Bennelongia Environmental Consultants

Short Range Endemic Survey at the Mt. Marion Lithium Project

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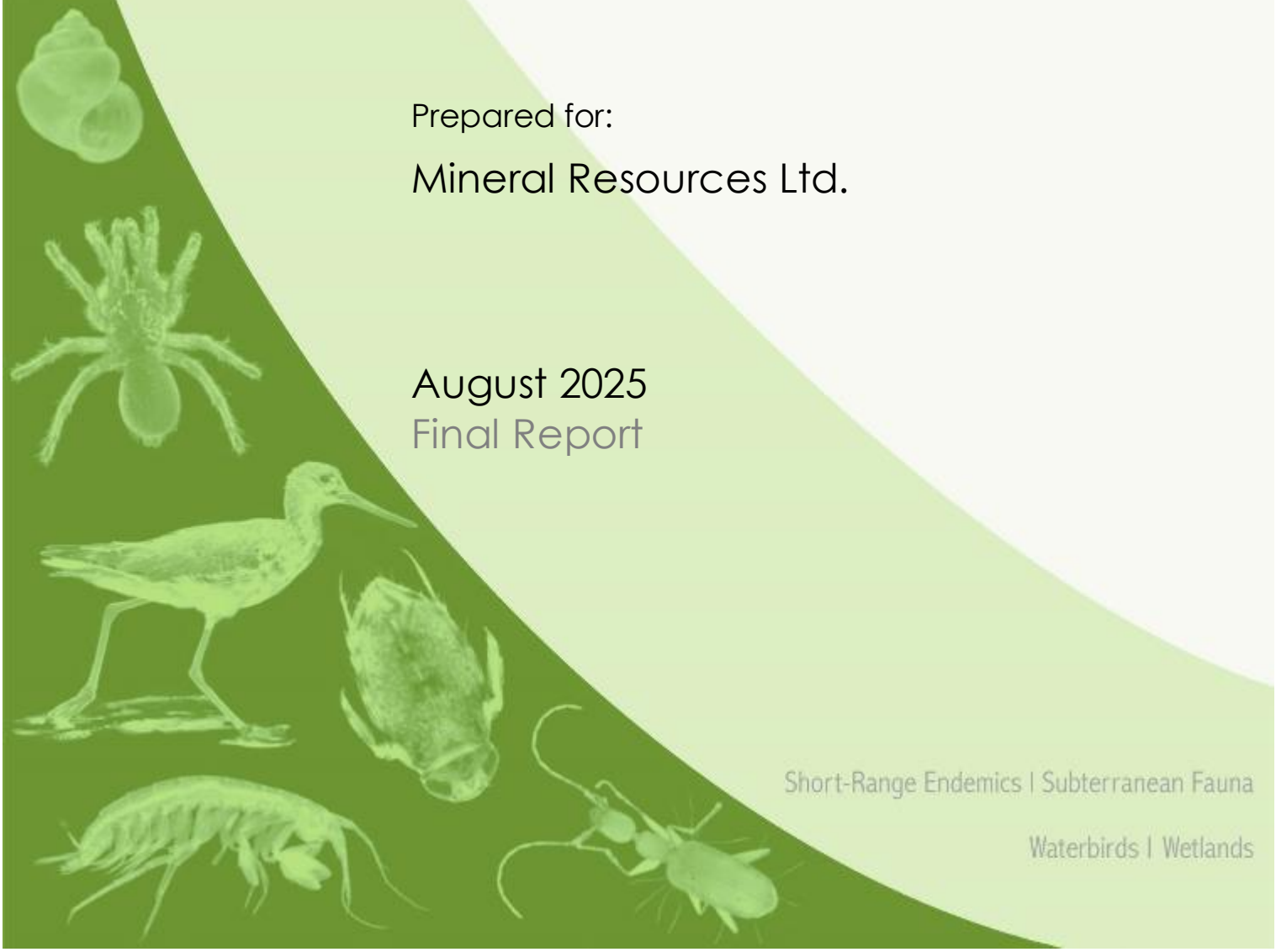
Final Report



Short-Range Endemics | Subterranean Fauna

Waterbirds | Wetlands

Short Range Endemic Survey at the Mt. Marion Lithium Project

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EXECUTIVE SUMMARY

The Mt. Marion lithium operation operated by Mineral Resources Ltd. (MinRes) is located approximately 40 kms south-west of Kalgoorlie in the Goldfields region of Western Australia. The mine site has one of the world's largest high-grade lithium concentrate reserves and has been producing lithium concentrate since 2017. MinRes have recently indicated the priority to expand exploration activities and infrastructure in the areas around the existing site boundary (the Project). It is likely that such expansions could disturb habitat prospective for short range endemic invertebrates (SREs). As such, MinRes has requested that Bennelongia Environmental Consultants (Bennelongia) undertake a desktop assessment and detailed SRE survey in the areas prioritised for exploration and infrastructure.

We report here on the findings from a desktop assessment, an assessment of habitat prospective for SREs and the results from two rounds of survey – one in the dry season (May) and one in the wet season (August) - to support existing mining proposals, hereon referred to as the Project Area, and areas of potential expansion as described by Programmes of Work (PoWs), hereon referred to as the Survey Area. The specific objectives of this work are to:

- Characterise the regional SRE invertebrate community within a desktop Search Area
- Identify the occurrence of prospective SRE habitat in the Project and Survey Areas
- Identify confirmed or likely SRE species in the Project and Survey Areas and assess their conservation significance

The Project occurs in the Eastern Goldfield subregion of the Coolgardie Bioregion in the Yilgarn Craton's Eastern Goldfields Terrain. The Coolgardie Bioregion includes granite outcrops, low greenstone hills, laterite uplands, and broad plains. The Eastern Goldfield subregion contains the interzone eucalypt and mulga/spinifex environments while numerous salt lakes occur throughout. The Eastern Goldfields subregion is characterised by mallees, acacias, thickets and shrub-heaths on sandplains, along with diverse eucalypt woodlands. The diverse vegetation types surrounding the Project Area play a crucial role in supporting terrestrial invertebrate populations, including those belonging to SRE Groups.

In addition to having ranges notionally less than 10,000 km^2, SRE species usually have 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 by the Environmental Protection Authority. Assessment focuses on so-called SRE Groups, which are higher-level taxonomic groupings known to contain moderate to high proportions of SRE species. SRE Groups include some families of land snails, millipedes, centipedes, pseudoscorpions, scorpions, spiders, slaters and in mesic landscapes velvet worms and earthworms. However, determining whether a species belonging to an SRE Group is in fact an SRE is often difficult.

To help determine SRE status, this report follows the Western Australia Museum's (WAM's) classification system for SREs in recognising three categories:

1. **Confirmed SRE** species 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 SRE** species belong to a group with gaps in our knowledge of its distribution, 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 is well represented in collections via comprehensive sampling.

In many surveys, most species fit the **Potential SRE** category, but the likelihood of species within the category actually being SREs varies substantially. To increase the accuracy of categorisation for this report, the Potential SRE category is further sub-divided into three categories:

A. **Potential - Data Deficient** indicating that insufficient data are available to determine SRE status. Insufficiency of data may be caused either by a lack of geographic or taxonomic

information, or because the individuals sampled are not identifiable to species level (e.g. nondiagnostic sex, juvenile, damaged). This category is applied only to those species that belong to a known SRE Group, rather than being applied to any undescribed species in the records.

B. **Potential - Unlikely** species status is applied in one of two cases. First, the species belongs to an SRE Group but has been collected from many sites and/or multiple habitats. Second, the species belongs to a smaller taxonomic group within the SRE Group that tends not to contain SREs.
C. **Potential - Likely** species are from taxonomic groups in which SREs are likely, and when specimens have been collected from one or very few sites and/or habitats.

For the desktop assessment, the likelihood of SREs occurring within the Survey Area was made by reviewing animal records and associated geologies and broad vegetation types within a 100 km x 100 km desktop search area (the Search Area), where a record is the presence of a species at a location on a specific date. The Search Area was centred on the centre of the Survey Area and was bounded by coordinates 30°37'37.49"S to 31°32'2.22"S and 120°55'37.98"E to 121°58'46.07"E, equating to a search area of approximately 10,000 km^2. 719 historical records of SRE group animals within the Search Area were retrieved from the WAM and Bennelongia databases, as well as relevant grey literature. This consisted of 1340 specimens from at least 137 unique species. 39.4 % of records were mygalomorph spiders, 23.2 % were pseudoscorpions, 15.2 % were scorpions, 11.8 % were gastropod snails, 4.0 % were isopod slaters, 3.5 % were centipedes and 2.8 % were millipedes.

Nine broad habitats prospective for SRE Group species were identified within the Survey Area. The most abundant habitat is open Eucalypt woodland. Other widely dispersed but less prominent habitats include drainage lines, rocky hills and shrublands. The open woodlands, rocky hills and drainage lines are all characterised by a Eucalypt overstorey with a mid-storey consisting of sparse heathland including acacia and melaleuca. The rocky hills habitat, as well as occurring on sloped terrain, have protruding rocky areas of greenstone/granite/quartz providing shelter habitat. The shrublands consist of undulating plains of open to closed dense shrubland/heathland of *Melaleuca pauperiflora*, *Acacia acuminata*, *Hakea* spp., *Senna* spp., and *Eremophila* spp. with minimal ground cover. None of the broad habitat types were restricted to the Survey Area; rather they appear to be widespread at a regional scale.

For the field survey, hand foraging and dry trapping sampling targeting invertebrates belonging to SRE Groups was carried out in 2024 over two rounds - thirty sites were sampled from 7th-14th May and 31 sites were sampled from 15th-22nd August. The aim of the survey was to document the SRE Group fauna of the Survey Area and assess habitat connectivity, as well as make informed predictions on the likely occurrence within the Project Area. Specimens collected in the field by hand foraging were preserved in 100% ethanol and transported to Bennelongia's laboratory for identification. Those specimens for which taxonomic identification was not possible by morphology were sent for DNA sequencing. In total, 458 records of SRE Groups were recovered from both rounds of survey. This consisted of 642 specimens from at least 74 unique species. Fifteen species (20.3 %) were snails, 19 species (25.7 %) were spiders, eight species (10.8 %) were pseudoscorpions, 11 species (14.9 %) were centipedes, ten species were isopod slaters (13.5 %), five species were scorpions (6.8 %), and there were six species (8.1 %) of millipedes. Mapping these records onto habitat shows that SRE Group species were recovered from all 52 sample sites and, consequently, all nine habitat types.

Of the 72 species-level identifications, no species had confirmed SRE status, two were considered to be Potential – Likely, 17 Potential – Unlikely, 14 Potential – Data Deficient and 40 were considered to be Widespread. The two Potential – Likely species are an isopod slater, *Buddelundia* `BIS554`, and a Bothriembryontid snail, *Bothriembryon* `BGA053`. No species were conservation-listed. A summary of the two Potential – Likely SRE species is provided here:

***Buddelundia* `BIS554`** is an isopod slater of family Armadillidae. In this survey, it was collected from three different sites: site 20 on the 12th May and site 22 on the 13th May from leaf litter, and site 54 on the 20th August from a rock flip (Figure 7). Sites 20 and 54 are in shrubland, while site 22 is in a floodplain. The vegetation at sites 20 and 54 is dense and includes *Melaleuca pauperiflora*, *Acacia acuminata*, *Hakea*

spp., *Senna* spp. and *Eremophila* spp. with minimal ground cover. In addition, this species was found at three sites at Lake Lefroy in 2023, around 68 kms away.

Bothriembryon **`BGA053`** is a gastropod snail of family Bothriembryontidae and is a newly discovered species. It was collected from four sites: site 30 on the 9th May, site 01 on the 11th May, site 36 on the 19th August and site 51 on the 21st August (Figure 7). It was found from tree digs, litter rakes and log flips in host habitat types that include Drainage Line (sites 01 and 30) and Floodplain (sites 36 and 51) with vegetation consisting of eucalypt overstorey with acacia mulga shrubs. The known linear range is 36 kms.

The desktop assessment revealed a rich and diverse regional SRE Group community with representation from all seven non-worm groups, and habitat assessment suggested that habitats within the Survey Area are highly prospective for SRE Group species. Results from the survey agreed with the desktop assessment and demonstrated a rich and diverse SRE Group community. Nonetheless, only a small proportion of species (two) were regarded as being likely SREs based on our classification system, as many species occupied diverse habitat types. Further, while one likely SRE species is potentially restricted to the Survey Area, its habitat extends beyond the Survey Area boundary so it is possible with further sampling it would be found outside the Survey Area. Neither of the likely SRE species was found in the Project Area from the limited sampling done at that location.

Extending these observations to the Project Area, most of the habitat is already disturbed habitat due to clearance, reducing the potential for prospective habitat. Of the remaining area, there are three main habitats prospective for SREs - open Eucalypt Woodland, Drainage Line and Rocky Hill. Open eucalypt woodland and drainage lines extend into other regions of the Survey Area and beyond, therefore while an SRE species may occur in these habitats, it is unlikely to be restricted to the Project Area. A rocky hill habitat does intersect the Project Area and is entirely contained within the wider Survey Area. There is a chance that a potentially restricted confirmed or likely SRE occurs within that habitat in the Project Area. However, considering no other 'Potential – Likely' SRE is restricted to the rocky hill habitat within the Survey Area we believe this is unlikely. Five SRE Group species were recorded at the one site within the Project Area that was sampled (site 61). Of the four with species-level identifications, all were widespread.

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1. INTRODUCTION

The Mt. Marion lithium operation operated by Mineral Resources Ltd. (MinRes) is located approximately 40 kms south-west of Kalgoorlie in the Goldfields region of Western Australia. The mine site has one of the world's largest high-grade lithium concentrate reserves and has been producing lithium concentrate since 2017. MinRes have recently indicated the priority to expand exploration activities and infrastructure in the areas around the existing site boundary, including area to the north and west (Hamptons) and tenements to the east and south, covering an area of approximately 27,429 ha (274.29 km^2) (the Survey Area, Figure 1). It is likely that such expansions could disturb habitat prospective for short range endemic invertebrates (SREs). As such, MinRes has requested that Bennelongia Environmental Consultants (Bennelongia) undertake a desktop assessment and detailed SRE survey in the areas prioritised for exploration and infrastructure.

