BLACK CAT SYNDICATE
KAL EAST PROJECT

FINGALS CLEARING PERMIT SUPPORTING DOCUMENT

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1 INTRODUCTION

1.1 BACKGROUND

Black Cat Syndicate Limited ("Black Cat") purchased a portion of Silver Lake Resources (SLR) Mt Monger tenement package in July 2020 which included the Imperial-Majestic, Fingals, Wombola Dam and Hammer-Tap gold deposits which are collectively referred to as the 'Kal East Project'.

The overall Kal East Project was first identified near Mount Monger in 1896 by local prospectors, following the major discovery of gold at Kalgoorlie in 1893.

The Project has been subject to land degradation as a result of extensive historic mining activities (both mining and processing), and rangeland grazing. The Mount Monger area has and continues to be used for pastoral activities (i.e. grazing) for more than 100 years.

Mining and mineral processing activities commenced at Fingals (formerly referred to as Mt Monger South) in 1991 with the development of open pit mining and construction of the treatment plant and paddock tailings storage facility (TSF). Ore was first treated in 1992. Four open pits (Fingals Fortune (also referred to as 'Fingals'), Bagus, Futi Bagus and Sibu) were mined from 1991 to 1994. The majority of the Project area was rehabilitated and no mining has occurred since this time.

Ore from Randall's was carted and treated through the Fingals plant. Tailings from both areas were deposited in the above ground Fingals TSF, and three in-pit TSF's (Bagus, Futi Bagus and Sibu).

No mining activities have been undertaken within the Fingals area since mining ceased in 1997. Progressive rehabilitation works across the project area were undertaken from 1993-1997 by General Gold. Bagus, Futi Bagus, Sibu and Fingals waste rock dumps were rehabilitated from 1993 until 1997 and partial rehabilitation of the TSF batters was undertaken. It is not known when this work was completed.

The three in-pit TSF's (Futi Bagus, Bagus, Sibu) have been rehabilitated. In 2012 the plant and majority of the infrastructure was removed from the site and the plant area rehabilitated.

Black Cat now intends to recommence mining activities at the Fingals Project area ('Project') with expansion of the existing Fingals, Bagus and Futi Bagus open pits and construction of associated mine infrastructure.

1.2 OBJECTIVE

This document is to complement the native vegetation clearing permit (NVCP) application relating for a maximum of 260 ha of native vegetation clearing within an overall clearing boundary of 641.1 ha.

As required by the DEMIRS, the ten clearing principles and background information has been provided in this document relating to the site location, ownership, hydrology, vegetation, fauna and land degradation issues.

To assist in the DEMIRS's assessment of this clearing permit application, a summary of the relevant environmental information for the Project area has been included in this document in addition to the biological survey reports.

1.3 LOCATION

The Project is located approximately 640 kilometres east of Perth and 45 kilometres southeast of Kalgoorlie in Western Australia (Figure 1).

1.4 OWNERSHIP AND TENURE

The Project is 100% owned by Black Cat (Kal East) Pty Ltd. The tenements part of the NVCP application are listed in Table 1 and shown in Figure 2 with the tenements part of the Kal East Project.

The Project is located on the Mt Monger Pastoral lease within the City of Kalgoorlie-Boulder.

The Majestic Timber Reserve is located approximately 3 km north of the Project.

Table 1: Tenements part of this NVCP Application

Tenement	Tenement Holder
M26/148	Black Cat (Kal East) Pty Ltd
M26/248	Black Cat (Kal East) Pty Ltd
M26/197	Black Cat (Kal East) Pty Ltd
M26/357	Black Cat (Kal East) Pty Ltd
M26/364	Black Cat (Kal East) Pty Ltd
M26/409	Black Cat (Kal East) Pty Ltd
M26/440	Black Cat (Kal East) Pty Ltd
M26/635	Black Cat (Kal East) Pty Ltd

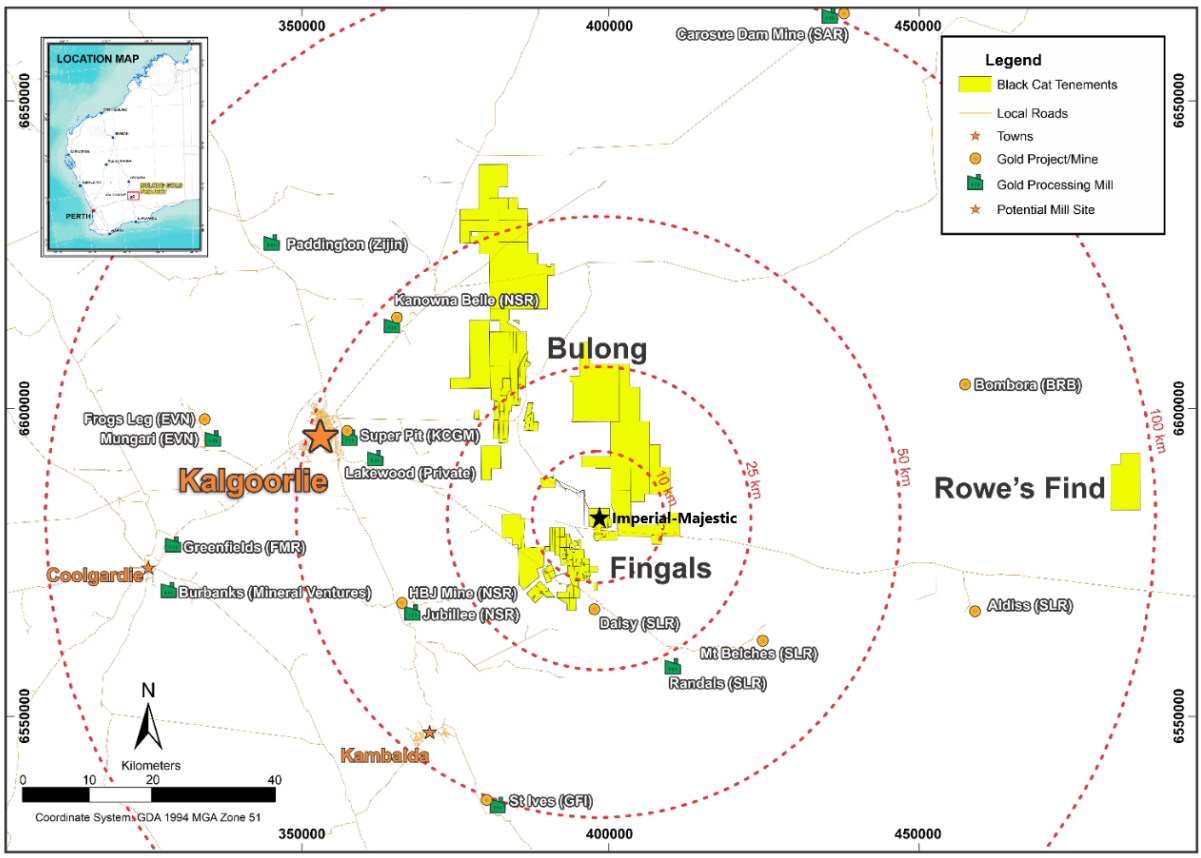

Figure 1: Location of Project

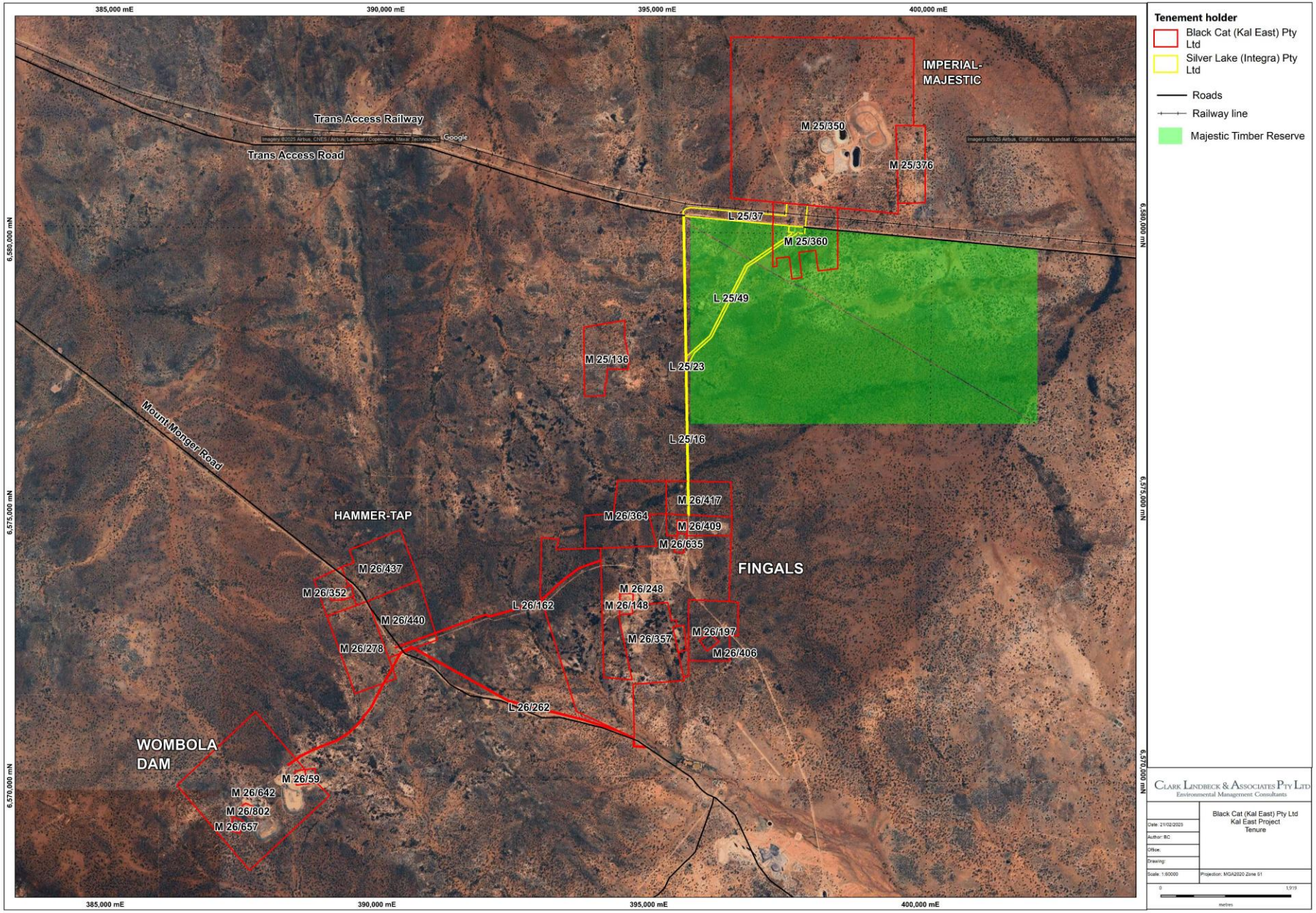

Figure 2: Project Tenure

2 PROPOSED CLEARING

2.1 PROJECT INFRASTRUCTURE

Black Cat intends to recommence mining activities at the Project with expansion of the existing Fingals, Bagus and Futi Bagus open pits and construction of associated mine infrastructure (Figure 3). Table 2 provides a summary of the elements proposed.

Black Cat proposes to develop the Project in two stages:

1. Mining of Fingals pit to just above the water table (MP currently under assessment)
2. Mining of the Fingals pit below the water table; and mining of Bagus and Futi Bagus pits (subject of a future MP).

This clearing permit application covers both Stages of development.

Table 2: Infrastructure proposed at Fingals

Item	Description
Fingals Fortune Pit	Expansion of Fingals Fortune pit and excavation of dry tailings stored in the northwest section of the Fingals pit and deposited onto the existing Fingals TSF.
Bagus and Futi Bagus Pits (Fingals East)	Excavation of tailings contained in the Bagus and Futi Bagus pit and relocation to the top of the Fingals TSF. Expansion of the Bagus and Futi Bagus pits (Fingals East).
Fingals TSF	The existing TSF will be raised by approximately 7.5 m by stacking tailings removed from the Fingals, Bagus and Futi Bagus pits tailings on top of the existing TSF. This will be undertaken in 2 stages in progressive 0.5m lifts: 1. Stacking dry tailings removed from the Fingals pits on top of the TSF. Approximately 115,000m^3 of tailings is stored in the Fingals pit. 2. Stacking dry tailings from Bagus and Futi Bagus. The total height of the finished facility will be ~ 15 m.
Fingals WRD	Expansion of the existing Fingals WRD to store waste from the pit expansion.
Fingals East WRD	Development of the Fingals East WRD to store waste from Bagus and Futi Bagus pits
Turkeys nest dam (former Process water dam)	The existing dam will be HDPE lined and fenced.
ROM	Establishment of ROM north of the Fingals pit and in between Futi Bagus and Bagus pits to temporarily store ore mined prior to haulage offsite to the Lakewood processing plant.
Mine services area	Provision for office, workshop, fuel storage and associated laydown/hardstand areas.
Borrow pit	Expansion of the existing borrow pit on M26/440 to access construction/sheeting material as required.
Haul road	New haul and access roads for transport within the site.
Topsoil/subsoil storage	Provision for topsoil and subsoil storage areas for use in rehabilitation.

2.2 CLEARING

To allow for construction of the proposed Project infrastructure, Black Cat is seeking approval to clear a maximum of 260 ha of native vegetation within an overall area of 641.1 ha (Figure 3).

This figure has factored in regrowth on rehabilitated areas at the Project.

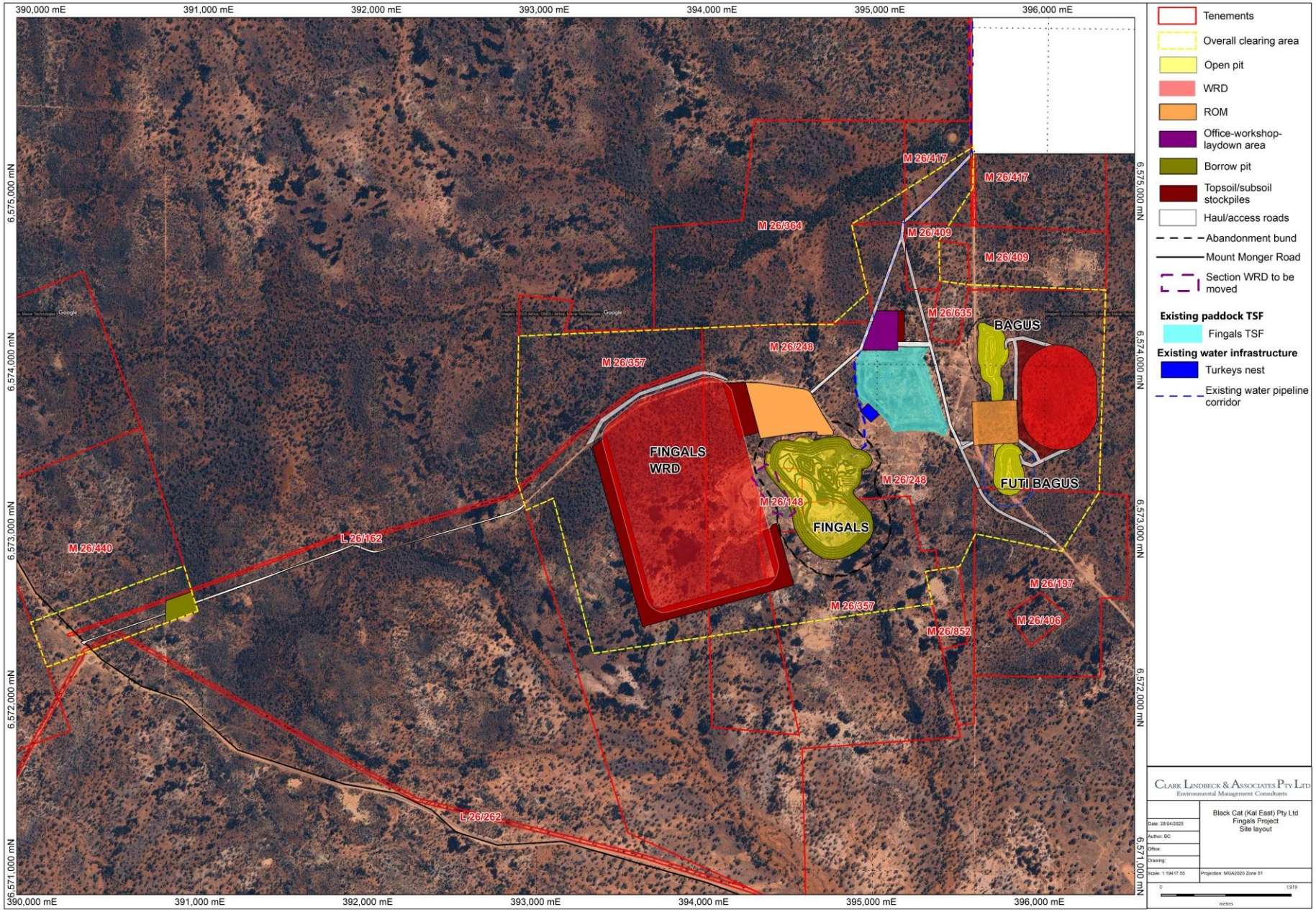

Figure 3: Site layout showing areas of proposed infrastructure

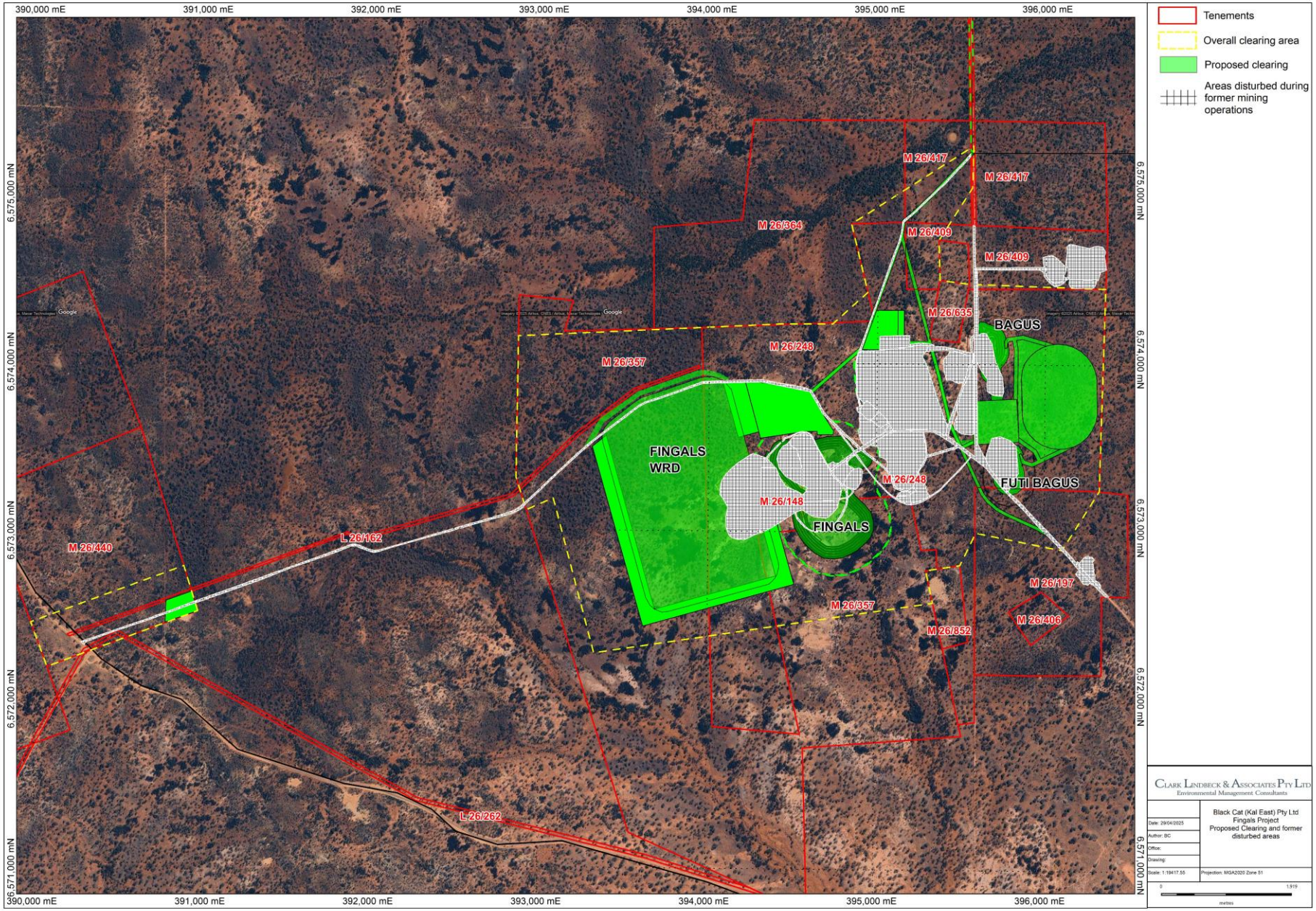

Figure 4: Proposed clearing and overall clearing area for the Project (former disturbed areas also shown)

3 EXISTING ENVIRONMENT

3.1 CLIMATE

The climate of the Eastern Murchison subregion is characterised as an arid climate with mainly winter rainfall and annual rainfall of approximately 200mm (Beard, 1990; Cowan, 2001). The nearest weather station is the Kalgoorlie-Boulder Airport weather station (#12038), which is located approximately 45km west of the survey area and commenced operation in 1939. Relevant metrological data from the Kalgoorlie-Boulder Airport weather station is summarised below and in Table 3 (BoM, 2025).

The mean annual maximum temperature is 25.3°C and mean annual minimum 16.7°C. Daily maximums above 30°C are usual from December to February. Diurnal temperature variations are commonly high throughout the year (Table 3).

3.1.1 Rainfall

The area is semi-arid and has an average annual rainfall of 266.4 mm. Most of the rain falls from January to March but the amount varies greatly both seasonally and annually. The highest daily rainfall recorded was 177 mm in February 1948. The region can receive high intensity rainfall from degenerating cyclonic low pressure systems and thunderstorms.

The low, highly erratic rainfall provides many challenges for the successful rehabilitation of disturbed areas. Even during the latter part of the dominant winter growing season, there is still less than a 40% chance (i.e. less than 4 out of 10 years) of receiving sufficient rainfall to generate a significant germination event.

An estimate has been made of the magnitude of 72 hour duration, 100 year return interval rainfall event (assumed to be cyclonic). During such an event, 100 mm of rainfall can be anticipated during a 72 hour event, with a 10% annual exceedance probability (GRM 2019).

3.1.2 Winds

The average wind speeds at Kalgoorlie-Boulder vary throughout the year from 11.8–17.1 km/h in the morning to 13.7-17.8 km/h in the afternoon (Table 3 and Figure 5 and Figure 6). Morning wind is predominantly from the east (NE-SE) varying in direction in the afternoon (Figure 5 and Figure 6).

3.1.3 Evaporation

Evaporation is high, particularly in the summer months (December to February inclusive) and the average mean daily evaporation rate is 7.2 mm (annual calculated rate is 2,628 mm) (Table 3).

3.1.4 Humidity

Humidity levels vary considerably both daily and yearly (Table 3). The mean monthly 9.00 am relative humidity varies from a low of 43% in December to a high of 74% in June. The mean monthly 3.00 pm relative humidity varies from a low of 24% in December and January to a high of 48% in June.

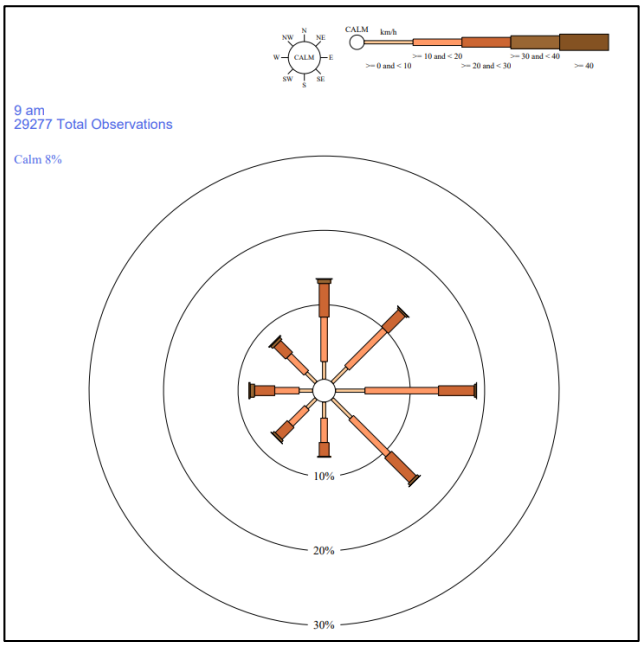

Figure 5: Kalgoorlie-Boulder annual 9 am wind roses

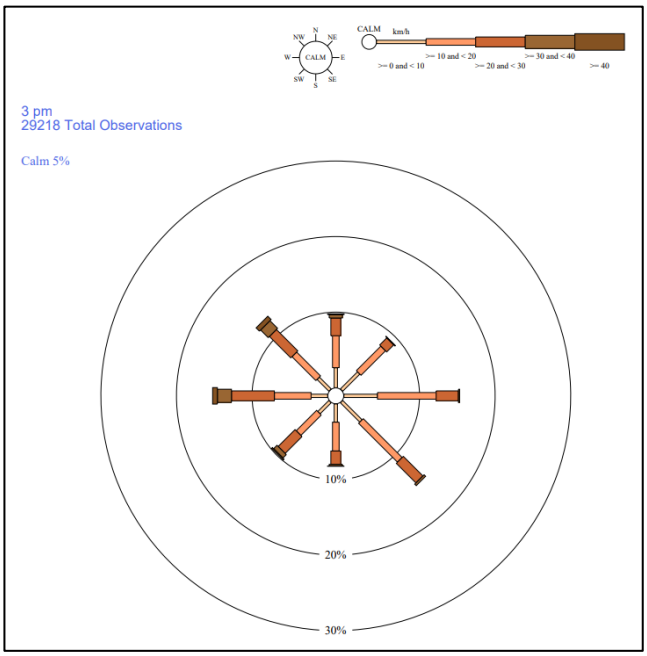

Figure 6: Kalgoorlie-Boulder 3 pm wind roses

Table 3: Meteorological data for Kalgoorlie-Boulder Airport (Station Number 12038) (BOM 2025)

Statistic Element	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Annual
Mean maximum temperature (°C)	33.7	32.1	29.5	25.3	20.7	17.6	16.8	18.7	22.4	26	29.1	32.1	25.3
Mean minimum temperature (°C)	18.3	17.9	16.1	12.7	8.7	6.3	5.1	5.7	8.1	11.2	14.2	16.7	11.8
Mean rainfall (mm)	27.4	31.6	25	20.2	24.6	27.1	24.2	21.3	13.7	15.8	18.7	16.5	266.1
Highest rainfall (mm)	185.9	307.8	197	98.6	110.2	185.7	82.6	74	98.3	84.4	115.4	88.6	530.8
Highest daily rainfall (mm)	154.4	177.8	70	49.8	45.2	57.2	28.6	49.6	44.2	45.6	77	50.6	177.8
Decile 1 (median) rainfall (mm)	0.6	1.2	0.6	1.3	2.4	5.2	5.4	4.1	1.5	1.1	0.5	1.3	149.3
Decile 5 (median) rainfall (mm)	11.2	14.5	10.1	12.7	18.6	18.6	20	16.2	10.7	10.2	15.3	12.4	254
Decile 9 (median) rainfall (mm)	83.2	79.2	68.5	54.6	47.3	54.6	49	44	29.5	34	40.4	39.9	395.1
Mean number of days of rain ≥ 1 mm	2.5	3.1	2.7	3.3	3.8	4.7	4.8	4	2.9	2.7	2.6	2.5	39.6
Mean number of days of rain ≥ 10 mm	0.7	0.9	0.6	0.6	0.7	0.7	0.6	0.5	0.3	0.4	0.5	0.6	7.1
Mean number of clear days	15.7	13.1	13.4	10.2	10.3	9.1	10.1	12.8	14.1	13.9	12.9	15.5	151.1
Mean number of cloudy days	5.6	6.3	6.9	9.2	10.2	10.4	9.7	7	6.2	5.9	6.5	5.3	89.2
Mean 9am temperature (°C)	23.8	22.8	21	17.9	13.9	11	9.9	11.6	14.8	17.9	20.6	22.7	17.3
Mean 9am relative humidity (%)	45	51	54	60	67	74	73	65	54	47	45	43	57
Mean 9am wind speed (km/h)	16.6	16.4	15.7	14.4	11.8	11.8	12.4	14.3	16.2	17.1	17.1	16.3	15
Mean 3pm temperature (°C)	32.3	30.9	28.6	24.3	19.9	16.8	16	17.8	21.3	24.7	27.8	30.7	24.3
Mean 3pm relative humidity (%)	24	30	32	38	44	48	46	39	31	27	25	24	34
Mean 3pm wind speed (km/h)	15.1	15.1	14.2	13.7	14.1	15.7	16.6	17.2	17.8	17.6	17.2	16	15.9
Mean daily evaporation (mm)	12.5	10.8	8.6	5.8	3.6	2.6	2.8	3.8	5.8	8.4	10.3	12	7.2

3.2 LANDSCAPE

3.2.1 IBRA Region

The Interim Biogeographic Regionalisation for Australia (IBRA) divides the Australian continent into 89 bioregions and 419 subregions (DAWE, 2020a). The project is located within the Eastern Goldfields Subregion and the Eastern Murchison Subregion.

As defined in the IBRA, the Project is located in the Eastern Goldfields, a subregion of the Coolgardie bioregion, within south-western Australia (McKenzie *et al.* 2003). The Project lies within the Archaean Yilgarn Craton, characterised by gently undulating topography. Surface material is deeply weathered, with scattered breakaways, dry creeks and low-lying hills of relatively fresh rock (Clarke 1994). Topographic lows are marked by salt lakes and associated dune systems, the largest being Lake Lefroy (Clarke 1994).

Many of the soil and vegetation descriptions of the north-east Goldfields are similar to those that occur in the southern Goldfields (Pringle *et al.* 1994). Dominant vegetation comprises woodlands and shrublands with ancient drainage valleys, low-lying chenopods along salt lakes, low or mid shrublands on hillsides and, stony plains and hardpan plains with *Eucalyptus* and *Acacia* woodlands. Soil types found in this region include calcareous loamy earths, red loamy earths associated with salt lakes and some red to brown hard pan shallow loams and red sandy duplexes (Tille 2006).

3.2.2 Land Systems

Based on the land-type classifications provided by Pringle *et al*. (1994), the Project area comprises:

- woodlands/shrublands with ancient drainage valleys;
- chenopod low or mid shrublands on hillsides and stony plains; and
- hardpan plains with Eucalypt and Acacia woodlands.

The Project area is situated between two extensive salt-lake systems. Lake Yindarlgooda and Lake Lefroy are approximately 6 km north and 30 km south of the Project area respectively. The majority of runoff from the Project surrounds is likely to drain into Lake Yindarlgooda. There are a number of braided drainage channels with very low relief which dissect the Project area. There are localised areas of relatively dense woodlands, particularly to the south-western parts of the Project area.

3.2.3 Soil-Landscape Zone

The project is located within the Kambalda soil-landscape zone of the Kalgoorlie Province) (Tille 2006). This zone covers 35,825 km^2 and comprises flat to undulating plains (with hills, ranges and some salt lakes and stony plains) on greenstone and granitic rocks of the Yilgarn Craton. Calcareous loamy earths and red loamy earths with salt lakes soils and some red-brown hardpan shallow loams and red sandy duplexes.

3.3 GEOLOGY

The Project area contains a wide range of Archean rocks, including ultramafic, mafic, felsic and intermediate igneous rocks as well as intrusive rocks occupying sills, dykes and veins, as shown in Figure 10. The succession is essentially divisible into two parts: a lower unit of felsic to intermediate volcanic, volcanogenic and intrusive rocks; and an upper unit of high magnesium basalt containing numerous units of fine-grained clastic sediment. The upper unit is intruded by ultramafic and mafic sills and irregular bodies of quartz feldspar porphyry. A higher unit of clastic sediments containing BIF occurs to the east of the area. Most aspects of the structural geology are related to the Bulong Anticline, the axial trace of which trends southwest through the centre of the Project area. This major fold is right, upright, upward facing, and plunges at 40^o to 60^o towards the S-SE.

The geological sequence at Fingals Fortune is comprised of mafic units of High-Mg basalts to pyroxenite gabbro composition, with intrusive dolerite sills running parallel to bedding with the whole sequence

cross-cut by quartz-feldspar porphyries. A deep weathering profile exists across the area extending down to ~60m in places.

The main mineralisation targeted by the proposed development within the Fingals Fortune area is hosted by the sheared basalt within quartz veins which are structurally controlled and occur as a series of stacked west dipping lodes containing nuggetty gold mineralisation. The shear zones display intense hydrothermal alteration with bleached sericite and pyrite associated with silicification and carbonate alteration. In contrast the mineralisation within the satellite pits to the east of the main deposit area occur parallel to bedding as porphyry hosted mineralisation (SWG 2022a).

3.4 SOILS

3.4.1 Overall Project Soils

The Project area is situated near the eastern margin of the salt lake or salinaland physiographic division. This division is characterised by an 'old' and 'new' plateau surface. The new plateau surface is represented by fresh bedrock and extensive tracts of superficial deposits derived from the old plateau surface. The old plateau surface is characterised by laterite, sand and gravel plains. This surface occurs in elevated country that separate major drainage basins.

The Project is situated on a topographic high which separated two major drainage systems. The drainage to the north flows to Lake Yindarlgooda while that in the south drains into Lake Lefroy. The divide is characterised by lateritic ridges with minor outcropping basalts.

The Project area soils are classed as the Mx43 soil group (Northcote *et al.,* 1968) comprising gently undulating valley plains and pediments; some outcrop of basic rock: chief soils are alkaline red earths with limestone or limestone nodules at shallow depth on gently sloping slightly concave plains with low gentle rises of soils. Associated are clay plains flanking ultrabasic rock outcrop.

3.4.2 Fingals Soils

Consistent with the time of the original approvals, no topsoil characterisation were undertaken prior to commencement of the former mine operations at Fingals.

Environmental Innovations (EI 2022a) were commissioned by Black Cat to undertake a surface soil characterisation for the Fingals Project.

In addition to chemical analyses undertaken, laboratory-scale erosion tests were undertaken on material existing, and, expected to be located on the outside of the closure landforms and erosion modelling assuming slope angles of 15°with lift heights of 10m.

Two Soil Management Units (SMU's) were identified at the Project by Environmental Innovations (EI) (2022):

- SMU1 – gravelly loamy sand – top 1m of soil across the Project area.
- SMU2 – calcareous loam and clay.

Generally, there is little to no evidence of surface organic accumulation, with most profiles lacking a defined topsoil or 'A' horizons. The top 10-30cm generally have some structure with larger soil particles partially indurated and forming a surface crust, likely the result of eluviation of finer clay particles over time. This partially structured upper zone quickly disappears, becoming an unstructured friable loamy sand unit with moderate to high gravel content. This unit generally extends to a depth of 80-100cm.

Underlying the gravelly loamy sand is an abrupt transition to a heavier clay unit which varies from a talcy earthy fabric to medium textured stiff red clays. Where the earthier fabric exists, it is usually a discrete layer above the underlying stiffer clays and is often associated with calcareous mottling.

Further detail on the soils is provided in Table 4.

Table 4: Soil characteristics of Fingals SMU's

SMU	Soil Characteristics
SMU1	Thickness of the gravelly loamy sands varies from 70 to 100 cm, typically containing gravel contents of 20 – 40% loosely held by a loamy sand matrix These soils have a relatively high saturated permeability (averaging slightly over, 1.8 m/day) which is due to the moderate clay and silt content within the < 2 mm fraction. The soils are calculated to contain a good capacity to store available water All soils within SMU 1 are moderately alkaline to alkaline, with an average pH of 8.2. The soils range from non-saline to moderately saline, with the salinity generally increasing slightly. The soils within the SMU have an average EC of 55 mS/m (slightly saline). Soils nutrient poor Soils non-sodic and low CEC.
SMU2	Soils typically contain ~ 10% gravel, with gravel content generally decreasing with depth The fine fraction (i.e. < 2 mm) is generally classified as a clay to sandy clay loam with an average of 68% sand and 32% silt + clay. Most of the soils in SMU 2 are macro-structurally unstable (i.e. slaking when rewet). Some of these soils also appear to be susceptible to hard-setting when disturbed. The pH of the soils within the lower subsoil unit averaged 8.6 (slightly alkaline) whilst the EC was slightly higher than that of SMU 1 with an average of 90 mS/m (slightly saline). display moderate nutrient levels for subsoils. Soils are generally considered non-dispersive, although some dispersion may occur if these soils are disturbed when wet.

