Bennelongia Environmental Consultants

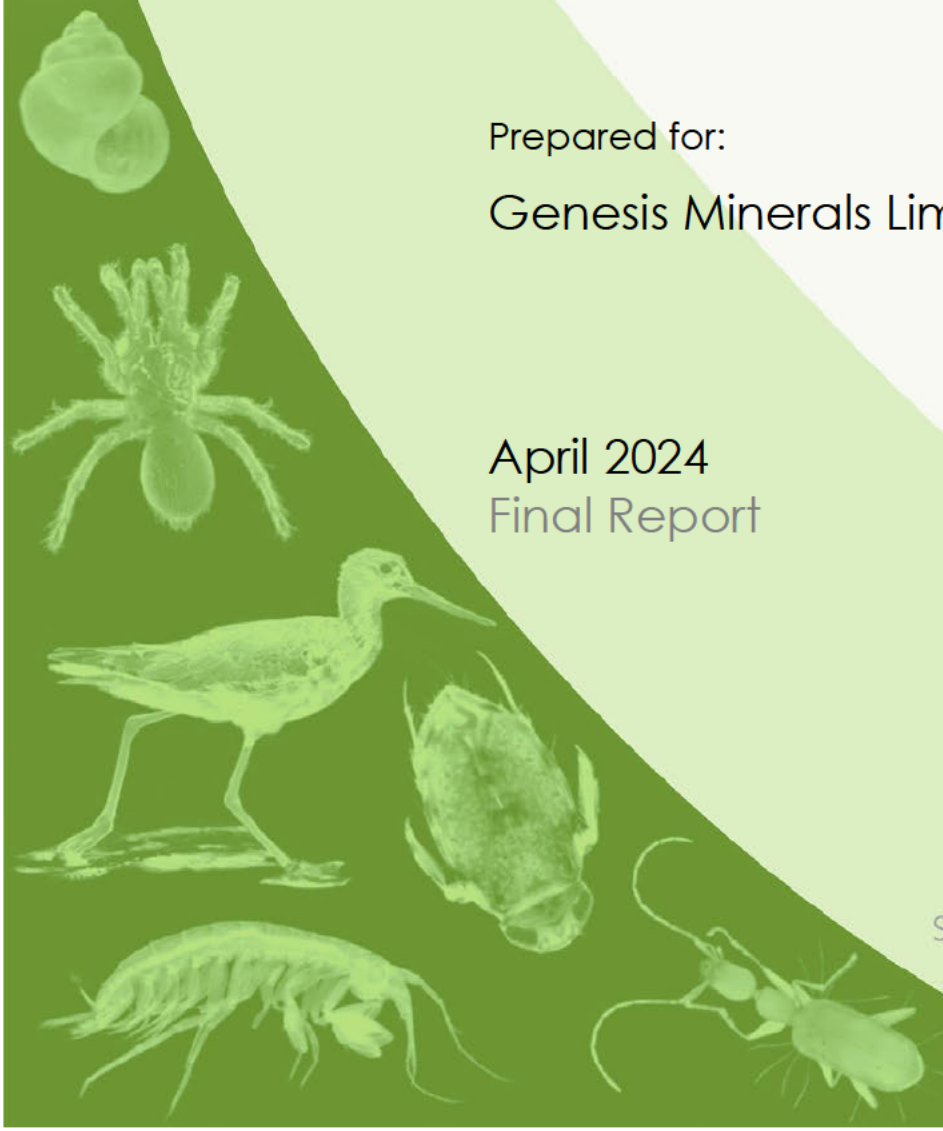
Genesis Minerals - Tower Hill expansion SRE Fauna Survey Report

Prepared for:

Genesis Minerals Limited

April 2024

Final Report



Short-Range Endemics I Subterranean Fauna

Waterbirds I Wetlands

Genesis Minerals – Tower Hill expansion SRE Fauna Survey Report

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EXECUTIVE SUMMARY

In 2023, Genesis Minerals (Genesis) acquired the Gwalia mine and surrounding development opportunities (together Leonora Operations; hereafter "the Project") and currently seeks to expand operations at the Tower Hill mine. The proposed expansion includes the development of the Tower Hill Open Pit, currently in care and maintenance, and associated infrastructure (such as waste rock landform, rom pad, and haul roads). The proposed expansion includes clearing of native vegetation, which may negatively affect populations of short-range endemic (SRE) species, terrestrial invertebrates with natural home ranges <10,000 km^2. Terrestrial Ecology commissioned Bennelongia to conduct a baseline SRE survey to determine the presence and composition of the SRE community at the Project.

Desktop assessment of an area 100 x 100 km centred on the Project recovered 157 records of animals from SRE Groups attributable to 45 known species. None of the SRE species in the search had sufficient taxonomic certainty and representation in collections to be classified as Confirmed SREs, but 9 species were categorised as Likely Potential SREs; 10 were categorised as Unlikely Potential SREs; 1 was categorised as Data Deficient; and 25 species were Widespread. A single invasive isopod was identified in the search area. The desktop assessment concluded that further survey was indicated.

Field survey was subsequently carried out from 28-31 March 2023. Habitat mapping identified eight habitats prospective for species from SRE Groups as occurring within the Project area. None of them is considered to be restricted to the survey area. A total of 61 specimens from at least 18 identifiable species belonging to SRE Groups were collected. Seven species were categorised as Widespread, and five species were categorised as Data Deficient. Six species were categorised as Potential SREs, three as Likely Potential SREs, and three as Unlikely Potential SREs:

The pseudoscorpion

- *Indolpium* `BPS496` - Likely Potential SRE;

The scorpions

- *Urodacus* `BSCO055` - Unlikely Potential SRE and
- *Urodacus* `BSCO070` - Unlikely Potential SRE;

And the mygalomorph spiders

- *Aname* `BMYG222``*mellosa* group` - Likely Potential SRE,
- *Idiosoma* `BMYG221` - Likely Potential SRE, and
- *Idiosoma* `MYG256` - Unlikely Potential SRE.

Based on the current known distributions of these species, the broad distribution of their habitats, and the limited impact on those habitats expected from Project activities, no significant impacts on the populations of the Potential SREs or any other terrestrial invertebrate species are expected to result from the development of the Project.

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1. INTRODUCTION

The proposal includes the development of the Tower Hill Open Pit (Figure 1), currently in care and maintenance, and associated infrastructure (waste rock landform, rom pad, haul roads). The Tower Hill Open Pit was historically used to store hypersaline discharge from other mine sites; substantial dewatering (5 GL) is required as part of development.

The proposed expansion includes clearing of native vegetation, which may negatively affect populations of short-range endemic (SRE) species, terrestrial invertebrates with natural home ranges <10,000 km^2. Terrestrial Ecology commissioned Bennelongia to conduct a field survey and desktop assessment to determine the presence and composition of the SRE community at the Project. This report collates the findings of the survey and the desktop assessment. In line with the frameworks established by the EPA (2016a, b), the objectives of this report are:

- To identify potentially prospective habitats for SREs within the proposal area based on existing information about vegetation and the factors known to affect the occurrence of SREs.
- To collate pre-existing records of animals belonging to SRE Groups from the proposal area and surrounds to determine the likelihood of significant species occurring in or affected by the proposal area.
- To present and summarise results of a field survey in the area.
- Using the above information, as well as information about the Project and its operations, to assess whether the Project may have significant impacts on the persistence or population sizes of any SRE species.

1.1. Environmental Context

1.1.1. Regional Geology

The Project lies in the Eastern Murchison subregion of the Murchison bioregion in Western Australia's Goldfields. The Eastern Murchison is primarily used for grazing on native pastures (85.47% of the area; Cowan 2001). The climate in Leonora is arid. The highest daily mean maximum and minimum temperatures fall in January (37.0 °C and 21.8 °C respectively), and the lowest in July (18.4 °C and 6.1 °C). Mean rainfall is highest in February (30.9 mm) and lowest in September (8.9 mm), but the month with highest mean number of days with rain is June (3.5 days).

The Project lies in the Gwalia Domain, which comprises Archaean mafic to ultramafic greenstone units. The Gwalia Domain is bounded by the Mount George Shear Zone to the east, the Sons of Gwalia Shear Zone to the west and south, and the Clifford Fault to the north. Mafic volcanic extrusives up to 400 m wide make up much of the Gwalia Domain, interspersed with minor thin cherty or pelitic interflow sediments. Dolerite sills and dykes also occur.

Surface geology is particularly important to the distribution of SRE species, especially burrowing species like mygalomorph spiders and urodacid scorpions (Koch 1978; Rix *et al.* 2018a; Shorthouse and Marples 1980). Much of the Project area is categorised as anthropogenically disturbed, in this case cleared for mining. Nevertheless, significant disturbance does not necessarily result in the absence of SRE species. Specimens have been collected in areas of regrowth following clearing (Bennelongia 2022b) and in remnant patches of native vegetation on land heavily cleared for pastoral use (Bennelongia in prep).

Beyond the immediate impact zones of existing and historic mining operations, regolith comprises predominantly colluvium and alluvium, with small lacustrine areas or areas of exposed rock (Figure 2). Patchy distributions of regolith types, as occurs in the Project area, are conducive to hosting SRE species.

1.1.2. Flora and Fauna

According to the pre-European vegetation mapping conducted by Beard (1975), four vegetation types occur at the Project (Figure 3). Three of these types are dominated by *Acacia aneura* (mulga) and the fourth by *Halosarcia* (samphire). Each of the four vegetation types is associated with variations in landforms such as creek lines, low hills, and plains, landforms known to influence SRE distribution. However, long-term mining operations have cleared much of this native vegetation. Cleared areas do not constitute appropriate habitat for SRE species.

Recent Survey

Bennelongia has recently conducted several surveys (Bennelongia 2020, 2022a) in the desktop search area defined in Section 2.1, the results of which are incorporated into the desktop assessment (Section 2).

Spectrum Ecology (2022) conducted a flora site visit and terrestrial fauna assessment of the Project area in November 2021. While on site, Spectrum personnel photographed a number of mygalomorph spider burrows which appear to be constructed of moustache-like twig arrangements typical of *Idiosoma* species (Rix *et al.* 2018a; Rix *et al.* 2017b), but the use of similar burrows by other genera renders positive identification impossible. Additionally, many species have extremely cryptic burrow lids, so it is likely that other species of trapdoor spider exist within the Project area. The trapdoor spider findings from this survey were ambiguous and did not include a definitive classification, so no data from this survey were used in the desktop assessment.