To account for variations in environmental conditions on SRE abundance, two rounds of survey are required – one in the dry season and one in the wet season. Here, we report on the findings from a desktop review, an assessment of habitat prospective for SREs and the results from both rounds of survey, to support the existing mining proposals (hereon referred to as the Project), and areas of potential expansion as described by Programmes of Work (PoWs) (hereon referred to as the Survey Area, see Figure 1). The specific objectives of this work are to:

- Characterise the regional SRE invertebrate community within a desktop Search Area
- Identify the occurrence of prospective SRE habitat in the Project and Survey Areas
- Identify confirmed or likely SRE species in the Project and Survey Areas and assess their conservation significance

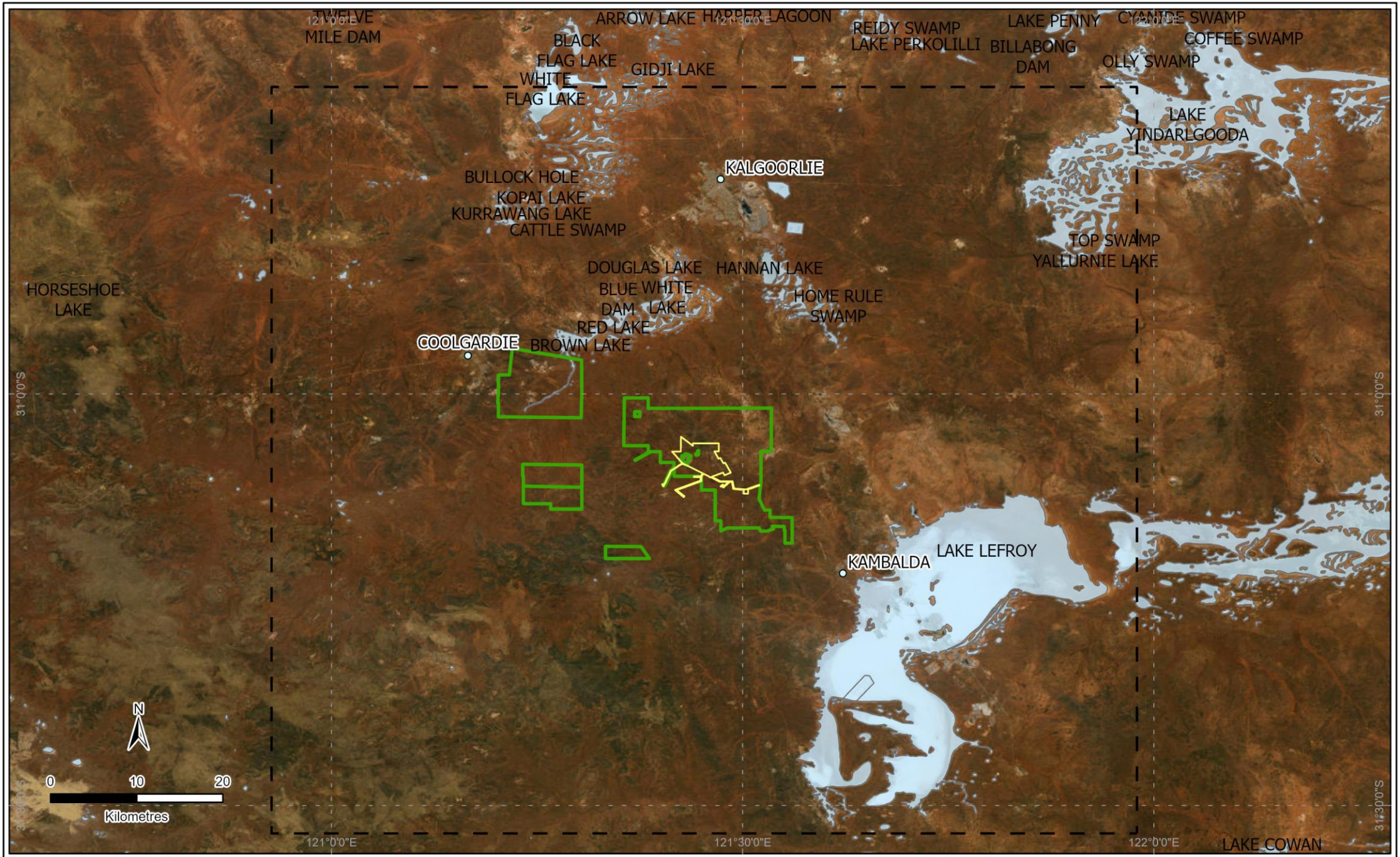
2. ENVIRONMENT

2.1. Project Location

The Project occurs in the Eastern Goldfield subregion of the Coolgardie Bioregion (COO3; Figure 2A) in the Yilgarn Craton's Eastern Goldfields Terrain. The Coolgardie Bioregion includes granite outcrops, low greenstone hills, laterite uplands, and broad plains. The Eastern Goldfield subregion contains the interzone eucalypt and mulga/spinifex environments while numerous salt lakes occur throughout. Both gold and nickel mining are central to the bioregion's economy, with its major population centres being Kalgoorlie, Coolgardie and Norseman. Climate in the bioregion is semi-arid, with an average annual rainfall of 248 mm (Cowan 2001). Table 1 shows the monthly total rainfall and monthly mean maximum temperatures from August 2023 to August 2024 at the Southern Cross Airfield (31.24° S, 119.36° E).

Table 1. Total rainfall (mm) and monthly mean maximum temperature (°C) at Southern Cross Airfield (31.24° S, 119.36° E).

	Aug 23	Sep 23	Oct 23	Nov 23	Dec 23	Jan 24	Feb 24	Mar 24	Apr 24	May 24	Jun 24	Jul 24	Aug 24
Rainfall (mm)	25.6	19.2	1.4	11	1	33.2	29.4	7	11.8	6.6	64	50.6	32.2
Temp. (°C)	21.4	25.8	29.1	31.8	34.7	35.9	37	29.8	25.8	24.6	18	17.5	19.1



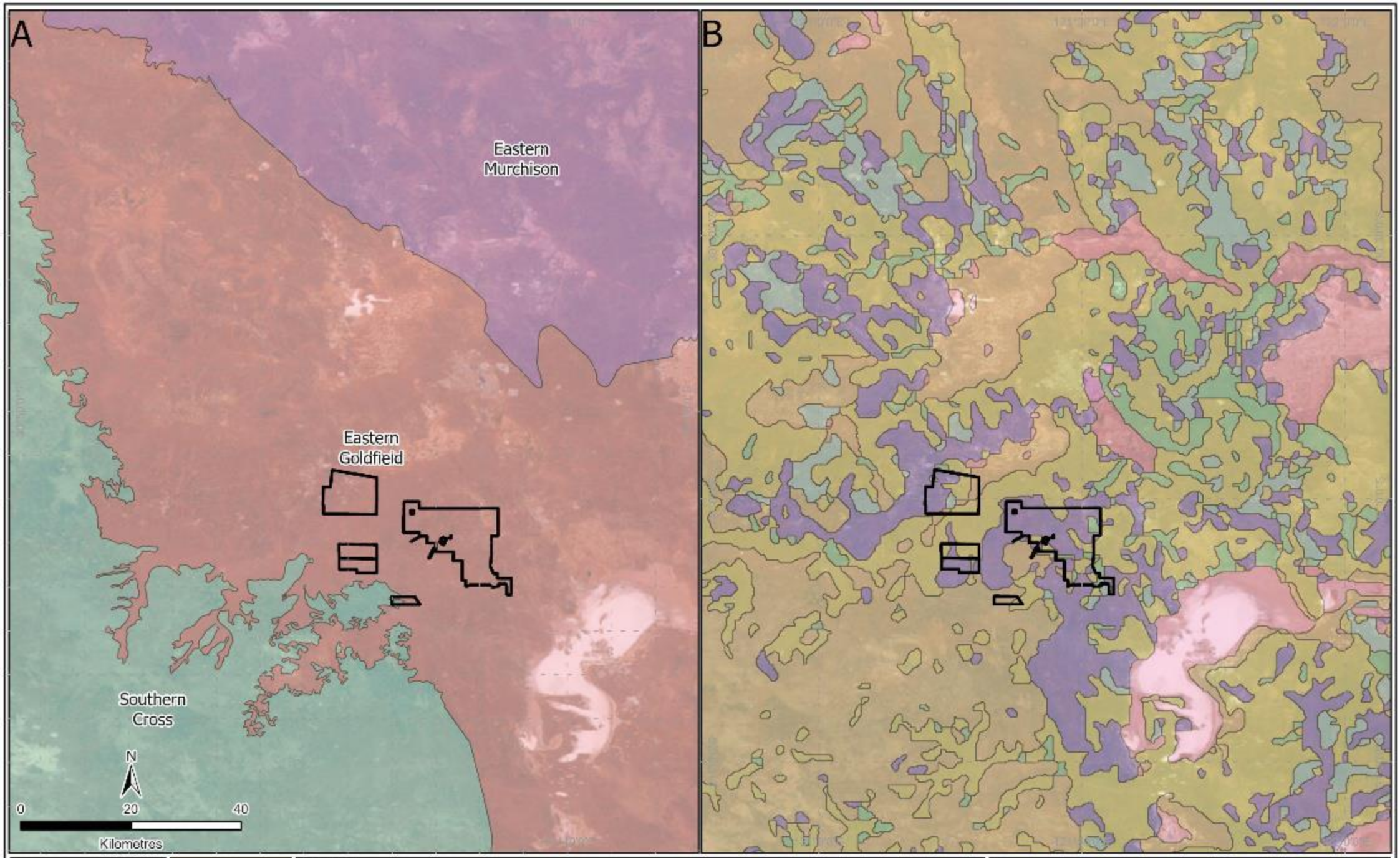
Bennelongia Environmental Consultants

GCS GDA 1994
Author: dwhite
Date: 21/04/2025

Legend

towns
waterbodies
Survey Area
Project Area
Search Area

Figure 1. The Project



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GCS GDA 1994
Author: D. White
Date: 3/02/2025

Legend

SRE Survey Footprint

Regolith

- Alluvium
- Anthropogenic areas
- Colluvium
- Exposed
- Lacustrine
- Residual
- Sandplain

Figure 2. IBRA subregions (A) and regolith (B) around the Survey Area.

2.2. Geological setting

The Project sits on the Yilgarn Craton in the central part of the Precambrian Western Shield of Australia and comprises gentle undulating plains 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 consists of gneisses and granites eroded into a flat plane covered with tertiary soils and scattered exposed bedrock. Calcareous earths are the dominant soil group and cover much of the plains and greenstone areas (Cowan 2001).

The Project Area and the vast majority of the Survey Area sit within the Eastern Goldfield sub-region of the Coolgardie IBRA region (Figure 2A). The Regolith around the Project Area is dominated by colluvium, mostly consisting of deposits of colluvium and sheetwash. There are small areas of alluvium, particularly in drainage channels, floodplains and deltas. Exposed weathered rock and sandplains are common (Newsome 2000) (Figure 2B).

2.3. Vegetation

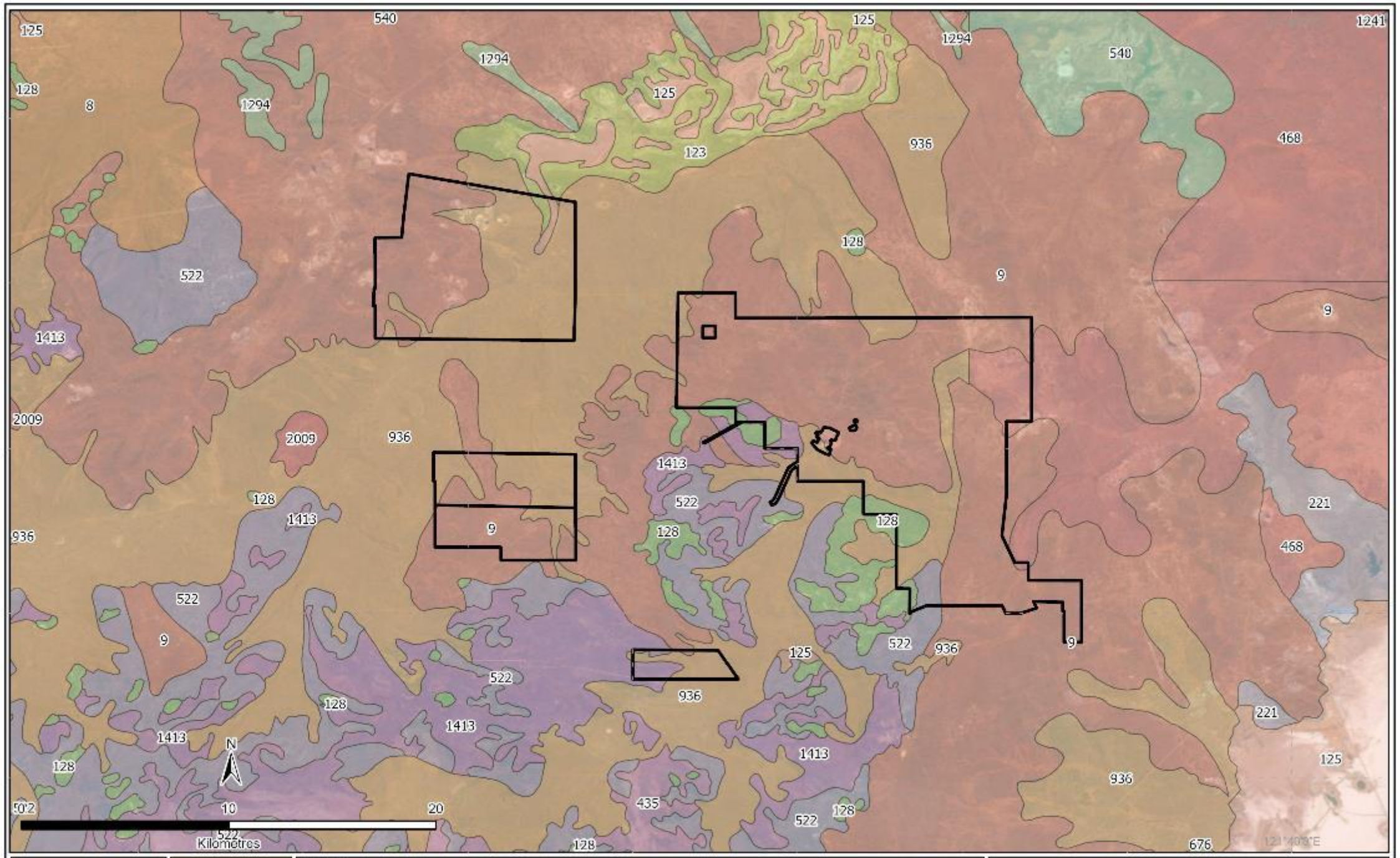
The Eastern Goldfields subregion is characterised by mallees, acacias, thickets and shrub-heaths on sandplains, along with diverse eucalypt woodlands (Cowan 2001). Approximately 16 Vegetation System Associations occur in the vicinity of the Survey Area, according to Beard's pre-European vegetation mapping (Beard 1975) (Table 2, Figure 3) and it is estimated that four of these (Systems 9, 123, 468, 1294) have greater than 85 % of their total extent within the subregion (Cowan 2001).

The Survey Area is dominated by two Vegetation System Association units, 9 and 936, with smaller representation of units 1413, 128, 468 and 522 (Figure 3). Vegetation systems 9 and 936 are characterised by medium woodlands, differing only in the species. System 9 is dominated by goldfields blackbutt (*Eucalyptus lesoufii*) and coral gum (*E. torquata*), while system 936 is dominated by salmon gum (*E. salmonophloia*). Systems 468 and 522 are also associated with medium woodland consisting of salmon gum and goldfields blackbutt, and redwood (*E. transcontinentalis*) & merrit (*E. urna*), respectfully. System 1413 is associated with acacia, casuarina & melaleuca thicket shrublands, while system 128 consists of rocky outcrops (Table 2; Figure 3).

