	13.22	2.53
Mulga shrubland over stony plains	30.58	5.86	-	-
**Mulga shrubland over BIF	49.79	9.54	18.99	3.64
Mulga shrubland over granite outcropping	15.70	3.01	-	-
Total	522.02	100	123.8	23.72

** denotes vegetation types mapped within the application area

The application area is mapped entirely within the 'New Forest (Including Twin Peaks and Barloweerie Range) vegetation complexes BIF (banded ironstone formation)' (Priority 1) priority ecological community (PEC) (GIS Database). There are two separate sections of this BIF PEC: New Forest 1, where the application area is located within and spans approximately 17,173 hectares, and New Forest 2, which spans approximately 2,656 hectares (GIS Database). The boundaries of this PEC is approximately mapped based on broad scale landform and geology, thus the extent of the PEC is likely to be significantly overestimated (DBCA, 2023b; GIS Database).

The detailed survey quadrat data was analysed to determine broad vegetation types, based on dominant flora species recorded (NVS, 2022a). These vegetation types were further defined based on topographical features (NVS, 2022a). From this, the vegetation mapping indicates the 'mulga shrubland over BIF' vegetation type directly correlates with this PEC, and represents approximately 19 hectares of the application area (NVS, 2022a).

Meissner and Wright (2010) conducted a flora and vegetation survey across the Barloweerie and Twin Peaks ranges in August 2008 by establishing 51 20 metre x 20 metre quadrats. The quadrats were established on crests, slopes, and foot slopes of the ranges (Meissner and Wright, 2010). This survey identified three distinct plant communities based on flora species present (Meissner and Wright, 2010):

- Community 1** Found on the crests and upper slopes of both ranges and has isolated to sparse shrublands of *Acacia aneura* and *Acacia ramulosa* over open to sparse shrublands of *Thryptomene decussata*, *Eremophila latrobei*, *Eremophila glutinosa* and *Acacia scleroclada* over open to sparse shrublands and grasslands of *Sida* sp. Golden calyces glabrous (H.N. Foote 32), *Ptilotus obovatus*, *Ptilotus schwartzii*, *Eriachne pulchella* and *Aristida contorta*. Mean species richness was 13.4 taxa (± 0.8) per site. The indicator species were *Cheilanthes sieberi* subsp. *sieberi*, *Eremophila latrobei* subsp. *latrobei* and *Thryptomene decussata*.
- Community 2** Occurred mainly on the lower slopes and footslopes of the Twin Peaks Greenstone Belt. Characterised by open to sparse shrublands of *Acacia aneura* and *Acacia ramulosa* over open to sparse shrublands of *Acacia tetragonophylla*, *Senna artemisioides* subsp. *helmsii*, *Senna* sp. Meekathara (E. Bailey 1–26), *Eremophila* spp. (*E. macmillaniana*, *E. simulans* and *E. glutinosa*) over mid-dense to open forbland and grassland of *Ptilotus obovatus*, *Aristida contorta* and *Eriachne pulchella*. Mean species richness was 14.3 taxa (± 0.8) per site. The indicator species were *Senna artemisioides* subsp. *helmsii*, *Sida ectogama*, *Acacia aneura* subsp. *alata*, *Eremophila galeata* and *Maireana triptera*.
- Community 3** Occurred on laterite breakaways surrounding Mount Barloweerie and is described as open to sparse shrublands of *Acacia aneura* and *Acacia aulacophylla* over open to sparse shrublands of *Philothea sericea* over sparse shrublands and forblands of *Ptilotus schwartzii* and *Stylidium longibracteatum*. The mean species richness was 12.2 taxa (± 1.5) per site and indicator species were *Acacia aulacophylla*, *Stylidium longibracteatum*, *Philothea sericea* and *Acacia* aff. *sibirica*.

The survey found that the plant communities were determined by geomorphology, which influenced soil properties (Meissner and Wright, 2010). Each plant community had significantly different environmental variables (soil and site attributes) (Meissner and Wright, 2010).

DBCA (2023b) advised that there is a potential for vegetation within the application area outside the mapped 'mulga shrubland over BIF' vegetation type that may be considered components of the BIF PEC. Due to lack of certainty of the NVS (2022a) BIF PEC mapping, further floristic analysis was requested to be undertaken (Appendix A; 10M Limited, 2023). Confidence that the BIF PEC doesn't occur beyond vegetation type 'mulga shrubland over BIF' would increase with improved substrate and landform descriptions, and further floristic analysis of the NVS (2022a) quadrat data against the Meissner and Wright (2010) survey baseline data (DBCA, 2023b).

Subsequently, NVS contacted DBCA to obtain the quadrat data, and seek additional advice and context on the Meissner and Wright (2010) survey. A comparative analysis of the NVS (2022a) and the Meissner and Wright (2010) flora data was completed and found that only one quadrat within the application area (Q25) closely resembles quadrats established by Meissner and Wright (2010). It can be assumed that the other quadrat (Q26) in the 'mulga shrubland over BIF' vegetation type captures a further variation of the BIF vegetation assemblage than originally described by Meissner and Wright (2010) (10M Limited, 2023).

As the Meissner and Wright (2010) survey information, along with broad scale landform and geology (DBCA, 2023b) was originally used to define the 'New Forest (Including Twin Peaks and Barloweerie Range) vegetation complexes BIF (banded ironstone formation)' PEC, the extent of the BIF PEC can only be defined utilising the same parameters. While it is entirely possible that the extent of the BIF PEC vegetation may extend beyond what is described as 'mulga shrubland over BIF' (NVS,

2022a), in the absence of a comprehensive and formal description from DBCA the delineation of the BIF PEC would be difficult (DBCA, 2023a). Given that Meissner and Wright (2010) did not map the plant communities it is not currently possible to determine whether there are more restricted components of this BIF PEC (DBCA, 2023a).

FLORA

A targeted flora survey was conducted over the part of the application by Native Vegetation Solutions (NVS) on 23-24 August 2021. The survey area searched was approximately 79.1 hectares within Exploration Licence 59/2408 (NVS, 2021). No threatened flora species were identified, however one priority flora species was recorded within the application area at one location (NVS, 2021):

- *Eremophila simulans* subsp. *megacalyx* (P3)

The following detailed flora and vegetation survey in November 2021 and 29 April 2022 recorded a total of 142 flora species (including weeds) within the survey area, with 135 species recorded within quadrats (NVS, 2022a). The 142 flora species consists of 31 families and 63 genera (NVS, 2022a). No threatened flora species were identified during the field assessment, however the following six priority flora species were recorded in the survey area (NVS, 2022a).

- *Acacia* sp. Muggon Station (P2)
- *Eremophila simulans* subsp. *megacalyx* (P3)
- *Gunniopsis divisa* (P3)
- *Hibiscus* sp. Perrinvale Station (P1)
- *Prostanthera petrophila* (P3)
- *Ptilotus beardii* (P3)

With regard to the above species, only *Eremophila simulans* subsp. *megacalyx* and *Hibiscus* sp. Perrinvale Station were recorded within the application area (NVS, 2022a).

One *Eremophila simulans* subsp. *megacalyx* individual was recorded in the 'mulga shrubland' vegetation type within the application area (NVS, 2022a). The *Eremophila simulans* subsp. *megacalyx* individual was the same individual recorded in August 2021 during the targeted flora survey (NVS, 2021; 2022a).

Eremophila simulans subsp. *megacalyx* is known from 11 locations, all located within the Murchison bioregion (Western Australian Herbarium, 1998-; GIS Database). These records have individual plant frequencies ranging from sparse or isolated to common and abundant at different locations (Western Australian Herbarium, 1998-; GIS Database). These records also range from 1968 to 2009 (Western Australian Herbarium, 1998-; GIS Database).

Inclusive of the individual recorded within the application area, the detailed flora survey identified a total of 161 *Eremophila simulans* subsp. *megacalyx* plants (NVS, 2021; 2022a). The proposed clearing of the one *Eremophila simulans* subsp. *megacalyx* plant is unlikely to be significant given it represents less than 1% of the total recorded during the detailed survey (NVS, 2022a).

One *Hibiscus* sp. Perrinvale Station individual was recorded in the 'mulga shrubland over BIF' vegetation type within the application area (NVS, 2022a). The desktop assessment for the detailed flora and vegetation survey did not return any previous records of *Hibiscus* sp. Perrinvale Station within 50 kilometres of the application area (NVS, 2022a). Due to this there was no additional effort spent searching for *Hibiscus* sp. Perrinvale Station, however the one *Hibiscus* sp. Perrinvale Station individual was recorded during this survey (NVS, 2022a). The outcome of identifying this *Hibiscus* sp. Perrinvale Station plant resulted in the need to conduct a following targeted flora survey (NVS, 2022a).

