



East Jimblebar and Caramulla  
Short-Range Endemic Invertebrate  
Fauna Survey

Biologic Environmental Survey

Report to BHP Western Australian Iron Ore

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## EXECUTIVE SUMMARY

BHP Western Australia Iron Ore (BHP WAIO) commissioned Biologic Environmental Survey (Biologic) to undertake a two-season Level 2 short-range endemic (SRE) invertebrate fauna survey covering the East Jimblebar and Caramulla area (hereafter referred to as the Study Area). The Study Area is located approximately 50 kilometres (km) east of Newman Township in the Pilbara region of Western Australia and covers an area of approximately 92 km<sup>2</sup>.

A desktop assessment and survey were carried out in a manner consistent with the Western Australian (WA) Environmental Protection Authority (EPA) and BHP WAIO's requirements for the environmental surveying and reporting of fauna. From the desktop assessment, 313 Potential and/or Confirmed SRE invertebrate records from six higher groups were identified within 20 km surrounding the Study Area. The higher groups comprised selenopid spiders, mygalomorph spiders, pseudoscorpions, scorpions, millipedes and isopods. Three Potential SRE invertebrate fauna from the database searches were recorded within the Study Area, comprising two mygalomorph spiders (*Synothele* `MYG116` and *Kwonkan* `MYG094`) and one scorpion (*Lychas annulatus*).

During the current survey visits, undertaken between the 1<sup>st</sup> and 6<sup>th</sup> of May (wet season) and between the 18<sup>th</sup> and 23<sup>rd</sup> of September 2019 (dry season), 103 sites were assessed, of which 76 sites were sampled for SRE invertebrates. These assessments classified the area into five broad habitat categories: Gorge/ Gully, Major Drainage Lines, Drainage Area/ Floodplain, Undulating Low Hills, and Sandy/ Stony Plains.

Only one habitat zone within the Study Area is regarded to be of high suitability for SRE fauna, and therefore of high significance: Gorge/ Gully. The remaining four habitat zones are of moderate-low (Major Drainage, Undulating Low Hills, Drainage Areas/ Floodplain) or low suitability (Sandy/ Stony Plains).

A total of 52 invertebrate specimens from known SRE groups were collected from 27 sampling sites. Invertebrates originated from microhabitats in leaf litter, topsoil, burrows and under rocks. The fauna comprised one spider, 44 pseudoscorpions and six scorpions. No Confirmed SRE taxa were detected. Ten taxa were considered to be Potential SREs: one mygalomorph spider (*Idiosoma* sp. indet.), seven pseudoscorpions (*Synsphyronus* sp. indet., *Austrohorus* sp. JIM 01, *Austrohorus* sp. JIM 02, *Beierolpium* sp. indet., *Indolpium* sp. indet., *Indolpium* sp. JIM 03, and *Indolpium* sp. JIM 04) and two scorpions (*Lychas* 'annulatus complex', *Urodacus* 'megamastigus complex').

Within these ten Potential SRE taxa, four taxa are currently regarded as most likely to be either restricted to the Study Area or the local area based on current information. The four

taxa comprised the mygalomorph spider *Idiosoma* sp. indet. and three pseudoscorpions (*Synsphyronus* sp. indet., *Austrohorus* sp. JIM 01, and *Indolpium* sp. indet.).

Given the relatively low suitability of the habitats within the Study Area and the extent of those habitats beyond the Study Area, it can be regarded as highly unlikely that any SRE invertebrate species would be restricted to the Study Area.

## 1 INTRODUCTION

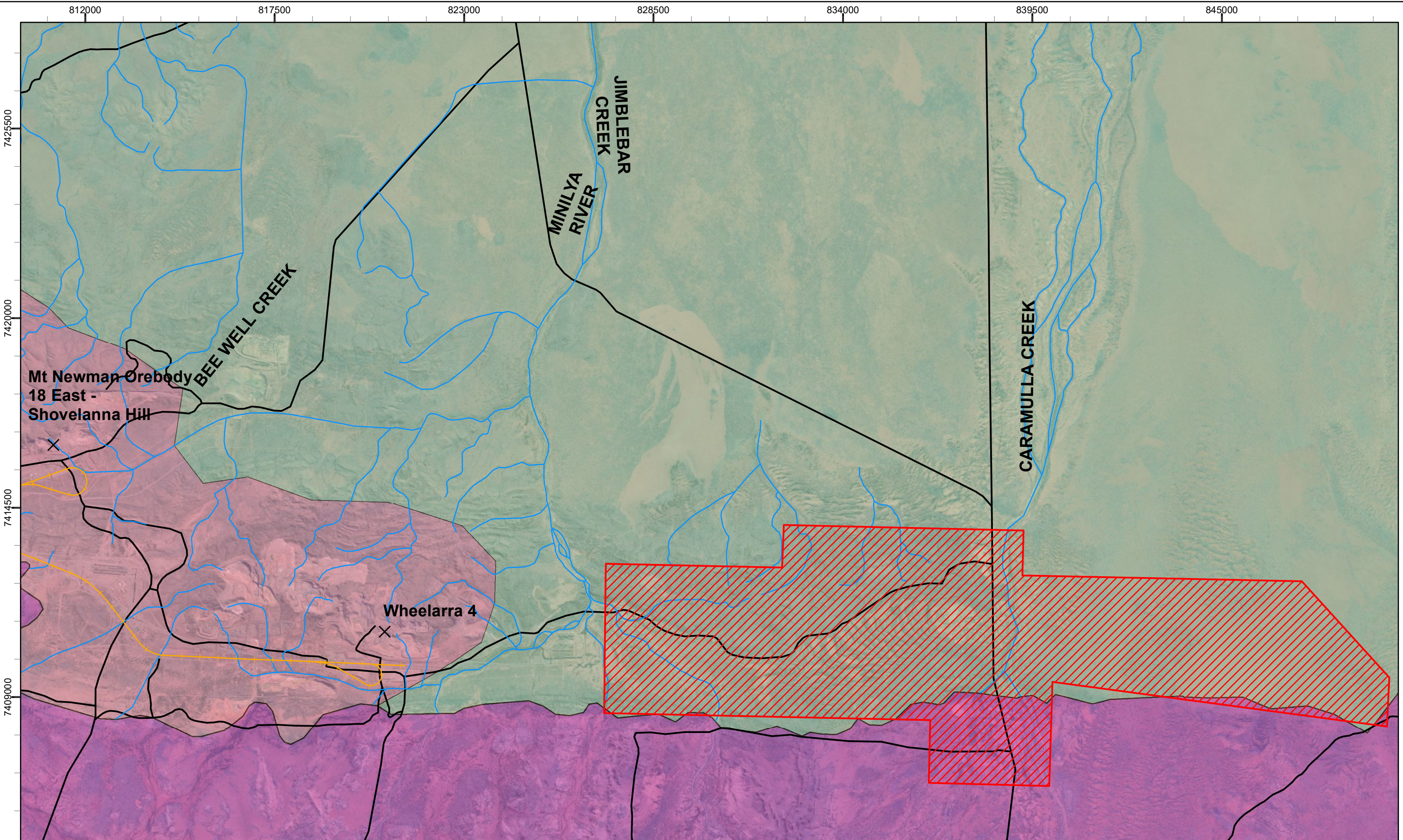
BHP Western Australia Iron Ore (BHP WAIO) commissioned Biologic Environmental Survey (Biologic) to undertake a two-season Level 2 short-range endemic (SRE) invertebrate fauna survey covering the East Jimblebar and Caramulla area (hereafter referred to as the Study Area). The Study Area is located approximately 50 kilometres (km) east of Newman Township in the Pilbara region of Western Australia (Figure 1.1) and covers an area of approximately 92 km<sup>2</sup>. The key objective of the survey, which was designed and conducted in accordance with relevant EPA guidelines, was to determine the presence and distribution of terrestrial invertebrate fauna of conservation significance to support environmental impact assessments.

### 1.1 Short-range endemic fauna









Endemism refers to the restriction of a species to a particular area, whether it is at the continental, national or local scale, the latter being commonly referred to as short-range endemism (Allen *et al.*, 2002). Harvey (2002) proposed a range criterion for terrestrial short-range endemic (SRE) species at less than 10,000 km<sup>2</sup> (or 100 km x 100 km), which has been adopted by regulatory authorities in Western Australia (EPA, 2016e). Short-range endemism in a species is determined by several factors including life history, physiology, dispersal capabilities and opportunities as well as the tendency for differentiation and speciation. Other biotic and abiotic interactions, both historical and current can also restrict the distribution of a species (Ponder & Colgan, 2002).

Many vertebrate fauna have been identified as restricted in geographical distribution and are often listed as species of conservation significance to be protected under state and federal legislation. In recent years, however, a number of invertebrate taxa have been discovered to contain a high proportion of species likely to be regarded as SRE (Harvey 2002). These taxa include freshwater snails (Ponder & Colgan, 2002), land snails (Johnson *et al.*, 2004) and mygalomorph spiders (Main *et al.*, 2000). SRE invertebrate species often share similar physiological, behavioural and life history characteristics that influence their restricted distributions and limit their wider dispersal (Harvey, 2002). For example, some specialised taxa can be limited by very specific habitat requirements (e.g. selenopid spiders within fractured rocky outcrops), while for others, physiological constraints limit their movement through drier habitats (e.g. snails).

This restriction in geographical distribution has led to SRE invertebrate fauna becoming an important component of the environmental impact assessment process providing a focal point for survey work aimed at protecting species of high conservation value.




**Legend**

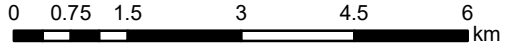
- |   |  |   |
|---|--|---|
|  Study Area |  Creeklines | <b>IBRA Subregions</b>  |
|  Rail       |  Road       |  Augustus  |
|  BHP Mines |  |  Fortescue |
|   |  |  Hamersley |



**biologic**  
Environmental Survey



1:100,000



**BHP Western Australian Iron Ore**  
**North Jimblebar SRE Invertebrate Survey**  
**Figure 1.1: Study Area and Regional Location**

Coordinate System: GDA 1994 MGA Zone 50  
Projection: Transverse Mercator  
Datum: GDA 1994  
Size A3. Created 12/01/2020

## 2 DESKTOP ASSESSMENT

A desktop assessment was carried out in a manner consistent with the Western Australian (WA) Environmental Protection Authority (EPA) environmental surveying and reporting of fauna, including the following documents:

- EPA Guidance No. 56, Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia (EPA, 2016d);
- EPA Guidance Statement No. 20, Sampling of Short Range Endemic Invertebrate Fauna for Environmental Impact Assessment in Western Australia (EPA, 2016e); and
- EPA Environmental Factor Guideline – Terrestrial Fauna (EPA, 2016a).

### 2.1 Review of databases

Five databases were searched for SRE invertebrate fauna records within and surrounding the Study Area to determine the likely SRE fauna values (Table 2.1).

**Table 2.1: Databases searched for the review of previous records**

Provider	Database	Reference	Search parameters
DBCA	Threatened and Priority Fauna Database	(DBCA, 2019)	Circle of radius 40 km centred on the coordinates: -23.408974°, 120.134664°
Atlas of Living Australia	Species Occurrence	(ALA, 2019)	Circle of radius 10 km centred on the coordinates: -23.407750°, 120.132940°
Western Australian Museum (WAM)	Arachnids and Myriapods	(WAM, 2019a)	40 x 40 km search area surrounding the Study Area: NW: -23.1715°, 119.9738° SE: -23.5393°, 120.3663°
WAM	Crustaceans	(WAM, 2019b)	40 x 40 km search area surrounding the Study Area: NW: -23.1715°, 119.9738° SE: -23.5393°, 120.3663°
WAM	Molluscs	(WAM, 2019c)	40 x 40 km search area surrounding the Study Area: NW: -23.1715°, 119.9738° SE: -23.5393°, 120.3663°

Within these databases, records of mygalomorph spiders, selenopid spiders, pseudoscorpions, scorpions, millipedes, terrestrial snails, and isopods were targeted. WAM databases were queried within a 10,000 km<sup>2</sup> area bounding the Study Area, thereby selecting species within these target groups known within the vicinity of the area. Indeterminate records were excluded, except where generic level characters and

distribution information was sufficient to point to a high likelihood that the species could be SRE.

## 2.2 Review of previous studies

Reports from previous SRE invertebrate fauna surveys within and immediately surrounding the Study Area were reviewed for local and regional context (Table 2.2). One of the previous surveys was undertaken partially within the Study Area (Table 2.2).

**Table 2.2: Previous reports in the vicinity of the Study Area**

Survey Title	Reference	Survey Type	Location	SRE Sampling Sites	Habitat Assessments
Jimblebar Iron Ore Project Terrestrial Invertebrate Short-range Endemic Assessment	Outback Ecology (2009)	SRE Survey	Overlaps the Study Area (Jimblebar East)	8 trapping sites (10 pitfall traps and 10 soil and litter samples per site) 6 opportunistic)	14
Shearer's West targeted Vertebrate and Short-range Endemic Invertebrate Fauna Assessment	Biologic (2019)	Level 2 Fauna Survey and SRE Survey	~3.5 km west of the Study Area	15 (active foraging, leaf sifting)	15
Orebody 19-31 Short-range Endemic Invertebrate Survey	Biologic (2014b)	SRE Survey	4 km north-west of the Study Area	114 in Trip 1 163 in Trip 2 (active foraging, leaf sifting)	186
South-west Jimblebar Short Range Endemic Invertebrate Survey	Biologic (2013)	SRE Survey	~10 km west of the Study Area	32 (active foraging, leaf sifting)	30
Dynasty Desktop Assessment of Short-range Endemic Invertebrates	Biologic (2014a)	SRE Desktop	~19 km west of the Study Area	Nil	Nil

### 3 SURVEY METHODS

#### 3.1 Field survey

##### 3.1.1 Field team and licensing

The SRE fauna sampling for this survey was conducted under a DBCA Regulation 17 “Licence to Take Fauna for Scientific Purposes” (BA27000037) issued to Nihara Gunawardene. The following personnel were involved in the field component of this project:

- Brad Durrant (Principal Zoologist)
- Dr Nihara Gunawardene (Senior Zoologist)
- Claire Brooks (Senior Zoologist)
- Mary van Wees (Senior Zoologist)
- Dr Tabitha Rudin (Zoologist)

##### 3.1.2 Survey timing and weather

The Level 2 SRE invertebrate fauna survey was a two-phase survey, undertaken in accordance with relevant EPA guidelines. The first sampling trip was conducted during the wet season (May 2019), with the second sampling trip being undertaken in September 2019, representing a dry season survey.

The survey dates were as follows:

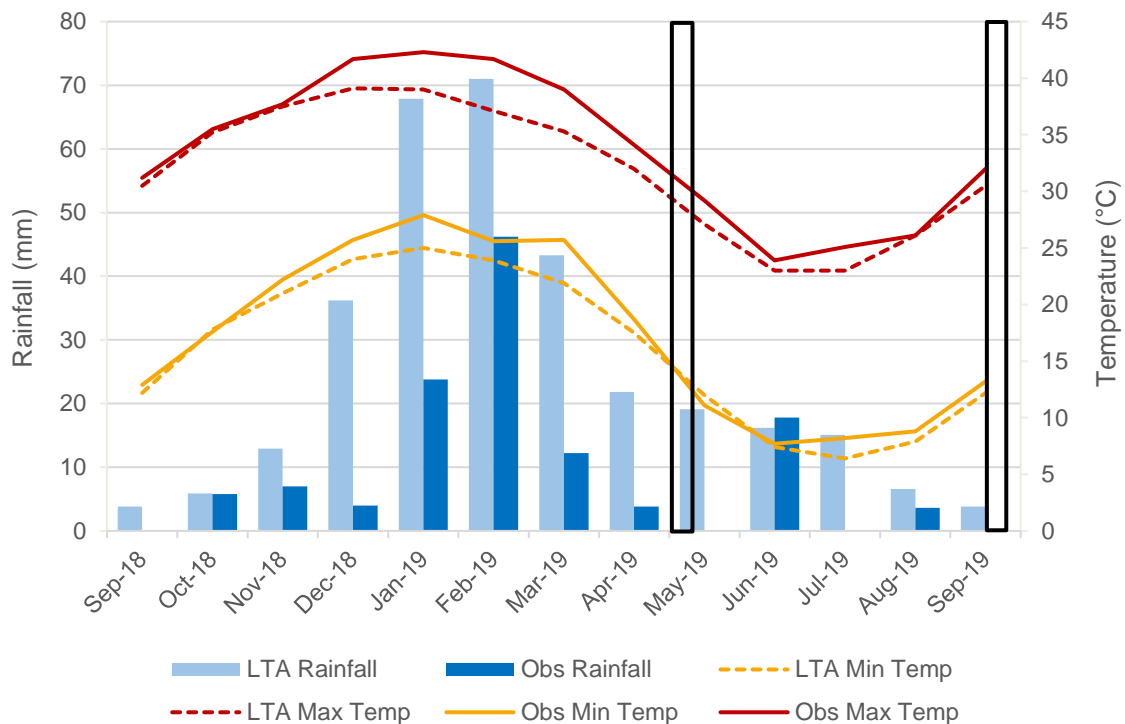
- 1<sup>st</sup> – 6<sup>th</sup> May 2019 (Trip 1, wet season); and
- 18<sup>th</sup> – 23<sup>rd</sup> September 2019 (Trip 2, dry season).