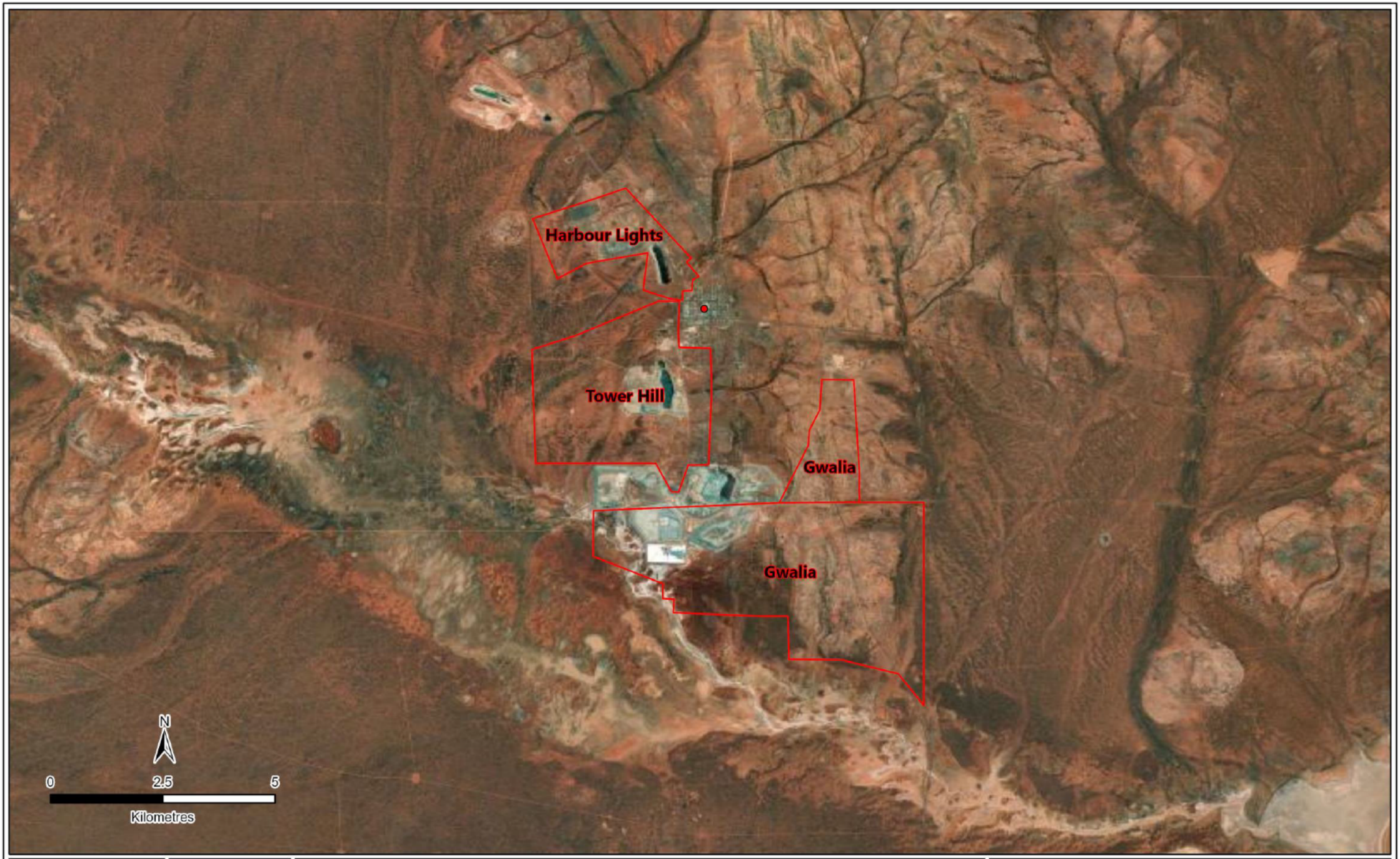
1.2. Short Range Endemism

A short range endemic (SRE) is an epigean terrestrial invertebrate species with a natural range of less than 10,000 km^2 (Harvey 2002). With its complex, ancient environments, Western Australia supports a rich diversity of SREs, and this diversity increases as awareness of SREs spreads. For instance, in recent years DNA barcoding techniques have revealed that taxa previously considered to be single species actually comprise complex cryptic lineages of multiple species (Cao *et al.* 2016; Rix *et al.* 2021).

Short range endemic species are particularly susceptible to disturbances because they have short ranges, tend to live in discontinuous habitats, and often produce few offspring. The main sources of disturbances that threaten the stability of SRE communities include habitat removal or modification, changes in fire regimens, the introduction of weeds and pathogens, and changes in local hydrology. Because of their increased susceptibility to disturbances, SREs are identified by the *Environmental Protection Act 1986* as significant species and targets of protection (EPA 2016b, 2018).

Several groups of animals have been identified as probably or definitely containing SREs (EPA 2016b). Not all species in these groups are SREs, but when any member of those groups is detected, the literature must be consulted to identify its range. Species investigated in this way are categorised as Confirmed SREs, Potential SREs, or Widespread (see Appendix 1). Potential SREs are further differentiated as Likely or Unlikely Potential SREs; Data Deficient species are conservatively considered Likely Potential SREs (Appendix 1), but throughout this report will be treated as a separate category from Likely Potential SREs to allow for species-specific discussion.

Where SREs have not been directly sampled in the past, prospective habitats can be estimated by investigating the habit preferences of existing records and cross-referencing those habitat types with habitat present in the target area. In general, SREs tend to inhabit relictual, isolated, sheltered, and moist habitats, as well as specialist habitats including rock outcrops (EPA 2016b).



Bennelongia Environmental Consultants

GCS GDA 1994
Author: Rhare
Date: 7/06/2023

Legend

- Project Area
- Leonora

Figure 1. Location of the Project and its operations. The proposed Tailings Storage Facility 5 site is 6 km south of Leonora, immediately south of the current Gwalia footprint.

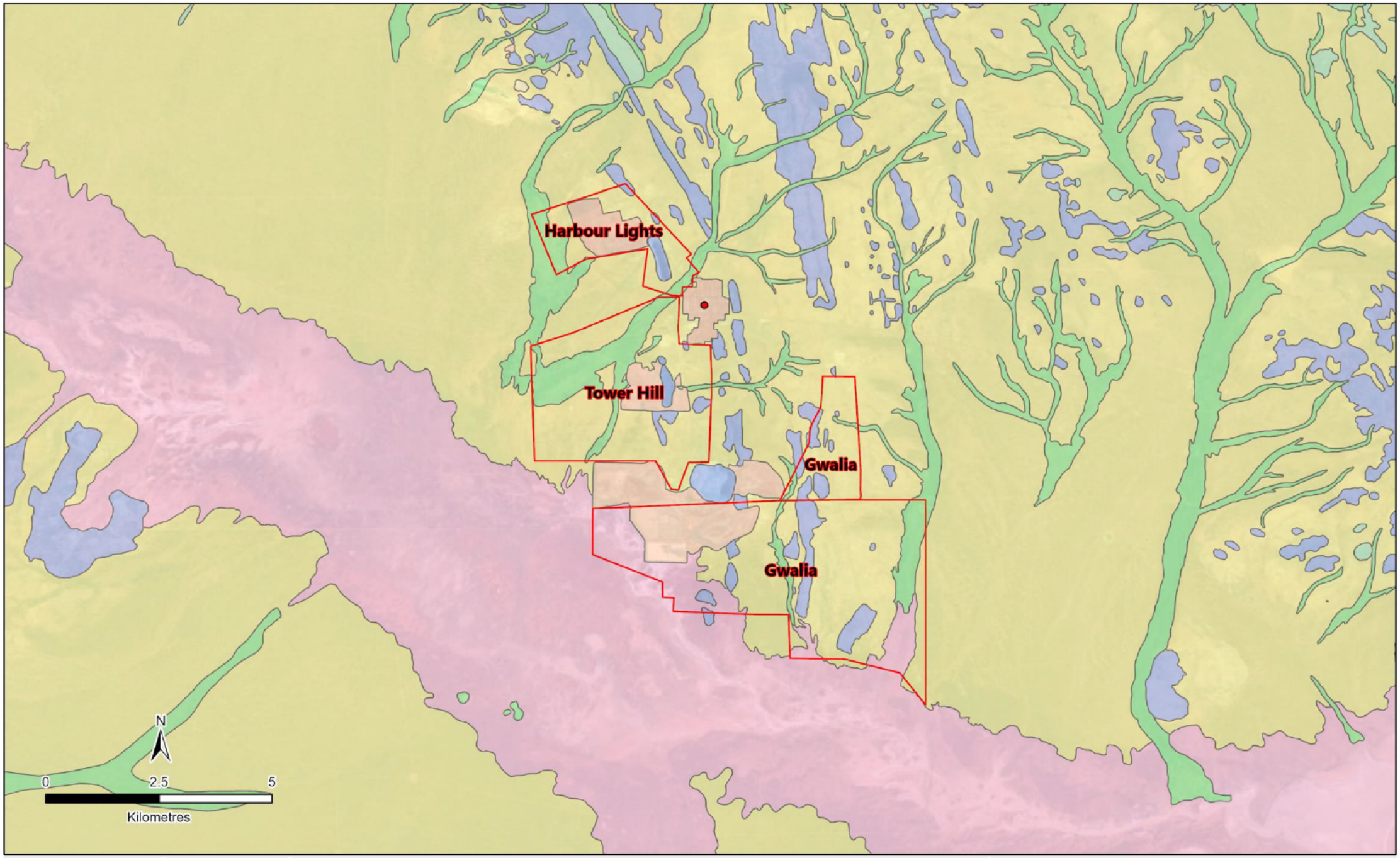
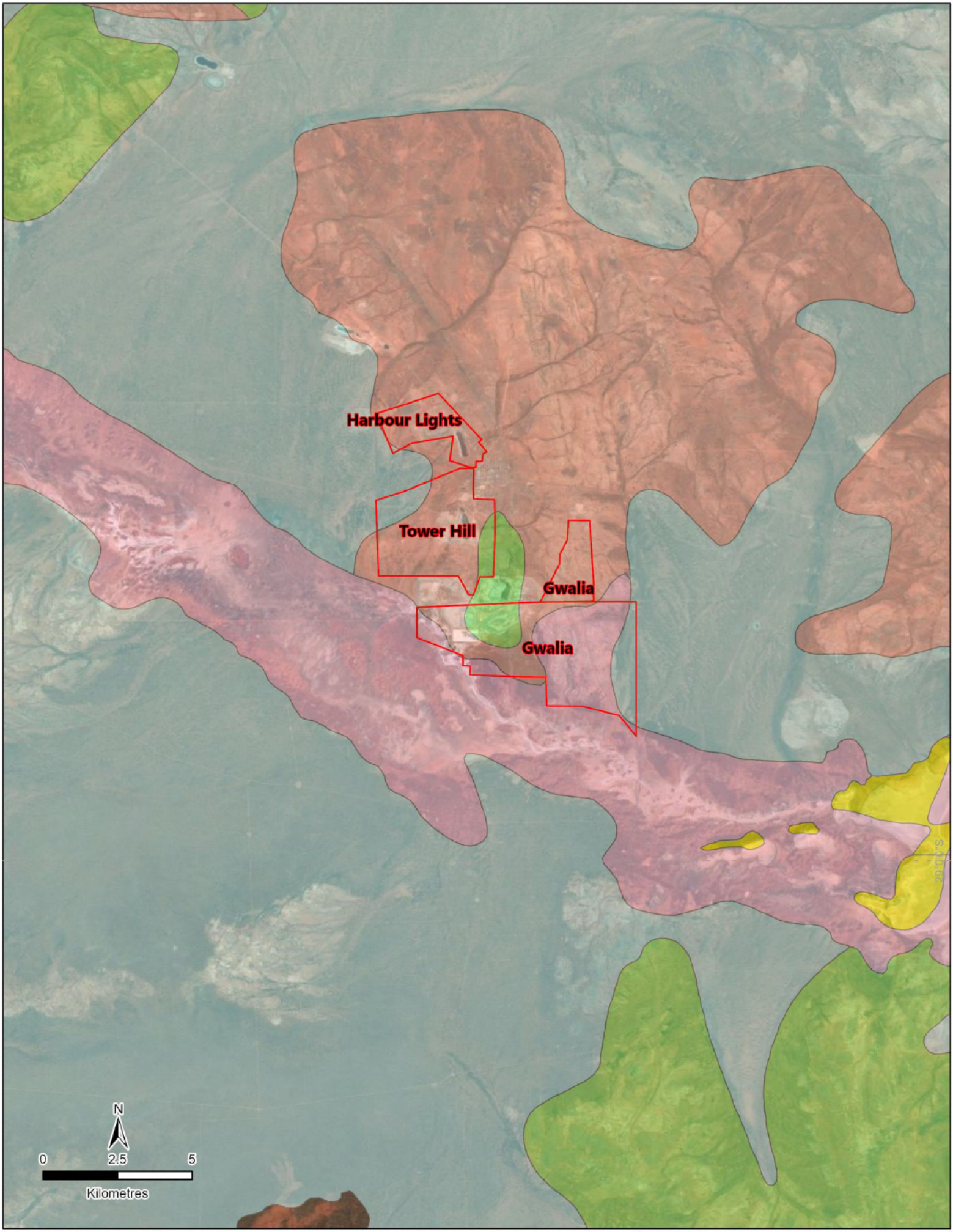


Figure 2. Surface geology at the Project.



