Bennelongia Environmental Consultants

Western Ridge Subterranean Fauna Survey and Habitat Assessment

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BHP Western Australian Iron Ore

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Final Report

Short-Range Endemics I Subterranean Fauna

Waterbirds I Wetlands

Western Ridge Subterranean Fauna Survey

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EXECUTIVE SUMMARY

Western Ridge is located approximately 11 km west-southwest of the town of Newman. Subterranean fauna of the area were surveyed 10 years ago under BHP's Regional Subterranean Fauna Sampling Program. A further two-season targeted subterranean fauna survey was conducted between 26 September and 18 November 2019 (round 1 of sampling) and between 30 January and 8 April 2020 (round 2). This report uses all data, from both 2010 and 2019-2020, to provide a general subterranean fauna assessment for the Western Ridge Study Area.

A desktop review of the literature and invertebrate databases conducted for an area of approximately 10,000 km^2 around Western Ridge showed the wider vicinity to be rich in subterranean fauna, especially stygofauna. Guided by the results of the desktop assessment, an additional 123 troglofauna and 38 stygofauna samples were collected in 2019-2020 to supplement survey results from 2010, giving a combined sampling effort of 224 troglofauna samples and 76 stygofauna samples from four rounds of sampling within the Study Area.

Troglofauna were sampled by scrapping and trapping, while stygofauna were sampled by net hauling. Animals were sorted in the laboratory and, as far as possible, all troglofauna and stygofauna were identified to species or morphospecies level. DNA analysis was conducted to support some morphological identifications.

Altogether 292 troglofauna specimens belonging to at least 22 species have been collected from the Study Area. They include palpigrads, pseudoscorpions, pauropods, symphylans, centipedes, millipedes, diplurans, cockroaches, beetles, flies and silverfish, as well as isopods. Seven species of troglofauna were collected as singletons. The other species were either found only within the Study Area but were collected from more than one bore (four species), or are known to have wider occurrence in the Pilbara than the Study Area (11 species).

Only 60 stygofauna specimens belonging to five species have been collected. This includes nematodes (treated here as a single species), oligochaetes and syncarids. All species have wider distributions than the Study Area. The depauperate nature of the community fits with the deep depth to the water table, which makes conditions inhospitable for stygofauna, and development is unlikely to impact the conservation status of any stygofauna species.

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1. INTRODUCTION

The Western Ridge Area (henceforth referred to as the 'Study Area') is located approximately 11 km west-southwest of the town of Newman, adjacent to BHB's Orebody 35 mine site. Development of the iron ore deposits in the Study Area has the potential to impact any subterranean fauna occurring there through the direct removal of habitat, and could also impact the subterranean fauna of surrounding areas if groundwater drawdown is necessary for mining below the water table. Bennelongia Environmental Consultants (BEC) surveyed the Study Area for subterranean fauna 10 years ago and have now conducted an additional two-season targeted subterranean fauna survey. This report uses historical and current sampling results, coupled with habitat modelling, to generate an updated and comprehensive subterranean fauna assessment for the area.

1.1. Background

Subterranean fauna comprise two distinct animal communities, ecologically separated by the upper limit of the water table. Cavities and interstitial spaces above water table are inhabited by troglofauna, found in voids filled with air. Similar underground voids below the water table, and hence filled with water, are used by stygofauna (Moldovan *et al.* 2018). Both communities are scientifically valuable because of their unique biodiversity, high levels of endemism and ancient origins (EPA 2016a). Pilbara stygofauna and troglofauna are thought to have colonised their subterranean habitats before and during the aridification of the surface over the past 15 million years or so (Byrne *et al.* 2008). Despite their long history of resilience to the aridification of the Australian biomes, the limited dispersal abilities and thus small ranges of subterranean species result in a great vulnerability to anthropogenic activities that interfere with underground habitats (EPA 2016a).

Understanding of the subterranean fauna in the Pilbara has progressed immensely since the 1990s (Humphreys 1999 Eberhard *et al.* 2005) as a result of sampling that has been mostly driven by the assessments of potential impacts of mining on these formations. The diversity of the region is now estimated to be around 1300 species of stygofauna, and at least another 1500 species of troglofauna (Halse 2018a, Halse 2018b) but reliable estimates are hindered by a developing and sometimes non-existent taxonomic framework for the animal groups encountered. It is, however, well established that the diversity of subterranean fauna is closely linked to the geology of an area because subterranean species can only colonise areas with appropriate spaces for animals to inhabit, whether these are interstitial species in alluvium, or fissures, vugs and voids in various chemically deposited or sedimentary rock formations. Geologies supporting rich troglofaunal communities include alluvium, mafic volcanic rocks and, especially, a variety of mineralised or weathered iron formations as well as calcrete. Stygofauna communities are usually richest in alluvial and calcrete aquifers, especially within palaeochannels (Halse 2018a). As a result of species occurrence being determined by geology and, particularly, the availability and nature of subterranean spaces, the composition and richness of both stygofauna and troglofauna communities often vary significantly over short distances. In order to achieve a reliable estimate of the diversity and composition of the subterranean fauna of an area, knowledge of local geology and hydrogeology needs to be coupled with biological survey.

1.2. Project History

The Study Area at Western Ridge extends up to 12 km in an east - west direction and 3.5 km north - south, covering just over 34 km^2 and including the Silver Knight, Mount Helen, Bill's Hill and Eastern Syncline deposits (Figure 1). These deposits are immediately south of BHP's Orebody 35 deposit at the Whaleback Hub. Between April and September 2010, BEC conducted a subterranean fauna survey in the Study Area as part of BHP's Regional Subterranean Fauna Sampling Program. Approximately 10 years later, between September 2019 and April 2020, a further two-season subterranean fauna survey and habitat assessment was conducted by BEC. This report combines the results of the 2019-2020 sampling with the older 2010 data, to characterise the subterranean fauna communities of the Western Ridge Area and assess whether any troglofauna or stygofauna species may possibly be restricted to the area and hence of conservation significance.