The diverse vegetation types surrounding the Project Area play a crucial role in supporting terrestrial invertebrate populations, including those belonging to SRE Groups, and thus contribute significantly to overall biodiversity and ecosystem health. Vegetation types offer a variety of microhabitats and resources exploited by terrestrial invertebrates. For instance, the open woodlands offer a mix of vegetation cover, sunlight, and soil conditions. Many invertebrate groups such as insects, slaters and arachnids thrive in these habitats, utilising the vegetation for shelter and food, while also contributing to nutrient cycling through their interactions with plants and soil.

Tall shrublands and scrublands offer additional niches for terrestrial invertebrates. These dense vegetation patches provide refuge for species such as spiders, which utilise the tangled vegetation for web or burrow construction and hunting. Moreover, the presence of flowering plants in these habitats attracts pollinating insects such as bees, butterflies, and moths, further enriching the diversity of invertebrate communities.

Any disturbances to vegetation could have the potential to cause habitat fragmentation, which may have detrimental effects on invertebrate populations. For example, small, isolated populations are more susceptible to stochastic events and there is an increased chance of inbreeding. Therefore, it is important to assess the extent of habitat reduction and potential loss of connectivity when assessing the potential impacts of new projects to SREs.



Bennelongia Environmental Consultants

GCS GDA 1994
Author: D. White
Date: 3/02/2025

KALGOORLIE
Project
PERTH

Legend

SRE Survey Footprint

Beard's Veg Assoc Systems

123, 1241, 125, 128, 1294, 1413, 2009, 221, 435, 468, 522, 540, 676, 8, 9, 936

Figure 3. Beard's Vegetation System Associations found in the vicinity of the Survey Area

Table 2. Beard's Vegetation System Association units found in the vicinity of the Survey Area (see Figure 3).

Veg Assoc code	Description
8	Medium woodland of salmon gum and gimlet.
9	Medium woodland of coral gum (*Eucalyptus torquata*) and goldfields blackbutt (*E. lesoufii*).
123	Succulent steppe with open low woodland; sheoak over saltbush & bluebush
125	Bare areas; salt lakes.
128	Bare areas; rock outcrops.
221	Succulent steppe; saltbush.
435	Shrublands of *Acacia neurophylla, A. beuverdiana* and *A. resinomarginata* thickets.
468	Medium woodland of salmon gum and goldfields blackbutt.
522	Medium woodland of redwood (*E. transcontinentalis*) & merrit (*E. floctoniae*)
540	Succulent steppe with open low woodland; sheoak over saltbush
676	Succulent steppe of samphire
936	Medium woodland of salmon gum
1241	Succulent steppe; bluebush
1294	Medium woodland; coral gum
1413	Shrublands of acacia, casuarina & melaleuca thicket
2009	Medium woodland; redwood & goldfields blackbutt

3. SRE FRAMEWORK

3.1. Short Range Endemics

In addition to having ranges notionally less than 10,000 km^2, SRE species usually have 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 the *Environmental Factor Guideline: Terrestrial Fauna* (EPA 2016a) and *Technical Guidance: Sampling of short range endemic invertebrate fauna* (EPA 2016b). Assessment focuses on so-called SRE Groups, which are higher-level taxonomic groupings known to contain moderate to high proportions of SRE species. SRE Groups include some families of land snails (Gastropoda; Bothriembryontidae and Camaenidae), millipedes (Diplopoda), centipedes (Chilopoda), pseudoscorpions (Pseudoscorpiones), scorpions (Scorpiones), spiders (Araneae; mainly Mygalomorphae), slaters (Isopoda), and in mesic landscapes velvet worms (Onychophora) and earthworms (Oligochaeta).

Not all species in SRE Groups have restricted ranges, many may be widespread. Determining whether a species belonging to an SRE Group is in fact an SRE is often difficult. One approach is to assume that the distribution of a species reflects the extent of its preferred or obligate habitat(s), and that species found only in restricted or patchy habitats have smaller ranges than those collected from extensive or common habitats. However, in cases where short range endemism is driven by life history characteristics,

a species may be a true SRE but inhabit a widespread, apparently well-connected habitat (Harvey 2002; Harvey *et al.* 2015; Harvey *et al.* 2011; Rix *et al.* 2015). Therefore, several factors are considered in conjunction when evaluating the SRE status of a species and the likelihood of threat to that species. These factors include: the known range of the species; habitat(s) at the collection site(s) and the spatial extent and connectivity of these habitats; and the distribution patterns of phylogenetically related surrogate species (ideally members of the same genus).

In order to synthesise investigations of these factors in the context of determining SRE status, this report follows the Western Australia Museum's (WAM's) classification system for SREs in recognising three categories:

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

In many surveys, most species fit the **Potential SRE** category, but the likelihood of species within the category actually being SREs varies substantially. To increase the accuracy of categorisation for this report, the Potential SRE category is further sub-divided into three categories:

D. **Potential - Data Deficient** indicating that insufficient data are available to determine SRE status. Insufficiency of data may be caused either by a lack of geographic or taxonomic information, or because the individuals sampled are not identifiable to species level (e.g. nondiagnostic sex, juvenile, damaged). This category is applied only to those species that belong to a known SRE Group, rather than being applied to any undescribed species in the records.
E. **Potential - Unlikely** species status is applied in one of two cases. First, the species belongs to an SRE Group but has been collected from many sites and/or multiple habitats. Second, the species belongs to a smaller taxonomic group within the SRE Group that tends not to contain SREs.
F. **Potential - Likely** species are from taxonomic groups in which SREs are likely, and when specimens have been collected from one or very few sites and/or habitats.

Identifying a species as a Potential or Confirmed SRE is often only the first step in determining the impacts of mining activities on that species. Even a Confirmed SRE species may be locally widespread around a project area, and therefore at minimal risk of disturbance. The actual level of threat to an SRE species depends on its distribution relative to the development footprint, rather than its SRE status alone. Determining the likely level of threat to a species therefore requires further consideration of the extent of the species' preferred habitat, both within and beyond the area of activity.

3.2. Conservation Framework

The *Biodiversity Conservation Act 2016* (BC Act) in Western Australia deals with the protection, conservation, and sustainable use of the state's biodiversity, and provides general protection for all native species. Some species are given special protection under the BC Act, primarily because they are rare, and are referred to as Threatened species. Species may also be recognised and protected as Threatened at the national level under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). There is a general concordance of species listed under the two acts, but the BC Act has greater invertebrate coverage. Additionally, the Department of Biodiversity, Conservation and Attractions (DBCA) lists some species as 'Priority' for conservation; species are typically listed as Priority when they are considered potentially under threat but there is insufficient evidence to support listing as Threatened.

Ecological communities, which are defined as naturally occurring biological assemblages associated with a particular type of habitat, may also be protected (DEC 2010). Both the BC and EPBC Acts list certain communities as Threatened Ecological Communities (TECs), with the BC Act list for Western Australia being larger. In addition to TECs, Priority Ecological Communities (PECs) are listed for informal protection by DBCA. PECs are communities that do not meet the survey criteria to be listed as TECs but may be vulnerable to disturbance.

4. METHODS

4.1. Desktop Assessment

To assess the likelihood of SREs occurring within the Survey Area a review of animal records and associated geologies was made within a 100 km x 100 km desktop search area (the Search Area), where a record is the presence of a species at a location on a specific date. The Search Area was centred on the centre of the Survey Area and was bounded by coordinates 30°37'37.49"S to 31°32'2.22"S and 120°55'37.98"E to 121°58'46.07"E, equating to a search area of approximately 10,000 km^2 (Figure 1).

A three-stepped approach was employed to assess habitat prospectivity. Initially, animal records from within the Search Area were retrieved from the Western Australia Museum (WAM) and Bennelongia databases, as well as scientific literature and previous subterranean fauna survey reports (Bamford *et al.* 2022). Records from the Survey Area that were collected prior to 2023 are included in the desktop search area records. A search of any conservation-listed species was made using DBCA's most recent list of conservation codes for Western Australia fauna downloaded from https://www.dbca.wa.gov.au/wildlife-and-ecosystems/animals/list-threatened-and-priority-fauna (accessed 30/01/2025), with the view to incorporate results into the overall assessment of SRE conservation values.

Second, landform and vegetation data consistent with prospective habitat for SRE groups at the Survey Area was assessed.

Finally, geographical proximity of historical SRE records with the Survey Area and their host vegetation and landform was assessed, along with connectivity and prospectivity at the Survey Area so that the likelihood of SRE group animals occurring at the Survey Area could be inferred.

4.2. Survey

4.2.1. Habitat mapping

Habitat mapping was developed by integrating the fauna habitat mapping provided by MinRes and prepared by SLR Consulting Australia Pty Ltd., with recognised vegetation system associations (Beard *et al.* 2013) alongside publicly available soil and landscape layers as well as our own site assessments.

Habitat categories need to represent habitat characteristics that are exploitable by SRE species, rather than solely emphasizing the unique attributes of individual vegetation units. Consequently, the characteristics of these vegetation units were cross-referenced with landform and soil conditions to discern distinct SRE habitats. Only landforms exhibiting significant differences, such as clay-loam floodplains versus hillslopes or ridges, were considered distinct habitats.

In summary, this integrated approach to habitat mapping offers a comprehensive framework for identifying habitats that may be critical for SRE species and assessing the impacts on SRE species of habitat clearing or other development activities.

4.2.2. Field Sampling

A field survey targeting invertebrates belonging to SRE Groups was carried out in 2024 over two rounds, by Kevin Sagastume-Espinoza, Ella Carstens, Jaxon Haines and Will Baxter. Thirty sites were sampled from 7th-14th May including five habitat assessment-only sites, and 31 sites were sampled from 15th-22nd August including four habitat assessment-only sites and one site (site 47) for which habitat assessment and a burrow excavation was done. In total, foraging survey was done at 52 sites and habitat assessment

was done at ten sites within the Survey Aea (Figure 4; Appendix 2). The aim of the survey was to document the SRE Group fauna of the Survey Area and assess habitat connectivity, to make informed predictions on the likely occurrence within the Project Area.

4.2.3. Sampling techniques

Two sampling techniques were used: hand foraging and dry trapping. Sampling techniques followed published guidelines (EPA 2016b). At least one hour was spent foraging on each site, with two team members separately using different techniques depending on the site type (i.e. 2 person hours).

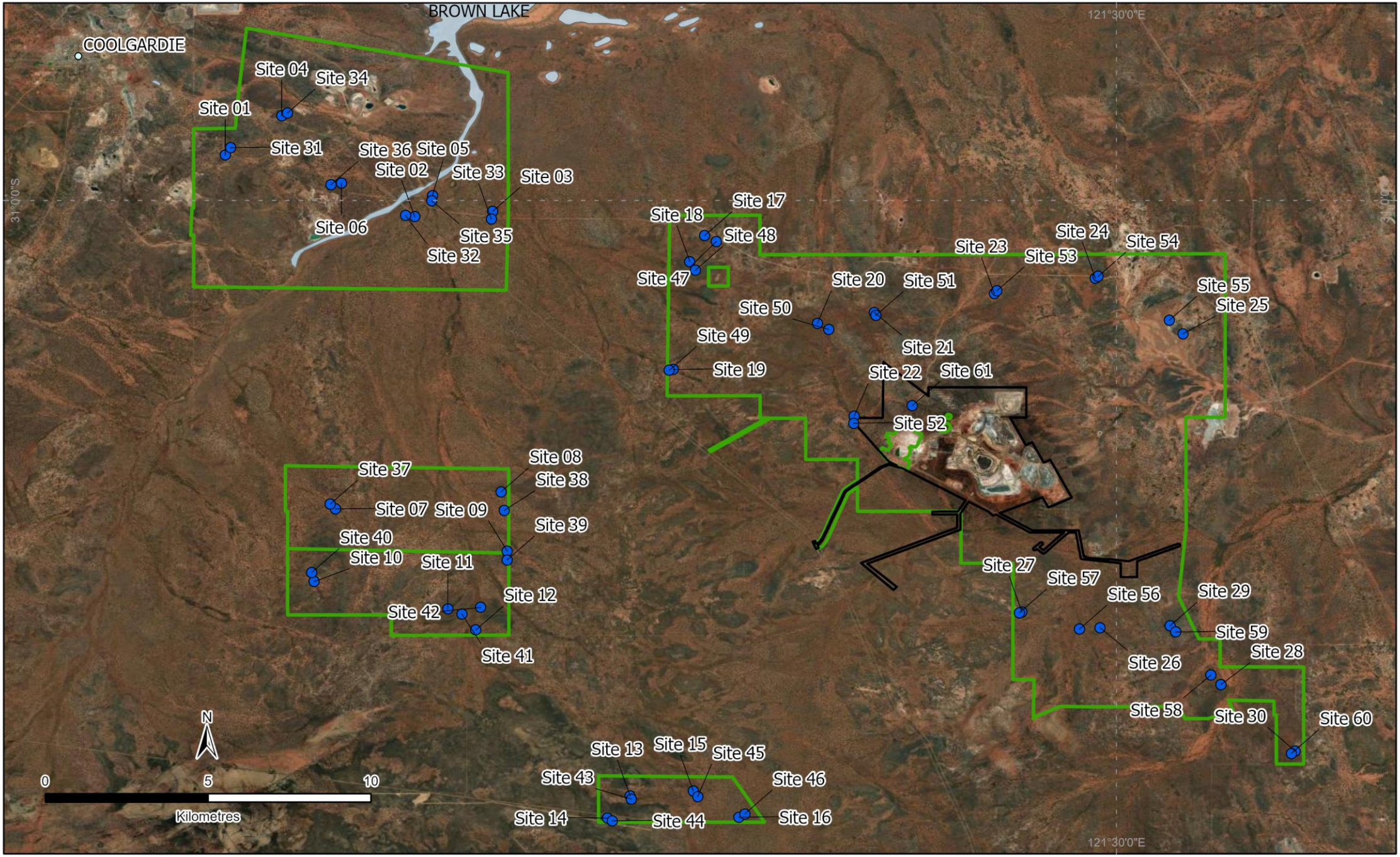
Hand foraging consisted of actively searching for taxa belonging to SRE Groups in their preferred habitats, making basic assumptions about the target species' (or Group's) biology. Hand foraging techniques included:

- Log flipping and raking: turning over and breaking apart logs and dead wood in search of isopods, myriapods, and pseudoscorpions. Raking also helps to uncover camouflaged mygalomorph spider burrows or to uncover buried land snails that may aestivate below the surface.
- Rock flipping: turning over rocks and other debris in search of harvestmen, centipedes, and isopods. Rocks were returned to their natural position when possible.
- Leaf litter sieving: sieving leaf litter to target litter- and soil-dwelling species. Leaf litter sieving also uncovers small-bodied SRE species (such as pseudoscorpions, millipedes, and land snails). Two leaf litter samples per site were collected and transported in cloth bags to the laboratory and placed in Tullgren funnels to collect litter-dwelling invertebrates.
- Leaf blowing: hand-held leaf blowers were used to remove leaf litter and reveal mygalomorph spider burrows covered by litter or otherwise difficult to identify unaided. If found, burrows were examined; burrows likely to house a mygalomorph spider were then excavated.
- Bark peeling and tree digging: removing pieces of bark from trees with smooth and exfoliating bark for inspection, and removing dirt from the bases of trees to search for SRE taxa. These techniques were only applied at sites containing trees (i.e. not only shrubs or spinifex).
- Night searching: with the aid of ultraviolet torches, selected sites were visited at night in search of scorpions, which fluoresce under ultraviolet light and are thereby easily detected.