The Study Area is mainly located within the Fortescue (PIL 2) subregion of the Pilbara bioregion, with a smaller southern section of the Study Area being located within the Augustus (GAS 3) subregion of the Gascoyne bioregion (Kendrick & McKenzie, 2001) (Figure 1.1). The Pilbara region features a semi-desert to tropical climate, with rainfall occurring sporadically within either summer or winter, but mostly during the summer months. Long-term climatic data is not available for the Study Area itself; however, long-term climatic data is available from the Bureau of Meteorology (BoM) weather station at Newman Airport located approximately 35 km west of the Study Area (BoM, 2019).

Observed weather conditions prior to and during all surveys are shown in Figure 3.1, alongside long-term climatic data for Newman Airport. The 2018/2019 wet season (November – April) was considerably hotter and drier than the long-term average conditions, with mean maximum temperatures ranging from 37.7°C to 42.3°C (on average 2.75°C hotter than the long-term average), and total observed rainfall reaching only 97

mm, or 38% of the long-term average (261 mm) at Newman Airport (BoM, 2019). No rainfall was recorded during the wet season survey (Trip 1) and the last rainfall prior to Trip 1 was in the second week of April (3.8 mm).

The average minimum (12.3 °C) and maximum (27.7 °C) temperatures during the dry season survey (Trip 2) were similar to the long-term averages for September (13.2 °C and 32.0 °C). No rain was recorded during this survey period and the last recorded rainfall prior to Trip 2 was on August 16<sup>th</sup> 2019 (2.4 mm, 4 weeks previously).



**Figure 3.1: Long-term average (LTA) and current (2018-2019) climatic data for Newman Airport (Station 007176). Approximate survey timing is indicated by the black boxes**

### 3.1.3 Site selection

Habitats considered suitable for SRE terrestrial invertebrates in the Pilbara were targeted for the baseline SRE invertebrate fauna survey, namely gorges/ deep gullies, shallow/ open gullies, ridges/ breakaways and drainage foci. Sampling was also undertaken in less suitable habitat types, including drainage lines, hillcrests and slopes, and minor rocky outcrops.

### 3.1.4 Habitat assessment

Habitat assessments were carried out at each site by observation of the physical characteristics of each site. The habitat assessments were aimed at determining the

significance of each site as suitable SRE habitat, and hence the likelihood that each site may contain SRE invertebrate fauna (see Appendix A). The broad habitat type in which the site occurred was observed and any site-specific landform characteristics (especially where samples were taken) were also recorded. Further physical characteristics of each site in a 20 x 20 m quadrat were recorded; these were drainage type, aspect, slope, percentage shade, evidence of moisture in soil, soil type and availability, presence of rock outcropping, rock size, percentage litter cover, major vegetation type and evidence of fire and disturbance. The broad habitat type is used for mapping the habitats found in the Study Area, whilst the physical characteristics are used to provide an overall picture of the habitat type should an SRE invertebrate be captured in that particular site.

### 3.1.5 Sampling techniques

The sampling techniques employed for the baseline SRE invertebrate fauna sampling included active foraging, leaf litter sifting, soil sifting and targeted searches for spider and scorpion burrows. The target taxonomic groups were trapdoor spiders (Mygalomorphae), selenopid spiders, scorpions, millipedes, pseudoscorpions, land snails, and isopods.

The sampling methods adopted were carried out in accordance with the following documents:

- Environmental Protection Authority (EPA) Position Statement No. 3 'Terrestrial Biological Surveys as an Element of Biodiversity Protection' (EPA, 2002);
- Guidance Statement No. 56 'Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia' (EPA, 2016c); and
- Guidance Statement No. 20 'Sampling of Short Range Endemic Fauna for Environmental Impact Assessment in Western Australia' No. 20 (EPA, 2016b).

#### **Active foraging**

Active foraging was undertaken at each sampling site for 1.5 person hours and involved various techniques relevant to the following microhabitats:

- Under rocks, within cracks and crevices: suitably sized rocks were overturned, and rocky microhabitats were actively searched for rock dwelling species;
- Woody debris: larger logs and woody debris were investigated and overturned searching for detritivores;
- Vegetation and tree bark: significant vegetation (e.g. Mulga, and fig trees) were actively searched, including underneath sheets of bark; and
- Burrow searching: active searches were undertaken for mygalomorph spider and scorpion burrows within suitable habitats. Note: searches for burrows are

undertaken during foraging time and also whilst walking through the Study Area, but time taken to excavate burrows is additional to foraging time.

### **Leaf litter searching**

Leaf litter, humus and soil (to approximately 15 cm below surface) was placed in a sieve at the site and agitated to divide the sample into three grades (>7 mm, >3 mm, >1.4 mm). Each grade was thoroughly searched for target SRE species such as pseudoscorpions, millipedes, snails, and small scorpions. The maximum volume of litter in the sieve was approximately 4808 cm<sup>3</sup>, and up to two sifts were conducted at each site, providing sufficient leaf litter and humus was available.

### **Specimen preservation**

All specimens were euthanised in 100% ethanol to preserve DNA for sequencing. Isopods were transferred to 70% ethanol for storage at the request of Dr Simon Judd.

All isopods were sent directly to Dr Simon Judd for identification and Arachnida specimens were identified by Dr Erich Volschenk.

## **3.2 Limitations of the survey**

EPA Guidance Statement No. 56 (EPA, 2016c) outlines several potential limitations to fauna surveys, which are presented and discussed in Table 3.1. Other than the unusually dry conditions prior to the wet season survey, it was considered that there were no material limitations to the survey.

**Table 3.1: Survey limitations and constraints**

Potential limitation or constraint	Applicability to this survey
Experience of personnel.	No constraint. All personnel have more than five years' experience collecting invertebrate fauna specimens.
Proportion of fauna identified.	No constraint. Morphological identifications carried out by established taxonomist Dr Erich Volschenk.
Sources of information (recent or historic) and availability of contextual information.	All previous surveys relevant to the planning of the survey were available and consulted.
Proportion of the task achieved.	A two season SRE baseline invertebrate fauna survey was completed for the Study Area.
Disturbances (e.g. fire or flood).	Recent fires within the Study Area (at North Caramulla) meant that, for a small portion of the Study Area, only habitat assessments were carried out.
Intensity of survey.	No constraint.
Completeness of survey.	The Study Area, considering current and previous survey effort and habitats covered has been adequately surveyed.
Resources (e.g. degree of expertise available).	All resources required to complete the survey were available.
Remoteness or access issues.	The majority of the Study Area was accessible either by vehicle or on foot, thus the sampling techniques used during this survey were unconstrained by accessibility or remoteness.
Scope (what faunal groups were sampled and whether any constraints affect this).	No constraint.
Timing of survey, weather, seasonality	The conditions prior to and during the wet season survey were considerably hotter and drier than the long-term average conditions. This is likely to have reduced the abundance and activity levels of some invertebrate fauna groups.

### 3.3 Assessment of species' conservation significance

The SRE status categories used in this report broadly follow the WAM's revised categorisation for SRE invertebrates. This system is based upon the 10,000 km<sup>2</sup> range criterion proposed by Harvey (2002) and uses three broad categories to deal with varying levels of taxonomic certainty that may apply to any given taxon (Table 3.2).

**Table 3.2: SRE categorisation used by Harvey (2002)**

	Taxonomic Certainty	Taxonomic Uncertainty
Distribution < 10 000km <sup>2</sup>	<p>Confirmed SRE</p> <ul style="list-style-type: none"> <li>• A known distribution of &lt; 10,000 km<sup>2</sup>.</li> <li>• The taxonomy is well known.</li> <li>• The group is well represented in collections and/ or via comprehensive sampling.</li> </ul>	<p>Potential SRE</p> <ul style="list-style-type: none"> <li>• Patchy sampling has resulted in incomplete knowledge of geographic distribution.</li> <li>• Incomplete taxonomic knowledge.</li> <li>• The group is not well represented in collections.</li> <li>• Category applies where there are significant knowledge gaps.</li> </ul> <p><b>SRE Sub-categories may apply:</b></p> <ul style="list-style-type: none"> <li>A) Data Deficient</li> <li>B) Habitat Indicators</li> <li>C) Morphology Indicators</li> <li>D) Molecular Evidence</li> <li>E) Research &amp; Expertise</li> </ul>
Distribution > 10 000km <sup>2</sup>	<p>Widespread (not an SRE)</p> <ul style="list-style-type: none"> <li>• A known distribution of &gt; 10,000 km<sup>2</sup>.</li> <li>• The taxonomy is well known.</li> <li>• The group is well represented in collections and/ or via comprehensive sampling.</li> </ul>	

Under this system, “Potential SRE” status is the default categorisation for species within the typical SRE taxonomic groups including mygalomorph spiders, selenopid spiders, land snails, pseudoscorpions, scorpions, and isopods, unless sufficient evidence exists to confirm Widespread or Confirmed SRE status.

Potential SRE status is sub-categorised by what is currently known about the species in question; *i.e.* whether there are B) habitat indicators, C) morphology indicators, D) molecular evidence, or E) a weight of general knowledge and experience with the group that suggests a reasonable likelihood that the species could be SRE. In terms of SRE likelihood, the more evidence that exists under sub categories 'B', 'C', 'D', and 'E', the greater the likelihood that further investigation would confirm that the species is a SRE; however, the Potential SRE category 'A' - data deficient is unique. This category indicates that the current information is insufficient to adequately assess the SRE status of the species in question. In such cases, where the SRE status cannot be confirmed, a conservative approach would be unable to consider the SRE risk to be higher than average where the taxonomy of the genus (or family) requires significant review in order to make any statement on SRE status, and/or the genus is not known to include any Confirmed SRE species within the region (subject to the extent of prior sampling/ taxonomic effort).

To avoid confusion with other Potential SRE species for which there is some certainty and/or some precedent for their SRE status, this report represents the WAM’s “Potential

SRE - category 'A' - data deficient" only as "data deficient". The results from taxonomists are also presented within the broader context of the results from habitat assessment, habitat connectivity, and other ecological information collected during the survey. This approach aims to provide a more holistic assessment of SRE likelihood at scales relevant to the project, as well as the standard SRE range criterion of <10,000 km<sup>2</sup> (Harvey, 2002).

## 4 RESULTS

### 4.1 Desktop assessment

#### 4.1.1 Database searches

The WAM and NatureMap database searches have provided an up to date SRE invertebrate fauna list for the Study Area and surrounds, containing records from all known previous surveys within a 20 km radius (congruent with other databases).

The database searches identified 300 Potential and/or Confirmed SRE invertebrate records from six higher groups including selenopid spiders, mygalomorph spiders, pseudoscorpions, scorpions, millipedes and isopods (Table 4.1 Appendix B). Of these, isopods accounted for the majority of records (213), with the remaining records comprising 29 selenopid spiders, four mygalomorph spiders, twelve pseudoscorpions, 26 scorpions and 16 millipedes (Table 4.1). The locations of these records are shown in Figure 4.1, alongside information regarding their SRE status. Three Potential SRE invertebrate fauna taxa from the database searches were recorded within the Study Area (highlighted in green text in Table 4.1).

**Table 4.1: Potential and Confirmed SRE invertebrate taxa within 20 km of the Study Area**

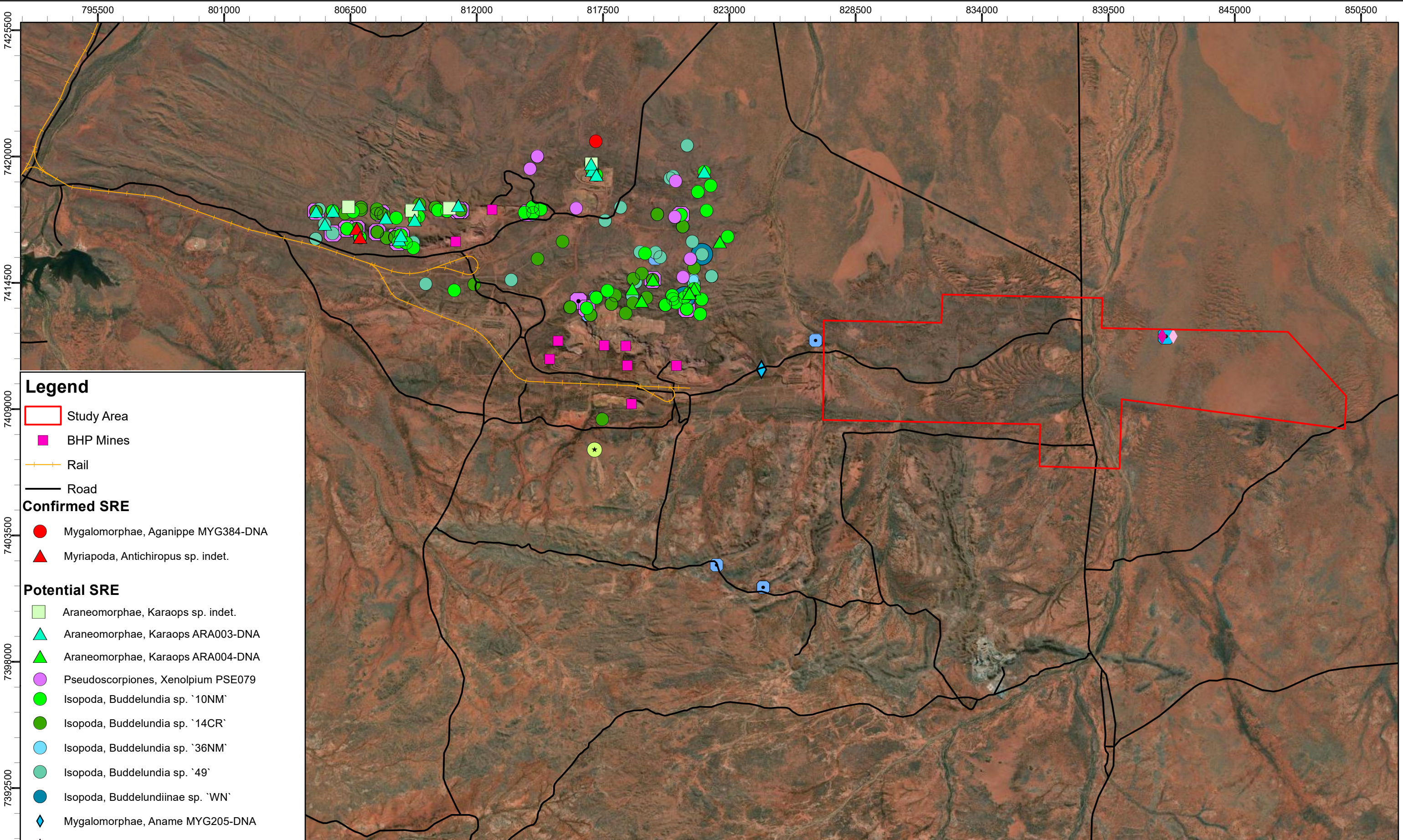
Higher Groups	Family	Lowest ID	SRE Status	Survey	# of records
Selenopid Spiders	Selenopidae	<i>Karaops</i> ARA003-DNA	Potential SRE	Orebody 19-31 SRE Survey	15
Selenopid Spiders	Selenopidae	<i>Karaops</i> ARA004-DNA	Potential SRE	Orebody 19-31 SRE Survey	10
Selenopid Spiders	Selenopidae	<i>Karaops</i> sp. indet.	Potential SRE	Orebody 19-31 SRE Survey	4
Mygalomorph Spiders	Barychelidae	<i>Synothele</i> `MYG116`	Potential SRE	WAM 2019a	1
Mygalomorph Spiders	Idiopidae	<i>Aganippe</i> MYG384-DNA	Confirmed SRE	Orebody 19-31 SRE Survey	1
Mygalomorph Spiders	Nemesiidae	<i>Aname</i> MYG205-DNA	Potential SRE	Jimblebar Iron Ore Project Terrestrial Invertebrate SRE Assessment	1
Mygalomorph Spiders	Nemesiidae	<i>Kwonkan</i> `MYG094`	Potential SRE	WAM 2019a	1
Pseudoscorpiones	Garypidae	<i>Synsphyronus</i> sp. indet.	Potential SRE	Orebody 19-31 SRE Survey	2
Pseudoscorpiones	Olpiidae	<i>Xenolpium</i> `PSE079`	Potential SRE	Orebody 19-31 SRE Survey	10
Scorpiones	Buthidae	<i>Lychas annulatus</i>	Potential SRE	WAM 2019a	1
Scorpiones	Buthidae	<i>Lychas</i> sp. 'bituberculatus group'	Potential SRE	Orebody 19-31 SRE Survey	7
Scorpiones	Buthidae	<i>Lychas</i> sp. hairy tail group	Potential SRE	Orebody 19-31 SRE Survey	18
Millipedes	Paradoxosomatidae	<i>Antichiropus</i> sp. indet.	Confirmed SRE	Orebody 19-31 SRE Survey	2
Millipedes	Trigoniulidae	<i>Austrostrophus stictopygus</i>	Potential SRE	Orebody 19-31 SRE Survey	14
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	Orebody 19-31 SRE Survey	49
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	Orebody 19-31 SRE Survey	99

