

Environmental Assessment

Cue Gold Project

Clearing Permit Application

M21/106, M21/107, M58/224, M58/366,
M58/367 & L58/42

Prepared for
Ramelius Resources Limited



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Glossary

Acronym	Description
ANCA	Australian Nature Conservation Agency.
BAM Act	<i>Biosecurity and Agriculture Management Act 2007</i> , WA Government.
BC Act	<i>Biodiversity Conservation Act 2016</i> , WA Government.
BoM	Bureau of Meteorology.
Botanica	Botanica Consulting Pty Ltd.
DAFWA	Department of Agriculture and Food (now DPIRD), WA Government.
DAWE	Department of Agriculture, Water and Environment (formerly DoEE), Australian Government (now known as DCCEEW).
DBCA	Department of Biodiversity, Conservation and Attractions (formerly DPaW), WA Government.
DCCEEW	Department of Climate Change, Energy the Environment and Water (formerly DAWE), Australian Government.
DER	Department of Environment Regulation (now DWER), WA Government.
DMIRS	Department of Mines, Industry Regulation and Safety (formerly DMP), WA Government
DMP	Department of Mines and Petroleum (now DMIRS), WA Government.
DoEE	Department of the Environment and Energy (now DAWE), Australian Government.
DoW	Department of Water (now DWER), WA Government.
DPaW	Department of Parks and Wildlife (now DBCA), WA Government.
DPIRD	Department of Primary Industries and Regional Development, WA Government
DWER	Department of Water and Environmental Regulation (formerly EPA, DER and DoW), WA Government
EP Act	<i>Environmental Protection Act 1986</i> , WA Government.
EP Regulations	Environmental Protection (Clearing of Native Vegetation) Regulations 2004, WA Government.
EPA	Environmental Protection Authority (now DWER), WA Government.
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> , Australian Government.
ESA	Environmentally Sensitive Area.
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.
Km	Kilometre (1,000 metres).
MVG	Major Vegetation Groups.
NVIS	National Vegetation Information System.
OEPA	Office of the Environmental Protection Authority, WA Government.
PEC	Priority Ecological Community.
Project	Symes Find Project.
RAOU	Royal Australia Ornithologist Union.
Ramelius	Ramelius Resources Limited.
SRE	Short Range Endemic.
SSC	Species Survival Commission, International.
TEC	Threatened Ecological Community.
WA	Western Australia.
WAHERB	Western Australian Herbarium.
WAM	Western Australian Museum, WA Government.

1 Introduction

The Cue Project is located approximately 45km north-east of Mount Magnet and 25km south-west of Cue in Western Australia's Murchison goldfield (Figure 1-1). The Project, formerly known as Moyagee, is situated on tenements adjacent to the Great Northern Highway south of Lake Austin.

The region surrounding the Project area has been disturbed by several periods of mining activating including early 20th century shaft mining and battering processing, and exploration ongoing since the 1980s.

In 2010, Silverlake Resources acquired the Moyagee site as part of the Murchison Gold Project. In 2015, Musgrave Minerals Ltd (Musgrave) entered into a farm-in and joint venture agreement with Silverlake Resources and acquired 100% of the project in August 2017.

In 2023, Mt Magnet Gold Pty Ltd (MMG) which is a wholly owned subsidiary of Ramelius Resources Limited (Ramelius) acquired 100% of Musgrave Minerals Ltd (Musgrave) and renamed the Project "Cue Gold Project" (Project).

The Project tenements (listed in Table 1-1) are located on the Wanarie Pastoral Lease which is owned and operated by Musgrave (Figure 1-1).

The Project requires a clearing permit application (referred to in this document as the 'assessment area') which encompasses an area of 548 ha (Figure 1-2). A total of 320 ha of clearing is proposed within the assessment area.

Table 1-1: Project Tenements

Tenement	Area (ha)	Holder	Granted	Expiry
M 21/106	889.65	Musgrave Minerals Limited	19/05/1999	18/05/2041
M 21/107	642.85	Musgrave Minerals Limited	19/05/1999	18/05/2041
M 58/224	312.70	Musgrave Minerals Limited	29/08/1995	28/08/2037
M 58/366	655.24	Musgrave Minerals Limited	14/11/2022	13/11/2043
M 58/367	250.30	Musgrave Minerals Limited	15/11/2022	14/11/2043
L58/42	120.27	Musgrave Minerals Limited	27/10/2020	26/10/2041