The targeted survey for *Hibiscus* sp. Perrinvale Station was conducted by Native Vegetation Solutions on 20 August 2022, over the Pleiades and Woolbung Peak areas (NVS, 2022b). No additional *Hibiscus* sp. Perrinvale Station plants were identified within the application area during the targeted survey, however 122 individuals were recorded 4.5 to 10 kilometres north of the application area (NVS, 2022b).

Hibiscus sp. Perrinvale Station is known from 15 locations with 14 of them located within the Murchison bioregion (Western Australian Herbarium, 1998-; GIS Database). All records were of isolated plants and range from 2006-2011 (Western Australian Herbarium, 1998-; GIS Database). Three of these Western Australian Herbarium (1998-) locations were revisited by NVS (2022b) in August 2022 and confirmed their presence.

Inclusive of the individual recorded within the application area, the targeted flora survey identified a total of 123 *Hibiscus* sp. Perrinvale Station plants (NVS, 2022a; 2022b). The one *Hibiscus* sp. Perrinvale Station individual recorded within the application area in April 2022 was revisited during the targeted survey, however the site had been disturbed by exploration activities and rehabilitation efforts, resulting in the clearing of this plant (NVS, 2022b). The proposed clearing is unlikely to have additional impacts to this species.

While the application area may provide suitable habitat for a number of priority flora species, including those recorded during the field assessments outside the application area, the proposed clearing is unlikely to directly impact these species (NVS, 2021; 2022a; 2022b). The exhaustive effort spent searching the application area in August 2021, April 2022, and August 2022 provides a level of confidence that no additional priority flora species other than the *Eremophila simulans* subsp. *megacalyx* and *Hibiscus* sp. Perrinvale Station individuals are present (NVS, 2021; 2022a; 2022b). Indirect impacts to priority flora species from the proposed clearing may be considered a potential loss of suitable habitat (NVS, 2021; 2022a; 2022b).

Three weed species were identified during the field assessment, none of these species were found within the application area or considered declared pests (NVS, 2022a).

Conclusion

The categorisation of the New Forest BIF PEC as a priority 1 ecological community is due to the known immediate threat (entire extent on mining tenure), not met adequacy of survey requirements, and not well defined (DEC, 2013; DBCA, 2022b). The main threatening process to the extent of this BIF PEC has been identified as clearing for mining (DBCA, 2021).

Based on the vegetation mapping of the application area as 'mulga shrubland' and 'mulga shrubland over BIF' and the position in the landscape it doesn't appear that the vegetation types recorded are highly restricted (DBCA, 2023a). Given the relatively small scale of the project and the biodiversity values known in the local area, the proposed clearing is unlikely to have a significant impact on the BIF PEC (DBCA, 2023a).

While the proposed clearing is unlikely to have a significant impact on the BIF PEC, due to the lack of information regarding cumulative impacts a restricted clearing condition is recommended as a precaution to limit disturbance to this BIF PEC. This condition will restrict the total amount of clearing of the 'mulga shrubland over BIF' vegetation type to 14.5 hectares (out of a total of 19 hectares), which is stated as the upper limit of clearing to this vegetation type in the supporting documentation (Clark Lindbeck, 2022).

Many of the priority flora species recorded in the local area (50 kilometre radius) are highly associated with the BIF PEC (GIS Database). Given the BIF PEC and described vegetation types extend well beyond the application area, the loss of potential suitable habitat from the proposed clearing is unlikely to have a significant impact on the conservation status of any potentially occurring priority flora species or those recorded during the field assessments (Meissner and Wright, 2010; NVS, 2021; 2022a; 2022b; DBCA, 2023a). No flora management condition is required.

Weeds have the potential to significantly change the dynamics of a natural ecosystem and lower the biodiversity of an area. Potential impacts to the biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

Conditions

To address the above impacts, the following management measure will be required as a condition on the clearing permit:

- restricted clearing condition within the 'mulga shrubland over BIF' vegetation type which will limit the total impact to the BIF PEC to 14.5 hectares; and
- weed management condition to take hygiene steps to minimise the risk of the introduction and spread of weeds.

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

Assessment

A database search conducted by Western Ecological (2022) identified records of a number of conservation significant fauna species within an 80 kilometre radius of the application area (Appendix B.1 and B.4). It was determined that many of these species would not occur in the application area due to a lack of suitable habitat present or outside their home range (Western Ecological, 2022). Many of the species identified within the desktop assessment were migratory birds with very large home ranges and/or a preference for wetland habitat such as lakes or large watercourses (Western Ecological, 2022). Given there are no significant wetland habitat within the application area, these species were not considered when determining species to undertake targeted surveys for (Western Ecological, 2022).

The field assessment was conducted over the 124 hectare application area by Western Ecological from 22-26 March 2022. The scope of the field assessment was to broadly define and describe fauna habitats within the application area and undertake targeted surveys for the following five conservation significant fauna species (Western Ecological, 2022).

- western spiny-tailed skink (*Egernia stokesii badia*, EN under EPBC Act and VU under BC Act);
- long-tailed dunnart (*Sminthopsis longicaudata*, P4);
- northern shield-backed trapdoor spider (*Idiosoma clypeatum*, P3);
- night parrot (*Pezoporus occidentalis*, EN under EPBC Act and CR under BC Act); and
- malleefowl (*Leipoa ocellata*, VU).

Two broad fauna habitats were identified during the field assessment (Western Ecological, 2022):

Broad fauna habitat types	Habitat extent in application area (ha)	Habitat extent in application area (%)
Scattered mulga shrubland	110	~88.7
Rocky mulga shrubland	14	~11.3
Total	124	100

The available fauna habitats were considered to be in 'excellent' condition (Keighery, 1994; Western Ecological, 2022). These habitats were considered to be relatively widespread and common in areas adjacent to the application area, and more broadly within the region (Western Ecological, 2022). The rocky mulga shrubland is likely to be more restricted within the region than the scattered mulga shrubland, as this habitat type is associated with the rocky outcropping of the banded ironstone formation (BIF) (Western Ecological, 2022).

The Murchison bioregion records a unique black form of the western spiny-tailed skink, that is known to inhabit areas of granite exposures and lateritic breakaways with a variable cover of loose boulders and pockets of soil and low shrubland vegetation (DEC, 2012). Western Ecological (2022) further describes their preferred shelter as areas of isolated stands of granite boulders or more extensive clusters of rock with abundant crevices and cracks present. The western spiny-tailed skink is most commonly observed when they bask close to their refugia (DEC, 2012).

The targeted western spiny-tailed skink and long-tailed dunnart surveys involved searching within suitable habitat in the application area (Western Ecological, 2022). These species prefer rocky areas, with cracks and crevices that can be used for shelter (Western Ecological, 2022). The surveys involved placing ten camera traps and bait stations throughout the application area for four nights, with three of the cameras located within rocky mulga shrubland habitat (Western Ecological, 2022). Western spiny-tailed skink latrine sites, which are piles of scat located outside of refuges, were also searched for during the field

assessment (Western Ecological, 2022). No western spiny-tailed skinks or long-tailed dunnarts were recorded on any of the camera traps, and no other evidence (scats) of either species were identified during the field assessment (Western Ecological, 2022).

Suitable habitat for northern shield-backed trapdoor spiders appears to be near drainage lines, under *Acacia* vegetation, on plains, low slopes, or on rocky slopes with a variety of soil types (Western Ecological, 2022). Burrow sites are usually found in areas with abundant leaf litter, they are distinctive with two tufts of leaf litter radiating out from the centre burrow rim (Western Ecological, 2022). There was limited suitable habitat present within the application area for northern shield-backed trapdoor spiders, however these areas were searched during the targeted survey and no burrows were observed (Western Ecological, 2022).

Night parrots are cryptic, nocturnal, primarily ground-feeding parrots that inhabit remote areas of Australia (DPaW, 2017). Due to this, there is limited ecological information about night parrots (Western Ecological, 2022). The broad habitat requirement for night parrots is old-growth *Triodia* species (DPaW, 2017). The flora and vegetation survey did not identify any *Triodia* species within the application area (NVS, 2022), however it is located within the medium priority area for night parrot surveys according to the interim survey guideline published by DPaW (2017). Western Ecological (2022) undertook a preliminary survey for night parrots which involved two Song Meter 4 (SM4) acoustic recording units placed at two locations for four nights within the application area. These acoustic recordings were later analysed for call identification (Western Ecological, 2022). No night parrot calls were identified from the recordings taken, and given the application area lacks large old-growth *Triodia* species it is highly unlikely for night parrots to occur (Western Ecological, 2022).