3.5 SURFACE WATER

The Project area is located in the Raeside-Ponton catchment (area = 115,965km^2) of the Salt Lake Basin (Basin No. 024). Lake Yindarlgooda is located 7km to the north. The site is located in the catchment of Lake Yindarlgooda and watercourses in the vicinity of the site drain to the north. There is one significant river system/ watercourse approximately 5.5km east of the Project with a catchment area of 114km^2. This water course drains to the north into Lake Yindarlgooda.

The Fingals deposit areas are situated on a topographic high which separates two major drainage systems. The drainage to the north flows to Lake Yindarlgooda while that in the south drains into the Lake Lefroy system located 15 km south-southwest of the Project area. The divide is characterised by lateritic ridges with minor outcropping basalts.

Runoff in the Project areas is generally associated with storm conditions, with high intensity rainfall events forming most of the annual rainfall. Most of the catchments' runoff is associated with these events (Davies and Associates, 1996).

GRM (2021a) completed a hydrometeorological and surface water assessment at Fingals. The Fingals deposit areas are situated on a topographic high which separates two major drainage systems (Figure 7). The divide is characterised by lateritic ridges with minor outcropping basalts. Nominal surface elevations in the vicinity of the FMC range between about 390 and 400 mAHD. Natural ground gradients in the vicinity of the FMC are relatively flat with average slopes in the order of 1.0% to 1.5% (GRM 2021a).

DWER's regional watershed divide between Lake Raeside-Ponton and Lake Lefroy Catchments passes through the Fingals area (Figure 7), along with existing landforms from previous mining activities. As a result the FMC has no discernible upstream catchment area and proposed surface water management measures need only to be designed for runoff resulting from direct precipitation only i.e. no surface water runoff is expected to report to the proposed project facilities from upstream areas.

GRM (2021a) inspection of the available topographical mapping and aerial photography indicate that the only credible flood risks to the Project area relates to potential flooding of the open pits from direct precipitation. The fact that the project site straddles the regional catchment divide means that no runoff will report from upstream catchment areas and Black Cat considers that there is no significant risk to post-closure landforms from flooding from the upper catchments.

3.6 GROUNDWATER

GRM (2022) completed a hydrogeological study to review and characterise the local groundwater environment in the Fingals Project area.

Two hydrostratigraphic units have been identified in the Fingals project region:

- Fractured rock aquifers associated with the Archean greenstone rocks – dominant aquifer type and can extend to depth of ~120m.
- Palaeochannel aquifers associated with high permeability units at the thalweg of paleochannel systems – extends into the northeast area of Fingals.

As indicated in Section 3.5, the regional watershed divide (catchments) passes through the Project area and the proximity of the catchment divide contributes to the deep groundwater level in the Fingals area, with the groundwater flow direction either northward, towards Lake Yindarlgooda, or south towards Lake Lefroy.

The pre-mining groundwater level in the Fingals Fortune pit area is indicated from resource drilling to be around 90 m below surface (roughly 314mRL).

Groundwater quality is variable across the region ranging from saline to hypersaline. Fresh to brackish groundwater sources (<3,000 mg/L Total Dissolved Solids (TDS) are rare and restricted to perched aquifers and soaks. Saline groundwater (3,000 to 30,000 mg/L TDS) is widely distributed and typically found in shallow pastoral boreholes within low-yielding surficial deposits and lateritic units. Hypersaline groundwater (>30,000 mg/L TDS) occurs mainly in palaeochannels and in bedrock aquifers below and adjacent to alluvial flats and playa lakes.

There are no groundwater users at the Project (either human, stock or groundwater dependent ecosystems). Groundwater is naturally saline and there are no stock watering bores.

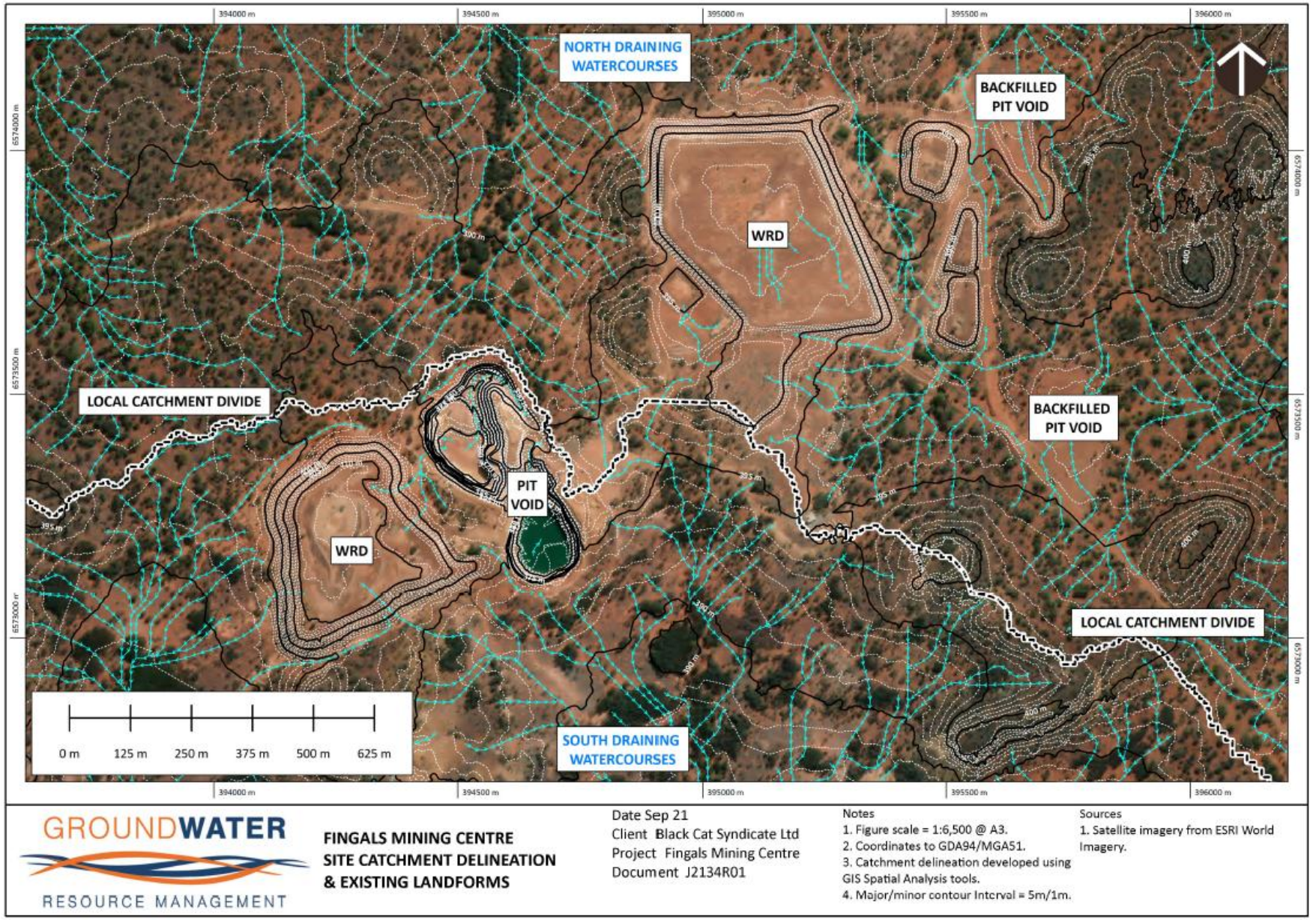

Figure 7: Site catchment and surface water flow (from GRM 2021a)

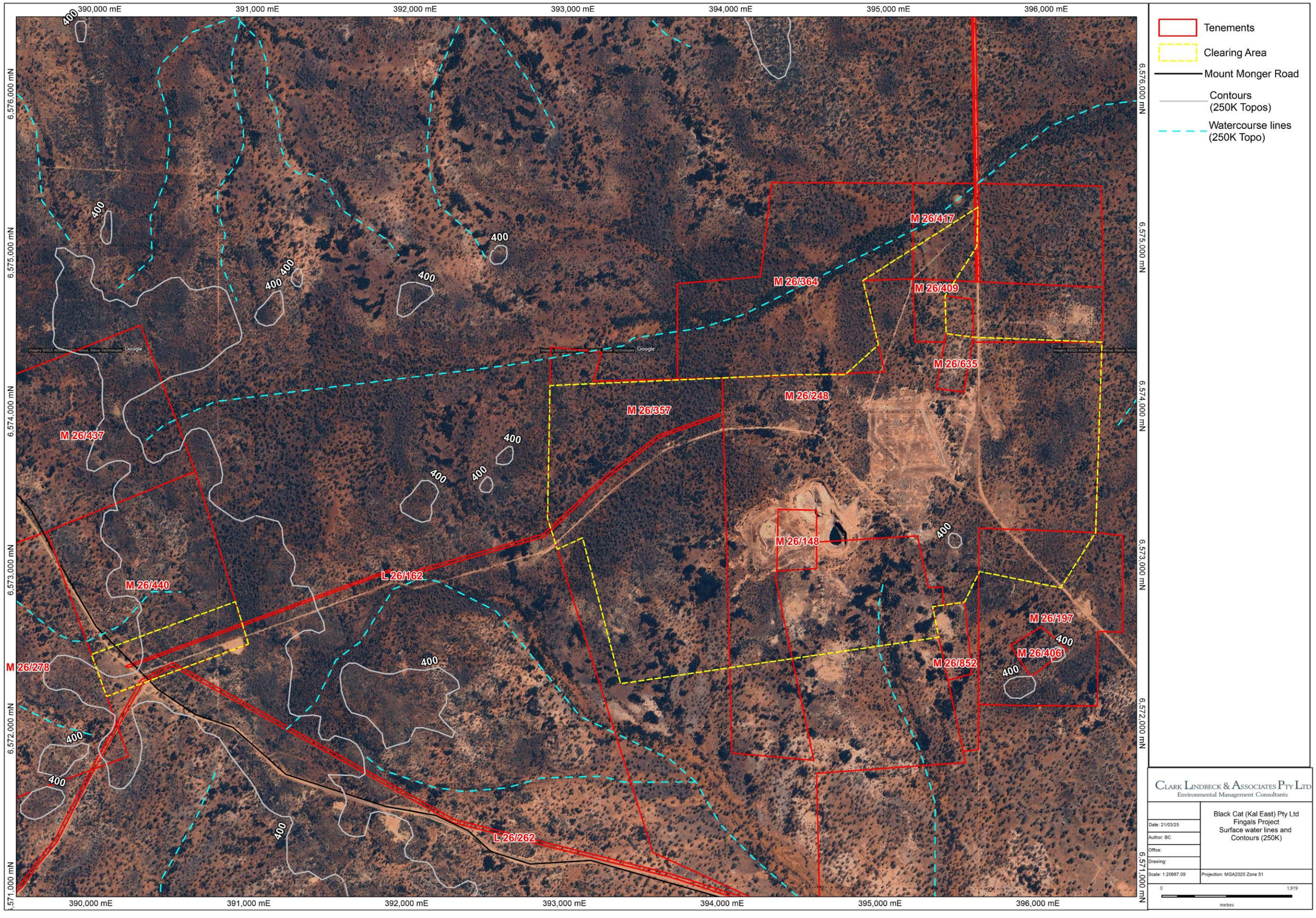

Figure 8: Drainage lines in proximity to the clearing area

3.7 VEGETATION AND FLORA

The Pre-European vegetation association descriptions and their remaining extent, as specified in the 2018 Statewide Vegetation Statistics (DBCA, 2019) are provided in Table 5.

The vegetation associations have >97% of their Pre- European extent remaining. Development within the clearing area will not significantly reduce the pre-European extent of these vegetation associations.

Table 5: Pre-European Vegetation Associations within the clearing area

Vegetation Association	Current Extent (ha)	Pre- European extent remaining (%)	% in DBCA managed lands	Floristic Description
Randell 9	235,162	97.8	1.53	Goldfields; gimlet, redwood etc. *E. salubris*, *E. oleosa*. Riverine; rivergum *E. camaldulensis*.
Randell 468	583,903	98.6	4.11	Goldfields; gimlet, redwood etc. *E. salubris*, *E. oleosa*. Riverine; rivergum *E. camaldulensis*.

An early flora survey conducted by Goldfields Environmental Management Pty Ltd in 1990 described the Project area. The survey identified a broad vegetation type in the area as a low eucalypt woodland though its composition and density vary with soil type and elevation. Lateritic rises of low relief feature a *Eucalyptus stricklandii* sparse low woodland which includes tall shrubs of *Allocasuarina acutivalvia* and *Melaleuca sheathiana*. shrubs include *Acacia* spp, *West ringia rigida, Grevillea acuria* and *Santalum spicatum.*

Elsewhere on calcareous plains between the lateritic rises, the eucalypt woodland varies from immature *Eucalyptus salubris* low woodland to more open *Eucalyptus gracilis* low woodland and a more open still *Eucalyptus salmonpholia* and *Eucalyptus transcontinentalia* woodland. The understorey in these areas is mainly composed of *Eremophila* spp and a variety of chenopods.

A Level 1 flora and vegetation study of the Fingals area including and proposed access track north on L25/23, was conducted in July 2012 by Botanica Consulting (Botanica) which identified seven vegetation communities:

- Open low woodland of *Eucalyptus salmonophloia* over dwarf scrub of *Maireana sedifolia* and *Tecticornia disarticulata*;
- Low woodland of *Eucalyptus stricklandii* over scrub of *Melaleuca sheathiana*;
- Low forest of *Eucalyptus ravida* over dwarf scrub of *Maireana triptera*;
- Open low woodland of *Eucalyptus lesouefii*, *E. salmonophloia* and *E. salubris* over dwarf scrub of *Tecticornia disarticulata*;
- Open low woodland of *Eucalyptus lesouefii* over low scrub of *Senna artemisioides subsp. filifolia* and dwarf scrub of *Maireana triptera*;
- Scrub of *Acacia sp.* narrow phyllode over dwarf scrub of *Maireana triptera*; and
- Forest of *Casuarina pauper* over low scrub of *Eremophila decipiens* and dwarf scrub of *Maireana triptera*.

Vegetation communities were represented by a total of 19 Families, 38 Genera and 67 Species.

More recently a reconnaissance flora/vegetation survey (and basic fauna survey) was undertaken by Botanica (2021) in November 2020 within the Fingals Project area. A copy of the survey report is attached as Appendix A.

Botanica (2021) identified five broad-scale vegetation communities were identified within the survey area (Figure 9):

- DD-CF1: *Casuarina pauper* low forest over Eremophila decipiens open shrubland over M*aireana triptera* low sparse shrubland.
- CLP-EW1: *Eucalyptus lesouefii* low open woodland over *Senna artemisioides subsp. filifolia* and *Maireana triptera* low open shrubland.
- CLP-EW2: *Eucalyptus ravida* low open woodland over *Maireana triptera* low open shrubland.
- RS-EW1: Eucalyptus lesouefii, E. salmonophloia and E. salubris woodland over *Tecticornia disarticulata* low open shrubland.
- RS-EW2: *Eucalyptus stricklandii* low woodland over *Melaleuca sheathiana* shrubland.

This vegetation is not considered to be of high biological diversity and is well represented outside of the survey area (Botanica 2021).

The field survey identified 67 flora taxa within the survey area, representing 38 genera across 19 families. No Threatened or Priority flora species were recorded within the survey area.

No Threatened or Priority ecological communities or otherwise significant vegetation were identified within the survey area.

The general area has been markedly affected by mining and pastoral activities over an extended period of time. Grazing by feral animals as well as stock is also apparent. This has resulted in a loss of tree cover and a reduction in the diversity of understorey species.

Although the area was heavily disturbed by mining activities in the 1990's, all remaining vegetation communities were described as being in 'good' health (Botanica 2021).

Although the minor expansion of the borrow pit on M26/440 was not part of the assessment, the vegetation groups are expected to be consistent with those mapped by Botanica (2021).

Six weed species were identified at Fingals by Botanica (2022):

- *Centaurea melitensis* (Maltese Cockspur).
- *Dittrichia graveolens* (Stinkwort).
- *Nicotiana glauca* (Tobacco Plant).
- *Oligocarpus calendulaceus.*
- *Salvia verbenaca* (Wild Sage).
- *Solanum nigrum* (Deadly Nightshade).

None of these species are listed as Declared pest under the *Biosecurity and Agriculture Management Act 2007*.

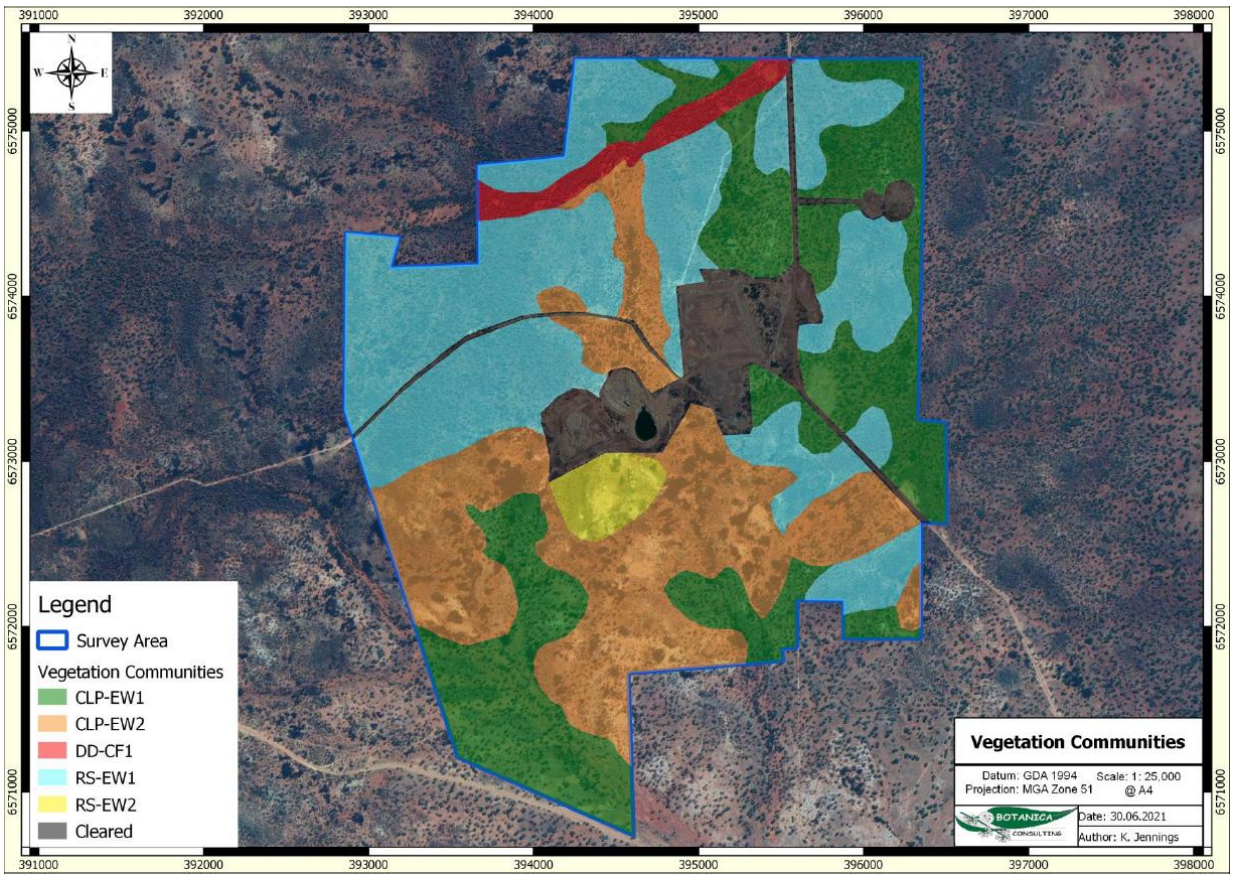

Figure 9: Vegetation communities in Fingals Project area (from Botanica 2021)

3.8 FAUNA

3.8.1 Terrestrial Fauna

A Level 1 fauna risk assessment was completed in 2012 by Terrestrial Ecosystems for the Fingals area which identified one broad fauna habitat type of open eucalypt woodland with a mixed understorey of scattered shrubs and chenopods. Habitat quality varied from very good to completely degraded (goat grazing and historical mining activity). It was considered the habitat represented many square kilometres of adjacent habitat with the resulting conclusion clearing was unlikely to have a significant impact on vertebrate fauna. The study area did not represent any conservation significant ecosystems.

A basic fauna survey was undertaken by Botanica (2021) in November 2020 within the Fingals Project area (Appendix A). Habitat and distribution data was used to determine the likelihood of occurrence significant fauna species at the Project, for which Botanica identified two species as potentially occurring:

- Grey Falcon (*Falco hypoleucos*)
- Malleefowl (*Leipoa ocellata*).

No evidence of significant fauna species was observed during the survey, including no evidence of Malleefowl nesting mounds or other activity. Botanica (2021) considered suitable habitat may be present for the Grey Falcon at the Project but is unlikely to represent critical habitat. Botanica (2021) considered noted that while habitats onsite for the species listed above are considered possibly suitable, some or all may be marginal in extent/quality and therefore the fauna species considered as possibly occurring may in fact only visit the area for short periods as infrequent vagrants.

Based on vegetation and associated landforms identified during the Botanica (2021) flora and vegetation assessment, three broad scale terrestrial fauna habitats were identified as occurring (Figure 10):

- *Eucalyptus* woodland on clay-loam plain
- *Eucalyptus* woodland on rocky slope
- *Casuarina* forest in drainage depression.

Although the minor expansion for the borrow pit on M26/440 was not part of the assessment, the vegetation groups are expected to be consistent with those mapped by Botanica (2021).

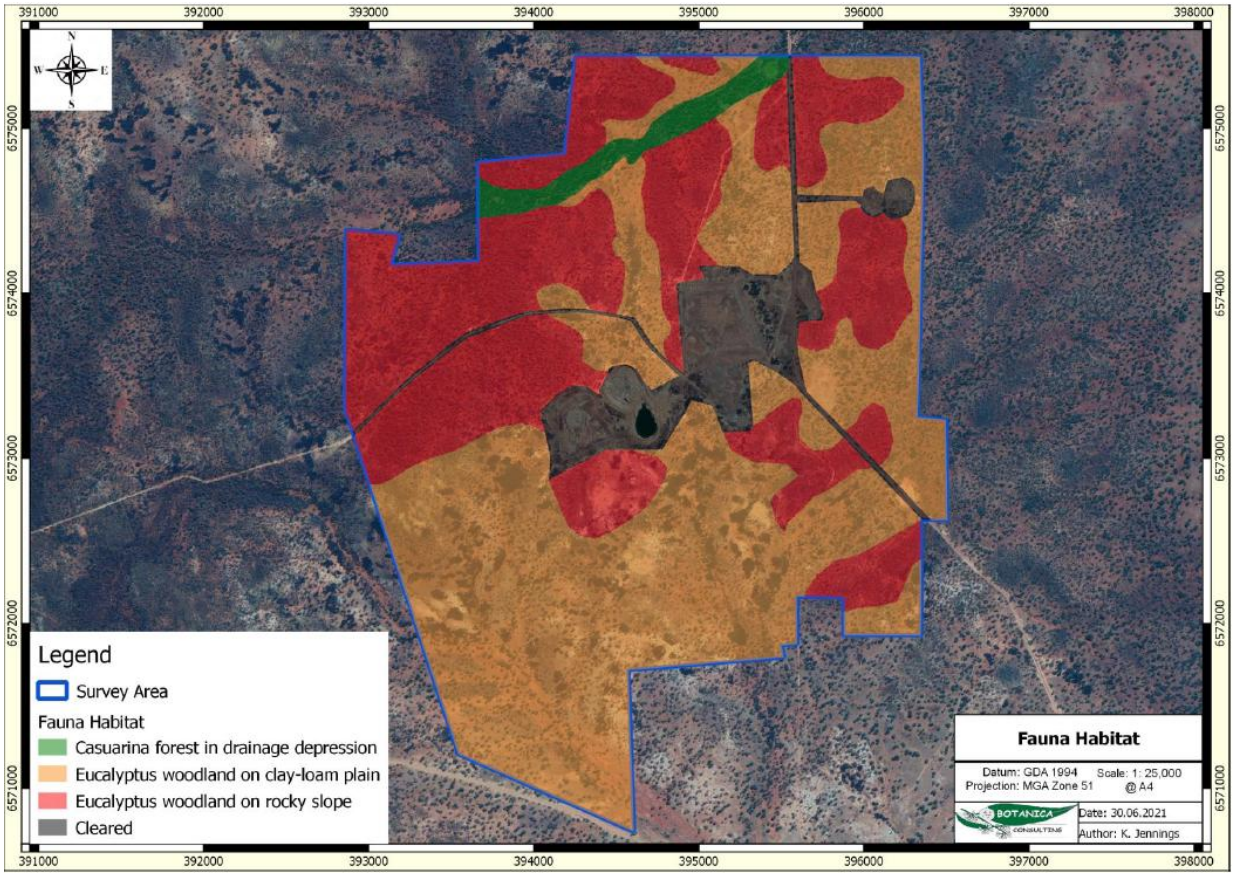

Figure 10: Fauna habitats in Fingals Project area (from Botanica 2021)

3.8.2 Short Range Endemic

3.8.2.1 Overall

Bennelongia (2022a) completed a desktop assessment for the Fingals Project area to assess the potential occurrence of SRE invertebrate species (Appendix B). Based on the desktop assessment, 63 species from SRE Groups have been recorded in the search area with relatively little sampling effort. The fauna surrounding the sampling area includes 21 species of mygalomorph spiders, two species of araneomorph spiders, five species of pseudoscorpion, 12 species of scorpion, four species of centipede, two species of millipede and 15 species of land snail Bennelongia (2022a).

The Project area contains many prospective habitats for SRE groups including, *Eucalyptus* woodland on rocky slopes and *Eucalyptus* woodland on clay-loam plain although these habitat types appear to be well connected and extend beyond the Project area. Bennelongia (2022a) determined that of the 61 SRE group species in the search area, there was only one Confirmed SRE, one Potential SRE, 35 Data deficient SREs and 25 Widespread species and considers the distribution of species in these SRE categories is more likely to reflect lack of information rather than providing a reliable guide to the pattern of species distributions.

Bennelongia (2022a) noted that two listed butterflies potentially occur at the Project, the Arid Bronze Azure Butterfly (*Ogyris subterrestris petrina*) and the Inland Hairstreak (*Jalmenus aridus*). This was further assessed by Botanica (2022) (Section 3.8.2.2).

While the Fingals Project area appears to be prospective for SRE Group species, Bennelongia (2022a) concluded that due to the relative size of the disturbance footprint and the extensiveness of connected habitat outside of the Project area, the threat to SRE species from the Project is low.

3.8.2.2 ABAB & Inland Streak

Botanica subsequently completed a desktop assessment of the Fingals Project area to assess the potential occurrence of the Arid Bronze Azure Butterfly (ABAB) (*Ogyris subterrestris petrina*) and the Inland Hairstreak (*Jalmenus aridus)* following the results of the Bennelongia (2022a) assessment which identified these species could be present (Appendix C).

The ABAB has an obligate association with a sugar ant *Camponotus* sp. nr. *Terebrans* and the most critical factor for habitat occupancy by the butterfly is the presence of large colonies of the host ant i.e. presence of ant used as indication of ABAB occurrence. The host ant colonies occur at the base of mature smooth-barked eucalypts and on soils/landscapes described as sand clay textured soil on a flat plain (Botanica 2022).

Of these five vegetation communities identified in the Fingals area, only two were considered possible to suit the soil type where the *Camponotus sp. nr. terebrans* are likely to be found the two Eucalypt woodland communities growing on clay loam plain (CLP-EW1, CLP-EW2), and only one (CLP-EW2) contained smooth bark Eucalypts. Botanica (2022) considered that it is unlikely the CLP-EW2 community support Camponotus sp. nr. terebrans, or the ABAB as:

"*only two species of smooth bark Eucalypts were identified in this vegetation community, and E. ravida was listed as the dominant tree in this community. Although a smooth bark Eucalypt, E. ravida is not mentioned in any literature indicating that it supports colonies of Camponotus sp. nr. terebrans. E. salmonophloia was present but in low numbers*".

In relation to the Inland Hairstreak, known habitat trees for this species are *Acacia tetragonophylla* and *Senna artemisioides* subsp. x *coriacea*. Of these species only one, *A.tetragonophylla* is located at the Project in the '*Casuarina* low forest in a drainage channel' vegetation community. While Botanica (2022) considers they could potentially be present (low probability) in this community, this vegetation community is not proposed to be disturbed.

3.9 LANDUSE AND DEGRADATION

The Project has been subject to land degradation as a result of extensive historic mining activities (both mining and processing), and rangeland grazing. The Mount Monger area has and continues to be used for pastoral activities (i.e. grazing) for more than 100 years.

The Project is located on Mt Monger Station Pastoral Lease and has historically been subject to goat grazing.

3.10 REHABILITATION

Black Cat has produced a Mine Closure Plan (MCP) to address the rehabilitation and closure works to return the area to its pre-mining land use (pastoral).

This MCP is currently being assessed by DEMIRS.

4 CLEARING PERMIT PRINCIPLES

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

The clearing permit application area is located within the Eastern Goldfields subregion of the IBRA Coolgardie Bioregion (GIS Database). The Eastern Goldfields subregion is characterised by vegetation of Mallees, Acacia thickets and shrub heaths on sandplains. Diverse Eucalyptus woodlands occur around salt lakes, on ranges, and in valleys. Salt lakes support dwarf shrublands of samphire, and woodlands and Dodonaea shrubland occur on basic graninulites of the Fraser Range (CALM, 2002).

No Threatened or Priority ecological communities or otherwise significant vegetation were identified within the survey area.

The field survey identified 67 flora taxa within the survey area, representing 38 genera across 19 families. No Threatened or Priority flora species were recorded within the survey area. This vegetation is not considered to be of high biological diversity and is well represented outside of the survey area (Botanica 2021).

The general area has been markedly affected by mining and pastoral activities over an extended period of time. Grazing by feral animals as well as stock is also apparent. This has resulted in a loss of tree cover and a reduction in the diversity of understorey species.

Six weed species were recorded during the survey vehicle hygiene measures and weed management will be implemented to prevent introduction and spread of weeds the result of clearing activities.

Based on the fauna work completed it is expected that all fauna habitats within the Project area are common within the locality and occur contiguously with the same habitat types outside of the clearing area.

Based on the above, the proposed clearing is not considered to comprise a high level of biological diversity. All vegetation groups are represented outside the proposed clearing area and the proposed clearing is not expected to reduce the biodiversity of the area.

Based on the above, the proposed clearing is not at variance to this Principle.

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

No evidence of conservation significant fauna has been recorded in fauna survey work completed at the Project.

Given the mobility of fauna species it is considered the proposed clearing would have no impact on the two species of conservation significance identified as having the potential to occur (Malleefowl and Grey Falcon).

All fauna habitats within the proposed clearing envelope are common in the local area and occur contiguously with the same habitat types outside of the proposed clearing area. Botanica (2021) identified no significant fauna habitat during their survey of the clearing area.

While the Fingals Project area appears to be prospective for SRE Group species, Bennelongia (2022a) concluded that due to the relative size of the disturbance footprint and the extensiveness of connected habitat outside of the Project area, the threat to SRE species from the Project is low.

The ABAB is not likely to be using the Fingals Project area for breeding, and it is unlikely that the host ant *Camponotus* sp. nr. *terebrans* are present in the area.

The Project area may support approximately 31 ha of a vegetation community where a species of Acacia is present, and the Inland Hairstreak may use this species as a food source, but there is a very low probability of them being present in the Project area. Any proposed clearing for mining would not impact this vegetation community (Botanica 2021).

Black Cat considers that the proposed clearing area is not necessary for the on-going maintenance of any significant fauna habitat and that equal or higher quality vegetation and fauna habitats exist in adjoining areas and the region area.

In addition, the proposed clearing will not significantly reduce the extent of fauna habitats at the Project or in the region. Given the above, the proposed clearing will not be at variance to this Principle.

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.

No plant taxa located in the proposed clearing area are gazetted as Threatened under the EPBC Act or BC Act.

No Priority flora were recorded in the proposed clearing area.

Given the above, the proposed clearing will not be at variance to this Principle.

(d) Native vegetation should not be cleared if it comprises the whole or part of, or is necessary for the maintenance of a Threatened Ecological Community (TEC).

No TEC's are listed under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* or endorsed by the Western Australian Minister for the Environment for the Project area.

Therefore, the proposed clearing is not at variance to this Principle.

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

The proposed clearing comprises two Vegetation Association which has approximately >97% of their pre-European extent remaining.

Given the above, the vegetation proposed to be cleared cannot be considered significant as a remnant in an area that has been extensively cleared.

Therefore, the proposed clearing will not be at variance to this Principle.

(f) Native vegetation should not be cleared if it is growing, in, or in association with, an environment associated with a watercourse or wetlands.

Surface drainage is largely via sheet flow with surface water flow only following periods of heavy rainfall.

The Fingals deposit areas are situated on a topographic high which separates two major drainage systems. As such the catchments are of small size, produce a small volume of runoff which is of low velocity. The vegetation in these drainage lines is not considered to be riparian vegetation.

There is, therefore, no vegetation growing in association with a water course or wetland. The proposed clearing is not at variance to this Principle.

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

The soils associated with both SMU 1 (top 1m) have been measured to be non-sodic and generally non-dispersive, through the influence of considerable gravel content (20-40%) and ideal chemical properties of the finer soil matrix (i.e. ESP< 6%).

The clearing area and surrounding region has not been extensively cleared but has been subject to historical disturbance.

The proposed clearing of 260 ha of vegetation is not likely to lead to land degradation issues such as salinity, water logging or acidic soils and therefore is not at variance to this Principle. All disturbed areas (with the exception of pits) will be rehabilitated at the completion of mining operations.

(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.

There are no conservation or nature reserves within the Project area.

The closest conservation area is the Majestic Timber Reserve, which is DBCA-managed land located approximately 3 km north of the survey area. Disturbances within the survey area are unlikely to impact this area.

The proposed clearing will not have any impact on the environmental values of conservation areas. The proposed clearing, therefore, is not at variance to 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.

Surface water in the Project area is sourced from direct precipitation and surface runoff following rainfall events. The Murchison area often receives considerable rainfall from degenerating cyclonic depressions from the northern parts of the State. However, overall, the mean annual rainfall is only 266.2 mm.

Evaporation rates in the region vary from 3000-3200 mm annually.

With such high annual evaporation rates, there is little surface flow during normal seasonal rains. Given the low annual rainfall and high evaporation rate there is expected to be minimal rainfall re-charge that would impact the groundwater levels or the quality of the groundwater in the local region.

There is no surface water of significance, large drainage lines, lakes or swamps in or in close proximity to the proposed clearing area.

The area proposed to be cleared does not fall within a Public Drinking Water Source Area (PDWSA) or PDWSA Protection Zone (www.dow.wa.gov.au).

The clearing of 260 ha of native vegetation is not likely to cause deterioration in the quality of surface or groundwater and, therefore, the proposed clearing is not at variance to this Principle.

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding.

Rainfall in the Eastern Goldfields subregion has an average rainfall of 200-300mm and an evaporation rate of 2400 mm. Rainfall data for Kalgoorlie-Boulder indicates that rainfall is spread throughout the year and rainfall events are unlikely to result in localised flooding. Clearing is not likely to increase the incidence or intensity of flooding within the survey area or surrounds.

The GRM (2021a) inspection of the available topographical mapping and aerial photography indicate that the only credible flood risks to the Project area relates to potential flooding of the open pits from direct precipitation. The Project site straddles the regional catchment divide means that no runoff will report from upstream catchment areas

As there is little surface flow during normal rains, the proposed clearing of 260 ha is not likely to cause or exacerbate the incidence or intensity of flooding. Therefore, the proposed clearing is not at variance to this Principle.

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Appendix A: Fingals Project Reconnaissance Flora/Vegetation and Basic Fauna Survey

Fingals Project
Reconnaissance Flora/ Vegetation and Basic Fauna Survey
Prepared for Black Cat Syndicate Ltd.