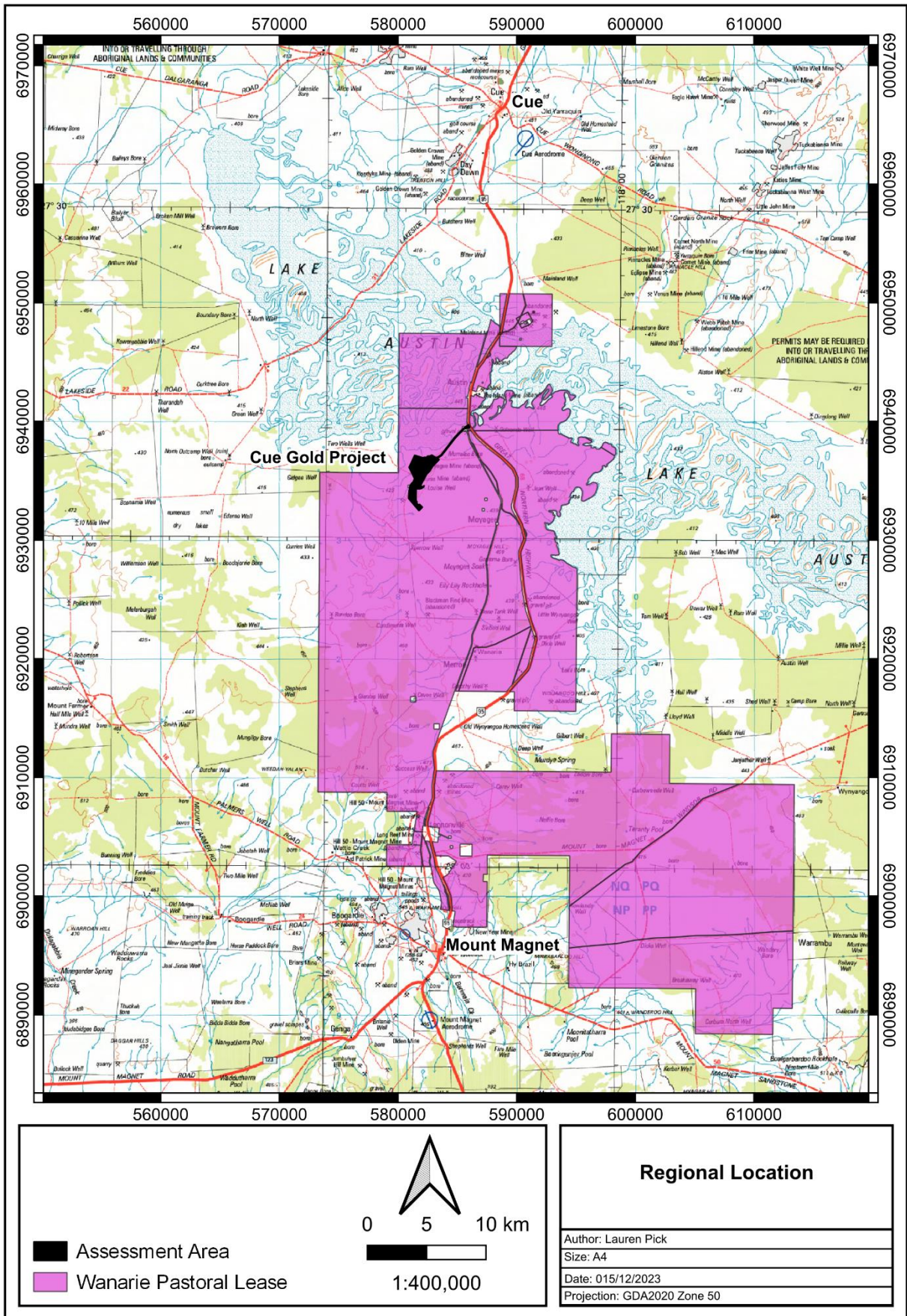


Figure 1-1: Regional location of the Cue Gold Project

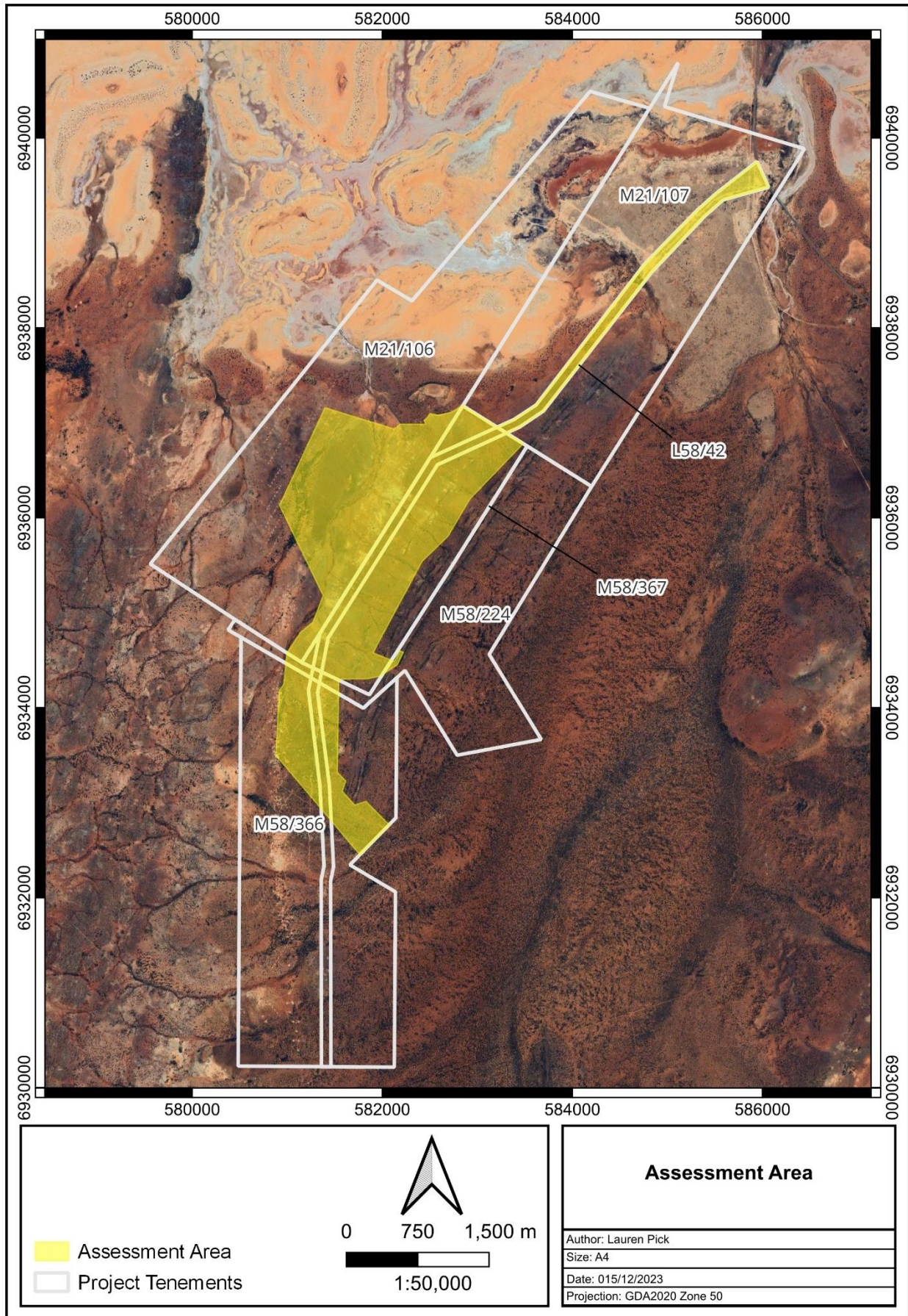


Figure 1-2: Assessment Area

2 Existing Environment

2.1 Regional Setting

The assessment area lies within the Eremaean Province of Western Australia (WA). Based on the Interim Biogeographic Regionalisation of Australia (IBRA, Version 7) (DotEE, 2012) the assessment area lies across the Murchison Bioregion. The bioregions are further divided into subregions with the assessment area located within the Eastern Murchison (MUR1) subregion (**Error! Reference source not found.**).

The landscape of the Murchison Bioregion comprises low hills, mesas of duricrust separated by flat colluvium and alluvial plain. It is dominated by the Archaean (over 2500 million years ago) granite greenstone terrain of the Yilgarn Craton (McKenzie, May and McKenna, 2002). Alluvial soils and sands mantle the granitic and greenstone units of the Yilgarn Craton. These soils are shallow, sandy and infertile. Underlying the soils in low areas is a red-brown siliceous hard pan (Curry et al. 1994). The soils in the eastern half of the bioregion are typically red sands, calcareous red earth soil, duplex soil and clays. There are 41 vegetation associations (hummock grasslands, succulent steppe or low woodlands) that have at least 85 per cent of their total area in the bioregion. The bioregion is rich and diverse in both its flora and fauna, but most species are wide ranging and usually occur in adjoining regions (McKenzie, May and McKenna, 2002).

The Eastern Murchison subregion comprises the northern parts of the craton's Southern Cross and Eastern Goldfields Terrains and is characterised by internal drainage and extensive areas of elevated red desert sandplains with minimal dune development. Salt Lake systems are associated with the occluded paleodrainage system. Broad plains of red-brown soils and breakaways complexes as well as red sandplains are widespread. Vegetation is dominated by Mulga woodlands and is often rich in ephemerals, hummock grasslands, saltbush shrublands and Samphire shrublands (McKenzie, May and McKenna, 2002). The Eastern Murchison subregion comprises diverse mulga woodlands, which occur on low greenstone belts. The sand plains have red loamy earths and red deep sands which are found on the sandy banks (Cowan, 2001).

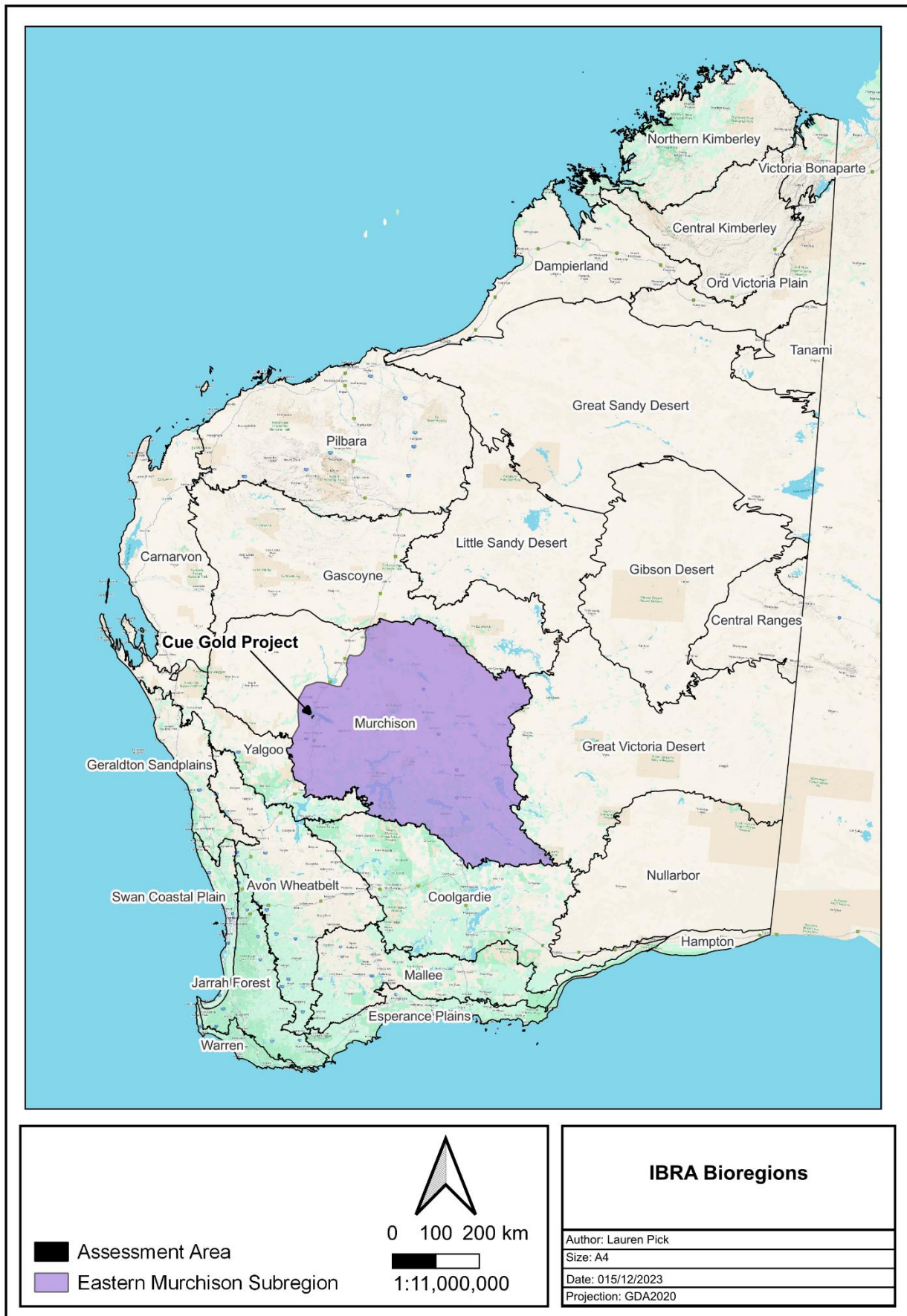


Figure 2-1: IBRA Bioregions in relation to the assessment area

2.2 Soils and Landscape Systems

The assessment area lies within the Murchison Province, which consists of hardpan wash plains and sandplains (with some stony plains, hills, mesas and salt lakes) on the granitic rocks and greenstone of the Yilgarn Craton. Soils include red loamy earths, red sandy earths, red shallow loams, red deep sands and red-brown hardpan shallow loams (with some red shallow sands and red shallow sandy duplexes). Vegetation comprises of mulga shrublands with spinifex grasslands (and some bowgada shrublands, eucalypt woodlands and halophytic shrublands). This zone is located in the inland Mid-west and northern Goldfields between Three Springs, the Gascoyne River, Wiluna, Cosmo Newberry and Menzies. (Tille, 2006).

The Murchison Province is further divided into soil-landscape zones, with the assessment area located within the Yalgoo Plains Zone (273).

This zone is comprised of hardpan wash plains (with some sandplains, stony plains, mesas and granite outcrops) on granitic rocks (with some greenstone) of the Yilgarn Craton (Murchison Domain). Soils include red loamy earths and red shallow loams (often with hardpans) with red deep sands and red shallow sands and some red shallow sandy duplexes. Vegetation comprises mulga shrublands with bowgada shrublands (and some halophytic shrublands). This zone is located in the south-western Murchison from Paynes Find to Cue and Twin Peaks Station (Tille, 2006).

In accordance with soil landscape system mapping data (Government of Western Australia, 2019), the soil landscape zones are divided into soil landscape systems, with the assessment area located within six soil landscape systems as described in Table 2-1 and shown in Figure 2-1.

Table 2-1: Soil landscape systems within the assessment area

Soil Landscape System	Description	Extent within assessment area
Austin System	Saline stony plains with low rises and drainage foci supporting low halophytic shrublands with scattered mulga and snakewood.	160 ha (29.2%)
Carnegie System	Salt lakes with fringing saline alluvial plains, kopi dunes and sandy banks, supporting halophytic shrublands and acacia tall shrublands.	23 ha (4.2%)
Gabanintha System	Greenstone ridges, hills and footslopes supporting sparse acacia and other mainly non-halophytic shrublands.	321 ha (58.6%)
Jundee System	Hardpan plains with variable gravelly mantles and minor sandy banks supporting weakly groved mulga shrublands.	1 ha (0.2%)
Mileura System	Saline and non-saline calcreted river plains with flood plains and calcrete platforms supporting variable tall shrublands, mixed halophytic shrublands and shrubby grasslands.	22 ha (4.0%)
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.	21 ha (3.8%)



Figure 2-2: Soil landscape systems within the assessment area

2.3 Hydrology

According to the Geoscience Australia database (2020), There are two minor ephemeral drainage lines within the assessment area, these all drain into Lake Austin, located directly adjacent to the assessment area (Figure 2-3). There are no perennial drainage lines in the assessment area.