Higher Groups	Family	Lowest ID	SRE Status	Survey	# of records
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `36NM`	Potential SRE	Orebody 19-31 SRE Survey	3
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	Orebody 19-31 SRE Survey	60
Isopoda	Armadillidae	Buddelundiinae sp. `WN`	Potential SRE	Orebody 19-31 SRE Survey	2

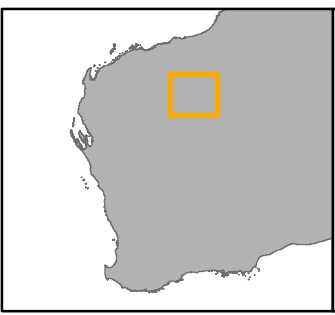
Note: Green text indicates taxa recorded within the Study Area.

#### **4.1.2 Previous surveys**

One previous SRE invertebrate fauna survey has been conducted partially within the Study Area over two phases in 2008 and 2009 (Outback Ecology, 2009). The survey recorded mygalomorph spiders, scorpions, pseudoscorpions, centipedes and snails; however, none of the species detected within the survey area were found to be SRE.



- Legend**
- Study Area
  - BHP Mines
  - Rail
  - Road
- Confirmed SRE**
- Mygalomorphae, Aganippe MYG384-DNA
  - ▲ Myriapoda, Antichiropus sp. indet.
- Potential SRE**
- Araneomorphae, Karaops sp. indet.
  - ▲ Araneomorphae, Karaops ARA003-DNA
  - ▲ Araneomorphae, Karaops ARA004-DNA
  - Pseudoscorpiones, Xenopium PSE079
  - Isopoda, Buddelundia sp. '10NM'
  - Isopoda, Buddelundia sp. '14CR'
  - Isopoda, Buddelundia sp. '36NM'
  - Isopoda, Buddelundia sp. '49'
  - Isopoda, Buddelundiinae sp. 'WN'
  - ◆ Mygalomorphae, Aname MYG205-DNA
  - ◆ Mygalomorphae, Kwonkan MYG094
  - ◆ Mygalomorphae, Synothele MYG116
  - ◊ Myriapoda, Austrostrophus stictopygus
  - ★ Pseudoscorpiones, Synsphyronus sp. indet.
  - Scorpiones, Lychas annulatus
  - Scorpiones, Lychas sp. hairy tail group
  - Scorpiones, Lychas sp. bituberculatus group



**biologic**  
Environmental Survey

N  
1:150,000  
0 1 2 4 6 8 km

**BHP Western Australian Iron Ore  
East Jimblebar and Caramulla SRE Invertebrate  
Survey**

**Figure 4.1: Previous SRE invertebrate records  
within 20 km of the Study Area**

Coordinate System: GDA 1994 MGA Zone 50  
Projection: Transverse Mercator  
Datum: GDA 1994

Size A3. Created 26/11/2019

## 4.2 Current survey sites

Survey effort for the current survey is shown in Figure 4.2. During the wet season survey (Trip 1), a total of 76 sites were surveyed. Of these, habitat assessments were undertaken at all 76 sites, with invertebrate sampling being undertaken at a subset of 33 sites. During Trip 2 (dry season), 57 sites were surveyed. Of these, 27 sites represented new additional sites, whereas the remaining 30 sites represented Trip 1 sites that were revisited for dry season sampling. Of the 27 new sites, invertebrate sampling was undertaken at 13 sites. In total (across both trips), 103 sites were surveyed. Habitat assessments were undertaken at all 103 sites, with sampling being undertaken at 76 sites.

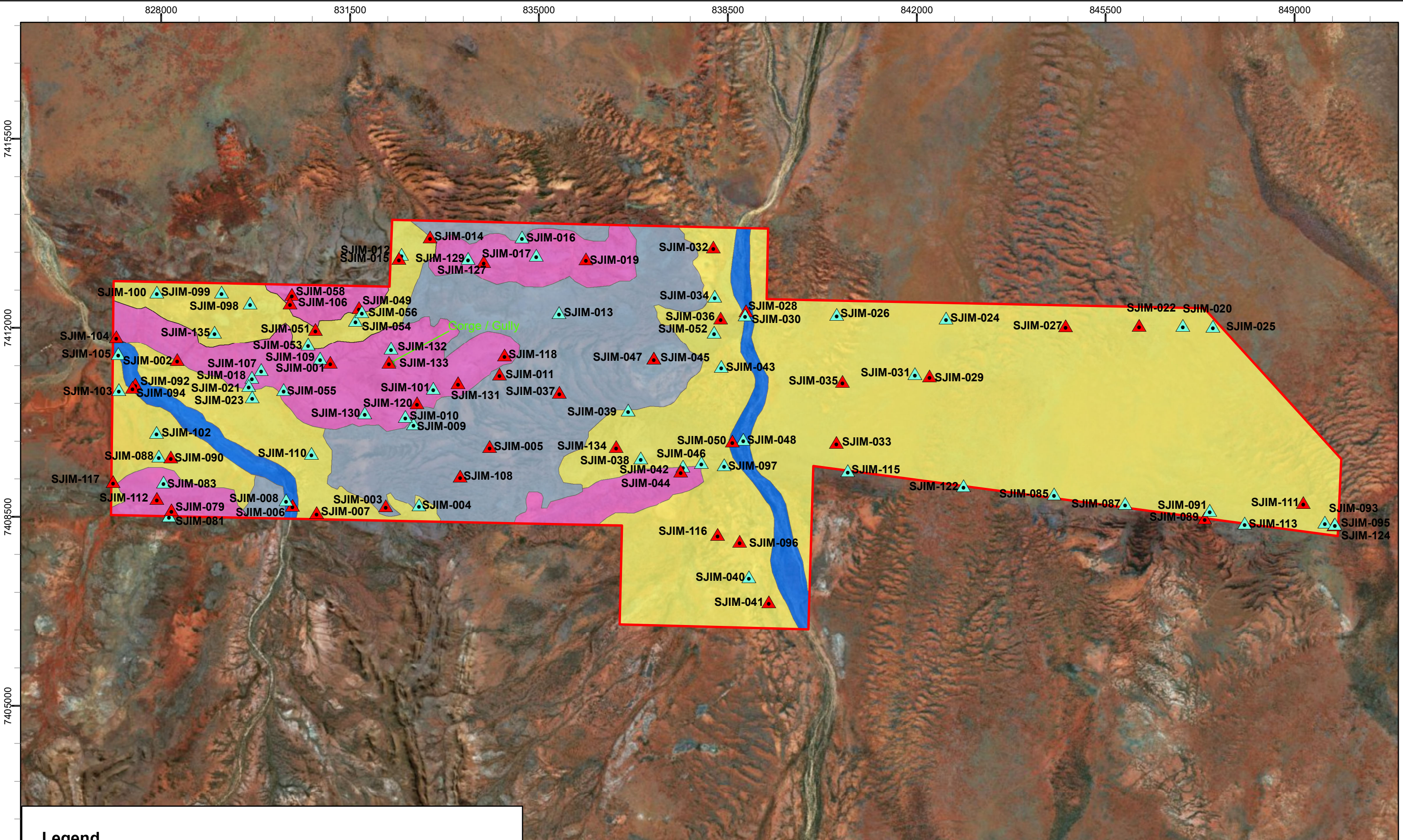
### 4.2.1 Habitat assessment

Habitat assessments were carried out at 103 sites across the Study Area in two trips (see Appendix C for full details). These assessments were used to classify the area into six broad habitat categories based on the major landform and drainage features that can influence SRE suitability (Table 4.2). These broad categories, along with aerial photography were then used to map the connectivity of these habitat types across the Study Area (Figure 4.2). A brief description of these broad habitat categories is provided below.

- **Gorge/ Gullies** - Rocky landforms usually offering moderate to moderate/high levels of shade and shelter, complex rocky microhabitats, and patches of dense vegetation. There was limited habitat of this type in the Study Area and only one site (SJIM-133) was classified as this habitat type. The site also contained a large cliff overhang and caves.
- **Major Drainage Lines** – Major drainage lines can be densely vegetated, and extensive, but tend to be prone to disturbances from rainfall events. These types of habitats are generally considered to act as corridors providing dispersal opportunities for some SRE invertebrate fauna. Two large drainage lines (Jimblebar Creek and Caramulla Creek) traversed the Study Area in a north to south direction, both creeks had large flat riverbeds with several tributaries spreading from them. However, as the area is considered to be in BOM Drought category 'Serious rainfall deficiency' (2019 annual rainfall lies below the 10th percentile of all records for the area) (BoM, 2019), the habitat was considered to be of Moderate to Low SRE suitability. Four sites were classified as this habitat category.
- **Drainage Area/ Floodplain** – Drainage areas containing minor drainage lines are variably vegetated, and extensive, but tend to be prone to disturbances from major

flooding. These types of habitats are generally considered to provide dispersal opportunities for some SRE invertebrate fauna. The whole Study Area contained large swathes of what would be considered the flood plains of Jimblebar and Caramulla Creeks, consequently, fourteen sites were located in this habitat category. As mentioned above, due to drought, the habitat was considered Moderate to Low SRE suitability.

- **Undulating Low Hills** – Undulating low hills are unlikely to support SRE species due to high exposure, low complexity, and low isolation. However, these hills have the capacity to contain small rockpiles, outcropping and breakaways, which may provide some shelter and isolation for SRE fauna. A large swathe in the north of the Study Area was considered this habitat type. Twenty-five sites were located in this habitat category with varying levels of SRE suitability from Moderate to Low.
- **Sandy/Stony Plains** – These areas are mostly flat, extensive, open plains that may feature pockets of shrubland or open woodland and limited detrital microhabitats, however these are unlikely to support SRE species due to high exposure, low complexity, and low isolation. This was the most extensive habitat category in the Study Area with 59 sites falling within this category. All were considered of Moderate to Low suitability for SRE.



**Legend**

Study Area

**Sites**

Habitat Assessment and Sampling

Habitat Assessment Only

**Habitat**

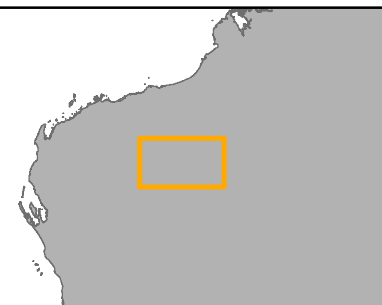
Drainage Area

Gorge / Gully

Low Undulating Hills

Major Drainage

Sandy / Stony Plains







1:63,752


**BHP Western Australian Iron Ore  
East Jimblebar and Caramulla SRE Invertebrate  
Survey**  
**Figure 4.2: Survey effort in the Study Area and  
habitat mapping**

Coordinate System: GDA 1994 MGA Zone 50  
Projection: Transverse Mercator  
Datum: GDA 1994  
Size A3. Created 14/01/2020

**Table 4.2: Broad Habitat Categories found in the Study Area**

Habitat Category	Habitat Suitability	Justification	SRE Groups	Representative Site Image
<b>Gorge/Gully</b>	High	These habitats are often the most suitable for SRE fauna owing to the high protection from exposure, high complexity and moisture retention, and inherent isolation due to discontinuous landforms. Gorges and south-facing gullies tend to have a higher degree of protection while north-facing gullies tend to be more exposed.	Paradoxsomatid millipedes, selenopid spiders, pseudoscorpions and terrestrial isopods.	
<b>Major Drainage Line</b>	Moderate/ Low	Isolation is generally low as drainage lines and drainage area/ floodplain habitats form an interconnected network of vegetation-based habitats, providing dispersal corridors for some SRE fauna.	Mygalomorph spiders, pseudoscorpions, scorpions, and terrestrial isopods.	

Habitat Category	Habitat Suitability	Justification	SRE Groups	Representative Site Image
<p><b>Drainage Area/ Floodplain</b></p>	<p>Moderate/ Low</p>	<p>Isolation is generally low as drainage lines and drainage area/ floodplain habitats form an interconnected network of vegetation-based habitats, providing dispersal corridors for some SRE fauna. These kinds of habitats can be important for burrowing species as they often occur on patches of deeper clay-loam soils, and for detritivore species that rely on dense leaf litter; however, they are often widespread and continuous. The low levels of habitat complexity, protection and isolation generally make these areas unsuitable for SRE species.</p>	<p>Mygalomorph spiders, pseudoscorpions, scorpions, and terrestrial isopods</p>	
<p><b>Undulating Low Hills</b></p>	<p>Moderate/ Low</p>	<p>These habitats are often comprised of gentle, open hill slopes with shallow gullies and small breakaways. These areas rarely feature dense vegetation and present limited complex sheltered habitats. These habitats often contain small, discontinuous outcrops and boulder piles on plains or open hill slopes. The low levels of habitat complexity, protection and isolation generally make these areas unsuitable for SRE species.</p>	<p>Mygalomorph spiders, selenopid spiders, pseudoscorpions, scorpions, and terrestrial isopods.</p>	

Habitat Category	Habitat Suitability	Justification	SRE Groups	Representative Site Image
<p><b>Sandy/ Stony Plains</b></p>	<p>Low</p>	<p>These kinds of habitats can be important for burrowing species as they often occur on patches of deeper clay-loam soils, and for detritivore species that rely on dense leaf litter; however, they are often widespread and continuous. While moderately dense shrubland on the plains can provide patches of detrital microhabitats and deep soils suitable substrate for burrowing taxa, these habitats tend to provide very little protection and are often widespread and continuous. The low levels of habitat complexity, protection and isolation generally make these areas unsuitable for SRE species.</p>	<p>Mygalomorph spiders, pseudoscorpions, scorpions, and terrestrial isopods</p>	

### 4.3 Current survey SRE invertebrate fauna results

SRE invertebrate sampling was conducted at 76 of the 103 sites assessed across the two survey trips (Figure 4.2). Invertebrate fauna samples were collected from 27 of the 76 sampling sites. A total of 52 invertebrate specimens from known SRE groups were collected from the 27 sampling sites. Invertebrates originated from microhabitats in leaf litter, topsoil, burrows and under rocks. The fauna comprised two spiders, 44 pseudoscorpions and six scorpions (Table 4.3, Figure 4.33). Each taxon is discussed in detail below. While none of these taxa are Confirmed SRE, eleven were considered to be Potential SRE. The remaining three taxa are regarded as Widespread.