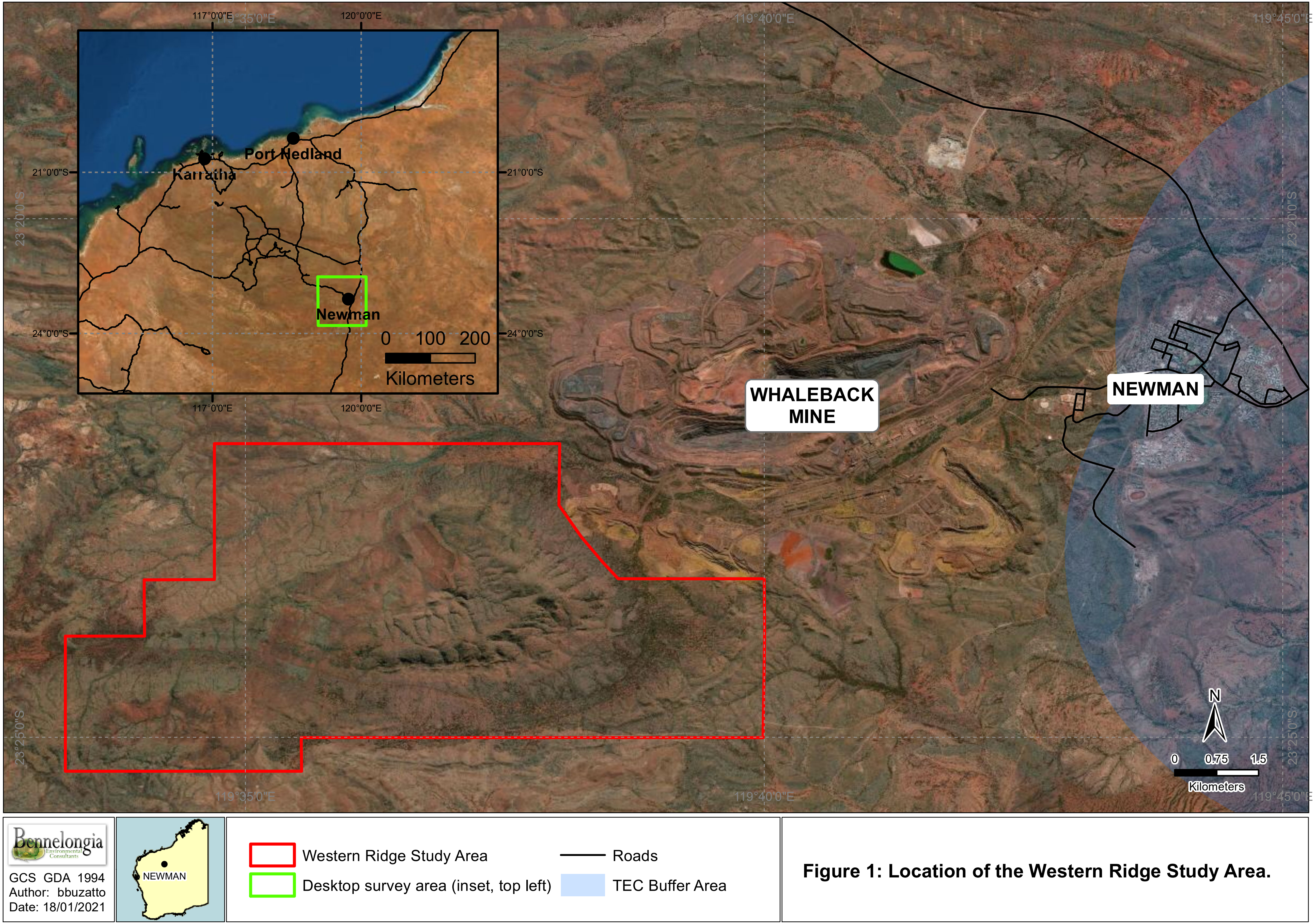


Figure 1: Location of the Western Ridge Study Area.

2. SITE GEOLOGY AND HYDROGEOLOGY

The Study Area contains significant iron ore deposits and the following description of its geology is taken from AQ2 (2020). The Study Area comprises an east-west oriented valley aligned along the local geological strike. The valley is bounded by low lying hills to the north and south comprising Brockman Iron Formation and Marra Mamba Iron Formation, respectively. A poorly defined drainage line flows through the valley to the east.

The geology consists of northward dipping, east-west striking banded iron formation (BIF), shale and dolomite sequences of the Hamersley Group. The valley between outcropping Brockman and Marra Mamba Iron Formations has Wittenoom, Mount Sylvia and Mount McCrae Formations in subcrop and is infilled by Tertiary Detritals (transported alluvial and colluvial detritals from the surrounding Hamersley Ranges). The dominant geological units found within the study area are as follows:

- Tertiary Detritals comprising:
  - Zones of matrix supported material containing gravel in a fine-grained matrix of silt and clay; these units are generally in environments away from the hills.
  - Porous, possibly vuggy, clast supported units comprising scree with a varying degree of iron cementation. These units are proximal to the hills.
- Bedrock Units:
  - Brockman Iron Formation- interbedded BIF, shale and chert.
  - Mt McCrae and Mt Sylvia Formations – predominantly shale.
  - Wittenoom Formation- dolomite and shales with minor BIF.
  - Marra Mamba Iron Formation- interbedded BIF, shale and chert.
- Mineralised zones - mineralisation typically occurs in the Brockman and Marra Mamba Iron Formations.
- Hardcap - occurs across all bedrock units but is most prominent and likely to be vuggy in the Brockman and Marra Mamba Iron Formations.

The watertable in the Study Area is deep, varying between approximately 55 and 110 m below ground level. Groundwater is fresh (260-950 mg/L total dissolved solids) and occurs in an aquifer within vuggy breccia and mineralised and fractured BIF.