Groundwater Dependent Ecosystems (GDE) includes biological assemblages of species such as wetlands or woodlands that use groundwater either opportunistically or as their primary water source. For the purposes of this report, a GDE is defined as any vegetation community that derives part of its water budget from groundwater and must be assumed to have some degree of groundwater dependency. In accordance with the BoM Atlas of Groundwater Dependent Ecosystems (BoM, 2022) database, there are no known aquatic or terrestrial GDEs within the assessment area. There is one high potential terrestrial GDE (associated with Lake Austin) located directly north of the assessment area; Shrublands; Bare lake beds inundated for short periods after rain.

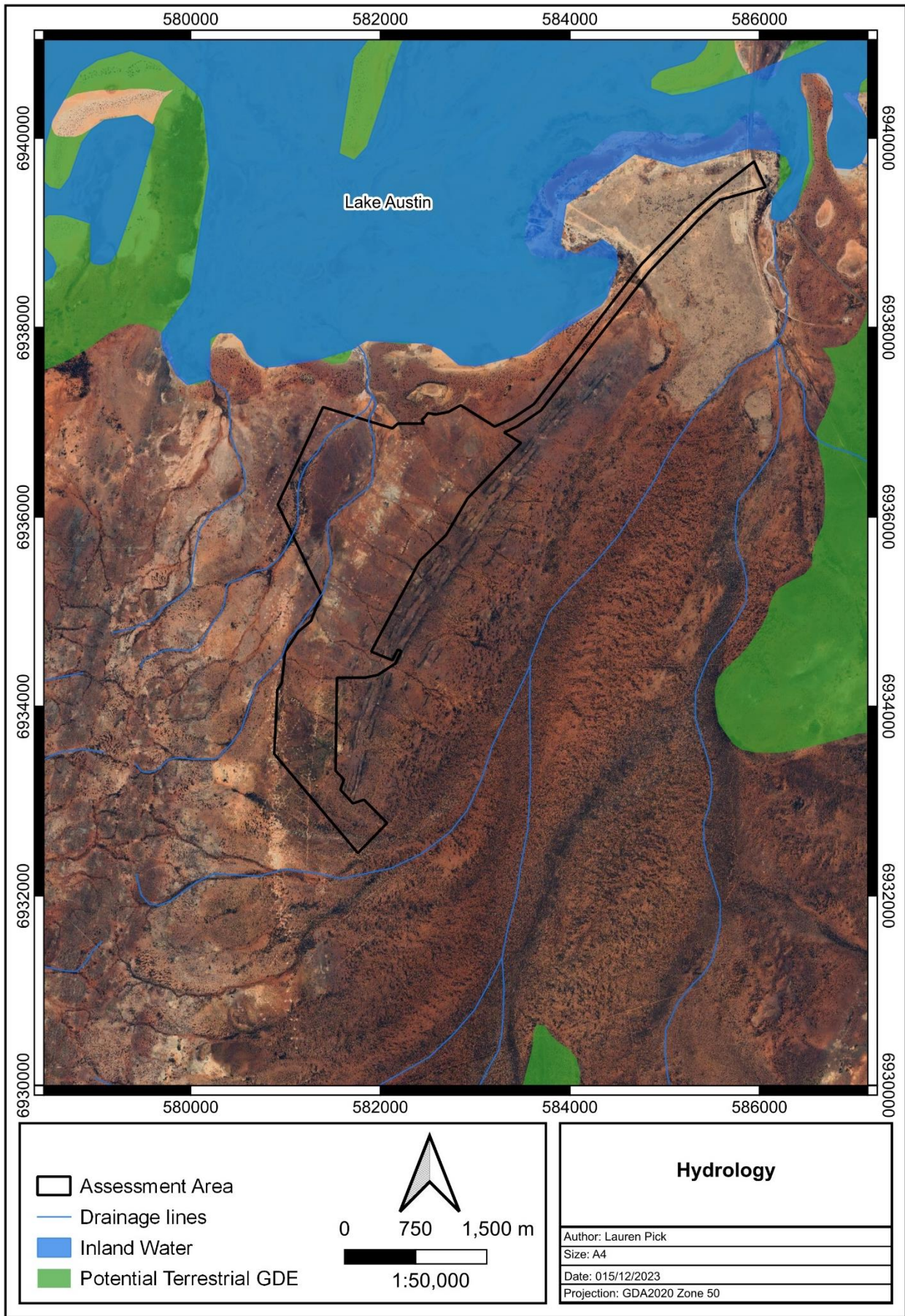


Figure 2-3: Hydrology of the assessment area

2.4 Conservation Values

No Threatened Ecological Communities (TEC) listed under the Commonwealth EPBC Act, or the Western Australian BC Act are known to occur within the survey area or within 40 km of the assessment area. Five Priority Ecological Communities (PEC) as listed by DBCA occur within 40 km of the assessment area one of which intersects the assessment area (Table 2-2).

Table 2-2: Priority Ecological Communities

Community	Conservation Status	Description (DBCA, 2021)	Locality
Austin Land System	Priority 3	Saline stony plains with low rises and drainage foci supporting low halophytic shrublands with scattered mulga; occurs mainly adjacent to lakes Austin and Annean below greenstone hill systems.	Intersects the western boundary of the assessment area
Lake Austin calcrete groundwater assemblage type on Murchison palaeodrainage on Austin Downs Station	Priority 1	Unique assemblages of invertebrates have been identified in the groundwater calcretes.	Located approximately 21 km north-west of the assessment area
Lake Austin vegetation complexes (banded ironstone formation)	Priority 1	Not available	Located approximately 1 km west of the assessment area
Mount Magnet vegetation complexes (banded ironstone formation)	Priority 1	Not available	Located approximately 20 km south of the assessment area
Taincrow calcrete groundwater assemblage type on Murchison palaeodrainage on Taincrow Station	Priority 1	Unique assemblages of invertebrates have been identified in the groundwater calcretes.	Located approximately 36 km north of the assessment area

There are no Ramsar wetlands or wetlands of national importance (ANCA Wetlands) within the assessment area or within 40 km of the assessment area. There are no Environmentally Sensitive Areas (ESA) as listed under the EP Act within the assessment area. The nearest ESA is located approximately 50 km west of the assessment area.

There are no proposed nor gazetted conservation reserves within the assessment area. The closest gazetted conservation reserve is the Lakeside Conservation Park, located approximately 5km north-west of the assessment area.

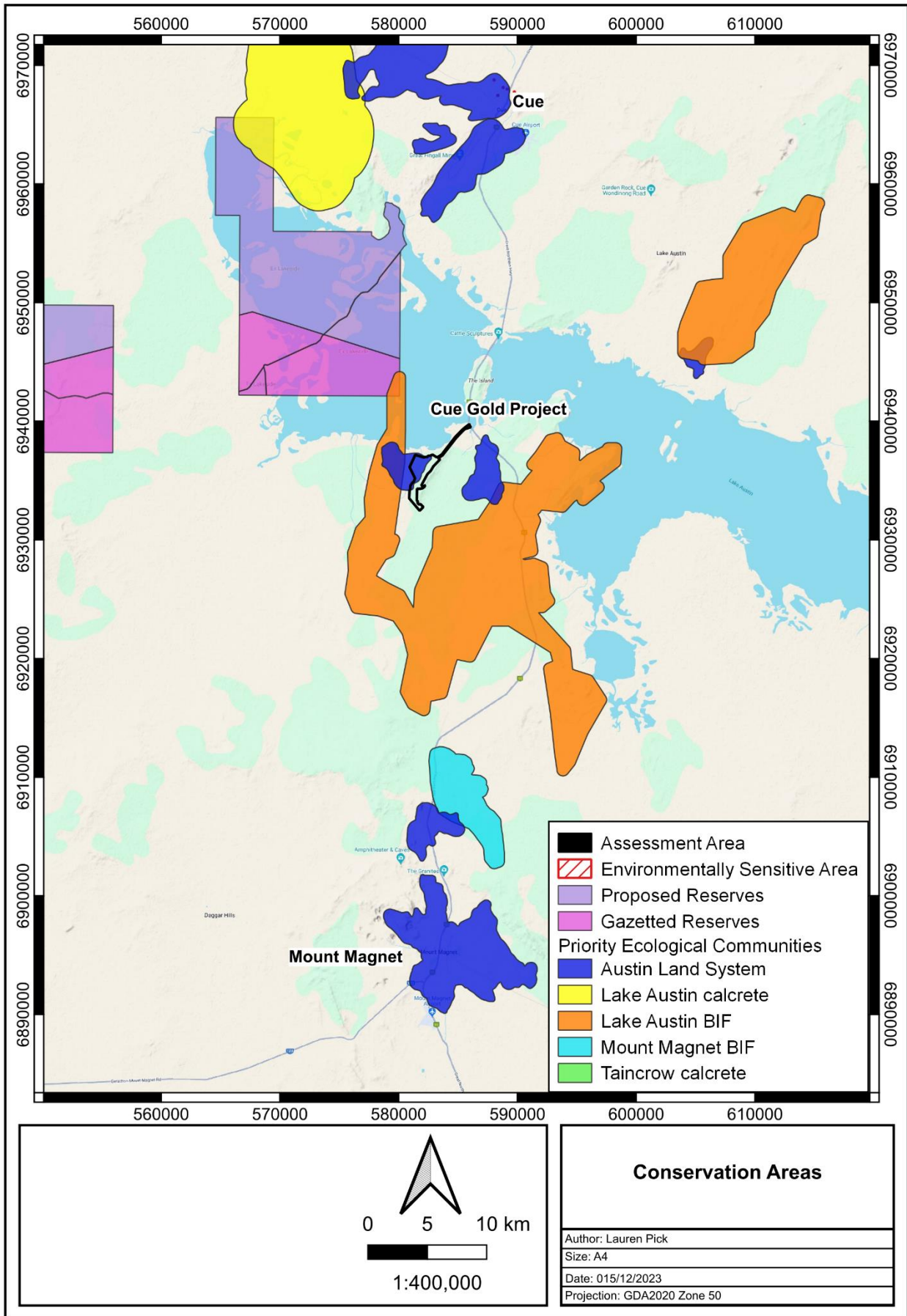


Figure 2-4: Conservation values in relation to the assessment area

2.5 Vegetation and Flora

The Pre-European vegetation association spatial mapping dataset (DPIRD, 2018) identified three vegetation associations as occurring within the assessment area (Figure 2-5). The association descriptions and their remaining extent, as specified in the 2018 Statewide Vegetation Statistics (Government of Western Australia, 2019) is provided in Table 2-3. Areas retaining less than 30% of their pre-European vegetation extent generally experience exponentially accelerated species loss, while areas with less than 10% are considered “endangered” (EPA, 2000). None of the vegetation associations within the assessment area are below the 30% threshold.