During the field assessment it was determined that the fauna habitats identified within the application area were unsuitable for malleefowl (Western Ecological, 2022). Malleefowl prefer habitat with dense canopy and suitable debris in which they can construct their mounds for breeding (Western Ecological, 2022). The habitats within the application area are too open, sparse and/or rocky for mound construction, and many of the flora species identified provide limited foraging habitat (Western Ecological, 2022). Given the lack of suitable breeding or foraging habitat, it is unlikely that malleefowl would be present within the application area (Western Ecological, 2022).

Conclusion

The application area contains habitat that may potentially be utilised by a number of conservation significant fauna species, however the field assessment did not identify any (Western Ecological, 2022). The scattered mulga shrubland habitat is common and widespread within the region, and extends well beyond the application area (Western Ecological, 2022). It is unlikely that the proposed clearing will significantly impact available habitat for species that may utilise these areas (Western Ecological, 2022).

The rocky mulga shrubland habitat is also common within the region, however this habitat within the application area is more restricted and isolated from other areas of rocky habitats in the surrounds and within the broader region (Western Ecological, 2022; GIS Database). While this habitat was determined to be marginal, the application area is well within the known range of the black form of the western spiny-tailed skink (DEC, 2012; Western Ecological, 2022). The western spiny-tailed skink national recovery plan states that all black form populations are important due to their overall small geographic range (DEC, 2012). Given one of the main threats to this species is from mining, leading to habitat fragmentation and modification of landscapes, a fauna management condition is recommended to mitigate impacts (DEC, 2012). In addition, it is recommended that long-tailed dunnart is incorporated into this fauna management condition due to their potential utilisation of the more isolated rocky mulga shrubland habitat.

Conditions

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

- Within two weeks prior to clearing the applicant will be required to engage a fauna specialist to undertake clearance surveys the rocky mulga shrubland habitat for western spiny-tailed skink and/or long-tailed dunnart. Where western spiny-tailed skink and/or long-tailed dunnart are identified the fauna specialist will be required to relocate any of these species and submit a report detailing the identified locations of these species and where they were relocated.

3.3. Relevant planning instruments and other matters

The clearing permit application was advertised on 13 December 2022 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 (WC2004/010) over the area under application (DPLH, 2023). This claim has been determined by the Federal Court on behalf of the claimant group. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are no registered Aboriginal Sites of Significance within the application area (DPLH, 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 that may be required for the proposed land use include:

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

It is the proponent's responsibility to liaise with the Department of Water and Environmental Regulation and the Department of Biodiversity, Conservation and Attractions, to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

End

Appendix A. Additional information provided by applicant

Details of information requested

Information was requested regarding:

- the extent and explanation of how the 'New Forest (Including Twin Peaks and Barloweerie Range) vegetation complexes BIF (banded ironstone formation)' (Priority 1) priority ecological community (PEC) was determined in the NVS (2022a) detailed survey; and
- further floristic analysis of quadrat data (NVS, 2022a) against the baseline survey (Meissner and Wright, 2010) to be undertaken with interpretation of the results.

Information provided by proponent

The response provided included:

- Native Vegetation Solutions contacted DBCA to obtain additional advice and context to the Meissner and Wright (2010) survey, and to also obtain the quadrat data of that survey.
- a dendrogram displaying the floristic quadrat grouping which was inclusive of the data from the detailed flora and vegetation survey (NVS, 2022a) and the baseline data (Meissner and Wright, 2010); and
- discussion and interpretation of the further analysis, concluding that the extent of the BIF PEC from the detailed survey (NVS, 2022a) was accurate given the available information and lack of formal description and definition of the BIF PEC by DBCA.

Appendix B. Site characteristics

B.1. Site characteristics

Characteristic	Details
Local context	The area proposed to be cleared is part of an expansive tract of native vegetation in the extensive land use zone of the Western Murchison bioregion in Western Australia (GIS Database).
Ecological linkage	The application area is not considered a significant ecological linkage. The vegetation immediately surrounding the application area and the majority of the region remains uncleared (GIS Database).
Conservation areas	The application area is not located within any conservation areas (GIS Database). The nearest conservation area is Toolonga Nature Reserve, located approximately 68.2 kilometres west-northwest of the application area (GIS Database).
Vegetation description	<p>The vegetation of the application area is broadly mapped as the following Beard vegetation association: 326: Low woodland over scrub; mulga over bowgada & minnieritchie scrub (GIS Database).</p> <p>A flora and vegetation survey was conducted over the application area and surrounds by Native Vegetation Solutions during November 2021 and April 2022. The following vegetation types were recorded within the application area (NVS, 2022a):</p> <p>A: Mulga shrubland; B: Mulga creekline vegetation; C: Mulga shrubland over laterite breakaways; and E: Mulga shrubland over BIF.</p>
Vegetation condition	<p>The vegetation survey (NVS, 2022a) indicates the vegetation within the proposed clearing area is in excellent, very good, good, and degraded (Keighery, 1994) condition, described as:</p> <ul style="list-style-type: none"> - 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; and

Characteristic	Details
	<ul style="list-style-type: none"> - 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. <p>The full Keighery (1994) condition rating scale is provided in Appendix D.</p>
Climate and landform	<p>The application area is mapped within elevations of 280-300 metres AHD (Clark Lindbeck, 2022; GIS Database). The climate of the Western Murchison subregion is arid, with the nearest weather station recording an average rainfall of approximately 219.8 millimetres per year (BoM, 2023; CALM, 2002).</p> <p>Woolbung Peak is located amid the Twin Peaks greenstone belt and occurs as an isolated peak within the application area (Clark Lindbeck, 2022). Woolbung Peak is measured at approximately 23 metres in height (Clark Lindbeck, 2022). The peak extends over a length of approximately 400 metres (Clark Lindbeck, 2022). Banded ironstone formations are associated with greenstone belts and this peak and the surrounding foot slopes and toe slopes are representative of a BIF and the mapped BIF PEC (Clark Lindbeck, 2022; Meissner and Wright, 2010; GIS Database).</p>
Soil description and land degradation risk	<p>The application area is mapped within the Violet land system (DPIRD, 2022; GIS Database). The Violet land system is described as undulating stony and gravelly plains with low rises supporting mulga shrublands (DPIRD, 2022). Extensive, gently undulating to level plains and low rises with mantles of ironstone pebbles and level to very gently inclined plains subject to sheet flow with mantles of fine ironstone gravel (DPIRD, 2022). Soils vary from dark red gravels, clayey sands or fine sandy loams to shallow red earths, clay loams or fine sandy loams (DPIRD, 2022). This land system is susceptible to water erosion when vegetation cover has been removed or the soil surface has been disturbed (DPIRD, 2022).</p>
Waterbodies and hydrogeography	<p>The desktop assessment and aerial imagery indicated that one ephemeral drainage line intersects the application area (GIS Database).</p> <p>The application area is not within any legislated surface water area (GIS Database). The application area is located within the Gascoyne Ground Water Area proclaimed under the <i>Rights in Water and Irrigation Act 1914</i> (GIS Database). The mapped groundwater salinity is 1000-3000 milligrams per litre which is described as brackish water quality (GIS Database).</p>
Flora	<p>There are records of 31 priority flora species recorded within 50 kilometres of the application area (GIS Database). The field assessments conducted within the application area and an area 7.5 kilometres north-northwest identified a total of six priority flora species (NVS, 2022a; 2022b). These field assessments identified two individual plants of two different priority flora species within the application area (NVS, 2022a; 2022b).</p>
Ecological communities	<p>The application area is located within the New Forest (Including Twin Peaks and Barloweerie Range) vegetation complexes BIF (banded ironstone formation) (NVS, 2022a; GIS Database). This community is categorised as a (Priority 1) Priority Ecological Community by DBCA (DBCA, 2021; GIS Database).</p> <p>The field assessment determined that the 'mulga shrubland over BIF' vegetation type represented this PEC, and constitutes approximately 19 hectares of the application area (NVS, 2022a).</p>
Fauna	<p>There are records of 17 fauna species of conservation significance within a 60 kilometre radius of the application area (GIS Database). This includes 14 birds (nine are classified as migratory, one other specially protected, three threatened, and one priority 4), one mammal, one reptile, and one invertebrate (GIS Database). The desktop assessment by Western Ecological (2022) included the above records, as well as identified one priority 4 mammal and one threatened bird.</p>

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	28,044,823	~99	2,185,987	7.77
Beard vegetation associations - State					
326	1,034,327	1,034,301	~99	339,348	32.81
Beard vegetation associations - Murchison Bioregion					
326	494,516	494,516	~99	103,603	20.95

Government of Western Australia (2019)

B.3. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix G.1), and biological survey information (NVS, 2021; 2022a; 2022B), the following conservation significant flora have records within a 50 kilometre radius of the application area.