July 2021
Version 2

Prepared by:
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Document Job Number: 2021/60

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Glossary

Acronym	Description
BAM Act	*Biosecurity and Agriculture Management Act 2007*, WA Government.
BC Act	*Biodiversity Conservation Act 2016*, WA Government.
Botanica	Botanica Consulting Pty Ltd.
BoM	Bureau of Meteorology.
DAFWA	Department of Agriculture and Food (now DPIRD), WA Government.
DAWE	Department of the Agriculture, Water and Environment (formerly known as DotEE), Australian Government.
DBCA	Department of Biodiversity, Conservation and Attractions (formerly DPaW), WA Government.
DEC	Department of Environment and Conservation (now DBCA), WA Government.
DER	Department of Environment Regulation (now DWER), WA Government.
DMIRS	Department of Mines, Industry Regulation and Safety (formerly DMP), WA Government
DotEE	Department of the Environment and Energy (now known as 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	Environmental Protection Act 1986, WA Government.
EP Regulations	Environmental Protection (Clearing of Native Vegetation) Regulations 2004, WA Government.
EPA	Environmental Protection Authority, WA Government.
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*, Australian Government.
ESA	Environmentally Sensitive Area.
Ha	Hectare (10,000 square meters).
IBRA	Interim Biogeographic Regionalization for Australia.
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union.
JAMBA	*Japan Australia Migratory Bird Agreement 1981.*
Km	Kilometer (1,000 meters).
LGA	Local Government Area
NVIS	National Vegetation Information System.
PEC	Priority Ecological Community.
TEC	Threatened Ecological Community.
WA	Western Australia.
WAHERB	Western Australian Herbarium.
WAM	Western Australian Museum, WA Government.

Executive Summary

Botanica Consulting Pty Ltd (Botanica) was commissioned by Black Cat Syndicate Ltd. (Black Cat) to undertake a reconnaissance flora/ vegetation survey and basic fauna survey within the Fingals Project area. The survey area is 1,192 ha in extent and is located approximately 45 km south-east of Kalgoorlie in the City of Kalgoorlie-Boulder LGA, Western Australia. Botanica conducted a reconnaissance flora/ vegetation and basic fauna survey on the 22nd November 2020, with the area traversed on foot and 4WD by Jim Williams (Director/Principal Botanist, Diploma of Horticulture). The survey was conducted to support a Native Vegetation Clearing Permit (NVCP) application and Mining Proposal with regards to the further development of the Fingals Project.

The survey area lies within the Eastern Goldfields (COO3) subregion of the Coolgardie Bioregion, as defined by the Interim Biogeographic Regionalisation of Australia (IBRA).

The Eastern Goldfields subregion (5,102,428 ha) lies on the Yilgarn Craton's Eastern Goldfields Terrain, which is described as gently undulating plains with a subdued relief, interrupted in the west with low hills and ridges of Archaean greenstones and in the east by a horst of Proterozoic basic granulite. The underlying geology is of gneisses and granites eroded into a flat plane covered with tertiary soils and with scattered exposures of bedrock. Calcareous earths are the dominant soil group and cover much of the plains and greenstone areas. A series of large playa lakes in the western half are the remnants of an ancient major drainage line (Cowan 2001).

The vegetation consists of Mallees, Acacia thickets and shrub-heaths on sandplains, with diverse *Eucalyptus* woodlands occurring around salt lakes, on ranges, and in valleys. Salt lake support dwarf shrublands of samphire. Woodlands and *Dodonaea* shrubland occur on basic granulite of the Fraser Range, and the area is rich in endemic Acacias.

The dominant land uses of the Eastern Goldfields subregion includes Unallocated Crown Land (UCL) and Crown reserves and pastoral grazing, with conservation areas and mining leases also present (Cowan, 2001). The survey area is located within the Mt Monger Pastoral Lease.

Prior to the field assessment a literature review was undertaken of previous flora and fauna assessments conducted within the local region. Documents reviewed included:

- Botanica (2012). Level 1 Flora and Vegetation Survey of the Fingals Mine Site Area. Prepared for Integra Mining Ltd, July 2012
- Botanica (2020). Reconnaissance Flora/ Vegetation Survey and Basic Fauna Survey L25/62. Prepared for Black Cat Syndicate, September 2020

In addition to the literature review, searches of the following databases were undertaken to aid in the compilation of a list of significant flora within the survey area:

- DBCA Threatened/ Priority Flora spatial data (DBCA, 2019);
- DBCA NatureMap database (DBCA, 2020); and
- EPBC Protected Matters search tool (DAWE, 2020a).

The NatureMap species search and EPBC Protected Matters search were conducted with a 40 km buffer from the survey area.

The desktop review identified 337 vascular flora species as occurring within 40 km of the survey area, representing 158 genera from 56 families. The most diverse families were Chenopodiaceae (43 species), Fabaceae (41 species) and Asteraceae (36 species). Significant genera were *Eucalyptus* (24 species), *Eremophila* (22 species) and *Acacia* (21 species).

The desktop review identified 42 introduced flora (weed) species as potentially occurring in the vicinity of the survey area. These species consist of 19 families, with the most commonly represented being Asteraceae (11 species), Brassicaceae (six species) and Poaceae (four species). Of these, three are listed as a Declared Pest on the Western Australian Organism List (WAOL) under the *Biosecurity and Agriculture Management* (BAM) *Act 2007*. Two of these, weeds are also listed as Weeds of National Significance, in addition to one WONS not listed as a Declared Pest, for a total of significant weed species.

The assessment of the DBCA Priority/ Threatened flora database (DBCA, 2019), NatureMap search (DBCA, 2020), Protected Matters searches (DAWE, 2020a) and previous relevant literature identified 15 significant flora species recorded within a 40 km radius of the survey area. These are comprised of one Threatened, nine Priority 1, two Priority 3 and three Priority 4 taxa. These taxa were assessed for distribution and known habitat to determine their likelihood of occurrence within the survey area. The assessment identified one Priority 1 taxa as likely to occur in the survey area, *Eremophila arachnoides* subsp*. tenera*. Three taxa were assessed as possibly occurring in the survey area, consisting of one Priority 1, one Priority 2 and one Priority Four taxa.

The Protected Matters search (DAWE, 2020a) did not identify any Threatened Ecological Communities recorded within 40 km of the survey area. Analysis of the Priority Ecological Communities within the Goldfields region (DBCA, 2017) did not identify any significant vegetation assemblages as likely or possibly occurring within the survey area.

A total of 224 terrestrial fauna taxa have been recorded within a 40 km radius of the survey area, consisting of 110 bird, 24 mammal, 65 reptile, two amphibian and 23 invertebrate taxa. The desktop review identified eight terrestrial fauna species of conservation significance as previously being recorded in the regional area, consisting of five Threatened, one Priority 4 and two migratory species. In addition, numerous migratory wading/shorebirds were assessed collectively due to their similar habitat requirements.

Habitat and distribution data was used to determine the likelihood of occurrence within the survey area. The assessment identified two significant fauna species as potentially occurring in the survey area.

There are no DBCA managed lands located within the survey area.

There are no Environmentally Sensitive Areas located within the survey area.

There are no Nationally Important or RAMSAR wetlands located within the survey area.

The closest significant environmental feature is the Majestic Timber Reserve, which is DBCA-managed land located approximately 1 km north of the survey area. Disturbances within the survey area are unlikely to impact this area.

The field survey identified 67 flora taxa within the survey area, including six introduced (weed) species. These taxa represented 38 genera across 19 families, with the most diverse genera being *Eucalyptus* (10 species), *Eremophila* (seven species) and *Maireana* (six species). Dominant families include Chenopodiaceae (18 species), Myrtaceae (10 species), and Scrophulariaceae (seven species).

No Threatened or Priority flora species were recorded within the survey area.

A total of five broad-scale vegetation communities were identified within the survey area. Vegetation community descriptions and extents were determined from field survey results, aerial imagery interpretation and extrapolation of the communities. The survey found RS-EW1 was the most widespread community in the survey area, occupying 388 ha (32.6%), while RS-EW2 was the most restricted with 26 ha (2.2%).

No Threatened or Priority ecological communities or otherwise significant vegetation were identified within the survey area.

Based on vegetation and associated landforms identified during the flora and vegetation assessment, three broad scale terrestrial fauna habitats were identified as occurring within the survey area. No evidence of significant fauna species were observed during the survey, including no evidence of Malleefowl nesting mounds or other activity.

Native vegetation within the survey area was rated as 'good', which describes obvious signs of damage caused by human activity since European settlement, including impacts to vegetation structure and composition from low levels of grazing, changed fire regimes and/or slightly aggressive weeds. Cleared areas associated with current mining operations were rated as 'completely degraded'.

Based on the outcomes from the survey undertaken, Botanica assessed the results of the desktop and field survey with regards to the native vegetation clearing principles listed under Schedule 5 of the EP Act. The assessment found that the proposed vegetation clearing activities may be at variance with clearing principle (f).

1 INTRODUCTION

1.1 Project Description

Botanica Consulting Pty Ltd (Botanica) was commissioned by Black Cat Syndicate Ltd. (Black Cat) to undertake a reconnaissance flora/ vegetation survey and basic fauna survey within the Fingals Project area (referred to as 'survey area') (Figure 1-1). The survey area is approximately 1,192 ha in extent and is located approximately 45 km south-east of Kalgoorlie in the City of Kalgoorlie-Boulder LGA, Western Australia. The survey was conducted to support a Native Vegetation Clearing Permit (NVCP) application and Mining Proposal with regards to the further development of the Fingals Project.

1.2 Objectives

The flora assessment was conducted in accordance with the requirements of a reconnaissance flora survey as defined in *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment – December 2016* (EPA, 2016a). The objectives of the assessment were to:

- gather background information on flora and vegetation in the target area (literature review, database and map-based searches);
- identify significant flora, vegetation and ecological communities and assess the potential sensitivity to impact;
- conduct a field survey to verify / ground truth the desktop assessment findings;
- undertake floristic community mapping to a scale appropriate for the bioregion and described according to the National Vegetation Information System (NVIS) structure and floristics;
- undertake vegetation condition mapping;
- assess the project area's plant species diversity, density, composition, structure and weed cover, using NVIS classification system for vegetation description;
- assess Matters of National Environmental Significance (MNES) and indicate whether potential impacts on MNES as protected under the EPBC Act are likely to require referral of the project to the Commonwealth DAWE; and
- determine the State legislative context of environmental aspects required for the assessment.

The fauna assessment was conducted in accordance with the requirements for a basic terrestrial fauna survey as defined in *Technical Guidance - Terrestrial Fauna Surveys for Environmental Impact Assessment – June 2020* (EPA, 2020). The objectives of the assessment were to:

- Gather background information on fauna in the survey area (literature review, database and map-based searches);
- Delineate and characterise the faunal assemblages and fauna habitats present in the survey area; and
- Assess the likelihood of significant fauna occurring within the survey area.

Figure 1-1: Regional map of the survey area

2 BIOPHYSICAL ENVIRONMENT

2.1 Regional Environment

The survey area lies within the Eastern Goldfields (COO3) subregion of the Coolgardie Bioregion, as defined by the Interim Biogeographic Regionalisation of Australia (IBRA).

The Eastern Goldfields subregion (5,102,428 ha) lies on the Yilgarn Craton's Eastern Goldfields Terrain, which is described as gently undulating plains with a subdued relief, interrupted in the west with low hills and ridges of Archaean greenstones and in the east by a horst of Proterozoic basic granulite. The underlying geology is of gneisses and granites eroded into a flat plane covered with tertiary soils and with scattered exposures of bedrock. Calcareous earths are the dominant soil group and cover much of the plains and greenstone areas. A series of large playa lakes in the western half are the remnants of an ancient major drainage line (Cowan 2001).

The vegetation consists of Mallees, Acacia thickets and shrub-heaths on sandplains, with diverse *Eucalyptus* woodlands occurring around salt lakes, on ranges, and in valleys. Salt lake support dwarf shrublands of samphire. Woodlands and *Dodonaea* shrubland occur on basic granulite of the Fraser Range, and the area is rich in endemic Acacias.

In accordance with Beard (1990) the survey area is located in the Coolgardie Botanical District of the Southwestern Interzone Province. The landscape is described as gently undulating with occasional ranges of low hills, with sandplains in the western part and some large playa lakes. Soils are principally brown calcareous earths, which overlays the Proterozoic granite and gneiss of the Fraser Range block and Archaean granite, with infolded volcanics and meta-sediments, of the Yilgarn block. Vegetation is predominately *Eucalyptus* woodlands, with slopes and flats containing *E*. *longicornis* alongside *E. salubris* and *E*. *salmonophloia*. Woodland understories range from tall sclerophyll shrubland dominated by *Melaleuca pauperiflora* to soft-leaved saltbush shrubland of *Atriplex vesicaria* and *A*. *nummularia*. Some hill slopes contain mallees of *E*. *livida* or *E*. *loxophleba*, while ironstone ridges are covered in thickets of *Acacia quadrimarginea*, *Allocasuarina acutivalvis* and *A*. *campestris*. Other vegetation assemblages include species-rich scrub-heaths and *Allocasuarina* thickets on sandplains, merging into *Acacia* thickets and Kwongan vegetation to the north.

2.2 Land Use

The dominant land uses of the Eastern Goldfields subregion includes Unallocated Crown Land (UCL) and Crown reserves and pastoral grazing, with conservation areas and mining leases also present (Cowan, 2001). The survey area is located within the Mt Monger Pastoral Lease.

2.3 Soils and Landscape Systems

The survey area lies within the Kalgoorlie Province, located in the southern Goldfields between Paynes Find, Menzies, Southern Cross and Balladonia. The landscape consists of undulating plains (with some sandplains, hills and salt lakes) on the granitic rocks and greenstone of the Yilgarn Craton. Soils range from calcareous loamy earths and red loamy earths with some salt lake soils to red deep sands, yellow sandy earths, shallow loams and loamy duplexes. Vegetation communities are predominately Eucalypt woodlands with some acacia-casuarina thickets, mulga shrublands, halophytic shrublands and spinifex grasslands.

The Kalgoorlie Province is further divided into six soil-landscape zones, with the survey area located within the Kambalda Zone (265). This zone is located in the south-eastern Goldfields between Menzies, Norseman and the Fraser Range and contains flat to undulating plains (with hills, ranges and some salt lakes and stony plains) on greenstone and granitic rocks of the Yilgarn Craton. Soils consist of calcareous loamy earths and red loamy earths with salt lakes soils and some redbrown hardpan shallow loams and red sandy duplexes. Vegetation includes red mallee, blackbutt-salmon gum-gimlet woodlands with mulga and halophytic shrublands (and some spinifex grasslands).

The Kambalda Zone is further divided into soil landscape systems, with the survey area located within the Mx43 soil landscape systems, as shown in Table 2-1 and Figure 2-1, in accordance with soil landscape system mapping data (Government of Western Australia, 2019).

Table 2-1: Soil Landscape Systems within the survey area

Soil Landscape System	Description	Extent within Survey Area ha (%)
Mx43	Gently undulating valley plains and pediments; some outcrop of basic rock	1,192 ha (100%)

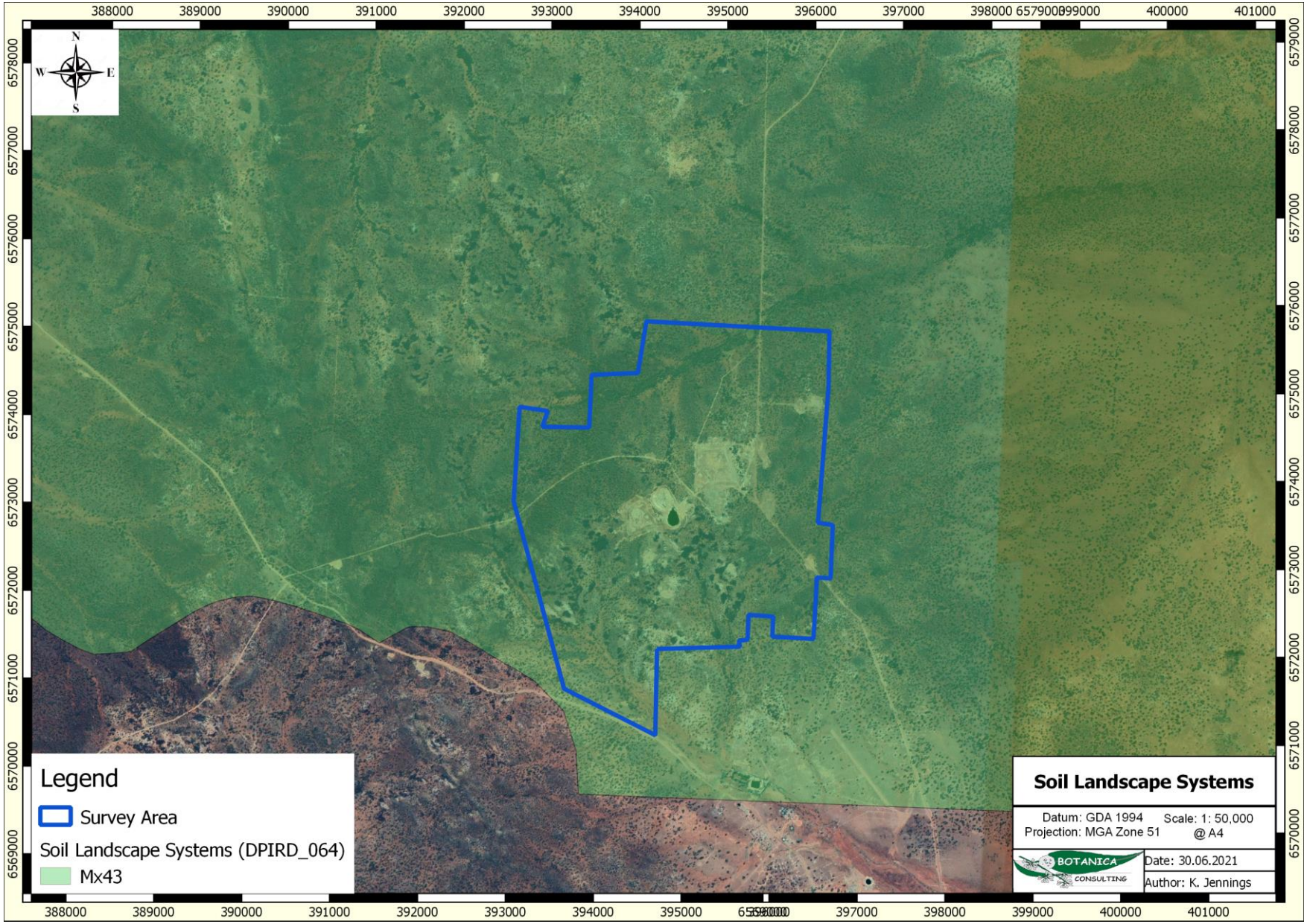


Figure 2-1: Soil Landscape Systems within the survey area

2.4 Regional Vegetation

In accordance with Tille (2006), the vegetation of the Kambalda Zone is typified by the preponderance of stony plains with acacia shrublands and halophytic shrublands, low hills with eucalypt or acacia woodlands with halophytic undershrubs, stony plains with acacia shrublands and alluvial plains with eucalypt woodlands and halophytic undershrubs rangeland.

More broadly, the vegetation of the Kalgoorlie Province is described by Tille (2006) as woodlands of redwood (*Eucalyptus transcontinentalis*), red mallee (*E. oleosa*), Dundas blackbutt (*E. dundasii*), merrit (*E. flocktoniae*) and salmon gum (*E. salmonophloia*), found on undulating plains over granite. There are also some hummock grasslands with red mallee over spinifex (*Triodia scariosa*) and thickets of *Acacia*, *Casuarina* and *Melaleuca* spp. Plains on greenstone have woodlands of York gum (*E. loxophleba*), salmon gum and gimlet (*E. salubris*). The valley plains have woodlands of salmon gum, red mallee, Goldfields blackbutt (*E. lesouefii*), gimlet, York gum and morrel (*E. longicornis*). These sometimes have an understorey of saltbush (*Atriplex* spp.), pearl bluebush (*Maireana sedifolia*), sago bluebush (*M. pyramidata*) and *Eremophila* spp. There are areas of spinifex grasslands with red mallee, mallees (e.g. *E. youngiana*) and marble gum (*E. gongylocarpa*). Low woodlands of mulga (*Acacia aneura*) and black sheoak (*Casuarina cristata*) over bluebush and saltbush are also present. Apart from the bare salt lake surfaces, saline valley floors have shrublands of samphire (*Halosarcia* spp.) and *Frankenia* spp. in lower areas, shrublands of saltbush and bluebush on red deep sandy duplexes, and woodlands of salmon gum, merrit, red mallee, gimlet and York gum. *Acacia neurophylla*, *A. beauverdiana* and *A. resinomarginea* thickets grow on gently sloping uplands on granite, with thickets of acacia, casuarina and melaleuca. There are also scrub-heaths and York gum-salmon gum-gimlet woodlands on these uplands. The hilly terrain on greenstone supports woodlands of salmon gum, Goldfields blackbutt, coral gum (*E. torquata*), York gum, gimlet, morrel, Dundas blackbutt and black sheoak. Thickets of granite wattle (*Acacia quadrimarginea*) are also present. The stony plains support scattered woodlands of Goldfields blackbutt, gimlet and salmon gum, along with shrublands of saltbush and bluebush. Sandplains in the west have acacia (*A. coolgardiensis, A. ramulosa, A. aneura, A. burkittii* and *A. tetragonophylla*) shrublands, commonly with patchy native pine (*Callitris glaucophylla C. preissii*) and mallees (*E. leptopoda, E. longicornis* and *E. loxophleba*). Native box (*Bursaria occidentalis*), *Melaleuca uncinata* and *Hakea recurva* may also be present. Hard spinifex (*T. basedowii*) grasslands with mulga, marble gum and mallees (e.g. *E. kingsmillii*) are found on sandplains to the east. The sandy-surfaced plains support acacia, casuarina and melaleuca thickets; woodlands of York gum, cypress pine (*Callitris columellaris*), salmon gum, gimlet and mulga; and shrublands of bowgada (*A. ramulosa*).

2.5 Conservation Values

The Eastern Goldfields subregion contains 16 vegetation associations, predominately open *Eucalyptus* woodlands, that have at least 85 per cent of their total extent in the bioregion (Cowan 2001) The subregion is considered a centre of endemism for Eucalypts in the Goldfields Woodlands region, and is also noted for the diversity of *Acacia* spp. and ephemeral flora communities of the tertiary sandplain shrublands and the valley floors of woodland areas.

The subregion contains one wetland of national importance: Rowles Lagoon System, located approximately 40 km east of the survey area. In addition, there are seven wetlands of subregional importance (Cowan, 2001). Other significant assemblages in the region include plant assemblages of the Fraser Range and the Woodline Hills.

No ecosystems are listed as threatened under WA State legislation occur within the subregion, but 18 communities and vegetation associations are thought to be at risk for a variety of reasons. Grazing from livestock, goats and rabbits and impacts from mining are the main threatening processes in the region, with changed fire regimes, erosion and sedimentation also causing significant impacts.

2.5.1 Great Western Woodlands

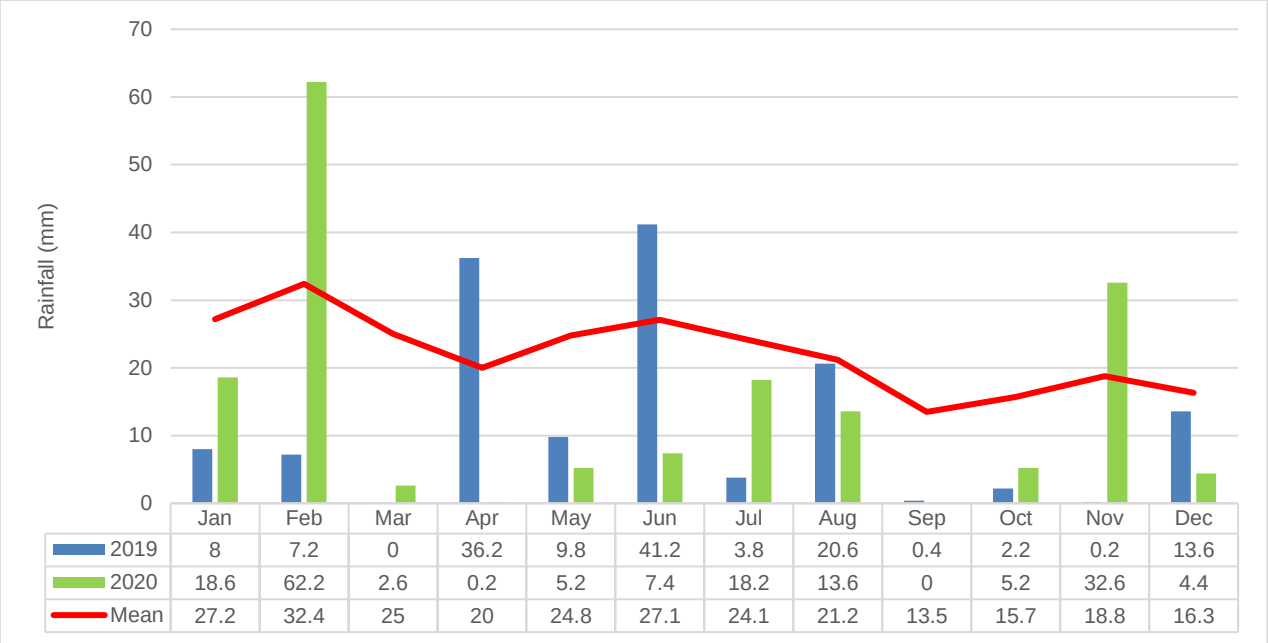
The survey area lies within the Great Western Woodlands, located approximately 30 km from the northern boundary. The Great Western Woodlands is considered by The Wilderness Society of WA to be of global biological and conservation importance as one of the largest and healthiest temperate woodlands on Earth, containing many endemic taxa. The region covers almost 16 million hectares (160,000 square kilometres), from the southern edge of the Western Australian Wheatbelt to the pastoral lands of the Mulga country in the north, the inland deserts to the northeast, and the treeless Nullarbor Plain to the east.

The Great Western Woodlands provides a connection between southwest forests and inland deserts (Gondwana Link) as well as linking the north-west passage to Shark Bay. The majority of the Great Western Woodlands is unallocated crown land (61.1%) with other interests including pastoral leases (20.4%), conservation reserves (15.4%) unallocated crown land, ex pastoral (2%) managed by the Department of Biodiversity, Conservation and Attractions (DBCA) and private land (approximately 1%) (Watson *et. al.,* 2008).

No specific management strategy or formal conservation status applies to the Great Western Woodlands. The Great Western Woodlands currently includes towns, highways, roads, railways, private property, Crown Reserves, agricultural activities and mining tenements.

2.6 Climate

The climate of the Eastern Goldfields subregion is characterised as arid to semi-arid with 200-300 mm of rainfall, sometimes in summer but usually in winter (Cowan 2001). Rainfall data for the Kalgoorlie airport weather station (#12038) located approximately 45 km north-west of the survey area is shown in Graph 2-1 (BoM, 2020). Mean monthly rainfall ranges from 31.6 mm in February to 13.7 mm in September, with a mean annual rainfall of 264.9 mm. The survey was conducted in November 2020 during a period of above average rainfall, however the preceding months (September and October) were characterised by below average rainfall. Although climate conditions are not considered optimal for the presence of flowering material and ephemeral species, this is unlikely to be a major survey constraint.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	8	7.2	0	36.2	9.8	41.2	3.8	20.6	0.4	2.2	0.2	13.6
2020	18.6	62.2	2.6	0.2	5.2	7.4	18.2	13.6	0	5.2	32.6	4.4
Mean	27.2	32.4	25	20	24.8	27.1	24.1	21.2	13.5	15.7	18.8	16.3

Graph 2-1: Average and monthly rainfall for the Kalgoorlie-Boulder Airport weather station (BoM, 2020)

2.7 Hydrology

According to the Geoscience Australia database (2015), there are no permanent or ephemeral inland waters within the survey area. Multiple minor ephemeral drainage lines intersect the survey area (Figure 2-2).

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, 2020b) database, there are no potential terrestrial or aquatic GDE's within the survey area.

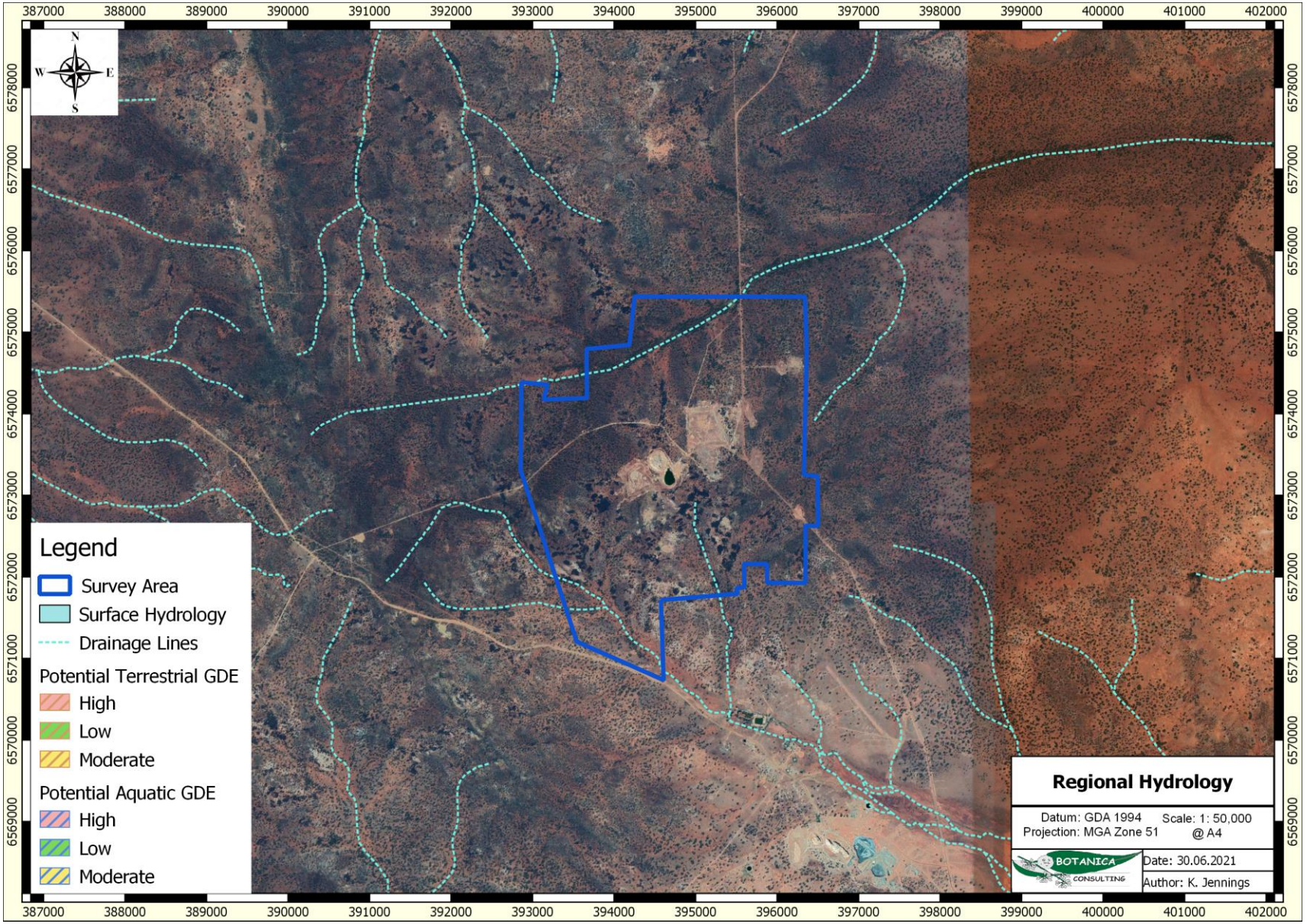


Figure 2-2: Surface Hydrology of the survey area

3 SURVEY METHODOLOGY

3.1 Desktop Assessment

Prior to the field assessment a literature review was undertaken of previous flora and fauna assessments conducted within the local region. Documents reviewed included:

- Botanica (2012). *Level 1 Flora and Vegetation Survey of the Fingals Mine Site Area*. Prepared for Integra Mining Ltd, July 2012
- Botanica (2020). Reconnaissance Flora/ Vegetation Survey and Basic Fauna Survey L25/62. Prepared for Black Cat Syndicate, September 2020

In addition to the literature review, searches of the following databases were undertaken to aid in the compilation of a list of significant flora within the survey area:

- DBCA Threatened/ Priority Flora spatial database (DBCA, 2019);
- DBCA NatureMap database (DBCA, 2020); and
- EPBC Protected Matters search tool (DAWE, 2020a).

The NatureMap species search and EPBC Protected Matters search were conducted with a 40 km buffer from the survey area.

Significant flora and fauna species identified by the desktop review were assessed with regards to their population extent and distribution and preferred habitat to determine their likelihood of occurrence within the survey area.

The assessment categorised flora species as follows:

- Unlikely- Suitable habitat is not expected to occur and/or the survey area is outside the known range of the species.
- Possible- Suitable habitat may be present, and the area is within the known range of the species. This option is also used when there is insufficient information to determine the preferred habitat of a species.
- Likely- Suitable habitat is expected to occur and there are records within 10 km of the survey area.
- Previously Recorded- A record for this species is located within the survey area. Field survey will ground-truth currently occurring individuals and populations.

Fauna species were categorised as follows:

- Would Not Occur: There is no suitable habitat for the species in the survey area and/or there is no documented record of the species in the general area since records have been kept and/or the species is generally accepted as being locally/regionally extinct (supported by a lack of recent records).
    - Locally Extinct: Populations no longer occur within a small part of the species natural range, in this case within 10 or 20km of the survey area. Populations do however persist outside of this area.
    - Regionally Extinct: Populations no longer occur in a large part of the species natural range, in this case within the Goldfields region. Populations do however persist outside of this area.

- Unlikely to Occur: The survey area is outside of the currently documented distribution for the species in question, or no suitable habitat (type, quality and extent) was identified as being present during the field assessment. Individuals of some species may occur occasionally as vagrants/transients especially if suitable habitat is located nearby but the site itself would not support a population or part population of the species.

- Possibly Occurs: Survey area is within the known distribution of the species in question and habitat of at least marginal quality was identified as likely to be present during the field survey and literature review, supported in some cases by recent records being documented in literature from within or near the survey area. In some cases, while a species may be classified as possibly being present at times, habitat may be marginal (e.g. poor quality, fragmented, limited in extent) and therefore the frequency of occurrence and/or population levels may be low.

- Known to Occur: The species in question has been positively identified as being present (for sedentary species) or as using the survey area as habitat for some other purpose (for non-sedentary/mobile species) during field surveys within or near the survey area. This information may have been obtained by direct observation of individuals or by way of secondary evidence (e.g. tracks, foraging debris, scats). In some cases, while a species may be classified as known to occur, habitat may be marginal (e.g. poor quality, fragmented, limited in extent) and therefore the frequency of occurrence and/or population levels may be low.

It should be noted that these lists are based on observations from a broader area than the assessment area (40 km radius) and therefore may include taxa not present. The databases also often include very old records that may be incorrect or in some cases the taxa in question have become locally or regionally extinct. Information from these sources should therefore be taken as indicative only and local knowledge and information also needs to be taken into consideration when determining what actual species may be present within the specific area being investigated.

The conservation significance of flora and fauna taxa was assessed using data from the following sources:

- *Environment Protection and Biodiversity and Conservation* (EPBC) *Act 1999*. Administered by the Australian Government (DAWE);
- *Biodiversity Conservation* (BC) *Act 2016*. Administered by the WA Government (DBCA);
- Red List produced by the Species Survival Commission (SSC) of the World Conservation Union (also known as the IUCN Red List – the acronym derived from its former name of the International Union for Conservation of Nature and Natural Resources). The Red List has no legislative power in Australia but is used as a framework for State and Commonwealth categories and criteria; and
- Priority Flora/ Fauna list. A non-legislative list maintained by DBCA for management purposes (fauna list released April 2019; flora list released December 2018).

The EPBC Act also requires the compilation of a list of migratory species that are recognized under international treaties including the:

- Japan Australia Migratory Bird Agreement 1981 (JAMBA)[1];
- China Australia Migratory Bird Agreement 1998 (CAMBA);
- Republic of Korea-Australia Migratory Bird Agreement 2007 (ROKAMBA); and
- Bonn Convention 1979 (The Convention on the Conservation of Migratory Species of Wild Animals).