4.2.4. Preservation and identification of samples

Specimens collected in the field by hand foraging were preserved in 100% ethanol and transported to Bennelongia's laboratory for identification. After sorting and separation from by-catch, specimens belonging to an SRE Group were transferred to a labelled vial of 100% ethanol for further identification.

Several areas of taxonomic expertise were required for identifications (Table 3), which were done using Leica stereomicroscopes. Those specimens for which taxonomic identification was not possible by morphology were sent for DNA sequencing. Voucher specimens of newly described species will be lodged at WAM.



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Legend

- Sample Site
- towns
- Survey Area
- Project Area
- waterbodies

Figure 4. Sample sites in Survey Area

Table 3. Details of personnel involved in the Mt. Marion SRE survey.

Name	Contribution	Role	Taxonomic group
Kevin Sagastume-Espinoza	Field survey; morphological IDs	Principal Biologist	Spiders and scorpions
Huon Clark	Morphological IDs	Principal Biologist	Isopods and harvestmen
Jane McRae	Morphological IDs	Senior Taxonomist	Pseudoscorpions
Ella Carstens	Field survey; morphological IDs	Biologist	Centipedes
Melita Pennifold	Morphological IDs	Senior Scientist	Millipedes and snails
Vitor Marques	GIS specialist	Senior Biologist	

4.2.5. DNA sequencing

56 samples from survey were selected for DNA sequencing, as well as 4 reference samples. Depending on the size of the specimens, either whole animals or dissected body parts (e.g. legs) were micro-pestled and incubated at 56°C for 24 – 48 hours with proteinase K before DNA was extracted using a Qiagen DNeasy Blood & Tissue kit (Qiagen 2006). Final elute volumes varied from 60 µL to 100 µL depending on the quantity and quality of dissected material. The mitochondrial COI gene was amplified by polymerase chain reaction (PCR) in all animals, using primer combinations jgLCO1490:jgHCO2198 and C1J1718:HC02198 (Geller *et al.* 2013; Simon *et al.* 1994). In addition, the 16S gene was targeted for Anamidae spiders using primers 16SAR-L:16SBR-H (Shin *et al.* 2013), the cytb gene was targeted for Barychelidae spiders using primers CYBJ10612_ld_f1:CYB_ld_r1 (Rix *et al.* 2017) and the 12S gene was targeted for isopod slaters using primers 12SCRF:12SCRR (Perina *et al.* 2023). Next, dual-direction, Sanger sequencing was undertaken for PCR products by the Australian Genome Research Facility (AGRF). Sequences returned were edited and aligned in Geneious Prime v2022.2.2 (https://www.geneious.com) (Geneious 2024). Pairwise genetic distances to related sequences in the Bennelongia database were calculated as uncorrected p-distances (total percentage of nucleotide differences between sequences). Similarity to all sequences in the non-redundant nucleotide database at GenBank was determined using the Basic Local Alignment Search Tool nucleotide (BLAST) suite of applications (https://blast.ncbi.nlm.nih.gov/Blast.cgi) (Altschul *et al.* 1990). To visualise genetic distances and phylogenetic relationships between taxa, distance based phylogenetic trees were generated, also in Geneious v2022.2.2. Publicly available sequences on GenBank were included in phylogenetic analysis to provide a framework for assessing intra- versus interspecific variation and determining species boundaries.

5. RESULTS

5.1. Desktop

719 historical records of SRE group animals within the Search Area were retrieved from the WAM and Bennelongia databases, as well as unpublished reports, where a record is the presence of a specimen at a site on a specific date (Appendix 1). This consisted of 1340 specimens from at least 137 unique species. 39.4 % of records were mygalomorph spiders, 23.2 % were pseudoscorpions, 15.2 % were scorpions, 11.8 % were gastropod snails, 4.0 % were isopod slaters, 3.5 % were centipedes and 2.8 % were millipedes. An overview of record locations is provided in Figure 5.

None of the SRE Group species from the desktop search were conservation-listed.

5.2. Habitat

Nine broad habitats prospective for SRE Group species were identified within the Survey Area (Table 4; Figure 6). Seven of these have been described by SLR Consultants for MinRes. Two were not captured by SLR. These are Floodplain, which we describe as an opening in eucalyptus woodland with light mixed shrub sometimes on ironstone gravel, with clayey sand; and Stony Plain, which we describe as floodplains

with typically granite rocky areas, open *Eucalyptus* woodland with sparse heathland/shrubland of mixed *Acacias* and *Melaleucas* over minimal ground cover.

The most abundant habitat is open Eucalypt woodland. Other widely dispersed but less prominent habitats include drainage lines, rocky hills and shrublands. The open woodlands, rocky hills and drainage lines are all characterised by a Eucalypt overstorey with a mid-storey consisting of sparse heathland including acacia and melaleuca. The rocky hills habitat, as well as occurring on sloped terrain, have protruding rocky areas of greenstone/granite/quartz providing shelter habitat. The shrublands consist of undulating plains of open to closed dense shrubland/heathland of *Melaleuca pauperiflora*, *Acacia acuminata*, *Hakea* spp., *Senna* spp., and *Eremophila* spp. with minimal ground cover.

These broad habitat types are likely to produce different arrangements of microhabitats suitable for SRE Group species. The microhabitats include leaf litter, dead logs and shaded areas under rocks. These microhabitats are exploited by varying SRE Groups in different ways. For example, leaf litter is often exploited by pseudoscorpion, slaters and centipede species which rely on the shade and humidity stored by the dead leaves. It is not uncommon for scorpions to be found hiding under leaf litter, but they often prefer more secure retreats such as under dead logs or big rocks. Open areas are often exploited by mygalomorph spiders which tend to use elements of several microhabitats for creation of their burrows. These can be covered by thick leaf litter, hidden under dead logs, at the base of dead trees, or directly in exposed topsoil.

None of the broad habitat types were restricted to the Survey Area; rather they appear to be widespread at a regional scale. It is therefore unlikely that project expansion would result in significant reduction of the identified SRE habitats.

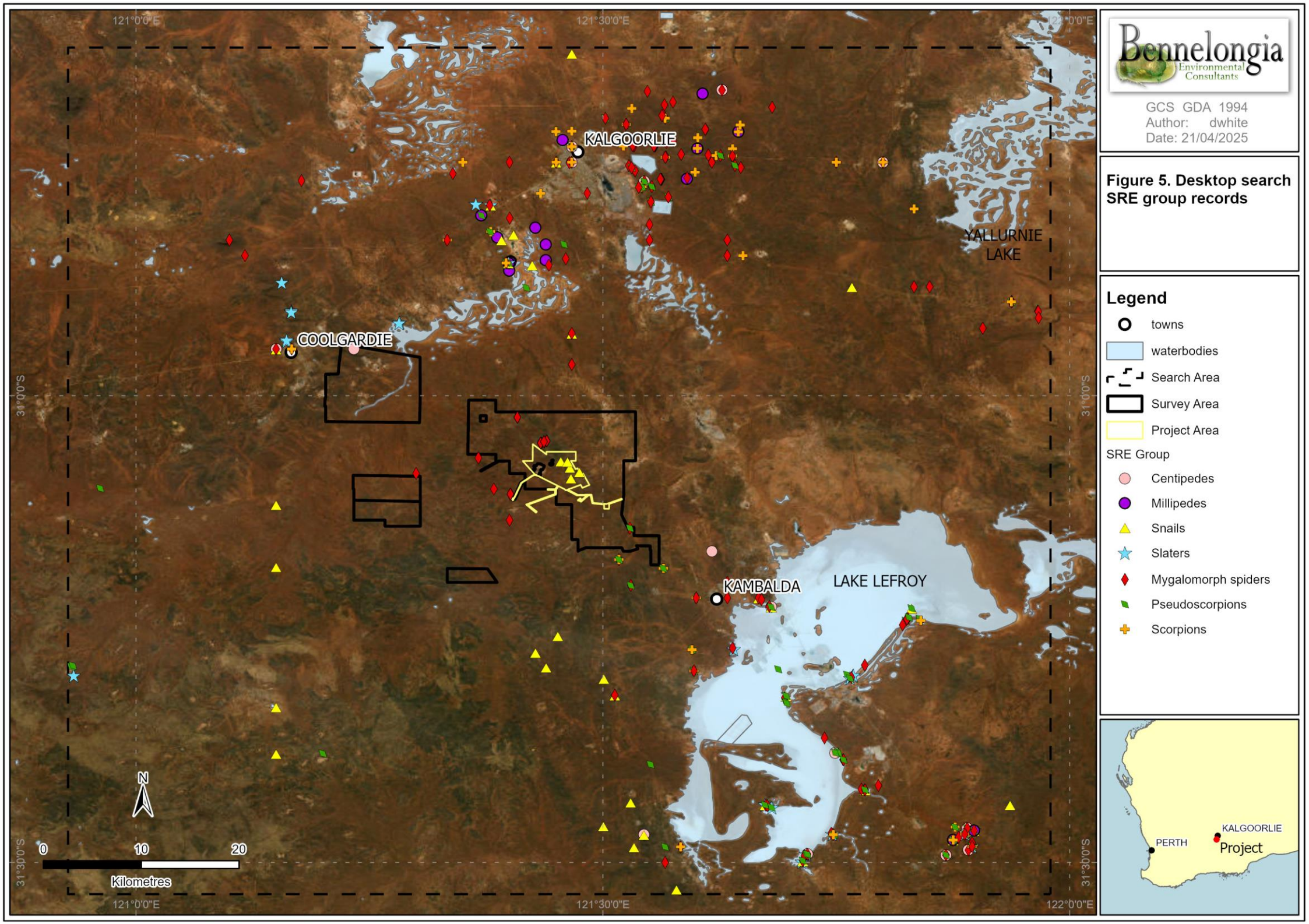

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Figure 5. Desktop search SRE group records

Legend

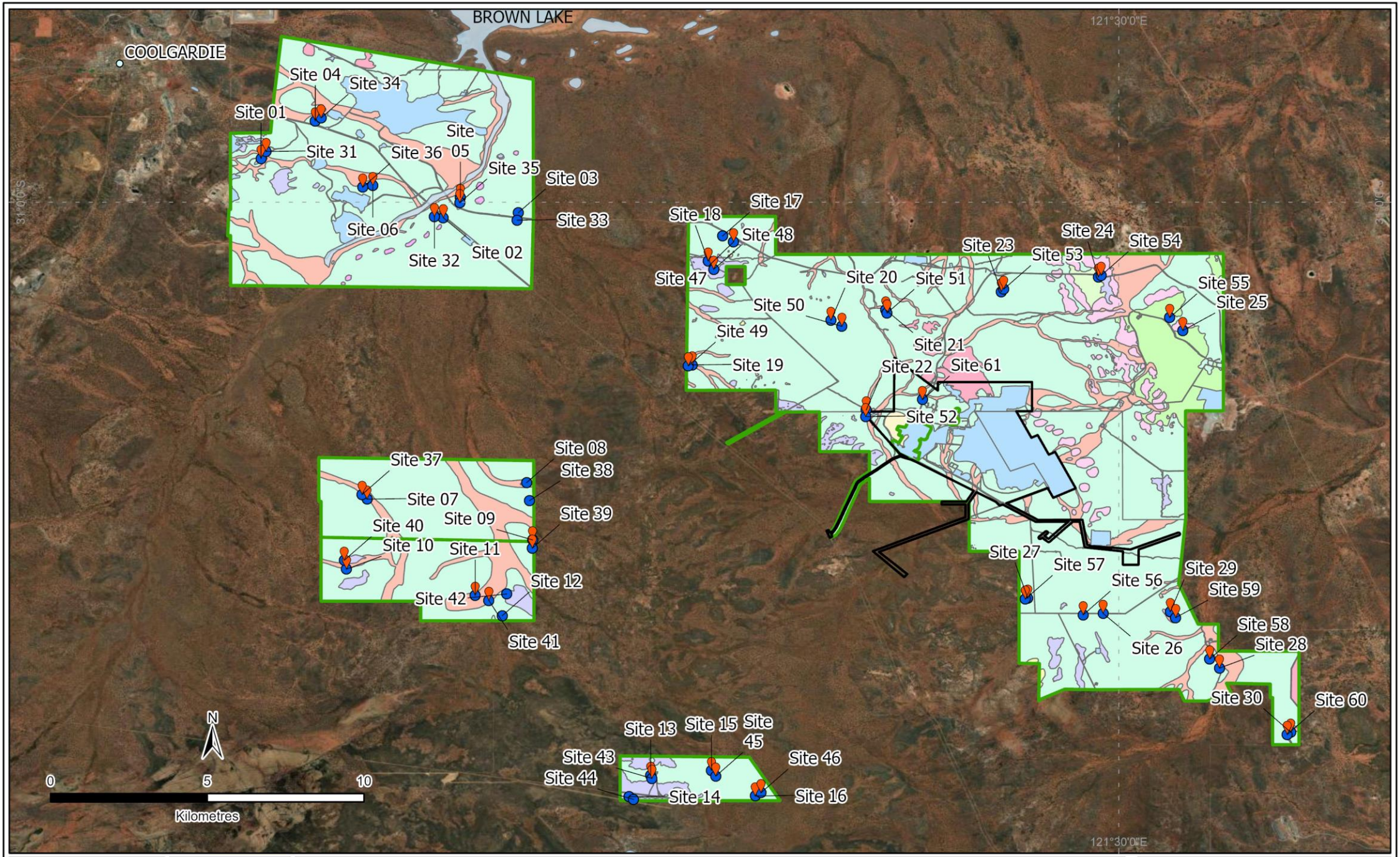
- towns
- waterbodies
- Search Area
- Survey Area
- Project Area

SRE Group

- Centipedes
- Millipedes
- Snails
- Slaters
- Mygalomorph spiders
- Pseudoscorpions
- Scorpions