Table 2-3: Pre-European vegetation associations within the assessment area

Vegetation Association	Current Extent (ha)	Pre-European extent remaining (%)	% Protected for Conservation	Floristic Description	Extent within assessment area
Upper Murchison 18	260,502.07	99.99	0	Low woodland; mulga (<i>Acacia aneura</i>)	24 ha (4.4%)
Upper Murchison 240	6,545.92	100.00	0	Succulent steppe with open scrub; scattered <i>Acacia sclerosperma</i> & bowgada over saltbush & bluebush	24 ha (4.4%)
Upper Murchison 313	33,493.32	97.80	0	Succulent steppe with open scrub; scattered <i>Acacia sclerosperma</i> & <i>A. victoriae</i> over bluebush	500 ha (91.2%)



Figure 2-5: Pre-European vegetation associations within the assessment area

The flora and vegetation of the assessment area and surrounds are well understood with numerous studies having been conducted across the area. Most recently, a detailed flora and vegetation assessment and targeted flora survey was conducted by Maia Environmental Consultancy in 2022/2023 spring/summer seasons. A detailed flora and vegetation assessment was undertaken by 360 Environmental in September 2020 following a detailed flora and vegetation survey conducted in 2018. Coffey Environments have conducted multiple flora and vegetation surveys across the area in 2013 as well as surveys conducted in surrounding areas including Lake Austin.

Twenty vegetation types were mapped over the Survey Area by Maia Environmental Consultancy (2023), thirteen of which are located within the assessment area as shown in Table 2-4. Two PECs (Lake Austin vegetation complexes (banded ironstone formation) and Austin Land System) were represented by vegetation within the assessment area.

Table 2-4: Summary of vegetation types of the Cue Gold Project

Vegetation Type	Vegetation Code	Representative Ecological Community	Priority	Extent within assessment area
Disturbed	N/A	N/A		65 ha (11.9%)
Lake bed	N/A	N/A		0 ha
Sparse Tussock Grassland of <i>Eragrostis falcata</i> with a mixed Low Sparse Shrubland mainly of <i>Frankenia laxiflora</i> , <i>Atriplex nana</i> and <i>Sclerolaena fimbriolata</i> with +/- Isolated Tall Shrubs of <i>Grevillea sarissa</i> and / or <i>Eremophila oldfieldii</i> subsp. <i>angustifolia</i>	EFTG	N/A		0 ha
Mixed Tall Acacia Shrubland mainly of <i>Acacia fuscaneura</i> , <i>A. grasbyi</i> and <i>A. tetragonophylla</i> with a Sparse Low Shrubland of <i>Maireana triptera</i> , <i>Solanum lasiophyllum</i> and <i>Sclerolaena densiflora</i> and Isolated Low Trees of <i>Acacia fuscaneura</i>	MATSL (1)	Austin Land System (P3) PEC		101 ha (18.4%)
Mixed Acacia Tall Shrubland mainly of <i>Acacia aptaneura</i> , <i>A. fuscaneura</i> and <i>A. grasbyi</i> with a Sparse mixed Shrubland mainly of <i>Eremophila georgei</i> , <i>E. forrestii</i> and <i>E. latrobei</i> subsp. <i>glabra</i> and a Low Sparse Shrubland of <i>Ptilotus obovatus</i> and <i>P. schwartzii</i>	MATSL (2)	Lake Austin vegetation complexes (banded ironstone formation) P1 PEC		0 ha
Mixed Acacia Tall Shrubland / Low Woodland to Isolated Tall Shrubs / Low Trees mainly of <i>Acacia aptaneura</i> , <i>A. fuscaneura</i> and <i>A. incurvaneura</i> with a Sparse Shrubland of <i>Eremophila georgei</i> and <i>E. forrestii</i> and a Low Sparse Shrubland of <i>Ptilotus obovatus</i> and Isolated Low Trees of <i>Acacia pruinocarpa</i>	MATSL (3)	Lake Austin vegetation complexes (banded ironstone formation) P1 PEC		0 ha
Mixed Acacia Tall Shrubland mainly of <i>A. tetragonophylla</i> , <i>A. craspedocarpa</i> and <i>A. caesaneura</i> with a mixed Sparse Shrubland mainly of <i>Eremophila forrestii</i> , <i>Solanum lasiophyllum</i> and <i>Ptilotus obovatus</i>	MATSL (4)	Austin Land System (P3) PEC		34 ha (6.2%)
Mixed Acacia Tall Shrubland mainly of <i>Acacia tetragonophylla</i> , <i>A. craspedocarpa</i> and <i>A. caesaneura</i> with a mixed Sparse Shrubland of <i>Eremophila galeata</i> and / or <i>Teucrium teucriiflorum</i> and Isolated Low Shrubs of <i>Ptilotus obovatus</i>	MATSL (5)	Austin Land System (P3) PEC		21.6 ha (3.9%)
Mixed Acacia Tall Shrubland mainly of <i>Acacia aptaneura</i> , <i>A. ramulosa</i> var. <i>ramulosa</i> and <i>A. caesaneura</i> with a mixed Sparse Shrubland of <i>Eremophila forrestii</i> subsp. <i>forrestii</i> , <i>E. latrobei</i> subsp. <i>latrobei</i> and <i>E. georgei</i> and Isolated Low Shrubs of <i>Ptilotus obovatus</i>	MATSL (6)	Austin Land System (P3) PEC		59 ha (10.8%)

Vegetation Type	Vegetation Code	Representative Priority Ecological Community	Extent within assessment area
Mixed Acacia Tall Shrubland mainly of <i>Acacia aptaneura</i> , <i>A. caesaneura</i> , <i>A. grasbyi</i> with a mixed Shrubland mainly of <i>Philotheca brucei</i> subsp. <i>Brucei</i> , <i>Thryptomene decussata</i> and <i>Eremophila latrobei</i> subsp. <i>latrobei</i> with +/- Isolated Low trees of <i>Acacia pruinocarpa</i>	MATSL (7)	Lake Austin vegetation complexes (banded ironstone formation) P1 PEC	0.4 ha (0.1%)
Mixed Tall Shrubland mainly of <i>Acacia tetragonophylla</i> , <i>A. eremaea</i> and <i>A. caesaneura</i> with a mixed Shrubland mainly of <i>Eremophila forrestii</i> subsp. <i>forrestii</i> , <i>E. galeata</i> and <i>Senna</i> sp. Meekatharra and mixed Isolated Low Shrubs mainly of <i>Enchylaena tomentosa</i> subsp. <i>tomentosa</i> , <i>Rhagodia drummondii</i> and <i>Maireana trichoptera</i>	MATSL (8)	Austin Land System (P3) PEC	41 ha (7.5%)
Mixed Low Chenopod Shrubland mainly of <i>Maireana pyramidata</i> , <i>Sclerolaena cuneata</i> and <i>Atriplex codonocarpa</i> with a Sparse Tall Shrubland of <i>Hakea preissii</i>	MLCSL	Austin Land System (P3) PEC	38 ha (6.9%)
Open Low mixed Shrubland mainly of <i>Maireana pyramidata</i> , <i>M. triptera</i> and <i>Ptilotus obovatus</i> with a Sparse mixed Shrubland mainly of <i>Eremophila galeata</i> , <i>Rhagodia drummondii</i> and <i>Senna</i> sp. Meekatharra (E. Bailey 1-26) and Isolated Tall Shrubs of <i>Hakea preissii</i> , <i>Acacia tetragonophylla</i> and <i>A. aptaneura</i>	MLSL (1)	Lake Austin vegetation complexes (banded ironstone formation) P1 PEC	130 ha (23.7%)
Mixed Low Shrubland mainly of <i>Maireana pyramidata</i> , <i>Ptilotus obovatus</i> and <i>Alyogyne pinoniana</i> var. <i>pinoniana</i> with a mixed Tall Sparse Shrubland of mainly <i>Acacia grasbyi</i> , <i>A. incurvaneura</i> and <i>A. caesaneura</i> with a Sparse Tussock Grassland of <i>Eragrostis eriopoda</i> , <i>Monachather paradoxus</i> and <i>Eriachne helmsii</i>	MLSL (2)	Austin Land System (P3) PEC	11 ha (2.0%)
Mixed Low Samphire Shrubland mainly of <i>Tecticornia pruinosa</i> , <i>T. peltata</i> and <i>T. fimbriata</i>	MLSSL (1)	Austin Land System (P3) PEC	6 ha (1.1%)
Mixed Low Samphire Shrubland mainly <i>Tecticornia pruinosa</i> , <i>Tecticornia</i> sp. Dennys Crossing (K.A. Shepherd & J. English KS 552) and <i>Tecticornia</i> sp. aff. <i>auriculata</i> with Isolated Tussock Grasses of <i>Eragrostis falcata</i>	MLSSL (2)	N/A	0 ha
Mixed Low Samphire Shrubland mainly of <i>Tecticornia pergranulata</i> subsp. <i>pergranulata</i> , <i>T. indica</i> subsp. <i>bidens</i> and <i>T. sp. aff. auriculata</i> with a Sparse Shrubland of <i>Atriplex amnicola</i>	MLSSL (3)	Austin Land System (P3) PEC	0 ha
Mixed Shrubland mainly of <i>Cratystylis subspinescens</i> , <i>Lycium australe</i> and <i>Rhagodia drummondii</i> with a mixed Low Chenopod Shrubland mainly of <i>Maireana trichoptera</i> , <i>M. carnosae</i> and <i>Sclerolaena cuneata</i> with Isolated Tall Shrubs to a Sparse Tall Shrubland of <i>Acacia victoriae</i> and <i>Eremophila longifolia</i>	MSL (1)	N/A	1 ha (0.2%)
Mixed Sparse Shrubland mainly of <i>Eremophila longifolia</i> , <i>Hakea preissii</i> and <i>Acacia victoriae</i> with a mixed Sparse Low Shrubland mainly of <i>Frankenia laxiflora</i> , <i>Maireana pyramidata</i> and <i>Solanum lasiophyllum</i>	MSSL	Austin Land System (P3) PEC	24 ha (4.4%)
Tall Closed Shrubland of <i>Melaleuca stereophloia</i> with an Open Shrubland of <i>Exocarpos aphyllus</i>	MstCSL	N/A	0 ha
Mixed Tall Open Shrubland mainly of <i>Acacia victoriae</i> subsp. <i>victoriae</i> , <i>Eremophila longifolia</i> , <i>A. craspedocarpa</i> with a mixed Low Open Shrubland mainly of <i>Maireana trichoptera</i> , <i>Solanum lasiophyllum</i> , <i>Salsola australis</i> and an Open Tussock Grassland of <i>Enneapogon caeruleus</i> and / or <i>Eragrostis falcata</i>	MTOSL	Austin Land System (P3) PEC	16 ha (2.9%)
Low Open Samphire Shrubland of <i>Tecticornia laevigata</i> with a +/- Tall Shrubland of <i>Casuarina obesa</i> and mixed Isolated Shrubs mainly of <i>Lycium australe</i> , <i>Eremophila pantonii</i> and <i>Scaevola spinescens</i>	TILSSL	N/A	0 ha