Most but not all migratory bird species listed in the annexes to these bilateral agreements are protected in Australia as Matters of National Environmental Significance (MNES) under the EPBC Act. Descriptions of conservation significant species and communities are provided in Appendix 1.

3.2 Field Assessment

Botanica conducted a reconnaissance flora/ vegetation and basic fauna survey on the 22nd November 2020, with the area traversed on foot and 4WD by Jim Williams (Director/Principal Botanist, Diploma of Horticulture).

3.2.1 Flora Assessment

Prior to the commencement of field work, aerial photography was inspected and obvious differences in the vegetation assemblages were identified. The different vegetation communities identified were then inspected during the field survey to assess their validity. A handheld GPS unit was used to record the coordinates of the boundaries between existing vegetation communities. At each sample point, the following information was recorded:

- GPS location;
- Photograph of vegetation;
- Dominant taxa for each stratum;
- All vascular taxa (including annual taxa);
- Landform classification;
- Vegetation condition rating;
- Collection and documentation of unknown plant specimens; and
- GPS location, photograph and collection of flora of conservation significance if encountered.

Unknown specimens collected during the survey were identified with the aid of samples housed at the Botanica Herbarium and Western Australian Herbarium. Vegetation was classified in accordance with NVIS classifications.

3.2.2 Fauna Assessment

Vegetation and landform units identified during the flora assessment have been used to define broad fauna habitat types across the site. This information has been supplemented with observations made during the fauna assessment.

[1] Most but not all species listed under JAMBA are also specially protected under Specially Protected Species of the BC Act.

The main aim of the fauna habitat assessment was to determine the likelihood of fauna species of conservation significance utilizing the areas that may be impacted during site development. The habitat information obtained was also used to aid in finalizing the overall potential fauna list.

As part of the desktop literature review, available information on the habitat requirements of the species of conservation significance listed as possibly occurring in the area was researched. During the field survey, the habitats within the study area were assessed and specific elements identified, if present, to determine the likelihood of listed threatened species utilizing the area and its significance to them.

Opportunistic observations of fauna species were made during all field survey work which involved a series of transects across the study area during the day including observations of bird species with binoculars. Secondary evidence of a species presence such as tracks, scats, skeletal remains, foraging evidence or calls were also noted if observed/heard.

3.2.3 Scientific Licences

Table 3-1: Scientific Licences of Botanica Staff coordinating the flora survey

Licensed staff	Permit Number	Valid Until
Jim Williams	FB62000108 (Licence to flora for scientific purposes)	27/05/2022

3.3 Survey Limitations and Constraints

It is important to note that flora surveys will entail limitations notwithstanding careful planning and design. Potential limitations are listed in Table 3-2.

The conclusions presented in this report are based upon field data and environmental assessments and/or testing carried out over a limited period of time and are therefore merely indicative of the environmental condition of the site at the time of the field assessments. Also, it should be recognised that site conditions can change with time. Information not available at the time of this assessment which may subsequently become available may alter the conclusions presented.

Some species are reported as potentially occurring based on there being suitable habitat (quality and extent) within the survey area or immediately adjacent. The habitat requirements and ecology of many of the species known to occur in the wider area are however often not well understood or documented. It can therefore be difficult to exclude species from the potential list based on a lack of a specific habitats or microhabitats within the survey area. As a consequence of this limitation, the potential species list produced is most likely an overestimation of those species that actually utilise the survey area for some purpose.

In recognition of survey limitations, a precautionary approach has been adopted for this assessment. Any flora and fauna species that would possibly occur within the survey area (or immediately adjacent), as identified through ecological databases, publications, discussions with local experts/residents and the habitat knowledge of the author, has been listed as having the potential to occur.

Table 3-2: Limitations and constraints associated with the survey

Variable	Potential Impact on Survey	Details
Access problems	Not a constraint	The survey was conducted via 4WD and on foot. Numerous tracks were located within the survey area, providing ease of access.
Competency/ Experience	Not a constraint	The BC personnel that conducted the survey were regarded as suitably qualified and experienced. **Coordinating Botanist/ Zoologist:** Jim Williams **Data Interpretation:** Jim Williams and Kelby Jennings.
Timing of survey, weather & season	Not a constraint	Fieldwork was undertaken within the EPA's recommended survey period (September - November) for the South-West and Interzone Province.
Area disturbance	Not a constraint	The area has been disturbed from exploration and mining operations, cattle grazing and other human impacts; however, vegetation was mostly intact and comprised of native vegetation.
Survey Effort/ Extent	Not a constraint	Survey intensity was appropriate for the size/significance of the area with a reconnaissance survey completed to identify vegetation types/fauna habitats and conservation significant species/communities.
Availability of contextual information at a regional and local scale	Not a constraint	Threatened flora database searches provided by the DBCA were used to identify any potential locations of Threatened/Priority taxa. BoM, DWER, DPIRD, DBCA and DAWE databases were reviewed to obtain appropriate regional desktop information on the biophysical environment of the local region. Previous Flora/ Fauna surveys within the local area have been assessed for pertinent information and environmental context of the regional area.
Completeness	Not a constraint	In the opinion of Botanica, the survey area was covered sufficiently in order to identify vegetation assemblages. All observed flora individuals were able to be identified to species level. The vegetation types for this study were based on visual descriptions of locations in the field. The distribution of these vegetation communities/ fauna habitats outside the study area is not known, however vegetation types identified were categorised via comparison to vegetation distributions throughout WA specified in the NVIS Major Vegetation Groups (DotEE, 2017b).

4 RESULTS

4.1 Desktop Assessment

4.1.1 Flora

The desktop review identified 337 vascular flora species as occurring within 40 km of the survey area, representing 158 genera from 56 families. The most diverse families were Chenopodiaceae (43 species), Fabaceae (41 species) and Asteraceae (36 species). Significant genera were *Eucalyptus* (24 species), *Eremophila* (22 species) and *Acacia* (21 species). This total includes 39 introduced (weed) species.

4.1.1.1 Introduced Flora

The desktop review identified 42 introduced flora (weed) species as potentially occurring in the vicinity of the survey area. These species consist of 19 families, with the most commonly represented being Asteraceae (11 species), Brassicaceae (six species) and Poaceae (four species). Of these, three are listed as a Declared Pest on the Western Australian Organism List (WAOL) under the *Biosecurity and Agriculture Management* (BAM) *Act 2007*. Two of these, weeds are also listed as Weeds of National Significance, in addition to one WONS not listed as a Declared Pest, for a total of significant weed species (Table 4-1).

The full list of potential weed species is contained in Appendix 2.

Table 4-1: Potentially occurring Declared Pests and WoNS

Taxon	Common Name	WAOL Status	Control Category	WONS
Echium plantagineum	Paterson's Curse	Declared Pest - s22(2)	No Control Category, Whole of State	No
Cylindropuntia fulgida var. mamillata		Declared Pest - s22(2)	C3 Management, Whole of State	Yes
Lycium ferocissimum	African Boxthorn	Permitted - s11	No Control Category	Yes
Lantana camara	Common Lantana	Declared Pest - s22(2)	C3 Management, Whole of State	Yes

4.1.1.2 Significant Flora

The assessment of the DBCA Priority/ Threatened flora database (DBCA, 2019), NatureMap search (DBCA, 2020), Protected Matters searches (DAWE, 2020a) and previous relevant literature identified 15 significant flora species recorded within a 40 km radius of the survey area. These are comprised of one Threatened, eight Priority 1, one Priority 2, two Priority 3 and three Priority 4 taxa (Appendix 3).

These taxa were assessed for distribution and known habitat to determine their likelihood of occurrence within the survey area. The assessment identified one Priority 1 taxa as likely to occur in the survey area, *Eremophila arachnoides* subsp*. tenera*. Three taxa were assessed as possibly occurring in the survey area, consisting of one Priority 1, one Priority 2 and one Priority Four taxa (Table 4-2). The full flora likelihood assessment is listed in Appendix 3. The locations of the DBCA database records are illustrated spatially in Figure 4-1.

Table 4-2: Potentially occurring significant flora species

Species	Rank	Habitat	Comments	Likelihood
Eremophila arachnoides subsp. *tenera*	P1	Flat calcareous plain.	Records within 5 km, habitat likely to be present.	Likely
Eremophila praecox	P2	Red/brown sandy loam. Undulating plains.	Potential habitat may be present, occurs within regional context.	Possible
Eremophila xantholaema	P1	-	Occurs within regional context.	Possible
Eucalyptus x brachyphylla	P4	Sandy loam. Granite outcrops.	Regional records, potential habitat may be present.	Possible

4.1.1.3 Significant Ecological Communities

The Protected Matters search (DAWE, 2020a) did not identify any Threatened Ecological Communities recorded within 40 km of the survey area. Analysis of the Priority Ecological Communities within the Goldfields region (DBCA, 2020) did not identify any significant vegetation assemblages as likely or possibly occurring within the survey area.

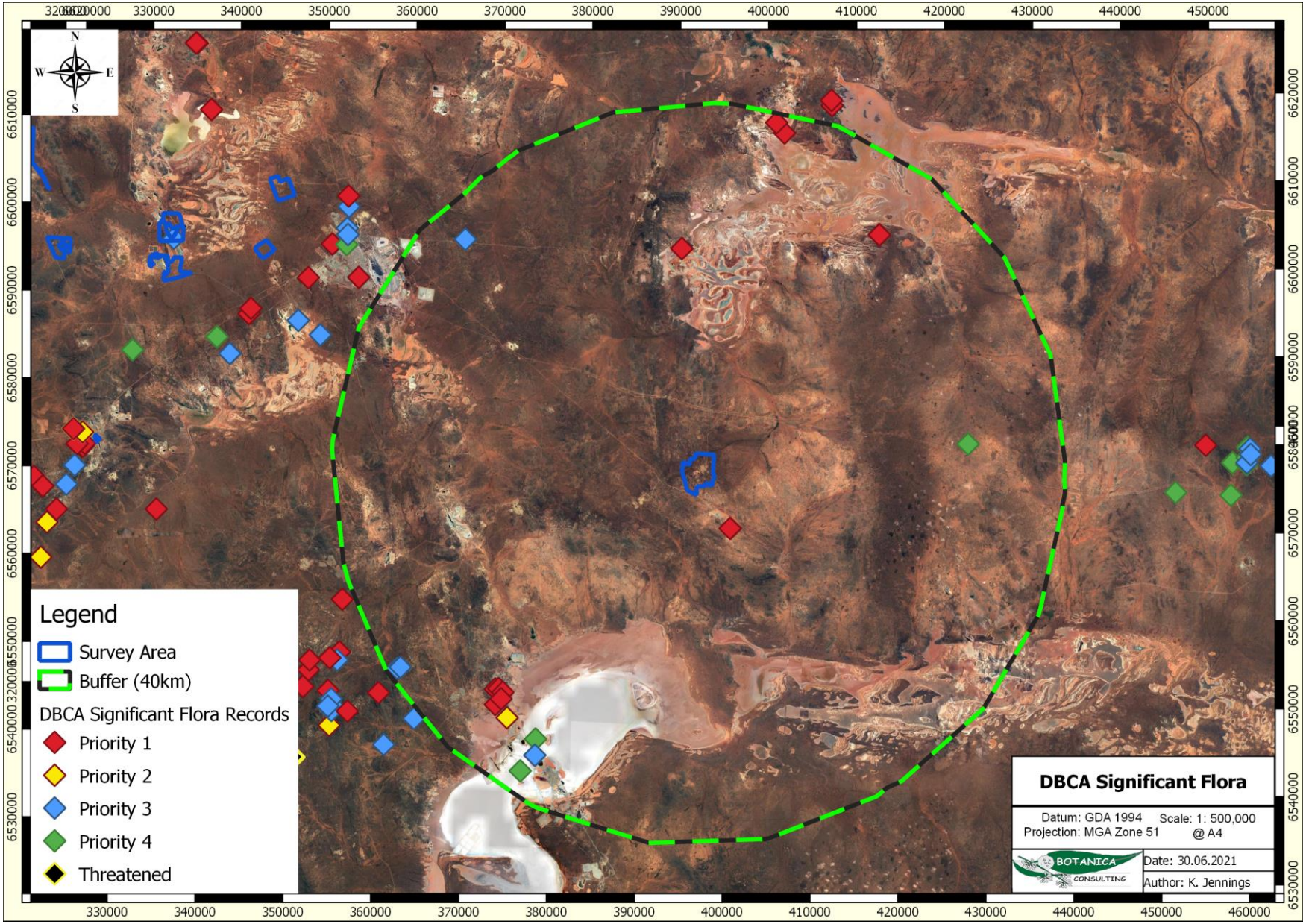


Figure 4-1: DBCA significant flora records

4.1.2 Vegetation Associations

The Pre-European vegetation association spatial mapping dataset (DPIRD, 2018) identifies three vegetation associations as occurring within the survey area (Figure 4-2). The association descriptions and their remaining extent, as specified in the 2018 Statewide Vegetation Statistics (DBCA, 2019) are provided in Table 4-3. 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). All vegetation associations >97% of their Pre-European extent. Development within the survey area will not significantly reduce the pre-European extent of these vegetation associations.

Table 4-3: Pre-European Vegetation Associations within the survey area

Vegetation Association	Current Extent (ha)	Pre-European extent remaining (%)	% in DBCA managed lands	Floristic Description	Extent within Survey Area ha (%)
Randell 9	235,162	97.8	1.53	Goldfields; gimlet, redwood etc. *E. salubris*, *E. oleosa*. Riverine; rivergum *E. camaldulensis*.	283.6 ha (23.8%)
Randell 1241	10,389	99.1	-	*Atriplex* spp. *Maireana* spp. communities on alkaline soils	109.4 ha (9.2%)
Randell 468	583,903	98.6	4.11	Goldfields; gimlet, redwood etc. *E. salubris*, *E. oleosa*. Riverine; rivergum *E. camaldulensis*.	799.6 ha (67.0%)

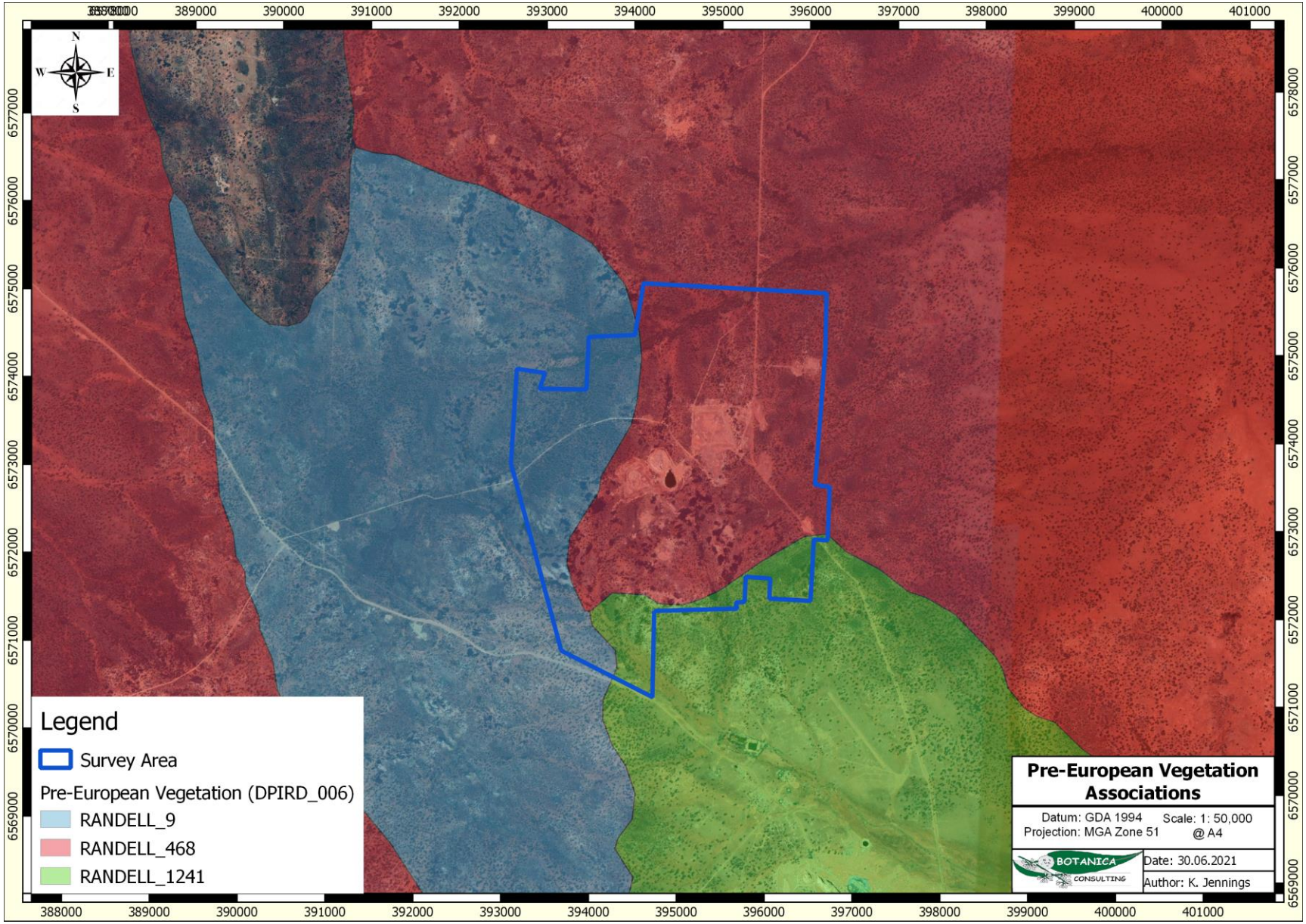


Figure 4-2: Pre-European Vegetation Associations within the survey area

4.1.3 Fauna

According to the results of the NatureMap search (DBCA, 2020), a total of 224 terrestrial fauna taxa have been recorded within a 40 km radius of the survey area, consisting of 110 bird, 24 mammal, 65 reptile, two amphibian and 23 invertebrate taxa. This total includes seven introduced (feral) species.

4.1.3.1 Introduced (Feral) Fauna

The NatureMap and EPBC database searches identified 11 feral fauna species, representing seven families, as potentially occurring in the survey area (Table 4-4).

Table 4-4: Potentially Occurring Introduced Fauna

Family	Taxon	Common Name
Bovidae	*Bos taurus*	European Cattle
	Capra hircus	Goat
Camelidae	*Camelus dromedarius*	Dromedary Camel
Canidae	*Canis lupus familiaris*	Domestic Dog
	Vulpes vulpes	Red Fox
Columbidae	*Columba livia*	Domestic Pigeon
	Streptopelia chinensis	Spotted Turtle-Dove
	Streptopelia senegalensis	Laughing Turtle-Dove
Felidae	*Felis catus*	Cat
Leporidae	*Oryctolagus cuniculus*	Rabbit
Muridae	*Mus musculus*	House Mouse

4.1.3.2 Conservation Significant Fauna

The desktop review identified eight terrestrial fauna species of conservation significance as previously being recorded in the regional area, consisting of five Threatened, one Priority 4 and two migratory species. In addition, numerous migratory wading/shorebirds were assessed collectively due to their similar habitat requirements. The full fauna likelihood assessment is listed in Appendix 4

Habitat and distribution data was used to determine the likelihood of occurrence within the survey area. The assessment identified two significant fauna species as potentially occurring in the survey area (Table 4-5 4-5).

Table 4-5: Significant fauna species potentially occurring in survey area

Species	Status	Likelihood
Grey Falcon (*Falco hypoleucos)*	T (VU)	Possible
Malleefowl (*Leipoa ocellata)*	T (VU)	Possible

4.1.4 Conservation Areas

There are no proposed or vested Conservation Reserves located within the survey area. There are no DBCA managed land located within the survey area. There are no Environmentally Sensitive Areas located within the survey area. There are no Nationally Important or RAMSAR wetlands located within the survey area.

The closest significant environmental feature is the Majestic Timber Reserve, which is DBCA-managed land located approximately 1 km north of the survey area. Disturbances within the survey area are unlikely to impact this area. The location of conservation areas in relation to the survey area is provided in Figure 4-3.

Figure 4-3: Conservation Areas

4.2 Field Assessment

4.2.1 Flora

The field survey identified 67 flora taxa within the survey area, including six introduced (weed) species. These taxa represented 38 genera across 19 families, with the most diverse genera being *Eucalyptus* (10 species), *Eremophila* (seven species) and *Maireana* (six species). Dominant families include Chenopodiaceae (18 species), Myrtaceae (10 species), and Scrophulariaceae (seven species). The full field species inventory is listed in Appendix 5.

4.2.1.1 Introduced Flora

Six species of introduced flora were recorded within the survey area (Table 4-6). None of these species are listed as a Weed of National Significance or a Declared Pest in Western Australia.

Table 4-6: Introduced flora species within the survey area

Family	Taxon
Asteraceae	*Centaurea melitensis*
Asteraceae	*Dittrichia graveolens*
Asteraceae	*Oligocarpus calendulaceus*
Lamiaceae	*Salvia verbenaca*
Solanaceae	*Nicotiana glauca*
Solanaceae	*Solanum nigrum*

4.2.1.2 Significant Flora

According to the EPA *Environmental Factor Guideline for Flora and Vegetation* (EPA, 2016b) 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.

No Threatened or Priority flora species were recorded within the survey area. No other significant flora (as described above) were identified within the survey area.

4.2.2 Vegetation Communities

A total of five broad-scale vegetation communities were identified within the survey area. Vegetation community description and extent are listed below in Table 4-7 and illustrated spatially in Figure 4-4. Vegetation community descriptions and extents were determined from field survey results, aerial imagery interpretation and extrapolation of the communities.

The survey found RS-EW1 was the most widespread community in the survey area, occupying 388 ha (32.6%), while RS-EW2 was the most restricted with 26 ha (2.2%).

Table 4-7: Vegetation Community Descriptions and Extent

Vegetation Community	Broad Floristic Formation (NVIS III)	Vegetation Description (NVIS V)	Landform	Image
DD-CF1 31 ha (2.6%)	*Casuarina* low forest	*Casuarina pauper* low forest over *Eremophila decipiens* open shrubland over *Maireana triptera* low sparse shrubland.	Drainage Channel	
CLP-EW1 314 ha (26.3%)	*Eucalyptus* low open woodland	*Eucalyptus lesouefii* low open woodland over *Senna artemisioides* subsp. *filifolia* and *Maireana triptera* low open shrubland.	Clay/loam plain.	

Vegetation Community	Broad Floristic Formation (NVIS III)	Vegetation Description (NVIS V)	Landform	Image
CLP-EW2 315 ha (26.4%)	*Eucalyptus* open woodland	*Eucalyptus ravida* low open woodland over *Maireana triptera* low open shrubland.	Clay/loam plain.	
RS-EW1 388 ha (32.6%)	*Eucalyptus* low open woodland	*Eucalyptus lesouefii*, *E. salmonophloia* and *E. salubris* woodland over *Tecticornia disarticulata* low open shrubland.	Lower rocky slopes	

Vegetation Community	Broad Floristic Formation (NVIS III)	Vegetation Description (NVIS V)	Landform	Image
RS-EW2 26 ha (2.2%)	*Eucalyptus* low woodland	*Eucalyptus stricklandii* low woodland over *Melaleuca sheathiana* shrubland.	Upper rocky slopes	

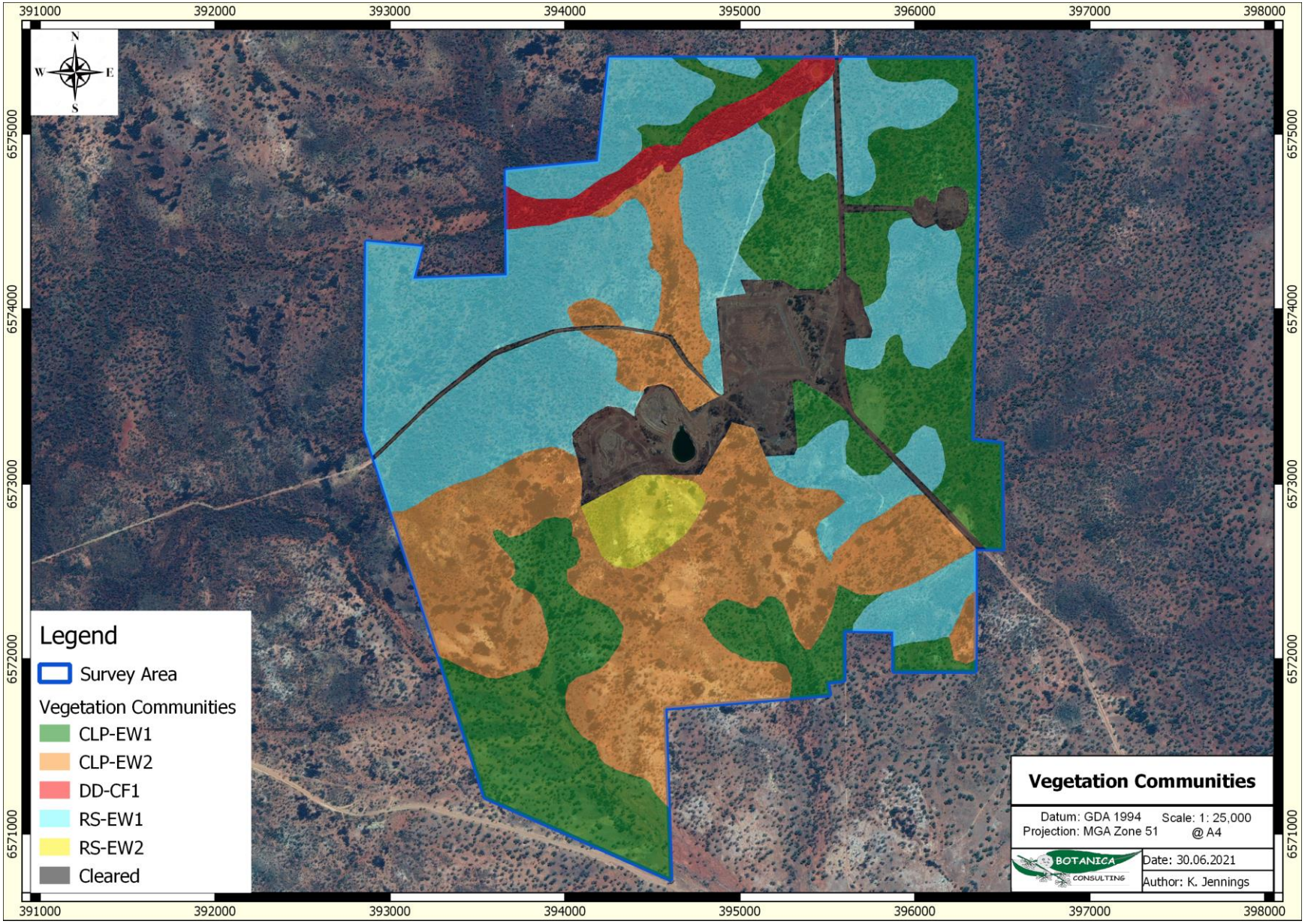


Figure 4-4: Vegetation Communities

4.2.3 Vegetation Condition

Based on the vegetation condition rating scale adapted from Keighery (1994) and Trudgen, (1988), native vegetation within the survey area was rated as 'good' (Table 4-8, Figure 4-5). 'Good' condition depicts more obvious signs of damage caused by human activity since European settlement, including impacts to vegetation structure and composition from low levels of grazing, changed fire regimes and/or slightly aggressive weeds. Cleared areas associated with current mining operations and road infrastructure/ easements were rated as 'completely degraded'.

Table 4-8: Vegetation Condition within the survey area

Condition Rating	Area (ha)	Area (%)
Good	1,074	90.1
Completely Degraded	118	9.9
Total	**1,192**	**100**

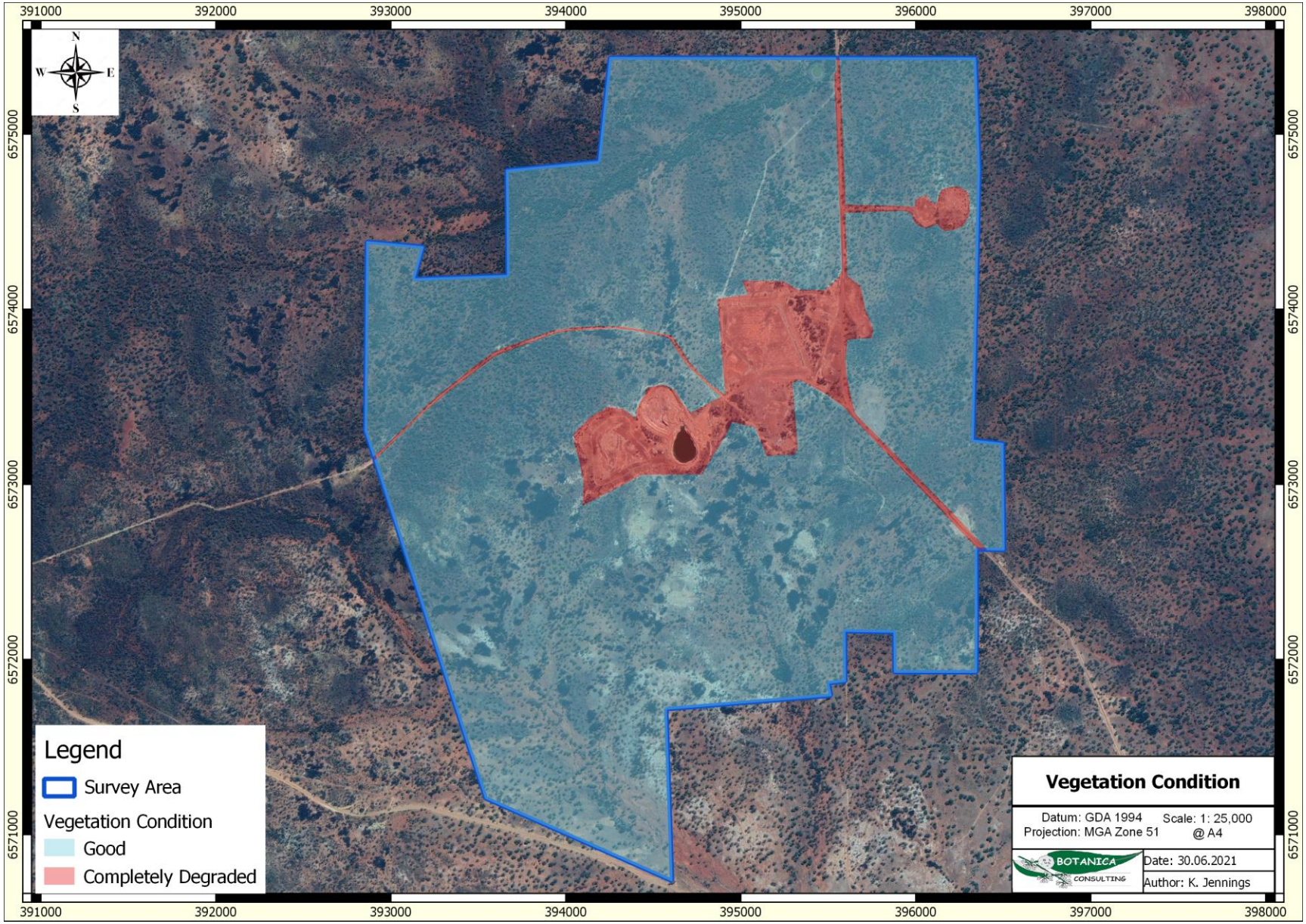


Figure 4-5: Vegetation Condition within the survey area

4.2.4 Significant Vegetation

According to the EPA *Environmental Factor Guideline for Flora and Vegetation* (EPA, 2016b) 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 or Priority ecological communities or otherwise significant vegetation were identified within the survey area.

4.2.5 Fauna Habitat

Based on vegetation and associated landforms identified during the flora and vegetation assessment, three broad scale terrestrial fauna habitats were identified as occurring within the survey area. Table 4-9 provides a visual representation of this habitat type, and the extent of fauna habitat is shown spatially in Figure 4-6.

Table 4-9: Terrestrial Fauna Habitats within the survey area

Fauna Habitat	Example Image
Eucalyptus woodland on clay-loam plain Area: 629 ha (52.8%)	

Fauna Habitat	Example Image
Eucalyptus woodland on rocky slope Area: 414 ha (34.7%)	
Casuarina forest in drainage depression Area: 31 ha (2.6%)	

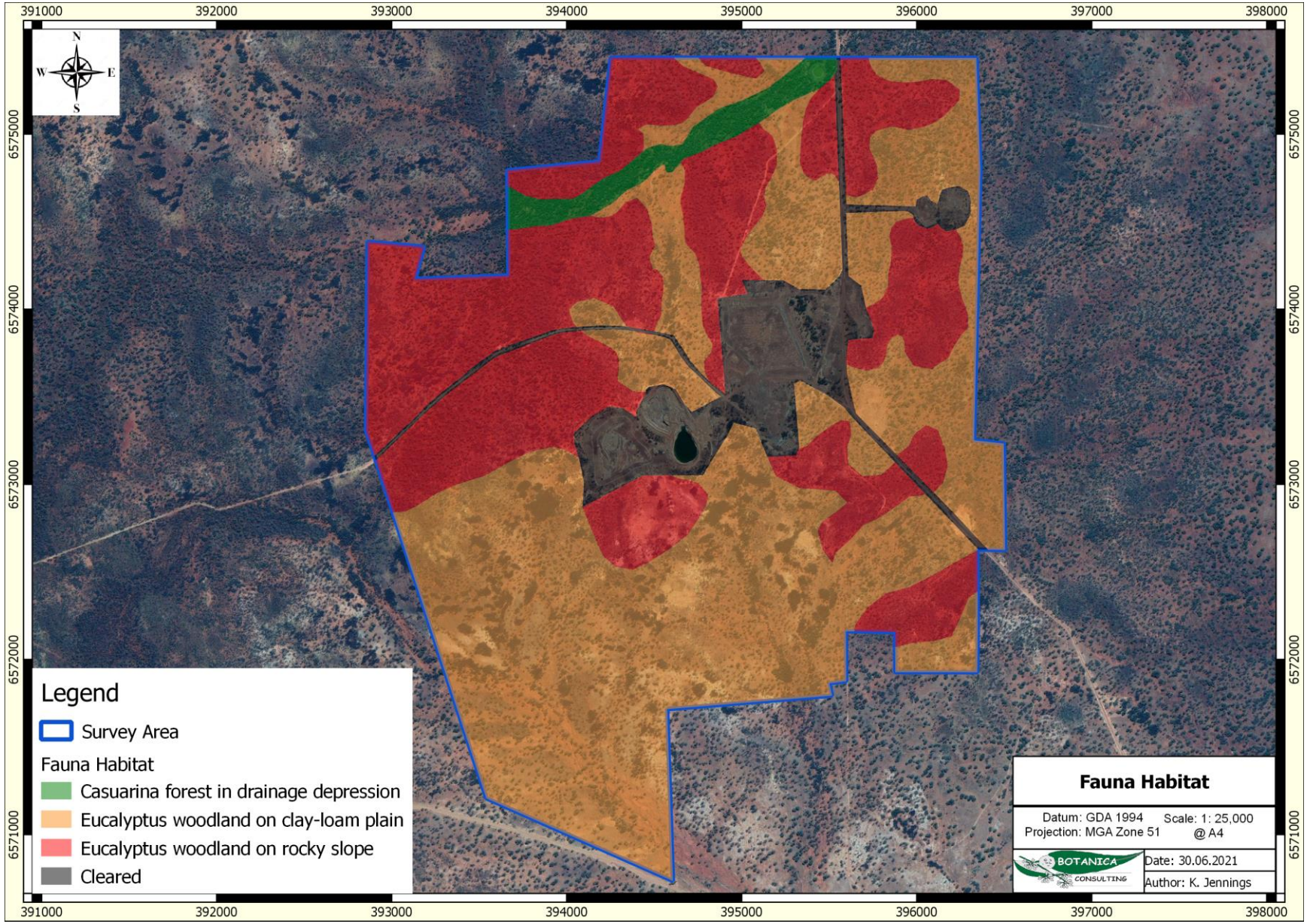


Figure 4-6: Terrestrial Fauna Habitats

4.2.6 Significant Fauna

According to the EPA *Environmental Factor Guideline for Terrestrial Fauna* (EPA, 2016d) significant fauna 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; and
- Fauna providing an important function required to maintain the ecological integrity of a significant ecosystem.