Table 4. SRE habitat types in the Survey Area

SRE Habitat	Description	Exposure	SRE Prospectivity	Sites
Chenopod Shrubland	Chenopod shrubland on clayey sand	High with dry conditions	Low	25, 55
Drainage Line	Areas that are often inundated with water after rainfall events, with a mixed *Eucalyptus* overstorey, open to spare mid-storey of *Acacia* and *Melaleuca* and a sparse understorey of *Solanum* and *Atriplex* spp. Often associated with ephemeral pools.	Low and damp topsoil	Moderate	01, 07, 11, 19, 22, 30, 37, 41, 52, 60
Eucalyptus Woodland	Moderately undulating plains of mixed *Euclayptus* woodland over-storey, and open to closed shrubland/heathland of *Melaleuca*, *Acacia*, *Hakea*, and *Allocasuarina*, with isolated to sparse understorey of *Atriplex* spp., *Solanum* spp.	Medium exposure and dry conditions	Moderate	02, 03, 05, 06, 08, 09, 10, 12, 13, 15, 16, 17, 18, 26, 28, 31, 32, 33, 39, 50, 56, 58
Sandplain/Floodplain	Opening in *Eucalyptus* woodland, light mixed shrub sometimes on ironstone gravel. Clayey sand.	Medium to high, dry conditions	Low	05, 21, 22, 23, 25, 35, 36, 38, 42, 43, 45, 46, 49, 51, 53, 61
Low Hills and Slopes	Areas of undulating hills with ironstone/greenstone rubble. *Eucalyptus* woodland cover-storey and sparse mid-storey of mixed *Acacia* and *Melaleuca*, over a sparse forbland of *Atriplex* and mixed sedges/herbs.	Medium to high exposure, mostly dry	Low to moderate	04, 10, 34, 40, 59
Rocky Hill	Area of undulating hills with protruding rocky areas of greenstone/granite/quartz. Typically, open *Eucalyptus* woodland with sparse heathland/shrubland of mixed *Acacias* and *Melaleucas* over minimal ground cover. Shelter habitat.	Medium to high exposure, damp topsoil	Low to moderate	29, 60
Rocky Outcrop	Areas of bare rock protruding from the ground with minimal vegetation. Caves, rock crevices.	High exposure, sheltered rock crevices	Moderate	27, 57
Shrubland/Heathland	Undulating plains of open to closed shrubland/heathland of *Melaleuca pauperiflora*, *Acacia acuminata*, *Hakea* spp., *Senna* spp. and *Eremophila* spp. with minimal ground cover. Dense vegetation.	Low to medium, areas of damp topsoil	Low to moderate	14, 20, 44, 47, 48, 54
Stony Plain	Floodplains with typically granite rocky areas. Open *Eucalyptus* woodland with sparse heathland/shrubland of mixed *Acacias* and *Melaleucas* over minimal ground cover.	Medium, dry conditions	Low to moderate	24



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Legend

- Survey Area
- Project Area
- towns
- waterbodies
- Sample Site
- SRE record

Habitat

- Chenopod Shrubland
- Claypan
- Cleared
- Drainage Line
- Eucalyptus Woodland
- Low Hills and Slopes
- Man-made Dam
- Rehab
- Rocky Hill
- Rocky Outcrop
- Shrubland/Heathland
- Stony Plain

Figure 6. Survey records mapped on to habitat

5.3. Survey

In total, 458 records of SRE Groups were recovered from both rounds of survey. This consisted of 642 specimens from at least 74 unique species. Fifteen species (20.3 %) were snails, 19 species (25.7 %) were spiders, eight species (10.8 %) were pseudoscorpions, 11 species (14.9 %) were centipedes, ten species were isopod slaters (13.5 %), five species were scorpions (6.8 %), and there were six species (8.1 %) of millipedes.

Mapping these records onto habitat shows that SRE Group species were recovered from all 52 sample sites and, consequently, all nine habitat types (Figure 6, Table 4).

5.3.1. DNA

DNA sequencing was completed successfully on 56 samples (i.e. zero failures) from the current survey. In addition, DNA sequencing was completed successfully on four samples (zero failures) that were collected from outside the Survey Area as part of reference sampling. To summarise, 60 out of 60 samples were successfully sequenced for this work (Appendix 3).

5.3.2. Species Accounts

At least 74 unique species were collected from the survey, two of which were not able to be identified to species level (Table 5). Of the 72 species-level identifications, no species had confirmed SRE status, two were considered to be Potential – Likely, 17 Potential – Unlikely, 14 Potential – Data Deficient and 40 were considered to be Widespread. The two Potential – Likely species are an isopod slater, *Buddelundia* `BIS554`, and a Bothriembryontid snail, *Bothriembryon* `BGA053`. No species were conservation-listed. A summary of the two Potential – Likely SRE species is provided here:

***Buddelundia* `BIS554`** is an isopod slater of family Armadillidae. In this survey, it was collected from three different sites: site 20 on the 12th May and site 22 on the 13th May from leaf litter, and site 54 on the 20th August from a rock flip (Figure 7). Sites 20 and 54 are in shrubland, while site 22 is in a floodplain. The vegetation at sites 20 and 54 is dense and includes *Melaleuca pauperiflora*, *Acacia acuminata*, *Hakea* spp., *Senna* spp. and *Eremophila* spp. with minimal ground cover. In addition, this species was found at three sites at Lake Lefroy in 2023, around 68 kms away.

***Bothriembryon* `BGA053`** is a stylommatophor snail of family Bothriembryontidae and is a newly discovered species. It was collected from four sites: site 30 on the 9th May, site 01 on the 11th May, site 36 on the 19th August and site 51 on the 21st August (Figure 7). It was found from tree digs, litter rakes and log flips in host habitat types that include Drainage Line (sites 01 and 30) and Floodplain (sites 36 and 51) with vegetation consisting of eucalypt overstorey with acacia mulga shrubs. Currently, the known linear range is 36 kms.

6. DISCUSSION

The desktop assessment revealed a rich and diverse regional SRE Group community with representation from all seven non-worm groups. The lack of worm records is not surprising considering the low amount of moisture in the landscape, combined with historically lower amounts of survey effort for oligochaetes and onychophorans. Considering the vegetation systems extend into the Survey Area, findings from the assessment suggest that habitats within the Survey Area are highly prospective for SRE Group species.

We described nine habitats within the Survey Area that are prospective for SREs, and indeed species records from SRE Groups came from all the sampling sites, which spanned all nine habitats (Table 4, Figure 6). Eucalypt woodland is prevalent across many habitats, as are *Acacia* and *Melaleuca* shrublands. Apart from the rocky outcrop habitat, all habitats have good continuity to areas outside the Survey Area, therefore we would predict that any future disturbance as a result of operations would unlikely remove an entire habitat from the local area.

In total, field survey returned at least 74 species from SRE Groups. Of the 72 species that were described to species level, none were confirmed SREs and two were Potential – Likely SREs: *Buddelundia* `BIS554`

and *Bothriembryon* `BGA053`. *Buddelundia* `BIS554` occurred in patches of shrubland within eucalypt woodland and an open floodplain within a drainage line. *Bothriembryon* `BGA053` occurred in drainage line and floodplains where vegetation consisted of acacia mulga shrubs and eucalypt overstorey. These habitat types are not restricted to the Survey Area and so habitat prospective for the Potential – Likely SRE species extends beyond areas of proposed impact. As such, while one Potential – Likely species is potentially restricted to the Survey Area (*Bothriembryon* `BGA053`), it is possible with further sampling it would be found outside the Survey Area. Neither species was found in the smaller Project Area from the limited sampling done in that area here.

Mygalomorph spiders are an important SRE group in Western Australia, and we show there is an abundant and diverse community at the Mount Marion lithium project. Of the 19 species collected in the current survey, none were considered to be Potential – Likely but five were considered to be Potential – Data Deficient, based on the low number of samples collected. These are *Aname* `BMYG244, *Teyl* `MYG012`, *Idiommata* sp. `kalgoorlie`, *Conothele* `MYG554` and *Bungulla* `BMYG251`. Increased number of samples for these species would help determine if they are likely or unlikely to be true SRE species. One group within mygalomorph spiders that has conservation significance is the shield-backed trapdoor spiders, i.e., species from the *Idiosoma nigrum* complex. While three species from the *Idiosoma* genus were recovered from this survey (*I.* `BMYG168`, *I.* `BMYG249` and *I.* `MYG244`), both morphological and genetic analysis concluded they are not part of the *nigrum* complex and are therefore not shield-backed trapdoor spiders.

To extrapolate observations to the Project Area, it must first be recognised that most of the habitat within the Project Area is already disturbed habitat due to clearance, reducing the potential for prospective habitat. Of the remaining area, there are three main habitats prospective for SREs - open Eucalypt Woodland, Drainage Line and Rocky Hill. Open eucalypt woodland and drainage lines extend into other regions of the Survey Area and beyond, therefore while an SRE species may occur in these habitats, it is unlikely to be restricted to the Project Area. A rocky hill habitat does intersect the Project Area and is entirely contained within the wider Survey Area. There is a chance that a potentially restricted Confirmed or Potential - Likely SRE occurs within that habitat in the Project Area. However, considering no other Potential - Likely SRE is restricted to the rocky hill habitat within the Survey Area we believe this is unlikely, and expect further sampling to exclude this remote possibility.

Five SRE Group species were recorded at the one site within the Project Area that was sampled (site 61). None of these species were considered to have either Confirmed or Potential – Likely status. More information of these species records is provided here:

Cryptops australis is an Australia-wide scolopendrid centipede that was found at five sites and three habitats within the Survey Area.

***Idiosoma* `BMYG168`** is a mygalomorph spider from family Idiopidae. It was recorded at a total of 14 sites within this survey and five habitats. It is a widespread species known to have a range within the Goldfields of around 229 kms.

***Idiosoma* `MYG244`** is also a mygalomorph spider from family Idiopidae. It was recorded at a total of 12 sites within this survey and four habitats. It is also a widespread species known to have a range within the Goldfields of around 100 kms.

Pupoides myoporinae is a gastropod snail from family Pupillidae**.** It was found at 16 sites within the Survey Area including five different habitats. This species is widespread found across southern Australia.

***Gastrocopta* sp.** is a gastropod snail from family Pupillidae and was found in a floodplain at site 61. It was unable to be assigned a species name due to extensive tissue and shell damage.

Table 5. SRE species from survey. Orange shading indicates Potential – Likely SREs.

Higher order identification	Lowest identification	No. of specimens	Sites	Habitat	Currently known distribution	SRE status
Arthropoda						
Chelicerata						
Arachnida						
Araneae						
Anamidae	*Aname* `BMYG244`	2	49	Floodplain	Survey Area, linear range < 1 km	Potential - data deficient
	Aname `BMYG245`	3	13, 47, 50	Eucalyptus woodland, shrubland	Survey Area, linear range ~ 20 kms	Potential - unlikely
	Aname `MYG212`	20	01, 04, 06, 10, 18, 21, 25, 31, 39, 43, 48, 50, 52, 53, 54, 55	Drainage line, low hills and slopes, eucalyptus woodland, floodplain, shrubland, chenopod shrubland	Goldfields, linear range > 300 kms	Widespread
	Proshermacha `BMYG227`	5	2, 11, 22, 26	Eucalyptus woodland, floodplain	Goldfields, linear range ~ 78 kms	Potential - unlikely
	Teyl `MYG012`	1	13	Eucalyptus woodland	Survey Area, singleton	Potential - data deficient
	Teyl `MYG895`	9	34, 41, 47, 49, 52, 54, 55, 60	Low hills and slopes, drainage line, shrubland, floodplain, chenopod shrubland, rocky hill	Survey Area, linear range ~ 39 kms	Potential - unlikely
Barychelidae	*Idiommata* `BMYG246`	2	10, 28	Eucalyptus woodland	Survey Area, linear range ~ 28 kms	Potential - unlikely
	Idiommata `BMYG247`	3	06, 31, 43	Eucalyptus woodland, floodplain	Survey Area, linear range ~ 26 kms	Potential - unlikely
	Idiommata sp. `kalgoorlie`	1	52	Drainage line	Survey Area, singleton	Potential - data deficient
	Synothele `BMYG172`	1	59	Low hills and slopes	Goldfields, linear range ~ 152 kms	Widespread
	Synothele cf. *houstoni*	16	01, 02, 06, 20, 22, 31, 35, 36,	Drainage line, eucalyptus woodland, shrubland, floodplain	Survey Area, linear range ~ 28 kms	Potential - unlikely

Higher order identification	Lowest identification	No. of specimens	Sites	Habitat	Currently known distribution	SRE status
			37, 39, 43, 46, 50, 52			
Euagridae	*Cethegus* `BMYG248`	9	09, 10, 11, 23, 31, 39, 46, 49	Eucalyptus woodland, drainage line, floodplain	Goldfields, linear range ~ 176 kms	Widespread
Halonoproctidae	*Conothele* `MYG554`	4	06, 11, 48, 56	Eucalyptus woodland, drainage line, shrubland	Survey Area, linear range ~ 28 kms	Potential - data deficient
Idiopidae	Idiopidae sp.	7	06, 24, 30, 34, 48, 59	Eucalyptus woodland, stony plain	n/a	n/a
	Bungulla `BMYG250`	2	16, 22	Eucalyptus woodland, floodplain	Survey Area, linear range ~ 15 kms	Potential - unlikely
	Bungulla `BMYG251`	3	34, 55	Low hills and slopes, chenopod shrubland	Survey Area, linear range ~ 28 kms	Potential - data deficient
	Gaius austini	9	04, 06, 07, 20, 31, 34, 36, 40, 58	Low hills and slopes, eucalyptus woodland, drainage line, shrubland, floodplain	Goldfields, linear range ~ 250 kms	Widespread
	Idiosoma `BMYG168`	18	01, 05, 09, 10, 18, 21, 31, 36, 45, 46, 48, 50, 56, 61	Drainage line, eucalyptus woodland, floodplain, shrubland	Goldfields, linear range ~ 229 kms	Widespread
	Idiosoma `BMYG249`	3	19, 28, 31	Drainage line, eucalyptus woodland	Survey Area, linear range ~ 36 kms	Potential - unlikely
	Idiosoma `MYG244`	19	21, 37, 41, 46, 48, 49, 50, 51, 53, 54, 55, 61	Floodplain, drainage line, shrubland, chenopod shrubland	Goldfields, linear range ~ 100 kms	Widespread
Pseudoscorpiones						

Higher order identification	Lowest identification	No. of specimens	Sites	Habitat	Currently known distribution	SRE status
Cheliferidae	Cheliferidae `BPS575`	27	01, 02, 10, 27, 29, 30, 31, 34, 37, 41, 49, 52, 60	Drainage line, eucalyptus woodland, rocky outcrop, rocky hill, low hills and slopes, floodplain	Survey Area, linear range ~ 39 kms	Widespread
Chernetidae	Chernetidae `BPS577`	28	05, 07, 19, 20, 22, 31, 36, 37, 50, 52	Eucalyptus woodland, drainage line, shrubland, floodplain	Survey Area, linear range ~ 22 kms	Widespread
	Nesidiochernes `BPS343`	8	10	Eucalyptus woodland	Goldfields, linear range ~ 172 kms	Widespread
Chthoniidae	*Austrochthonius* `BPS576`	3	11, 19	Drainage line	Survey Area, linear range ~ 11 kms	Potential - data deficient
Garypidae	*Synsphyronus dorothyae*	8	25, 59	Floodplain, low hills and slopes	Survey Area, linear range ~ 11 kms	Potential - unlikely
	Synsphyronus lathrius	9	22, 30, 34, 45, 51, 52, 60	Drainage line, low hills and slopes, floodplain, drainage line, rocky hill	WA, linear range > 300 kms	Widespread
Olpiidae	Olpiidae sp.	1	21	Floodplain	n/a	n/a
	Austrohorus `BPS580`	5	01, 24, 40, 60	Drainage line, stony plain, low hillls and slopes, drainage line	Survey Area, linear range ~ 40 kms	Potential - unlikely
	Beierolpium 8/4 `BPS579`	18	06, 09, 11, 19, 22, 23, 27, 30, 32, 34, 39, 55, 57	Eucalyptus woodland, drainage line, floodplain, rocky outcrop, low hills and slopes, chenopod shrubland, rocky outcrop	Survey Area, linear range ~ 39 kms	Potential - unlikely
Scorpiones						
Bothriuridae	*Cercophonius michaelseni*	4	02, 19	Eucalyptus woodland, drainage line	WA, linear range > 350 kms	Widespread
Buthidae	*Isometroides vescus* s.l.	1	28	Eucalyptus woodland	WA, linear range > 400 kms	Widespread
	Lychas `BSCO092` `splendens group`	9	02, 20, 24, 28, 37, 39	Eucalyptus woodland, shrubland, stony plain, drainage line	WA, linear range > 580 kms	Widespread