3. METHODS

3.1. Desktop assessment

A comprehensive review of literature and invertebrate fauna databases was conducted for an area approximately 100 x 100 km around the Study Area (see green square in the inset map in Figure 1). This area is almost 320 times larger than the Study Area and serves to provide a list of the stygofauna and troglofauna that could possibly occur in the Study Area and its potential to contain species or communities of conservation significance. However, the implied suitability of the Study Area needs checking against both its geology to determine whether it is prospective and, more importantly, the direct empirical results of sampling (see Section 4.2).

The databases consulted included: (a) records kept by the Western Australian Museum [WAM]; (b) records from the Department of Biodiversity, Conservation and Attractions [DBCA]; (c) the Atlas of Living Australia; (d) lists of conservation-significant communities and species (Biodiversity Conservation Act 2016 and Environment Protection and Biodiversity Conservation Act 1999); and (e) BEC's own database, which has been compiled from over 13 years of subterranean fauna surveys throughout the Pilbara and other parts of Western Australia.

3.2. Sampling locations and effort: historical and additional surveys

The exploration drill holes sampled for subterranean fauna by Bennelongia (2010) are shown in Figure 2. The survey was conducted over two rounds of sampling. One hundred and one troglofauna samples were collected from 60 drill holes (Round 1: 13 April – 19 June; Round 2: 19 July – 8 September 2010). Thirty-eight stygofauna samples were collected from 20 drill holes (Round 1: 12 -15 April; Round 2: 19-22 July). Some troglofauna were collected as by-catch during stygofauna sampling, and vice-versa, and these animals are included in the results of sampling.

The 2019-2020 survey effort took into account the results of the 2010 sampling and targeted new drill holes that had not been previously sampled. The results of the first round of sampling in 2019 then informed planning for the second round in 2020. In the first round (26 September - 18 November), 49 troglofauna samples were collected and in the second round (30 January – 8 April), 74 troglofauna samples were collected. For stygofauna, in each round 19 samples were collected.

In total, 76 stygofauna and 224 troglofauna samples were collected during the 2010 and 2019-2020 surveys (Table 1).

Table 1: Historical and new sampling effort in the Study Area.

	Historical sampling	Round 1 (2019)	Round 2 (2020)	**TOTAL**
Troglofauna	101	49	74	**224**
Stygofauna	38	19	19	**76**

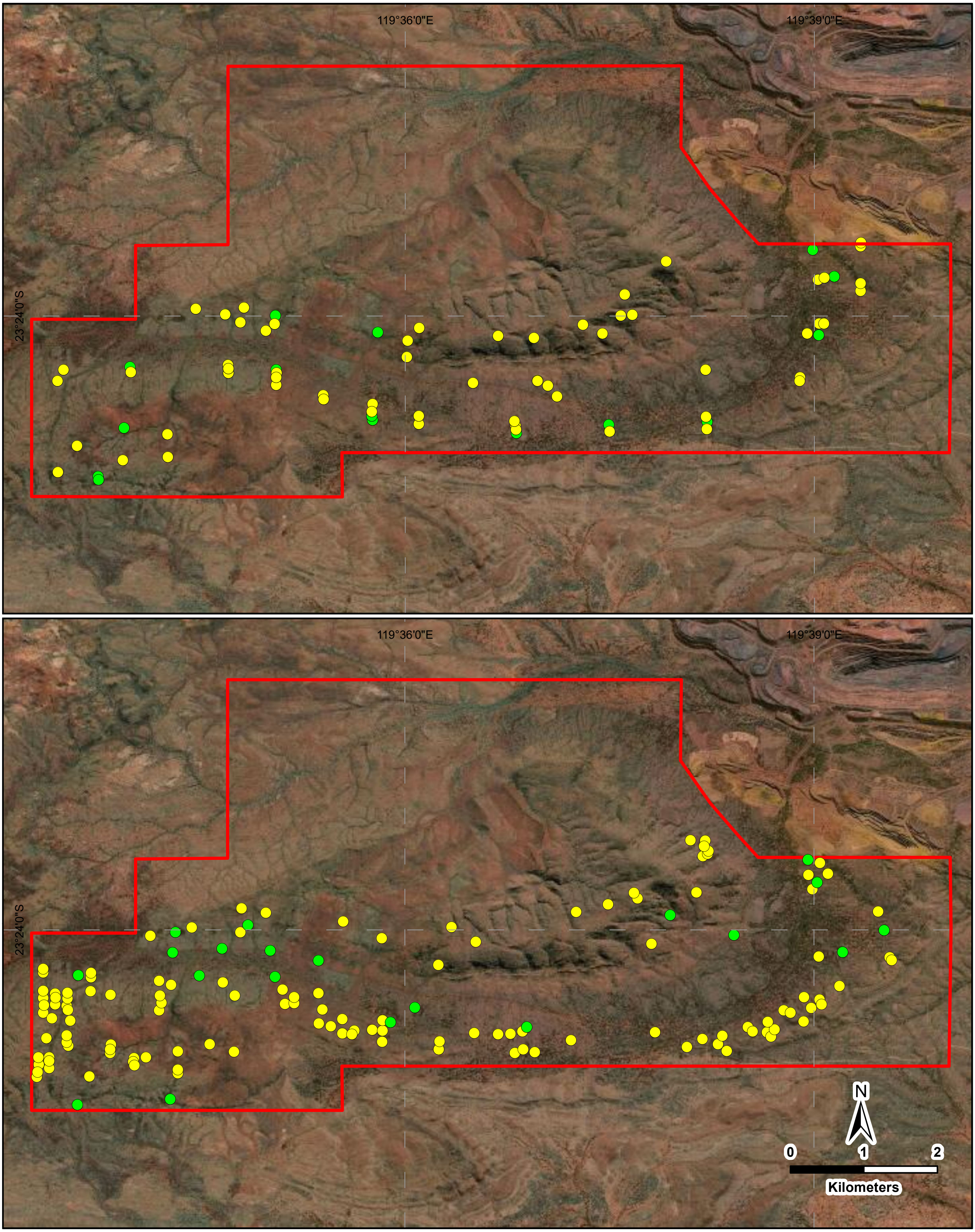
3.3. Field sampling methods

The subterranean fauna surveys reported here were conducted according to the general principles laid out for subterranean fauna sampling by the Environmental Protection Authority (EPA) in *Technical Guidance – subterranean fauna survey* (EPA 2016c), *Technical Guidance – sampling methods for subterranean fauna* (EPA 2016b), and the *Environmental Factor Guideline – subterranean fauna* (EPA 2016a).