Bennelongia Environmental Consultants

GCS GDA 1994
Author: Rhare
Date: 14/06/2023

Beard vegetation units

- Project Area
- 28: Open low woodland of mulga (*Acacia aneura*)
- 18: Low woodland of mulga (*Acacia aneura*) with eucalyptus
- 39: Shrublands of mulga (*Acacia aneura*) scrub
- 676: Succulent steppe of samphire (*Halosarcia* sp.)
- 125: Bare areas; salt lakes

Figure 3. Vegetation associations at the Project

2. DESKTOP ASSESSMENT

2.1. Methods

The desktop assessment combined three sources of information using GIS mapping:

- Boundary information and description of Project activity was supplied by Terrestrial Ecosystems.
- Records of the occurrence of SREs in the vicinity of the project were derived from searching the Western Australia Museum and Bennelongia databases, as well as relevant consulting reports. For each identifiable taxon, the number of records (i.e. the number of times the taxon was found) and the number of individuals collected (i.e. how many were found in each record) from any or all of these sources was collated. Distribution patterns of identifiable taxa were cross-referenced with the Atlas of Living Australia.
- Publicly available habitat data such as vegetation and geological data, as well as descriptions in reports previously conducted at the area (Spectrum Ecology 2022), were consulted.

These sources were combined in order to assess the presence or likely presence of SREs, based on prior records and habitat information. Database searches covered an area of 10,000 km^2 centred on the Project (vertices at -28.4322, 120.8207 and -29.3341, 121.8410; Figure 4). Analysis and mapping were undertaken using ArcGIS Pro v2.9.

Following database searches, only those taxa belonging to groups known to contain SREs were retained downstream; other records were discarded. Where possible, each taxon retained downstream was categorised according to the Bennelongia classification schema (Appendix 1) using a combination of information concerning that taxon's distribution, habitat preferences, and biology.

2.2. Results

2.2.1. Listed Terrestrial Invertebrate Species, TECs, and PECs

No listed threatened or priority terrestrial invertebrate fauna species were identified as having previously been collected in the desktop search area. There are no Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) concerning terrestrial invertebrates in Project area.

2.2.2. Known SRE Records

The desktop search recovered 157 records attributable to 45 species from SRE Groups (Figure 4; Appendix 2). Groups represented include mygalomorph spiders, pseudoscorpions, scorpions, centipedes, millipedes, isopods, and snails. None of the SRE species in the search had sufficient taxonomic certainty and representation in collections to be classified as Confirmed SREs, but 8 species were categorised as Likely Potential SREs; 10 were categorised as Unlikely Potential SREs; 1 was categorised as Data Deficient; and 25 species were Widespread. A single invasive isopod was identified in the search area.

Twelve higher order records (highlighted orange in Appendix 2) may represent additional records of species already listed in the table and are therefore not assessed. Species shaded blue in Appendix 2 are also higher order identifications but constitute unique representatives of taxonomic groups not otherwise represented in the search area. These are more challenging to assess so a conservative approach has been taken based on broad knowledge of the groups to which they belong. Overall, while some "species" may in fact be complexes of multiple species, and others might have been listed twice or more due to taxonomic uncertainty, the results indicate a substantial SRE community within the search area.

Below is a brief account of the broad groups identified as a part of the desktop study with notes on likely habitats and the distribution of those habitats in the Project Area.

Mygalomorph Spiders

Mygalomorph spiders are increasingly recognised as exhibiting the traits conducive to short-range endemism such as limited dispersal ability (Bond and Stockman 2008; Main 2003; Rix *et al.* 2017a), long generation times (Rix *et al.* 2019), and microhabitat specificity (Rix *et al.* 2018a; Rix *et al.* 2019). The desktop search identified 16 species of mygalomorph spiders within the desktop search area. Of these, three are Likely Potential SREs, four are Unlikely Potential SREs, one is Data Deficient, and the remaining eight are Widespread.

All three Likely Potential SREs are from the genus *Aname,* namely *Aname* `Phoenix0055`, *Aname* `Phoenix0056`, *Aname* `Phoenix0058`. Members of this family are commonly referred to as open-holed trapdoor spiders because they do not cap their burrows with lids. This group of trapdoor spider (among others) lacks a rastellum, a structure that aids digging in compact soils, and as such tend to be restricted to loosely compacted soils such as sand (Main *et al.* 2000). The Data Deficient *Aname* `glenorn sp. 2` was collected in a widespread low mulga woodland with *Eucalyptus* on soils characterised by slope deposits including colluvium and sheetwash (Figure 5). Because it was collected as a singleton, it has been classified as Data Deficient.

The other three species of *Aname* (*A.* `Phoenix0055`, *A.* `Phoenix0056`, *A.* `Phoenix0058`) were collected in the more patchily distributed mulga shrubland (Figure 5) and are thus considered Likely Potential SREs. *Aname* `Phoenix0055` was collected from slope deposits while the other two species were collected from soils containing more exposed rock. It is not uncommon to find trapdoor spiders in microhabitats of accumulated soils amongst exposed rock.

Four Unlikely Potential SRE spider species were recovered from the search area, namely *Kwonkan goongarriensis*, *Idiommata* sp., *Triattame* sp., and *Idiosoma* `occidentalis sp. group`. These species were recovered as occurring over widespread habitats, including some not expected to occur in the Project area. Therefore, they are not expected to have restricted distributions, and hence were categorised as Unlikely Potential SREs.

Pseudoscorpions

Eight species of pseudoscorpions were identified within the desktop search area, of which two are considered to be Likely Potential SREs. Both species (Atemninae sp. and *Nesidiochernes* sp.) are higher order identifications and are known from a mulga shrubland patches on alluvial soils associated with drainage lines (Figure 6). Since these are the only specimens from their respective family and genus, they are considered unique species, and because they were collected in patchy environments, they are considered Likely Potential SREs.

Scorpions

The taxonomic framework for scorpions in Australia needs revision. Relatively few species have been described, but many more remain undescribed in the WAM collection (Koch 1977; Volschenk *et al.* 2010; Volschenk *et al.* 2012; Volschenk *et al.* 2000). Many scorpion species are morphologically cryptic with some only distinguishable from each other after dissecting and examining internal organs such as the hemispermatophore (Buzatto et al. in prep). Broadly, the distribution of scorpions appears to be influenced by temperature and rainfall (Polis 1990; Smith 1995) but at a local scale soil and vegetation characteristics play a stronger role (Bradley 1986; Polis 1990).

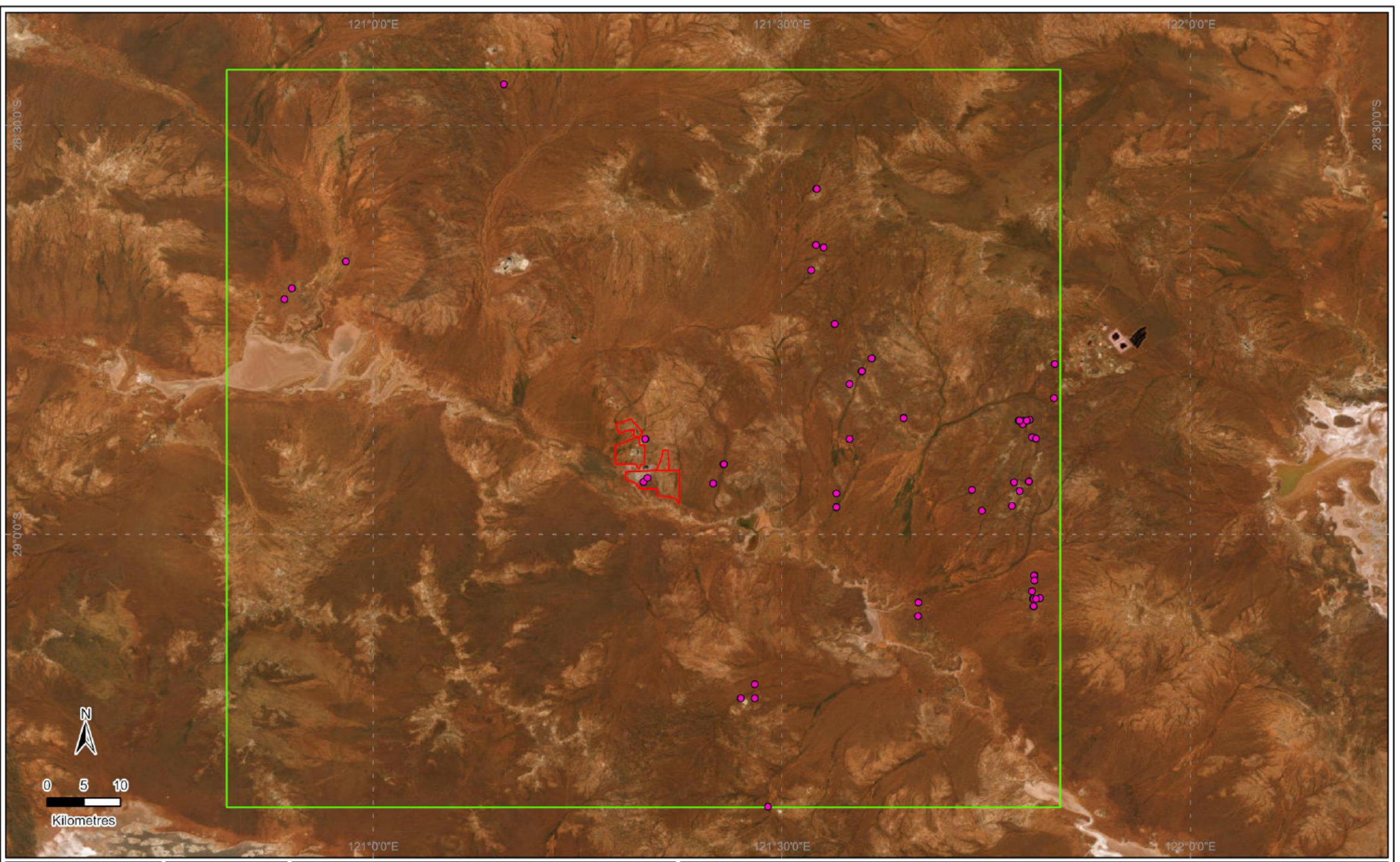


Figure 4. Desktop search area and records of animals belonging to SRE Groups.

Nine species, representing all three families of scorpions present in Western Australia (Urodacidae, Buthidae, and Bothriuridae), were recovered in the desktop search. Two of the nine are considered Likely Potential SREs (*Cercophonius* sp. and *Urodacus* `gibson 1?`); the remainder are Widespread or Unlikely Potential SREs.