Species name	Conservation status	Total individuals recorded in survey areas*	Total individuals proposed to be cleared	Percentage of individuals to be cleared (%)	Distance of closest record to application area (km)	Number of known locations from Florabase**
<i>Acacia atopa</i>	P3				45.6	26
<i>Acacia</i> sp. Muggon Station	P2	120	nil	nil	4.7	5
<i>Baeckea</i> sp. Mount Barloweerie	P1				4.8	7
<i>Balladonia aevoides</i>	P3				38.3	16
<i>Calandrinia butcherensis</i>	P1				45.2	12
<i>Calandrinia umbelliformis</i>	P1				44.2	6
<i>Dicrastylis linearifolia</i>	P3				45.2	35
<i>Eremophila mirabilis</i>	P2				43.3	12
<i>Eremophila muelleriana</i>	P3				41	14
<i>Eremophila physocalyx</i>	P3				10.5	12
<i>Eremophila simulans</i> subsp. <i>megacalyx</i>	P3	161	1	~0.6	within application area (next closest is 0.59)	11
<i>Frankenia confusa</i>	P4				37.9	29
<i>Goodenia neogoodenia</i>	P4				40.9	20
<i>Gunniopsis divisa</i>	P3	7	nil	nil	0.06	25
<i>Hemigenia tysonii</i>	P3				23.5	22
<i>Hibiscus</i> sp. Perrinvale Station	P1	123	nil (1 was cleared during exploration activities)	nil	4.8	15
<i>Indigofera eriophylla</i>	P1				3.6	4
<i>Isotropis petrensis</i>	P1				39	10
<i>Lepidium scandens</i>	P3				11.2	7
<i>Lepidium xylodes</i>	P1				31.3	7
<i>Micromyrtus placoides</i>	P3				29.3	25
<i>Micromyrtus racemosa</i> var. <i>Jingemarra</i>	P2				32.4	2
<i>Petrophile pauciflora</i>	P3				41.7	23
<i>Petrophile vana</i>	P1				47	5
<i>Prostanthera petrophila</i>	P3	10	nil	nil	0.9	44
<i>Psammomoya ephedroides</i>	P3				19.2	8
<i>Ptilotus beardii</i>	P3	10	nil	nil	8	38
<i>Sauropus</i> sp. Woolgorong	P3				21.3	35
<i>Solanum pycnotrichum</i>	P2				30.2	7
<i>Stackhousia clementii</i>	P3				30.5	21
<i>Verticordia jamiesonii</i>	P3				42.2	34

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

*Figure 3

**Western Australian Herbarium (1998-)

B.4. Fauna analysis table

List of DMIRS conservation significant fauna database search within a 60 kilometre radius of the application area (GIS Database). This is a complete list of all conservation significant fauna species that have previously been recorded, excluding one fish species and one extinct mammal species within 60 kilometres (GIS Database).

Species	Common name	WA con status	EPBC status
Invertebrates			
<i>Idiosoma clypeatum</i>	northern shield-backed trapdoor spider	P3	-
Reptiles			
<i>Egernia stokesii badia</i>	western spiny-tailed skink	VU	EN
Birds			
<i>Calidris acuminata</i>	sharp-tailed sandpiper	MI	MI
<i>Calidris ferruginea</i>	curlew sandpiper	CR	MI
<i>Calidris ruficollis</i>	red-necked stint	MI	MI
<i>Calidris subminuta</i>	long-toed stint	MI	MI
<i>Chlidonias leucopterus</i>	white-winged black tern, white-winged tern	MI	MI
<i>Falco peregrinus</i>	peregrine falcon	OS	-
<i>Gelochelidon nilotica</i>	gull-billed tern	MI	MI
<i>Leipoa ocellata</i>	malleefowl	VU	VU
<i>Plegadis falcinellus</i>	glossy ibis	MI	MI
<i>Polytelis alexandrae</i>	princess parrot	P4	VU
<i>Rostratula australis</i>	Australian painted snipe	EN	EN
<i>Tringa glareola</i>	wood sandpiper	MI	MI
<i>Tringa nebularia</i>	common greenshank, greenshank	MI	MI
<i>Tringa stagnatilis</i>	marsh sandpiper, little greenshank	MI	MI
Mammals			
<i>Petrogale lateralis lateralis</i>	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	EN

VU: Vulnerable, EN: Endangered, CR: Critically Endangered, MI: Migratory, OS: Other specially protected species, P: Priority 1-4

Appendix C. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
<p>Principle (a): "Native vegetation should not be cleared if it comprises a high level of biodiversity."</p> <p>Assessment: The area proposed to be cleared contains locally and regionally significant flora and assemblages of plants.</p> <p>A portion of the application area is mapped as the 'New Forest (Including Twin Peaks and Barloweerie Range) vegetation complexes BIF (banded ironstone formation)' (Priority 1) priority ecological community (PEC) (NVS, 2022a; GIS Database).</p>	At variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p>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."</p> <p>Assessment: Fauna habitats identified within the application area may provide significant habitat for a number of conservation significant fauna species (Western Ecological, 2022).</p>	May be at variance	Yes <i>Refer to Section 3.2.2, above.</i>
<p>Principle (c): "Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."</p> <p>Assessment: There are no known records of Threatened flora within or within 50 kilometres of the application area (GIS Database). Flora surveys of the application area and surrounds did not record any species of Threatened flora (NVS, 2022a; 2022b).</p>	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
None of the vegetation types recorded within the application area and surrounds are known habitat for any species of Threatened flora, and the vegetation proposed to be cleared is unlikely to be necessary for the continued existence of any species of Threatened flora (NVS, 2022a; 2022b).		
<p><u>Principle (d):</u> <i>“Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community.”</i></p> <p><u>Assessment:</u> There are no known Threatened Ecological Communities (TECs) located within or in close proximity to the application area (GIS Database). Flora and vegetation surveys of the application area and surrounds did not identify any vegetation representative of a TEC (NVS, 2022a; 2022b).</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> 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).</p> <p>The application area is broadly mapped as Beard vegetation association 326: Low woodland over scrub; mulga over bowgada & minnieritchie scrub (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). The application area is not considered to be a significant remnant of native vegetation in an area that has been extensively cleared.</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> The application area is not located within any conservation areas (GIS Database). The nearest conservation area is Toolonga Nature Reserve, located approximately 68.2 kilometres west-northwest of the application area (GIS Database). Given the distance to Toolonga Nature Reserve, the proposed clearing is unlikely to have an impact on the environmental values of any 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> One ephemeral drainage line intersects the application area along the proposed access track (GIS Database). While this drainage line may temporarily flow after heavy rainfall events, the field assessments did not identify any vegetation growing in association with this watercourse (NVS, 2022a; 2022b). The proposed clearing is unlikely to impact any riparian vegetation.</p>	Not likely to be 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> The application area is mapped within the Violet land system (DPIRD, 2022; GIS Database). The Violet land system is described as undulating stony and gravelly plains with low rises supporting mulga shrublands (DPIRD, 2022). Extensive, gently undulating to level plains and low rises with mantles of ironstone pebbles and level to very gently inclined plains subject to sheet flow with mantles of fine ironstone gravel (DPIRD, 2022). Soils vary from dark red gravels, clayey sands or fine sandy loams to shallow red earths, clay loams or fine sandy loams (DPIRD, 2022). Abundant mantles provide effective protection against soil erosion over most of this land system, except where the soil surface has been disturbed (DPIRD, 2022). In such circumstances, the soil becomes moderately susceptible to water erosion. Narrow drainage tracts are mildly susceptible to water erosion in this land system.</p> <p>Based on available information, the landforms and soils of the application area are susceptible to water erosion if perennial shrub cover is substantially reduced and/or the soil surface is disturbed (DPIRD, 2022). Potential erosion may be adequately</p>	May be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
minimised through a staged clearing condition that will require the permit holder to enact the purpose for which the clearing is authorised within three months of clearing.		
<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> The desktop assessment and aerial imagery indicate that one ephemeral drainage line intersects the application area along the proposed access track (GIS Database). This area is relatively small within the context of the larger application area, and clearing the vegetation along this drainage line is unlikely to cause deterioration in the quality of surface water (GIS Database).</p> <p>There are no Public Drinking Water Source Areas within or in close proximity to the application area (GIS Database). The mapped groundwater salinity is 1000-3000 milligrams per litre which is described as brackish water quality (GIS Database). The quality of groundwater is unlikely to be significantly impacted from the proposed clearing.</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> The desktop assessment and aerial imagery indicated that one ephemeral drainage line intersects the application area along the proposed access track (GIS Database). This watercourse may flow following heavy rainfall events, however the proposed clearing is unlikely to contribute to an increased incidence or intensity of flooding. The topography within the larger proposed mining area exists at a higher elevation to the surrounds, and is unlikely to contribute to waterlogging if vegetation is removed (GIS Database).</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 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. Biological survey information excerpts