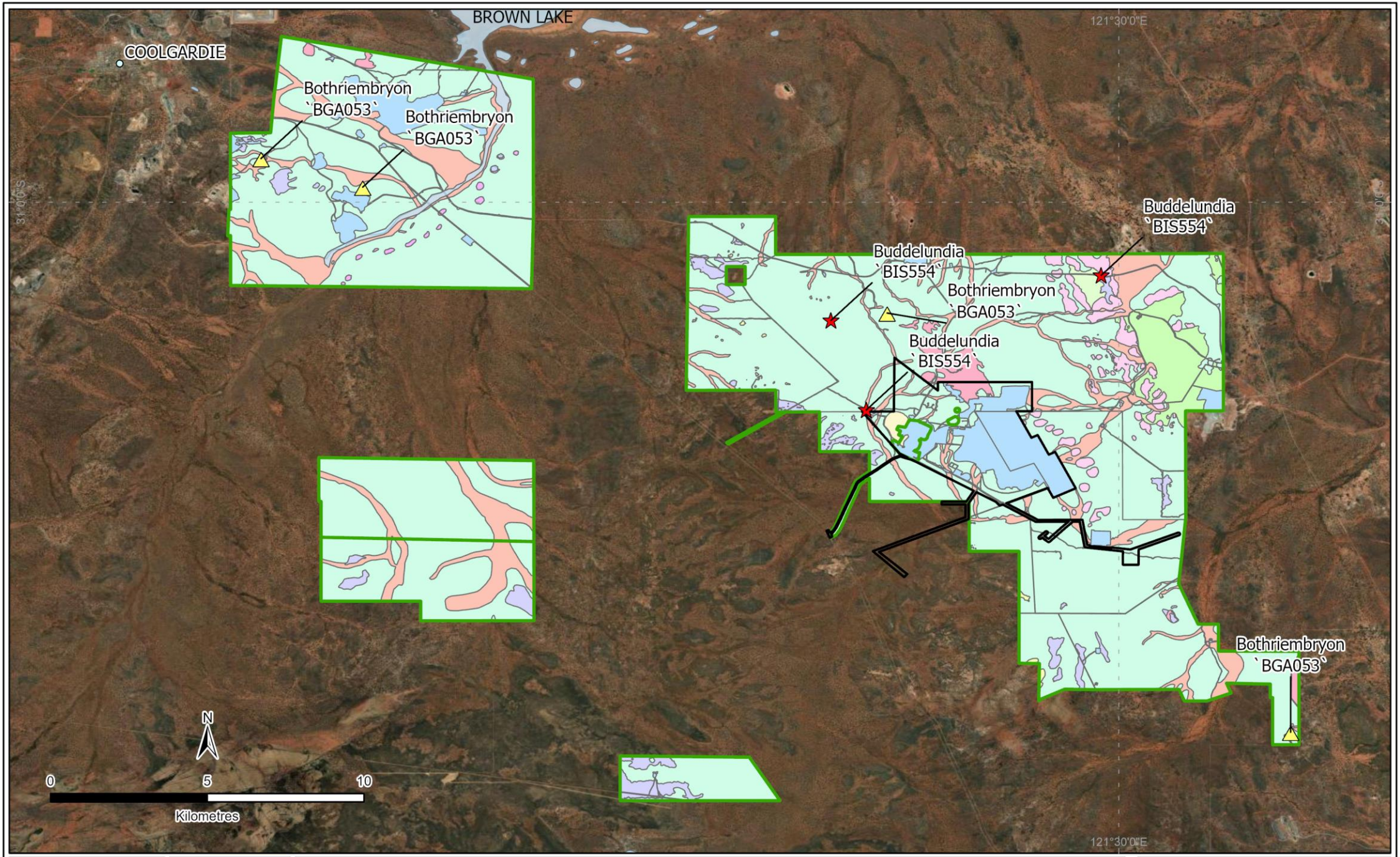
Higher order identification	Lowest identification	No. of specimens	Sites	Habitat	Currently known distribution	SRE status
	Lychas `SCO039` (annulatus complex)	10	06, 28, 35, 43, 56	Eucalyptus woodland, floodplain	WA, linear range > 1000 kms	Widespread
Urodacidae	*Urodacus* `BSCO066`	11	02, 05, 19, 35, 48, 57	Eucalyptus woodland, drainage line, floodplain, shrubland, rocky outcrop	Goldfields, linear range ~ 168 kms	Widespread
Crustacea						
Malacostraca						
Isopoda						
Armadillidae	*Acanthodillo* `BIS577`	2	20, 52	Shrubland, drainage line	Survey Area, linear range ~ 3.7 kms	Potential - data deficient
	Buddelundia `BIS554`	5	20, 22, 54	Shrubland, drainage line	Goldfields, linear range ~ 68 kms	Potential - likely
	Buddelundia `BIS573`	12	09, 22, 29, 31, 48, 50	Eucalyptus woodland, floodplain, rocky hill, shrubland	Survey Area, linear range ~ 33 kms	Potential - unlikely
	Buddelundia `BIS574`	3	40	Low hills and slopes	Survey Area - all from one site	Potential - data deficient
	Cubaris `BIS576`	1	02	Eucalyptus woodland	Goldfields, linear range ~ 100 kms	Widespread
Philosciidae	Laevophiloscia `BIS572`	5	11, 24, 54	Drainage line, stony plain, shrubland	Survey Area, linear range ~ 23 kms	Potential - unlikely
	Philosciidae `BIS571`	1	20	Shrubland	Survey Area from one site - singleton	Potential - data deficient
	Philosciidae `BIS575`	2	16, 30	Eucalyptus woodland, drainage line	Survey Area, linear range ~ 17 kms	Potential - data deficient
	Philosciidae `BIS595`	1	60	Rocky hill	Survey Area from one site - singleton	Potential - data deficient
Platyarthridae	Platyarthridae `BIS590`	1	55	Chenopod shrubland	Survey Area from one site - singleton	Potential - data deficient
Myriapoda						
Chilopoda						
Geophilida						

Higher order identification	Lowest identification	No. of specimens	Sites	Habitat	Currently known distribution	SRE status
Chilenophilidae	*Sepedonophilus* `BGE083`	28	05, 10, 13, 15, 16, 21, 22, 23, 24, 28, 29, 30, 31, 34, 40, 46, 51	Eucalyptus woodland, floodplain, stony plain, rocky hill, drainage line, low hills and slopes	Goldfields, linear range ~ 84 kms	Potential - unlikely
Lithobiomorpha						
Henicopidae	*Anopsobius relictus*	1	55	Chenopod shrubland	Australia-wide, Tasmania	Widespread
	Lamyctes africanus	1	43	Floodplain	Cosmopolitan	Widespread
	Henicopidae sp.	1	27	Rocky outcrop	Survey Area from one site - singleton	Potential - data deficient
Scolopendrida						
Cryptopidae	*Cryptops australis*	5	20, 22, 54, 60, 61	Shrubland, floodplain, rocky hill	Australia-wide	Widespread
	Cryptops spinipes	1	22	Floodplain	Australia-wide	Widespread
	Cryptops sp.	6	21, 31, 50	Floodplain, eucalyptus woodland	n/a	n/a
Scolopendridae	*Colobopleurus* `BSCOL119`	1	15	Eucalyptus woodland	Survey Area from one site - singleton	Potential - data deficient
	Cormocephalus michaelseni	3	07, 30, 54	Drainage line, shrubland	Australia-wide	Widespread
	Cormocephalus sp.	2	11	Drainage line	n/a	n/a
	Otostigmus `BSCOL071`	1	49	Floodplain	WA, linear range > 1000 kms	Widespread
	Scolopendra laeta	7	34, 40, 49, 54, 57	Low hills and slopes, floodplain, shrubland, rocky outcrop	Autsralia-wide	Widespread
	Scolopendra morsitans	8	01, 13, 15, 27, 29, 37, 43, 54	Drainage line, eucalyptus woodland, rocky outcrop, rocky hill, floodplain, shrubland	Cosmopolitan	Widespread
Scutigeromorpha	Scutigeromorpha sp.	2	22, 60	Drainage line	n/a	n/a
Diplopoda	Diplopoda sp.	1	49	Floodplain	n/a	n/a

Higher order identification	Lowest identification	No. of specimens	Sites	Habitat	Currently known distribution	SRE status
Polydesmida						
Paradoxosomatidae	*Antichiropus* `BDI088`	6	02, 27, 31, 32, 46	Eucalyptus woodland, rocky outcrop, floodplain	Survey Area, linear range ~ 29 kms	Potential - unlikely
	Antichiropus `BDI089`	8	02, 13, 24, 43, 54	Eucalyptus woodland, stony plain, floodplain, shrubland	Survey Area, linear range ~ 25 kms	Widespread
	Antichiropus sp. B06	1	19	Drainage line	Goldfields, linear range ~ 97 kms	Potential - unlikely
	Antichiropus sp.	5	16, 24, 29, 35	Eucalyptus woodland, stony plain, rocky hill, floodplain	n/a	n/a
Polyxenida						
Polyxenidae	*Unixenus* sp.	1	7	Drainage line	n/a	n/a
Synxenidae	*Phryssonotus novaehollandiae*	4	23, 39, 53, 60	Floodplain, eucalyptus woodland, drainage line	Australia-wide	Widespread
Polyzoniida						
Siphonotidae	Siphonotidae `BDI064`	21	06, 21, 22, 28, 30, 31, 36, 50, 52, 60	Eucalyptus woodland, floodplain, drainage line	Survey Area, linear range ~ 39 kms	Potential - unlikely
Mollusca						
Gastropoda	Gastropoda sp.	1	24	Stony plain	n/a	n/a
Stylommatophora						
Bothriembryontidae	*Bothriembryon* `BGA053`	5	01, 30, 36, 51	drainage line, floodplain	Survey Area, linear range ~ 36 kms	Potential - likely

Higher order identification	Lowest identification	No. of specimens	Sites	Habitat	Currently known distribution	SRE status
	Bothriembryon cf. `Koolyanobbing` n.sp. BOT054	2	29, 40	Rocky hill, low hills and slopes	Goldfields, linear range ~ 198 kms	Widespread
	Bothriembryon sp.	1	30	Drainage line	n/a	n/a
Camaenidae	*Quistrachia monogramma*	1	49	Floodplain	WA, linear range > 1000 kms	Widespread
	Sinumelon cf. *tarcoolanum*	1	50	Eucalyptus woodland	Goldfields, linear range ~ 207 kms	Widespread
	Sinumelon jimberlanensis	8	01, 11, 40, 50, 52, 54	Drainage line, low hills and slopes, eucalyptus woodland, shrubland	Goldfields, linear range ~ 583 kms	Widespread
	Sinumelon sp.	2	07, 31	Drainage line, eucalyptus woodland	n/a	n/a
Punctidae	*Westralaoma aprica*	5	05, 18, 50, 59	Eucalyptus woodland, low hills and slopes	WA and SA	Widespread
	Westralaoma expicta	31	01, 05, 40, 41, 46, 48, 49, 51, 59	Drainage line, eucalyptus woodland, low hills and slopes, floodplain, shrubland	WA, linear range > 1000 kms	Widespread
Pupillidae	*Gastrocopta bannertonensis*	5	09, 10, 20, 29	Eucalyptus woodland, shrubland, rocky hill	Australia-wide	Widespread
	Gastrocopta cf. *margaretae*	1	31	Eucalyptus woodland	WA, linear range ~ 358 kms	Widespread
	Gastrocopta margaretae	35	05, 09, 16, 18, 35, 40, 41, 46, 50, 51, 53, 59	Eucalyptus woodland, floodplain, low hills and slopes, drainage line	Australia-wide	Widespread
	Gastrocopta sp.	1	61	Floodplain	n/a	n/a
	Pupilla ficulnea	2	01, 04	Drainage line, low hills and slopes	WA, SA, NT	Widespread

Higher order identification	Lowest identification	No. of specimens	Sites	Habitat	Currently known distribution	SRE status
	Pupoides adelaidae	41	05, 09, 11, 16, 18, 23, 25, 26, 28, 29, 31, 39, 40, 48, 50, 53, 58, 59	Floodplain, eucalyptus woodland, drainage line, rocky hill, low hills and slopes, shrubland	Australia-wide	Widespread
	Pupoides eremicolus	1	28	Eucalyptus woodland	WA, NT, QLD	Widespread
	Pupoides myoporinae	52	02, 07, 22, 28, 29, 30, 39, 40, 45, 46, 49, 50, 51, 58, 59, 61	Eucalyptus woodland, drainage line, floodplain, rocky hill, low hills and slopes	WA, SA, VIC, NSW	Widespread
	Pupoides sp.	17	01, 05, 09, 16, 18, 25, 39, 51	Drainage line, eucalyptus woodland, floodplain	n/a	n/a
Succineidae	*Austrosuccinea australis*	3	10, 23	Eucalyptus woodland, floodplain	WA, SA	Widespread
	Austrosuccineidae sp.	2	20, 22	Shrubland, floodplain	n/a	n/a



Bennelongia Environmental Consultants

GCS GDA 1994
Author: dwhite
Date: 21/04/2025

Legend

- Survey Area
- Project Area
- towns
- waterbodies
- Bothriembryon `BGA053`
- Buddelundia `BIS554`

Habitat

- Chenopod Shrubland
- Claypan
- Cleared
- Drainage Line
- Eucalyptus Woodland
- Low Hills and Slopes
- Man-made Dam
- Rehab
- Rocky Hill
- Rocky Outcrop
- Shrubland/Heathland
- Stony Plain

Figure 7. Potential likely SREs

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8. APPENDICES

Appendix 1 SRE Group species from the Search Area

Higher order identification	Lowest identification	No. of specimens
Arthropoda		
Chelicerata		
Arachnida		
Araneae		
Actinopodidae	*Missulena harewoodi*	2
	Missulena occatoria	6
	Missulena sp.	4
Anamidae	*Aname* `BMYG226` (mellosa group)	1
	Aname `FP-10058`	1
	Aname `FP-10059 (SIGM121; female)`	1
	Aname `FP-10060 (SIGM; males)`	4
	Aname `FP-6168`	9
	Aname `MYG212`	11
	Aname `MYG213`	1
	Aname `MYG738`	9
	Aname lillianae	1
	Aname mainae	3
	Aname simoneae	3
	Aname sp.	14
	Aname tenuipes	2
	Anamidae sp.	7
	Kwonkan `MYG175 (FP-10067)`	1
	Kwonkan `Phoenix0082`	3
	Kwonkan `Phoenix0085`	2
	Kwonkan `SIGM104`	2
	Kwonkan sp.	3
	Proshermacha `BMYG227` (credo group)	3
	Proshermacha `MYG502`	1
	Proshermacha `MYG506`	2
	Proshermacha sp.	2
	Teyl `door-building`	13
	Teyl `double-door sp.`	1
	Teyl `MYG021`	3
	Teyl `Phoenix0081`	4
	Teyl luculentus	1
	Teyl sp.	2