#### **Mygalomorphae**

##### **Idiopidae**

###### *Idiosoma* sp. indet. – Potential SRE

One individual of this genus was collected from site SJIM-090 during the Trip 1 wet season survey. The specimen was collected from a burrow within Sandy/ Stony Plain habitat. Due to the specimen being a female, it could not be identified past genus as adult male specimens are required for positive species identification.

This taxon is regarded as a Potential SRE (WAM Categories 'A' Data deficient, 'B' Habitat Indicators and 'E' Research and Expertise). Further molecular work would be required to resolve this deficiency.

#### **Pseudoscorpiones**

Pseudoscorpions were represented by one Atemnidae genus (*Oratemnus*), one Garypidae genus (*Synsphyronus*) and three Olpiidae genera (*Austrohorus*, *Beierolpium* and *Indolpium*).

##### **Atemnidae**

###### *Oratemnus* sp. indet. - Widespread

Thirteen specimens of *Oratemnus* were collected from eight sites (SJIM-014, SJIM-022, SJIM-029, SJIM-032, SJIM-047, SJIM-089, SJIM-093 and SJIM-104) in litter microhabitats within Sandy/ Stony Plain and Drainage Area/Floodplain sites. The specimens comprised six males, five females and three juveniles. The specimens could not be identified to species as the entire genus requires phylogenetic revision.

The members of this genus are generally known to be widespread across the Pilbara and therefore this taxon is considered likely to be Widespread.

## **Garypidae**

### *Synsphyronus* sp. indet. – Potential SRE

One juvenile specimen of this genus was collected from under rocks at SJIM-058, a Breakaway in Undulating Low Hills habitat. The specimen was collected during the Trip 1 wet season survey. There are two previous records of this genus (*Synsphyronus* sp. indet.) from two similarly rocky locations within 10-15 km of the current record location at Wheelarra Hill and Shearers West (Biologic, 2014b, 2019).

This taxon is regarded as a Potential SRE (WAM Category 'A' Data Deficient, 'B' Habitat Indicators and 'E' Research and Expertise)

## **Olpidae**

### *Austrohorus* sp. JIM 01 – Potential SRE

Two specimens of this yet undescribed species were collected from rock and litter microhabitats at two sites (SJIM-037 and SJIM-044). The specimens, which comprised one male and one female, were collected from Sandy/ Stony Plain and Undulating Low Hills sites during the Trip 1 wet season survey.

This taxon is regarded as a Potential SRE (WAM Category 'A' Data Deficient, 'B' Habitat Indicators and 'E' Research and Expertise).

### *Austrohorus* sp. JIM 02 – Potential SRE

Three specimens of this second undescribed *Austrohorus* species were collected from rock and leaf litter microhabitats at three sites (SJIM-019, SJIM-106 and SJIM-133). The specimens, which comprised two males and one female, were collected from Gorge/Gully and Undulating Low Hills sites. All specimens appeared morphologically distinct from *Austrohorus* sp. JIM-01. There are two records of *Austrohorus* sp. JIM 02 from two locations within Jimblebar North, 7-10 km from the current record locations (Biologic, In prep.)

This taxon is regarded as a Potential SRE (WAM Category 'A' Data Deficient, 'B' Habitat Indicators and 'E' Research and Expertise).

### *Beierolpium* sp. 8/3 – Widespread

Eleven specimens of this taxon were recorded from nine sites (SJIM-001, SJIM-006, SJIM-019, SJIM-033, SJIM-035, SJIM-058, SJIM-093, SJIM-127 and SJIM-133) in leaf litter and rock microhabitats within Hillcrest/Hillslope, Sandy/ Stony Plain, Undulating Low Hills,

Gorge/Gully sites. This taxon has been recorded throughout the Pilbara, including up to 220 km to the north east of the Study Area.

This taxon is regarded as Widespread.

*Beierolpium* sp. indet. – Potential SRE

A single juvenile specimen of the genus *Beierolpium* was recorded from leaf litter microhabitat during the Trip 2 dry season survey. The specimen was collected from site SJIM-090 within Sandy/ Stony Plain habitat. Due to the specimen being immature, it could not be confidently aligned with *Beierolpium* sp. 8/3. However, it is considered likely that the unidentified *Beierolpium* specimen is a representative of *Beierolpium* sp. 8/3. Molecular work would be necessary to establish further taxonomic clarity.

This taxon is regarded as a Potential SRE (WAM Category 'A' Data Deficient, 'B' Habitat Indicators and 'E' Research and Expertise).

*Indolpium* sp. JIM-03 – Potential SRE

Three specimens of this yet undescribed species of *Indolpium* were collected from leaf litter at two sites (SJIM-011 and SJIM-032) during the Trip 1 wet season survey. The specimens, which comprised two females and one juvenile, were collected from Sandy/ Stony Plain and Undulating Low Hills sites. There are two previous records of *Indolpium* sp. JIM-03 from two locations within 5-10 km of the current record locations (Biologic 2019).

This taxon is regarded as a Potential SRE (WAM Category 'A' Data Deficient and 'E' Research and Expertise).

*Indolpium* sp. JIM-04 – Potential SRE

Five male specimens representing a second undescribed *Indolpium* species were collected from rock and leaf litter microhabitats at four sites (SJIM-007, SJIM-022, SJIM-096 and SJIM-104). Two specimens were collected during the Trip 1 wet season survey, with the other three being collected during the dry season survey (Trip 2). All specimens appeared morphologically distinct from *Indolpium* sp. JIM-03. The four sites from which specimens were collected comprised of Undulating Low Hills and Sandy/ Stony Plain habitats. There are two previous records of *Indolpium* sp. JIM-04 from two locations within 2-20 km of the current record locations (Biologic 2019).

This taxon is regarded as a Potential SRE (WAM Category 'A' Data Deficient and 'E' Research and Expertise).

*Indolpium* sp. indet. – Potential SRE

Five juvenile specimens of *Indolpium* were collected from four sites (SJIM-037, SJIM-044, SJIM-106 and SJIM-127) during Trips 1 and 2 of the survey. Due to the specimens being immature, they could not be confidently aligned with either of the other two *Indolpium* species identified above. However, it is considered likely that the unidentified *Indolpium* specimens are representatives of *Indolpium* sp. JIM-03 and/or *Indolpium* sp. JIM-04. Molecular work would be necessary to determine further taxonomic clarity. The specimens were collected from both rock and leaf litter microhabitats within Sandy/ Stony Plain, Drainage Area/ Floodplain and Undulating Low Hills sites.

This taxon is regarded as a Potential SRE (WAM Category 'A' Data Deficient and 'E' Research and Expertise).

**Scorpiones**

**Buthidae**

*Isometroides* 'pilbara 1' – Widespread

A single female *Isometroides* 'pilbara 1' specimen was recorded from a vertebrate pitfall trap at site GHDJIM4. Trapping was conducted during the Trip 1 wet season survey in Mulga Woodland habitat within the broad Sandy/ Stony Plain habitat type. Members of this genus are known to actively hunt Mygalomorphae trap-door spiders in their own burrows. They are the only group known to display this behaviour.

There are no known SRE species within the genus and therefore the taxon is considered Widespread.

*Lychas* 'annulatus complex' – Potential SRE

Three male specimens were collected in Sandy/ Stony Plain habitat via pitfall trapping. The specimens were collected from two sites (GHDJIM1 and GHDJIM2) during the Trip 1 wet season survey.

Whilst the morphological taxonomy of this group is poorly developed, growing DNA evidence suggests that this taxon is part of a species complex found throughout the Pilbara which is regarded as likely to contain SRE species (E. Volschenk, *pers. comm.* 2016). This taxon is therefore regarded as a Potential SRE (WAM Category 'A' Data Deficient and 'E' Research and Expertise).

## **Urodacidae**

### *Urodacus* 'megamastigus complex' – Potential SRE

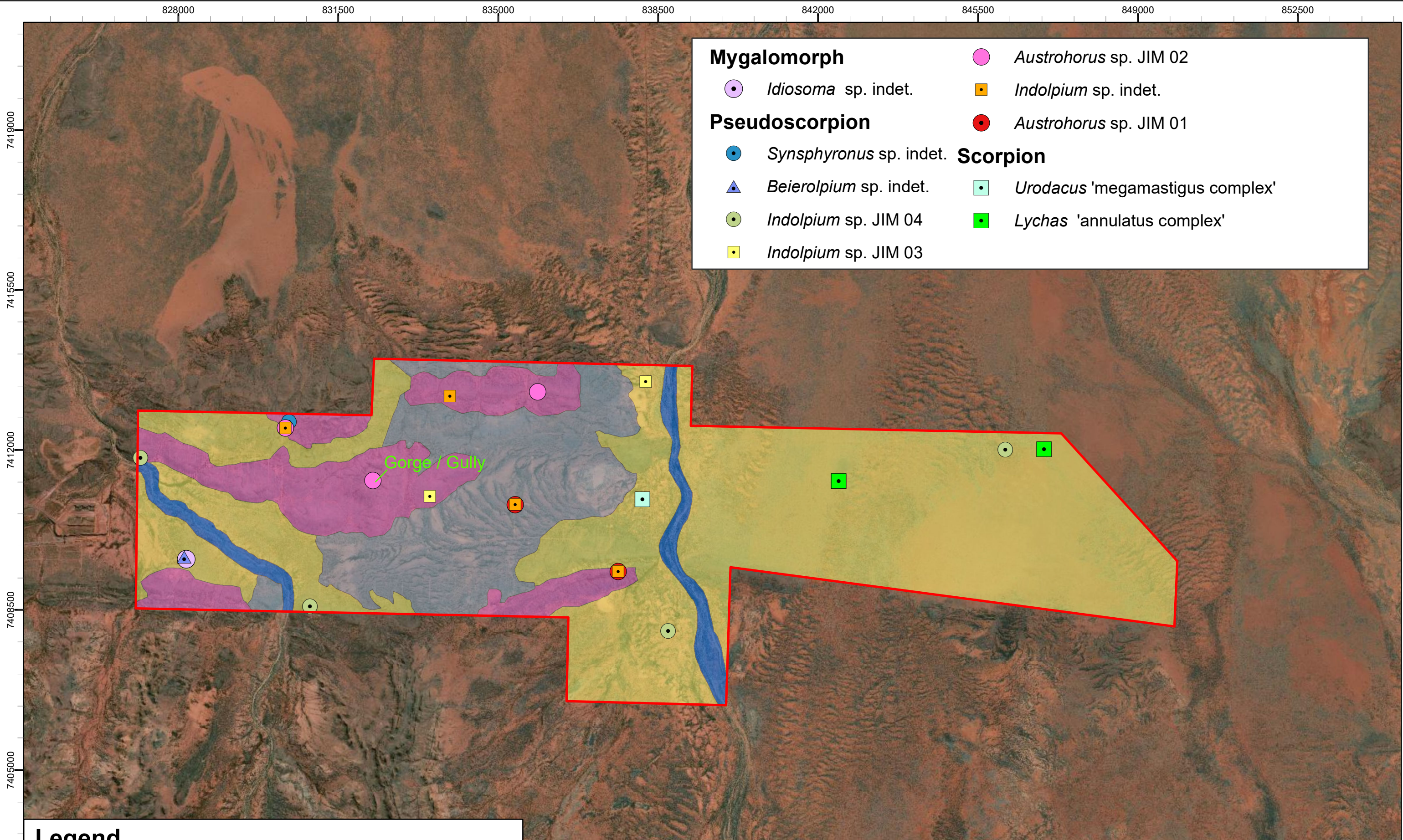
Two male *Urodacus* specimens were recorded from a vertebrate pitfall trap at site GHDJIM5. Trapping was conducted during the Trip 1 wet season survey in Mulga Woodland within Sandy/ Stony Plain habitat type.

This taxon belongs to one of five *Urodacus* species complexes and is regarded as a Potential SRE (WAM Category 'A' Data Deficient and 'E' Research and Expertise).

**Table 4.3: Current survey SRE invertebrate survey fauna results.**

Higher Taxon	Lowest taxonomic identification	SRE Status	Site	Habitat Category	Site Habitat	Microhabitat	No indiv.
<b>Araneae</b>							
Idiopidae	<i>Idiosoma</i> sp. indet.	Potential SRE	SJIM-090	Sandy/ Stony Plain	Sand Plain	Burrow	1
<b>Pseudoscorpiones</b>							
Atemnidae	<i>Oratemnus</i> sp. indet.	Widespread	SJIM-014	Sandy/ Stony Plain	Sand Plain	Litter	3
			SJIM-022	Sandy/ Stony Plain	Sand Plain	Litter	2
			SJIM-029	Sandy/ Stony Plain	Sand Plain	Litter	2
			SJIM-032	Sandy/ Stony Plain	Sand Plain	Litter	2
			SJIM-047	Drainage Area/ Floodplain	Claypan	Litter	1
			SJIM-089	Sandy/ Stony Plain	Sand Plain	Litter	1
			SJIM-093	Drainage Area/ Floodplain	Sand Plain	Litter	1
			SJIM-104	Drainage Area/ Floodplain	Footslope	Litter	1
Garypidae	<i>Synsphyronus</i> sp. indet.	Potential SRE	SJIM-058	Undulating Low Hills	Breakaway	Rock	1
Olpidae	<i>Austrohorus</i> sp. JIM 01	Potential SRE	SJIM-037	Sandy/ Stony Plain	Sand Plain	Litter	1
			SJIM-044	Undulating Low Hills	Ironstone Outcrops	Rock	1
	<i>Austrohorus</i> sp. JIM 02	Potential SRE	SJIM-019	Undulating Low Hills	Minor Drainage Line	Litter	1
			SJIM-106	Undulating Low Hills	Boulders/ Rockpiles	Rock	1
			SJIM-133	Gorge/ Gully	Gully	Rock	1
	<i>Beierolpium</i> '8/3'	Widespread	SJIM-001	Drainage Area/ Floodplain	Minor Drainage Line	Litter	2
			SJIM-006	Drainage Area/ Floodplain	Medium Drainage Line	Litter	1
			SJIM-019	Undulating Low Hills	Minor Drainage Line	Litter	1
			SJIM-033	Sandy/ Stony Plain	Sand Plain	Litter	2
			SJIM-035	Sandy/ Stony Plain	Sand Plain	Litter	1
			SJIM-058	Undulating Low Hills	Breakaway	Rock	1
			SJIM-093	Drainage Area/ Floodplain	Sand Plain	Litter	1
			SJIM-127	Undulating Low Hills	Minor Drainage Line	Litter	1
	SJIM-133	Gorge/ Gully	Gully	Rock	1		
<i>Beierolpium</i> sp. indet.	Potential SRE	SJIM-090	Sandy/ Stony Plain	Sand Plain	Litter	1	
<i>Indolpium</i> sp. indet.	Potential SRE	SJIM-037	Sandy/ Stony Plain	Sand Plain	Litter	1	