3.3.1. Troglofauna

As far as possible, each troglofauna sample represents the combined results of two different, complementary sampling techniques: scraping and trapping. Previous studies have shown that use of both techniques yields greater diversity of troglofauna than either technique alone. Furthermore, troglofauna occur at low abundance and yields are low, so that use of two techniques contributes significantly to obtaining a representative sample of the troglofaunal community in a sampling area (Halse and Pearson 2014a):

1. **Scraping** is an active sampling technique that is used prior to setting traps. In each scraping event, a troglofauna net is prepared with a weighted ring net of 150 µm mesh, and a diameter closely matched to 60% of the bore diameter. This net is lowered to the bottom of a bore or to the water table, and subsequently scraped back to the surface at least four times. In each of these *scrapes* a different section of the wall of the hole is targeted (e.g., north, south) to maximize the organisms retrieved. The contents of each scrape are immediately transferred to 100% ethanol for preservation of the sample and its DNA.



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GCS GDA 1994
Author: bbuzatto
Date: 18/01/2021

Figure 2: Historical (top panel) and new (bottom panel) sampling sites in the Study Area.

2. **Trapping** is a passive sampling technique used after the drill hole is scraped. Traps of cylindrical PVC (270 x 70 mm) with holes drilled on the side and top to function as entrances were baited with microwaved leaf litter. Traps were lowered on nylon cord to the end of the bore, or to a few metres above the water table. One trap was set near the bottom of the drill hole or just above the water table, which varied between 10 and 60 m. At about one-quarter of holes, a second trap was set approximately halfway between the surface and the first trap. Traps were then left inside bores for seven to 10 weeks, allowing troglofauna enough time to colonize them. During that period, the bores were sealed to minimise movement of surface animals into the troglofauna traps. When traps are retrieved, their contents were transferred to a zip-lock bag and transported alive to the laboratory in Perth.

3.3.2. Stygofauna

Stygofauna were collected by an active sampling technique. At each hole, a small, weighted plankton net was lowered to the bottom of the hole and then agitated vigorously to stir benthic and epibenthic fauna into the water column, where animals were then captured as the net was slowly retrieved. Six separate net hauls were made (three with 50 µm mesh net and three with 150 µm mesh net). The contents of the net were transferred to 100% ethanol for preservation after each haul (EPA 2016b). Contamination between sites was avoided by washing the nets between the sampling of different drill holes.

3.4. Laboratory processing

All samples were sorted in the laboratory. Leaf litter retrieved from traps was processed in Berlese funnels under halogen lamps for 72 hours, during which time the light and heat drives animals downwards and towards a vial containing 100% ethanol as a preservative. Litter was quickly checked after removal from the funnels to ensure no invertebrates remained.

Samples in ethanol from the Berlese fennels were carefully screened under a dissecting microscope. Troglofauna scrape samples and stygofauna net samples were elutriated to separate animals from sediment and put through sieves to fractionate the contents according to size (53, 90 and 250 µm) to improve searching efficiency. All potential subterranean animals were removed from these samples for species or morpho-species level identification. Surface animals were identified to Order level.

Troglofauna and stygofauna identification were made using published, unpublished and informal taxonomic keys, as well as species descriptions in the scientific literature. Morphospecies were established using the characters of existing species keys, and the lowest level of identification possible was reached given the constraints of sex, maturity of the specimens (juveniles and females are often impossible to identity to species level) and possible damage to body parts. During the final phase of identification, dissecting and compound microscopes were used, with the process often requiring dissection of specimens. After the taxonomic assessment was completed, representative animals were lodged with the Western Australian Museum.

DNA sequencing of 10 animals was used to confirm morphological identifications or provide names for juvenile or damaged animals. Depending on the size of the specimens, legs or whole animals were used for DNA extractions using a Qiagen DNeasy Blood & Tissue kit (Qiagen 2006). Elute volumes varied from 40 µL to 200 µL depending on age, condition and quantity of material. Primers combinations used for PCR amplifications were: (1) LCO1490:HCO2198 and LCO1490:HCOoutout for the MT-CO1 gene (Folmer *et al.* 1994; Schwendinger and Giribet 2005); (2) 12Sai:12RJ and 12Sai:12Sbi for the 12S gene (Kambhampati and Smith 1995; Simon *et al.* 1994); (3) 28sfmal:28srmal for the 28S gene (Luan *et al.* 2005); (4) paraln_for:pmaln16srev for the 16S gene (Helix, unpublished); and (5) G51:G52 for the 18S gene (Hillis and Dixon 1991). Next, dual-direction, sanger sequencing was undertaken for PCR products by the Australian Genome Research Facility (AGRF). The sequences returned were edited and aligned in Geneious (Kearse *et al.* 2012), where neighbour-joining phylogenetic trees were then calculated using the and 1000 bootstraps. Genetic distances (using the Tamura-Nei method) between unique sequences were measured as uncorrected p-distances (total percentage of nucleotide differences between sequences). Sequences on GenBank and in grey literature were included in phylogenetic analysis in order to provide a framework for assessing intra and interspecific variation, as well as to examine levels of differentiation among individuals within described species across their geographic ranges.

3.5. Personnel

Fieldwork in 2010 was undertaken by Grant Pearson, Jim Cocking, Andrew Trotter, Dean Main and Michael Curran. Sample sorting for that survey was done by Jane McRae, Michael Scanlon, Jim Cocking, Heather McLetchie, Dean Main, Andrew Trotter and Michael Curran, and identifications were performed by Michael Scanlon (oligochaetes) and Jane McRae (all other taxonomic groups). Fieldwork in 2019-2020 was done by Jim Cocking, Michael Scanlon, Anton Mittra and Michael Curran. Samples were sorted by Jim Cocking, Michael Scanlon, Jessica Tacey, Heather McLetchie, Melanie Fulcher, and Melita Pennifold, and all identifications were made by Jane McRae. Habitat modelling was undertaken by Alex Storey at AQ2. DNA sequencing was done by Yvette Hitches at Helix Molecular Solution and ARGF. Bruno Buzatto and Huon Clark analysed DNA sequence data to determine species relationships.