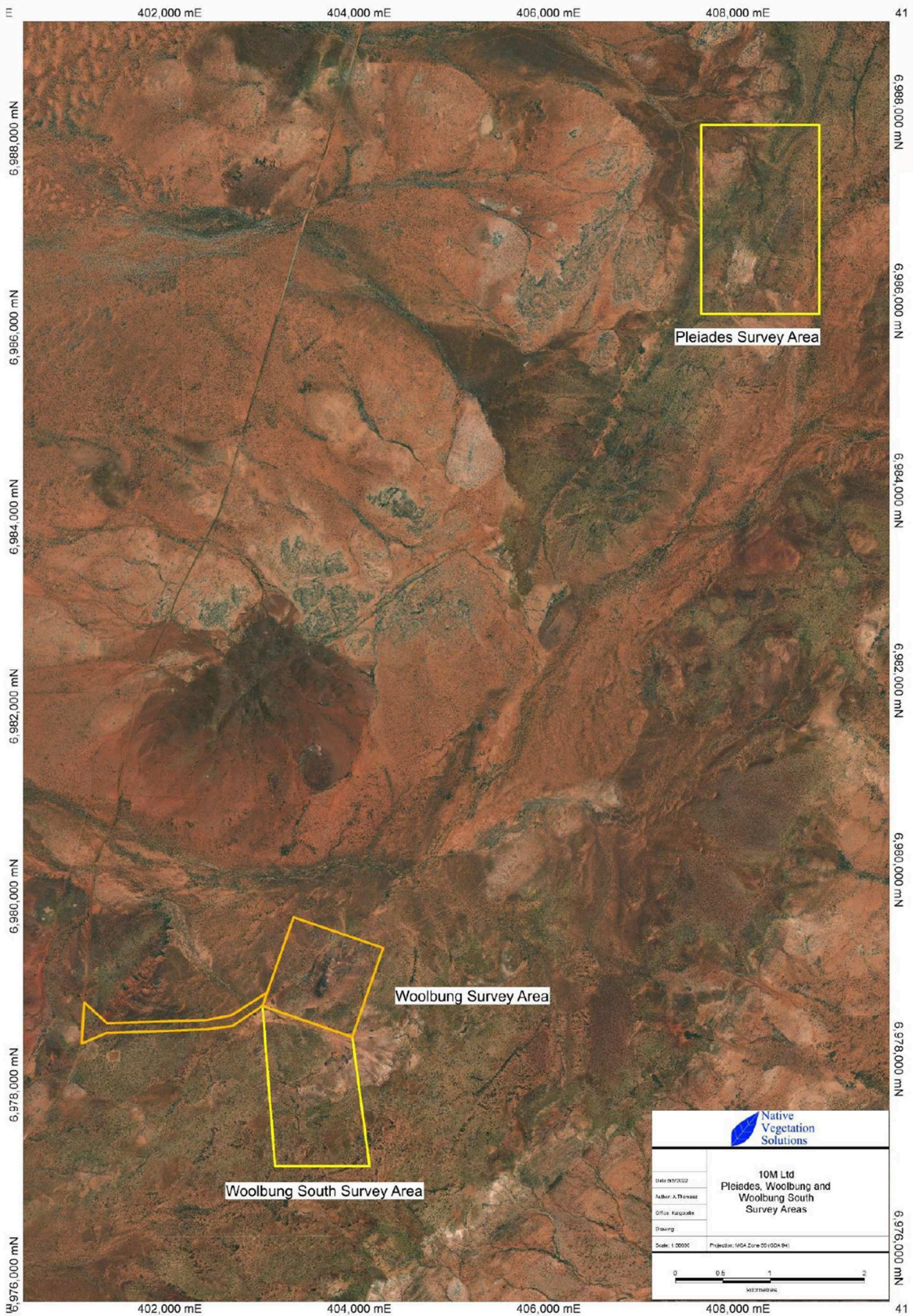


Figure 3: Pleiades, Woolbung Peak, and Woolbung South survey areas (NVS, 2022a).

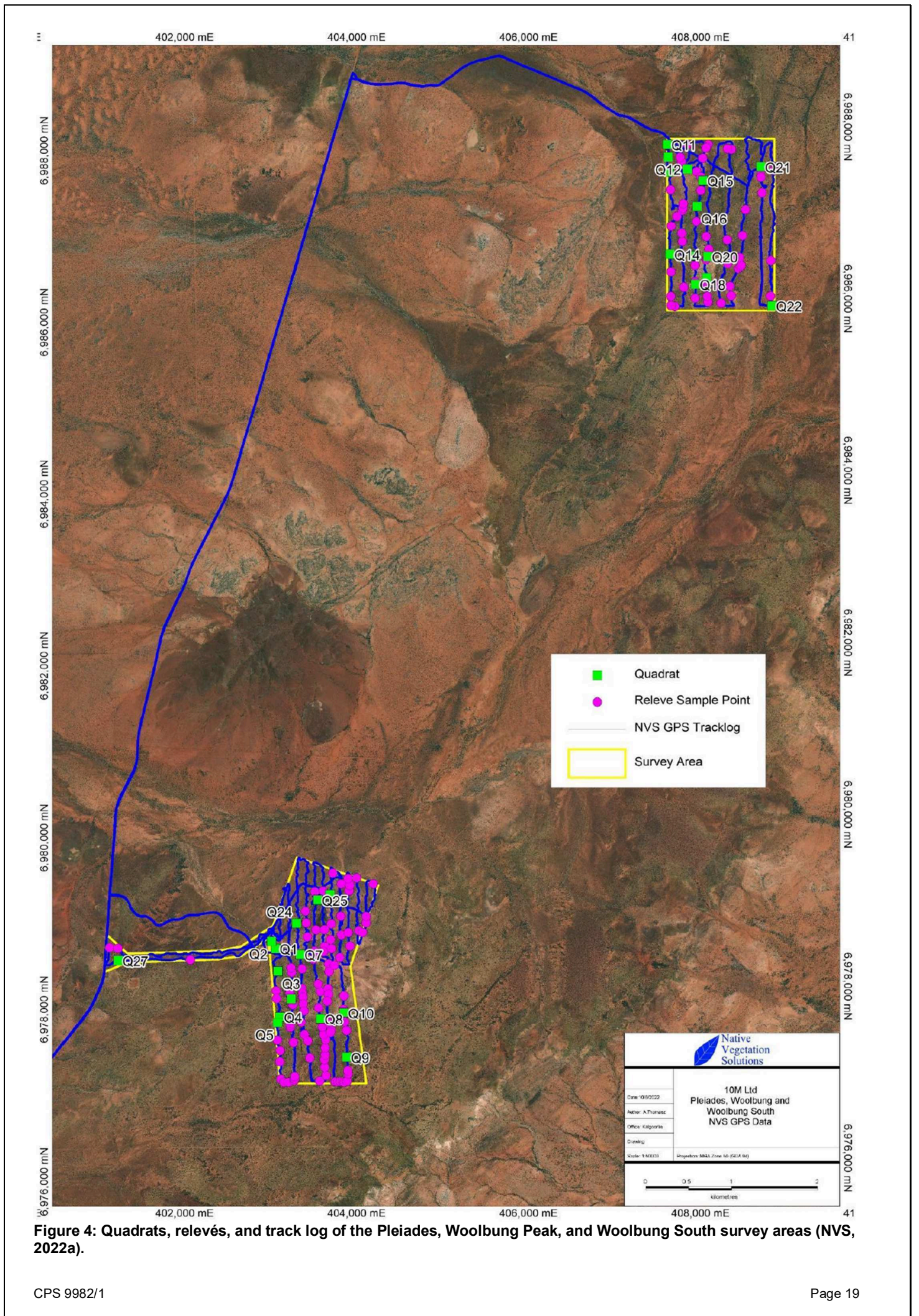


Figure 4: Quadrats, relevés, and track log of the Pleiades, Woolbung Peak, and Woolbung South survey areas (NVS, 2022a).