Green shaded cells-indicates vegetation types within the assessment area

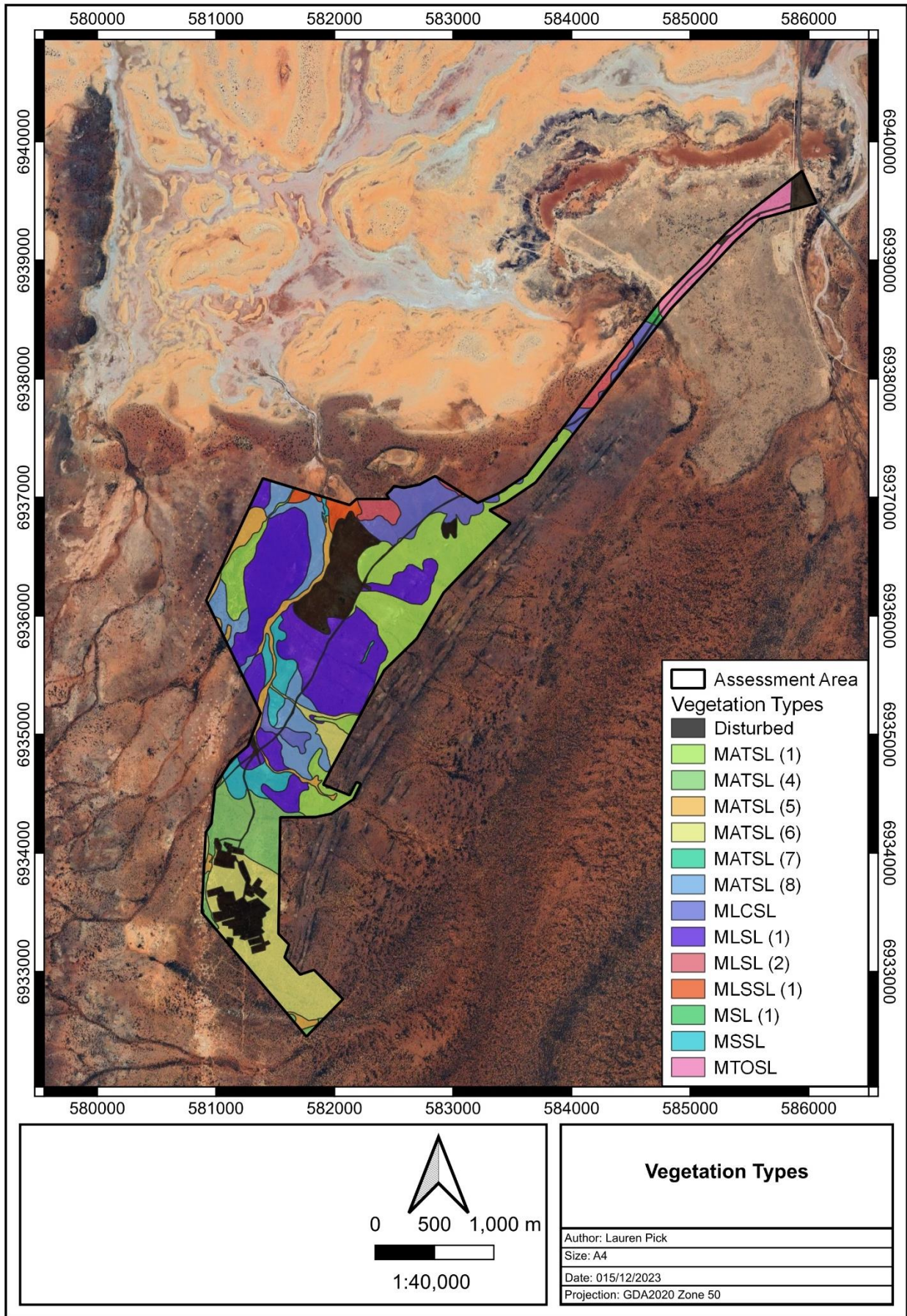


Figure 2-6: Vegetation types within the assessment area

2.5.1 Vegetation Condition

Based on the vegetation condition rating scale adapted from Keighery (1994) and Trudgen, (1988), native vegetation condition within the assessment area was categorized as 'good' to 'completely degraded' (Table 2-5). Disturbances within the assessment area include introduced weed species, fragmentation, adjacent agricultural activities (fertilizers, herbicides etc.), grazing and changed fire regimes.

Table 2-5: Vegetation condition rating within the assessment area

Condition rating	Description	Extent within assessment area
Degraded	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.	65 ha (11.9%)
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.	236 ha (43.1%)
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.	100 ha (18.2%)
Excellent	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.	147 ha (26.8%)

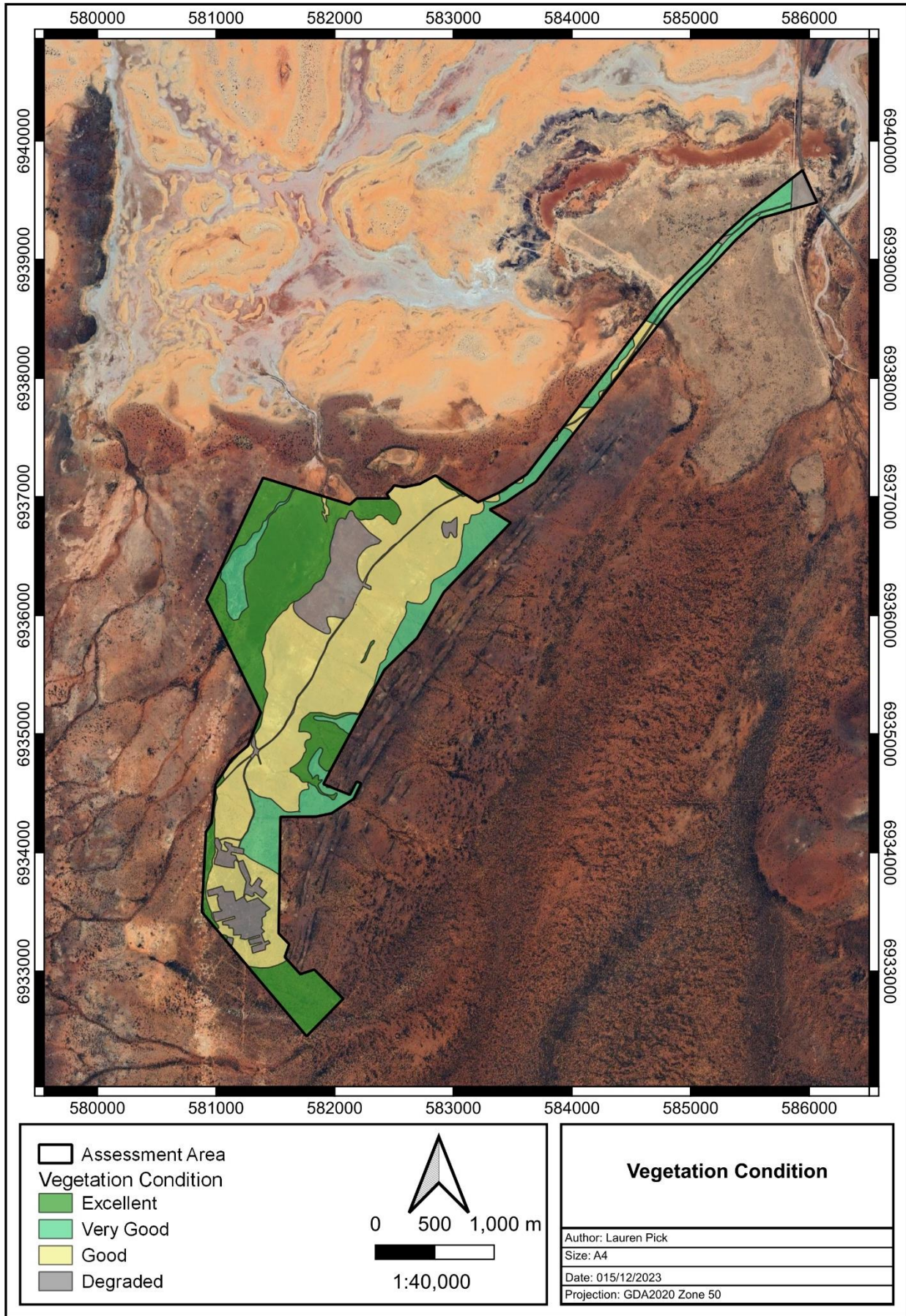


Figure 2-7: Vegetation condition within the assessment area

2.5.2 Significant Flora

According to the EPA Environmental Factor Guideline for Flora and Vegetation (EPA, 2016a) significant flora includes:

- flora being identified as threatened or priority species;
- locally endemic flora or flora associated with a restricted habitat type (e.g. surface water or groundwater dependent ecosystems);
- new species or anomalous features that indicate a potential new species;
- flora representative of the range of a species (particularly, at the extremes of range, recently discovered range extensions, or isolated outliers of the main range);
- unusual species, including restricted subspecies, varieties or naturally occurring hybrids; and
- flora with relictual status, being representative of taxonomic groups that no longer occur widely in the broader landscape.

According to the DBCA flora database search results (DBCA, 2023a), there are no DBCA known records of Threatened or Priority flora within the assessment area (Figure 2-8).

No Threatened flora were recorded during flora surveys within the assessment area.

One Priority flora taxon was recorded during flora surveys within the assessment area; *Hibiscus* sp. Perrinvale Station (J. Warden & E. Ager WB 10581) (P1). Of the 49 plants recorded during the field survey, a total of four plants (four records) are located within the assessment area (Figure 2-9). A total of 50 plants are known to occur within the local area. The proposed clearing of four plants represents a potential impact of impact of 8% of the known local population of this taxon.