No evidence of significant fauna species were observed during the survey, including no evidence of Malleefowl nesting mounds or other activity.

The current status of some species on site and/or in the general area is difficult to determine, however, based on the habitats present and, in some cases, direct observations or recent nearby records, the following species of conservation significance can be regarded as possibly utilising the survey area for some purpose at times, these being:

- **Malleefowl (*Leipoa ocellata)* - Vulnerable (EPBC Act and BC Act)**
  This species is occasionally recorded in the Eastern Goldfields subregion. Habitat appears marginal/or unsuitable for breeding, however occasional transients could potentially occur. No evidence of malleefowl activity (inactive or active mounds, tracks, feathers or bird observations etc.) were observed within the survey area. Significant impact unlikely.

- **Grey Falcon (*Falco hypoleucos)* - Vulnerable (EPBC Act and BC Act)**
  This species is sparsely recorded throughout inland Australia. Suitable habitat likely to be present but in unlikely to represent critical habitat. Significant impact unlikely.

It should be noted that while habitats onsite for one or more of the species listed above are considered possibly suitable, some or all may be marginal in extent/quality and therefore the fauna species considered as possibly occurring may in fact only visit the area for short periods as infrequent vagrants.

4.3 Matters of National Environmental Significance

4.3.1 *Environment Protection and Biodiversity Conservation Act 1999*

The EPBC Act protects matters of national environmental significance, and is used by the Commonwealth DAWE to list threatened taxa and ecological communities into categories based on the criteria set out in the Act (www.environment.gov.au/epbc/index.html). The Act provides a national environmental assessment and approval system for proposed developments and enforces strict penalties for unauthorised actions that may affect matters of national environmental significance. Matters of national environmental significance as defined by the Commonwealth EPBC Act include:

- Nationally threatened flora species;
- World heritage properties;
- National heritage places;
- Wetlands of international importance (often called 'Ramsar' wetlands after the international treaty under which such wetlands are listed);
- Nationally threatened ecological communities;
- Commonwealth marine area;
- The Great Barrier Reef Marine Park; and
- Nuclear actions (including uranium mining) a water resource, in relation to coal seam gas development and large coal mining development.

No matters of national environmental significance as defined by the Commonwealth EPBC Act were identified within the survey area.

4.4 Matters of State Environmental Significance

4.4.1 Environmental Protection Act WA 1986

The EP Act provides for the prevention, control and abatement of pollution and environmental harm, for the conservation, preservation, protection, enhancement and management of the environment. The Act is administered by The Department of Water and Environment Regulation (DWER), which is the State Government's environmental regulatory agency.

Under Section 51C of the EP Act and the *Environmental Protection (Clearing of Native Vegetation) Regulations (Regulations) WA 2004* any clearing of native vegetation in Western Australia that is not eligible for exemption under Schedule 6 of the *EP Act 1986* or under the Regulations 2004 requires a clearing permit from the DWER or DMIRS. Under Section 51A of the *EP Act 1986* native vegetation includes aquatic and terrestrial vegetation indigenous to Western Australia, and intentionally planted vegetation declared by regulation to be native vegetation, but not vegetation planted in a plantation or planted with commercial intent. Section 51A of the *EP Act 1986* defines clearing as "the killing or destruction of; the removal of; the severing or ringbarking of trunks or stems of; or the doing of substantial damage to some or all of the native vegetation in an area, including the flooding of land, the burning of vegetation, the grazing of stock or an act or activity that results in the above". Exemptions under Schedule 6 of the EP Act and the EP Regulations do not apply in ESAs as declared under Section 51B of the EP Act or TEC listed under State and Commonwealth legislation.

No evidence of the survey area containing any TEC or Threatened flora or fauna was found during the survey period. The survey area is not located within an ESA.

4.4.2 Biodiversity Conservation Act 2016

This Act is used by the Western Australian DBCA for the conservation and protection of biodiversity and biodiversity components in Western Australia and to promote the ecologically sustainable use of biodiversity components in the State. Taxa are classified as 'Threatened" when their populations are geographically restricted or are threatened by local processes (see following sections for Threatened definitions). Under this Act all native flora and fauna are protected throughout the State. Financial penalties are enforced under this Act if threatened species are collected without an appropriate licence.

Under Section 54(1) of the BC Act, habitat is eligible for listing as critical habitat if:

a) it is critical to the survival of a threatened species or a threatened ecological community; and
b) its listing is otherwise in accordance with the ministerial guidelines.

No threatened species or critical habitat listed under the BC Act were recorded within the survey area.

4.5 Native Vegetation Clearing Principles

Based on the outcomes from the survey undertaken, Botanica assessed the results of the desktop and field survey with regards to the native vegetation clearing principles listed under Schedule 5 of the EP Act (Table 4-10). The assessment found that the proposed vegetation clearing activities may be at variance with clearing principle (f).

Table 4-10: Assessment 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 identified within the survey area is not considered to be of high biological diversity and is well represented outside of the survey area. The survey area does not occur within any mapped Priority Ecological Communities (PECs), Threatened Ecological Communities (TECs) or associated buffer zones and does not contain any Banded Ironstone Formations. No Threatened Flora taxa listed under the BC Act and EPBC Act are located within the survey area. No Priority Flora taxa were identified within the survey area.	Clearing is unlikely to be at variance to this principle
(b)	comprises the whole or part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to WA.	No significant fauna were observed within the survey area. No significant fauna habitat was observed within the survey area.	Clearing is unlikely to be at variance to 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 survey area.	Clearing is not at variance to this principle

Letter	Principle	Assessment	Outcome
Native vegetation should not be cleared if it:			
(d)	comprises the whole or part of or is necessary for the maintenance of a threatened ecological community (TEC).	No TEC listed under the EPBC Act or by the BC Act occur within the survey area.	Clearing is not at variance to this principle
(e)	is significant as a remnant of native vegetation in an area that has been extensively cleared	All vegetation associations in the survey area retains >97% of their original pre-European vegetation extent.	Clearing is unlikely to be at variance to this principle
(f)	is growing, in, or in association with, an environment associated with a watercourse or wetland	Multiple minor ephemeral drainage lines intersect the survey area which were mostly associated with vegetation community DD-CF1, which accounts for 2.6% of the survey area.	Clearing may be at variance to this principle
(g)	Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.	The survey area and surrounding region has not been extensively cleared. Clearing within the survey area is not considered likely to lead to land degradation issues such as salinity, water logging or acidic soils.	Clearing is unlikely to be at variance to 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 survey area is not located within a proposed or vested conservation area. The closest conservation area is the Majestic Timber Reserve, which is DBCA-managed land located approximately 1 km north of the survey area. Disturbances within the survey area are unlikely to impact this area.	Clearing may be at variance to 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.	No surface water bodies are located within the survey area. Clearing in ephemeral drainage lines is unlikely to result in significant impacts to water quality.	Clearing is unlikely to be at variance to this principle
(j)	Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding	Rainfall in the Eastern Goldfields subregion has an average rainfall of 200-300mm and an evaporation rate of 2400 mm. Rainfall data for Kalgoorlie-Boulder indicates that rainfall is spread throughout the year and rainfall events are unlikely to result in localised flooding. Clearing within the survey area is not likely to increase the incidence or intensity of flooding within the survey area or surrounds.	Clearing is unlikely to be at variance to this principle

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Appendix 1: Conservation Ratings BC Act and EPBC Act

Definitions of Conservation Significant Species

Code	Category
State categories of threatened and priority species	
Threatened Species (T) 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).	
CR	**Critically Endangered** 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** 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** 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 Listed by order of the Minister as extinct under section 23(1) of the BC Act as extinct or extinct in the wild.	
EX	**Extinct** 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 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.	
IA	**International Agreement/ Migratory** 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*

Code	Category
	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** 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*.
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 1: 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 2: 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 3: 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 4: 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.
Commonwealth categories of threatened species	
EX	**Extinct** Taxa where there is no reasonable doubt that the last member of the species has died.
EW	**Extinct in the Wild**

Code	Category
	Taxa where it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
CR	**Critically Endangered** Taxa that are facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
EN	**Endangered** Taxa which are not critically endangered and is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
VU	**Vulnerable** Taxa which are not critically endangered or endangered and is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
CD	**Conservation Dependent** Taxa which are the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered; or (b) the following subparagraphs are satisfied: (i) the species is a species of fish; (ii) the species is the focus of a plan of management that provides for actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long term survival in nature are maximised; (iii) the plan of management is in force under a law of the Commonwealth or of a State or Territory; (iv) cessation of the plan of management would adversely affect the conservation status of the species.

Definitions of Conservation Significant Communities

Category Code	Category
State categories of Threatened Ecological Communities (TEC)	
PD	**Presumed Totally Destroyed**
	An ecological community will be listed as Presumed Totally Destroyed if there are no recent records of the community being extant and either of the following applies:
	• records within the last 50 years have not been confirmed despite thorough searches or known likely habitats or;
	• all occurrences recorded within the last 50 years have since been destroyed.
CR	**Critically Endangered**
	An ecological community will be listed as Critically Endangered when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future, meeting any one of the following criteria:
	The estimated geographic range and distribution has been reduced by at least 90% and is either continuing to decline with total destruction imminent, or is unlikely to be substantially rehabilitated in the immediate future due to modification;
	The current distribution is limited i.e. highly restricted, having very few small or isolated occurrences, or covering a small area;
	The ecological community is highly modified with potential of being rehabilitated in the immediate future.
EN	**Endangered**
	An ecological community will be listed as Endangered when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future. The ecological community must meet any one of the following criteria:
	The estimated geographic range and distribution has been reduced by at least 70% and is either continuing to decline with total destruction imminent in the short-term future, or is unlikely to be substantially rehabilitated in the short-term future due to modification;
	The current distribution is limited i.e. highly restricted, having very few small or isolated occurrences, or covering a small area;

Category Code	Category
	The ecological community is highly modified with potential of being rehabilitated in the short-term future.
VU	**Vulnerable**
	An ecological community will be listed as Vulnerable when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing high risk of total destruction in the medium to long term future. The ecological community must meet any one of the following criteria:
	The ecological community exists largely as modified occurrences that are likely to be able to be substantially restored or rehabilitated;
	The ecological community may already be modified and would be vulnerable to threatening process, and restricted in range or distribution;
	The ecological community may be widespread but has potential to move to a higher threat category due to existing or impending threatening processes.
Commonwealth categories of Threatened Ecological Communities (TEC)	
CE	**Critically Endangered** If, at that time, an ecological community is facing an extremely high risk of extinction in the wild in the immediate future (indicative timeframe being the next 10 years).
EN	**Endangered** If, at that time, an ecological community is not critically endangered but is facing a very high risk of extinction in the wild in the near future (indicative timeframe being the next 20 years).
VU	**Vulnerable** If, at that time, an ecological community is not critically endangered or endangered, but is facing a high risk of extinction in the wild in the medium–term future (indicative timeframe being the next 50 years).
Priority Ecological Communities (PEC)	
P1	**Poorly-known ecological communities**
	Ecological communities with apparently few, small occurrences, all or most not actively managed for conservation (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) and for which current threats exist.
P2	**Poorly-known ecological communities**
	Communities that are known from few small occurrences, all or most of which are actively managed for conservation (e.g. within national parks, conservation parks, nature reserves, State forest, un-allocated Crown land, water reserves, etc.) and not under imminent threat of destruction or degradation.
P3	**Poorly known ecological communities**
	Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or:
	Communities known from a few widespread occurrences, which are either large or within significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or;
	Communities made up of large, and/or widespread occurrences, that may or not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing and inappropriate fire regimes.
P4	**Ecological communities that are adequately known, rare but not threatened** or meet criteria for near threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.
P5	**Conservation Dependent ecological communities**
	Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

Appendix 2: Potentially Occurring Introduced (Weed) Flora Species

Family	Taxon	Common Name	WAOL Status	Control Category	WONS
Aizoaceae	*Mesembryanthemum crystallinum*	Iceplant	Permitted - s11	No Control Category	No
	Mesembryanthemum nodiflorum	Slender Iceplant	Permitted - s11	No Control Category	No
Asteraceae	*Carduus tenuiflorus*	Winged Slender Thistle	Permitted - s11	No Control Category	No
	Carthamus lanatus	Saffron Thistle	Permitted - s11	No Control Category	No
	Centaurea melitensis	Maltese Cockspur, Malta Thistle	Permitted - s11	No Control Category	No
	Gazania linearis		Permitted - s11	No Control Category	No
	Leontodon rhagadioloides		Permitted - s11	No Control Category	No
	Monoculus monstrosus		Permitted - s11	No Control Category	No
	Oligocarpus calendulaceus		Permitted - s11	No Control Category	No
	Oncosiphon suffruticosum	Calomba Daisy	Permitted - s11	No Control Category	No
	Sonchus oleraceus	Common Sowthistle	Permitted - s11	No Control Category	No
	Symphyotrichum squamatum	Bushy Starwort	Permitted - s11	No Control Category	No
	Dittrichia graveolens	Stinkwort	Permitted - s12	No Control Category	No
Boraginaceae	*Echium plantagineum*	Paterson's Curse	Declared Pest - s22(2)	No Control Category, Whole of State	No
	Heliotropium europaeum	Common Heliotrope	Permitted - s11	No Control Category	No
	Heliotropium supinum	Prostrate Heliotrope	Permitted - s11	No Control Category	No
Brassicaceae	*Alyssum linifolium*	Flax-leaf Alyssum	Permitted - s11	No Control Category	No
	Carrichtera annua	Ward's Weed	Permitted - s11	No Control Category	No
	Lepidium africanum	Rubble Peppercress	Permitted - s11	No Control Category	No
	Sisymbrium erysimoides	Smooth Mustard	Permitted - s11	No Control Category	No
	Sisymbrium irio	London Rocket	Permitted - s11	No Control Category	No
	Sisymbrium orientale	Indian Hedge Mustard	Permitted - s11	No Control Category	No
Cactaceae	*Cylindropuntia fulgida var. mamillata*		Declared Pest - s22(2)	C3 Management, Whole of State	Yes
Chenopodiaceae	*Chenopodium album*	Fat Hen	Permitted - s11	No Control Category	No
Crassulaceae	*Bryophyllum delagoense*		Permitted - s11	No Control Category	No
Cucurbitaceae	*Citrullus colocynthis*		Permitted - s11	No Control Category	No

Family	Taxon	Common Name	WAOL Status	Control Category	WONS
Fabaceae	*Medicago polymorpha*	Burr Medic	Permitted - s11	No Control Category	No
Geraniaceae	*Erodium cicutarium*	Common Storksbill	Permitted - s11	No Control Category	No
Lamiaceae	*Salvia verbenaca*	Wild Sage	Permitted - s11	No Control Category	No
Martyniaceae	*Proboscidea louisianica*	Purple Flower Devil's Claw	Permitted - s11	No Control Category	No
Papaveraceae	*Argemone ochroleuca* subsp. *ochroleuca*		Permitted - s11	No Control Category	No
Poaceae	*Bromus diandrus*	Great Brome	Permitted - s11	No Control Category	No
	Cenchrus ciliaris	Buffel Grass	Permitted - s11	No Control Category	No
	Cenchrus setaceus	Fountain Grass	Permitted - s11	No Control Category	No
	Hordeum glaucum	Northern Barley Grass	Permitted - s11	No Control Category	No
Polygonaceae	*Rumex vesicarius*	Ruby Dock	Permitted - s11	No Control Category	No
Primulaceae	*Lysimachia arvensis*	Pimpernel	Permitted - s11	No Control Category	No
Resedaceae	*Reseda luteola*	Wild Mingnonette	Permitted - s11	No Control Category	No
Solanaceae	*Nicotiana glauca*	Tree Tobacco	Permitted - s11	No Control Category	No
	Lycium ferocissimum	African Boxthorn	Permitted - s11	No Control Category	Yes
	Solanum nigrum	Deadly Nightshade	Permitted - s13	No Control Category	No
Verbenaceae	*Lantana camara*	Common Lantana	Declared Pest - s22(2)	C3 Management, Whole of State	Yes

Appendix 3: Significant Flora Likelihood Assessment

Taxon	Conservation Status	Habitat	Comments	Likelihood
Austrostipa sp. Carlingup Road (S. Kern & R. Jasper LCH 18459)	P1	Rocky basalt hillslopes and crests.	Widespread but sparse records, habitat unlikely to be present.	Unlikely
Calandrinia lefroyensis		Red sandy loam soil. Saline flats, edge of salt lakes.	Outside known range, potential habitat likely marginal.	Unlikely
Cyathostemon divaricatus		Rocky hillslope. Red loam over laterite.	Outside known range, habitat unlikely to occur.	Unlikely
Eremophila arachnoides subsp. *tenera*		Flat calcareous plain.	Records within 5 km, habitat likely to be present.	Likely
Eremophila xantholaema		-	Occurs within regional context.	Possible
Eucalyptus websteriana subsp. *norsemanica*		Rocky rises.	Outside known range.	Unlikely
Ptilotus rigidus		Quartz and ironstone hillsides, outcrops. Near salt lakes.	Outside known range, habitat unlikely to occur.	Unlikely
Ricinocarpos digynus		Rocky hillslopes.	Outside known range, potential habitat likely marginal.	Unlikely
Tecticornia flabelliformis		Clay. Saline flats.	Outside known range, habitat unlikely to occur.	Unlikely
Eremophila praecox	P2	Red/brown sandy loam. Undulating plains.	Potential habitat may be present, occurs within regional context.	Possible
Melaleuca coccinea	P3	Sandy loam over granite. Granite outcrops, sandplain, river valleys.	Outside known range, habitat unlikely to occur.	Unlikely
Styphelia rectiloba		Granite outcrops and breakaways.	Outside known range, habitat unlikely to occur.	Unlikely
Eucalyptus kruseana	P4	Sandy loam. Granite outcrops & hills.	Outside known range, habitat unlikely to occur.	Unlikely
Eucalyptus x brachyphylla		Sandy loam. Granite outcrops.	Regional records, potential habitat may be present.	Possible
Sowerbaea multicaulis		Yellow-brown sand.	Outside known range, habitat unlikely to occur.	Unlikely

Appendix 4: Significant Fauna Likelihood Assessment

Taxon	Conservation Status			Habitat Description	Assessment	Likelihood
	EPBC Act	BC Act	DBCA Priority			
Night Parrot *Pezoporus occidentalis*	EN	CR	-	Most habitat records are of Triodia (Spinifex) grasslands and/or chenopod shrublands in the arid and semi-arid zones, or *Astrebla* spp. (Mitchell grass), shrubby samphire and chenopod associations, scattered trees and shrubs, *Acacia aneura* (Mulga) woodland, treeless areas and bare gibber are associated with sightings of the species. Roosting and nesting sites are consistently reported as within clumps of dense vegetation, primarily old and large Spinifex (*Triodia*) clumps, but sometimes other vegetation types (DAWE, 2020b).	Would not occur. Very marginal habitat.	Would Not Occur
Grey Falcon *Falco hypoleucos*	VU	VU	-	The Grey Falcon occurs at low densities across inland Australia. The species frequents timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined water courses. The species has been observed hunting in treeless areas and frequents tussock grassland and open woodland, especially in winter. While breeding Grey Falcons feed almost exclusively on birds. Prey species include doves, pigeons, small parrots and cockatoos and finches, but a variety of other bird prey species has been recorded. Nonavian prey recorded by direct observation include small mammals and lizards.	Possibly Occurs. Survey area may form part of larger home range.	Possible
Malleefowl *Leipoa ocellata*	VU	VU	-	Scrublands and woodlands dominated by mallee and wattle species (DAWE, 2020b).	Possibly Occurs. Habitat likely marginal and unsuitable for breeding. Occasional transients only.	Possible
Fork-tailed Swift *Apus pacificus*	MI	MI	-	Low to very high airspace over varied habitat from rainforest to semi desert (Birdlife Australia, 2019).	Unlikely to occur. Very occasional transients only.	Unlikely
Migratory Shorebirds (Various species)	IA/MI	IA/MI	P3-P4	Prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline salt lakes inland (DAWE, 2020b).	Habitat would not be present.	Would Not Occur
Grey Wagtail *Motacilla cinerea*	MI	MI	-	Running water in disused quarries, sandy, rocky streams in escarpments and rainforest, sewerage ponds, ploughed fields and airfields (Morecombe 2004).	Would Not Occur. No suitable habitat.	Would Not Occur

Taxon	Conservation Status			Habitat Description	Assessment	Likelihood
	EPBC Act	BC Act	DBCA Priority			
Thick-billed Grasswren (Western) *Amytornis textilis* subsp. *textilis*	-	-	P4	The western subspecies of the Thick-billed Grasswren occurs in semi-arid shrubland on coastal dunes, plains and drainage lines. In non-coastal areas, it occurs in fire-affected shrublands dominated by Ptilotus obovatus and Solanum orbiculatum following uncontrolled fires, low shrublands on calcareous sandplains, dominated by Acacia spp., Exocarpos spp., and other shrubs such as Thryptomene spp., and Ptilotus spp., mixed with hummocks of spinifex Triodia spp., and sometimes with Atriplex spp., and in dense thickets of Muehlenbeckia cunninghamii, Atriplex spp. and Eremophila spp. growing in drainage lines.	Potential habitat unlikely to occur or, if present, to represent critical habitat.	Unlikely
Chuditch, Western Quoll *Dasyurus geoffroii*	VU	VU	-	Previously occurred throughout arid and semi-arid Australia but is now restricted to south-west Western Australia. (DAWE, 2020b).	Unlikely to Occur. Considered to be locally extinct.	Unlikely
Western Spiny-tailed Skink *Egernia stokesii* subsp. *badia*	EN	EN	-	The Western Spiny-tailed Skink is known to occur in a broad semi-arid area in south-west WA, between Shark Bay and Minnivale and east to Cue. Most records of the brown form Western Spiny-tailed Skink are in York Gum (Eucalyptus loxophleba) woodland with some records in Gimlet (E. salubris) and Salmon Gum (E. salmonophloia) woodland. Populations persist in woodland patches as small as one hectare and completely surrounded by wheatfields. Sites with the greatest number of individuals contain numerous fallen logs and were subjected to low-intensity grazing by domestic stock. Hollow logs are used as refuge sites in woodland habitat . Preferred refuges consist of piles of several, overlapping, hollow logs providing a combination of basking and shelter sites. An increasing number of skinks are being located in altered habitat under piles of wood, scrap metal or under buildings on private property (SPRAT, 2020).	Potential habitat may occur, but likely to be considered marginal. Not widely recorded in region.	Unlikely

Appendix 5: List of species identified within each vegetation type

(A) blue text-denotes annual taxa; (W) green text-denotes introduced taxa (WAHERB, 2021)

Family	Taxon	DD-CF1	CLP-EW1	CLP-EW2	RS-EW1	RS-EW2
Amaranthaceae	*Ptilotus exaltatus (A)*		*			
	Ptilotus helichrysoides					*
	Ptilotus obovatus	*	*	*		
Asteraceae	*Centaurea melitensis (W)*	*				
	Dittrichia graveolens (W)	*				
	Olearia muelleri				*	*
	Oligocarpus calendulaceus (W)	*				
Boraginaceae	*Halgania andromedifolia*				*	
Casuarinaceae	*Casuarina pauper*	*	*		*	
Chenopodiaceae	*Atriplex codonocarpa (A)*				*	
	Atriplex nummularia		*		*	
	Dissocarpus paradoxus					
	Enchylaena tomentosa		*			
	Eriochiton sclerolaenoides		*		*	
	Maireana georgei		*	*		
	Maireana oppositifolia		*			
	Maireana pentatropis				*	
	Maireana pyramidata		*		*	
	Maireana sedifolia		*		*	
	Maireana triptera	*	*	*	*	
	Melaleuca sheathiana		*		*	*
	Rhagodia eremaea		*			
	Salsola australis (A)				*	
	Sclerolaena diacantha		*		*	
	Sclerolaena eriacantha		*			
	Sclerolaena parvifolia		*		*	
	Tecticornia disarticulata				*	
Fabaceae	*Acacia sp. narrow phyllode*				*	*
	Acacia tetragonophylla	*				
	Senna artemisioides subsp. *filifolia*	*	*		*	
	Swainsona canescens				*	
Geraniaceae	*Erodium crinitum*					
Goodeniaceae	*Scaevola spinescens*					*
Lamiaceae	*Salvia verbenaca (W)*	*				
Malvaceae	*Sida calyxhymenia*					
Myrtaceae	*Eucalyptus celastroides*			*	*	*
	Eucalyptus ewartiana					
	Eucalyptus gracilis	*				
	Eucalyptus griffithsii		*			
	Eucalyptus lesouefii		*		*	
	Eucalyptus ravida			*	*	
	Eucalyptus salmonophloia			*	*	
	Eucalyptus salubris	*			*	
	Eucalyptus stricklandii				*	*
	Eucalyptus transcontinentalis				*	
Nitrariaceae	*Nitraria billardierei*				*	
Pittosporaceae	*Pittosporum angustifolium*	*			*	

Family	Taxon	DD-CF1	CLP-EW1	CLP-EW2	RS-EW1	RS-EW2
Poaceae	*Austrostipa nitida*		*			
	Grevillea nematophylla					*
Santalaceae	*Exocarpos aphyllus*	*			*	*
	Santalum acuminatum			*		*
	Santalum spicatum	*				*
Sapindaceae	*Alectryon oleifolius*					
	Dodonaea lobulata		*			
	Dodonaea microzyga					
Scrophulariaceae	*Eremophila alternifolia*	*				
	Eremophila angustifolia		*	*	*	
	Eremophila clarkei					
	Eremophila decipiens	*				
	Eremophila glabra				*	
	Eremophila interstans		*	*	*	
	Eremophila scoparia		*	*	*	
Solanaceae	*Lycium australis*				*	
	Nicotiana glauca (W)			*		
	Solanum nigrum (W)	*				
	Solanum lasiophyllum					
Zygophyllaceae	*Roepera eremaea (A)*		*			

Appendix 6: Vegetation Condition Rating

Vegetation Condition Rating	South West and Interzone Botanical Provinces	Eremaean and Northern Botanical Provinces
Pristine	Pristine or nearly so, no obvious signs of disturbance or damage caused by human activities since European settlement.	N/A
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very Good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor	N/A	Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely Degraded	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 and shrubs.	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e., areas that are cleared or ‘parkland cleared’ with their flora comprising weed or crop species with isolated native trees or shrubs.

Appendix 7: NatureMap Species List (40km buffer)

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report

Created By Guest user on 24/11/2020

Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 121° 54' 13" E,30° 57' 50" S
Buffer 40km
Group By Family

Family	Species	Records
Acanthizidae	7	302
Acarosporaceae	3	3
Accipitridae	4	25
Aegothelidae	1	12
Agamidae	9	71
Agaricaceae	1	1
Aizoaceae	5	6
Amaranthaceae	6	11
Anatidae	9	67
Apocynaceae	2	3
Araneidae	1	2
Ardeidae	1	1
Artamidae	3	30
Asparagaceae	1	1
Asphodelaceae	1	4
Asteraceae	36	62
Boidae	1	3
Boraginaceae	6	8
Bothriuridae	1	3
Bovidae	2	3
Branchipodidae	1	1
Brassicaceae	10	15
Burramyidae	1	32
Buthidae	1	6
Cacatuidae	1	4
Cactaceae	1	2
Campephagidae	2	31
Caprimulgidae	1	3
Carphodactylidae	1	2
Caryophyllaceae	1	1
Casuariidae	1	31
Casuarinaceae	2	9
Celastraceae	1	1
Centropagidae	1	1
Charadriidae	4	8
Chenopodiaceae	43	129
Cladoniaceae	1	1
Colchicaceae	1	1
Collemataceae	2	5
Columbidae	4	43
Convolvulaceae	2	2
Corvidae	2	82
Cracticidae	4	140
Crassulaceae	1	2
Cuculidae	3	7
Cucurbitaceae	1	1
Cupressaceae	1	2
Cyperaceae	2	2
Daphniidae	1	6
Dasyuridae	7	134
Dicaeidae	1	6
Dicruridae	3	44
Dilleniaceae	1	1
Diplodactylidae	7	155
Elapidae	13	83
Estrilidae	1	6
Euphorbiaceae	5	5
Fabaceae	41	68
Falconidae	3	26
Felidae	1	3
Frankeniaceae	7	10
Garypidae	3	7
Gekkonidae	4	138
Geraniaceae	2	3
Goodeniaceae	6	7
Graphidaceae	3	6
Gyrostemonaceae	1	1
Halcyonidae	1	4
Haloragaceae	4	6
Hirundinidae	4	44
Icmadophilaceae	1	1
Idiopidae	1	1
Lamiaceae	7	11
Lamponidae	1	1
Leporidae	1	18
Limnodynastidae	2	20
Loranthaceae	3	9

Lycosidae	5	43
Macropodidae	1	12
Maluridae	4	64
Malvaceae	10	18
Martyniaceae	1	1
Megalosporaceae	2	5
Megapodiidae	1	14
Meliphagidae	10	530
Meropidae	1	22
Molluginaceae	1	1
Montiaceae	3	4
Muridae	3	161
Myrtaceae	33	129
Nemesiidae	2	3
Neosittidae	1	3
Nicodamidae	1	2
Orchidaceae	1	1
Pachycephalidae	4	148
Papaveraceae	1	1
Pardalotidae	3	107
Parmeliaceae	23	37
Petroicidae	5	52
Phalacrocoracidae	3	8
Phasianidae	1	2
Physciaceae	1	1
Pittosporaceae	1	3
Plantaginaceae	1	4
Poaceae	21	25
Podargidae	1	5
Podicipedidae	2	18
Polygonaceae	2	4
Pomatostomidae	1	25
Pottiaceae	1	1
Primulaceae	1	2
Proteaceae	7	12
Psittacidae	3	57
Psoraceae	2	8
Pteridaceae	1	1
Pygopodidae	4	14
Rallidae	2	7
Recurvirostridae	2	6
Resedaceae	1	1
Rhamnaceae	2	2
Ruppiaceae	1	1
Rutaceae	1	1
Salticidae	1	1
Santalaceae	2	3
Sapindaceae	4	12
Scincidae	24	235
Scolopacidae	3	3
Scolopendridae	2	7
Scrophulariaceae	25	63
Scutigeridae	1	1
Solanaceae	8	11
Sparassidae	1	1
Tachyglossidae	1	5
Teloschistaceae	3	4
Theridiidae	1	2
Thymelaeaceae	1	1
Triopsidae	1	4
Trochanteriidae	1	1
Turnicidae	1	1
Typhaceae	1	1
Urodacidae	1	14
Ustilaginaceae	1	1
Varanidae	2	17
Verbenaceae	1	1
Vespertilionidae	7	23
Violaceae	1	1
Zosteropidae	1	2
Zygophyllaceae	3	3
TOTAL	**607**	**3990**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Acanthizidae					
1.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
2.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
3.	24264	*Acanthiza robustirostris (Slaty-backed Thornbill)*			
4.	24265	*Acanthiza uropygialis (Chestnut-rumped Thornbill)*			
5.	25528	*Aphelocephala leucopsis (Southern Whiteface)*			
6.	24278	*Pyrrholaemus brunneus (Redthroat)*			
7.	30948	*Smicrornis brevirostris (Weebill)*			
Acarosporaceae					
8.	27574	*Acarospora citrina*			
9.	27576	*Acarospora nodulosa*			
10.	28195	*Acarospora nodulosa var. reagens*			
Accipitridae					
11.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
12.	25536	*Accipiter fasciatus (Brown Goshawk)*			
13.	24285	*Aquila audax (Wedge-tailed Eagle)*			
14.		*Elanus axillaris*			
Aegothelidae					
15.	25544	*Aegotheles cristatus (Australian Owlet-nightjar)*			
Agamidae					
16.	25458	*Ctenophorus caudicinctus (Ring-tailed Dragon)*			
17.	24871	*Ctenophorus cristatus (Bicycle Dragon)*			
18.	24873	*Ctenophorus fordi (Mallee Sand Dragon)*			
19.	24886	*Ctenophorus reticulatus (Western Netted Dragon)*			
20.	24888	*Ctenophorus salinarum (Salt Pan Dragon)*			
21.	24904	*Moloch horridus (Thorny Devil)*			
22.	25510	*Pogona minor (Dwarf Bearded Dragon)*			
23.	24907	*Pogona minor subsp. minor (Dwarf Bearded Dragon)*			
24.	30814	*Tympanocryptis cephalus (Pebble Dragon)*			
Agaricaceae					
25.	38765	*Battarrea stevenii*			
Aizoaceae					
26.	11681	*Disphyma crassifolium subsp. clavellatum*			
27.	2807	*Gunniopsis quadrifida (Sturts Pigface)*			
28.	2813	*Mesembryanthemum crystallinum (Iceplant)*	Y		
29.	2814	*Mesembryanthemum nodiflorum (Slender Iceplant)*	Y		
30.	2822	*Tetragonia eremaea*			
Amaranthaceae					
31.	2707	*Ptilotus carlsonii*			
32.	2721	*Ptilotus exaltatus (Tall Mulla Mulla)*			
33.	2732	*Ptilotus holosericeus*			
34.	2747	*Ptilotus obovatus (Cotton Bush)*			
35.	31252	*Ptilotus rigidus*		P1	
36.	43203	*Surreya diandra*			
Anatidae					
37.	24312	*Anas gracilis (Grey Teal)*			
38.	24315	*Anas rhynchotis (Australasian Shoveler)*			
39.	24316	*Anas superciliosa (Pacific Black Duck)*			
40.	24318	*Aythya australis (Hardhead)*			
41.	24319	*Biziura lobata (Musk Duck)*			
42.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
43.	24322	*Cygnus atratus (Black Swan)*			
44.	24326	*Malacorhynchus membranaceus (Pink-eared Duck)*			
45.	24331	*Tadorna tadornoides (Australian Shelduck, Mountain Duck)*			
Apocynaceae					
46.	12949	*Marsdenia australis*			
47.	48986	*Vincetoxicum lineare*			
Araneidae					
48.		*Araneus senicaudatus*			
Ardeidae					
49.		*Egretta novaehollandiae*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Artamidae					
50.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
51.	24353	*Artamus cyanopterus (Dusky Woodswallow)*			
52.	24356	*Artamus personatus (Masked Woodswallow)*			
Asparagaceae					
53.	1338	*Thysanotus manglesianus (Fringed Lily)*			
Asphodelaceae					
54.	1366	*Bulbine semibarbata (Leek Lily)*			
Asteraceae					
55.	7836	*Angianthus tomentosus (Camel-grass)*			
56.	7846	*Asteridea athrixioides*			
57.	7847	*Asteridea chaetopoda*			
58.	7880	*Brachyscome lineariloba*			
59.	7905	*Calotis multicaulis (Many-stemmed Burr-daisy)*			
60.	7910	*Carduus tenuiflorus (Slender Thistle, Winged Slender Thistle, Sheep Thistle)*	Y		
61.	7911	*Carthamus lanatus (Saffron Thistle)*	Y		
62.	7916	*Centaurea melitensis (Maltese Cockspur, Malta Thistle)*	Y		
63.	7922	*Cephalipterum drummondii (Pompom Head)*			
64.	7949	*Cratystylis conocephala (Greybush)*			
65.	7950	*Cratystylis microphylla (Small-leaved Grey Bush)*			
66.	7951	*Cratystylis subspinescens (Australian Sage, Spiny Grey Bush)*			
67.	12720	*Erymophyllum glossanthus*			
68.	16311	*Gazania linearis*	Y		
69.	12743	*Hyalosperma glutinosum*			
70.	15447	*Hyalosperma glutinosum subsp. glutinosum*			
71.	8087	*Isoetopsis graminifolia (Cushion Grass)*			
72.	12628	*Lemooria burkittii*			
73.	44490	*Leontodon rhagadioloides*	Y		
74.	8107	*Minuria cunninghamii (Bush Minuria)*			
75.	29418	*Monoculus monstrosus*	Y		
76.	8140	*Olearia muelleri (Goldfields Daisy)*			
77.	19828	*Oligocarpus calendulaceus*	Y		
78.	20661	*Oncosiphon suffruticosum (Calomba Daisy)*	Y		
79.	8173	*Podolepis capillaris (Wiry Podolepis)*			
80.	8192	*Pterocaulon sphacelatum (Apple Bush, Fruit Salad Plant)*			
81.	13241	*Rhodanthe chlorocephala subsp. rosea*			
82.	13301	*Rhodanthe floribunda*			
83.	13254	*Rhodanthe stricta*			
84.	8200	*Schoenia cassiniana (Schoenia)*			
85.	8207	*Senecio glossanthus (Slender Groundsel)*			
86.	25881	*Senecio lacustrinus*			
87.	8231	*Sonchus oleraceus (Common Sowthistle)*	Y		
88.	8238	*Streptoglossa liatroides*			
89.	25902	*Symphyotrichum squamatum (Bushy Starwort)*	Y		
90.	12652	*Trichanthodium skirrophorum*			
Boidae					
91.	25240	*Morelia spilota subsp. imbricata (Carpet Python)*			
Boraginaceae					
92.	6681	*Echium plantagineum (Paterson's Curse)*	Y		
93.	29840	*Halgania cyanea var. Allambi Stn (B.W. Strong 676)*			
94.	31117	*Halgania cyanea var. Charleville (R.W. Purdie +111)*			
95.	6707	*Heliotropium curassavicum (Smooth Heliotrope)*			
96.	6710	*Heliotropium europaeum (Common Heliotrope)*	Y		
97.	6717	*Heliotropium supinum (Prostrate Heliotrope)*	Y		Y
Bothriuridae					
98.		*Cercophonius michaelseni*			
Bovidae					
99.	24251	*Bos taurus (European Cattle)*	Y		
100.	24253	*Capra hircus (Goat)*	Y		
Branchipodidae					
101.		*Parartemia veronicae*			Y
Brassicaceae					
102.	2990	*Alyssum linifolium (Flax-leaf Alyssum)*	Y		
103.	2992	*Arabidella trisecta*			
104.	3008	*Carrichtera annua (Ward's Weed)*	Y		
105.	3018	*Lepidium africanum (Rubble Peppercress)*			