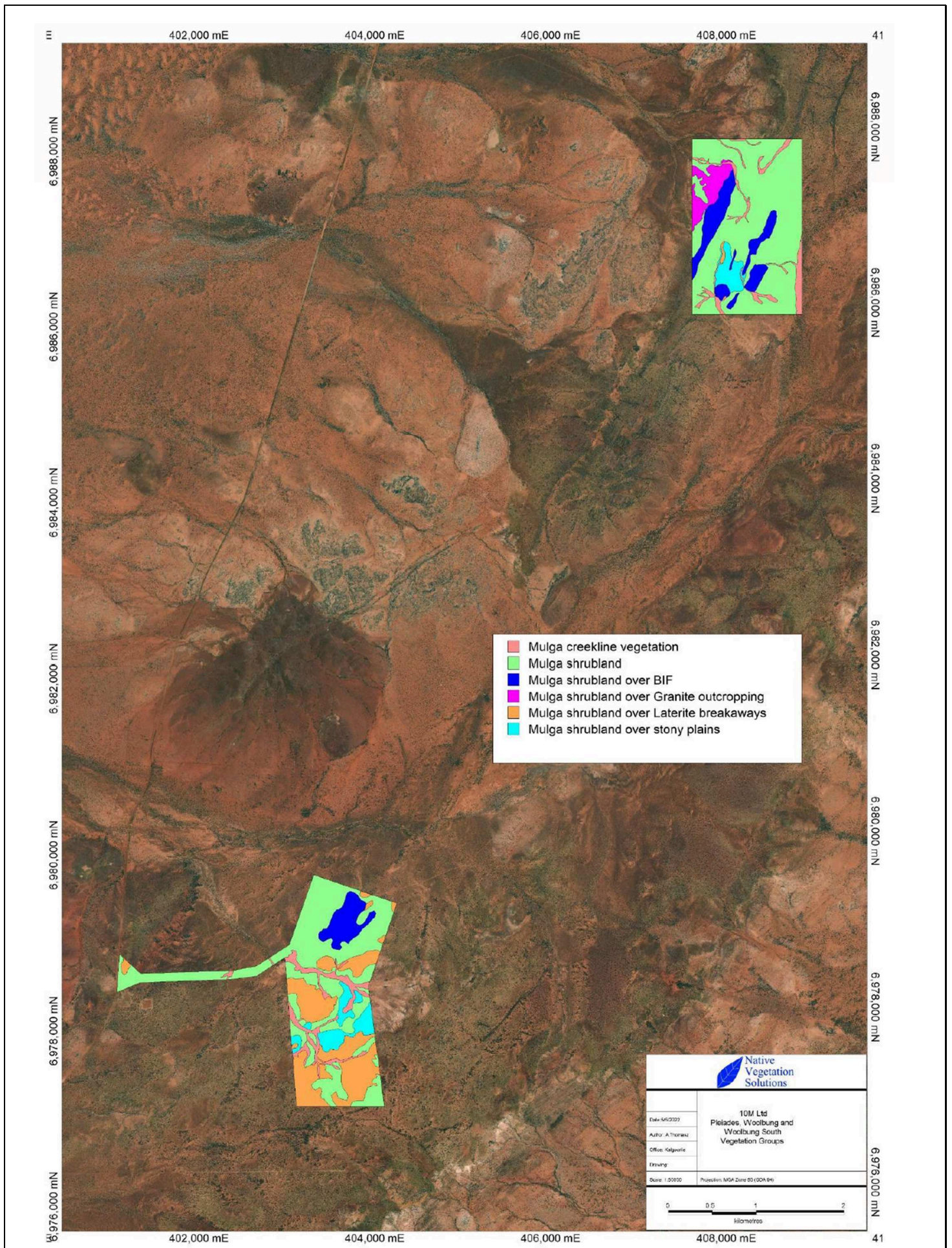


Figure 5: Vegetation mapping of the Pleiades, Woolbung Peak, and Woolbung South survey areas (NVS, 2022a).

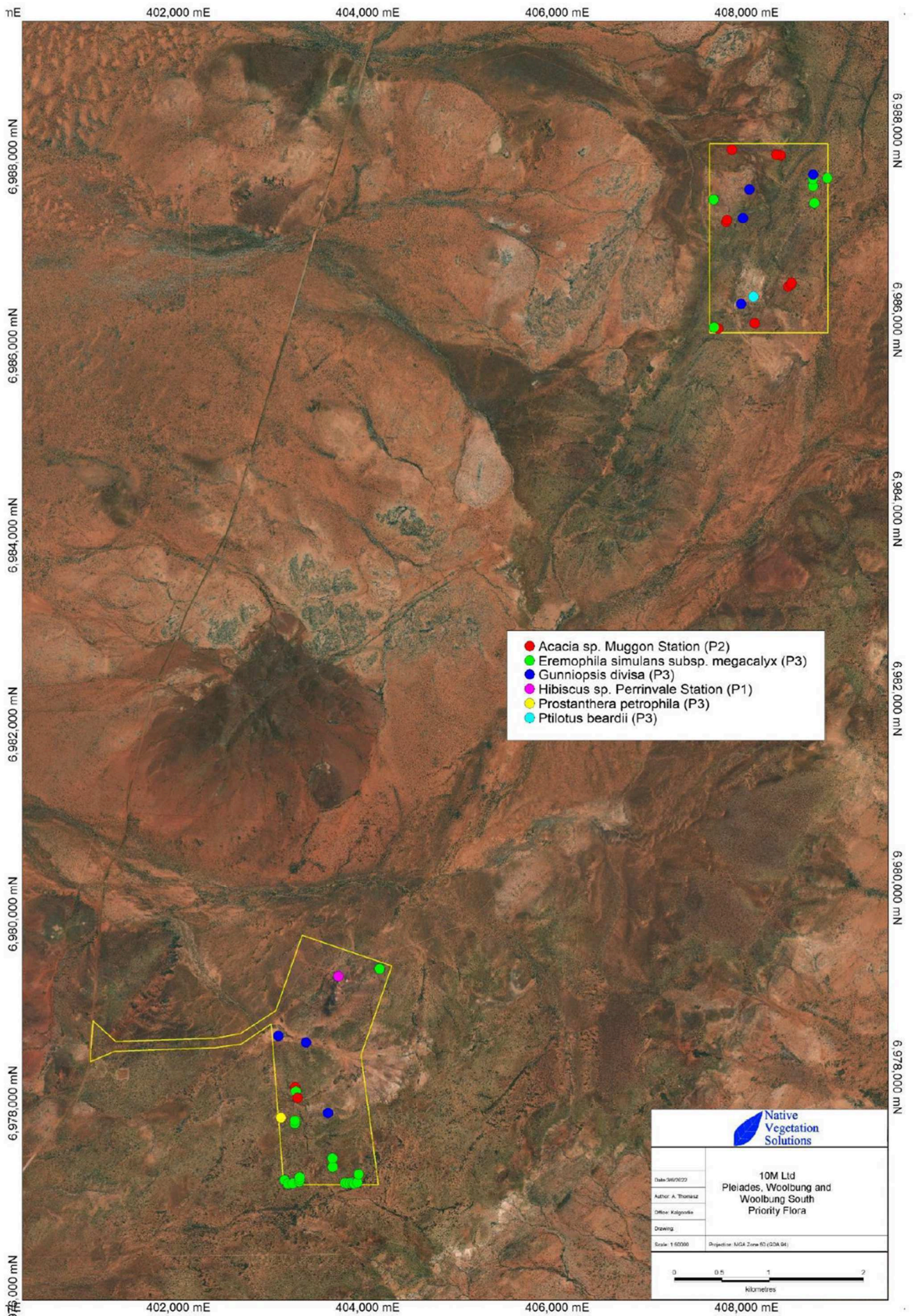


Figure 6: Priority flora locations recorded in the Pleiades, Woolbung Peak, and Woolbung South survey areas (NVS, 2022a).