Higher Taxon	Lowest taxonomic identification	SRE Status	Site	Habitat Category	Site Habitat	Microhabitat	No indiv.
			SJIM-044	Undulating Low Hills	Ironstone Outcrops	Litter	1
			SJIM-106	Undulating Low Hills	Boulders/ Rockpiles	Rock	1
			SJIM-127	Undulating Low Hills	Minor Drainage Line	Litter	2
	<i>Indolpium</i> sp. JIM 03	Potential SRE	SJIM-011	Undulating Low Hills	Breakaway	Litter	2
			SJIM-032	Sandy/ Stony Plain	Sand Plain	Litter	1
	<i>Indolpium</i> sp. JIM 04	Potential SRE	SJIM-007	Undulating Low Hills	Breakaway	Rock	1
			SJIM-022	Sandy/ Stony Plain	Sand Plain	Litter	2
			SJIM-096	Sandy/ Stony Plain	Sand Plain	Litter	1
SJIM-104			Drainage Area/ Floodplain	Footslope	Litter	1	
<b>Scorpionida</b>							
Buthidae	<i>Isometroides</i> 'pilbara 1'	Widespread	EJM-04	Sandy/ Stony Plains	Mulga Woodland	N/A	1
	<i>Lychas</i> 'annulatus complex'	Potential SRE	EJM-01	Sandy/ Stony Plain	Sand Plain	N/A	1
			EJM-02	Sandy/ Stony Plain	Sand Plain	N/A	2
Urodacidae	<i>Urodacus</i> 'megamastigus complex'	Potential SRE	EJM-05	Sandy/ Stony Plain	Mulga Woodland	N/A	2
<b>Grand Total</b>							<b>51</b>



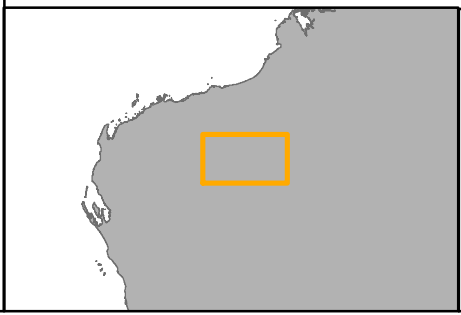
<b>Mygalomorph</b>		<i>Austrohorus</i> sp. JIM 02
<i>Idiosoma</i> sp. indet.	<i>Indolpium</i> sp. indet.	
<b>Pseudoscorpion</b>		<i>Austrohorus</i> sp. JIM 01
<i>Synsphyronus</i> sp. indet.	<i>Urodacus</i> 'megamastigus complex'	<b>Scorpion</b>
<i>Beierolpium</i> sp. indet.	<i>Lychas</i> 'annulatus complex'	
<i>Indolpium</i> sp. JIM 04		
<i>Indolpium</i> sp. JIM 03		

**Legend**

Study Area

**Habitat**

Low Undulating Hills	Major Drainage
Drainage Area	Sandy / Stony Plains
Gorge / Gully	



**biologic**  
Environmental Survey

N

1:75,376

0 0.5 1 2 3 4 km

**BHP Western Australian Iron Ore  
East Jimblebar and Caramulla SRE Invertebrate  
Survey**

**Figure 4.3: Potential SRE invertebrate fauna  
collected during the current survey**

Coordinate System: GDA 1994 MGA Zone 50  
Projection: Transverse Mercator  
Datum: GDA 1994

Size A3. Created 14/01/2020

## 5 DISCUSSION

### 5.1 SRE invertebrate fauna

Of the ten Potential SRE taxa recorded in the Study Area, the following four taxa are currently regarded as most likely to be either restricted to the Study Area or the local area based on current information:

- *Idiosoma* sp. indet.
- *Synsphyronus* sp. indet.
- *Austrohorus* sp. JIM 01
- *Indolpium* sp. indet.

The shield-backed trapdoor spider of the genus *Idiosoma* (otherwise known as the *nigrum*-group) was collected from Sand Plain habitat in the south-eastern corner of the Study Area. Trapdoor spiders of this genus are known to have restricted ranges and many members are of long-standing conservation significance (Rix *et al.*, 2018). The database searches did not reveal any previous *Idiosoma* records (or indeterminate Idiopidae records) within 20 km of the Study Area which may indicate that this species is more likely to be locally restricted, although there has been limited sampling to the east of the Study Area. The record currently represents the most northerly documentation of this genus within Western Australia, with the closest record, an *Idiosoma clypeatum* specimen, being located 500 km south-west within the Murchison IBRA subregion (Rix *et al.*, 2018).

One juvenile *Synsphyronus* sp. indet. pseudoscorpion specimen was collected from rocky microhabitat within Hillcrest/Hillslope habitat during the wet season survey. Although the record is indeterminate, this genus is regarded as highly likely to contain SRE species (E. Volschenk *pers. comm.*). This genus is known from only two records in the local area, both located approximately 10 – 15 km west / north-west of the Study Area (Wheelarra Hill and Jimplebar North) (Biologic, 2014b). The two previous records were also both within rocky microhabitats of the Hillcrest/Hillslope habitats. Molecular sequencing would be required to determine whether the three records represent the same species.

The pseudoscorpion *Austrohorus* sp. JIM 01 was recorded from two sites in Sandy/ Stony Plain and Undulating Low Hills habitats, located approximately 2.7 km apart from each other. The records were found to be morphologically distinct from *Austrohorus* sp. JIM 02, which is known to have a wider local distribution outside of the Study Area (Biologic, 2019). There is a high potential for *Austrohorus* sp. JIM 01 to be distributed beyond the Study Area as both habitats extend out of the Study Area to the north/east and south.

Five juvenile *Indolpium* sp. indet. were recorded from four sites in Sandy/ Stony Plain and Undulating Low Hills habitat. They are likely to represent either of the two *Indolpium* species collected during this survey (*Indolpium* sp. JIM 03 and *Indolpium* sp. JIM 04), both of which are known to have wider local distributions outside of the Study Area (Biologic, 2019). Molecular work would be necessary to provide further taxonomic clarity as the immature nature of the specimens limits further morphological identification. Furthermore, *Indolpium* sp. indet. specimens are unlikely to be restricted to the Study Area as the habitats they were collected in extend well beyond the Study Area.

The remaining Potential SRE species are likely to have distributions ranging beyond the Study Area based on current information.

## 5.2 SRE habitat

Very little of the Study Area was regarded to be of high suitability for SRE fauna with only one site (Gorge/ Gully Habitat Category) out of 103 regarded as high SRE suitability. Despite the presence of some shallow gully habitats within the Low Undulating Hills, much of this was of Moderate to Low SRE suitability. Given the relatively low suitability of the habitats within the Study Area and the extent of those habitats beyond the Study Area, it can be regarded as highly unlikely that any SRE invertebrate species would be restricted to the Study Area.

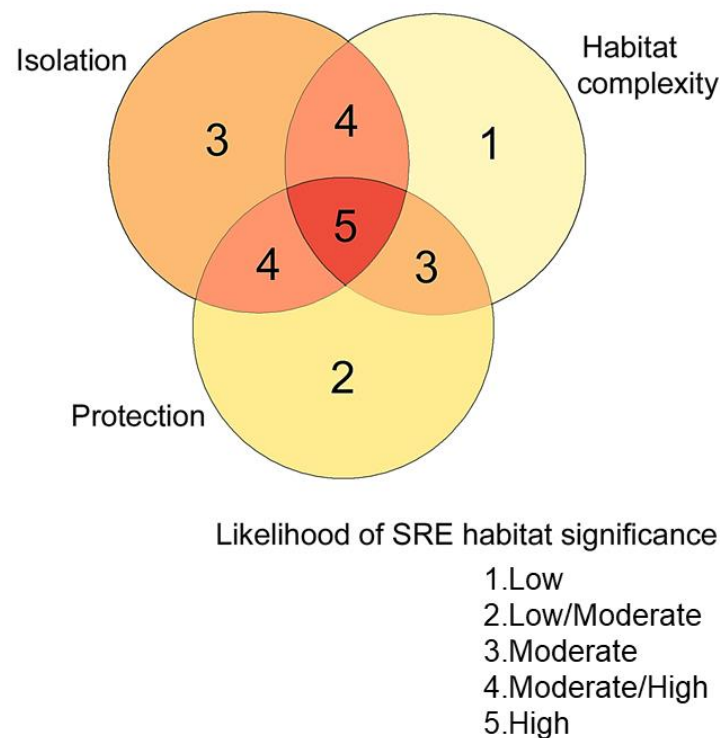
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## Appendix A: Factors affecting the suitability of habitat for Short Range Endemic Invertebrate Fauna.

Habitat assessments were based on three major factors influencing the significance of habitats for SRE species; isolation, protection and habitat complexity, as briefly outlined below and illustrated in Figure 5.1.



**Figure 5.1: Habitat assessment diagram.**

*Isolation:* based on the level of connectivity between sites, which share similar habitat characteristics. Isolation is the most important factor when it comes to the level of risk, as any fauna with limited dispersal characteristics, regardless of the habitat preference, will likely be, an isolated population. Examples include islands and mountaintops; in the Pilbara, peaks like Mt Meharry have been shown to harbour significant SRE species (Durrant, 2011).

*Protection:* this primarily covers protection from exposure. With respect to the Pilbara region however, protection from disturbance is also very important for the long-term viability of SRE habitats and communities, *i.e.* protection from fire, flood and invasive species.

Protection is provided at two levels; the site level where the structural composition of the site (aspect, slope *etc.*) can provide protection from exposure and disturbance by providing physical barriers (*e.g.* gorges and gullies); and the habitat level where certain microhabitat

characteristics, associated with habitat complexity, provide more direct protection, particularly from exposure (*i.e.* leaf litter, rocky substrates, canopy cover and soil depth).

*Habitat complexity*: this factor drives species richness and often abundance at a site, *i.e.* the more complex a site is, the more species and individuals it is likely to contain. This is particularly important, as a number of SRE groups are predators; therefore the richness and abundance of prey species are critical to their survival.

Complexity, with respect to SREs, is based around a number of microhabitat types:

- Leaf litter: both depth and structural variation;
- Rocky substrates: loose rocks and crevices;
- Vegetation variation: flora richness and structural variation; and
- Soil: depth and structural variation.

Likewise, the complexity of the habitat is important to detritivore SRE taxa, such as isopods, millipedes and some snails, which rely upon decaying leaf litter, woody debris and organic matter for survival. Examples in the Pilbara include deep gullies and gorges, where many of these areas contain most of the above microhabitat types, and therefore tend to be the richest areas.

## Appendix B: Database SRE Fauna Records

Higher Order	Family	Species	SRE Status	Latitude	Longitude
Mygalomorphae	Idiopidae	<i>Aganippe</i> MYG384-DNA	Confirmed SRE	-23.2929	120.1007
Myriapoda	Paradoxosomatidae	<i>Antichiropus</i> sp. indet.	Confirmed SRE	-23.3291	119.9997
Myriapoda	Paradoxosomatidae	<i>Antichiropus</i> sp. indet.	Confirmed SRE	-23.3326	120.0013
Myriapoda	Pachybolidae	<i>Austrostrophus stictopygus</i>	Potential SRE	-23.3341	120.0176
Myriapoda	Pachybolidae	<i>Austrostrophus stictopygus</i>	Potential SRE	-23.3314	120.0187
Myriapoda	Pachybolidae	<i>Austrostrophus stictopygus</i>	Potential SRE	-23.3314	120.0187
Myriapoda	Pachybolidae	<i>Austrostrophus stictopygus</i>	Potential SRE	-23.3292	119.9957
Myriapoda	Pachybolidae	<i>Austrostrophus stictopygus</i>	Potential SRE	-23.3227	119.9823
Myriapoda	Pachybolidae	<i>Austrostrophus stictopygus</i>	Potential SRE	-23.3201	120.0779
Myriapoda	Pachybolidae	<i>Austrostrophus stictopygus</i>	Potential SRE	-23.3227	119.9823
Myriapoda	Pachybolidae	<i>Austrostrophus stictopygus</i>	Potential SRE	-23.3227	119.9823
Myriapoda	Pachybolidae	<i>Austrostrophus stictopygus</i>	Potential SRE	-23.3232	119.9946
Myriapoda	Pachybolidae	<i>Austrostrophus stictopygus</i>	Potential SRE	-23.3229	120.0100
Myriapoda	Pachybolidae	<i>Austrostrophus stictopygus</i>	Potential SRE	-23.3208	120.0014
Myriapoda	Pachybolidae	<i>Austrostrophus stictopygus</i>	Potential SRE	-23.3216	120.0014
Myriapoda	Pachybolidae	<i>Austrostrophus stictopygus</i>	Potential SRE	-23.3236	120.0112
Myriapoda	Pachybolidae	<i>Austrostrophus stictopygus</i>	Potential SRE	-23.3205	120.0389
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3598	120.1467
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3585	120.0983
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3579	120.1409
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3565	120.1318
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3565	120.1318
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3556	120.1361
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3543	120.1024
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3542	120.1350
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3541	120.1471
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3534	120.1398
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3527	120.1346
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3526	120.0418
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3518	120.1419
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3515	120.1070
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3500	120.1438
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3383	120.1421
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3365	120.1226
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3362	120.0241
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3343	120.0209
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3341	120.0176
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3326	120.0013
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3326	120.0013
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3314	120.0187
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3293	120.1576
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3292	119.9956
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3252	120.0243

Higher Order	Family	Species	SRE Status	Latitude	Longitude
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3247	120.0165
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3239	120.0260
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3225	119.9981
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3225	119.9894
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3225	119.9894
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3216	120.0226
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3215	120.0746
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3215	120.0380
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3215	120.0711
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3213	120.0342
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3211	120.1376
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3205	120.0389
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3201	120.0779
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3192	120.0743
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3191	120.1485
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3119	120.1445
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3093	120.1500
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3061	120.1012
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3044	120.0994
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3044	120.0994
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3039	120.1471
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3018	120.0988
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `10NM`	Potential SRE	-23.3018	120.0988
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3611	120.1000
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3611	120.1000
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3601	120.1150
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3598	120.1467
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3585	120.0983
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3585	120.0983
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3583	120.0913
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3583	120.0913
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3579	120.1409
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3579	120.1409
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3579	120.1409
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3567	120.1089
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3567	120.1089
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3565	120.1318
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3565	120.1318
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3562	120.1180
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3556	120.1361
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3556	120.1361
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3543	120.1024
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3543	120.1024
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3542	120.1350

Higher Order	Family	Species	SRE Status	Latitude	Longitude
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3541	120.1471
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3539	120.1237
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3534	120.1398
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3534	120.1398
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3534	120.1398
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3534	120.1398
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3531	120.1104
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3527	120.1346
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3518	120.1419
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3518	120.1419
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3501	120.0502
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3467	120.1179
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3467	120.1261
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3467	120.1261
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3444	120.1215
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3418	120.1437
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3396	120.0770
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3343	120.0209
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3343	120.0209
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3343	120.0209
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3326	120.0013
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3326	120.0013
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3326	120.0013
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3326	120.0013
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3326	120.0126
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3325	120.0875
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3322	120.0162
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3322	120.0162
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3322	120.0162
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3322	120.0162
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3322	120.0162
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3314	120.0187
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3304	120.0086
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3304	120.0086
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3304	120.0086
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3304	120.0086
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3292	119.9956
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3292	119.9956
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3292	119.9956
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3291	119.9997
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3291	119.9997
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3256	120.1384
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3256	120.1384
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3252	120.0243

Higher Order	Family	Species	SRE Status	Latitude	Longitude
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3239	120.0260
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3236	120.0112
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3232	119.9946
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3231	120.0081
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3229	120.0100
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3229	120.0100
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3227	119.9823
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3227	119.9823
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3225	119.9981
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3225	119.9894
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3219	120.1353
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3219	120.1353
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3216	120.0014
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3215	120.0746
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3215	120.0380
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3213	120.0082
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3213	120.0342
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3211	120.0438
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3211	120.0438
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3211	120.1376
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3211	120.1376
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3210	120.1275
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3210	120.1275
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3208	120.0014
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3206	119.9962
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3206	119.9962
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3205	120.0389
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3202	120.0330
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3202	120.0330
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3201	120.0779
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3192	120.0743
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3192	120.0743
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.3191	120.0262
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `14CR`	Potential SRE	-23.4020	120.1060
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `36NM`	Potential SRE	-23.3579	120.1409
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `36NM`	Potential SRE	-23.3567	120.1089
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `36NM`	Potential SRE	-23.3480	120.1437
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3611	120.1000
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3583	120.0913
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3579	120.1409
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3567	120.1089
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3565	120.1318
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3565	120.1318
Isopoda	Armadiillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3542	120.1350