4. RESULTS

4.1. Desktop assessment

The desktop review identified records of 132 troglofauna species and 150 stygofauna species in the wider 100 x 100 km search area that are additional to the species collected during fieldwork in the Study Area. The most diverse troglofauna groups in the search area were arachnids (30 species), myriapods (23 species) and insects (22 species), while for stygofauna the most significant groups were crustaceans (90 species) and earthworms (12 species). These numbers include only specimens identified to species level, but a comprehensive list including specimens identified to higher order taxonomic levels is available in Appendices 1 and 2. The large list of stygofauna collected in the wider vicinity of Western Ridge is a result of the proximity of the Study Area to the Ethel Gorge Threatened Ecological Community (11 km to the east). Previous stygofauna sampling in areas directly surrounding Western Ridge (Orebodies 29 and 35; ALS Water Sciences Group 2010) only detected 20 taxa of stygofauna, which is more comparable to the lower diversity detected in the Study Area (see 4.2.2 below). The large list of troglofauna largely reflects the small ranges of these species and, consequently, the high beta diversity so that the large search area contains many species, even though richness may be relatively low or moderate at individual sites.

4.2. Survey results

4.2.1. Troglofauna

Altogether 292 specimens belonging to at least 22 species were collected from the Study Area in 2019-2020. This includes representatives of two orders of arachnids, four classes of myriapods, six orders of hexapods, and a single species of crustacean (the isopod *Troglarmadillo* sp. ISO005). Arachnids were represented by two species of Palpigradi and three species of pseudoscorpions. Within myriapods, the classes Pauropoda (2 species), Symphyla (2 species), Chilopoda (2 species) and Diplopoda (1 species) were collected. Within hexapods, the orders Diplura (3 species), Blattodea (1 species), Coleoptera (1 species), Diptera (1 species), Hemiptera (1 species) and Zygentoma (2 species) were collected. The most abundant and widespread species were the polyxenid millipede *Lophoturus madecassus* and the silverfish *Dodecastyla* sp. B02. All other species were recorded at low to moderate abundances (Table 2), with minimum linear ranges varying from 200 m to >450 km.

Seven species of troglofauna were collected as singletons, and four other species were collected only in the Study Area, although Parajapygidae sp. is possibly a species known from elsewhere.

Table 2: Troglofauna collected at the Western Ridge Study Area in 2010 and 2019-2020.
Grey highlight, higher level identification likely to belong to a listed species.

Higher groups *Species*	**Specimens (samples)**	**Drill holes (individuals/bore)**	**Occurrences outside Study Area (range)**
ARACHNIDA			
Palpigradi			
Eukoenenia sp. BPAL046*	3(3)	WSR1659R, WSR1661R, WSR1749R	Study Area only (linear range just over 1 km)
Palpigradi sp. B07	9(7)	EXR0648(2), EXR1446R, EXR1659R(3), EXR1666R(3)	Study Area only (linear range of 1 km)
Pseudoscorpiones			
Indohya sp. BPS294*	1(1)	WSR1659R	Study Area only (**singleton**)
Lechytia PSE019	1(1)	EXR0353	Jimblebar (Mesa Gap) and Orebody 35 (linear range just over 48 Km)
Tyrannochthonius PSE053	2(2)	EXR1659R, EXR1666R	Study Area only (linear range ~200 m)
PAUROPODA			
Tetramerocerata			
Decapauropus tenuis (=Pauropodidae sp. B04)	13(3)	EXR0647(4), EXR1666R(9)	Widespread in Australia
Pauropodidae sp. B09	2(1)	EXR0647(2)	Orebody 29 (11.4 km linear range)
SYMPHYLA			
Cephalostigmata			
Hanseniella BSYM095*	1(1)	WSR1917R	Study Area only (**singleton**)
Symphylella sp. B02	1(1)	EXR0784	Jimblebar East, Hashimoto 4 and Orebody 35 (76 Km linear range)
CHILOPODA			
Chilopoda sp.	1(1)	EXR0993	Uncertain (fragment; probably *Cryptops* sp. as below)
Scolopendrida			
Cryptops BSCOL064*	1(1)	WSR1644R	Study Area only (**singleton**)
Cryptops BSCOL065*	1(1)	WSR1586DTM	Study Area only (**singleton**)

Higher groups *Species*	Specimens (samples)	Drill holes (individuals/bore)	Occurrences outside Study Area (range)
DIPLOPODA			
Polyxenida			
Lophoturus madecassus	121(30)	EXR0347(8), EXR0350(9), EXR0647(10), EXR0786(3), EXR0989(42), EXR0990, EXR0992(3), EXR1668R, WSR0171DT(15), WSR0305R(5), WSR0423R(3), WSR1598R(7), WSR1608R, WSR1658R(4), WSR1729R, WSR1863R, WSR1967R(2), WSR1982R(3), WSR1994R(2)	Widespread in the Pilbara and WA
ENTOGNATHA			
Diplura			
Japygidae BDP165	1(1)	EXR0992	Study Area only (**singleton**)
Japygidae DPL002 s.l.	4(2)	EXR0647(3), EXR0994	Widespread in the Pilbara (at least 327 km linear range)
Parajapygidae sp.	1(1)	EXR0993	Uncertain (fragment) **(singleton#)**
INSECTA			
Blattodea			
Nocticola BBL040*	5(2)	WSR1800R(5), XAN0026R	Study Area only (linear range just over 7 km)
Coleoptera			
Lathrobiina sp. B01	4(1)	EXR0992(4)	Study Area only (**singleton**)
Diptera			
Sciaridae sp. B01*	26(7)	EXR0350(21), WSR1586DTM(3), WSR1982R, WSR2037DTM	Widespread in the Pilbara (at least 473 km linear range)
Hemiptera			
Phaconeura sp. B04*	9(5)	WSR0305R, WSR1043R, WSR1606R(5), WSR1647R, WSR1659R	Widespread in the Pilbara and WA
Zygentoma			
Dodecastyla sp. B02	81(6)	EXR0647(80), EXR1433R, WSR1974R	Widespread in the Pilbara (at least 505 km linear range)