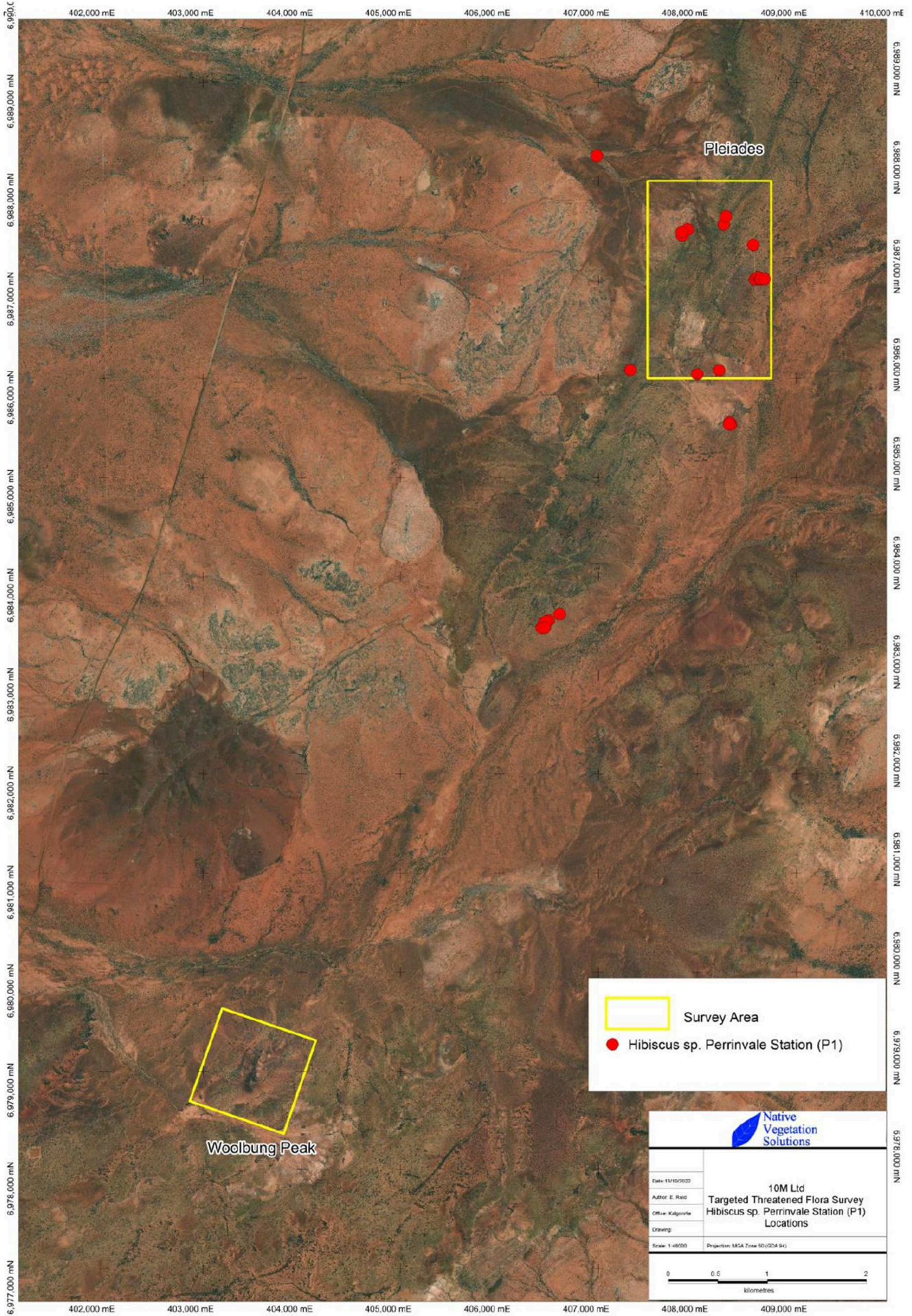


Figure 7: *Hibiscus* sp. Perrinvale Station (P1) locations recorded during the targeted flora survey (NVS, 2022b).

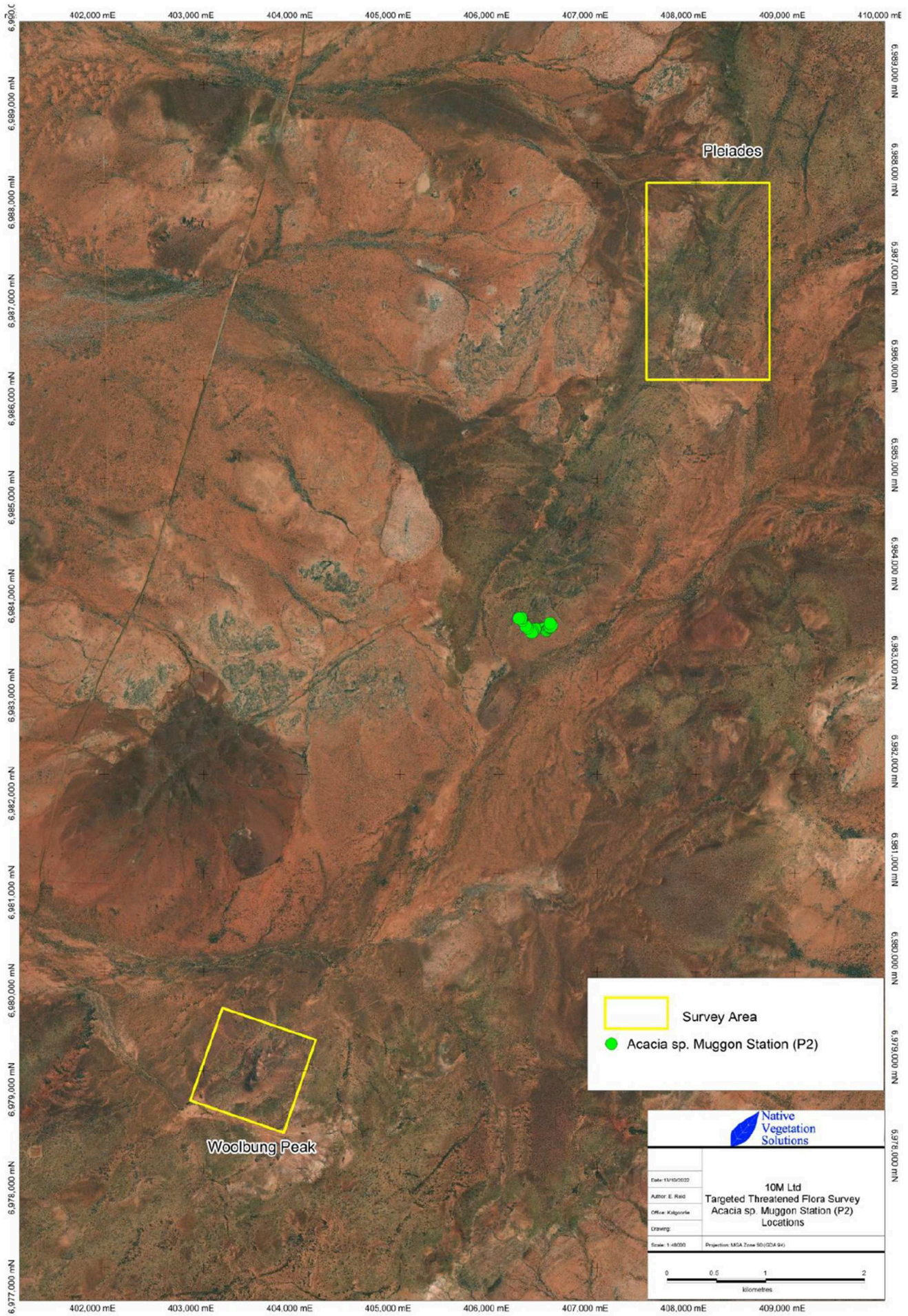


Figure 8: *Acacia* sp. Muggon Station (P2) locations recorded during the targeted flora survey (NVS, 2022b).