Higher Order	Family	Species	SRE Status	Latitude	Longitude
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3534	120.1398
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3533	120.1176
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3533	120.1176
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3527	120.1346
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3518	120.1419
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3518	120.1419
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3502	120.0296
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3480	120.0660
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3480	120.1437
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3480	120.1437
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3478	120.1189
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3467	120.1179
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3448	120.1512
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3448	120.1512
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3378	120.1292
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3363	120.1469
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3361	120.1271
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3360	120.1205
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3341	120.0240
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3335	119.9824
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3335	119.9824
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3326	120.0126
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3326	120.0126
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3315	120.1427
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3314	120.0187
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3314	120.0187
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3312	119.9896
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3304	120.0086
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3291	119.9997
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3277	119.9861
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3239	120.1054
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3231	120.0081
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3231	120.0081
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3229	120.0100
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3227	119.9823
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3227	119.9823
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3225	119.9894
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3220	120.0746
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3219	119.9837
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3219	120.1353
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3216	120.0014
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3215	120.0746
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3213	120.0082
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3213	120.0082

Higher Order	Family	Species	SRE Status	Latitude	Longitude
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3213	120.0342
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3208	120.0014
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3208	120.0014
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3206	119.9962
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3192	120.0743
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3186	120.1118
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3068	120.1327
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.3060	120.1339
Isopoda	Armadillidae	<i>Buddelundia</i> sp. `49`	Potential SRE	-23.2937	120.1395
Isopoda	Armadillidae	Buddelundiinae sp. `WN`	Potential SRE	-23.3534	120.1398
Isopoda	Armadillidae	Buddelundiinae sp. `WN`	Potential SRE	-23.3363	120.1469
Araneomorphae	Selenopidae	<i>Karaops</i> ARA003-DNA	Confirmed SRE	-23.3331	120.0180
Araneomorphae	Selenopidae	<i>Karaops</i> ARA003-DNA	Confirmed SRE	-23.3044	120.0994
Araneomorphae	Selenopidae	<i>Karaops</i> ARA003-DNA	Confirmed SRE	-23.3314	120.0187
Araneomorphae	Selenopidae	<i>Karaops</i> ARA003-DNA	Confirmed SRE	-23.3277	119.9862
Araneomorphae	Selenopidae	<i>Karaops</i> ARA003-DNA	Confirmed SRE	-23.3227	119.9823
Araneomorphae	Selenopidae	<i>Karaops</i> ARA003-DNA	Confirmed SRE	-23.3018	120.0989
Araneomorphae	Selenopidae	<i>Karaops</i> ARA003-DNA	Confirmed SRE	-23.3247	120.0120
Araneomorphae	Selenopidae	<i>Karaops</i> ARA003-DNA	Confirmed SRE	-23.3225	119.9895
Araneomorphae	Selenopidae	<i>Karaops</i> ARA003-DNA	Confirmed SRE	-23.3061	120.1012
Araneomorphae	Selenopidae	<i>Karaops</i> ARA003-DNA	Confirmed SRE	-23.3061	120.1012
Araneomorphae	Selenopidae	<i>Karaops</i> ARA003-DNA	Confirmed SRE	-23.3191	120.0262
Araneomorphae	Selenopidae	<i>Karaops</i> ARA003-DNA	Confirmed SRE	-23.3191	120.0262
Araneomorphae	Selenopidae	<i>Karaops</i> ARA003-DNA	Confirmed SRE	-23.3252	120.0243
Araneomorphae	Selenopidae	<i>Karaops</i> ARA003-DNA	Confirmed SRE	-23.3193	120.0428
Araneomorphae	Selenopidae	<i>Karaops</i> ARA003-DNA	Confirmed SRE	-23.3039	120.1471
Araneomorphae	Selenopidae	<i>Karaops</i> ARA004-DNA	Confirmed SRE	-23.3313	120.1543
Araneomorphae	Selenopidae	<i>Karaops</i> ARA004-DNA	Confirmed SRE	-23.3467	120.1262
Araneomorphae	Selenopidae	<i>Karaops</i> ARA004-DNA	Confirmed SRE	-23.3467	120.1262
Araneomorphae	Selenopidae	<i>Karaops</i> ARA004-DNA	Confirmed SRE	-23.3504	120.1175
Araneomorphae	Selenopidae	<i>Karaops</i> ARA004-DNA	Confirmed SRE	-23.3500	120.1438
Araneomorphae	Selenopidae	<i>Karaops</i> ARA004-DNA	Confirmed SRE	-23.3518	120.1419
Araneomorphae	Selenopidae	<i>Karaops</i> ARA004-DNA	Confirmed SRE	-23.3518	120.1419
Araneomorphae	Selenopidae	<i>Karaops</i> ARA004-DNA	Confirmed SRE	-23.3518	120.1419
Araneomorphae	Selenopidae	<i>Karaops</i> ARA004-DNA	Confirmed SRE	-23.3552	120.1216
Araneomorphae	Selenopidae	<i>Karaops</i> ARA004-DNA	Confirmed SRE	-23.3552	120.1216
Araneomorphae	Selenopidae	<i>Karaops</i> sp. indet.	Potential SRE	-23.3018	120.0990
Araneomorphae	Selenopidae	<i>Karaops</i> sp. indet.	Potential SRE	-23.3206	119.9960
Araneomorphae	Selenopidae	<i>Karaops</i> sp. indet.	Potential SRE	-23.3216	120.0230
Araneomorphae	Selenopidae	<i>Karaops</i> sp. indet.	Potential SRE	-23.3204	120.0390
Mygalomorphae	Nemesiidae	<i>Kwonkan</i> MYG094	Potential SRE	-23.3644	120.3450
Scorpiones	Buthidae	<i>Lychas annulatus</i>	Potential SRE	-23.3644	120.3450
Scorpiones	Buthidae	<i>Lychas</i> sp. ' <i>bituberculatus</i> group'	Potential SRE	-23.3543	120.1020

Higher Order	Family	Species	SRE Status	Latitude	Longitude
Scorpiones	Buthidae	<i>Lychas</i> sp. 'bituberculatus group'	Potential SRE	-23.3611	120.0991
Scorpiones	Buthidae	<i>Lychas</i> sp. 'bituberculatus group'	Potential SRE	-23.3692	120.1960
Scorpiones	Buthidae	<i>Lychas</i> sp. 'bituberculatus group'	Potential SRE	-23.3385	120.1270
Scorpiones	Buthidae	<i>Lychas</i> sp. 'bituberculatus group'	Potential SRE	-23.4666	120.1760
Scorpiones	Buthidae	<i>Lychas</i> sp. 'bituberculatus group'	Potential SRE	-23.4583	120.1560
Scorpiones	Buthidae	<i>Lychas</i> sp. 'bituberculatus group'	Potential SRE	-23.4666	120.1760
Scorpiones	Buthidae	<i>Lychas</i> sp. hairy tail group	Potential SRE	-23.3211	120.1376
Scorpiones	Buthidae	<i>Lychas</i> sp. hairy tail group	Potential SRE	-23.3467	120.1261
Scorpiones	Buthidae	<i>Lychas</i> sp. hairy tail group	Potential SRE	-23.3304	120.0086
Scorpiones	Buthidae	<i>Lychas</i> sp. hairy tail group	Potential SRE	-23.3215	120.0724
Scorpiones	Buthidae	<i>Lychas</i> sp. hairy tail group	Potential SRE	-23.3312	119.9896
Scorpiones	Buthidae	<i>Lychas</i> sp. hairy tail group	Potential SRE	-23.3291	119.9997
Scorpiones	Buthidae	<i>Lychas</i> sp. hairy tail group	Potential SRE	-23.3585	120.0983
Scorpiones	Buthidae	<i>Lychas</i> sp. hairy tail group	Potential SRE	-23.3557	120.0948
Scorpiones	Buthidae	<i>Lychas</i> sp. hairy tail group	Potential SRE	-23.3211	120.0426
Scorpiones	Buthidae	<i>Lychas</i> sp. hairy tail group	Potential SRE	-23.3211	120.0438
Scorpiones	Buthidae	<i>Lychas</i> sp. hairy tail group	Potential SRE	-23.3211	120.0438
Scorpiones	Buthidae	<i>Lychas</i> sp. hairy tail group	Potential SRE	-23.3579	120.1409
Scorpiones	Buthidae	<i>Lychas</i> sp. hairy tail group	Potential SRE	-23.3227	119.9823
Scorpiones	Buthidae	<i>Lychas</i> sp. hairy tail group	Potential SRE	-23.3322	120.0162
Scorpiones	Buthidae	<i>Lychas</i> sp. hairy tail group	Potential SRE	-23.3341	120.0176
Scorpiones	Buthidae	<i>Lychas</i> sp. hairy tail group	Potential SRE	-23.3229	120.0100
Scorpiones	Buthidae	<i>Lychas</i> sp. hairy tail group	Potential SRE	-23.3292	119.9956
Scorpiones	Buthidae	<i>Lychas</i> sp. hairy tail group	Potential SRE	-23.3314	120.0187
Mygalomorphae	Barychelidae	<i>Synothele</i> MYG116	Potential SRE	-23.3644	120.3450
Mygalomorphae	Nemesiidae	<i>Aname</i> MYG205-DNA	Potential SRE	-23.3811	120.1733
Pseudoscorpiones	Garypidae	<i>Synsphyronus</i> sp. indet.	Potential SRE	-23.3542	120.1350
Pseudoscorpiones	Garypidae	<i>Synsphyronus</i> sp. Indet.	Potential SRE	-23.4140	120.1030
Pseudoscorpiones	Olpiidae	<i>Xenolpium</i> PSE079	Confirmed SRE	-23.2992	120.0760
Pseudoscorpiones	Olpiidae	<i>Xenolpium</i> PSE079	Confirmed SRE	-23.3383	120.1420
Pseudoscorpiones	Olpiidae	<i>Xenolpium</i> PSE079	Confirmed SRE	-23.3042	120.0730
Pseudoscorpiones	Olpiidae	<i>Xenolpium</i> PSE079	Confirmed SRE	-23.3454	120.1390
Pseudoscorpiones	Olpiidae	<i>Xenolpium</i> PSE079	Confirmed SRE	-23.2992	120.0760
Pseudoscorpiones	Olpiidae	<i>Xenolpium</i> PSE079	Confirmed SRE	-23.2992	120.0760
Pseudoscorpiones	Olpiidae	<i>Xenolpium</i> PSE079	Confirmed SRE	-23.2992	120.0760
Pseudoscorpiones	Olpiidae	<i>Xenolpium</i> PSE079	Confirmed SRE	-23.3193	120.0930
Pseudoscorpiones	Olpiidae	<i>Xenolpium</i> PSE079	Confirmed SRE	-23.3219	120.1350
Pseudoscorpiones	Olpiidae	<i>Xenolpium</i> PSE079	Confirmed SRE	-23.3078	120.1350

### Appendix C: Site Data

Site	Latitude	Longitude	Date of assessment	Habitat Type	Landform	SRE Suitability	Slope	Aspect	Outcropping	Leaf Litter Availability	Soil Type	Drainage	Shade Availability
SJIM-001	-23.3740	120.2390	1/05/2019	Drainage Area/ Floodplain	Minor Drainage Line	Moderate/Low	Flat	Flat	Negligible	Many Large Patches	Clayey Sand	Creek	Medium 40-60%
SJIM-001	-23.3740	120.2390	19/09/2019	Drainage Area/ Floodplain	Minor Drainage Line	Moderate/Low	Flat	Flat	Negligible	Many Large Patches	Clayey Sand	Creek	Medium 40-60%
SJIM-002	-23.3741	120.2113	1/05/2019	Drainage Area/ Floodplain	Other- Mulga Woodland	Moderate/Low	Flat	Flat	Negligible	Many Large Patches	Clayey Sand	Creek	Med to High 60-80%
SJIM-002	-23.3741	120.2113	19/09/2019	Drainage Area/ Floodplain	Other- Mulga Woodland	Moderate/Low	Flat	Flat	Negligible	Many Large Patches	Loamy Sand	Negligible	Low to Med 20-40%
SJIM-003	-23.3978	120.2496	2/05/2019	Drainage Area/ Floodplain	Other- Mulga Woodland	Moderate/Low	Flat	Flat	Negligible	Many Large Patches	Clayey Sand	Sheet Flow	Medium 40-60%
SJIM-003	-23.3978	120.2496	19/09/2019	Drainage Area/ Floodplain	Other- Mulga Woodland	Moderate/Low	Flat	Flat	Negligible	Many Large Patches	Clayey Sand	Sheet Flow	Medium 40-60%
SJIM-004	-23.3974	120.2556	2/05/2019	Sandy/ Stony Plain	Stony Plain	Low	Flat	Flat	Negligible	None Discernible	Clayey Sand	Negligible	Negligible <5%
SJIM-005	-23.3875	120.2682	2/05/2019	Drainage Area/ Floodplain	Other- Mulga Woodland	Moderate/Low	Flat	Flat	Negligible	Many Large Patches	Clayey Sand	Sheet Flow	Med to High 60-80%
SJIM-005	-23.3875	120.2682	19/09/2019	Drainage Area/ Floodplain	Other- Mulga Woodland	Moderate/Low	Flat	Flat	Negligible	Many Large Patches	Clayey Sand	Sheet Flow	Med to High 60-80%
SJIM-006	-23.3980	120.2327	2/05/2019	Drainage Area/ Floodplain	Medium Drainage Line	Moderate	Flat	West	Negligible	Many Small Patches	Clayey Sand	River	Low to Med 20-40%
SJIM-006	-23.3980	120.2327	19/09/2019	Drainage Area/ Floodplain	Medium Drainage Line	Moderate	Flat	West	Negligible	Many Small Patches	Clayey Sand	River	Low to Med 20-40%
SJIM-007	-23.3992	120.2371	2/05/2019	Undulating Low Hills	Breakaway	Moderate/Low	Steep	South	Extensive Outcropping	Scarce	Clayey Sand	Negligible	High 80-100%
SJIM-007	-23.3992	120.2371	19/09/2019	Undulating Low Hills	Breakaway	Moderate	Steep	South	Extensive Outcropping	Scarce	Clayey Sand	Negligible	High 80-100%
SJIM-008	-23.3971	120.2315	2/05/2019	Undulating Low Hills	Boulders/ Rockpiles	Low	Low	East	Minor Outcropping	Many Small Patches	Clayey Sand	Negligible	Negligible <5%
SJIM-009	-23.3839	120.2543	2/05/2019	Sandy/ Stony Plain	Stony Plain	Low	Flat	Flat	Negligible	None Discernible	Medium Clay	Negligible	Negligible <5%
SJIM-010	-23.3827	120.2528	2/05/2019	Sandy/ Stony Plain	Stony Plain	Low	Low	South	Negligible	None Discernible	Clayey Sand	Negligible	Negligible <5%
SJIM-011	-23.3769	120.2622	2/05/2019	Undulating Low Hills	Breakaway	Moderate/Low	Steep	South	Major Outcropping	Few Small Patches	Light Medium Clay	Negligible	Medium 40-60%
SJIM-011	-23.3769	120.2622	19/09/2019	Undulating Low Hills	Breakaway	Moderate/Low	Steep	South	Major Outcropping	Few Small Patches	Light Medium Clay	Negligible	Medium 40-60%