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			Y		
106.	3033	*Lepidium oxytrichum*			
107.	3069	*Sisymbrium erysimoides (Smooth Mustard)*	Y		
108.	3070	*Sisymbrium irio (London Rocket)*	Y		
109.	3072	*Sisymbrium orientale (Indian Hedge Mustard)*	Y		
110.	3076	*Stenopetalum filifolium*			
111.	3079	*Stenopetalum pedicellare*			
Burramyidae					
112.	24086	*Cercartetus concinnus (Western Pygmy-possum, Mundarda)*			
Buthidae					
113.		*Isometroides vescus*			
Cacatuidae					
114.		*Eolophus roseicapillus*			
Cactaceae					
115.	20759	*Cylindropuntia fulgida var. mamillata*	Y		
Campephagidae					
116.	24361	*Coracina maxima (Ground Cuckoo-shrike)*			
117.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
Caprimulgidae					
118.	24368	*Eurostopodus argus (Spotted Nightjar)*			
Carphodactylidae					
119.	24966	*Nephrurus laevissimus*			
Caryophyllaceae					
120.	8900	*Spergularia marina*			
Casuariidae					
121.	24470	*Dromaius novaehollandiae (Emu)*			
Casuarinaceae					
122.	1730	*Allocasuarina helmsii*			
123.	12658	*Casuarina pauper (Black Oak)*			
Celastraceae					
124.	29813	*Stackhousia sp. Mt Keith (G. Cockerton & G. O'Keefe 11017)*			
Centropagidae					
125.		*Calamoecia sp.*			
Charadriidae					
126.	47937	*Elseyornis melanops (Black-fronted Dotterel)*			
127.	24379	*Erythrogonys cinctus (Red-kneed Dotterel)*			
128.	48135	*Thinornis rubricollis (Hooded Plover, Hooded Dotterel)*		P4	
129.	24386	*Vanellus tricolor (Banded Lapwing)*			
Chenopodiaceae					
130.	2449	*Atriplex acutibractea (Toothed Saltbush)*			
131.	11435	*Atriplex acutibractea subsp. acutibractea*			
132.	2450	*Atriplex amnicola (Swamp Saltbush)*			
133.	2453	*Atriplex codonocarpa (Flat-topped Saltbush)*			
134.	2455	*Atriplex eardleyae*			
135.	2459	*Atriplex holocarpa (Pop Saltbush)*			
136.	2468	*Atriplex nana*			
137.	11516	*Atriplex nummularia subsp. spathulata (Old Man Saltbush)*			
138.	2475	*Atriplex semibaccata (Berry Saltbush)*			
139.	2479	*Atriplex stipitata (Mallee Saltbush)*			
140.	2481	*Atriplex vesicaria (Bladder Saltbush)*			
141.	2483	*Chenopodium album (Fat Hen)*	Y		
142.	2487	*Chenopodium curvispicatum*			
143.	2498	*Didymanthus roei*			
144.	2502	*Dysphania kalpari (Rat's Tail, Kalpari)*			
145.	2514	*Eriochiton sclerolaenoides (Woolly Bindii)*			
146.	2533	*Maireana amoena*			
147.	2535	*Maireana appressa*			
148.	2542	*Maireana erioclada*			
149.	2545	*Maireana glomerifolia (Ball Leaf Bluebush)*			
150.	2553	*Maireana oppositifolia*			
151.	2555	*Maireana pentatropis*			
152.	2557	*Maireana platycarpa (Shy Bluebush)*			
153.	2568	*Maireana trichoptera (Downy Bluebush)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
154.	2581	*Rhagodia drummondii*			
155.	2599	*Sclerolaena brevifolia*			
156.	2609	*Sclerolaena diacantha (Grey Copperburr)*			
157.	2610	*Sclerolaena drummondii*			
158.	2612	*Sclerolaena eurotioides (Fluffy Bindii)*			
159.	2625	*Sclerolaena obliquicuspis (Limestone Bindii)*			
160.	2641	*Tecticornia arborea (Bulli Bulli)*			
161.	31719	*Tecticornia chartacea*			
162.	31492	*Tecticornia disarticulata*			
163.	46513	*Tecticornia doliiformis*			
164.	31834	*Tecticornia flabelliformis*		P1	
165.	33319	*Tecticornia indica subsp. bidens*			
166.	31674	*Tecticornia peltata*			
167.	33297	*Tecticornia pergranulata subsp. pergranulata (Blackseed Samphire)*			
168.	31618	*Tecticornia pruinosa*			
169.	33218	*Tecticornia pterygosperma subsp. pterygosperma*			
170.	31716	*Tecticornia syncarpa*			
171.	31494	*Tecticornia triandra (Desert Glasswort)*			
172.	31717	*Tecticornia undulata*			
Cladoniaceae					
173.	48176	*Cladia beaugleholei*			
Colchicaceae					
174.	1403	*Wurmbea tenella (Eight Nancy)*			
Collemataceae					
175.	27703	*Collema coccophorum*			
176.	48194	*Collema novozelandicum*			
Columbidae					
177.	24399	*Columba livia (Domestic Pigeon)*	Y		
178.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
179.	24409	*Phaps chalcoptera (Common Bronzewing)*			
180.	25590	*Streptopelia senegalensis (Laughing Turtle-Dove)*	Y		
Convolvulaceae					
181.	6614	*Convolvulus remotus*			
182.	6659	*Wilsonia humilis (Silky Wilsonia)*			
Corvidae					
183.	24416	*Corvus bennetti (Little Crow)*			
184.	25592	*Corvus coronoides (Australian Raven)*			
Cracticidae					
185.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
186.	25595	*Cracticus tibicen (Australian Magpie)*			
187.	25596	*Cracticus torquatus (Grey Butcherbird)*			
188.	25597	*Strepera versicolor (Grey Currawong)*			
Crassulaceae					
189.	19376	*Bryophyllum delagoense*	Y		
Cuculidae					
190.	25598	*Cacomantis flabelliformis (Fan-tailed Cuckoo)*			
191.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
192.	24431	*Chrysococcyx basalis (Horsfield's Bronze Cuckoo)*			
Cucurbitaceae					
193.	7369	*Citrullus colocynthis*	Y		
Cupressaceae					
194.	8466	*Callitris columellaris (White Cypress Pine)*			
Cyperaceae					
195.	765	*Chrysitrix distigmatosa*			
196.	34969	*Eleocharis acutangula*			Y
Daphniidae					
197.		*Daphnia carinata*			
Dasyuridae					
198.	24092	*Dasyurus geoffroii (Chuditch, Western Quoll)*		T	
199.	24094	*Ningaui ridei (Wongai Ningaui)*			
200.	24108	*Sminthopsis crassicaudata (Fat-tailed Dunnart)*			
201.	24109	*Sminthopsis dolichura (Little long-tailed Dunnart)*			
202.	24111	*Sminthopsis gilberti (Gilbert's Dunnart)*			

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203.		*Sminthopsis murina*			
204.	24117	*Sminthopsis ooldea (Ooldea Dunnart)*			
Dicaeidae					
205.	25607	*Dicaeum hirundinaceum (Mistletoebird)*			
Dicruridae					
206.	24443	*Grallina cyanoleuca (Magpie-lark)*			
207.	48096	*Rhipidura albiscapa (Grey Fantail)*			
208.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
Dilleniaceae					
209.	19692	*Hibbertia ancistrophylla*			
Diplodactylidae					
210.	24918	*Crenadactylus ocellatus subsp. ocellatus (Clawless Gecko)*			
211.	25469	*Diplodactylus granariensis*			
212.	24940	*Diplodactylus pulcher*			
213.	30938	*Lucasium damaeum*			
214.	30935	*Lucasium maini*			
215.	24982	*Rhynchoedura ornata (Western Beaked Gecko)*			
216.	24923	*Strophurus assimilis (Goldfields Spiny-tailed Gecko)*			
Elapidae					
217.	25247	*Demansia psammophis subsp. psammophis (Yellow-faced Whipsnake)*			
218.	25251	*Echiopsis curta (Bardick)*			
219.	25301	*Furina ornata (Moon Snake)*			
220.	25248	*Neelaps bimaculatus (Black-naped Snake)*			
221.	25253	*Parasuta gouldii*			
222.	25254	*Parasuta monachus*			
223.	25261	*Pseudechis australis (Mulga Snake)*			
224.	25259	*Pseudonaja affinis subsp. affinis (Dugite)*			
225.	42416	*Pseudonaja mengdeni (Western Brown Snake)*			
226.	25263	*Pseudonaja modesta (Ringed Brown Snake)*			
227.	25264	*Pseudonaja nuchalis (Gwardar, Northern Brown Snake)*			
228.	25266	*Simoselaps bertholdi (Jan's Banded Snake)*			
229.	25269	*Suta fasciata (Rosen's Snake)*			
Estrilidae					
230.	30870	*Taeniopygia guttata (Zebra Finch)*			
Euphorbiaceae					
231.	4598	*Beyeria lechenaultii (Pale Turpentine Bush)*			
232.	4626	*Euphorbia drummondii (Caustic Weed, Piwi)*			
233.	12097	*Euphorbia tannensis subsp. eremophila (Desert Spurge)*			
234.	19587	*Monotaxis grandiflora var. obtusifolia*			
235.	45075	*Ricinocarpos sp. Eastern Goldfields (A. Williams 3)*		P1	
Fabaceae					
236.	3200	*Acacia acuminata (Jam, Mangard)*			
237.	3217	*Acacia aneura (Mulga, Wanari)*			
238.	37260	*Acacia aptaneura*			
239.	3248	*Acacia burkittii (Sandhill Wattle)*			
240.	44514	*Acacia collegialis*			
241.	16120	*Acacia donaldsonii*			
242.	3324	*Acacia erinacea*			
243.	3366	*Acacia hemiteles*			
244.	16164	*Acacia inceana subsp. inceana*			
245.	3393	*Acacia jennerae*			
246.	14610	*Acacia kalgoorliensis*			
247.	13503	*Acacia masliniana*			
248.	36416	*Acacia mulganeura*			
249.	3452	*Acacia murrayana (Sandplain Wattle)*			
250.	3463	*Acacia nyssophylla*			
251.	3473	*Acacia oswaldii (Miljee, Nelia)*			
252.	3495	*Acacia prainii (Prain's Wattle)*			
253.	16145	*Acacia resinosa*			
254.		*Acacia sp.*			
255.	3599	*Acacia warramaba*			
256.	16157	*Acacia xerophila var. brevior*			
257.	13114	*Chorizema racemosum*			
258.	17417	*Cullen discolor*			
259.	8977	*Daviesia aphylla*			
260.	3802	*Daviesia croniniana*			

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261.	3813	*Daviesia grahamii*			
262.	3943	*Glycyrrhiza acanthocarpa (Native Liquorice)*			
263.	14779	*Jacksonia arida*			
264.	4079	*Medicago polymorpha (Burr Medic)*	Y		
265.	4089	*Mirbelia depressa*			
266.	4094	*Mirbelia microphylla*			
267.	17645	*Senna artemisioides*			
268.	12276	*Senna artemisioides subsp. filifolia*			
269.	12315	*Senna pleurocarpa var. angustifolia*			
270.	18446	*Senna stowardii*			
271.	12355	*Swainsona affinis*			
272.	4217	*Swainsona beasleyana*			
273.	4220	*Swainsona canescens (Grey Swainsona)*			
274.	4221	*Swainsona colutoides (Bladder Vetch)*			
275.	4231	*Swainsona kingii*			
276.	35841	*Templetonia incrassata*			
Falconidae					
277.	25621	*Falco berigora (Brown Falcon)*			
278.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
279.	25623	*Falco longipennis (Australian Hobby)*			
Felidae					
280.	24041	*Felis catus (Cat)*	Y		
Frankeniaceae					
281.	5191	*Frankenia cinerea*			
282.	5197	*Frankenia desertorum*			
283.	5204	*Frankenia interioris*			
284.	11592	*Frankenia interioris var. interioris*			
285.	11969	*Frankenia interioris var. parviflora*			
286.	5209	*Frankenia pauciflora (Seaheath)*			
287.	5212	*Frankenia setosa (Bristly Frankenia)*			
Garypidae					
288.		*Synsphyronus dorothyae*			
289.		*Synsphyronus lathrius*			
290.		*Synsphyronus mimulus*			
Gekkonidae					
291.	24957	*Gehyra purpurascens*			
292.	24959	*Gehyra variegata*			
293.	24961	*Heteronotia binoei (Bynoe's Gecko)*			
294.	24983	*Underwoodisaurus milii (Barking Gecko)*			
Geraniaceae					
295.	4333	*Erodium cicutarium (Common Storksbill)*	Y		
296.	4335	*Erodium cygnorum (Blue Heronsbill)*			
Goodeniaceae					
297.	7419	*Coopernookia strophiolata*			
298.	13155	*Dampiera latealata*			
299.	7477	*Dampiera stenostachya (Narrow-spiked Dampiera)*			
300.	7514	*Goodenia havilandii*			
301.	7527	*Goodenia mimuloides*			
302.	7644	*Scaevola spinescens (Currant Bush, Maroon)*			
Graphidaceae					
303.	27723	*Diploschistes scruposus*			
304.	27725	*Diploschistes thunbergianus*			
305.	44221	*Xalocoa ocellata*			
Gyrostemonaceae					
306.	2778	*Codonocarpus cotinifolius (Native Poplar, Kundurangu)*			
Halcyonidae					
307.	42351	*Todiramphus pyrrhopygius (Red-backed Kingfisher)*			
Haloragaceae					
308.	33620	*Glischrocaryon angustifolium*			
309.	11801	*Gonocarpus confertifolius var. helmsii*			
310.	6174	*Haloragis gossei*			
311.	6180	*Haloragis trigonocarpa*			
Hirundinidae					
312.	47909	*Cheramoeca leucosterna (White-backed Swallow)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
313.	24491	*Hirundo neoxena (Welcome Swallow)*			
314.	48060	*Petrochelidon ariel (Fairy Martin)*			
315.	48061	*Petrochelidon nigricans (Tree Martin)*			
Icmadophilaceae					
316.	28060	*Siphula coriacea*			
Idiopidae					
317.		*Anidiops villosus*			
Lamiaceae					
318.	6751	*Cyanostegia microphylla (Tinsel Flower)*			
319.	6771	*Dicrastylis parvifolia*			
320.	17206	*Physopsis viscida*			
321.	15822	*Prostanthera althoferi subsp. althoferi*			
322.	6917	*Prostanthera incurvata*			
323.	6929	*Salvia verbenaca (Wild Sage)*	Y		
324.	9247	*Westringia rigida (Stiff Westringia)*			
Lamponidae					
325.		*Asadipus phaleratus*			
Leporidae					
326.	24085	*Oryctolagus cuniculus (Rabbit)*	Y		
Limnodynastidae					
327.	25425	*Neobatrachus kunapalari (Kunapalari Frog)*			
328.	25427	*Neobatrachus sutor (Shoemaker Frog)*			
Loranthaceae					
329.	2369	*Amyema benthamii*			
330.	2380	*Amyema miquelii (Stalked Mistletoe)*			
331.	2383	*Amyema preissii (Wireleaf Mistletoe)*			
Lycosidae					
332.		*Hoggicosa castanea*			
333.		*Hoggicosa storri*			
334.		*Hogna salifodina*			
335.		*Mainosa longipes*			
336.		*Tasmanicosa leuckartii*			
Macropodidae					
337.	24132	*Macropus fuliginosus (Western Grey Kangaroo)*			
Maluridae					
338.	24541	*Amytornis textilis subsp. textilis (Western Grasswren, Thick-billed Grasswren (western))*		P4	
339.	25652	*Malurus leucopterus (White-winged Fairy-wren)*			
340.	24551	*Malurus pulcherrimus (Blue-breasted Fairy-wren)*			
341.	25654	*Malurus splendens (Splendid Fairy-wren)*			
Malvaceae					
342.	4999	*Brachychiton gregorii (Desert Kurrajong, Ngalta)*			
343.	4955	*Lawrencia glomerata*			
344.	4956	*Lawrencia helmsii (Dunna Dunna)*			
345.	4957	*Lawrencia repens*			
346.	4959	*Lawrencia squamata*			
347.	31351	*Malva preissiana*			
348.	4964	*Radyera farragei (Knobby Hibiscus)*			
349.	4970	*Sida calyxhymenia (Tall Sida)*			
350.	4981	*Sida intricata (Tangled Sida)*			
351.	16924	*Sida spodochroma*			
Martyniaceae					
352.	7121	*Proboscidea louisianica (Purple Flower Devil's Claw)*	Y		
Megalosporaceae					
353.	27587	*Aspicilia calcarea*			
354.		*Aspicilia sp.*			
Megapodiidae					
355.	24557	*Leipoa ocellata (Malleefowl)*		T	
Meliphagidae					
356.	24559	*Acanthagenys rufogularis (Spiny-cheeked Honeyeater)*			
357.	24561	*Anthochaera carunculata (Red Wattlebird)*			
358.	24564	*Certhionyx variegatus (Pied Honeyeater)*			
359.	24567	*Epthianura albifrons (White-fronted Chat)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
360.	24570	*Epthianura tricolor (Crimson Chat)*			
361.	25659	*Lichenostomus leucotis (White-eared Honeyeater)*			
362.	25661	*Lichmera indistincta (Brown Honeyeater)*			
363.	24583	*Manorina flavigula (Yellow-throated Miner)*			
364.	25663	*Melithreptus brevirostris (Brown-headed Honeyeater)*			
365.	42344	*Purnella albifrons (White-fronted Honeyeater)*			
Meropidae					
366.	24598	*Merops ornatus (Rainbow Bee-eater)*			
Molluginaceae					
367.	48203	*Hypertelis cerviana*			
Montiaceae					
368.	48774	*Calandrinia lefroyensis*		P1	
369.	2860	*Calandrinia polyandra (Parakeelya)*			
370.	30396	*Calandrinia translucens*			
Muridae					
371.	24223	*Mus musculus (House Mouse)*	Y		
372.	24232	*Pseudomys bolami (Bolam's Mouse)*			
373.	24237	*Pseudomys hermannsburgensis (Sandy Inland Mouse)*			
Myrtaceae					
374.	44082	*Cyathostemon divaricatus*		P1	
375.	35618	*Darwinia sp. Karonie (K. Newbey 8503)*			
376.	14300	*Eucalyptus celastroides subsp. celastroides (Mirret)*			
377.	5588	*Eucalyptus ceratocorys*			
378.	5665	*Eucalyptus griffithsii (Griffith's Grey Gum)*			
379.	5673	*Eucalyptus horistes*			
380.	19324	*Eucalyptus hypolaena*			
381.	5687	*Eucalyptus kruseana (Bookleaf Mallee)*		P4	
382.	5697	*Eucalyptus lesouefii (Goldfields Blackbutt)*			
383.	20802	*Eucalyptus longissima*			
384.	13037	*Eucalyptus loxophleba subsp. lissophloia*			
385.	20091	*Eucalyptus oleosa subsp. oleosa*			
386.	18580	*Eucalyptus planipes*			
387.	5747	*Eucalyptus platycorys (Boorabbin Mallee)*			
388.	12380	*Eucalyptus ravida (Silver-topped Gimlet)*			
389.	5766	*Eucalyptus salmonophloia (Salmon Gum, Wurak)*			
390.	5767	*Eucalyptus salubris (Gimlet)*			
391.	5780	*Eucalyptus stricklandii (Strickland's Gum)*			
392.	5792	*Eucalyptus torquata (Coral Gum)*			
393.	5793	*Eucalyptus transcontinentalis (Redwood, Pungul)*			
394.	34775	*Eucalyptus vittata*			
395.	5798	*Eucalyptus websteriana (Webster's Mallee)*			
396.	13053	*Eucalyptus websteriana subsp. norsemanica*		P1	
397.	13054	*Eucalyptus websteriana subsp. websteriana*			
398.	18269	*Eucalyptus x brachyphylla*		P4	
399.	5802	*Eucalyptus yilgarnensis (Yorrell)*			
400.	5891	*Melaleuca coccinea (Goldfields Bottlebrush)*		P3	
401.	15603	*Melaleuca fulgens subsp. fulgens*			
402.	19486	*Melaleuca hamata*			
403.	5925	*Melaleuca lateriflora (Gorada)*			
404.	5966	*Melaleuca sheathiana (Boree, Buri)*			
405.	19787	*Micromyrtus monotaxis*			
406.	19699	*Thryptomene australis subsp. brachyandra*			
Nemesiidae					
407.		*Aname mainae*			
408.		*Aname tepperi*			
Neosittidae					
409.	25673	*Daphoenositta chrysoptera (Varied Sittella)*			
Nicodamidae					
410.		*Nicodamus mainae*			
Orchidaceae					
411.	48481	*Pterostylis tryphera*			
Pachycephalidae					
412.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
413.	24618	*Oreoica gutturalis (Crested Bellbird)*			
414.	24619	*Pachycephala inornata (Gilbert's Whistler)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
415.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
Papaveraceae					
416.	17797	*Argemone ochroleuca subsp. ochroleuca*	Y		
Pardalotidae					
417.	25681	*Pardalotus punctatus (Spotted Pardalote)*			
418.	25682	*Pardalotus striatus (Striated Pardalote)*			
419.	24630	*Pardalotus striatus subsp. westraliensis (Striated Pardalote)*			
Parmeliaceae					
420.	42107	*Austroparmelina elixiana*			
421.	28103	*Xanthoparmelia amphixantha*			
422.	28105	*Xanthoparmelia antleriformis*			
423.	18001	*Xanthoparmelia dayiana*		P3	
424.	29031	*Xanthoparmelia hueana*			
425.	29032	*Xanthoparmelia imitatrix*			
426.	28142	*Xanthoparmelia incerta*			
427.	28143	*Xanthoparmelia incrustata*			
428.	28144	*Xanthoparmelia isidiigera*			
429.	29021	*Xanthoparmelia loxodella*			
430.	28331	*Xanthoparmelia luteonotata*			
431.	28158	*Xanthoparmelia neorimalis*			
432.	28166	*Xanthoparmelia pertinax*			
433.	28167	*Xanthoparmelia praegnans*			
434.	29036	*Xanthoparmelia pulla*			
435.	28172	*Xanthoparmelia reptans*			
436.	44326	*Xanthoparmelia rimalis*			
437.	28174	*Xanthoparmelia scabrosa*			
438.	28327	*Xanthoparmelia semiviridis*			
439.	44936	*Xanthoparmelia torulosa*			
440.	28356	*Xanthoparmelia verrucella*			
441.	28186	*Xanthoparmelia versicolor*			
442.	18002	*Xanthoparmelia xanthomelanoides*		P2	
Petroicidae					
443.	24650	*Drymodes brunneopygia (Southern Scrub-robin)*			
444.	24651	*Eopsaltria australis subsp. griseogularis (Western Yellow Robin)*			
445.	47997	*Melanodryas cucullata (Hooded Robin)*			
446.	25693	*Microeca fascinans (Jacky Winter)*			
447.	24659	*Petroica goodenovii (Red-capped Robin)*			
Phalacrocoracidae					
448.		*Microcarbo melanoleucos*			
449.	25697	*Phalacrocorax carbo (Great Cormorant)*			
450.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			
Phasianidae					
451.	24671	*Coturnix pectoralis (Stubble Quail)*			
Physciaceae					
452.	27968	*Physcia albicans*			
Pittosporaceae					
453.	19744	*Pittosporum angustifolium*			
Plantaginaceae					
454.	7300	*Plantago drummondii (Sago Weed)*			
Poaceae					
455.	207	*Aristida contorta (Bunched Kerosene Grass)*			
456.	17236	*Austrostipa drummondii*			
457.	17237	*Austrostipa elegantissima*			
458.	17246	*Austrostipa nitida*			
459.	19588	*Austrostipa nodosa*			
460.	36283	*Austrostipa sp. Carlingup Road (S. Kern & R. Jasper LCH 18459)*		P1	
461.	249	*Bromus diandrus (Great Brome)*	Y		
462.	258	*Cenchrus ciliaris (Buffel Grass)*	Y		
463.	41568	*Cenchrus setaceus (Fountain Grass)*	Y		
464.	357	*Enneapogon caerulescens (Limestone Grass)*			
465.	358	*Enneapogon cylindricus (Jointed Nineawn)*			
466.	365	*Enneapogon polyphyllus (Leafy Nineawn)*			
467.	368	*Enteropogon ramosus (Windmill Grass, Curly Windmill Grass)*			
468.	381	*Eragrostis falcata (Sickle Lovegrass)*			
469.	448	*Hordeum glaucum (Northern Barley Grass)*	Y		

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
470.	504	*Panicum effusum (Hairy Panic Grass)*			
471.	521	*Paspalidium gracile (Slender Panic)*			
472.	40431	*Rytidosperma acerosum*			
473.	40425	*Rytidosperma caespitosum*			
474.	688	*Triodia irritans (Porcupine Grass)*			
475.	699	*Triodia scariosa*			
Podargidae					
476.	25703	*Podargus strigoides (Tawny Frogmouth)*			
Podicipedidae					
477.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
478.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
Polygonaceae					
479.	11052	*Persicaria prostrata*			
480.	2443	*Rumex vesicarius (Ruby Dock)*	Y		
Pomatostomidae					
481.	24683	*Pomatostomus superciliosus (White-browed Babbler)*			
Pottiaceae					
482.	32341	*Crossidium davidai*			
Primulaceae					
483.	36375	*Lysimachia arvensis (Pimpernel)*	Y		
Proteaceae					
484.	1949	*Grevillea acuaria*			
485.	19314	*Grevillea hookeriana subsp. apiciloba*			
486.	19541	*Grevillea nematophylla subsp. nematophylla*			
487.	2055	*Grevillea oncogyne*			
488.	13458	*Grevillea sarissa subsp. sarissa*			
489.	2104	*Grevillea teretifolia (Round Leaf Grevillea)*			
490.	2196	*Hakea preissii (Needle Tree, Dandjin)*			
Psittacidae					
491.		*Barnardius zonarius*			
492.	24748	*Platycercus varius (Mulga Parrot)*			
493.	25721	*Platycercus zonarius (Australian Ringneck, Ring-necked Parrot)*			
Psoraceae					
494.	27999	*Psora crystallifera*			
495.	28000	*Psora decipiens*			
Pteridaceae					
496.	31	*Cheilanthes austrotenuifolia*			
Pygopodidae					
497.	24995	*Delma australis*			
498.	24997	*Delma butleri*			
499.	25766	*Delma fraseri (Fraser's Legless Lizard)*			
500.	25005	*Lialis burtonis*			
Rallidae					
501.	25727	*Fulica atra (Eurasian Coot)*			
502.	48141	*Tribonyx ventralis (Black-tailed Native-hen)*			
Recurvirostridae					
503.	25734	*Himantopus himantopus (Black-winged Stilt)*			
504.	24776	*Recurvirostra novaehollandiae (Red-necked Avocet)*			
Resedaceae					
505.	3085	*Reseda luteola (Wild Mingnonette)*	Y		
Rhamnaceae					
506.	16185	*Cryptandra graniticola*			
507.	16200	*Stenanthemum stipulosum*			
Ruppiaceae					
508.	116	*Ruppia polycarpa*			
Rutaceae					
509.	4501	*Phebalium lepidotum*			
Salticidae					
510.		*Clynotis albobarbatus*			
Santalaceae					
511.	10977	*Exocarpos aphyllus (Leafless Ballart)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
512.	2359	*Santalum spicatum (Sandalwood, Wilarak)*			
Sapindaceae					
513.	11730	*Alectryon oleifolius subsp. canescens*			
514.	4769	*Dodonaea lobulata (Bead Hopbush)*			
515.	4770	*Dodonaea microzyga*			
516.	4780	*Dodonaea stenozyga*			
Scincidae					
517.	30893	*Cryptoblepharus buchananii*			
518.	25020	*Cryptoblepharus plagiocephalus*			
519.	25026	*Ctenotus atlas*			
520.	25052	*Ctenotus leonhardii*			
521.	25074	*Ctenotus schomburgkii*			
522.	25465	*Ctenotus uber (Spotted Ctenotus)*			
523.	25089	*Cyclodomorphus melanops subsp. elongatus (Slender Blue-tongue)*			
524.	25092	*Egernia depressa (Southern Pygmy Spiny-tailed Skink)*			
525.	25094	*Egernia formosa*			
526.	25107	*Egernia stokesii subsp. badia (Western Spiny-tailed Skink, Gidgee Skink)*		T	
527.	25109	*Eremiascincus richardsonii (Broad-banded Sand Swimmer)*			
528.	25115	*Hemiergis initialis subsp. initialis*			
529.	25117	*Hemiergis peronii subsp. peronii*			
530.		*Lerista kingi*			
531.	25155	*Lerista muelleri*			
532.	25162	*Lerista picturata*			
533.	42411	*Lerista timida*			
534.	41411	*Liopholis inornata (Desert Skink)*			
535.	41413	*Liopholis multiscutata (Bull Skink)*			
536.	25184	*Menetia greyii*			
537.	25188	*Morethia adelaidensis*			
538.	25190	*Morethia butleri*			
539.	25192	*Morethia obscura*			
540.	25519	*Tiliqua rugosa*			
Scolopacidae					
541.	24779	*Calidris acuminata (Sharp-tailed Sandpiper)*		IA	
542.	24780	*Calidris alba (Sanderling)*		IA	
543.	24788	*Calidris ruficollis (Red-necked Stint)*		IA	
Scolopendridae					
544.		*Scolopendra laeta*			
545.		*Scolopendra morsitans*			
Scrophulariaceae					
546.	7180	*Eremophila alternifolia (Poverty Bush)*			
547.	11769	*Eremophila arachnoides subsp. tenera*		P1	
548.	7189	*Eremophila clarkei (Turpentine Bush)*			
549.	14895	*Eremophila decipiens subsp. decipiens*			
550.	7195	*Eremophila dempsteri*			
551.	7211	*Eremophila georgei*			
552.	14340	*Eremophila glabra subsp. glabra*			
553.	7219	*Eremophila granitica (Thin-leaved Poverty Bush)*			
554.	15112	*Eremophila interstans subsp. interstans*			
555.	15111	*Eremophila interstans subsp. virgata*			
556.	7226	*Eremophila ionantha (Violet-flowered Eremophila)*			
557.	16363	*Eremophila maculata subsp. brevifolia (Native Fuchsia)*			
558.	7242	*Eremophila miniata (Kopi Poverty Bush)*			
559.	15003	*Eremophila oldfieldii subsp. angustifolia*			
560.	18570	*Eremophila oppositifolia subsp. angustifolia*			
561.	7250	*Eremophila pantonii*			
562.	14594	*Eremophila parvifolia subsp. auricampa*			
563.	14516	*Eremophila praecox*		P1	
564.	7259	*Eremophila pustulata (Warted Eremophila)*			
565.	15172	*Eremophila rugosa*			
566.	7267	*Eremophila scoparia (Broom Bush ()*			
567.	49080	*Eremophila xantholaema*		P1	Y
568.	17158	*Myoporum montanum (Native Myrtle)*			
569.	7293	*Myoporum platycarpum (Sugarwood)*			
570.	18259	*Myoporum platycarpum subsp. platycarpum*			
Scutigeridae					
571.		*Thereuopoda lesueurii*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Solanaceae					
572.	6967	*Lycium australe (Australian Boxthorn)*			
573.	6974	*Nicotiana glauca (Tree Tobacco)*	Y		
574.	11331	*Nicotiana occidentalis subsp. obliqua*			
575.	7013	*Solanum hoplopetalum (Thorny Solanum)*			
576.	7018	*Solanum lasiophyllum (Flannel Bush, Mindjulu)*			
577.	7023	*Solanum nummularium (Money-leaved Solanum)*			
578.	7028	*Solanum petrophilum (Rock Nightshade)*			
579.	7030	*Solanum plicatile*			
Sparassidae					
580.		*Holconia nigrigularis*			
Tachyglossidae					
581.	24207	*Tachyglossus aculeatus (Short-beaked Echidna)*			
Teloschistaceae					
582.	44945	*Caloplaca hnatiukii*			
583.	44983	*Fulgensia cranfieldii*			
584.	27754	*Fulgensia subbracteata*			
Theridiidae					
585.		*Latrodectus hasseltii*			
Thymelaeaceae					
586.	5231	*Pimelea angustifolia (Narrow-leaved Pimelea)*			
Triopsidae					
587.	39407	*Triops australiensis (Shield Shrimp)*			
Trochanteriidae					
588.		*Longrita grasspatch*			
Turnicidae					
589.	24851	*Turnix velox (Little Button-quail)*			
Typhaceae					
590.	99	*Typha orientalis (Bulrush, Cumbungi)*			
Urodacidae					
591.		*Urodacus armatus*			
Ustilaginaceae					
592.	45897	*Ustilago comburens*			
Varanidae					
593.	25218	*Varanus gouldii (Bungarra or Sand Monitor)*			
594.	25526	*Varanus tristis (Racehorse Monitor)*			
Verbenaceae					
595.	6733	*Lantana camara (Common Lantana)*	Y		
Vespertilionidae					
596.	24186	*Chalinolobus gouldii (Gould's Wattled Bat)*			
597.	24187	*Chalinolobus morio (Chocolate Wattled Bat)*			
598.	24194	*Nyctophilus geoffroyi (Lesser Long-eared Bat)*			
599.	24199	*Scotorepens balstoni (Inland Broad-nosed Bat)*			
600.	24202	*Vespadelus baverstocki (Inland Forest Bat)*			
601.	24205	*Vespadelus finlaysoni (Finlayson's Cave Bat)*			
602.	24206	*Vespadelus regulus (Southern Forest Bat)*			
Violaceae					
603.	11973	*Hybanthus floribundus subsp. curvifolius*			
Zosteropidae					
604.	25765	*Zosterops lateralis (Grey-breasted White-eye, Silvereye)*			
Zygophyllaceae					
605.	48885	*Roepera aurantiaca subsp. aurantiaca*			
606.	48892	*Roepera glauca (Pale Twinleaf, Pale Twin-leaf)*			
607.	48899	*Roepera reticulata*			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

Appendix 8: EPBC Protected Matters Search (40km buffer)