Higher groups *Species*	**Specimens (samples)**	**Drill holes (individuals/bore)**	**Occurrences outside Study Area (range)**
Trinemura sp. B04	1(1)	EXR0780	Jimblebar East (at least 45 km linear range)
MALACOSTRACA			
Isopoda			
Troglarmadillo ISO005	3(2)	EXR0348(2), EXR0782	Orebody 35 (8.5 km linear range)
TOTAL	**292(81)**		

*Indicates species analysed genetically, as well as morphologically; #Parajapygidae sp. is a family level identification and the species is possibly known from outside the Study Area.

4.2.2. Stygofauna

The diversity of stygofauna collected in the study area is much lower than that of troglofauna, with only 60 specimens of five or more species collected (Table 3). This total includes an uncertain number of species of nematodes (not formally assessed by the impact assessment process), three species of earth worms and one new species of bathynellid crustacean from the superorder Syncarida (*Pilbaranella* sp. C). Whereas the earthworm *Enchytraeus* Pilbara sp. 2 was collected in high abundance, the other two earthworm species were collected in low to moderate abundances. All three species of earthworms are widespread and the syncarid has a known linear range of 20 km. Ranges of the nematodes are unknown. None of the species in the assessment is known only from the Study Area.

Table 3: Stygofauna collected at the Western Ridge Study Area in 2020 and 2019-2020.

Higher groups *Species*	**Specimens (samples)**	**Bores (individuals/bore)**	**Occurrences outside WRSA (range)**
NEMATODA			
Nematoda spp.	8(6)	EXR1086, MH83_002, WSR0546R, WSR1219R(2), WSR1827R, WSR1883R(2)	Uncertain
CLITELLATA			
Tubificida			
Enchytraeidae sp. E12*	6(1)	ES83_019	Widespread in the Pilbara
Enchytraeus Pilbara sp. 2 (PSS)	33(5)	EXP0182(5), EXR1343(4), EXR1659R(20), EXR1660R(4)	Widespread in the Pilbara
Phreodrilidae sp. P11	1(1)	EXR0785	Eastern Ridge (Orebodies 25, 31, 32 and Homestead) and Ophthalmia (upper, central and lower) (linear range of 75 Km)
MALACOSTRACA			
Syncarida			
Pilbaranella sp. C*	12(1)	WSR1911R(12)	Eastern Ridge (Orebody 25 and Homestead; linear range of 20 Km)
TOTAL	**60(14)**		

*Indicates species analysed genetically, as well as morphologically.

5. DISCUSSION

5.1. Troglofauna

With 22 species collected, the troglofauna diversity and abundance in the Study Area is similar to what has been found in other parts of the Ophthalmia Range (Bennelongia 2014a, b, c,). Sampling at the Study Area in 2010 yielded at least 17 species of troglofauna, with an additional six species collected in 2019-2020 as a result of increasing effort by 120% (Table 1). The explanation for six extra species being collected, rather than five, is that one of the 2010 species was a higher-level identification (Chilopoda sp.) and other specimens of the order were collected and identified to species in 2019-2020. Further sampling in the Study Area is likely to show that some additional species occur but the current results are considered adequate to characterise the community and its conservation value.

Some of the morphological identifications were hampered by the individuals collected being juveniles or females, and in these cases molecular analyses were used to substantiate identifications. In other cases, molecular analyses were used to further identifications. A summary of the conclusions of combined molecular and morphological results is given below, as well as an assessment of each species' vulnerability to development in the area:

***Eukoenenia* sp. BPAL046 (Palpigradi: Eukoeneniidae)**

The specimens of Palpigradi collected consisted of two adult females and one juvenile, so molecular analyses were needed to place it in the genus *Eukoenenia*. These analyses support the new specimens being conspecific (identical in the 12S gene and only diverging 0 – 0.2% in the gene COI). However, the only other species of Palpigradi collected in the Study Area previously (Palpigradi B07) has never been sequenced before, and molecular analyses could not rule out the possibility that *Eukoenenia* sp. BPAL046 and Palpigradi sp. B07 are in fact the same species. If they are, the known range of this species would increase to 4.3 km, otherwise the known ranges of each would be just over 1 km. While there are widespread palpigrads, for example Palpigradi sp. B01 has been recorded in the Pilbara from areas over 400 km apart, most troglofaunal palpigrads appear to have small ranges (Halse and Pearson 2014b).

***Indohya* sp. BPS294 (Pseudoscorpions: Hyidae)**

The one specimen of *Indohya* was a juvenile, so could not be morphologically identified to the species level. The genetic analyses confirmed its placement in the genus *Indohya* and ruled out conspecificity with any of four other species in the genus based on divergences of at least 19.5% in the COI gene. There are no available sequences from the species *Indohya* PSE002 and *Indohya* PSE150, but these species have only been recorded from Koodaideri and Christmas Creek, more than 100 km north of the Study Area. So, while it cannot be categorically ruled out that the new specimen belongs to one of these species, it is unlikely. Given that no other species of *Indohya* has been identified from the desktop search area around Western Ridge (Appendix 1), this individual probably represents a new species. The largest known range in the genus is that of *Indohya* PSE005, which has a linear range of 27 km, and so the new species is quite likely to have a range no larger than the Study Area.