Site	Latitude	Longitude	Date of assessment	Habitat Type	Landform	SRE Suitability	Slope	Aspect	Outcropping	Leaf Litter Availability	Soil Type	Drainage	Shade Availability
SJIM-012	-23.3557	120.2514	2/05/2019	Sandy/ Stony Plain	Stony Plain	Low	Flat	Flat	Negligible	Few Small Patches	Clayey Sand	Negligible	Low 5-20%
SJIM-013	-23.3648	120.2801	2/05/2019	Sandy/ Stony Plain	Stony Plain	Low	Flat	Flat	Limited Outcropping	Scarce	Medium Clay	Negligible	Negligible <5%
SJIM-014	-23.3527	120.2565	2/05/2019	Sandy/ Stony Plain	Sand Plain	Moderate/Low	Flat	Flat	Negligible	Many Large Patches	Clayey Sand	Creek	Med to High 60-80%
SJIM-014	-23.3527	120.2565	22/09/2019	Sandy/ Stony Plain	Sand Plain	Moderate	Flat	Flat	Negligible	Many Large Patches	Clayey Sand	Creek	Med to High 60-80%
SJIM-015	-23.3564	120.2510	2/05/2019	Undulating Low Hills	Undulating Low Hills	Moderate	Flat	Flat	Negligible	Few Large Patches	Clayey Sand	Negligible	Medium 40-60%
SJIM-015	-23.3564	120.2510	22/09/2019	Undulating Low Hills	Undulating Low Hills	Moderate	Flat	Flat	Negligible	Few Large Patches	Clayey Sand	Negligible	Medium 40-60%
SJIM-016	-23.3523	120.2732	2/05/2019	Sandy/ Stony Plain	Minor Drainage Line	Low	Flat	Flat	Minor Outcropping	Few Small Patches	Sand	Creek	Low to Med 20-40%
SJIM-017	-23.3553	120.2758	2/05/2019	Undulating Low Hills	Other- Mulga Woodland	Low	Low	North/ West	Negligible	Few Small Patches	Clayey Sand	Negligible	Low 5-20%
SJIM-018	-23.3768	120.2248	2/05/2019	Undulating Low Hills	Gully	Moderate	Moderate	South	Extensive Outcropping	Many Small Patches	Clayey Sand	Gully	Low to Med 20-40%
SJIM-019	-23.3558	120.2848	2/05/2019	Undulating Low Hills	Minor Drainage Line	Low	Flat	Flat	Negligible	Few Small Patches	Clayey Sand	Creek	Low to Med 20-40%
SJIM-019	-23.3558	120.2848	22/09/2019	Undulating Low Hills	Minor Drainage Line	Low	Flat	Flat	Negligible	Few Small Patches	Clayey Sand	Creek	Low to Med 20-40%
SJIM-020	-23.3646	120.3931	3/05/2019	Sandy/ Stony Plain	Sand Plain	Moderate/Low	Flat	Flat	Negligible	Scarce	Sand	Negligible	Negligible <5%
SJIM-021	-23.3782	120.2243	2/05/2019	Undulating Low Hills	Gully	Moderate	Moderate	East	Moderate Outcropping	Few Small Patches	Clayey Sand	Negligible	Low 5-20%
SJIM-022	-23.3647	120.3852	3/05/2019	Sandy/ Stony Plain	Sand Plain	Moderate/Low	Flat	Flat	Negligible	Many Small Patches	Sand		Low to Med 20-40%
SJIM-022	-23.3647	120.3852	20/09/2019	Sandy/ Stony Plain	Sand Plain	Moderate/Low	Flat	Flat	Negligible	Many Small Patches	Sand		Low to Med 20-40%
SJIM-023	-23.3800	120.2250	2/05/2019	Sandy/ Stony Plain	Sandy/ Stony Plain	Low	Flat	Flat	Negligible	Scarce	Clayey Sand	Negligible	Low 5-20%
SJIM-024	-23.3643	120.3502	3/05/2019	Sandy/ Stony Plain	Sand Plain	Moderate/Low	Flat	Flat	Negligible	Scarce	Clayey Sand		Negligible <5%
SJIM-025	-23.3646	120.3985	3/05/2019	Sandy/ Stony Plain	Sand Plain	Low	Flat	Flat	Negligible	None Discernible	Clayey Sand	Negligible	Negligible <5%
SJIM-026	-23.3640	120.3304	3/05/2019	Sandy/ Stony Plain	Sand Plain	Moderate/Low	Flat	Flat	Negligible	Scarce	Clayey Sand		Negligible <5%
SJIM-027	-23.3651	120.3719	3/05/2019	Sandy/ Stony Plain	Other- Eucalypt Woodland	Low	Flat	Flat	Negligible	Few Large Patches	Clayey Sand	Negligible	Low to Med 20-40%

Site	Latitude	Longitude	Date of assessment	Habitat Type	Landform	SRE Suitability	Slope	Aspect	Outcropping	Leaf Litter Availability	Soil Type	Drainage	Shade Availability
SJIM-027	-23.3651	120.3719	20/09/2019	Sandy/ Stony Plain	Other-Eucalypt Woodland	Low	Flat	Flat	Negligible	Few Large Patches	Clayey Sand	Negligible	Low to Med 20-40%
SJIM-028	-23.3638	120.3140	3/05/2019	Major Drainage Line	Major Drainage Line	Moderate	Flat	Flat	Negligible	Many Small Patches	Sand	River	Low to Med 20-40%
SJIM-028	-23.3638	120.3140	20/09/2019	Major Drainage Line	Major Drainage Line	Moderate	Flat	Flat	Negligible	Many Small Patches	Sand	River	Low to Med 20-40%
SJIM-029	-23.3740	120.3475	3/05/2019	Sandy/ Stony Plain	Sand Plain	Low	Flat	Flat	Negligible	Scarce	Clayey Sand	Negligible	Low 5-20%
SJIM-029	-23.3740	120.3475	20/09/2019	Sandy/ Stony Plain	Sand Plain	Moderate/Low	Flat	Flat	Negligible	Scarce	Clayey Sand	Negligible	Low 5-20%
SJIM-030	-23.3645	120.3139	3/05/2019	Major Drainage Line	Major Drainage Line	Moderate/Low	Flat	Flat	Negligible	Scarce	Sand	River	Negligible <5%
SJIM-031	-23.3736	120.3448	3/05/2019	Sandy/ Stony Plain	Sand Plain	Low	Flat	Flat	Negligible	None Discernible	Clayey Sand	Negligible	Negligible <5%
SJIM-032	-23.3533	120.3078	3/05/2019	Sandy/ Stony Plain	Sand Plain	Moderate/Low	Flat	Flat	Negligible	Few Large Patches	Clayey Sand		Medium 40-60%
SJIM-032	-23.3533	120.3078	22/09/2019	Sandy/ Stony Plain	Sand Plain	Moderate/Low	Flat	Flat	Negligible	Few Large Patches	Clayey Sand		Medium 40-60%
SJIM-033	-23.3854	120.3309	20/09/2019	Sandy/ Stony Plain	Sand Plain	Low	Flat	Flat	Negligible	Few Small Patches	Clayey Sand	Negligible	Low 5-20%
SJIM-033	-23.3854	120.3309	3/05/2019	Sandy/ Stony Plain	Sand Plain	Moderate/Low	Flat	Flat	Negligible	Few Small Patches	Clayey Sand	Negligible	Low 5-20%
SJIM-034	-23.3615	120.3083	3/05/2019	Sandy/ Stony Plain	Sand Plain	Low	Flat	Flat	Negligible	Scarce	Clayey Sand		Negligible <5%
SJIM-035	-23.3753	120.3317	3/05/2019	Sandy/ Stony Plain	Sand Plain	Low	Flat	Flat	Negligible	Scarce	Clayey Sand	Negligible	Negligible <5%
SJIM-035	-23.3753	120.3317	20/09/2019	Sandy/ Stony Plain	Sand Plain	Moderate/Low	Flat	Flat	Negligible	Scarce	Clayey Sand	Negligible	Low 5-20%
SJIM-036	-23.3651	120.3094	3/05/2019	Sandy/ Stony Plain	Sandy/ Stony Plain	Low	Flat	Flat	Negligible	Many Small Patches	Clayey Sand		Low to Med 20-40%
SJIM-036	-23.3651	120.3094	20/09/2019	Sandy/ Stony Plain	Sandy/ Stony Plain	Low	Flat	Flat	Negligible	Many Small Patches	Clayey Sand		Low to Med 20-40%
SJIM-037	-23.3781	120.2805	3/05/2019	Sandy/ Stony Plain	Sand Plain	Low	Flat	Flat	Negligible	Many Large Patches	Clayey Sand	Negligible	Low to Med 20-40%
SJIM-037	-23.3781	120.2805	22/09/2019	Sandy/ Stony Plain	Other-Vegetation Grove	Low	Flat	Flat	Negligible	Many Large Patches	Clayey Sand	Negligible	Low to Med 20-40%
SJIM-038	-23.3888	120.2955	3/05/2019	Undulating Low Hills	Gully	Low	Moderate	South	Moderate Outcropping	Scarce	Sand		Low 5-20%
SJIM-039	-23.3809	120.2931	3/05/2019	Sandy/ Stony Plain	Sandy/ Stony Plain	Low	Flat	Flat	Negligible	Many Large Patches	Clayey Sand	Negligible	Low 5-20%
SJIM-040	-23.4082	120.3156	3/05/2019	Sandy/ Stony Plain	Sandy/ Stony Plain	Low	Flat	Flat	Negligible	None Discernible	Sand		Negligible <5%

Site	Latitude	Longitude	Date of assessment	Habitat Type	Landform	SRE Suitability	Slope	Aspect	Outcropping	Leaf Litter Availability	Soil Type	Drainage	Shade Availability
SJIM-041	-23.4123	120.3193	3/05/2019	Drainage Area/ Floodplain	Minor Drainage Line	Moderate/Low	Flat	Flat	Negligible	Many Large Patches	Clayey Sand	Negligible	Medium 40- 60%
SJIM-041	-23.4123	120.3193	22/09/2019	Drainage Area/ Floodplain	Minor Drainage Line	Moderate/Low	Flat	Flat	Negligible	Many Large Patches	Clayey Sand	Negligible	Medium 40- 60%
SJIM-042	-23.3900	120.3032	3/05/2019	Undulating Low Hills	Ironstone Outcrops	Moderate/Low	Low	North	Minor Outcropping	Few Small Patches	Sand	Creek	Low 5-20%
SJIM-043	-23.3732	120.3097	3/05/2019	Sandy/ Stony Plain	Sand Plain	Low	Flat	Flat	Negligible	Few Large Patches	Clayey Sand	Negligible	Negligible <5%
SJIM-044	-23.3909	120.3028	3/05/2019	Undulating Low Hills	Ironstone Outcrops	Moderate/Low	Moderate	South	Moderate Outcropping	Few Large Patches	Clayey Sand		Low to Med 20-40%
SJIM-045	-23.3720	120.2975	3/05/2019	Sandy/ Stony Plain	Drainage Area/ Floodplain	Low	Flat	Flat	Negligible	Scarce	Clayey Sand	Negligible	Negligible <5%
SJIM-046	-23.3893	120.3065	3/05/2019	Sandy/ Stony Plain	Undulating Low Hills	Low	Low	East	Limited Outcropping	Scarce	Clayey Sand		Negligible <5%
SJIM-047	-23.3720	120.2975	22/09/2019	Drainage Area/ Floodplain	Claypan	Low	Flat	Flat	Negligible	Many Large Patches	Clayey Sand	Negligible	Medium 40- 60%
SJIM-047	-23.3720	120.2975	3/05/2019	Drainage Area/ Floodplain	Claypan	Low	Flat	Flat	Negligible	Many Large Patches	Clayey Sand	Negligible	Medium 40- 60%
SJIM-048	-23.3853	120.3140	3/05/2019	Major Drainage Line	Major Drainage Line	Moderate/Low	Flat	Flat	Negligible	Many Large Patches	Sand	River	Medium 40- 60%
SJIM-049	-23.3648	120.2439	4/05/2019	Undulating Low Hills	Breakaway	Moderate/High	Steep	South	Major Outcropping	None Discernible	Clayey Sand	Negligible	High 80- 100%
SJIM-049	-23.3648	120.2439	19/09/2019	Undulating Low Hills	Breakaway	Moderate	Steep	South	Major Outcropping	None Discernible	Clayey Sand	Negligible	High 80- 100%
SJIM-050	-23.3856	120.3121	3/05/2019	Sandy/ Stony Plain	Sand Plain	Moderate/Low	Flat	Flat	Negligible	Many Large Patches	Clayey Sand		Low to Med 20-40%
SJIM-051	-23.3685	120.2361	4/05/2019	Undulating Low Hills	Breakaway	High	Moderate	South	Major Outcropping	Few Small Patches	Medium Clay	Negligible	Low to Med 20-40%
SJIM-051	-23.3685	120.2361	20/09/2019	Undulating Low Hills	Breakaway	High	Moderate	South	Major Outcropping	Few Small Patches	Medium Clay	Negligible	Low to Med 20-40%
SJIM-052	-23.3675	120.3083	3/05/2019	Sandy/ Stony Plain	Stony Plain	Low	Flat	Flat	Negligible	Scarce	Clayey Sand		Negligible <5%
SJIM-053	-23.3710	120.2349	4/05/2019	Undulating Low Hills	Minor Drainage Line	Low	Flat	Flat	Negligible	Few Small Patches	Clayey Sand	Negligible	Low 5-20%
SJIM-054	-23.3669	120.2434	4/05/2019	Sandy/ Stony Plain	Undulating Low Hills	Low	Low	South	Limited Outcropping	None Discernible	Clayey Sand		Low 5-20%
SJIM-055	-23.3787	120.2306	4/05/2019	Sandy/ Stony Plain	Sand Plain	Low	Flat	Flat	Negligible	Few Small Patches	Clayey Sand	Negligible	Low 5-20%
SJIM-056	-23.3654	120.2444	4/05/2019	Undulating Low Hills	Gully	Moderate/Low	Moderate	North/ West	Major Outcropping	Few Small Patches	Clayey Sand		Low to Med 20-40%
SJIM-058	-23.3628	120.2317	4/05/2019	Undulating Low Hills	Breakaway	Moderate/High	Steep	South	Extensive Outcropping	Many Small Patches	Loamy Sand		High 80- 100%

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SJIM-058	-23.3628	120.2317	19/09/2019	Undulating Low Hills	Breakaway	Moderate/High	Steep	South	Extensive Outcropping	Many Small Patches	Loamy Sand		High 80-100%
SJIM-079	-23.4002	120.2104	5/05/2019	Undulating Low Hills	Breakaway	Low	Low	South/West	Minor Outcropping	Few Small Patches	Clayey Sand	Negligible	Low 5-20%
SJIM-081	-23.3992	120.2108	5/05/2019	Undulating Low Hills	Breakaway	Low	Steep	South	Moderate Outcropping	Few Small Patches	Sand	Negligible	Low to Med 20-40%
SJIM-083	-23.3947	120.2092	5/05/2019	Drainage Area/Floodplain	Minor Drainage Line	Low	Flat	Flat	Negligible	Many Small Patches	Clayey Sand	Negligible	Medium 40-60%
SJIM-085	-23.3932	120.3705	6/05/2019	Sandy/ Stony Plain	Sand Plain	Moderate/Low	Flat	Flat	Negligible	Scarce	Sand	Negligible	Negligible <5%
SJIM-087	-23.3945	120.3834	6/05/2019	Sandy/ Stony Plain	Sand Plain	Moderate/Low	Flat	Flat	Negligible	Few Small Patches	Sand	Negligible	Low 5-20%
SJIM-088	-23.3903	120.2083	5/05/2019	Sandy/ Stony Plain	Sand Plain	Moderate/Low	Flat	Flat	Negligible	Many Small Patches	Clayey Sand		Low 5-20%
SJIM-089	-23.3966	120.3979	20/09/2019	Sandy/ Stony Plain	Other-Eucalypt Woodland	Moderate/High	Flat	Flat	Negligible	Evenly Spread	Loamy Sand	Negligible	Med to High 60-80%
SJIM-089	-23.3966	120.3979	6/05/2019	Sandy/ Stony Plain	Sand Plain	Moderate	Flat	Flat	Negligible	Evenly Spread	Loamy Sand		High 80-100%
SJIM-090	-23.3904	120.2105	5/05/2019	Sandy/ Stony Plain	Sand Plain	Moderate/Low	Flat	Flat	Negligible	Scarce	Sand	Negligible	Low 5-20%
SJIM-090	-23.3904	120.2105	18/09/2019	Sandy/ Stony Plain	Sand Plain	Moderate/Low	Flat	Flat	Negligible	Scarce	Sand	Negligible	Low 5-20%
SJIM-091	-23.3954	120.3987	6/05/2019	Sandy/ Stony Plain	Sand Plain	Moderate/Low	Flat	Flat	Negligible	Many Small Patches	Clayey Sand		Low 5-20%
SJIM-092	-23.3783	120.2037	5/05/2019	Major Drainage Line	Major Drainage Line	Moderate	Flat	Flat	Negligible	Many Large Patches	Sand	River	Low 5-20%
SJIM-092	-23.3783	120.2037	18/09/2019	Major Drainage Line	Major Drainage Line	Moderate	Flat	Flat	Negligible	Many Large Patches	Sand	River	Low 5-20%
SJIM-093	-23.3972	120.4213	6/05/2019	Drainage Area/Floodplain	Sand Plain	Low	Flat	Flat	Negligible	Many Large Patches	Sandy Loam	Negligible	Low to Med 20-40%
SJIM-093	-23.3973	120.4206	20/09/2019	Drainage Area/Floodplain	Sand Plain	Moderate/High	Flat	Flat	Negligible	Many Large Patches	Sandy Loam	Negligible	Low to Med 20-40%
SJIM-094	-23.3789	120.2033	18/09/2019	Sandy/ Stony Plain	Minor Drainage Line	Moderate/Low	Flat	Flat	Negligible	Few Large Patches	Clayey Sand		Low 5-20%
SJIM-094	-23.3789	120.2033	5/05/2019	Sandy/ Stony Plain	Sand Plain	Moderate/Low	Flat	Flat	Negligible	Few Large Patches	Clayey Sand		Low 5-20%
SJIM-095	-23.3969	120.4197	6/05/2019	Sandy/ Stony Plain	Sand Plain	Moderate/Low	Flat	Flat	Negligible	Many Small Patches	Clayey Sand		Low 5-20%
SJIM-096	-23.4024	120.3138	22/09/2019	Sandy/ Stony Plain	Sand Plain	Moderate/Low	Flat	Flat	Negligible	Many Small Patches	Clayey Sand		Low to Med 20-40%
SJIM-096	-23.4024	120.3138	6/05/2019	Sandy/ Stony Plain	Sand Plain	Moderate/Low	Flat	Flat	Negligible	Many Small Patches	Clayey Sand		Low to Med 20-40%