Cercophonius sp. was collected in relatively patchy vegetation of succulent samphire steppe associated with inland lakes and playas (Figure 7). The soil group at this location is "Lacustrine lakes, playas, and fringing dunes." *Cercophonius* species appear susceptible to anthropomorphic disturbance: members of this genus have been completely lost in areas heavily cleared for farming (Koch 1977). Given its patchy habitat and susceptibility to disturbance, this species is regarded as a Likely Potential SRE.

Urodacus `gibson 1?` was collected in a small patch of mulga scrub over colluvial slope deposits bordering drainage alluvials (Figure 7). The distribution of *Urodacus* species is influenced by substrate, with different species having morphological adaptations depending on their preferred substrate (Polis 1990). This can result in species utilising patchy areas of an apparently widespread habitat. *Urodacus* `Gibson 1?` is categorised as a Likely Potential SRE due to the patchy nature of the vegetation at the collection point and a possible association with drainage lines, an inherently fragmented habitat type.

Millipedes

Millipedes, particularly of the genus *Antichiropus*, have a high incidence of short-range endemism (Car and Harvey 2014; Car *et al.* 2019; Car *et al.* 2013). This genus is predominately restricted to Western Australia with very few records known from east of the Nullarbor (Car *et al.* 2013). While recent work has described several new species of *Antichiropus*, many more remain to be described and new species are regularly being collected (Car and Harvey 2014; Car *et al.* 2019; Car *et al.* 2013). The specimen recorded here, identified to the level of *Antichiropus* sp., was collected in widespread mulga woodland on a patch of exposed rock (Figure 7). This being the sole known record of a genus known to contain SRE species, and having been collected on patchy soil, this specimen is categorised as a Likely Potential SRE.

2.3. Discussion

The desktop search supports the notion that animals belonging to SRE Groups will be present at the Project. The Project area is made up of multiple separate development envelopes, all of which have been at least partially disturbed by past mining activities. The remaining undisturbed areas comprise five geological units as defined by the regolith mapping (Figure 2) and four vegetation units (Figure 3). Both of these landscape features exhibit patchily distributed areas that may harbour SRE species.

Previous pilot studies (Spectrum Ecology 2022) identified the presence of mygalomorph spider burrows within the Project area based on the structure of conspicuous burrow lids. However, identification to a lower level than infraorder (Mygalomorphae) is impossible without the collection of a spider. It is likely that more spider species (including more cryptic species) and other SRE Group animals will be present at the Project beyond those detected by the desktop search. SRE animals are more likely to be collected following rainfall, which is difficult to predict and thus schedule around in regions like the Goldfields.

Overall, despite its close proximity to Leonora and the high level of historical anthropogenic disturbance, the Project hosts habitats likely to support SRE species. Additionally, evidence of SREs has been observed at the Project, indicating that a dedicated survey would identify further SRE species.

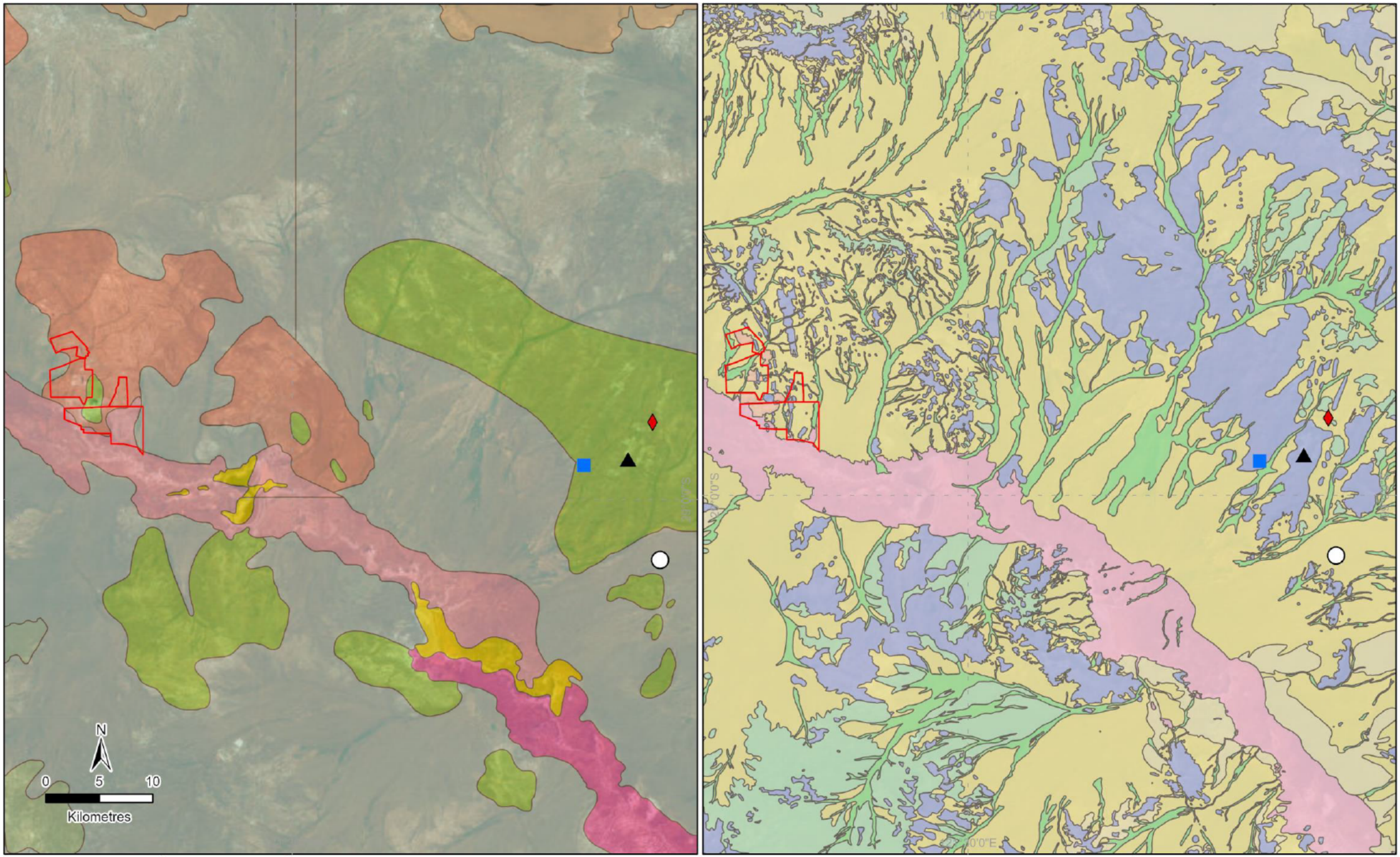


Figure 5. Location of Potential (Likely) SRE Aname spp. in the desktop search area