Higher order identification	Lowest identification	No. of specimens
Barychelidae	Barychelidae sp.	3
	Idiommata `flare tip`	1
	Idiommata `kalgoorlie`	3
	Idiommata sp.	3
	Mandjelia `MYG035 (FP-10094)`	1
	Synothele `BMYG228`	1
	Synothele `Phoenix0083`	5
	Synothele `Phoenix0084`	1
Euagridae	*Cethegus* `MYG050`	7
	Cethegus sp.	4
Halonoproctidae	*Conothele* `FP-10144 ('kalgoorlie')`	1
	Conothele `MYG554`	4
	Conothele sp.	6
Idiopidae	*Bungulla* `MYG677`	1
	Gaius `FP-11362` (kalgoorlie)	2
	Gaius austini	34
	Gaius sp.	3
	Gaius villosus	4
	Idiopidae sp.	1
	Idiosoma `BMYG225`	13
	Idiosoma `BMYG226`	5
	Idiosoma `FP-10147 (MYG256)`	1
	Idiosoma `FP-10192 ('kalgoorlie1')`	1
	Idiosoma `FP-10195 (SIGM120)`	1
	Idiosoma `kalgoorlie`	3
	Idiosoma `MYG159`	1
	Idiosoma `MYG244`	6
	Idiosoma `MYG256`	11
	Idiosoma `MYG737`	1
	Idiosoma `MYG832`	1
	Idiosoma `Phoenix0086`	1
	Idiosoma `sp. near MYG224`	1
	Idiosoma `squama`	1
	Idiosoma sp.	25
	Idiosoma sp. (goldfields group)	2
	Idiosoma sp. (occidentale group)	1
Theraphosidae	*Selenocosmia stirlingi*	1
	Selenotholus foelschei	4
Pseudoscorpiones		
Chthoniidae	*Austrochthonius* sp.	2
Cheiridiidae	Cheiridiidae sp.	2
Cheliferidae	Cheliferidae `sp. Fi01`	1
	Protochelifer sp.	6

Higher order identification	Lowest identification	No. of specimens
Chernetidae	Chernetidae `BPS558`	1
	Chernetidae `PSEAAF` sp.	10
	Chernetidae sp.	7
	Conicochernes `PSE024`	25
	Conicochernes sp.	14
	Nesidiochernes `sp. Fi01`	3
	Nesidiochernes `sp. Fi02`	2
	Nesidiochernes sp.	20
	Sundochernes sp.	2
Garypidae	*Synsphyronus* `cf. mimulus`	6
	Synsphyronus `PSE078`	7
	Synsphyronus alisonae	29
	Synsphyronus dorothyae	18
	Synsphyronus lathrius	28
	Synsphyronus mimulus	32
	Synsphyronus sp.	16
Garypinidae	*Amblyolpium* `BPS559`	1
	Amblyolpium sp.	4
Geogarypidae	*Geogarypus taylori*	6
Olpiidae	*Austrohorus* `salt lake species`	2
	Austrohorus `sp. Fi01`	2
	Austrohorus sp.	2
	Beierolpium 8/3 `BPS556`	1
	Beierolpium 8/4 small sp.	17
	Beierolpium 8/4 sp.	18
	Beierolpium 8/4-Fi02 sp.	9
	Beierolpium sp.	4
	Indolpium `BPS552`	2
	Indolpium `Fi03`	2
	Indolpium sp.	2
	Olpiidae sp.	24
	Xenolpium sp.	1
Sternophoridae	*Afrosternophorus* sp.	1
Scorpiones	Scorpiones sp.	1
Bothriuridae	*Cercophonius michaelseni*	4
Buthidae	Buthidae sp.	1
	Isometroides `goldfields1`	6
	Isometroides sp.	1
	Isometroides vescus	8
	Lychas `Fimiston`	6
	Lychas `BSCO092` (splendens group)	3
	Lychas `pilbara1`	1
	Lychas `SCO039` (annulatus complex)	2

Higher order identification	Lowest identification	No. of specimens
	Lychas annulatus	4
	Lychas jonesae	4
	Lychas sp.	6
	Lychas sp. (annulatus complex)	1
	Lychas sp. (bituberculatus complex)	3
	Lychas splendens	36
Urodacidae	*Urodacus* `magestic`	1
	Urodacus armatus	27
	Urodacus hoplurus	1
	Urodacus novaehollandiae	14
	Urodacus sp.	17
	Urodacus yaschenkoi	1
Crustacea		
Malacostraca		
Isopoda	Isopoda sp.	1
Armadillidae	*Acanthodillo* `sp. 1`	7
	Armadillidae sp.	2
	Buddelundia `BIS554`	5
	Buddelundia `sp. 39`	1
	Buddelundia frontosa	41
	Buddelundia sp. B41	1
	Cubaris `sp. lefroy`	1
Philosciidae	Philosciidae sp.	2
Myriapoda	Myriapoda sp.	1
Chilopoda		
Geophilida	Geophilida sp.	2
Chilenophilidae	Chilenophilidae sp.	1
	Sepedonophilus `BGE083`	1
Scolopendrida		
Cryptopidae	*Cryptops* `BSCOL063` (spinipes s.l.)	1
	Cryptops australis	1
Scolopendridae	*Cormocephalus michelseni*	1
	Cormocephalus similis	1
	Cormocephalus turneri	3
	Scolopendra laeta	8
	Scolopendra morsitans	6
Scutigerida		
Scutigeridae	*Thereuopoda lesueurii*	1
Diplopoda		
Polydesmida		
Paradoxosomatidae	*Antichiropus* `DIP065`	6

Higher order identification	Lowest identification	No. of specimens
	Antichiropus `DIP067, Broad Arrow`	5
	Antichiropus `DIP145, kalgoorlie`	1
	Antichiropus sp.	9
Polyxenida		
Polyxenidae	*Unixenus mjoebergi*	4
	Unixenus sp.	2
Polyzoniida		
Siphonotidae	Siphonotidae `sp. no stripe`	1
	Siphonotidae sp.	1
Mollusca		
Gastropoda		
Stylommatophora		
Bothriembryontidae	*Bothriembryon* aff. *sedgwicki*	1
	Bothriembryon cf. *rusticus*	1
	Bothriembryon cf. *sedgwicki*	10
	Bothriembryon sp.	74
Camaenidae	Camaenidae sp.	1
	Sinumelon cf. *jimberlanense*	22
	Sinumelon cf. *vagente*	2
	Sinumelon jimberlanensis	1
	Sinumelon kalgum	5
	Sinumelon sp.	23
Pupillidae	*Gastrocopta margaretae*	2
	Pupilla australis	1
	Pupoides adelaidae	80
	Pupoides cf. *beltianus*	1
	Pupoides cf. *myoporinae*	2
	Pupoides myoporinae	26
Gastrocoptidae	*Gastrocopta* aff. *margaretae*	101
	Gastrocopta bannertonensis	37
	Gastrocopta cf. *bannertonensis*	12
	Gastrocopta margaretae	4
Punctidae	*Westralaoma* cf. *expicta*	1
	Westralaoma expicta	28
	Westralaoma sp.	24

Appendix 2 Sample site details

fieldcode	Latitude	Longitude	Sampling Method	Targeted Habitat
Site 01	-30.98539	121.21327	Forage	Drainage line
Site 02	-31.00519	121.27421	Forage, Dry Traps	Eucalyptus woodland
Site 03	-31.0035	121.29927	Habitat	Eucalyptus woodland
Site 04	-30.97282	121.23142	Forage	Low hills and slopes
Site 05	-30.99842	121.27992	Forage, Dry Traps	Floodplain
Site 06	-30.99444	121.25065	Forage	Eucalyptus woodland
Site 07	-31.09923	121.24869	Forage, Dry Traps	Drainage line
Site 08	-31.09371	121.30204	Habitat	Eucalyptus woodland
Site 09	-31.11284	121.30402	Forage	Eucalyptus woodland
Site 10	-31.1226	121.24185	Forage, Dry Traps	Eucalyptus woodland
Site 11	-31.13139	121.28487	Forage	Eucalyptus woodland
Site 12	-31.13817	121.2939	Habitat	Eucalyptus woodland
Site 13	-31.19155	121.34355	Forage, Dry Traps	Eucalyptus woodland
Site 14	-31.19867	121.33625	Habitat	Shrubland
Site 15	-31.18997	121.36385	Forage	Eucalyptus woodland
Site 16	-31.19842	121.37847	Forage	Eucalyptus woodland
Site 17	-31.01125	121.36756	Habitat	Eucalyptus woodland
Site 18	-31.01966	121.36274	Forage	Eucalyptus woodland
Site 19	-31.05438	121.35741	Forage, Dry Traps	Drainage line
Site 20	-31.0395	121.40379	Forage	Shrubland
Site 21	-31.036	121.42212	Forage	Floodplain
Site 22	-31.06941	121.41561	Forage	Floodplain
Site 23	-31.02991	121.46073	Forage	Floodplain
Site 24	-31.02501	121.49322	Forage, Dry Traps	Stony plain
Site 25	-31.04288	121.52141	Forage	Floodplain
Site 26	-31.13741	121.49477	Forage	Eucalyptus woodland
Site 27	-31.13234	121.4696	Forage	Rocky outcrop
Site 28	-31.1557	121.53366	Forage, Dry Traps	Eucalyptus woodland
Site 29	-31.13683	121.51723	Forage	Rocky hill
Site 30	-31.17711	121.55747	Forage	Drainage line
Site 31	-30.98306	121.21498	Forage	Drainage line
Site 32	-31.00482	121.271241	Forage, Dry Traps	Shrubland
Site 33	-31.00599	121.298868	Habitat	Shrubland
Site 34	-30.97184	121.233328	Forage	Hillslope
Site 35	-31.00015	121.279719	Forage, Dry Traps	Floodplain
Site 36	-30.99497	121.247262	Forage	Shrubland
Site 37	-31.09765	121.247065	Forage, Dry Traps	Drainage lines
Site 38	-31.09971	121.303032	Habitat	Shrubland
Site 39	-31.11562	121.303956	Forage	Shrubland
Site 40	-31.11967	121.241066	Forage, Dry Traps	Hillslope
Site 41	-31.13308	121.289439	Forage	Drainage lines

fieldcode	Latitude	Longitude	Sampling Method	Targeted Habitat
Site 42	-31.13091	121.295406	Habitat	Sandplain
Site 43	-31.19255	121.343953	Forage, Dry Traps	Sandplain
Site 44	-31.19957	121.337788	Habitat	Sandplain
Site 45	-31.19181	121.365255	Forage	Shrubland
Site 46	-31.19733	121.380411	Forage	Shrubland
Site 47	-31.01324	121.37124	Burrow, Habitat	Shrubland
Site 48	-31.02241	121.36458	Forage	Sandplain
Site 49	-31.05466	121.356119	Forage, Dry Traps	Drainage lines
Site 50	-31.04149	121.407451	Forage	Shrubland
Site 51	-31.03702	121.422562	Forage	Rocky plains
Site 52	-31.07166	121.415426	Forage	Floodplain
Site 53	-31.02907	121.461522	Forage	Sandplain
Site 54	-31.02443	121.494124	Forage, Dry Traps	Rocky plains
Site 55	-31.03852	121.517044	Forage	Floodplain/shrubland
Site 56	-31.13788	121.488109	Forage, Dry Traps	Floodplain
Site 57	-31.13263	121.468757	Forage	Rocky outcrop
Site 58	-31.15265	121.530417	Forage	Shrubland
Site 59	-31.13882	121.519041	Forage	Hillslope
Site 60	-31.17787	121.556309	Forage	Drainage lines
Site 61	-31.06597	121.434346	Forage	Sandplain

Appendix 3 Summary of genetic analysis

Final Identification	Identification before DNA	Bore Code	Location	Year	Comments
Aname `BMYG244`	*Aname* sp.	MRL586	Kalgoorlie	2024	No species level match was found in databases with either COI or the 16S genes, therefore a new species code was assigned.
Aname `BMYG245`	*Aname* sp.	MRL532	Kalgoorlie	2024	No species level match was found in databases with either COI or the 16S genes, therefore a new species code was assigned. A match was found with the spider from site MRL584.
Aname `BMYG245`	*Aname* sp.	MRL584	Kalgoorlie	2024	No species level match was found in databases with either COI or the 16S genes. A match was found with the spider from site MRL532, therefore the same new species code was assigned.
Aname `MYG212`	*Aname* sp.	MRL525	Kalgoorlie	2024	Species level match to *Aname* sp. MYG212 both in Bennelongia and public databases. Also matches spiders recovered from sites MRL544 and MRL592.
Aname `MYG212`	*Aname* sp.	MRL544	Kalgoorlie	2024	Species level match to *Aname* sp. MYG212 both in Bennelongia and public databases. Also matches spiders recovered from sites MRL525 and MRL592.
Aname `MYG212`	*Aname* sp.	MRL592	Kalgoorlie	2024	Species level match to *Aname* sp. MYG212 both in Bennelongia and public databases. Also matches spiders recovered from sites MRL525 and MRL544.
Anopsobius relictus	*Anopsobius relictus*	MRL592	Kalgoorlie	2024	Genetic analysis does not contend the morphological identification.

Final Identification	Identification before DNA	Bore Code	Location	Year	Comments
Antichiropus `BDI088`	*Antichiropus* `BDI088`	MRL583	Kalgoorlie	2024	No species level match found in Bennelongia or public databases, therefore assigned a new species code. Same as animal from site MRL521.
Antichiropus `BDI088`	*Antichiropus* sp.	MRL521	Kalgoorlie	2024	No species level match found in Bennelongia or public databases. Same as animal from site MRL521, therefore assigned the same new species code.
Antichiropus `BDI089`	*Antichiropus* sp.	MRL543	Kalgoorlie	2024	No species level match found in Bennelongia or public databases, therefore assigned a new species code.
Antichiropus sp. B06	*Antichiropus* sp. B06	MRL538	Kalgoorlie	2024	Morphologically identified as *Antichiropus* sp. B06 and 7.1% distant to *A*. B06 in the Bennelongia database therefore retains this assignment.
Antichiropus sp. B06	*Antichiropus* sp. B06	AGP004	65 km north Kalgoorlie	2016	Reference *Antichiropus* sp. B06.
Bothriembryon `BGA053`	*Bothriembryon* sp.	MRL549	Kalgoorlie	2024	No species level match found in Bennelongia or public databases, therefore assigned a new species code.
Buddelundia `BIS573`	*Buddelundia* `BIS573`	MRL541	Kalgoorlie	2024	No species level match found in Bennelongia or public databases, therefore assigned a new species code.
Buddelundia `BIS574`	*Buddelundia* sp. B41	MRL577	Kalgoorlie	2024	No species level match found in Bennelongia or public databases, including *Buddelundia* sp. B41, therefore assigned a new species code.