Site	Latitude	Longitude	Date of assessment	Habitat Type	Landform	SRE Suitability	Slope	Aspect	Outcropping	Leaf Litter Availability	Soil Type	Drainage	Shade Availability
SJIM-097	-23.3896	120.3107	6/05/2019	Drainage Area/ Floodplain	Minor Drainage Line	Moderate/Low	Flat	Flat	Negligible	Evenly Spread	Loamy Sand	Creek	Low to Med 20-40%
SJIM-098	-23.3644	120.2242	6/05/2019	Sandy/ Stony Plain	Stony Plain	Moderate/Low	Flat	Flat	Negligible	Few Small Patches	Clayey Sand	Negligible	Low 5-20%
SJIM-099	-23.3627	120.2190	6/05/2019	Sandy/ Stony Plain	Undulating Low Hills	Low	Flat	Flat	Negligible	Few Small Patches	Loamy Sand	Negligible	Low 5-20%
SJIM-100	-23.3629	120.2073	6/05/2019	Sandy/ Stony Plain	Stony Plain	Low	Flat	Flat	Negligible	Many Small Patches	Clayey Sand	Negligible	Low to Med 20-40%
SJIM-101	-23.3779	120.2577	2/05/2019	Drainage Area/ Floodplain	Drainage Area/ Floodplain	Moderate/Low	Flat	Flat	Negligible	Many Small Patches	Clayey Sand	Sheet Flow	Low to Med 20-40%
SJIM-102	-23.3863	120.2078	18/09/2019	Sandy/ Stony Plain	Sand Plain	Moderate/Low	Flat	Flat	Negligible	Few Small Patches	Clayey Sand	Negligible	Low 5-20%
SJIM-103	-23.3794	120.2008	18/09/2019	Sandy/ Stony Plain	Sand Plain	Low	Flat	Flat	Negligible	Scarce	Loamy Sand	Negligible	Negligible <5%
SJIM-104	-23.3706	120.2001	19/09/2019	Drainage Area/ Floodplain	Footslope	Moderate/Low	Steep	South/ West	Major Outcropping	Evenly Spread	Clayey Sand		Low to Med 20-40%
SJIM-105	-23.3733	120.2005	19/09/2019	Drainage Area/ Floodplain	Medium Drainage Line	Low	Flat	North	Negligible	Scarce	Clay Loam Sandy	Negligible	Low 5-20%
SJIM-106	-23.3642	120.2314	19/09/2019	Undulating Low Hills	Boulders/ Rockpiles	Moderate/Low	Low	South/ East	Minor Outcropping	Scarce	Clayey Sand	Negligible	Negligible <5%
SJIM-107	-23.3755	120.2265	19/09/2019	Undulating Low Hills	Stony Plain	Low	Low	South	Limited Outcropping	Few Small Patches	Clayey Sand	Negligible	Negligible <5%
SJIM-108	-23.3925	120.2629	19/09/2019	Drainage Area/ Floodplain	Sandy/ Stony Plain	Moderate/Low	Flat	Flat	Negligible	Many Small Patches	Sandy Loam	Sheet Flow	Low to Med 20-40%
SJIM-109	-23.3733	120.2371	19/09/2019	Sandy/ Stony Plain	Stony Plain	Low	Flat	Flat	Negligible	Few Small Patches	Clayey Sand	Negligible	Negligible <5%
SJIM-110	-23.3893	120.2359	19/09/2019	Sandy/ Stony Plain	Sandy/ Stony Plain	Moderate/Low	Flat	Flat	Negligible	Scarce	Clayey Sand	Negligible	Low 5-20%
SJIM-111	-23.3937	120.4157	20/09/2019	Sandy/ Stony Plain	Sand Plain	Moderate/Low	Flat	Flat	Negligible	Many Small Patches	Sand	Negligible	Low 5-20%
SJIM-112	-23.3974	120.2081	21/09/2019	Undulating Low Hills	Medium Drainage Line	Moderate	Low	North	Negligible	Few Small Patches	Sandy Loam	Creek	Low to Med 20-40%
SJIM-113	-23.3973	120.4051	20/09/2019	Sandy/ Stony Plain	Other- Vegetation Grove	Moderate	Flat	Flat	Negligible	Many Large Patches	Sand	Negligible	Low to Med 20-40%
SJIM-115	-23.3901	120.3331	20/09/2019	Sandy/ Stony Plain	Stony Plain	Low	Flat	Flat	Limited Outcropping	Scarce	Loamy Sand	Negligible	Negligible <5%
SJIM-116	-23.4013	120.3098	22/09/2019	Sandy/ Stony Plain	Sand Plain	Low	Flat	Flat	Negligible	Few Small Patches	Clayey Sand	Negligible	Low to Med 20-40%
SJIM-117	-23.3947	120.2001	21/09/2019	Sandy/ Stony Plain	Medium Drainage Line	Low	Flat	Flat	Negligible	Evenly Spread	Clay Loam	Creek	Med to High 60- 80%

Site	Latitude	Longitude	Date of assessment	Habitat Type	Landform	SRE Suitability	Slope	Aspect	Outcropping	Leaf Litter Availability	Soil Type	Drainage	Shade Availability
SJIM-118	-23.3721	120.2705	22/09/2019	Undulating Low Hills	Breakaway	Moderate/Low	Moderate	South	Minor Outcropping	Few Small Patches	Sandy Loam	Negligible	Low to Med 20-40%
SJIM-120	-23.3804	120.2548	22/09/2019	Sandy/ Stony Plain	Sandy/ Stony Plain	Low	Flat	Flat	Limited Outcropping	Few Small Patches	Clayey Sand	Negligible	Low 5-20%
SJIM-122	-23.3922	120.3541	20/09/2019	Sandy/ Stony Plain	Sandy/ Stony Plain	Moderate/Low	Flat	Flat	Major Outcropping	Few Small Patches	Clayey Sand	Negligible	Low 5-20%
SJIM-124	-23.3971	120.4214	20/09/2019	Sandy/ Stony Plain	Sandy/ Stony Plain	Moderate	Flat	Flat	Negligible	Many Small Patches	Clayey Sand	Negligible	Low to Med 20-40%
SJIM-127	-23.3566	120.2663	22/09/2019	Undulating Low Hills	Minor Drainage Line	Low	Flat	Flat	Negligible	Many Large Patches	Light Clay	Creek	Med to High 60-80%
SJIM-129	-23.3561	120.2635	22/09/2019	Undulating Low Hills	Minor Drainage Line	Low	Flat	Flat	Negligible	Few Large Patches	Light Clay	Creek	Low to Med 20-40%
SJIM-130	-23.3823	120.2454	23/09/2019	Sandy/ Stony Plain	Sand Plain	Moderate/Low	Flat	Flat	Negligible	Many Small Patches	Sand	Negligible	Low 5-20%
SJIM-131	-23.3753	120.2696	22/09/2019	Sandy/ Stony Plain	Sandy/ Stony Plain	Low	Flat	Flat	Negligible	Few Large Patches	Clay Loam Sandy	Negligible	Low 5-20%
SJIM-132	-23.3714	120.2499	23/09/2019	Hillcrest/ Hillslope	Breakaway	Moderate/Low	Moderate	East	Minor Outcropping	Scarce	Light Clay	Negligible	Low to Med 20-40%
SJIM-133	-23.3738	120.2496	23/09/2019	Gorge/ Gully	Gully	High	Steep	South	Major Outcropping	Many Small Patches	Clay Loam	Gully	Med to High 60-80%
SJIM-134	-23.3870	120.2911	23/09/2019	Sandy/ Stony Plain	Stony Plain	Moderate/Low	Flat	Flat	Negligible	Few Large Patches	Clayey Sand	Negligible	Low to Med 20-40%
SJIM-135	-23.3694	120.2179	22/09/2019	Sandy/ Stony Plain	Stony Plain	Low	Flat	Flat	Negligible	Few Small Patches	Clayey Sand	Negligible	Low 5-20%

### Appendix D: Fauna Data

Site	Collection Date	Higher Taxon	Family	Species	SRE status	Specimens
EJM-01	2019-04-30	Scorpionida	Buthidae	<i>Lychas</i> 'annulatus complex'	Potential SRE: DD	1
EJM-02	2019-04-30	Scorpionida	Buthidae	<i>Lychas</i> 'annulatus complex'	Potential SRE: DD	1
EJM-02	2019-04-30	Scorpionida	Buthidae	<i>Lychas</i> 'annulatus complex'	Potential SRE: DD	1
EJM-04	2019-04-30	Scorpionida	Buthidae	<i>Isometroides</i> 'pilbara 1'	Widespread	1
EJM-05	2019-05-01	Scorpionida	Urodacidae	<i>Urodacus</i> 'megamastigus complex'	Potential SRE: DD	1
EJM-05	2019-05-01	Scorpionida	Urodacidae	<i>Urodacus</i> 'megamastigus complex'	Potential SRE: DD	1
SJIM-001	1/05/2019	Pseudoscorpiones	Olpiidae	<i>Beierolpium</i> '8/3'	Widespread	2
SJIM-006	19/09/2019	Pseudoscorpiones	Olpiidae	<i>Beierolpium</i> '8/3'	Widespread	1
SJIM-007	2/05/2019	Pseudoscorpiones	Olpiidae	<i>Indolpium</i> sp. JIM 04	Potential SRE: DD	1
SJIM-011	2/05/2019	Pseudoscorpiones	Olpiidae	<i>Indolpium</i> sp. JIM 03	Potential SRE: DD	2
SJIM-014	2/05/2019	Pseudoscorpiones	Atemnidae	<i>Oratemnus</i> sp.	Widespread	3
SJIM-019	2/05/2019	Pseudoscorpiones	Olpiidae	<i>Austrohorus</i> sp. JIM 02	Potential SRE: DD	1
SJIM-019	22/09/2019	Pseudoscorpiones	Olpiidae	<i>Beierolpium</i> '8/3'	Widespread	1
SJIM-022	3/05/2019	Pseudoscorpiones	Atemnidae	<i>Oratemnus</i> sp.	Widespread	2
SJIM-022	20/09/2019	Pseudoscorpiones	Olpiidae	<i>Indolpium</i> sp. JIM 04	Potential SRE: DD	2
SJIM-029	20/09/2019	Pseudoscorpiones	Atemnidae	<i>Oratemnus</i> sp.	Widespread	2
SJIM-032	3/05/2019	Pseudoscorpiones	Olpiidae	<i>Indolpium</i> sp. JIM 03	Potential SRE: DD	1
SJIM-032	3/05/2019	Pseudoscorpiones	Atemnidae	<i>Oratemnus</i> sp.	Widespread	1
SJIM-032	22/09/2019	Pseudoscorpiones	Atemnidae	<i>Oratemnus</i> sp.	Widespread	1
SJIM-033	3/05/2019	Pseudoscorpiones	Olpiidae	<i>Beierolpium</i> '8/3'	Widespread	2
SJIM-035	20/09/2019	Pseudoscorpiones	Olpiidae	<i>Beierolpium</i> '8/3'	Widespread	1
SJIM-037	3/05/2019	Pseudoscorpiones	Olpiidae	<i>Austrohorus</i> sp. JIM 01	Potential SRE: DD	1
SJIM-037	3/05/2019	Pseudoscorpiones	Olpiidae	<i>Indolpium</i> sp.	Potential SRE: DD	1
SJIM-044	3/05/2019	Pseudoscorpiones	Olpiidae	<i>Austrohorus</i> sp. JIM 01	Potential SRE: DD	1
SJIM-044	3/05/2019	Pseudoscorpiones	Olpiidae	<i>Indolpium</i> sp.	Potential SRE: DD	1
SJIM-047	22/09/2019	Pseudoscorpiones	Atemnidae	<i>Oratemnus</i> sp.	Widespread	1

SJIM-058	4/05/2019	Pseudoscorpiones	Garypidae	<i>Synsphyronus</i> sp.	Potential SRE: DD	1
SJIM-058	4/05/2019	Pseudoscorpiones	Olpiidae	<i>Beierolpium</i> '8/3'	Widespread	1
SJIM-089	6/05/2019	Araneae			Potential SRE: DD	1
SJIM-089	6/05/2019	Pseudoscorpiones	Atemnidae	<i>Oratemnus</i> sp.	Widespread	1
SJIM-090	5/05/2019	Araneae	Idiopidae	<i>Idiosoma</i> sp.	Potential SRE: DD	1
SJIM-090	18/09/2019	Pseudoscorpiones	Olpiidae	<i>Beierolpium</i> sp.	Potential SRE: DD	1
SJIM-093	6/05/2019	Pseudoscorpiones	Olpiidae	<i>Beierolpium</i> '8/3'	Widespread	1
SJIM-093	6/05/2019	Pseudoscorpiones	Atemnidae	<i>Oratemnus</i> sp.	Widespread	1
SJIM-096	6/05/2019	Pseudoscorpiones	Olpiidae	<i>Indolpium</i> sp. JIM 04	Potential SRE: DD	1
SJIM-104	19/09/2019	Pseudoscorpiones	Olpiidae	<i>Indolpium</i> sp. JIM 04	Potential SRE: DD	1
SJIM-104	19/09/2019	Pseudoscorpiones	Atemnidae	<i>Oratemnus</i> sp.	Widespread	1
SJIM-106	19/09/2019	Pseudoscorpiones	Olpiidae	<i>Austrohorus</i> sp. JIM 02	Potential SRE: DD	1
SJIM-106	19/09/2019	Pseudoscorpiones	Olpiidae	<i>Indolpium</i> sp.	Potential SRE: DD	1
SJIM-127	22/09/2019	Pseudoscorpiones	Olpiidae	<i>Indolpium</i> sp.	Potential SRE: DD	2
SJIM-127	22/09/2019	Pseudoscorpiones	Olpiidae	<i>Beierolpium</i> '8/3'	Widespread	1
SJIM-133	23/09/2019	Pseudoscorpiones	Olpiidae	<i>Austrohorus</i> sp. JIM 02	Potential SRE: DD	1
SJIM-133	23/09/2019	Pseudoscorpiones	Olpiidae	<i>Beierolpium</i> '8/3'	Widespread	1