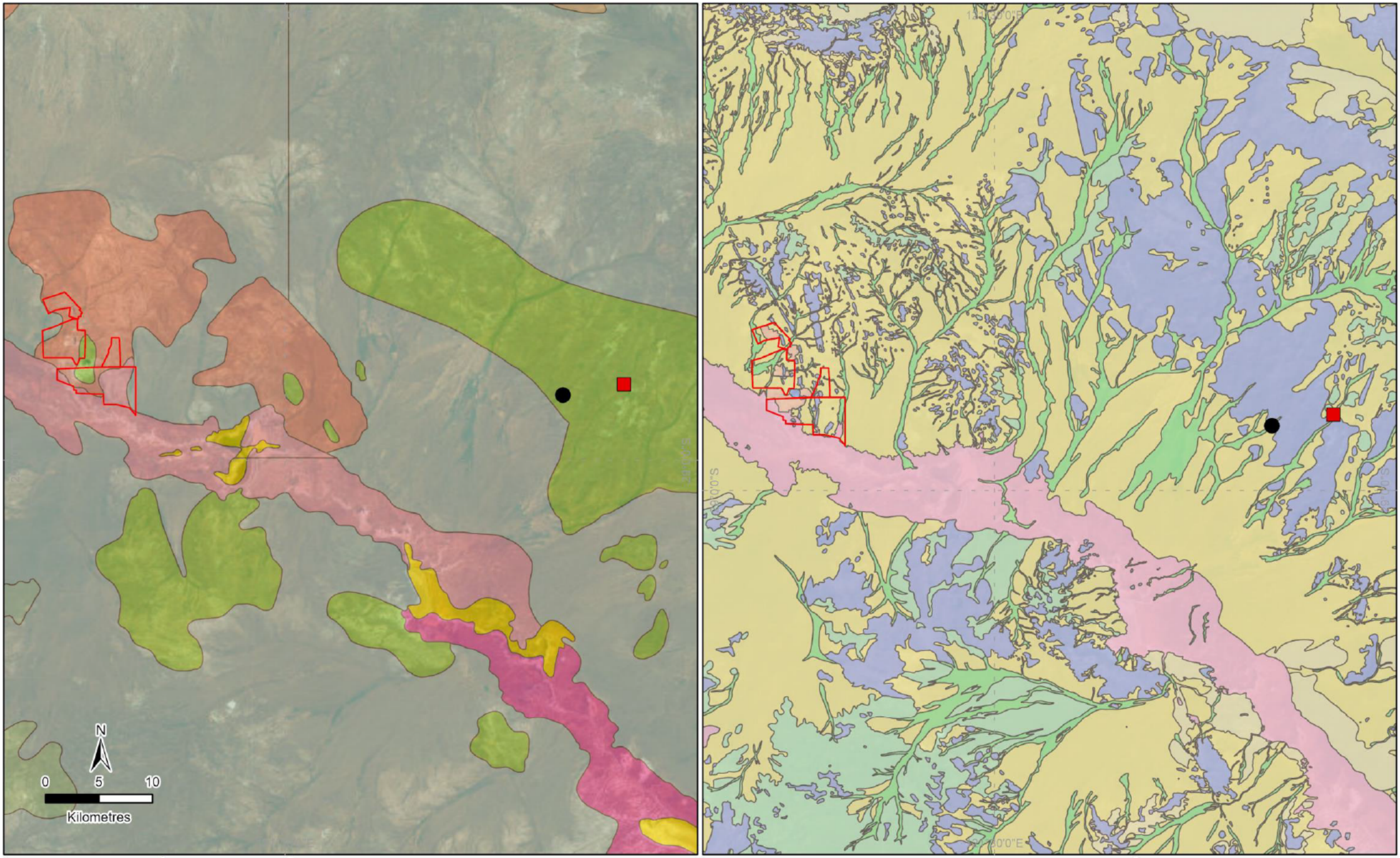
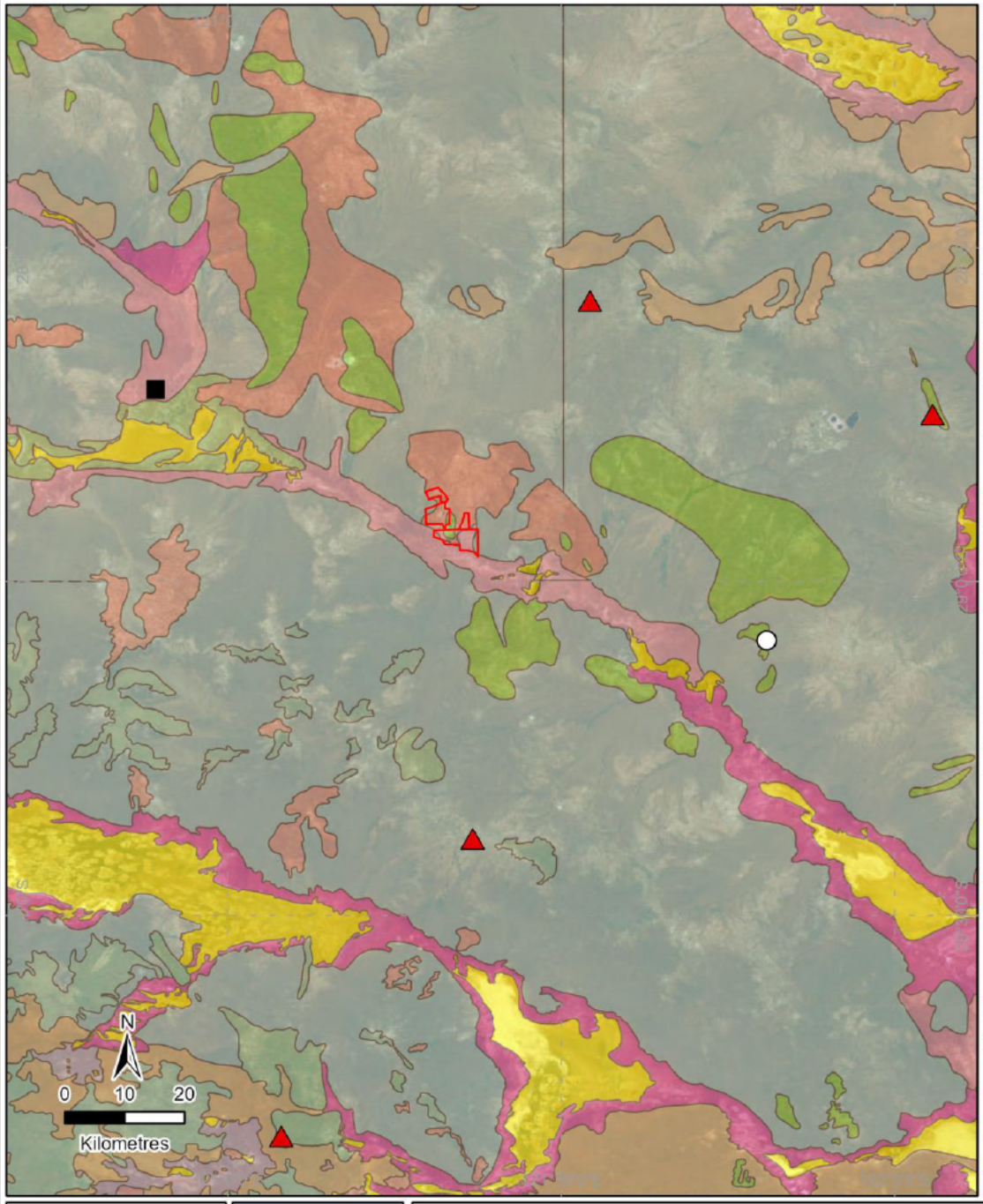
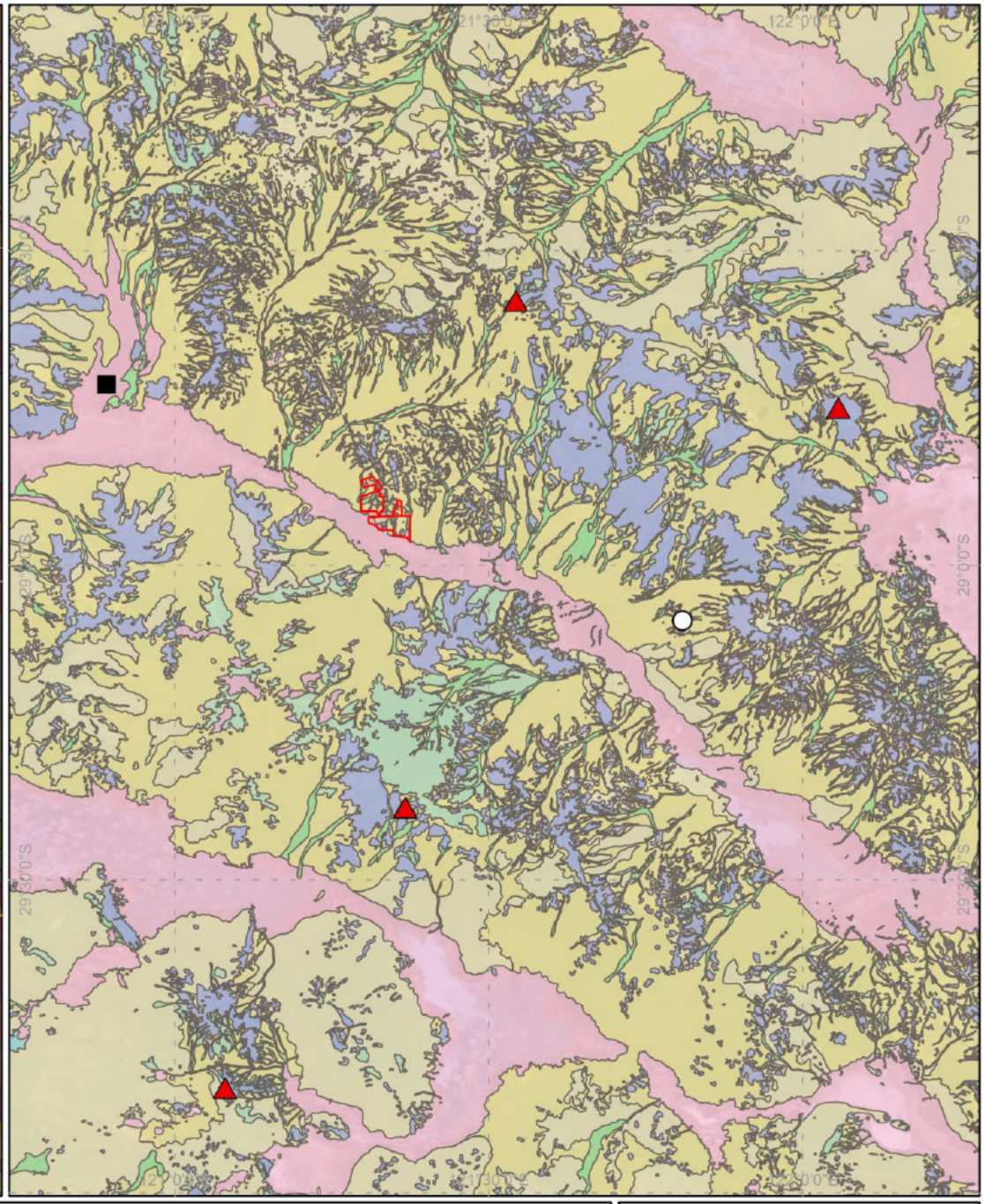


Figure 6. Location of Potential (Likely) SRE pseudoscorpions in the desktop search area.





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GCS GDA 1994
Author: Rhare
Date: 14/06/2023

Legend

Project Area

Millipedes
- Antichiropus sp.

Scorpions
- Cercophonius sp.
- Urodacus `gibson 17`

Vegetation
- 109
- 125
- 1413
- 1446
- 18
- 182
- 20
- 251
- 28
- 29
- 389
- 39
- 400
- 483
- 484
- 501
- 676
- 84
- 936

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

Figure 7. Location of Potential (Likely) SRE scorpions and millipede in the desktop search area.

3. FIELD SURVEY

3.1. Methods

A field survey targeting invertebrates belonging to SRE Groups was carried out from 28-31 March 2023. The aim of the survey was to collect species from recognised SRE Groups from representative habitat types in the vicinity of the Project, focussing on those species recovered during the desktop assessment. A total of 10 sites were sampled in the vicinity of the Project area, with an additional site opportunistically sampled for a mygalomorph burrow (Figure 8 and Table 1; see Appendix 2 for site photographs). Sampling used active search methods that varied at each site according to habitat, biology of target taxa, and visual observations of burrows or other tell-tale signs of target species.

3.1.1. Sampling Techniques

Sampling techniques followed published guidelines (EPA 2016b). At least one hour was spent on each site, with two team members conducting the different techniques depending on the site type. Hand foraging was the only sampling technique used. No wet nor dry traps were set during the field survey.

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 litter typically comprised *Eucalyptus* and/or *Banksia* leaves.
- 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.
- Burrow excavating: once a mygalomorph or scorpion burrow was found, the soil around it was gently removed using trowels and knives to reveal its extent. If the animal did not exit the burrow during this process, the burrow was lifted gently from beneath to stimulate movement. The animal was collected and placed in a vial.

3.1.2. SRE Habitat mapping

Habitat was mapped by integrating recognised vegetation units (Beard *et al.* 2013) with publicly available soil and landscape spatial layers. These categories were erected with a focus on habitat characteristics that are exploitable by SRE species, rather than solely emphasising the unique attributes of individual vegetation units. The vegetation units defined by Beard *et al.* (2013) offer intricate insights into the dominant plant species and associated understory taxa. However, for the specific purpose of identifying habitats suitable for species belonging to SRE Groups, a broader categorization approach was necessary.

These vegetation units were amalgamated into more generalised groups such as woodlands, shrublands, or steppe, among others. The characteristics of these vegetation units were then 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. Synthesising both biotic and abiotic spatial data facilitated a finer delineation of habitats, enabling more accurate assessments of habitat suitability and distribution. Importantly, the grouping of vegetation units was not solely based on their rarity within the project area, but rather on their overall structural attributes and their relationship with abiotic factors. Overall, this combined approach is more accurate and relevant to SREs than either approach alone.

In essence, this integrated approach to habitat mapping offers a comprehensive framework for conservation and management strategies, allowing us to identify habitats that may be crucial for SRE species, and the likelihood of potential impacts on populations of SRE species as a result of habitat clearing or other development activities.

3.1.3. Preservation and Identification Techniques

Specimens collected in the field through hand foraging techniques were placed in 100% ethanol. Specimens collected via all foraging techniques were transported to Bennelongia's laboratory for identification. Specimens were first sorted and separated from by-catch. When a specimen belonging to an SRE Group was found during this process, it was transferred to a labelled vial of 100% ethanol for further identification. Samples were sorted under a dissecting microscope and, where necessary, dissected and examined under a differential interference contrast compound microscope.

Specimens were identified to described species where possible using available keys and species descriptions. In many cases among SRE Groups, species descriptions and taxonomic frameworks are lacking. In these cases, specimens may be identified morphologically and/or genomically as belonging to discrete putative species that await formal description; such species are usually assigned placeholder codes (e.g. 'B01'). When the taxonomic framework is exceptionally poor and/or the specimen in question is damaged, juvenile, or of the nondiagnostic sex, the specimen is classified to the lowest level possible. These specimens often carry the miscellaneous designation "sp."

3.1.4. Molecular Methods

During the identification process, unidentifiable specimens (e.g. juvenile or damaged specimens) were flagged for DNA sequencing. Fifteen animals from the survey were flagged in this way and were sequenced to improve taxonomic resolution. For all samples, DNA was extracted using a Qiagen DNeasy Blood & Tissue kit (Qiagen 2006). For smaller animals, legs and other body parts (e.g. sections of the abdomen) were used for DNA extraction. For larger animals, and where possible, muscle tissue was collected from the legs. Elute volumes varied from 50 µL to 100 µL, and were dependent on the age, condition, and quantity of material available.

Primer combinations used for PCR amplifications were LCO1490:HCO2198, C1J1718:HCO2198, and LCO1490:HCOoutout, targeting the COI region of the mitochondrial genome; and 16SAR-L:16SBR-H targeting the 16S gene (Folmer *et al.* 1994; Schwendinger and Giribet 2005). PCR products were sequenced using dual-direction Sanger sequencing carried out by the Australian Genome Research Facility (AGRF). The returned sequences were edited and aligned manually in Geneious (version 2022.2.2; Kearse *et al.* 2012). Geneious was also used to calculate neighbour-joining phylogenetic trees with 1,000 bootstrap permutations.