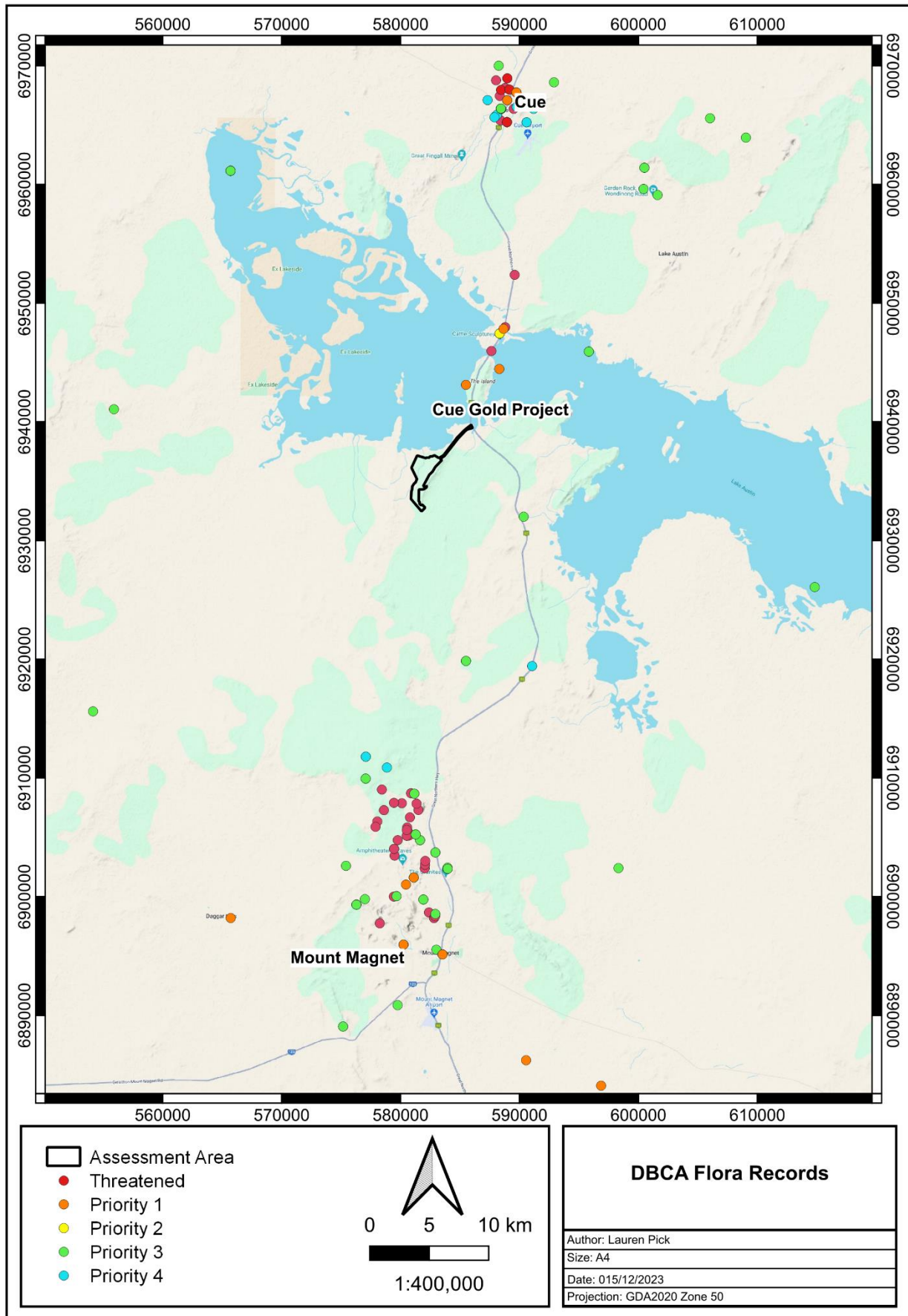


Figure 2-8: DBCA flora database records (DBCA, 2023a)

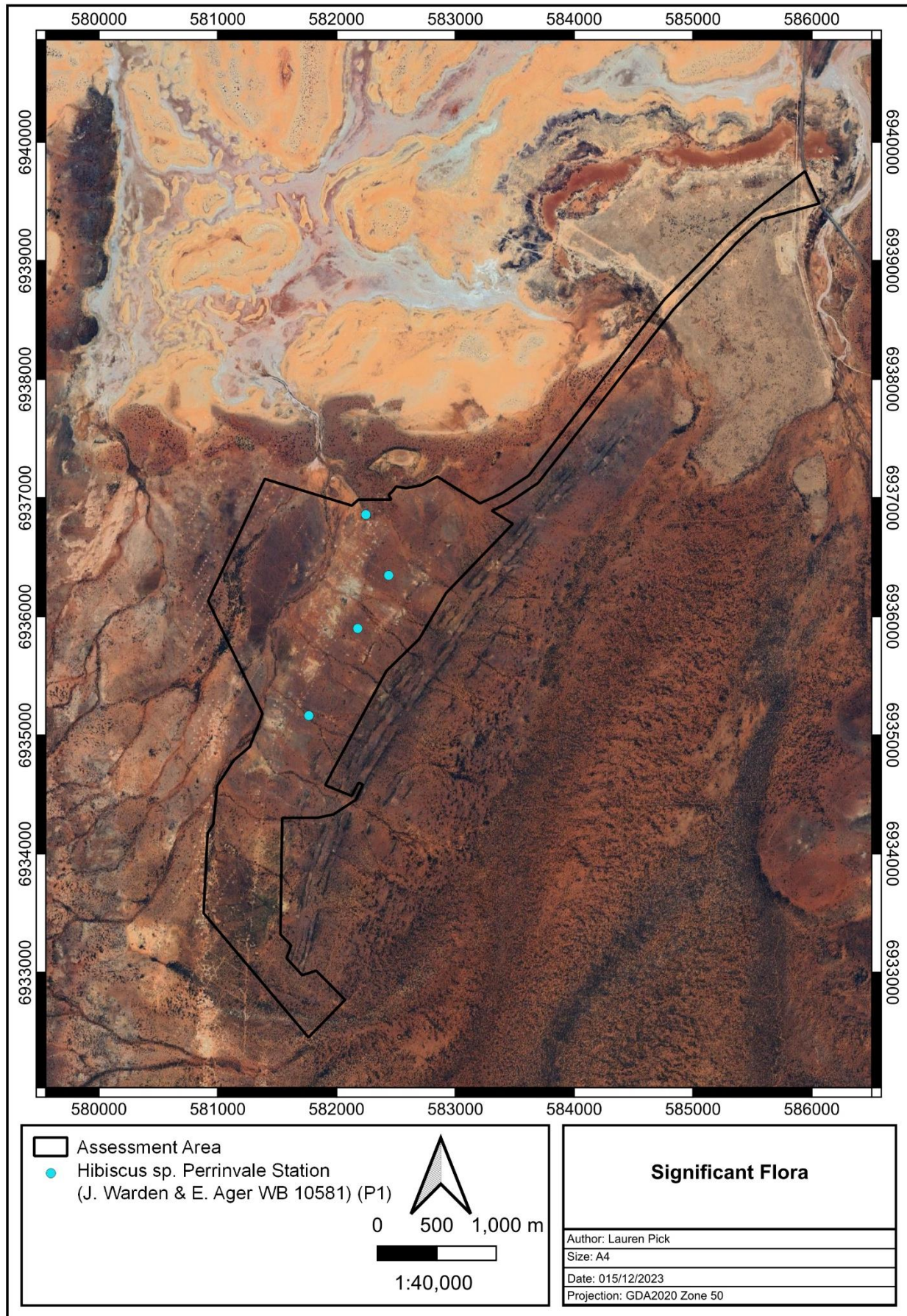


Figure 2-9: Flora survey significant flora records (Maia, 2023)

2.5.3 Significant Vegetation

According to the EPA Environmental Factor Guideline for Flora and Vegetation (EPA, 2016a) significant vegetation includes:

- vegetation being identified as threatened or priority ecological communities;
- vegetation with restricted distribution;
- vegetation subject to a high degree of historical impact from threatening processes;
- vegetation which provides a role as a refuge; and
- vegetation providing an important function required to maintain ecological integrity of a significant ecosystem.

No Threatened Ecological Communities were identified within the assessment area. Two Priority Ecological Communities were identified within the assessment area; Lake Austin vegetation complexes (banded ironstone formation) (Priority 1) and Austin Land System (Priority 3). The extent of these communities within the assessment area and potential impacts from clearing within the assessment area are provided in Table 2-6 and shown in Figure 2-10.

Table 2-6: Significant vegetation within the assessment area

Ecological Community	Total Extent (ha)	Extent within assessment area (ha)	% impact
Lake Austin vegetation complexes (banded ironstone formation)	35,510	130	0.4
Austin Land System	22,443	352	1.6