Australian Government

Department of Agriculture, Water and the Environment

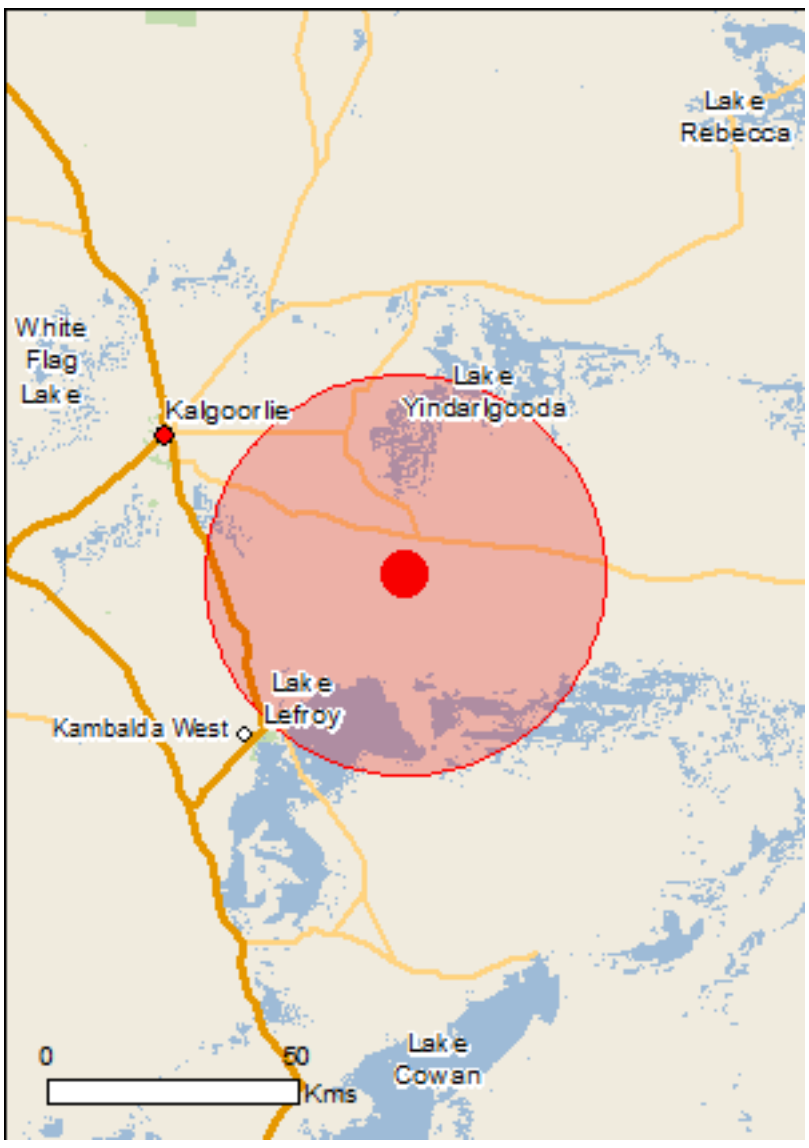
EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

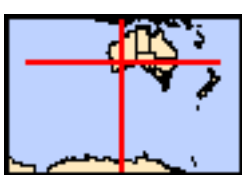
Report created: 24/11/20 06:40:24



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2015

Coordinates

Buffer: 40.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	6
Listed Migratory Species:	7

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	12
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	2
Regional Forest Agreements:	None
Invasive Species:	14
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat known to occur within area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat may occur within area
Mammals		
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat may occur within area
Plants		
Tecticornia flabelliformis Bead Glasswort [82664]	Vulnerable	Species or species habitat known to occur within area

Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Tringa nebularia		
Common Greenshank, Greenshank [832]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land -

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba		
Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis		
Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Chrysococcyx osculans		
Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
Merops ornatus		
Rainbow Bee-eater [670]		Species or species habitat may occur within

Name	Threatened	Type of Presence
		area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Thinornis rubricollis Hooded Plover [59510]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Kambalda	WA
Lakeside Timber Reserve	WA

Invasive Species	[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Mammals		
Camelus dromedarius Dromedary, Camel [7]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur

Name	Status	Type of Presence
		within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Carrichtera annua Ward's Weed [9511]		Species or species habitat likely to occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Cylindropuntia spp. Prickly Pears [85131]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-30.96467 121.90331

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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Appendix B: Desktop Assessment of Short-Range Endemic fauna at the Fingals Project

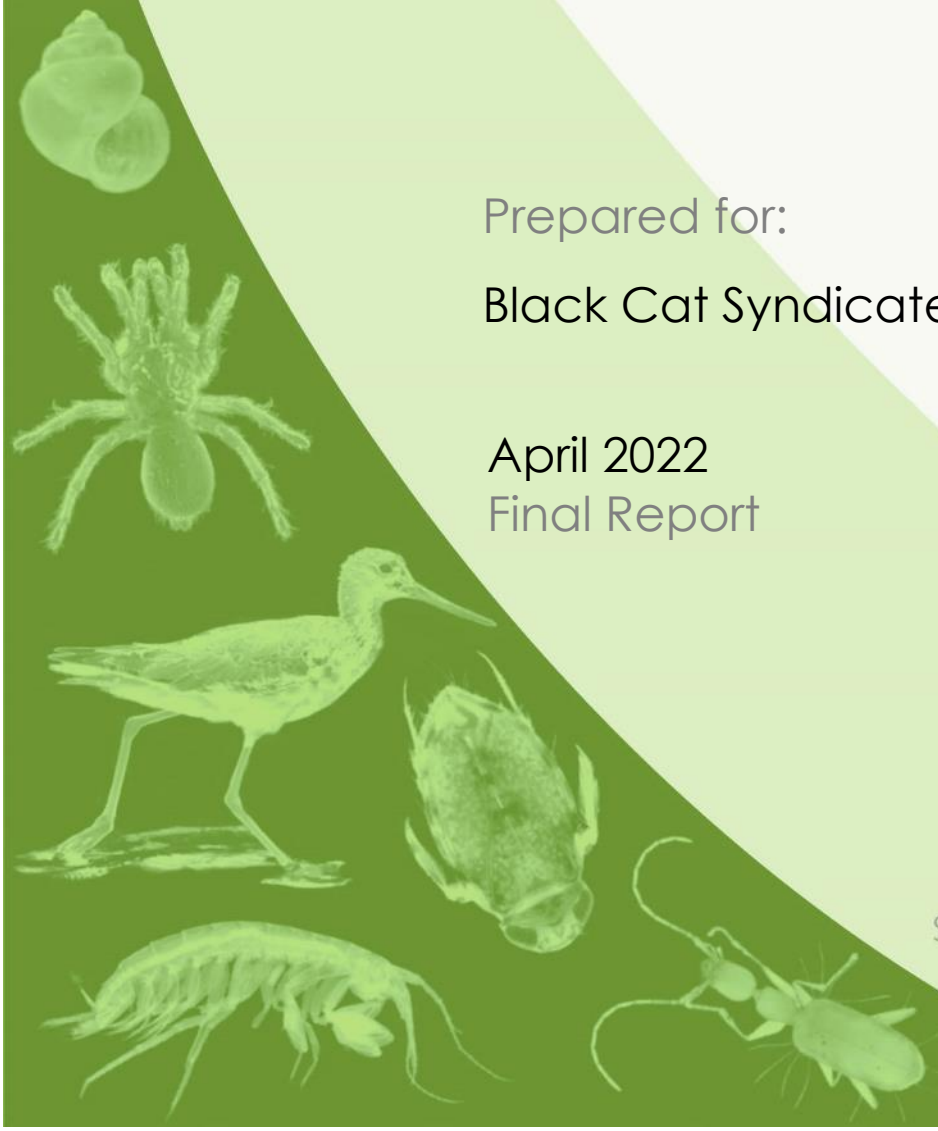
Bennelongia Environmental Consultants

Fingals Short-Range Endemic Fauna Desktop Assessment

Prepared for:

Black Cat Syndicate Ltd

April 2022
Final Report



Short-Range Endemics | Subterranean Fauna

Waterbirds | Wetlands

Desktop Assessment of Short-Range Endemic fauna at the Fingals Project

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ABN: 55 124 110 167

Report Number: 507

Report Version	Prepared by	Reviewed by	Submitted to Client	
			Method	Date
Draft	Monique Moroney	Stuart Halse	Email	25 February 2022
Final	Melanie Fulcher		Email	13 April 2022

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EXECUTIVE SUMMARY

Black Cat Syndicate Limited is looking to recommence gold mining at the Fingals Project,which was last mined in the early 1990's. The Project is located in the goldfields, 40km east of Kalgoorlie. Proposed operations will involve cutback and expansion of the existing open cut pits as well as the construction of associated mine infrastructure. The disturbance footprint is estimated at 230 ha of which approximately 60 ha has been formerly disturbed.

This desktop assessment aims to assess the prevalence of SRE invertebrate species in the search area around the Project. In total, 63 species from SRE Groups have been recorded in the search area with relatively little sampling effort. The fauna surrounding the sampling area includes 21 species of mygalomorph spiders, two species of araneomorph spiders, five species of pseudoscorpion, 12 species of scorpion, four species of centipede, two species of millipede and 15 species of land snail.

The Project area contains many prospective habitats for SRE groups including, *Eucalyptus* woodland on rocky slopes and *Eucalyptus* woodland on clay-loam plain although these habitat types appear to be well connected and extend beyond the Project area. However, there has been no sampling within the Project area to quantify SRE species occurrence in different habitats. Of the 61 SRE group species in the search area, there was only one Confirmed SRE, one Potential SRE, 35 Data deficient SREs and 25 Widespread species. The distribution of species in these SRE categories is more likely to reflect lack of information rather than providing a reliable guide to the pattern of species distributions.

Two listed butterflies have been recorded in the search area and potentially occur at the Project, the Arid Bronze Azure Butterfly (*Ogyris subterrestris petrina*) and the Inland Hairstreak (*Jalmenus aridus*).

While the Project appears to be prospective for SRE Group species, there is no information confirming the general assignment of prospectivity to different habitat types, however, due to the relative size of the disturbance footprint (230 ha) and the extensiveness of connected habitat outside of the Project area the threat to SRE species from the proposed development is low.

CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. INTRODUCTION

Black Cat Syndicate Limited is looking to recommence gold mining at the Fingals Project, which was last mined in the early 1990s. The Project is located in the Goldfields, 40 km east of Kalgoorlie. Proposed operations will involve expansion of the existing open mine pits as well as the construction of associated mine infrastructure. The disturbance footprint is estimated at 230 ha, of which approximately 60 ha is formerly disturbed.

This report provides a desktop assessment of the potential threat posed by Project development to the occurrence of short-range endemic invertebrates (SREs). Only some ground dwelling invertebrate groups are considered as SREs by the Western Australia Environmental Protection Authority (EPA) but SREs constitute part of the 'Terrestrial Fauna' factor in the EPA's assessment process. Up to 14 factors may be considered in an assessment by the EPA, with five of these being related to terrestrial habitats (EPA 2021).

The specific aims of the assessment are to:

1. Review available vegetation and geological information to assess the prospectivity of habitats within, and surrounding, the Project for SRE fauna.
2. Compile records of SREs (as well as listed invertebrate species) in the vicinity of the Project to determine their likely ranges and preferred habitats; and
3. Assess the likelihood of SRE and listed species occurring in the Project area and the likelihood of the conservation status of these species being significantly degraded by Project development.

2. CONSERVATION FRAMEWORK

2.1. Listing of Threatened Invertebrates

Native flora and fauna in Western Australia are protected at both State and Commonwealth levels. At the state level, the *Biodiversity Conservation Act 2016* (BC Act) provides a legal framework for protection of species, particularly for species listed by the Minister for the Environment as threatened. At a national level, the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) also protects species listed as threatened. In addition to the formal list of threatened species in Western Australia under the BC Act, the Department of Biodiversity, Conservation and Attractions (DBCA) maintains a list of priority fauna species that are of conservation importance but, for various reasons, do not meet the criteria for listing as threatened. Both the EPBC and BC Acts provide frameworks for the protection of threatened ecological communities (TECs). DBCA also informally recognises communities of potential conservation concern as priority ecological communities (PECs). However, there are no TECs or PECs based on SREs.

2.2. SRE Terrestrial Invertebrates

SRE species are defined as having overall ranges of less than 10,000 km^2 (Harvey 2002). They tend to exhibit patchy distributions within their range, slow growth, low fecundity, and poor dispersal capabilities. Guidelines for the consideration and assessment of SRE invertebrates in Western Australia are provided in *Environmental Factor Guideline: Terrestrial fauna* (EPA 2016a) and *Technical Guidance: Sampling of short range endemic invertebrate fauna* (EPA 2016b). Assessment typically focuses on a number of taxonomic groups (the SRE Groups) that are known to contain at least some, but more commonly moderate to high proportions of, SRE species. The groups include land snails (Gastropoda); millipedes (Diplopoda); centipedes (Chilopoda); pseudoscorpions (Pseudoscorpiones); scorpions (Scorpiones); spiders [Araneae, mainly Mygalomorphae (trapdoor spiders)]; slaters (Isopoda); and harvestmen (Opiliones). Some other animals, such as velvet worms (Onychophora) and earthworms (Oligochaeta), form SRE Groups but are restricted to mesic landscapes.

Groups containing species that are mostly widespread due to high vagility, ecological plasticity or xeric adaptation may also have species with restricted ranges (e.g., Framenau *et al.* 2008; López-López *et al.*

2016; Rix *et al.* 2015) and, conversely, some species belonging to SRE Groups are in fact widespread. Determining whether a species belonging to an SRE Group has a significantly restricted range (estimated as less than 10,000 km^2) is often difficult. One indicator, other than extensive sampling results, is that the distribution of an SRE Group species is likely to reflect the extent of its preferred or obligate habitat(s). Thus, species found only in restricted or patchy habitats usually have smaller ranges than those collected from extensive or common habitats. A caveat to use of this indicator is that sometimes short-range endemism is related to life history or behaviour, rather than historical biogeography, and species in widespread habitats may be SREs through occupying only part of the geographic range of a habitat (Harvey 2002; Harvey *et al.* 2011; Rix *et al.* 2015).

Here we followed the SRE classification used by the Western Australian Museum (WAM), where a species can be classified into one of the following categories:

1. **Confirmed SREs** have a known distribution range smaller than 10,000 km^2. The taxonomy is well known, and the group well represented in collections and/or via comprehensive sampling.
2. **Potential SREs** belong to a group with gaps in our knowledge, either because the group is not well represented in collections, taxonomic knowledge is incomplete, or the distribution is poorly understood due to insufficient sampling.
3. **Widespread (not SRE)** species have a known distribution range larger than 10,000 km^2. The taxonomy is well known, and the group well represented in collections via comprehensive sampling.

In this report, the WAM category Potential SRE is broken into three categories. These are Potential SRE, Unlikely SRE and **Data deficient SRE.** Decisions about Unlikely and Potential SREs are based mainly on expert opinion (mostly reflecting the distribution patterns of other species of the same genus or family), the number of habitats in which the species has been recorded, and the extent and connectivity of these habitats.

Species for which there is very little relevant information, e.g. they are known from a single record, are assigned to the Data deficient SRE category. This reflects that there is too little information to assign the species to a risk-based SRE category, although if being precautionary some, or all, Data deficient SREs might be treated as Potential SREs.

3. PROJECT SETTING

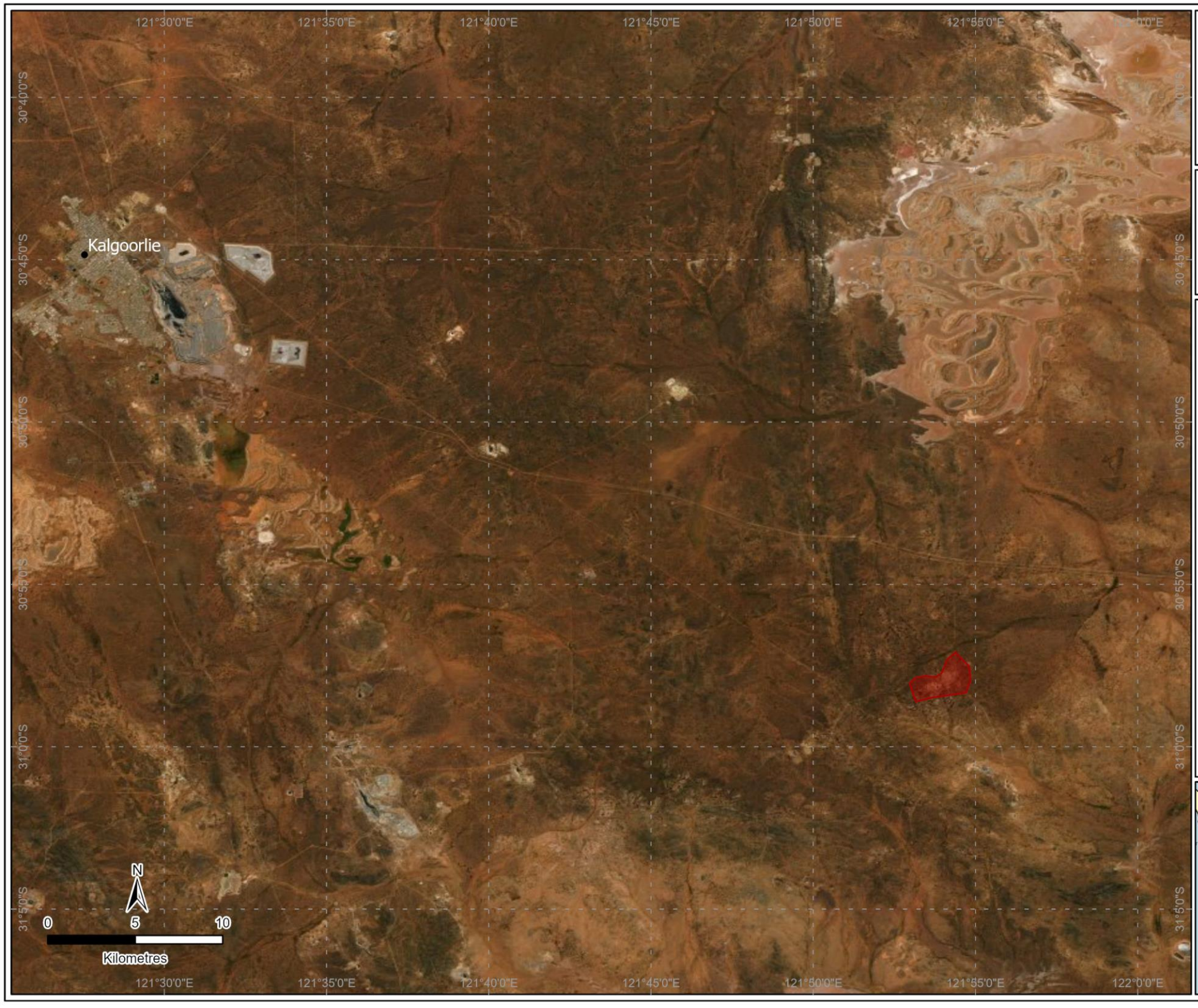
The Project is situated within the Mt Monger Pastoral Lease in the Eastern Goldfields in the Coolgardie Bioregion. The landscape consists of undulating plains separated by low hills and sandplains. There are also Salt Lake systems in the area. Vegetation is predominantly eucalypt woodlands, mulga shrublands, acacia-casuarina thickets, spinifex grassland and halophytic shrublands (Botanica Consulting 2020; 2021).

3.1. Local Habitat

Habitat mapping and assessment completed by Botanica Consulting was used to assess habitats and vegetation (Table 1) present at the Project for their prospectivity to harbour SRE groups. Emphasis was placed on identifying relict, isolated, sheltered, or moist habitats, but 'specialist' habitats, such as rocky outcrops and ranges, may also harbour SRE species. Isolated or patchy habitats are generally considered to be more prospective for SRE species.

The condition of about 70% of the vegetation at the Project was rated as 'good', indicating that it should be suitable for occurrence of SRE species if they naturally use these habitats (Figure 2). In broad terms, the main vegetation/habitat types in the Project are:

- *Eucalyptus* woodland on clay-loam plain.
- *Eucalyptus* woodland on rocky slopes.
- *Allocasuarina* forest in drainage depression.



Bennelongia Environmental Consultants

GCS GDA 1994
Author: MMoroney
Date: 10/02/2022

Figure 1. Location of the Project

Legend

Development Envelope

The most prospective habitats for SRE species at the project are predicted to be the *Allocasuarina* in drainage lines (DD-CF1) and *Eucalyptus* woodland on upper rocky slopes (RS-EW2) (Table 1, Figure 3). This is due to their spatial isolation and disconnectedness within the Project area, with each habitat type accounting for approximately 4% of total habitat in the area (Table 1, Figure 3). The *Allocasuarina* in drainage line habitat occurs only to the north of the Project area but there is a small area of *Eucalyptus* woodland on upper rocky slopes essentially confined to the Project area (Figure 3).

Habitats such as the *Eucalyptus* woodland on clay-loam plain (CLP-EW1, CLP-EW2) have been demonstrated to host SRE groups and are also considered prospective but, because they are more extensive and well-connected throughout the wider landscape; species using them are generally likely to have larger distributions than the species in restricted habitats (Table 1, Figure 3).

Table 1. Summary of habitats present at the Project as shown in Figure 3

Vegetation Code	Vegetation	Description	Landform
DD-CF1	*Casuarina* low forest (2.6%)	*Casuarina pauper* low forest over *Eremophila decipiens* open shrubland over *Maireana triptera* low sparse shrubland.	Drainage Channel
CLP-EW1	*Eucalyptus low open woodland* (26.3%)	*Eucalyptus lesouefii low open woodland over Senna artemisioides subsp. filifolia and Maireana triptera low open shrubland.*	Clay/loam plain.
CLP-EW2	*Eucalyptus open woodland* (26.4%)	*Eucalyptus ravida low open woodland over Maireana triptera low open shrubland.*	Clay/loam plain
RS-EW1	*Eucalyptus low open woodland* (32.6%)	*Eucalyptus lesouefii, E. salmonophloia and E. salubris woodland over Tecticornia disarticulata low open shrubland.*	Lower rocky slopes
RS-EW2	*Eucalyptus low woodland* (2.2%)	*Eucalyptus stricklandii low woodland over Melaleuca sheathiana shrubland.*	Upper rocky slopes

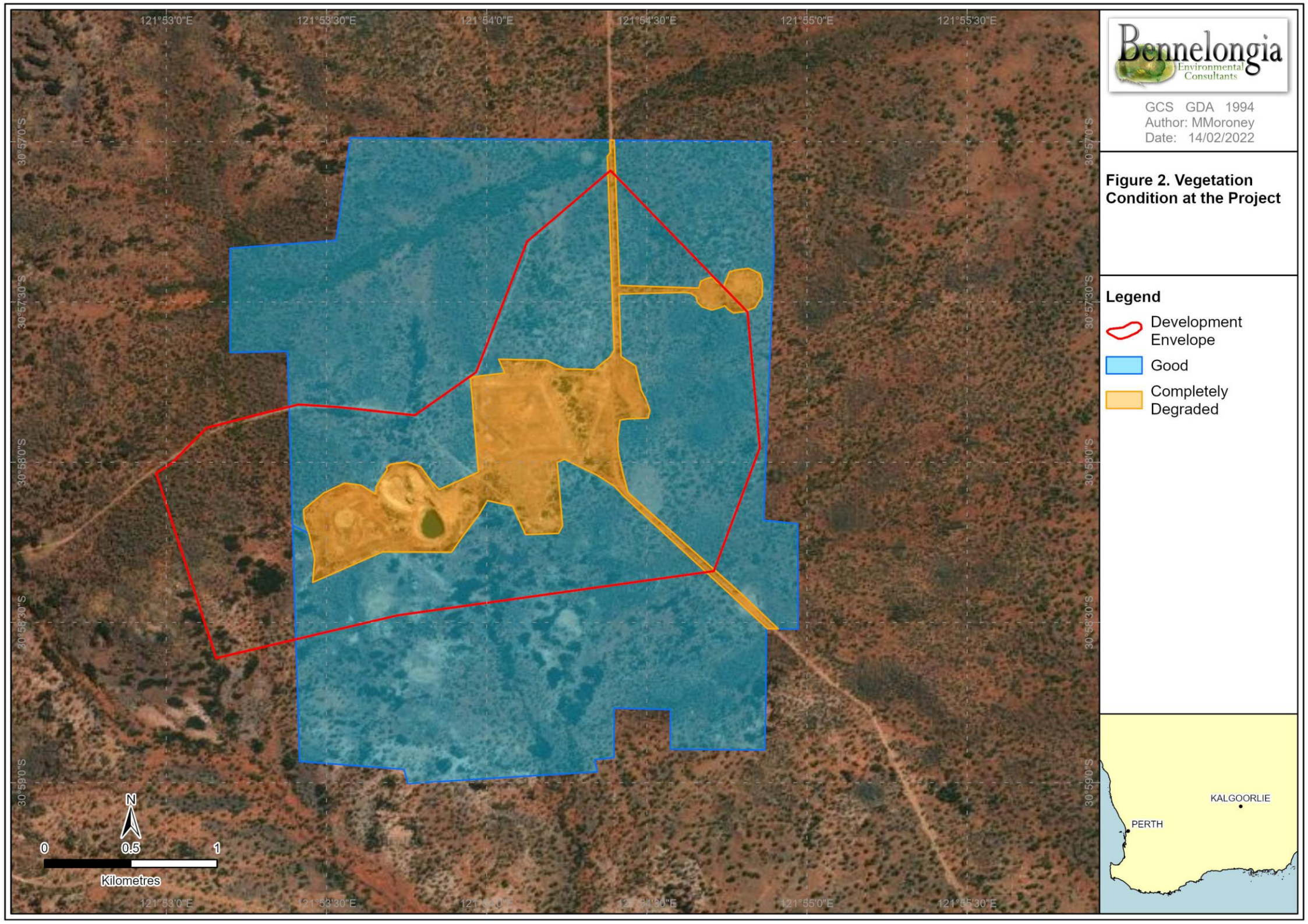
4. DESKTOP ASSESSMENT

4.1. Records of SRE Group Species in the Search Area

Records of species from SRE groups were compiled by searching the Western Australian Museum (WAM) database, Bennelongia Environmental Consultants database, published research papers and available environmental reports. A comprehensive review of the databases mentioned above was conducted on a 100 x 100 km square area centred on the Project. The distributions of records of species belonging to SRE Groups in Figure 4.

Based on the desktop search at least 61 species belonging to SRE groups have been recorded in the search area, including 21 species of mygalomorph spiders, two species of araneomorph spiders, five species of pseudoscorpion, 12 species of scorpion, four species of centipede, two species of millipede and 15 species of land snail (Table 2, Figure 4). It is important to note, however, the number of species is approximate because of incomplete or inconsistent taxonomy for some records. Some recorded species may contain multiple taxa and, conversely, some specimens assigned to different taxa may actually represent the same species. It should also be recognised that the list of species recorded in the sub-region serves mainly to provide a guide to type of community that can be expected in the Project area rather than indicating how many, and which particular, species occur in the Project area.

A description of the SRE Group species recorded in the search area is provided below.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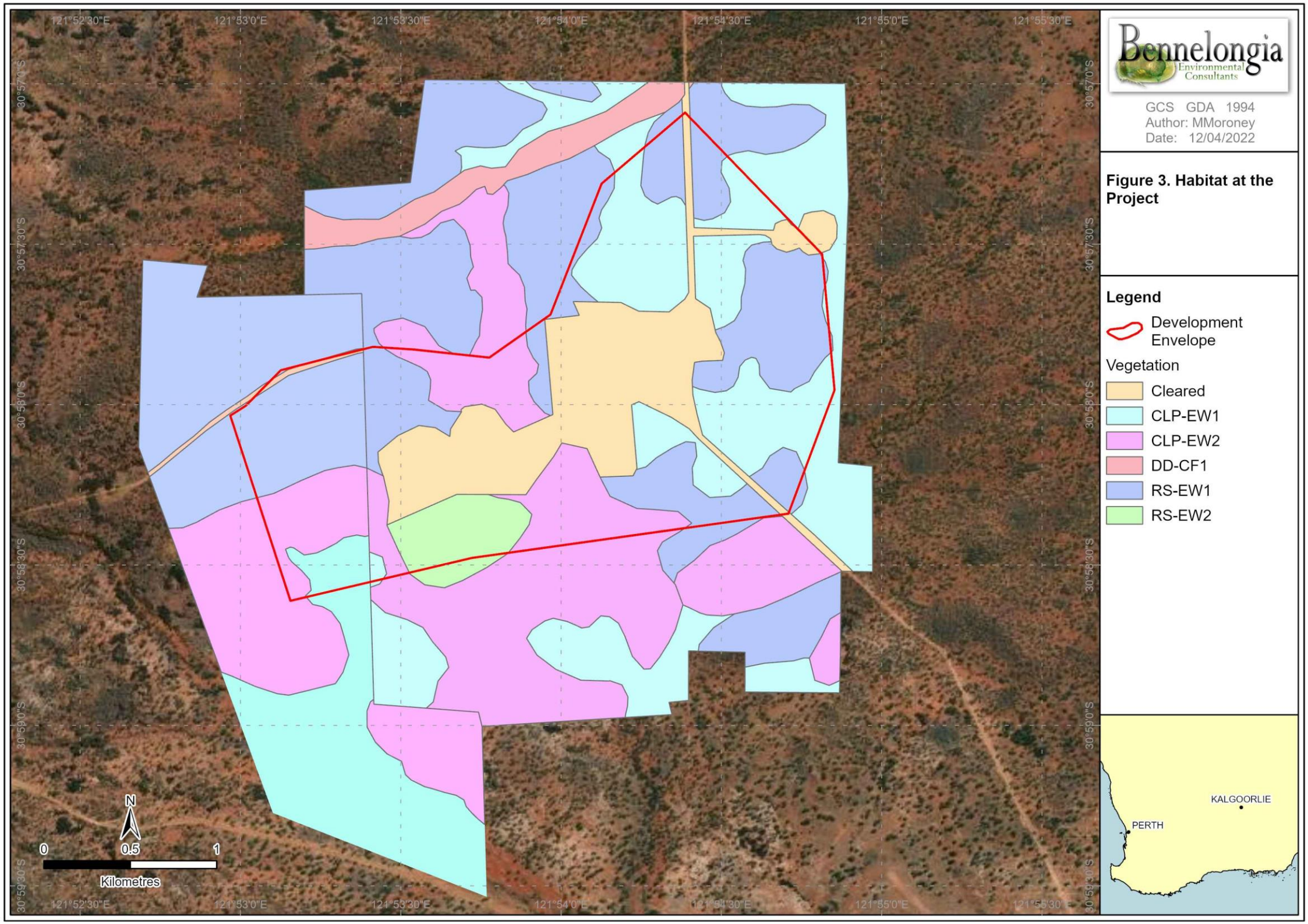
Kilometres
Bennelongia
Environmental Consultants
GCS GDA 1994
Author: MMoroney
Date: 14/02/2022
Figure 2. Vegetation Condition at the Project
Legend
Development Envelope
Good
Completely Degraded
KALGOORLIE
PERTH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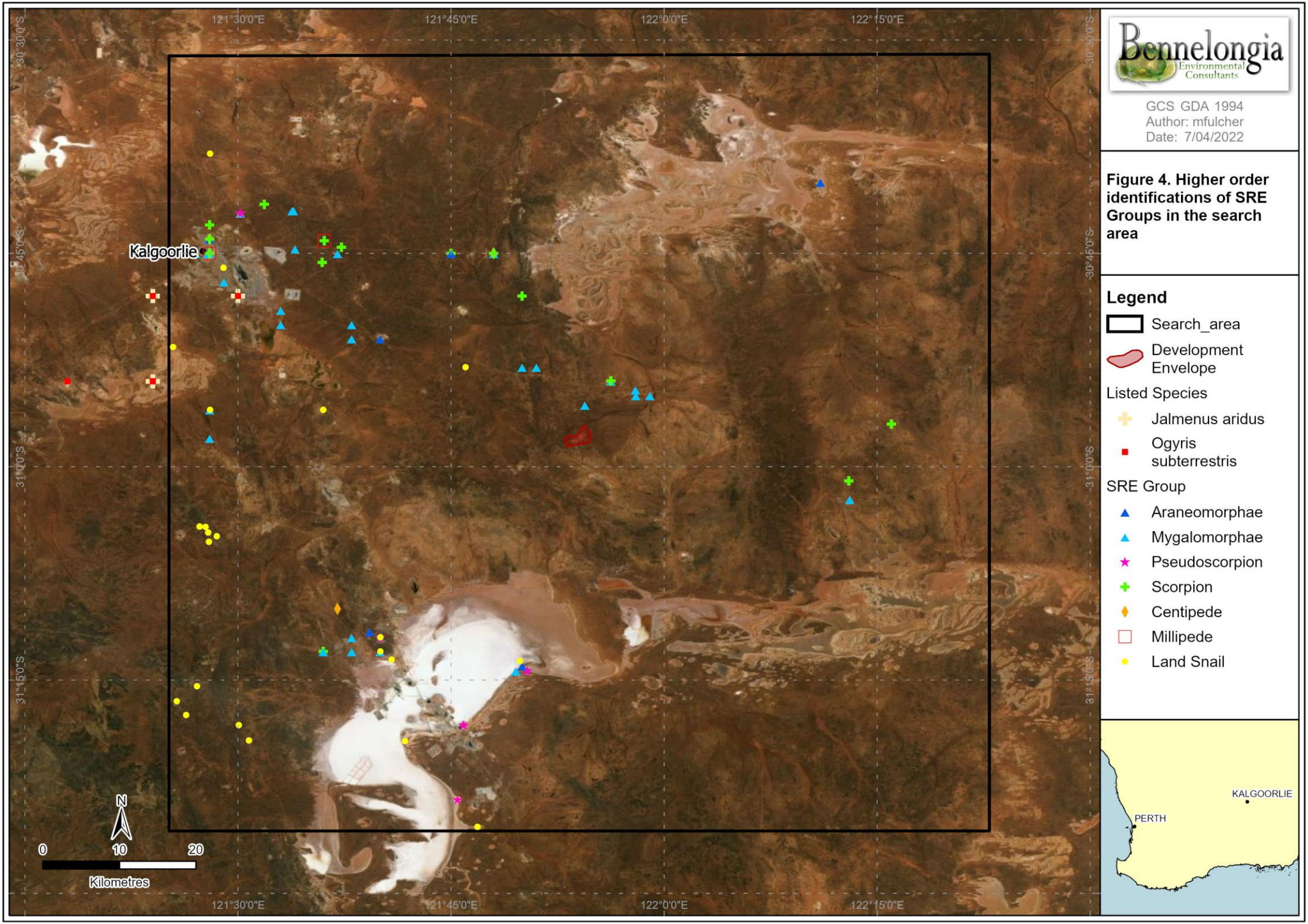
Bennelongia
Environmental Consultants
GCS GDA 1994
Author: MMoroney
Date: 12/04/2022
Figure 3. Habitat at the Project
Legend
Development Envelope
Vegetation
Cleared
CLP-EW1
CLP-EW2
DD-CF1
RS-EW1
RS-EW2
KALGOORLIE
PERTH



Bennelongia Environmental Consultants

GCS GDA 1994
Author: mfulcher
Date: 7/04/2022

Figure 4. Higher order identifications of SRE Groups in the search area

Legend

- Search_area
- Development Envelope

Listed Species

- Jalmenus aridus
- Ogyris subterrestris

SRE Group

- Araneomorphae
- Mygalomorphae
- Pseudoscorpion
- Scorpion
- Centipede
- Millipede
- Land Snail

4.2. SRE Groups in the Search Area

Araneomorph Spiders

At least one species of salt lake specialist araneomorph spider has been recorded in the search area. *Tetralycosa baudinettei* is a halotolerant wolf spider found on salt lakes. It is currently only known from a few salt lakes in the Goldfields, including Lake Lefroy which is 30 km south of the Project. *Tetralycosa baudinettei* has very limited distribution and is a Confirmed SRE (Framenau and Hudson 2017). Owing to its specific habitat, it is unlikely to occur at the Project.

The family Hersiliidae (long-tailed spiders) are characterised by their very long spinnerets and are commonly found on tree trunks. There are only two genera in Australia, the genus *Tamopsis* is endemic to Western Australia and is known to contain some SRE species. *Tamopsis* sp. is therefore currently considered to be a Data deficient SRE.

Mygalomorph spiders

Twenty-one species of mygalomorph spider belonging to seven families have been recorded in the search area. Of these, six are believed to be widespread species and one to be a Potential SRE.

Two species from the family Actinopodidae (mouse spiders) were recorded in the search area, *Missulena harewoodi* and *Missulena occatori*. *Missulena occatoria* is one of the most widespread species of *Missulena* and has a distinct red pars cephalica, so is commonly known as the 'red headed mouse spider'. This species has wide dispersal because spiderlings disperse on the wind, which is uncommon in mygalomorph spiders (ALA 2022).