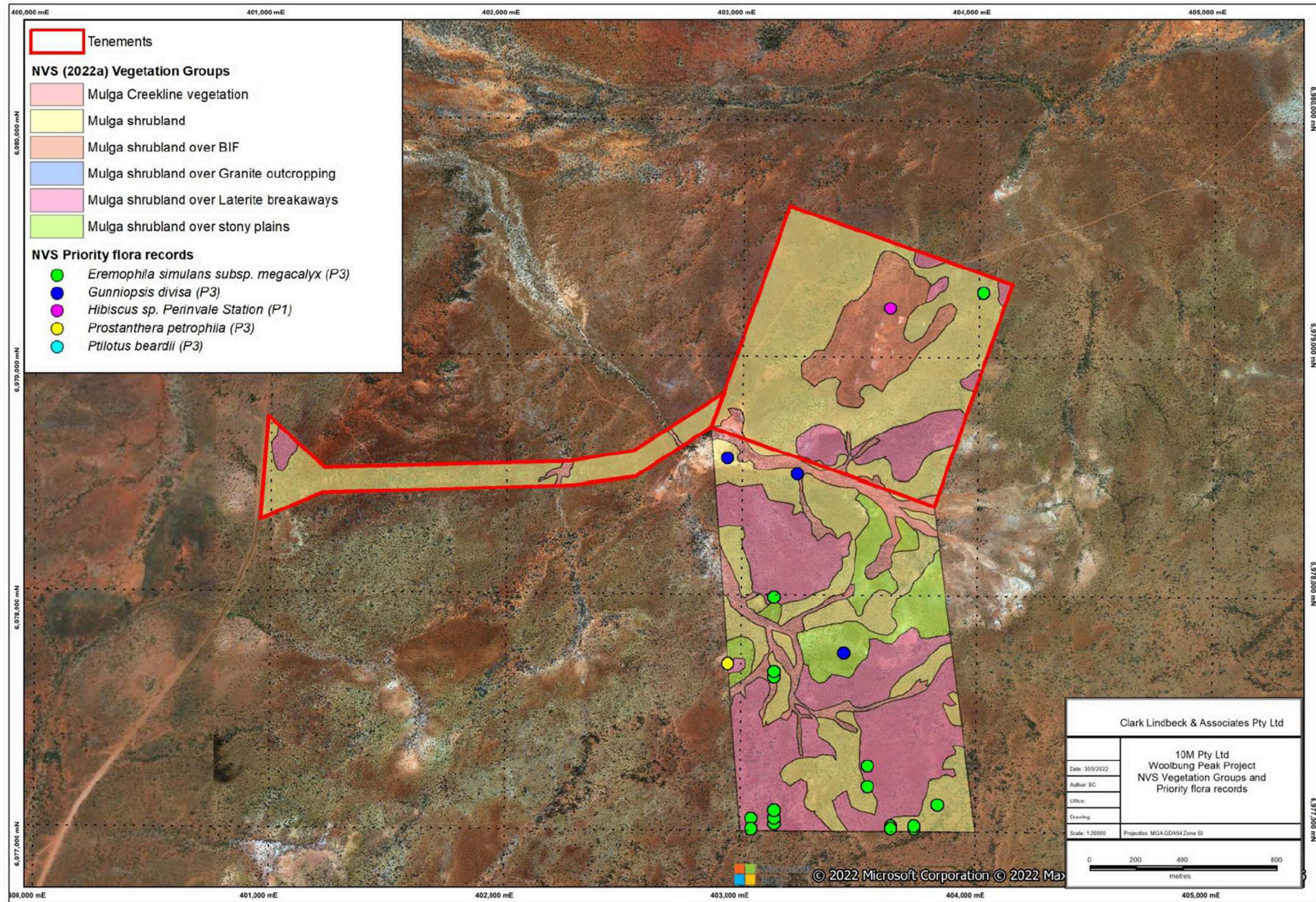


Figure 9: Vegetation mapping and priority flora records within the Woolbung Peak and Woolbung South survey areas (Clark Lindbeck, 2022).

Appendix G. Sources of information

G.1. GIS databases

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

- 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)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- Hydrography, Linear (DWER-031)
- 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)

G.2. References

- 10M Limited (2023) Additional information received in relation to clearing permit application CPS 9982/1. 10M Limited, Western Australia, 17 March 2023.
- Bureau of Meteorology (BoM) (2023) Bureau of Meteorology Website – Climate Data Online, Murgoo. Bureau of Meteorology. <http://www.bom.gov.au/climate/data/> (Accessed 10 February 2023).
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002. Department of Conservation and Land Management, Western Australia.
- Clark Lindbeck (2022). Woolbung Peak Project. Supporting Document for Clearing Permit Application. M59/768 & L59/202. Prepared by Clark Lindbeck & Associates Pty Ltd, for 10M Limited, November 2022.
- Department of Biodiversity, Conservation and Attractions (DBCA) (2021) Priority Ecological Communities for Western Australia Version 32. Species and Communities Program, Department of Biodiversity, Conservation and Attractions, July 2021.
- Department of Biodiversity, Conservation and Attractions (DBCA) (2023a) Additional comments received in relation to Clearing Permit Application CPS 9982/1. Species and Communities Branch, Department of Biodiversity, Conservation and Attractions, Western Australia, March 2023.
- Department of Biodiversity, Conservation and Attractions (DBCA) (2023b) Advice received in relation to Clearing Permit Application CPS 9982/1. Species and Communities Branch, Department of Biodiversity, Conservation and Attractions, Western Australia, January 2023.
- Department of Environment and Conservation (DEC) (2012) Western Spiny-tailed Skink (*Egernia stokesii*) National Recovery Plan. Wildlife Management Program No. 53. Department of Environment and Conservation, June 2012.
- Department of Environment and Conservation (DEC) (2013) Definitions, Categories and Criteria for Threatened and Priority Ecological Communities. Department of Environment and Conservation, January 2013.
- 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 Parks and Wildlife (DPaW) (2017) Interim guideline for preliminary surveys of night parrot (*Pezoporus occidentalis*) in Western Australia. Version 1. Department of Parks and Wildlife, May 2017.
- 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 24 January 2023).
- Department of Primary Industries and Regional Development (DPIRD) (2022) Advice received in relation to Clearing Permit Application CPS 9982/1. Office of the Commissioner of Soil and Land Conservation, Department of Primary Industries and Regional Development, Western Australia, December 2022.
- Department of Water and Environmental Regulation (DWER) (2021) Procedure: Native vegetation clearing permits. Joondalup. Available from: https://www.wa.gov.au/system/files/2021-10/Procedure_Native_vegetation_clearing_permits.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>
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Meissner, R. and Wright, J. (2010) Flora and vegetation of banded iron formations of the Yilgarn Craton: Barloweerie and Twin Peaks Greenstone Belts. Science Division, Department of Environment and Conservation. Conservation Science Western Australia 7(3): 557–570.
- NVS (2021) Targeted Threatened Flora Search of the Woolbung Peak Prospect - August 2021. Prepared by Native Vegetation Solutions, for Clark Lindbeck & Associates, October 2021.
- NVS (2022a) Detailed Flora and Vegetation Survey of the Pleiades, Woolbung Peak and Woolbung South Prospects. Prepared by Native Vegetation Solutions, for 10M Limited, June 2022.
- NVS (2022b) Targeted Flora Survey letterhead – August 2022. Prepared by Native Vegetation Solutions, for 10M Limited, October 2022.
- Western Australian Herbarium (1998-) FloraBase - the Western Australian Flora. Department of Biodiversity, Conservation and Attractions, Western Australia. <https://florabase.dpaw.wa.gov.au/> (Accessed 2-14 March 2023).
- Western Ecological (2022) Basic and Targeted Fauna Assessment – Woolbung Peak. Prepared by Western Ecological Pty Ltd, for 10M Pty Ltd, May 2022.

4. Glossary

Acronyms:

BC Act	<i>Biodiversity Conservation Act 2016</i> , Western Australia
BoM	Bureau of Meteorology, Australian Government
DAA	Department of Aboriginal Affairs, Western Australia (now DPLH)
DAFWA	Department of Agriculture and Food, Western Australia (now DPIRD)
DAWE	Department of Agriculture, Water and the Environment, Australian Government
DBCA	Department of Biodiversity, Conservation and Attractions, Western Australia
DER	Department of Environment Regulation, Western Australia (now DWER)
DMIRS	Department of Mines, Industry Regulation and Safety, Western Australia
DMP	Department of Mines and Petroleum, Western Australia (now DMIRS)
DoEE	Department of the Environment and Energy (now DAWE)
DoW	Department of Water, Western Australia (now DWER)
DPaW	Department of Parks and Wildlife, Western Australia (now DBCA)
DPIRD	Department of Primary Industries and Regional Development, Western Australia
DPLH	Department of Planning, Lands and Heritage, Western Australia
DRF	Declared Rare Flora (now known as Threatened Flora)
DWER	Department of Water and Environmental Regulation, Western Australia
EP Act	<i>Environmental Protection Act 1986</i> , Western Australia
EPA	Environmental Protection Authority, Western Australia
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
PEC	Priority Ecological Community, Western Australia
RIWI Act	<i>Rights in Water and Irrigation Act 1914</i> , Western Australia
TEC	Threatened Ecological Community

Definitions:

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

T Threatened species:

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

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

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

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

CR Critically endangered species

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

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

EN Endangered species

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

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

VU Vulnerable species

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

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

Extinct Species:

EX Extinct species

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

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

EW Extinct in the wild species

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

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

Specially protected species:

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

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

MI Migratory species

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

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

Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

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

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

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

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

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.