Tamura-Nei genetic distances were measured as uncorrected *p*-distances (total percentage of nucleotide differences between squares). Sequences on GenBank and in grey literature were included in the phylogenetic analysis to provide a framework for assessing intra- and interspecific variation.

3.1.5. Survey Timing and Limitations

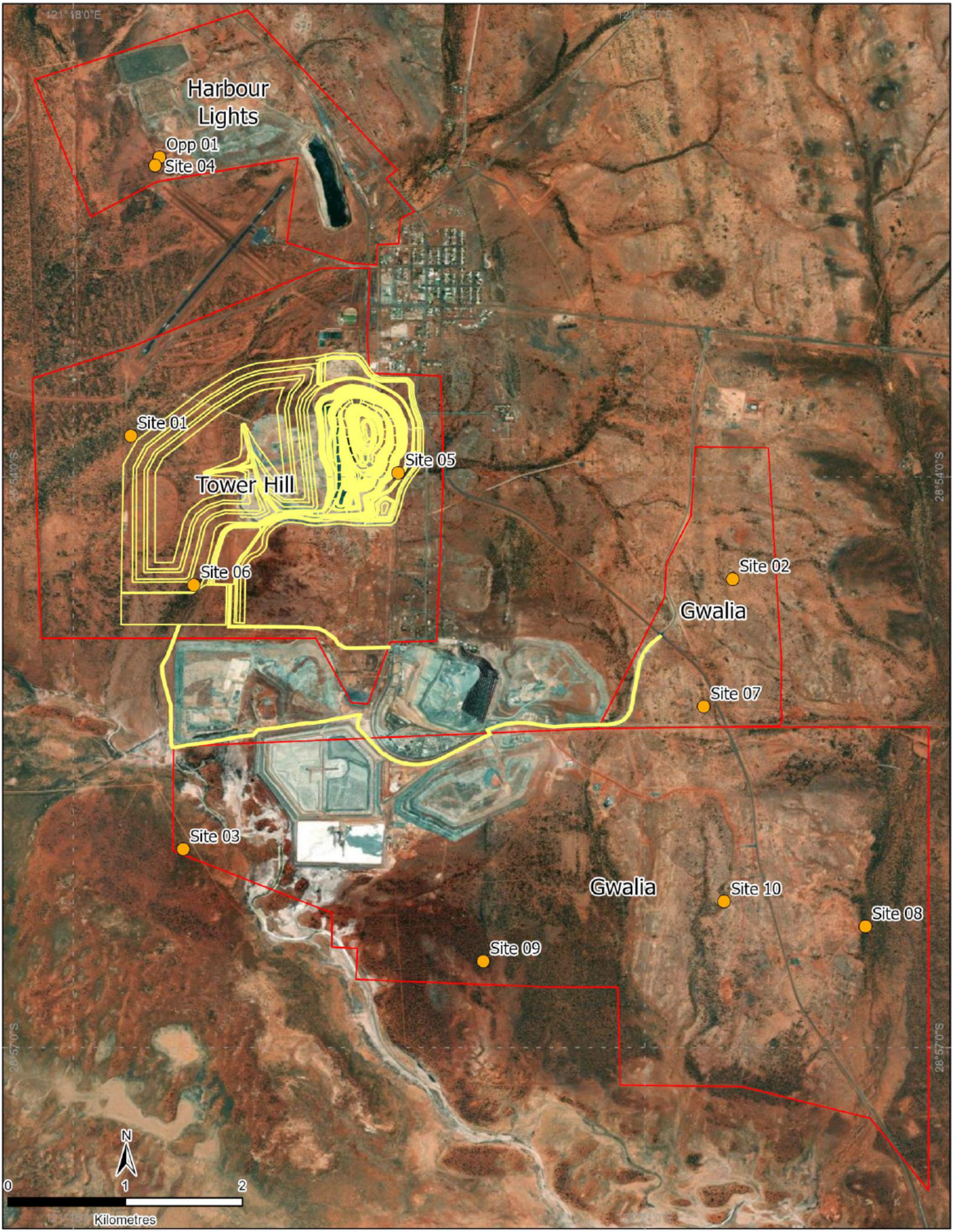
Many SRE Groups are active and therefore more likely to be collected during and immediately following substantial rainfall. Rainfall was recorded on the five days leading up to the survey (23-27 March; 8 mm total rainfall) and on two of the four survey days (2.2 mm on 30 March and 4.6 mm on 31 March), suggesting optimal survey timing.

3.1.6. Personnel

Field sampling was carried out by [redacted] Samples were sorted in the laboratory by [redacted] Samples were subsequently identified by [redacted] Molecular extraction was carried out by [redacted]

Table 1. Sites sampled for SREs during the field survey.

Site Code	Lease	Latitude	Longitude	Date Visited	Soil Type
Site 01	Tower Hill	-28.8964	121.30504	28/03/2023	Alluvium drainage
Site 02	Gwalia	-28.90893	121.35768	29/03/2023	Colluvium
Site 03	Gwalia	-28.93257	121.30961	31/03/2023	Alluvium drainage
Site 04	Harbour Lights	-28.87273	121.30715	28/03/2023	Colluvium
Site 05	Tower Hill	-28.89965	121.32843	29/03/2023	Alluvium drainage
Site 06	Tower Hill	-28.90945	121.31053	31/03/2023	Alluvium drainage
Site 07	Gwalia	-28.92008	121.35516	29/03/2023	Exposed
Site 08	Gwalia	-28.93934	121.36929	29/03/2023	Alluvium drainage
Site 09	Gwalia	-28.94238	121.33588	29/03/2023	Lacustrine
Site 10	Gwalia	-28.93716	121.35694	29/03/2023	Colluvium
Opp 01	Harbour Lights	-28.87203	121.30752	28/03/2023	Colluvium near site 04



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Date: 13/03/2024

Legend

- Project Area
- TWH LOM Impact area
- SRE Survey sites

Figure 8. SRE sampling sites in the Project area.

3.2. Survey Results

3.2.1. SRE Habitats in the Project area

Habitat mapping as described in section 3.1.2 identified nine general habitats in the Project area (Table 3; Figure 9). Of these, eight were moderately prospective for species belonging to SRE Groups, with disturbed areas (the ninth habitat) not considered prospective. All nine habitats also extended outside the Project area, where three additional habitats also occur (Table 2; Appendix 4).

The most abundant habitat within the Project area was the stony plains with bluebush shrubland, with over 1,690 ha, followed by disturbed areas, with over 550 ha (Table 3). The proposed impact area sits within three main habitats (excluding the already disturbed area): stony plains with bluebush shrubland, hardpan plains with mulga shrubland, and low greenstone hills and plains with mulga and chenopod shrublands (Figure 9), all of which are also abundant outside of the proposed impact areas.

Because of their extensive distribution, no significant impacts on the identified habitats are expected as a result of Project development.

Table 2. SRE Habitats identified as occurring in the Project area.
Grey highlighting represents habitats not found inside the Project area, but in close association to the same (see Appendix 4).

No.	SRE Habitat	Area (ha)
1	Stony plains with bluebush shrubland	1692.39
2	Sand and gravel flats adjacent in playa lakes or evaporation areas	0.92
3	Drainage lines	92.25
4	Hardpan plains with mulga shrubland	290.64
5	Low greenstone hills and plains with mulga and chenopod shrublands	161.09
6	Hardpan plains with sandy banks supporting tall mulga shrublands	143.10
7	Mixed dunes over alluvial deposits	215.95
8	Undulating plains and low stony hills with mulga and chenopod shrubland	324.88
9	Disturbed	554.54
10	Banded iron formation (BIF) ridges with mulga shrubland	NA
11	Stony hills on volcanic rocks with acacia shrublands	NA
12	Sandy plains with mulga shrubland	NA

3.2.2. Species Accounts

The survey collected 61 specimens from at least 18 identifiable species belonging to SRE Groups. Some specimens were immature or belonged to the nondiagnostic sex, so could not be identified to sufficient level to align them with other recorded species; such specimens are therefore not considered distinct species unless they are the only representatives of a higher taxonomic rank.

Recorded species comprise five mygalomorph spiders, three scorpions, three centipedes, one millipede, four pseudoscorpions, and two land snails (Table 3). Millipedes were the most abundant SRE group in the survey even though they were represented by only one identifiable species, along with several high order records from unidentified specimens. The least abundant groups were centipedes and land snails, with just five and six specimens, respectively (Table 3).

Of the 18 identifiable species collected from the field survey, 3 were categorised as Likely Potential SREs, 3 as Unlikely Potential SREs, 5 as Data Deficient Potential SREs, and 7 were Widespread. No Confirmed

SRE species have been identified as occurring in the Project area. Two of the Likely Potential SRE species are the undescribed mygalomorph spiders, *Aname* `BMYG222``*mellosa* group` and *Idiosoma* `BMYG221`, and one is the undescribed pseudoscorpion species: *Indolpium* `BPS496`.

Land snails

Two species of land snails were collected from the Project area, *Pupoides beltianus* and *Succinea* sp. Both species are categorised as Widespread and of no conservation concern for the purpose of the Project development.

Pseudoscorpions

Four species of pseudoscorpions were recovered from the Project area. Among them, three species (*Austrohorus* `BPS498`, *Beierolpium* 8/4 `BPS535`, and *Indolpium* `BPS497`) were categorised as Data Deficient Potential SREs because they are known either from a single specimen or from a single collection location (Table 3) and available information is insufficient to provide further categorisation.

The other species, *Indolpium* `BPS496`, is currently known only from outside of the impact area. This species is known from a single habitat and is conservatively categorised as a Likely Potential SRE. However, despite a current lack of records, the species is expected to occur more abundantly outside the Project area: most samples have been collected from mulga trees, which are widespread and abundant inside and outside of the Project area.

Two pseudoscorpion specimens were only able to be identified to higher order Family level as they were juveniles and could not be identified further (Table 3).

Scorpions

Three species of scorpions were identified from the Project area: *Lychas* `SCO039` (*annulatus* complex), *Urodacus* `BSCO055`, and *U.* `BSCO070`. One of them, *Lychas* `SCO039` (*annulatus* complex), is a Widespread species, but is likely a species complex comprising several cryptic, undescribed species. This species was collected from both inside and outside the impact area.

Both *Urodacus* species are categorised as Unlikely Potential SREs. *Urodacus* `BSCO055` is known to occur approximately 75 km NE of the Project area and in the present survey was collected only from outside the impact area. *Urodacus* `BSCO070` was collected only from inside the impact area in the present survey, but it is also known to occur approximately 170 km NE of the Project area. Given the currently known distributions of both species are relatively broad, they are not considered of conservation concern in the context of the Project.

Mygalomorph spiders

Five species of mygalomorph spiders were collected, from three families: Anamidae, Barychelidae, and Idiopidae. The family Barychelidae was represented by a single Widespread species (*Synothele arrakis*), while the families Anamidae and Idiopidae were each represented by two species: *Aname* `BMYG222``*mellosa* group` and *A.* `MYG629`; and *Idiosoma* `BMYG221` and *I.* `MYG256`, respectively.

Aname `BMYG222``*mellosa* group` was collected for the first time during the present survey. Morphological and molecular identification confirmed that it did not match any known species of *Aname*. This species is currently only known from the survey area, from sites inside and outside of the proposed impact area, and from a single habitat (Figure 9), so it is categorised as a Likely Potential SRE. *Aname* `MYG629` is part of the *mellosa* group, has been collected previously from the Murchison Bioregion, and is considered Widespread (Rix *et al.* 2021).