Missulena harewoodi is considered a Data deficient SRE that is currently only known from the type location near Kalgoorlie in *Eucalyptus* low woodland over open scrub (Framenau and Harms 2017). This habitat type is present at the Project and therefore *Missulena harewoodi* could potentially be present.

The open-holed trapdoor spiders from the family Anamidae represented most of the records in the search area. Wishbone spiders from the genera *Aname, Kwonkan, Proshermacha* and *Teyl* were represented by at least nine species (Table 2).

At least three species from the genus *Aname* have been recorded in the search area: *Aname* `mainae`, *Aname* `MYG001 group, Randalls` and *Aname simoneae*. *Aname simoneae* is Widespread in the Yilgarn (Harvey *et.al* 2020). *Aname* `mainae`, is a widespread taxon that may comprise of a species complex. Its type location is in South Australia and it was originally thought to be widespread across Southern Australia (Main 1982). It is now thought likely that *Aname* 'mainae' is restricted to the Eyre Peninsula and does not extend into Western Australia (Castalanelli *et.al* 2020). Therefore, *Aname* `mainae` is considered a Data deficient SRE (Table 2). *Teyl* `double-door`, *Kwonkan* `MYG213`, Kwongan 'SIGM104' and *Proshermacha* `MYG506` are all Data deficient SREs and were collected within 30 km of, and potentially occur at, the Project. Teyl 'MYG021' is a Widespread species known from Coolgardie and Teyl 'door-building Diplurid' is a Potential SRE known only from multiple records over a range of 19 km in the search area.

The genus *Cethegus* of family Euagridae is represented by the species complex *Cethegus fugax*, which is treated as a Data deficient SRE (Table 2).

Six species of the family Idiopidae have been recorded in the search area. Four of these belong to the genus *Idiosoma*, which is known to contain Confirmed SREs (Rix *et al.* 2018; Rix *et al.* 2017). However, *Idiosoma* `goldfields sp. group`, *Idiosoma* `occidentalis sp. group`, *Idiosoma* `squama` and Idiosoma `MYG159` are all considered Data deficient SREs that potentially occur at the Project (Table 2). The other two species, *Gaius villosus* and *Gaius austini,* are Widespread.

Table 2. Species records from target SRE groups within the search area
N.B. Grey denotes higher order identifications that might belong to other listed species (not viewed as unique species), those marked with an asterisk represent Data Deficient Potential SREs and blue represents species complexes.

Higher Classification	Lowest Identification	SRE Status	Comment
Arachnida			
Araneae			
Araneomorphae			
Hersiliidae	*Tamopsis* sp.	*Potential SRE	
Lycosidae	*Tetralycosa baudinettei*	**Confirmed SRE**	Halotolerant species, restricted to salt lake habitat (Framenau and Hudson 2017)
	Lycosidae sp.		
Mygalomorphae			
Actinopodidae	*Missulena harewoodi*	*Potential SRE	Only known from the type locality- male holotype 20 km E of Kalgoorlie (Framenau and Harms 2017)
	Missulena occatoria	Widespread	Widespread (ALA 2022) most widely distributed *Missulena* species due to wind dispersal
	Missulena sp.		
Anamidae	*Aname* `*mainae*`	*Potential SRE	Widespread group, however likely species complex (Castalanelli *et.al* 2020).
	Aname `MYG001 group, Randalls`	*Potential SRE	Widespread group, however likely species complex.
	Aname simoneae	Widespread	Widespread in the Yilgarn (Harvey *et.al* 2020)
	Aname sp.		
	Kwonkan `MYG213`	*Potential SRE	Currently only known from single site 7km N of the Project
	Kwonkan `SIGM104`	*Potential SRE	Currently only known from Lake Lefroy (approximately 30 km from development envelope)
	Proshermacha `MYG506`	*Potential SRE	Two adult males collected from single site 7km N of the Project
	Teyl `door-building Diplurid`	**Potential SRE**	Current known minimum linear range of 19km
	Teyl `double-door`	*Potential SRE	Currently only known from single site 9km N of the Project
	Teyl `MYG021`	Widespread	Also known from Coolgardie current minimum known linear range of 160km
	Teyl sp.		
	Anamidae sp.		
Barychelidae	*Idiommata* sp.	*Potential SRE	

Higher Classification	Lowest Identification	SRE Status	Comment
Euagridae	*Cethegus `fugax`*	*Potential SRE	Species complex (Raven 1983)
	Cethegus sp.	*Potential SRE	
Halanoproctidae	*Conothele* sp.	*Potential SRE	
Idiopidae	*Gaius austini*	Widespread	Also known from Ularring 230 km North
	Gaius villosus	Widespread	
	Gaius sp.		
	Idiosoma `goldfields sp. group`	*Potential SRE	Species complex
	Idiosoma `MYG159`	*Potential SRE	Only know from site near Kalgoorlie 48km NW of the Project
	Idiosoma `occidentalis sp. group`	*Potential SRE	Species complex
	Idiosoma `squama`	*Potential SRE	
	Idiosoma sp.		
Theraphosidae	*Selenotholus foelschei*	Widespread	
	Mygalomorphae sp.		
Pseudoscorpiones			
Chernetidae	*Conicochernes* `PSE024`	*Potential SRE	Only known from Fimiston gold mine 12 km E of Kalgoorlie
	Chernetidae sp.		
Garypidae	*Synsphyronus* `PSE078`	*Potential SRE	Only known from 12 km SE of lake Lefroy
	Synsphyronus sp.		
Olpiidae	*Austrohorus* `salt lake species`	*Potential SRE	Only known from Lake Lefroy, collected in shrublands of samphire
	Beierolpium sp.	*Potential SRE	
Sternophoridae	*Afrosternophorus* sp.	*Potential SRE	
Scorpiones			
Bothriuridae	*Cercophonius michaelseni*	Widespread	Minimum linear range of 360 km. Known from multiple locations in Southern WA (Bennelongia Database)
Buthidae	*Isometroides* `goldfields 1`	Widespread	Widespread in the Yilgarn
	Isometroides `vescus`	*Potential SRE	Widespread species, however likely species complex.
	Lychas `bituberculatus complex`	*Potential SRE	
	Lychas `pilbara1`	Widespread	

Higher Classification	Lowest Identification	SRE Status	Comment
	Lychas annulatus	*Potential SRE	Widespread species, however likely species complex.
	Lychas jonesae	Widespread	
	Lychas splendens	Widespread	
	Lychas sp.	*Potential SRE	
	Buthidae sp.	*Potential SRE	
Urodacidae	*Urodacus `armatus`*	*Potential SRE	
	Urodacus `magestic`	*Potential SRE	Only known from Majestic mine approximately 6km North of the Project
	Urodacus hoplurus	Widespread	
	Urodacus yaschenkoi	*Potential SRE	Widespread species, however likely species complex (Luna-Ramirez *et.al* 2017).
	Urodacus sp.	*Potential SRE	
	Scorpiones sp.	*Potential SRE	
Chilopoda			
Scolopendrida			
Scolopendridae	*Cormocephalus turneri*	Widespread	
	Scolopendra laeta	Widespread	
	Scolopendra morsitans	Widespread	
Scutigerida			
Scutigeridae	*Thereuopoda lesueurii*	Widespread	Also known from Holt Rock 295km SE of the Project
Diplopoda			
Julida			
Julidae	*Cylindroiulus brittanicus*	Widespread	
Polydesmida			
Paradoxosomatidae	*Antichiropus `DIP145, kalgoorlie`*	*Potential SRE	Only known from site 12km E of Kalgoorlie
Gastropoda			
Bothriembryontidae	*Bothriembryon* sp.	*Potential SRE	
Camaenidae	*Sinumelon* cf. *jimberlanensis*	*Potential SRE	Uncertain ID
	Sinumelon cf. *vagente*	*Potential SRE	Uncertain ID
	Sinumelon kalgum	Widespread	

Higher Classification	Lowest Identification	SRE Status	Comment
	Sinumelon sp.	*Potential SRE	
Punctidae	*Westralaoma expicta*	Widespread	
	Westralaoma cf. *expicta*	*Potential SRE	Uncertain ID
Pupillidae	*Gastrocopta bannertonensis*	Widespread	
	Gastrocopta cf. *bannertonensis*	*Potential SRE	Uncertain ID
	Gastrocopta margaretae	Widespread	
	Gastrocopta aff. *margaretae*	*Potential SRE	Uncertain ID
	Pupoides adelaidae	Widespread	
	Pupoides beltianus	Widespread	
	Pupoides myoporinae	Widespread	
	Pupoides cf. *myoporinae*	*Potential SRE	Uncertain ID
Succineidae	*Succinea* sp.		
Tomichiidae	*Coxiella striatula*	Widespread	
	Coxiella c.f *striatula*	*Potential SRE	Uncertain ID

The families Barychelidae and Halanoproctidae were represented by higher level identifications, *Idiommata* sp. and *Conothele* sp., respectively. Both genera contain confirmed SRE species and they are therefore considered Data deficient SREs.

Pseudoscorpions

Epigean pseudoscorpions species are generally considered to have widespread distributions and it has been suggested that few species are SREs (Harvey 2002). Phoresy (dispersal by means of attachment to a host organism) has been documented for many families of pseudoscorpion (Jhasser Martínez *et al.* 2018; Lira and Tizo-Pedroso 2017; Muchmore 1972). Notably, however, some species have limited distributions and are normally restricted to specialised habitats including granite outcrops (Harvey 2010, 2012; Harvey 2018; Harvey *et al.* 2015). Pseudoscorpion taxonomy is poorly resolved, largely due to the group containing many species and thus range determination can be difficult.

At least five species from four families of pseudoscorpion have been recorded within the study area and are all considered Data deficient SREs. *Austrohorus* `salt lake species` was collected from the fringing habitat of Lake Lefroy in shrublands of samphire and is unlikely to occur at the Project. *Synsphyronus* `PSE078` is currently only known from one site near Lake Lefroy, approximately 50 km south of the development envelope. *Conicochernes* `PSE024` is known from a single site approximately 50 km north-east of the Project. Both species potentially occur at the Project. The higher-level records of *Beierolpium* and *Afrosternophorus* represent additional species but meaningful range information cannot be inferred; they are treated as Data deficient SREs.

Scorpions

Many scorpion species in Western Australia have been informally named with voucher specimens lodged in WAM, but there is no public information to allow these species to be recognised. Accordingly, determining the distribution of species requires visits to WAM to determine whether specimens match vouchers. Some information is provided below.

Urodacidae

The genus *Urodacus* (burrowing scorpions) is endemic to Australia, and there are currently 20 described species, with many undescribed species known in the WAM collection. Some of the described species are widespread, but even in these species the populations are restricted and only occupy small and patchy areas of the available habitat. At the same time, other *Urodacus* species are Confirmed SREs, so that undescribed *Urodacus* are often considered to be Potential SREs.

Four species of *Urodacus* have been recorded in the search area, *U. armatus*, *U.* `majestic`, *U. hoplurus* and *U. yaschenkoi*. *Urodacus* `majestic` is currently only known from 6 km north of the Project; it is a Data deficient SRE that is likely to occur at the Project. *Urodacus hoplurus* is a Widespread species. *Urodacus armatus* has a State-wide distribution but is probably a species complex (Volschenk *et al.* 2010). *Urodacus armatus* has been recorded 25 km north of the Project and is treated here as a Data deficient SRE that likely occurs at the Project. *Urodacus yaschenkoi* is treated as a Data deficient SRE because there is some evidence to suggest it is also a species complex (Luna-Ramirez *et.al* 2017).

Buthidae

The genus *Isometroides* occurs across semi-arid and arid areas, and it is currently represented by two described species, with many more awaiting description. The two species recorded in the search area are the widespread *Isometroides* `goldfields 1` and *Isometroides vescus*. The spider hunting scorpion *Isometroides vescus* is regarded as a widespread species (ALA 2022) but there is some evidence that the Western Australian specimens represent a species complex and it is treated as a Data deficient species.

The genus *Lychas* occurs throughout Australia and includes some widespread species inhabiting sandy plains and open woodlands. Five species of *Lychas* have been recorded in the search area: *Lychas*

annulatus, *Lychas* `pilbara 1, *Lychas* `bituberculatus complex`, *Lychas splendens* and *Lychas jonesae*. Of these species, *Lychas jonesae, Lychas splendens* and *Lychas* `pilbara 1` are Widespread. *Lychas annulatus* records are widespread in the Bennelongia database but are considered to be part of a species complex and thus a Data deficient SRE that may occur at the Project. There is no information available on *Lychas* `bituberculatus complex`, which is treated as a Data deficient SRE.

Myriapods
Although some centipedes are known to be Confirmed SREs, those previously recorded in the search area are all Widespread species (Table 2).

The millipede *Antichiropus* `DIP145, Kalgoorlie` belongs to a genus that is well-known for containing SRE species. This species is currently only known from a site 35km north of the Project and is treated as a Data deficient SRE. The millipede *Cylindroiulus brittanicus* is a northern hemisphere species.

Snails
Fifteen species of snail have been recorded in the search area belonging to six families. The majority of the land snails are Widespread species, however due to the taxonomic uncertainty of some of the records (i.e. *Westralaoma* cf. *expicta*) some have been assigned as Data deficient SREs.

Bothriembryon sp. belongs to a genus known to contain some SRE species. There are multiple records of this genus within the search area but, as it is a higher-level identification, little can be inferred about its range. It is classified as a Data deficient SRE.

4.2.1. Listed Species
The desktop assessment identified two butterfly species listed under the *Biodiversity Conservation Act 2016* that could potentially occur near the Project (Figure 4). These are the Critically Endangered butterfly *Ogyris subterrestris petrina* and Priority 1 butterfly *Jalmenus aridus*.

Ogyris subterrestris petrina is known from sites near Kalgoorlie (ALA 2022) and occurs in mallee-dominated woodland. This species depends on the sugar ant (*Camponotus terebrans*), with the butterfly depositing its eggs at the entrances of sugar ant nests that abut the base of living trees and shrubs of various species. The host ant species is a widespread but generally uncommon ant that occurs in much of inland southern Australia. There are records of this butterfly species in the search area, and the primary habitat associated is mallee-dominated woodlands (where the host ant constructs nests). It is possible that *Ogyris subterrestris petrina* occurs at the Project.

The Priority 1 butterfly *Jalmenus aridus* is known from a handful of records near Kalgoorlie and Ngaanyatjarraku in the Northern Yilgarn, indicating that it may be rare, but widespread in the Yilgarn. The species is not commonly collected and is poorly represented in Australian research collections. The larvae of this butterfly feed on the leaves and flowers of *Senna* spp. and *Acacia tetragonophylla* (Graham and Moulds 1988). Both host plants occur widely in the Yilgarn and are generalist species that do not occur on specific geologies or soils, so this butterfly may be widespread but poorly sampled. Both *Senna* spp. and *Acacia tetragonophylla* have been recorded at the Project (Botanica 2021). These butterflies are not SREs but rather of conservation significance due to being listed as Priority 1 and Critically Endangered species.

5. CONCLUSION
This desktop assessment aims to evaluate the prevalence of SRE Group species in the search area around the Project. Based on records of 61 SRE Groups species in the search area, where there has been only low survey effort, the Project appears to have the potential to harbour a high number of species from groups that contain SRE species.

The likelihood of the species belonging to SRE Groups having small ranges is unclear. Of the 61 species, there was only one Confirmed SRE, one Potential SRE, 35 Data deficient SREs and 25 Widespread species. The distribution species in these SRE categories is more likely to reflect lack of information rather than providing a reliable guide to the pattern of species distributions.

The Project area contains many prospective habitats for SRE groups including, *Eucalyptus* woodland on rocky slopes and *Eucalyptus* woodland on clay-loam plain. The most prospective habitats for SRE species at the project are predicted to be the *Allocasuarina* in drainage lines and *Eucalyptus* woodland on upper rocky slopes. This is due to their spatial isolation and disconnectedness within the Project area, with each habitat type accounting for approximately 4% of total habitat in the area. The remaining habitat types appear to be well connected and extend beyond the Project area.

In total, the desktop assessment revealed that 63 species from SRE groups occur in the search area. These include 21 species of mygalomorph spiders, two species of araneomorph spiders, five species of pseudoscorpion, 12 species of scorpion, four species of centipede, two species of millipede and 17 species of land snail (Table 2).

Two listed butterflies have been recorded in the search area and potentially occur at the Project, the Arid Bronze Azure Butterfly (*Ogyris subterrestris petrina*) and the Inland Hairstreak (*Jalmenus aridus*).

There is a great deal of taxonomic uncertainty in the identifications of the records captured in the desktop search, however it is clear that a diverse community of potentially restricted species occurs within the broad region of the Project. The Project area is prospective for SRE groups however the relative size of the disturbance footprint (230 ha) and the extensiveness of connected habitat outside of the Project area, the threat to SRE species from the proposed development is likely to be low.

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Appendix C: Memorandum: Arid Bronze Azure Butterfly and Inland Hairstreak desktop assessment

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Memorandum: Arid Bronze Azure Butterfly and Inland Hairstreak desktop assessment

Botanica Consulting Pty Ltd (Botanica) was commissioned by Black Cat Syndicate (Black Cat) to undertake a desktop assessment of the Fingals Project area to determine if the Arid Bronze Azure Butterfly (ABAB) and the Inland Hairstreak would be present.

Black Cat had commissioned Bennelongia Environmental Consultants to undertake a desktop assessment to determine the prevalence of SRE invertebrate species in the Project area and within a 100 x 100 km square area centered on the Project. This assessment identified two species of butterflies that were recorded in a desktop search area, the Arid Bronze Azure Butterfly (*Ogyris subterrestris petrina*) and the Inland Hairstreak (*Jalmenus aridus*). The arid bronze azure butterfly is a threatened species that is listed as critically endangered under the national *Environment Protection and Biodiversity Protection Act 1999* and the state *Biodiversity Conservation Act 2016*. The Inland Hairstreak is listed as Priority 1 fauna under the state *Biodiversity Conservation Act 2016*.

Project Setting

Black Cat is looking to recommence gold mining at the Fingals Project, which was last mined in the early 1990's. The Project is located in the goldfields, 40km southeast of Kalgoorlie (Figure 1). Proposed operations will involve cutback and expansion of the existing open cut pits as well as the construction of associated mine infrastructure. The disturbance footprint is estimated at 230 ha of which, approximately 60 ha is formerly disturbed.

The Project is situated within the Mt Monger Pastoral Lease in the Eastern Goldfields in the Coolgardie Bioregion. The landscape consists of undulating plains separated by low hills and sandplains. There are also salt lake systems in the area. Vegetation is predominantly eucalypt woodlands, mulga shrublands, acacia-casuarina thickets, spinifex grassland and halophytic shrublands.

Botanica completed a reconnaissance flora/ vegetation survey and basic fauna survey within the Fingals Project area in November 2020, covering approximately 1,192 ha. The survey identified five broad-scale vegetation communities within the survey area. The survey found the *Eucalyptus* low open woodland on lower rocky slopes was the most widespread community in the survey area, occupying 388 ha (32.6%).

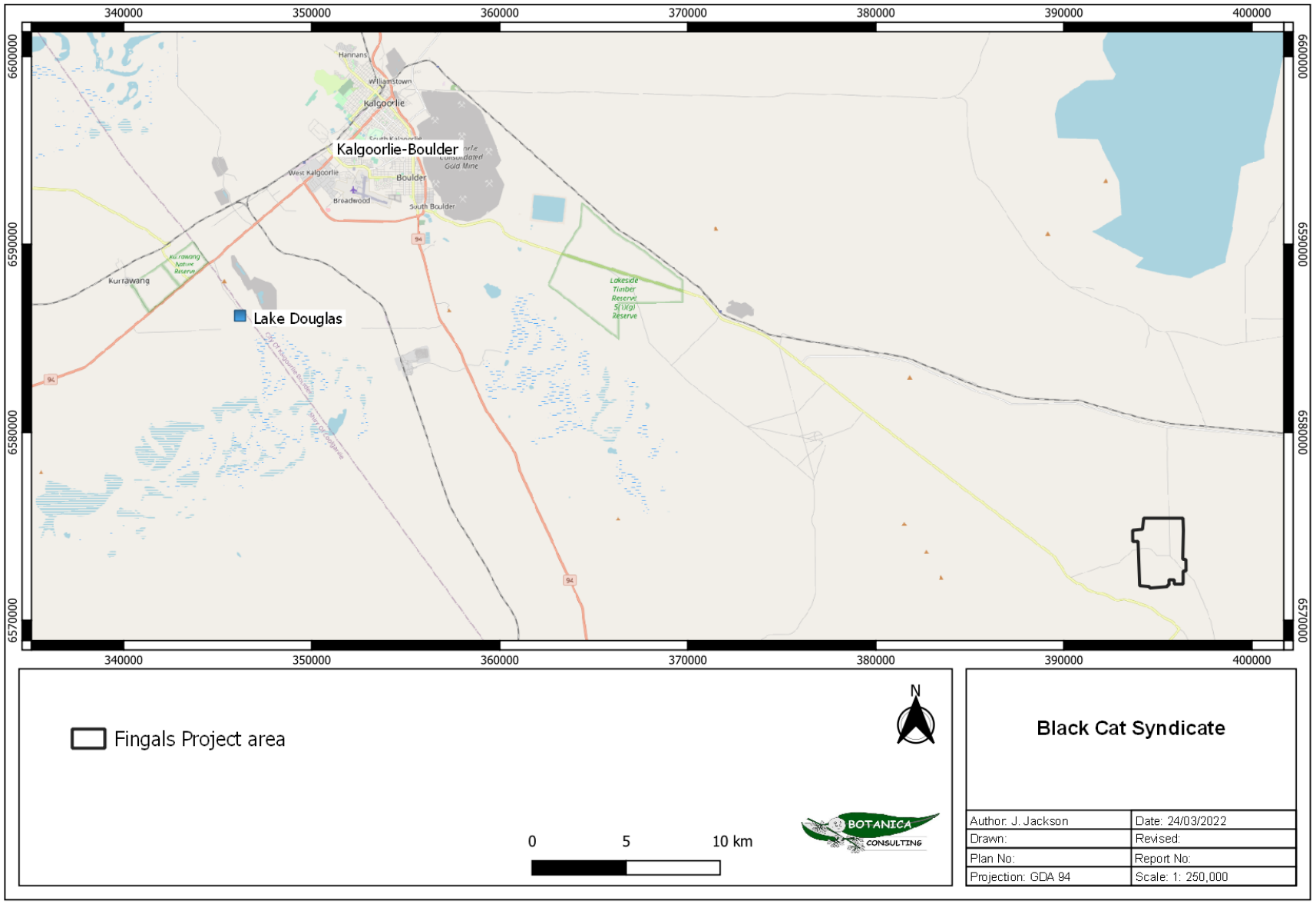

Figure 1. Regional Map showing the location of the Fingals Project area

Arid Bronze Azure Butterfly and *Camponotus terebrans*

The arid bronze azure butterfly (ABAB) (*Ogyris subterrestris petrina*) is a threatened species that is listed as critically endangered under the national *Environment Protection and Biodiversity Protection Act 1999* and the state *Biodiversity Conservation Act 2016*. The ABAB is listed due to its severely fragmented distribution with only two extant subpopulations being recorded in Western Australia. These subpopulations are at Barbalin Nature Reserve west of Mukinbudin in the Western Australian wheatbelt, and at a second site ~100 km from Barbalin. A third subpopulation (the first discovered, in the 1980s) occurred near Lake Douglas, 12 km southwest of Kalgoorlie but is now locally extinct and no ABAB have been recorded there since 1993 (DBCA, 2020a). In late 2020, Zoologist Greg Harewood sighted an ABAB north of Kalgoorlie within similar habitat to the extinct Lake Douglas population (*E. concinna* mallee woodland). Due to the sensitive nature of this record which potentially represents a new population of this species, specific location details will not be presented here, and a reference will be withheld.

The ABAB has an obligate association with a sugar ant *Camponotus* sp. nr. *terebrans*. The ABAB's larvae live entirely within the ant's nest during their development. The ants protect the larvae from predators and are thought to be rewarded with secretions produced by the larvae. The most critical factor for habitat occupancy by the butterfly is the presence of large colonies of the host ant; only large colonies can support the ABAB because, being a parasitic species, it requires large numbers of hosts.

Camponotus terebrans, also known as the brown-headed sugar ant, are relatively distinctive in that they have a dark brown head and matching abdomen (pictured below). The ant is approximately 8 millimetres long with some variation between minor workers (smaller) and major workers (larger) (Harewood, 2020).

Camponotus terebrans is one of the most common ants in sandy soils of southern Australia and is one of the first ant species to colonise disturbed sites (McArthur et al, 1997).

At the two known extant sites where the ABAB occurs, the vegetation is mature mixed gimlet *Eucalyptus salubris* / Salmon gum *E. salmonophloia* woodlands on red-brown loam soils, with an open understorey. In addition to gimlet and salmon gum, other smooth-barked eucalyptus at these sites which have basal ant colonies include wandoo *E. capillosa* subsp. wandoo, smooth-barked York gum *E. loxophleba* subsp. *lissophloia* and ribbon barked mallee *E. sheathiana*. The habitat at the locally extinct Lake Douglas site differs from the other sites but is also dominated by mature smooth-barked eucalypt woodland, particularly Victoria Desert mallee *E. concinna* (DBCA, 2020a). The host ant colonies occur at the base of mature smooth-barked eucalypts. To determine if the host ant is present at a site, and in what numbers, a random sample of trees is examined and assessed for ant presence/absence. DBCA has published survey guidelines for the ABAB and these outline the recommend survey techniques to determine the presence of this species.

Previous surveys completed by Botanica for the *Camponotus* sp. nr. *terebrans* has identified three colonies from nearly 700 trees sampled. Two of these were at the base of *E. salmonophloia,* the other was at the base of a *E. yilgarnensis*. *E. yilgarnensis* is typically a mallee that grows to about 6 m high. The bark is usually rough, fibrous, or flaky at the base of the trunk, this is known as a 'stocking', and the rest of the trunk is smooth above (DBCA, 2021). In this case, this *E. yilgarnensis* was mostly smooth barked and did not have a stocking. Soils and landscapes where these colonies were found were described as a sandy clay textured soil on a flat plain.

Inland Hairstreak

The Inland Hairstreak (*Jalmenus aridus)* is endemic to Western Australia and is listed as Priority 1 fauna under the state *Biodiversity Conservation Act 2016*. Only 16 collections are known, 15 of these are from near Kalgoorlie, one is from the Gibson desert (ALA, 2020). It was last sighted in Western Australia at Karamindie, which is about 28 km south of Kalgoorlie (DBCA, 2021a). Little is known about its biology or ecology. Based on the historical records, the larva of this species is thought to feed on leaves and flowers of young shrubs of *Senna nemophila* (recent taxonomic revisions classify as *Senna artemisioides* subsp. × *coriacea*) and mature trees of *Acacia tetragonophylla*, which grow in shallow gullies with gentle slopes (Braby, 2016). The larvae of the butterfly are attended by the Froglet ant *Froggatella kirbii*. The adults are likely to stay close to the breeding habitats. There are likely two generations per year, although adults are absent in some years (Braby, 2016). There are no published survey guidelines for the Inland Hairstreak, however due to this species association with *Froggattella kirbii,* it is recommended to search for these near known habitat trees for the species (*Acacia tetragonophylla* and *Senna artemisioides* subsp. x *coriacea*).

Previous surveys completed by Botanica for the Inland Hairstreak has not found any colonies or individuals.

Assessment of the Project Area as Potential Habitat for the ABAB

The 2020 Botanica survey of the Fingals Project area identified a total of five broad-scale vegetation communities. Of these five vegetation communities, only two were considered possible to suit the soil type where the *Camponotus* sp. nr. *terebrans* are likely to be found. These were the two Eucalypt woodland communities growing on clay loam plain.

Ten species of Eucalypts were identified across these five vegetation communities. Of these ten, only four are smooth barked at the base and therefore considered potential habitat trees for the *Camponotus* sp. nr. *terebrans* (Table 1).

An assessment of each of these vegetation communities is presented in Table 2. It is unlikely that the Fingals Project area would support the *Camponotus* sp. nr. *terebrans,* or the ABAB.

Table 1: Eucalypts identified in the Fingals Project area

Family	*Taxon*	DD-CF1	CLP-EW1	CLP-EW2	RS-EW1	RS-EW2
Myrtaceae	*Eucalyptus celastroides*			*	*	*
	Eucalyptus ewartiana					
	Eucalyptus gracilis	*				
	Eucalyptus griffithsii		*			
	Eucalyptus lesouefii		*		*	
	Eucalyptus ravida			*	*	
	Eucalyptus salmonophloia			*	*	
	Eucalyptus salubris	*			*	
	Eucalyptus stricklandii				*	*
	Eucalyptus transcontinentalis				*	

*Green shading indicates a smooth bark Eucalypt.

Table 2: Assessment of vegetation communities for ABAB habitat potential

Vegetation Community	Broad Floristic Formation (NVIS III)	Vegetation Description (NVIS V)	Landform	Assessment for ABAB habitat potential
DD-CF1 31 ha (2.6%)	*Casuarina* low forest	*Casuarina pauper* low forest over *Eremophila decipiens* open shrubland over *Maireana triptera* low sparse shrubland.	Drainage Channel	Very unlikely. Casuarina woodlands are not known to support the ant *Camponotus* sp. nr. *terebrans,* or the ABAB.
CLP-EW1 314 ha (26.3%)	*Eucalyptus* low open woodland	*Eucalyptus lesouefii* low open woodland over *Senna artemisioides* subsp. *filifolia* and *Maireana triptera* low open shrubland.	Clay/loam plain.	Unlikely. The soil type may support *Camponotus* sp. nr. *terebrans* but given that no smooth bark Eucalypts were identified in this vegetation community (Table 1), and *E. lesouefii* is listed as the dominant tree it is unlikely to support *Camponotus* sp. nr. *terebrans,* or the ABAB.
CLP-EW2 315 ha (26.4%)	*Eucalyptus* open woodland	*Eucalyptus ravida* low open woodland over *Maireana triptera* low open shrubland.	Clay/loam plain.	Unlikely. The soil type may support *Camponotus* sp. nr. *terebrans* but only two species of smooth bark Eucalypts were identified in this vegetation community (Table 1), and *E. ravida* was listed as the dominant tree in this community. Although a smooth bark Eucalypt, *E. ravida* is not mentioned in any literature indicating that it supports colonies of *Camponotus* sp. nr. *terebrans. E. salmonophloia* was present but in low numbers. It is unlikely this community would support *Camponotus* sp. nr. *terebrans,* or the ABAB.
RS-EW1 388 ha (32.6%)	*Eucalyptus* low open woodland	*Eucalyptus lesouefii*, *E. salmonophloia* and *E. salubris* woodland over *Tecticornia disarticulata* low open shrubland.	Lower rocky slopes	Very unlikely. Rocky soil substrates are not known to support the ant *Camponotus* sp. nr. *terebrans,* or the ABAB.
RS-EW2 26 ha (2.2%)	*Eucalyptus* low woodland	*Eucalyptus stricklandii* low woodland over *Melaleuca sheathiana* shrubland.	Upper rocky slopes	Very unlikely. Rocky soil substrates are not known to support the ant *Camponotus* sp. nr. *terebrans,* or the ABAB.

Assessment of the Project Area as Potential Habitat for the Inland Hairstreak

The 2020 Botanica survey of the Fingals Project area identified *Acacia tetragonophylla* to be present in the *Casuarina* low forest in a drainage channel vegetation community. This community was estimated to cover approximately 31 ha (2.6%) in the northwestern corner of the Project area (as identified in vegetation community type DD-CF1 in Figure 2). It is not known if these *A. tetragonophylla* were old mature trees, as described by Braby (2016) as the preferred trees for the larvae to feed on. No *Senna artemisioides* subsp. × *coriacea* were identified in the Project area.

It is difficult to assess an area for its potential as habitat for the Inland Hairstreak, as little is known about this species and its general ecology. Botanica would rate this vegetation community as being likely to be potential habitat for the Inland Hairstreak, and its larvae may use this species for a food source but considers that there is a very low probability of them being present in the Project area. Furthermore, the proposed mine development footprint is illustrated in Figure 2, overlaying this with the potential habitat of the Inland Hairstreak demonstrates that any mine development would not encroach on this habitat and would not impact any population of the Inland Hairstreak if present.

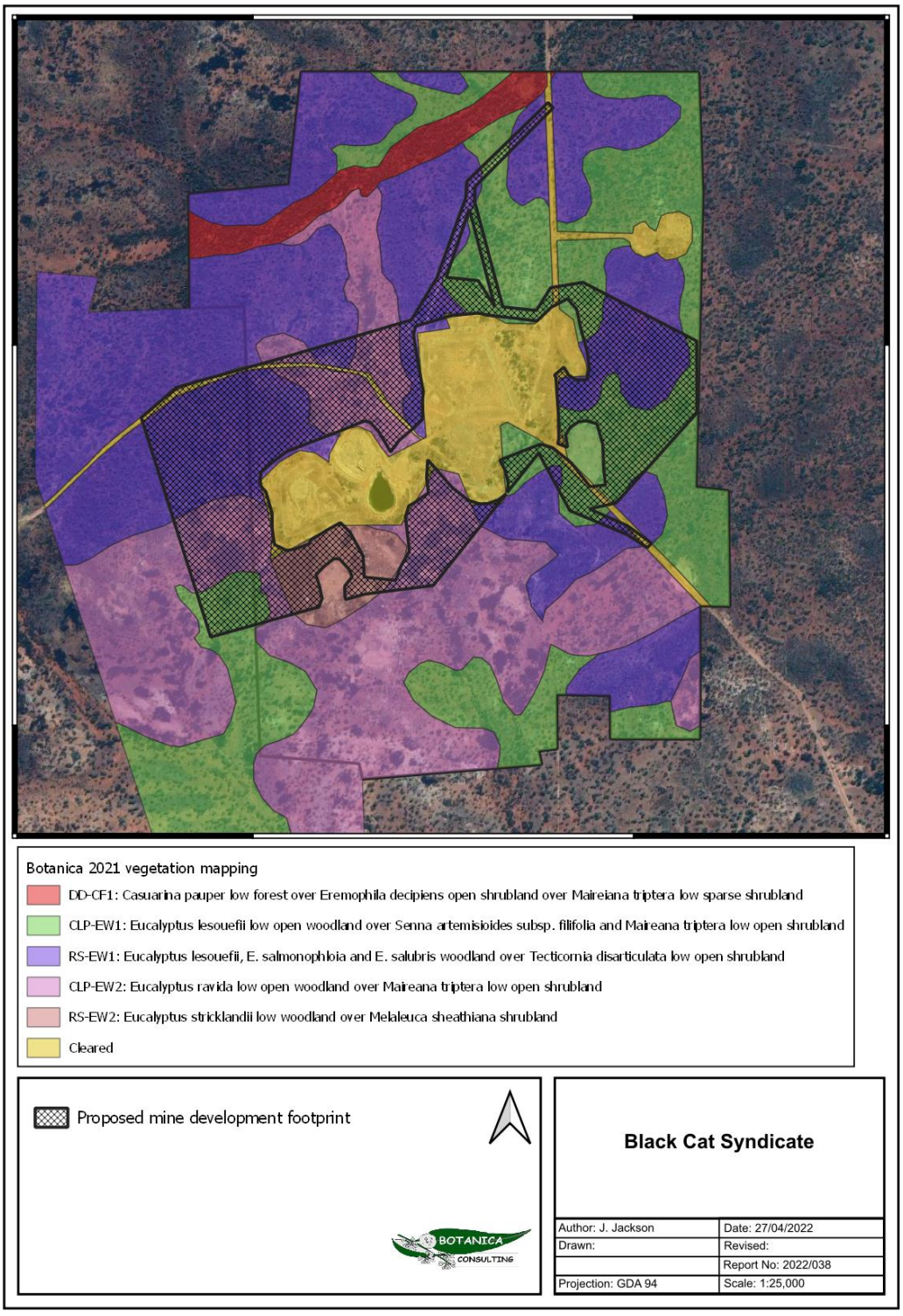

Figure 2: Overlay of proposed mine development footprint over vegetation communities

Summary

The ABAB is not likely to be using the Fingals Project area for breeding, and it is unlikely that the host ant *Camponotus* sp. nr. *terebrans* are present in the area.

The Project area may support approximately 31 ha of a vegetation community where a species of Acacia is present, and the Inland Hairstreak may use this species as a food source, but there is a very low probability of them being present in the Project area. Any proposed clearing for mining would not impact this vegetation community.

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