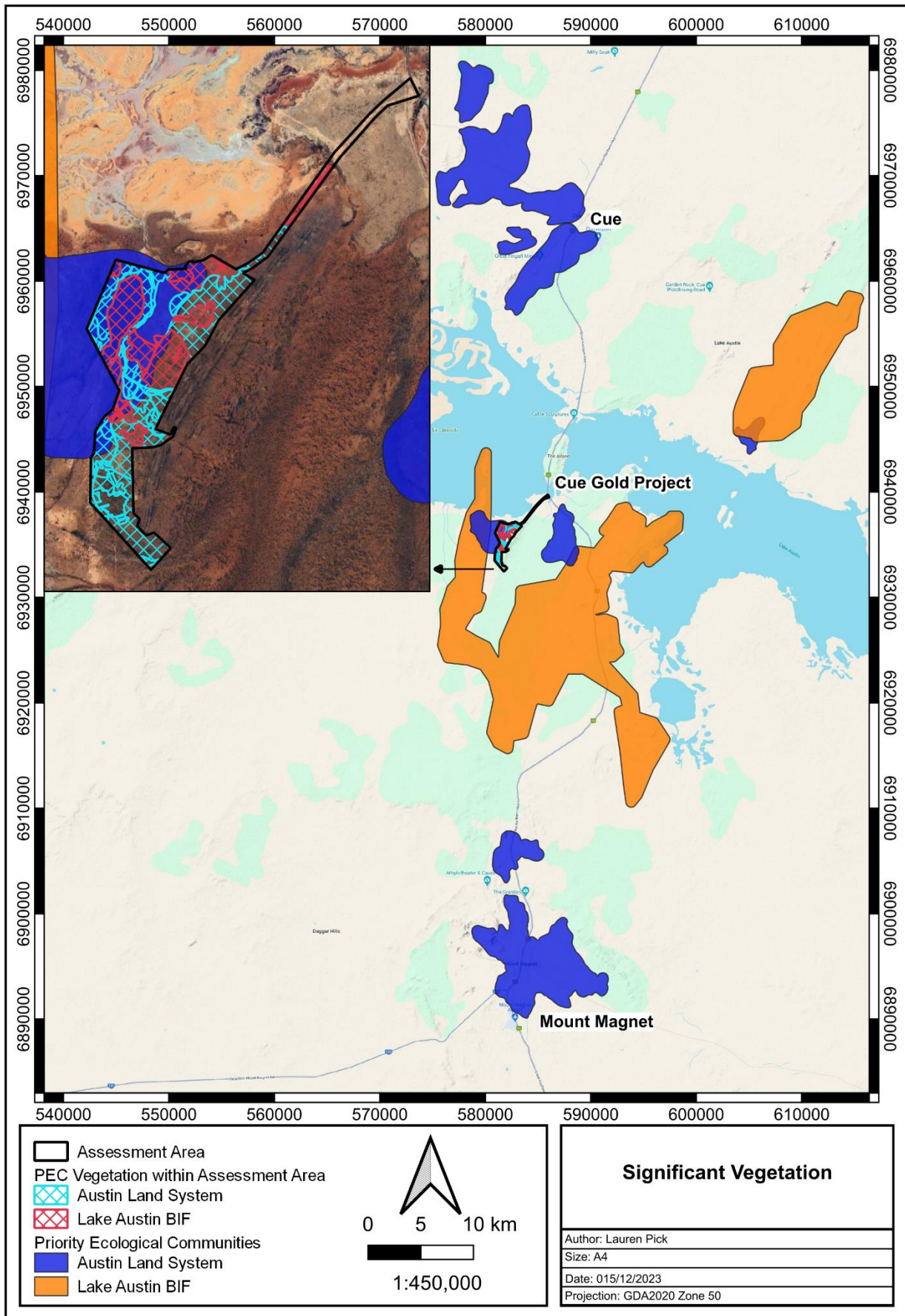


Figure 2-10: Significant vegetation within the assessment area

2.6 Fauna




A detailed terrestrial vertebrate fauna survey was undertaken in September 2020 by 360 Environmental. The survey included trap sites installed within areas of suitable and representative habitat. Motion sensitive cameras were used in conjunction with systematic trapping sites and positioned in locations of particular interest. Autonomous Recording Units (ARUs) were used to target bat species and the Night Parrot (*Perzoporus occidentalis*).





A subsequent vertebrate fauna survey and risk assessment was conducted by Terrestrial Ecosystems in 2022 to assess fauna habitat and their condition as well as assessing presence of conservation significant fauna to develop mitigation and management strategies. Previous surveys include a Level 2 fauna assessment by Coffey Environments in 2011 which extended north of the Cue Gold Project.


The field assessment and available reports indicate the vertebrate fauna assemblage present in the Project area is likely to be like that in the many square kilometres of similar habitat in the adjacent areas. Terrestrial Ecosystems identified the following fauna habitats within the Cue Gold Project area summarised in Table 2-7.

Fauna habitat types represented in the project area are abundant and in similar condition in adjacent areas, and the project area is unlikely to support a high level of fauna diversity due to a lack of understory and leaf litter. The fauna assemblage that is present in the project area is also present and abundant in the adjacent areas (Terrestrial Ecosystems, 2023). The uncleared fauna habitat present in the Project area is generally in good condition.

Table 2-7: Fauna habitats identified at the Cue Gold Project

Fauna Habitat	Image	Extent within assessment area
Chenopod shrublands		20.6 ha (3.8%)
Halosarcia lake surrounds		8 ha (1.5%)
Sand dune		15 ha (2.7%)

Fauna Habitat	Image	Extent within assessment area
Banded Ironstone rises, breakaways and rocky areas		0.4 ha (0.1%)
Lakebed		0 ha
Mulga Drainage		30 ha (5.5%)
Mulga Woodland		125 ha (22.8%)

Fauna Habitat	Image	Extent within assessment area
Mixed open shrubland		323 ha (58.9%)
Disturbed	N/A	28 ha (5.1%)

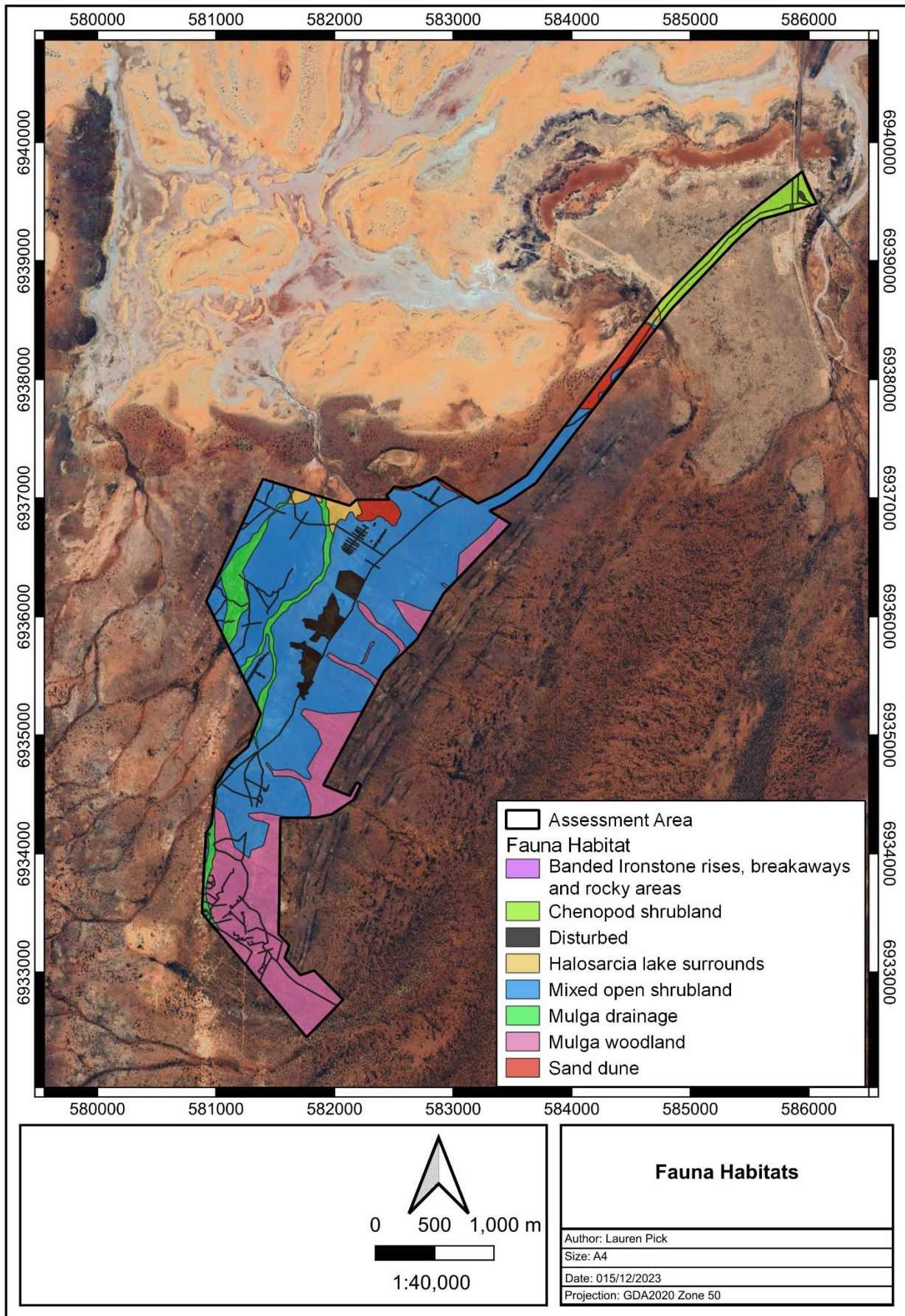


Figure 2-11: Fauna habitats within the assessment area

2.6.1 Significant Fauna

According to the EPA *Environmental Factor Guideline for Terrestrial Fauna* (EPA, 2016b) fauna of conservation significance includes:

- Fauna being identified as a threatened or priority species
- Fauna species with restricted distribution
- Fauna subject to a high degree of historical impact from threatening processes
- Fauna providing an important function required to maintain the ecological integrity of a significant ecosystem.

According to the DBCA fauna database search results (DBCA, 2023b), there are no DBCA known records of Threatened or Priority fauna within the assessment area (Figure 2-8).

No Threatened, Priority or otherwise significant fauna were recorded during fauna surveys within the assessment area. As summarised in Table 2-8, the potential impacts on significant fauna from vegetation clearing within the assessment area is considered low.