The species *Idiosoma* `MYG256` is categorised as an Unlikely Potential SRE as it has been previously collected from localities approximately 100 km NE of the Project area and so is unlikely to have a restricted distribution. By contrast, *Idiosoma* `BMYG221` is currently known from only two localities

sharing a single habitat type: one in the proposed impact area and the other inside the Project boundary but outside the proposed impact area. Considering its small known distribution, we categorise this species as a Likely Potential SRE.

Centipedes

Three species of centipedes were collected form the Project area: *Scolopendra morsitans, Mecistocephalus* `BGE074`, and *Lamyctes* `BLITH003`. *Scolopendra morsitans* is a Widespread species distributed throughout most of Australia (Atlas of Living Australia 2024). The other two species, *Mecistocephalus* `BGE074` and *Lamyctes* `BLITH003`, were represented by singleton specimens collected from inside the impact area (Table 3); because they are singletons, they are categorised as Data Deficient Potential SREs. However, given the habitats where the species were collected, it is likely they will have wider distributions outside of both the impact area and the Project area.

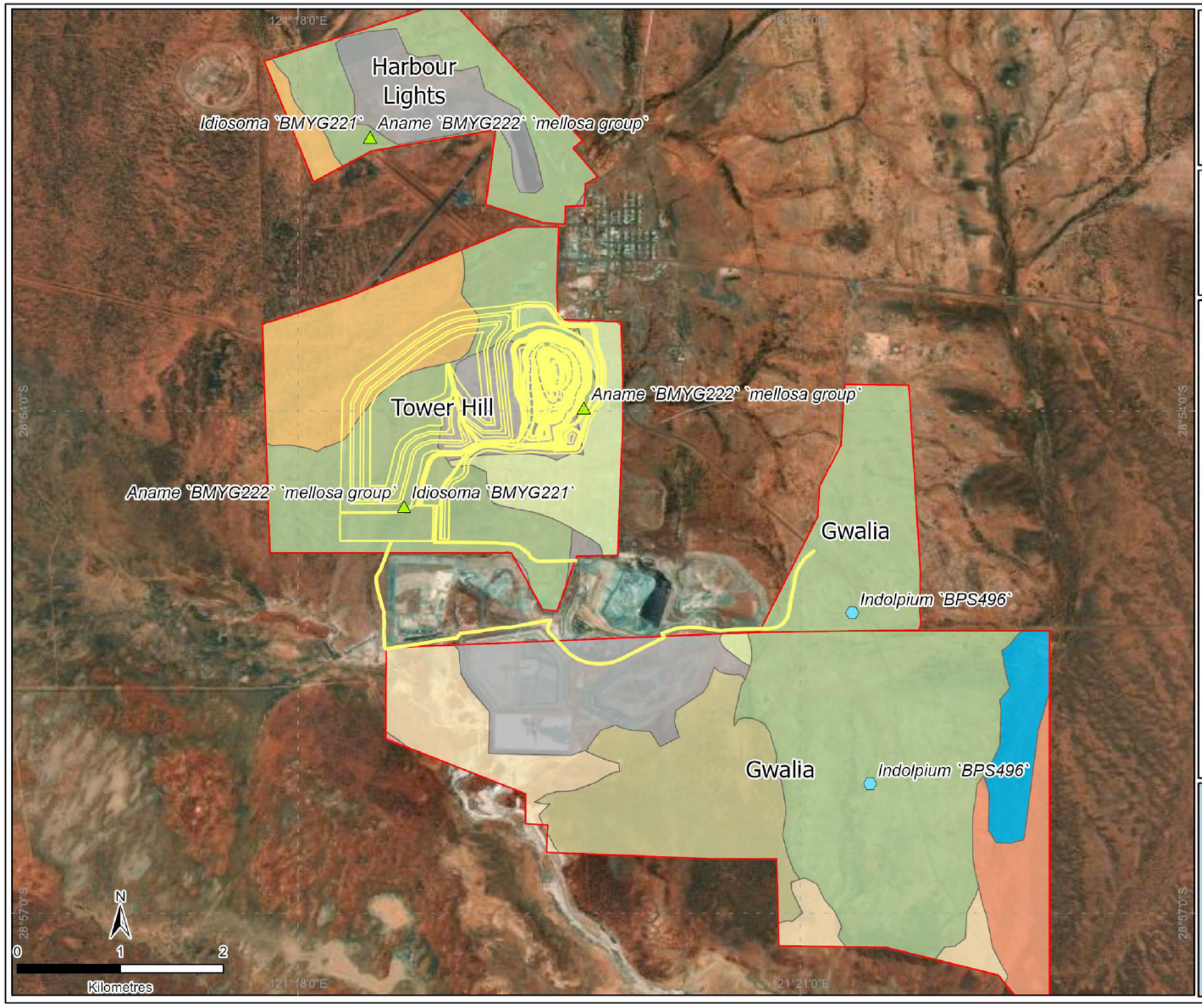
Millipedes

A single species of millipede was collected from the Project area, the Wdespread *Phryssonotus novaehollandiae*. This species is known to have the most widespread distribution of any native Australian millipede species (Short and Huynh 2009), and is therefore of no conservation concern. No records of the SRE genus *Antichiropus* were found from the Project area, even though the genus was recovered during the desktop assessment. It is likely the survey area lacks suitable habitat for this genus, or that, if the genus is present in the Project area, it might be so in low densities.

Table 3. Species from SRE Groups collected from the Project area.
Orange highlighting indicates Likely Potential SRE category. Blue highlighting indicates an Unlikely Potential SRE category. Grey highlighting indicates Data Deficient Potential SRE category.

No	Lowest ID	Specimen count	SRE Status	Comments	Collection records and sites
	Stylommatophora				
1	*Pupoides beltianus*	3	Widespread		
2	*Succinea* sp.	3	Widespread		
	Pseudoscorpiones				
3	*Austrohorus* `BPS498`	1	Data Deficient Potential SRE	Singleton specimen.	Outside impact area; Site 2
4	*Beierolpium* 8/4 `BPS535`	4	Data Deficient Potential SRE	Single collection locality.	Outside impact area; Site 2
5	*Indolpium* `BPS496`	3	Likely Potential SRE	Currently only known from two localities outside of the impact area and from a single habitat.	Outside impact area; Sites 7 and 10
6	*Indolpium* `BPS497`	1	Data Deficient Potential SRE	Singleton specimen.	Outside impact area; Site 3
	Atemnidae sp.	1	Higher order ID		
	Olpiidae sp.	1	Higher order ID		
	Scorpiones				
7	*Lychas* `SCO039` (*annulatus* complex)	6	Widespread	Widespread undescribed species likely to be part of a species complex.	Inside and Outside impact area; Sites 5, 7, and 9
8	*Urodacus* `BSCO055`	1	Unlikely Potential SRE	Known from localities approximately 75 km NE from the Project area.	Outside impact area; Site 4
9	*Urodacus* `BSCO070`	1	Unlikely Potential SRE	Known from localities approximately 170 km NE from the Project area.	Inside impact area; Site 6
	Araneae				

No	Lowest ID	Specimen count	SRE Status	Comments	Collection records and sites
10	*Aname* `BMYG222` `*mellosa* group`	3	Likely Potential SRE	Currently only known from the survey area, however, it has been collected from outside of the proposed impact area. Collected from single habitat.	Inside and Outside impact area, also collected at sites on Harbour Lights; Sites 4, 5, and 6
11	*Aname* `MYG629`	1	Widespread	Recovered from desktop assessment.	Outside impact area; Site 7
12	*Idiosoma* `BMYG221`	4	Likely Potential SRE	Known only from two sites at a single habitat type.	Inside and Outside impact area, also collected at sites on Harbour Lights; Sites 4 and 6
13	*Idiosoma* `MYG256`	1	Unlikely Potential SRE	Known also from localities over 150 km from Project area.	Outside impact area; Site Opp 1
14	*Synothele arrakis*	1	Widespread	Closest records range between 30 linear km up to 160 linear km.	Outside impact area; Site 7
	Myriapoda				
	Scolopendrida				
15	*Scolopendra morsitans*	1	Widespread		Inside impact area; Site 6
	Geophilida				
16	*Mecistocephalus* `BGE074`	1	Data Deficient Potential SRE	Singleton specimen.	Inside impact area; Site 6
	Mecistocephalidae sp.	2	Higher order ID		
	Lithobiomorpha				
17	*Lamyctes* `BLITH003`	1	Data Deficient Potential SRE	Singleton specimen.	Inside impact area; Site 6
	Polyxenida				
18	*Phryssonotus novaehollandiae*	11	Widespread		Inside and Outside impact area; Sites 2, 4, 5, 7, and 8
	Polyxenidae sp.	10	Higher order ID		
	Total	**61**			



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Date: 13/03/2024

Figure 9. Potential SRE species recovered from the field survey mapped over SRE habitats.

Legend

- Project Area
- TWH LOM Impact area

SRE Group

- Araneae
- Pseudoscorpiones

SRE Habitat

- Disturbed
- Drainage lines
- Hardpan plains with mulga shrubland
- Hardpan plains with sandy banks supporting tall mulga shrublands
- Low greenstone hills and plains with mulga and chenopod shrublands
- Mixed dunes over alluvial deposits
- Sand and gravel flats adjacent in playa lakes or evaporation areas
- Stony plains with bluebush shrubland
- Undulating plains and low stony hills with mulga and chenopod shrubland

3.3. Discussion and conclusions

Numerous habitats potentially prospective for species from SRE Groups were identified in the Project area. Two habitats stand out as the most likely to host SRE species: stony plains with bluebush shrubland, and hardpan plains with mulga shrubland, both of which are abundant inside and outside the Project area (Appendix 4). These habitats are primarily dominated by grasses and shrublands with high densities of mulga (*Acacia* spp.), and soils characterised by combinations of gravel, sands, or silts from alluvium or colluvium. These habitats conditions are often ideal for species of burrowing animals such as mygalomorph spiders or burrowing scorpions. Additionally, the vegetation species found within these habitats are ideal for pseudoscorpion species as they often inhabit microhabitats under bark or among leaf litter. Other bark- or leaf-dwelling terrestrial invertebrate groups may also benefit from these habitat types, such as centipedes and millepedes. Drainage lines adjacent to these habitat types may also yield species from SRE Groups, particularly groups associated with more humid environments such as land snails and slaters. Overall, the presence of these two habitat types both within and beyond the Project boundaries suggest that Project activities will not significantly affect their availability, nor populations of SRE Groups restricted to those habitat types.

The field survey recovered relatively few species from SRE Groups (18). Slaters (Crustacea: Isopoda) are commonly collected during SRE surveys, and their absence here is noteworthy. It is possible the high sun exposure and low humidity in the general area render it less likely for slater species to occur; alternatively, if slaters do occur in the area, they might not have been collected because none of the survey sites occurred on drainage lines, with which slaters are typically associated. Nevertheless, representatives of all other major SRE Groups (excluding velvet worms) were recovered from the Project area. Thus, the absence of slaters and the relatively low diversity notwithstanding, the area is evidently capable of supporting SREs.

Six of the species collected were categorised as Potential SREs (Likely or Unlikely), five are Data Deficient, and the remainder are known or expected to have widespread distributions. None of the six Potential SRE species is expected to be significantly affected by Project development. One species, the Unlikely Potential SRE mygalomorph spider *Idiosoma* `MYG256`, is known to occur abundantly outside of the Project area and from numerous localities, some over 150 km from the Project area. The other two Unlikely Potential SRE species, the burrowing scorpions *Urodacus* `BSCO055` and *U.* `BSCO070`, also occur outside the Project area, in localities approximately 75 km and 170 km NE from the Project area, respectively. The three Likely Potential SRE species, the pseudoscorpion *Indolpium* `BPS496` and the mygalomorph spiders *Aname* `BMYG222``*mellosa* group` and *Idiosoma* `BMYG221`, are currently only known from the Project area. However, all three were collected from widespread habitats and are expected to occur in other habitats which extend beyond the Project area.