Final Identification	Identification before DNA	Bore Code	Location	Year	Comments
Buddelundia BIS554	*Buddelundia* `BIS574`	MRL541	Kalgoorlie	2024	Species level match found with *Buddelundia* 'BIS554' from the Bennelongia database therefore name re-assigned.
Bungulla `BMYG250`	*Idiosoma* sp.	MRL535	Kalgoorlie	2024	No species or genus level match found in Bennelongia or public databases. Genus level matches to *Bungulla* found in both, therefore re-assigned genus and assigned a new species code.
Bungulla `BMYG251`	*Idiosoma* sp.	MRL571	Kalgoorlie	2024	No species or genus level match found in Bennelongia or public databases. Genus level matches to Bungulla found in both, therefore re-assigned genus and assigned a new species code.
Cethegus `BMYG248`	*Cethegus* sp.	MRL542	Kalgoorlie	2024	No species level match found in Bennelongia or public databases, therefore assigned a new species code.
Chernetidae `BPS577`	Chernetidae `BPS577`	MRL538	Kalgoorlie	2024	No species level match found in Bennelongia or public databases, therefore morphologically assigned species code retained.
Colobopleurus `BSCOL119`	*Colobopleurus* `BSCOL119`	MRL534	Kalgoorlie	2024	No species level match found in Bennelongia or public databases, therefore morphologically assigned species code retained.
Conothele `MYG554`	*Conothele* sp.	MRL525	Kalgoorlie	2024	Species level match to *Conothele* `MYG554` in Genbank. Also same as *Conothele* sp. from site MRL593.

Final Identification	Identification before DNA	Bore Code	Location	Year	Comments
Conothele `MYG554`	*Conothele* sp.	MRL593	Kalgoorlie	2024	Species level match to *Conothele* `MYG554` in Genbank. Also same as *Conothele* sp. from site MRL525.
Cubaris BIS576	*Cubaris* `BIS576`	MRL521	Kalgoorlie	2024	No species level match found in Bennelongia or public databases, therefore morphologically assigned species code retained.
Cubaris BIS576	*Cubaris* sp.	ARL021	Goongarrie	2023	Sequenced as reference sample for *Cubaris* 'BIS576' from MRL521.
Cubaris BIS576	*Cubaris* sp.	ARL025	Goongarrie	2023	Sequenced as reference sample for *Cubaris* 'BIS576' from MRL521.
Gaius austini	*Gaius* sp.	MRL526	Kalgoorlie	2024	Species level match to *Gaius austini* on Genbank using the cytb gene. Species level match to spiders from sites MRL595 and MRL568 using COI.
Gaius austini	*Gaius villosus* s.l.	MRL595	Kalgoorlie	2024	Species level match to *Gaius austini* on Genbank using the cytb gene. Species level match to spiders from sites MRL526 and MRL568 using COI.
Gaius austini	*Gaius austini*	MRL568	Kalgoorlie	2024	Species level match to *Gaius austini* on Genbank using the cytb gene. Species level match to spiders from sites MRL526 and MRL595 using COI.
Gastrocopta margaretae (SW sp.)	*Gastrocopta margaretae*	MRL588	Kalgoorlie	2024	Species level match in Genbank and Bennelongia databases, therefore morphologically assigned species code retained.

Final Identification	Identification before DNA	Bore Code	Location	Year	Comments
Idiommata `BMYG246`	*Idiommata* sp.	MRL547	Kalgoorlie	2024	No species level match in Bennelongia or public databases, therefore new species code assigned.
Idiommata `BMYG247`	*Idiommata* sp.	MRL525	Kalgoorlie	2024	No species level match in Bennelongia or public databases. Species level match to *Idiommata* sp. from site MRL568, therefore same new species code assigned.
Idiommata `BMYG247`	*Idiommata* sp.	MRL568	Kalgoorlie	2024	No species level match in Bennelongia or public databases. Species level match to *Idiommata* sp. from site MRL525, therefore same new species code assigned.
Idiommata sp. `kalgoorlie`	*Idiommata* sp.	MRL589	Kalgoorlie	2024	Species level match to *Idiommata* sp. `kalgoorlie` in Genbank.
Idiosoma `BMYG168`	*Gaius* sp.	MRL537	Kalgoorlie	2024	Species level match to *Idiosoma* `BMYG168` in Bennenlongia database using COI and cytb, no genus level match to *Gaius*. Species level match to *Idiosoma* sp. from sites MRL583 and MRL568.
Idiosoma `BMYG168`	*Idiosoma* sp.	MRL583	Kalgoorlie	2024	Species level match to *Idiosoma* `BMYG168` in Bennenlongia database using COI and cytb. Species level match to *Idiosoma* sp. from sites MRL537 and MRL568.
Idiosoma `BMYG168`	*Idiosoma* sp.	MRL568	Kalgoorlie	2024	Species level match to *Idiosoma* `BMYG168` in Bennenlongia database using COI and cytb. Species level match to *Idiosoma* sp. from sites MRL537 and MRL583.
Idiosoma `BMYG249`	*Idiosoma* sp.	MRL547	Kalgoorlie	2024	No species level match in Bennelongia or public databases, therefore a new species code assigned.

Final Identification	Identification before DNA	Bore Code	Location	Year	Comments
Idiosoma `MYG244`	*Idiosoma* sp.	MRL590	Kalgoorlie	2024	Species level match to *Idiosoma* sp. MYG244 in Genbank.
Lychas `BSCO092` `splendens group`	*Lychas* `BSCO092` `splendens group`	MRL547	Kalgoorlie	2024	Species level match to *Lychas* `BSCO092` `splendens group` in Bennelongia database, therefore morphological ID retained.
Lychas `SCO039` (annulatus complex)	*Lychas* `SCO039` (annulatus complex)	MRL547	Kalgoorlie	2024	Species level match to *Lychas* `SCO039` (annulatus complex) in Bennelongia database, therefore morphological ID retained.
Lychas `SCO039` (annulatus complex)	*Isometroides vescus* s.l.	MRL525	Kalgoorlie	2024	Species level match to *Lychas* `SCO039` (annulatus complex) in Bennelongia database, and only 2.7% distant to *Lychas* `SCO039` (annulatus complex) from site MRL547. Therefore name re-assigned.
Nesidiochernes `BPS343`	Chernetidae `BPS577`	MRL529	Kalgoorlie	2024	Species level match to Chernetidae `BPS343` IN Bennelongia database and genus level match to *Nesidiochernes* in Genbank, so re-assigned to *Nesidiochernes* `BPS343`.
Otostigmus `BSCOL071`	*Otostigmus* `BSCOL125`	MRL586	Kalgoorlie	2024	Species level match to Scolopendrinae `BSCOL071` and morphologically assigned to Otostigmus, a genus within the Scolopendrinae sub-family.
Philosciidae `BIS571`	Philosciidae `BIS371`	MRL539	Kalgoorlie	2024	No species level match to Bennelongia or public databases, including to Philosciidae `BIS371`, therefore a new species code assigned.
Philosciidae `BIS595`	Philosciidae sp.	MRL597	Kalgoorlie	2024	No species level match to Bennelongia or public databases, therefore a new species code assigned.

Final Identification	Identification before DNA	Bore Code	Location	Year	Comments
Platyarthridae `BIS590`	Platyarthridae `BIS590`	MRL592	Kalgoorlie	2024	No species level match to Bennelongia or public databases therefore new morphologically assigned species code retained.
Proshermacha `BMYG227`	*Proshermacha credo*	MRL541	Kalgoorlie	2024	Species level match to Proshermacha `BMYG227` in Bennelongia database, and only 2.8% distant to Proshermacha sp. from site MRL597.
Proshermacha `BMYG227`	*Proshermacha* sp.	MRL597	Kalgoorlie	2024	Species level match to Proshermacha `BMYG227` in Bennelongia database, and only 2.8% distant to Proshermacha sp. from site MRL541.
Siphonotidae `BDI064`	Siphonotidae sp. `BDI089`	MRL541	Kalgoorlie	2024	Species level match to Siphonotidae `BDI064` from Coolgardie collected from site SPEC003 in 2019.
Siphonotidae `BDI064`	Siphonotidae `BDI064`	SPEC003	Coolgardie	2019	Reference Siphonotidae `BDI064`.
Synothele `BMYG172`	*Synothele* sp.	MRL596	Kalgoorlie	2024	Species level match to Synothele `BMYG172` in the Bennelongia database.
Synothele cf. *houstoni*	*Synothele* sp.	MRL520	Kalgoorlie	2024	This is a type locality specimen for *Synothele* cf. *houstoni*. No species level match to Bennelongia or public databases.
Synsphyronus lathrius	*Synsphyronus lathrius*	MRL588	Kalgoorlie	2024	No species level match to Bennelongia or public databases, *Synsphyronus lathrius* not included. Morphologically assigned species name retained.
Teyl `MYG012`	*Teyl* sp.	MRL532	Kalgoorlie	2024	Species level match to *Teyl* `MYG012` in Genbank with 16S gene.

Final Identification	Identification before DNA	Bore Code	Location	Year	Comments
Teyl `MYG895`	*Teyl* sp.	MRL584	Kalgoorlie	2024	Species level match to *Teyl* `MYG895` in Rix database. < 2 % distant to *Teyl* sp. from sites MRL592 and MRL586.
Teyl `MYG895`	*Teyl* sp.	MRL592	Kalgoorlie	2024	Species level match to Teyl `MYG895` in Rix database. < 2 % distant to Teyl sp. from sites MRL584 and MRL586.
Teyl `MYG895`	*Teyl* sp.	MRL586	Kalgoorlie	2024	Species level match to Teyl `MYG895` in Rix database. < 2 % distant to Teyl sp. from sites MRL584 and MRL592.
Urodacus `BSCO066`	*Urodacus* `BSCO061`	MRL585	Kalgoorlie	2024	Species level match to Urodacus `BSCO066` in Bennelongia database and inter-species distance to Urodacus `BSCO061`. < 1 % distant to Urodacus from site MRL538. Therefore, re-assigned to Urodacus `BSCO066`.
Urodacus `BSCO066`	*Urodacus* `BSCO061`	MRL538	Kalgoorlie	2024	Species level match to Urodacus `BSCO066` in Bennelongia database and inter-species distance to Urodacus `BSCO061`. < 1 % distant to Urodacus from site MRL585. Therefore, re-assigned to Urodacus `BSCO066`.

Appendix 4 Site photos

Site01		Site02	
			
Site03		**Site04**	
			
Site05		**Site06**	
			

Site07


Site08


Site09


Site10


Site11


Site12


Site13		Site14	
			
Site15		**Site16**	
			
Site17		**Site18**	
			

Site19		Site20	
			
Site21		Site22	
			
Site23		Site24	
			

Site25		Site26	
			
Site27		**Site28**	
			
Site29		**Site30**	
			

Site31		Site32	
			
Site33		**Site34**	
			
Site35		**Site36**	
			

Site37		Site38	
			
Site39		**Site40**	
			
Site41		**Site42**	
			

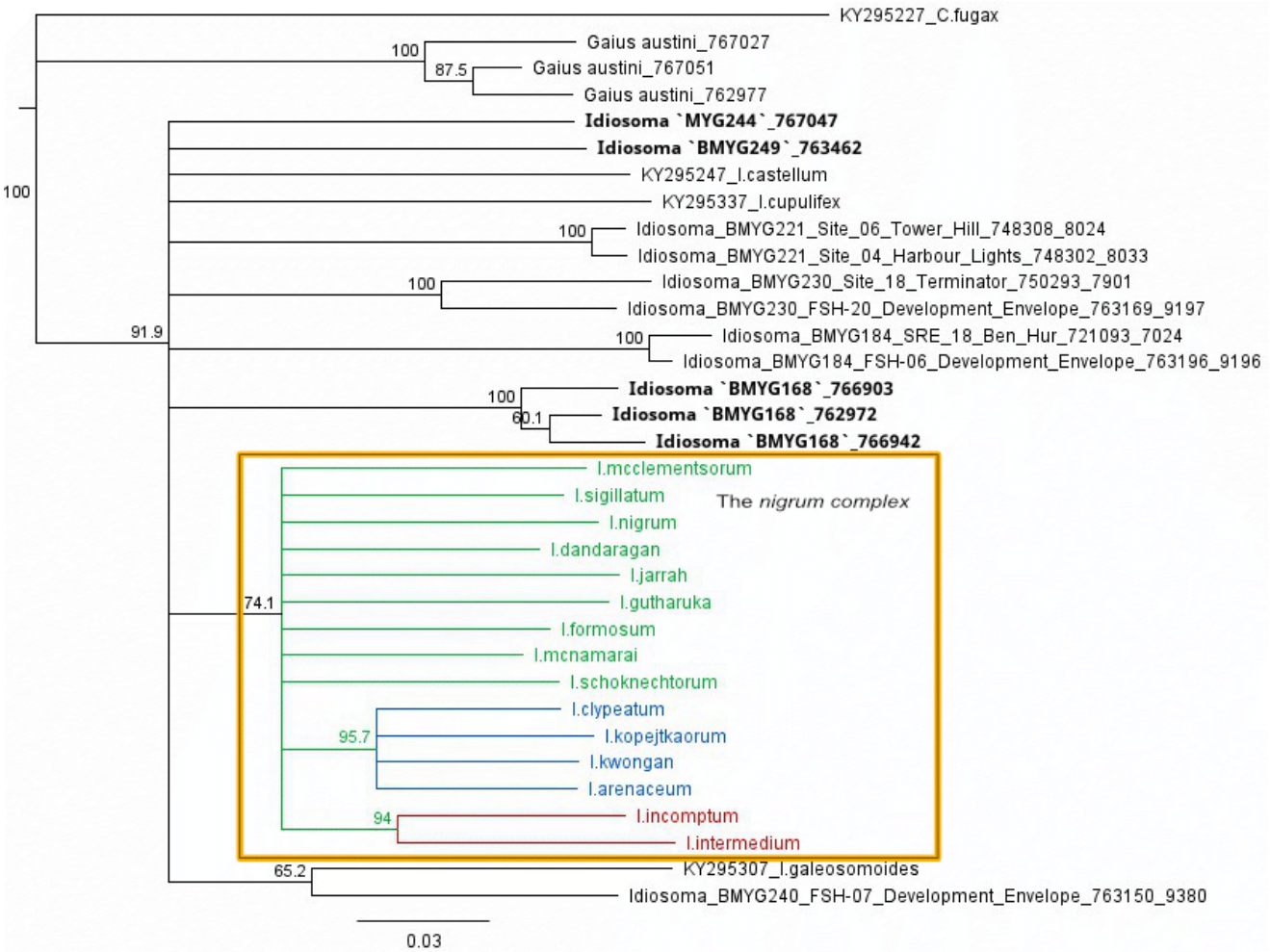
Site43		Site44	
			
Site45		**Site46**	
			
Site47		**Site48**	
			

Site49		Site50	
			
Site51		**Site52**	
			
Site53		**Site54**	
			

Site55		Site56	
			
Site57		**Site58**	
			
Site59		**Site60**	
			

Site61			
			

Appendix 5 Neighbor-Joining phylogenetic tree of *Idiosoma* collected during survey



A consensus NJ distance tree was generated from 644 bp of the COI gene using the Tamura-Nei genetic distance and with bootstrap node support based on 1000 replicates. Branches labelled in bold type are the *Idiosoma* species collected during survey. The green, blue and red coloured branches within the nigrum complex represent the three phylogenetically defined sub-clades.