***Tyrannochthonius* PSE053 (Pseudoscorpions: Chthoniidae)**

Two individuals of the species *Tyrannochthonius* PSE053 were collected in the Study Area in 2010. A female was collected in a stygofauna net haul (troglofauna bycatch in a stygofauna sample) from bore EXR1659R, whereas a small juvenile was collected in a scrape of bore EXR1666R. These bores are approximately 210 m apart, and the individuals were originally identified as *T.* sp. B20 and *T.* sp. B21 (Bennelongia 2010), respectively, since the female and juvenile could not be easily morphologically matched. Since the initial report, however, these animals have been synonymised and called *Tyrannochthonius* PSE053 by the Western Australian Museum, where the female from bore EXR1659R is lodged under registration number T119464. Subterranean species of this genus are usually short-range endemics found at very few locations in localised habitats like limestone and mesa formations (Edward and Harvey 2008). Therefore, it is likely that *T.* PSE053 is restricted to the Western Ridge Study Area.

***Hanseniella* sp. BSYM095 (Symphyla: Scutigerellidae)**
Morphological comparisons ruled out this specimen belonging to nearby species *H.* sp. B14 and *H.* sp. B19 but did not provide evidence to match or rule out the specimen belonging to *H.* sp. B27 (Appendix 1). In terms of distribution, *H.* B19 has been recorded at Eastern Ridge, much closer to the Study Area than the locations where *H.* B26 and *H.* B27 are found (Orebody 19 and Orebody 18, respectively), and yet *H.* B19 can be morphologically ruled out as a match for the new specimen. Unfortunately, the specimen could not be sequenced to check its relationships. Therefore, *Hanseniella* sp. BSYM095, which is known as a single animal by scraping, is treated as a new species. It was collected from WSR1917R (Figure 5).

Symphylans in the Pilbara usually have small distributions with the estimated median linear range being about 3 km (re-calculated from Halse and Pearson 2014). The drill log for WSR1917R shows it passes through calcrete/scree near the surface and vuggy breccia and vuggy BIF at depth, with some unprospective clay dominated habitat between the scree and breccia (AQ2 2020). *H.* sp. BSYM095 is most likely to have been collected from scree/calcrete habitat, although possibly it occurs under a layer of unprospective habitat in deeper vuggy breccia or vuggy BIF.

***Cryptops* sp. BSCOL064 and *Cryptops* sp. BSCOL065 (Chilopoda: Cryptopidae)**
Cryptops species in the Pilbara have variable distributions, with some being large as in the case of C. sp. B10 (see below), but others being quite small. The estimated median linear range of troglofaunal Cryptops in the Pilbara is about 6 km (re-calculated from Halse and Pearson 2014). The Bennelongia database contained 48 sequences of the gene COI for *Cryptops*, and GenBank had additional 95 COI sequences of this genus. After combining these sequences, realigning them and editing them to similar lengths (removing poor quality and short sequences in the process), a neighbour-joining tree was run with 132 sequences in the ingroup (plus *Theatops erythrocephalus* as an outgroup). The two target specimens of *Cryptops* did not group with any other previously sequenced species. *C.* sp. BSCOL064 was at least 17.8% divergent in the gene COI to its nearest relative (*C.* sp. B06), whereas *C.* sp. BSCOL065 was at least 20.4% divergent to its nearest relative (C. sp. B11). However, sequences were not available for species of *Cryptops* that occur in the Study Area, or its vicinity, named *C.* sp. B07, *C.* sp. B10 and *C.* sp. B43. Conspecificity with *C.* sp. B07 could be ruled out morphologically, but *C.* sp. B10 and *C.* sp. B43 are lodged at the Western Australia Museum and, as yet, we have not been able to compare them to the new specimens. *C.* sp. B43 is known from one bore in Eastern Ridge, about 16 km to the east of the Study Area., whereas C. sp. B10 has been collected from bores in Mining Area C (Packsaddle P1) and in Eastern Ridge (Orebody 24), with in a linear range of more than 100 km.

If confirmed as new species, *C.* BSCOL064 and *C.* BSCOL065 would both be represented by singletons (Figure 4). *C.* sp. BSCOL065 was collected from a depth of 15 m in hole WSR1586DTM (Figure 5; AQ2 2020). The habitat at this depth (and in most of the hole) was vuggy BIF.

Lathrobiina sp. B01 (Coleoptera: Staphyliniidae)
Four individuals of subterranean staphylinid beetles were collected from a trap set in bore EXR0992 (30 m deep). These individuals were initially identified to family only, with the name 'Staphyliinidae sp. B3' (Bennelongia 2010; note a typo in that report, where there is a wrong double "i" in the family name). Subsequently, photos of the individuals were submitted to Alfred Newton from the Chicago Field Museum, who identified the animals to the subtribe Lathrobiina, within the tribe Paederini and the subfamily Paederinae. Subterranean staphylinids are rarely collected, but species of troglofaunal beetles commonly have restricted ranges (Bennelongia unpublished data). It is therefore likely that Lathrobiina sp. B01 represents a new species (from a new or undetermined genus) with a small range, and potentially restricted to the Study Area.

***Nocticola* BBL040 (Blattodea: Nocticolidae)**

Six individuals of *Nocticola* cockroach were collected, but some were juveniles and could not be identified to species. The adult male was clearly a new species, referred to as *Nocticola* sp. BBL040. That individual (QD92 in Figure 3), along with two juveniles (QD90 and QD91 in Figure 3), were sequenced for molecular confirmation of the new species status. A BLAST search of GenBank was performed with the COI sequences obtained, returning 16 *Nocticola* cockroaches, used as references for comparison. The three individuals sequenced were nearly identical in the COI gene (only 0 – 1.6% divergence), but they were all at least 9.1% divergent to any other species in the analyses, confirming that these individuals represent a new species of *Nocticola*. Species of *Nocticola* in the Pilbara usually have linear ranges of no more than 40 km and often only a few kilometres (Trotter *et al.* 2017), so that the species may be restricted to the Study Area. Individuals were collected from two different holes (7 km apart; Figure 4).