Based on the current known distributions of these species, the size of the proposed impact area, and the limited impact on the identified habitats, it is not expected that there will be any significant impacts on the populations of the Potential SRE species due to the development of the Project.

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Appendix 1: Bennelongia SRE Categories

Bennelongia SRE categories (modified from WAM system).

	Taxonomic Certainty	Taxonomic Uncertainty
Distribution <10,000 km^2	**Confirmed SRE** • A known distribution of < 10,000 km^2 • The taxonomy is well known. • The group is well represented in collections and/or via comprehensive sampling	**Likely Potential SRE** • Category applies where there are significant knowledge gaps, e.g. o Patchy sampling has resulted in incomplete knowledge of geographic distribution o Incomplete taxonomic knowledge o The group is not well represented in collections
Distribution >10,000 km^2	**Widespread** (not an SRE) • A known distribution of > 10,000 km^2 • The taxonomy is well known • The group is well represented in collections and/ or via comprehensive sampling	**Likely or Unlikely Potential SRE**, depending on: A) Habitat Indicators B) Research & Expertise C) Morphology Indicators D) Molecular Evidence E) Data Deficient (Considered Likely as default)

Indicators used to assign Likely or Unlikely modifier to Potential SRE species.

	Likely Potential SRE	**Unlikely Potential SRE**
A) Habitat	Single habitat prospective for SREs	Multiple habitats including non-prospective habitats
B) Research & Expertise	Based on knowledge of the biology/ecology of related species, expert considers it to be an SRE	Based on knowledge of the biology/ecology of related species, expert considers it to be widespread
C) Morphology	Not applicable	Not applicable
D) Molecular Evidence	Very high genetic variability within small sampled area	Not applicable
E) Data Deficient	Information lacking; precautionary approach	Not applicable

Appendix 2: Species identified in the desktop search area and their SRE status.

Bolded values indicate higher taxonomic ranks. No. refers to the number of individuals recorded across all records. Orange highlighting indicates higher order identifications of specimens that may be representatives of species listed. Blue highlighting indicates higher order identifications of specimens that are not represented elsewhere in the list; these entries are considered discrete species. Grey highlighting indicates identification of invasive species. WAM: Western Australian Museum. ALA: Atlas of Living Australia (2024).

Higher order identification	Lowest identification	No.	Known distribution	Number of known habitats	Comments on habitats	SRE status	Reference	Comment
Arthropoda								
Arachnida								
Araneae								
Actinopodidae								
	Missulena occatoria	1	Australia wide	Multiple		Widespread	(Miglio *et al.* 2014)	
	Missulena sp.	4	Higher order ID					
Anamidae								
	Aname `glenorn sp. 2`	2	Singleton	One	Found in widespread habitat	Potential (Data Deficient)		

Higher order identification	Lowest identification	No.	Known distribution	Number of known habitats	Comments on habitats	SRE status	Reference	Comment
	Aname `MYG629`	5	113 km	Two	Found in widespread habitats	Widespread		
	Aname `Phoenix0055`	5	Singleton	One	Found in a widespread but patchily distributed habitat	Potential (Likely)		
	Aname `Phoenix0056`	1	Singleton	One	Found in a widespread but patchily distributed habitat	Potential (Likely)		
	Aname `Phoenix0058`	2	Singleton	One	Found in a widespread but patchily distributed habitat	Potential (Likely)		
	Aname sp.	2	Higher order ID					

Higher order identification	Lowest identification	No.	Known distribution	Number of known habitats	Comments on habitats	SRE status	Reference	Comment
	Kwonkan goongarriensis	1	84 km	Two	Found in widespread habitats and habitats not identified at the Project	Potential (Unlikely)	(Main 1983)	
Barychelidae								
	Idiommata sp.	1	Higher order ID		Found in widespread habitats	Potential (Unlikely)		Based on other known distributions of similar species utilising similar habitat in the broader Goldfields region.
	Synothele arrakis	2	365 km	Multiple	Found in widespread habitats and habitats not identified at the Project	Widespread	(Raven 1994)	
	Trittame sp.	1	Higher order ID		Found in widespread habitats	Potential (Unlikely)		

Higher order identification	Lowest identification	No.	Known distribution	Number of known habitats	Comments on habitats	SRE status	Reference	Comment
	Barychelidae sp.	1	Higher order ID					
Idiopidae								
	Eucyrtops eremaeus	3	121 km	Two	Found in widespread habitats	Widespread		
	Gaius villosus	4	750 km	Multiple	Found in widespread habitats and habitats not identified at the Project	Widespread	(Rix *et al.* 2018b)	
	Idiosoma `MYG014`	1	105 km	Two	Found in widespread habitats	Widespread		
	Idiosoma `occidentalis sp. group`	3	Singleton	One	Found in patchy habitats	Potential (Unlikely)		

Higher order identification	Lowest identification	No.	Known distribution	Number of known habitats	Comments on habitats	SRE status	Reference	Comment
	Idiosoma manstridgei	1	850 km	Multiple	Found in patchily distributed habitats and habitats not identified at the Project	Widespread	(Rix *et al.* 2017b)	
	Idiosoma sp.	21	Higher order ID					
Theraphosidae								
	Selenotholus foelschei	2	480 km	Multiple	Found in widespread habitat and habitats not identified at the Project	Widespread	(Hogg 1902)	
Pseudoscorpiones								
Atemnidae	Atemninae sp	1	Higher order ID		Found in patchily distributed habitats	Potential (Likely)		
Chernetidae								
	Nesidiochernes sp.	1	Higher order ID		Found in patchily distributed habitats	Potential (Likely)		

Higher order identification	Lowest identification	No.	Known distribution	Number of known habitats	Comments on habitats	SRE status	Reference	Comment
	Chernetidae sp.	2	Higher order ID					
Garypinidae								
	Solinus sp.	1	Higher order ID		Found in widespread habitats	Potential (Unlikely)		
Geogarypidae								
	Geogarypus taylori	2	Australia Wide	Multiple	Collected in Vic, SA, NSW, NT, and WA	Widespread	(Harvey 1986)	
Olpiidae								
	Austrohorus sp.	2	Higher order ID		Found in widespread habitats and habitats not identified at the Project	Widespread		Olpiids generally not considered to be SREs
	Beierolpium 8/3 sp.	1	Higher order ID		Found in widespread habitats	Widespread		Olpiids generally not considered to be SREs

Higher order identification	Lowest identification	No.	Known distribution	Number of known habitats	Comments on habitats	SRE status	Reference	Comment
	Euryolpium sp.	2	Higher order ID		Found in patchily distributed habitats	Potential (Unlikely)		Conservative approach based on potential habitat restrictions
	Indolpium sp.	3	Higher order ID		Found in widespread habitats	Widespread		Olpiids generally not considered to be SREs
	Olpiidae sp.	3	Higher order ID					
	Pseudoscorpiones sp.	1	Higher order ID					
Scorpiones								
Bothriuridae								
	Cercophonius sp.	1	Higher order ID		Found in patchily distributed habitats	Potential (Likely)		
Buthidae								

Higher order identification	Lowest identification	No.	Known distribution	Number of known habitats	Comments on habitats	SRE status	Reference	Comment
	Isometroides `MM1`	1	29 km	Two	Found in widespread habitats	Potential (Unlikely)		
	Isometroides sp.	2	Higher order ID					
	Isometroides vescus	1	Western Australian distribution	Multiple		Widespread	(Main 1956)	
	Lychas `annulatus complex`	1	Widespread Species Complex	Two	Found in widespread habitats	Widespread		
	Lychas jonesae	13	142 km	Two	Found in widespread habitats and habitats not identified at the Project	Widespread	WAM and ALA	
	Lychas sp.	3	Higher order ID					

Higher order identification	Lowest identification	No.	Known distribution	Number of known habitats	Comments on habitats	SRE status	Reference	Comment
Urodacidae								
	Urodacus `gibson 1?`	1	Singleton	One	Found in patchily distributed habitat	Potential (Likely)		
	Urodacus `yeelirrie?`	3	1.3 km	Two	Found in widespread habitats and habitats not identified at the Project	Potential (Unlikely)		
	Urodacus armatus s.l.	5	205 km	Multiple	Found in widespread habitats and habitats not identified at the Project	Widespread		
	Urodacus hoplurus	1	186 km	Multiple	Found in widespread habitats and habitats not identified at the Project	Widespread		
	Urodacus sp.	17	Higher order ID					

Higher order identification	Lowest identification	No.	Known distribution	Number of known habitats	Comments on habitats	SRE status	Reference	Comment
Chilopoda								
Geophilida								
Chilenophilidae	Chilenophilidae sp.	1	Higher order ID		Found in widespread habitats	Potential (Unlikely)		
Mecistocephalidae	Mecistocephalidae sp.	1	Higher order ID		Found in patchily distributed habitats	Widespread		Family not considered to contain SREs
	Geophilida sp.	3	Higher order ID					
Scolopendrida								
Scolopendridae								
	Arthrorhabdus paucispinus	1	800 km	Multiple		Widespread	(Koch 1984)	
	Cormocephalus sp.	1	Higher order ID					
	Cormocephalus turneri	1	Southern Australia	Multiple		Widespread	(Koch 1983b)	
	Scolopendra laeta	15	Australia Wide	Multiple		Widespread	(Koch 1982; Vahtera *et al.* 2013)	

Higher order identification	Lowest identification	No.	Known distribution	Number of known habitats	Comments on habitats	SRE status	Reference	Comment
	Scolopendra morsitans	5	Australia Wide	Multiple		Widespread	(Koch 1983a)	
Scutigerida								
Scutigeridae								
	Pilbarascutigera sp.	1	Higher order ID		Found in patchily distributed habitats	Potential (Unlikely)		Scutigerids considered unlikely to be SREs
Diplopoda								
Polydesmida								
Paradoxosomatidae								
	Antichiropus sp.	1	Higher order ID		Found in widespread habitats	Potential (Likely)	(Car and Harvey 2014; Car *et al.* 2019; Car *et al.* 2013)	*Antichiropus* millipedes known to have a high number of SREs
Malacostraca								
Isopoda								
Armadillidae								

Higher order identification	Lowest identification	No.	Known distribution	Number of known habitats	Comments on habitats	SRE status	Reference	Comment
	Buddelundia `39`	2	240 km	Multiple	Found in patchily distributed habitats and habitats not identified at the Project	Widespread		
Porcellionidae								
	Porcellionides pruinosus	6	Invasive Species				(Stanisic *et al.* 2017)	
Mollusca								
Gastropoda								
Stylommatophora								
Pupillidae								
	Pupoides cf. *adelaidae*	15			Found in patchily distributed habitats	Widespread	(Stanisic *et al.* 2017)	Likely *Pupoides adelaidae*
Succineidae								
	Succinea sp.	12	Higher order ID		Found in widespread habitats	Widespread	(Stanisic *et al.* 2017)	Mainland succineids tend to be widespread

Appendix 3: Photographs of Sites Sampled for SREs in March 2023

Site 01

Site 01

Site 02

Site 02

Site 03

Site 03

Site 04

Site 04

Site 05

Site 05

Site 06

Site 06

Site 07

Site 07

Site 08

Site 08

Site 09

Site 09

Site 10

Site 10

Appendix 4: Map of SRE Habitats inside and outside of the Project area