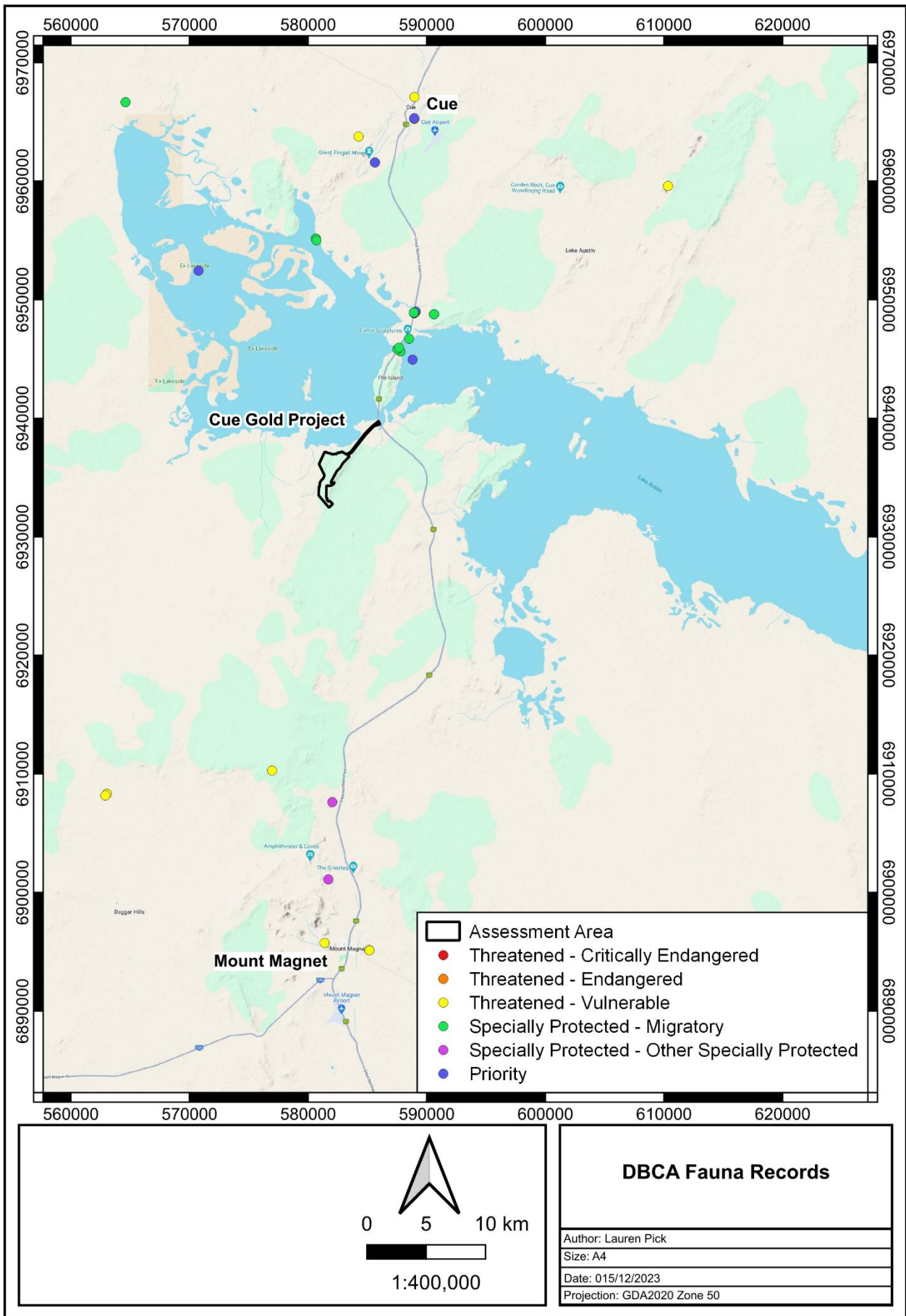


Figure 2-12: DBCA fauna database records (DBCA, 2023b)

Table 2-8: Potential for significant fauna of the Cue Gold Project

Species	Status under BC Act and DBCA Priority species list	Status under Commonwealth EPBC Act	Comment on potential presence of a species in the region	Potential impacts of vegetation clearing
Night Parrot <i>Pezoporus occidentalis</i>	Critically Endangered	Endangered	Highly unlikely to be in the project area, due to a lack of suitable habitat and lack of recent records.	The potential for impacting on this species is therefore very low. Lack of suitable habitat within project footprint.
Curlew Sandpiper <i>Calidris ferruginea</i>	Critically Endangered	Critically Endangered	There is a low possibility that it could be seen around the shores of Lake Austin when it contains water. It would readily move if disturbed.	Mining activity in the project area is unlikely to significantly impact on this species.
Western Spiny-tailed Skink <i>Egernia stokesii badia</i>	Endangered	Endangered	Unlikely to be in the project area due to a lack of suitable habitat and was not found in earlier site surveys.	The potential to impact on this species is therefore very low.
Chuditch <i>Dasyurus geoffroii</i>	Vulnerable	Vulnerable	Highly unlikely to occur in the project area.	Lack of suitable habitat within project footprint.
Australian Painted Snipe <i>Rostratula australis</i>	Endangered	Endangered	There is a low possibility that it could be seen around the shores of Lake Austin when it contains water. It would readily move if disturbed.	Mining activity in the project area is unlikely to significantly impact on this species.
Grey Falcon <i>Falco hypoleucos</i>	Vulnerable	Vulnerable	Highly unlikely to be in the project area.	The potential for impacting on this species is therefore very low.
Malleefowl <i>Leipoa ocellata</i>	Vulnerable	Vulnerable	Unlikely to be in the project area due to a lack of suitable habitat and the presence of feral fauna.	The potential for impacting on this species is therefore very low.
Fork-tailed Swift <i>Apus pacificus</i>	Migratory	Migratory	Highly unlikely to be in the project area.	The potential for impacting on this species is therefore very low.
Grey Wagtail <i>Motacilla cinerea</i>	Migratory	Migratory	Highly unlikely to be in the project area.	The potential for impacting on this species is therefore very low.
Common Greenshank <i>Tringa nebularia</i>	Migratory	Migratory	There is a low possibility that it could be seen around the shores of Lake Austin when it contains water. It would readily move if disturbed.	Mining activity in the project area is unlikely to significantly impact on this species.
Common Sandpiper <i>Actitis hypoleucos</i>	Migratory	Migratory	There is a low possibility that it could be seen around the shores of Lake Austin when it contains water. It would readily move if disturbed.	Mining activity in the project area is unlikely to significantly impact on this species.
Pectoral Sandpiper <i>Calidris melanotos</i>	Migratory	Migratory	There is a low possibility that it could be seen around the shores of Lake Austin when it contains water. It would readily move if disturbed.	Mining activity in the project area is unlikely to significantly impact on this species.
Sharp-tailed Sandpiper <i>Calidris acuminata</i>	Migratory	Migratory	There is a low possibility that it could be seen around the shores of Lake Austin when it contains water. It would readily move if disturbed.	Mining activity in the project area is unlikely to significantly impact on this species.
Gull Billed Tern <i>Gelochelidon nilotica</i>	Migratory	Migratory	Recorded in eBird at Lake Austin, so there is a low possibility that it could be seen around the shores of Lake Austin when it contains water. It would readily move if disturbed.	Mining activity in the project area is unlikely to significantly impact on this species.

Species	Status under BC Act and DBCA Priority species list	Status under Commonwealth EPBC Act	Comment on potential presence of a species in the region	Potential impacts of vegetation clearing
Peregrine Falcon <i>Falco peregrinus</i>	OS			May infrequently be seen in the region, however, clearing vegetation is unlikely to impact on this species.
Lont-tailed Dunnart <i>Antechinomys longicaudatus</i>	P4		It was not caught in the two previous fauna surveys in the project area as trapping and site surveys did not target the rocky ridges and breakaways. There is suitable habitat present, but there are no recent records of the species nearby.	Although, it hasn't been recorded in the vicinity of the project area recently, the presence of appropriate habitat indicates that there is a low possibility of this species being present in the project area.

3 Native Vegetation Clearing Principles

The proposed clearing within the assessment area has been assessed against the native vegetation clearing principles as shown in Table 3-1. The assessment found that the proposed vegetation clearing activities are not at variance or unlikely to be at variance with the clearing principles.

Table 3-1: Assessment of clearing against native vegetation clearing principles

Letter	Principle	Assessment	Outcome
Native vegetation should not be cleared if it:			
(a)	comprises a high level of biological diversity.	Vegetation within the assessment area is not considered to be of high biological diversity and is well represented outside the assessment area.	Clearing is unlikely to be at variance with this principle
(b)	comprises the whole or part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to WA.	There are no known records of Threatened Fauna within the assessment area. Clearing vegetation will not result in the loss of significant habitat for indigenous fauna.	Clearing is unlikely to be at variance with this principle
(c)	includes, or is necessary for the continued existence of rare flora.	No Threatened Flora taxa, pursuant to the BC Act and the EPBC Act were identified within the assessment area.	Clearing is not at variance with this principle
(d)	comprises the whole or part of or is necessary for the maintenance of a threatened ecological community (TEC).	No Threatened Ecological Communities were identified within the assessment area.	Clearing is not at variance with this principle
(e)	is significant as a remnant of native vegetation in an area that has been extensively cleared	Three pre-European vegetation associations occur within the assessment area, all of which retain >97% of their pre-European extent. No remnant vegetation occurs within the assessment area.	Clearing is not at variance with this principle
(f)	is growing, in, or in association with, an environment associated with a watercourse or wetland	There are no inland waters, wetlands or perennial drainage lines within the assessment area. Two minor ephemeral drainage lines intersect the assessment area. Vegetation associated with ephemeral drainage lines (Mulga woodland) represents 5.5% of the total assessment area.	Clearing is unlikely to be at variance with this principle
(g)	Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.	Clearing within the assessment area is not considered likely to increase land degradation issues such as salinity, water logging or acidic soils.	Clearing is unlikely to be at variance with this principle
(h)	Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.	The assessment is not located within and proposed or gazetted conservation reserves.	Clearing is unlikely to be at variance with this principle
(i)	Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.	There are no inland waters, wetlands or perennial drainage lines within the assessment area. Two minor ephemeral drainage lines intersect the assessment area. Vegetation associated with ephemeral drainage lines (Mulga woodland) represents 5.5% of the total assessment area. It is unlikely that the clearing of the vegetation in the assessment area will cause deterioration in the quality of underground water, as groundwater salinity in the assessment area is indicated to be > 35,000 mg/L (DWER, 2018). Clearing activities are unlikely to impact hydrological systems.	Clearing is unlikely to be at variance with this principle
(j)	Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding	The climate of the Eastern Murchison subregion is characterised as an arid climate with summer and winter rainfall of approximately 200 mm annually. Clearing within the assessment area is not likely to increase the incidence or intensity of flooding within the assessment area or surrounds.	Clearing is unlikely to be at variance with this principle

4 Conclusions and Summary

- Thirteen vegetation types are present within the assessment area. Vegetation within the assessment area was representative of two Priority Ecological Communities; Lake Austin vegetation complexes (banded ironstone formation)-clearing represents 0.4% impact on total extent and Austin Land System-clearing represents 1.6% impact on total extent.
- No Threatened flora were recorded within the assessment area (no DBCA known records and no records during field surveys). One Priority flora was recorded within the assessment area; *Hibiscus* sp. Perrinvale Station (J. Warden & E. Ager WB 10581) (P1). The proposed clearing of four plants represents a potential impact of impact of 8% of the known local population of this taxon.
- Eight fauna habitats are present within the assessment area. Fauna habitat types represented in the assessment area are abundant and in similar condition in adjacent areas, and the project area is unlikely to support a high level of fauna diversity due to a lack of understorey and leaf litter. The fauna assemblage that is present in the project area is also present and abundant in the adjacent areas.
- No Threatened or Priority fauna were recorded within the assessment area (no DBCA known records and no records during field surveys).
- The clearing permit area has been designed to avoid clearing impacts to Lake Austin and to minimise clearing within BIF habitats with vegetation associated with banded ironstone rises, breakaways and rocky areas only representing 0.1% of the total assessment area.

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