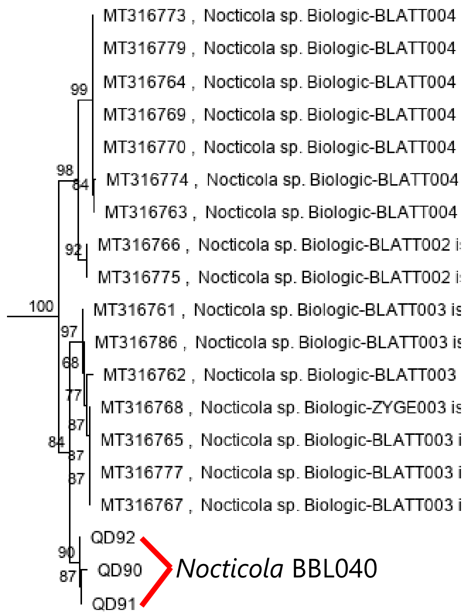


Figure 3: Neighbour-joining tree of *Nocticola* spp.

Table 4. Intra (bold) and interspecific (not bold) divergences in MT-CO1 of species of the subterranean cockroach *Nocticola*.

	BLATT002	BLATT004	QD90	QD91	QD92	BLATT003
BLATT002	**0.1**					
BLATT004	7.9 - 8.5	**0.2 - 1**				
QD90*	17.9 - 17.9	18.4 - 19.1	**-**			
QD91*	17.4 - 17.4	18.7 - 19.5	**1.6**	**-**		
QD92*	17.4 - 17.4	18.7 - 19.5	**1.6**	**0**	**-**	
BLATT003	17.9 - 18.7	16.7 - 18.4	9.3 - 9.6	9.1 - 9.7	9.1 - 9.7	**0 - 2.5**

*The codes QD90 - 92 refer to individuals of the new species *N.* sp. BBL040.

***Phaconeura sp.* B04 (Hemiptera: Meenoplidae)**

Nine individuals of the genus *Phaconeura* were collected in the 2019-2020 survey of the Study Area, but only one of these individuals was an adult male that was identified as belonging to the widespread species *P.* sp. B04. The male and four of the juveniles were sequenced to confirm this morphological identification. All sequenced specimens were confirmed to belong to *Phaconeura* sp. B04 (maximum of 2.7% divergence with other individuals of that species in the COI gene). *Phaconeura* sp. B04 has previously been collected in the Study Area (Figure 4) and is widespread in Western Australia.

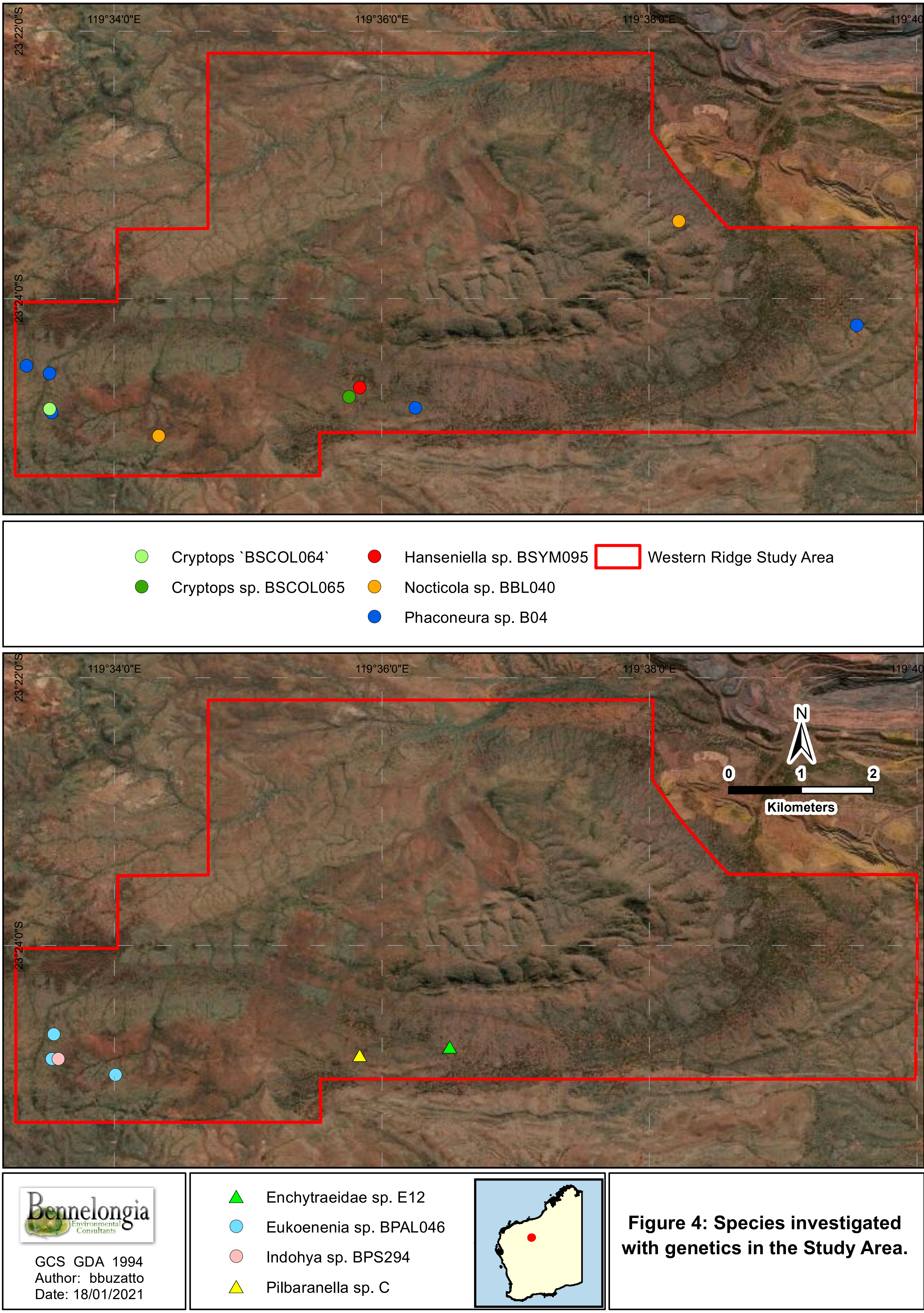


Figure 4: Species investigated with genetics in the Study Area.

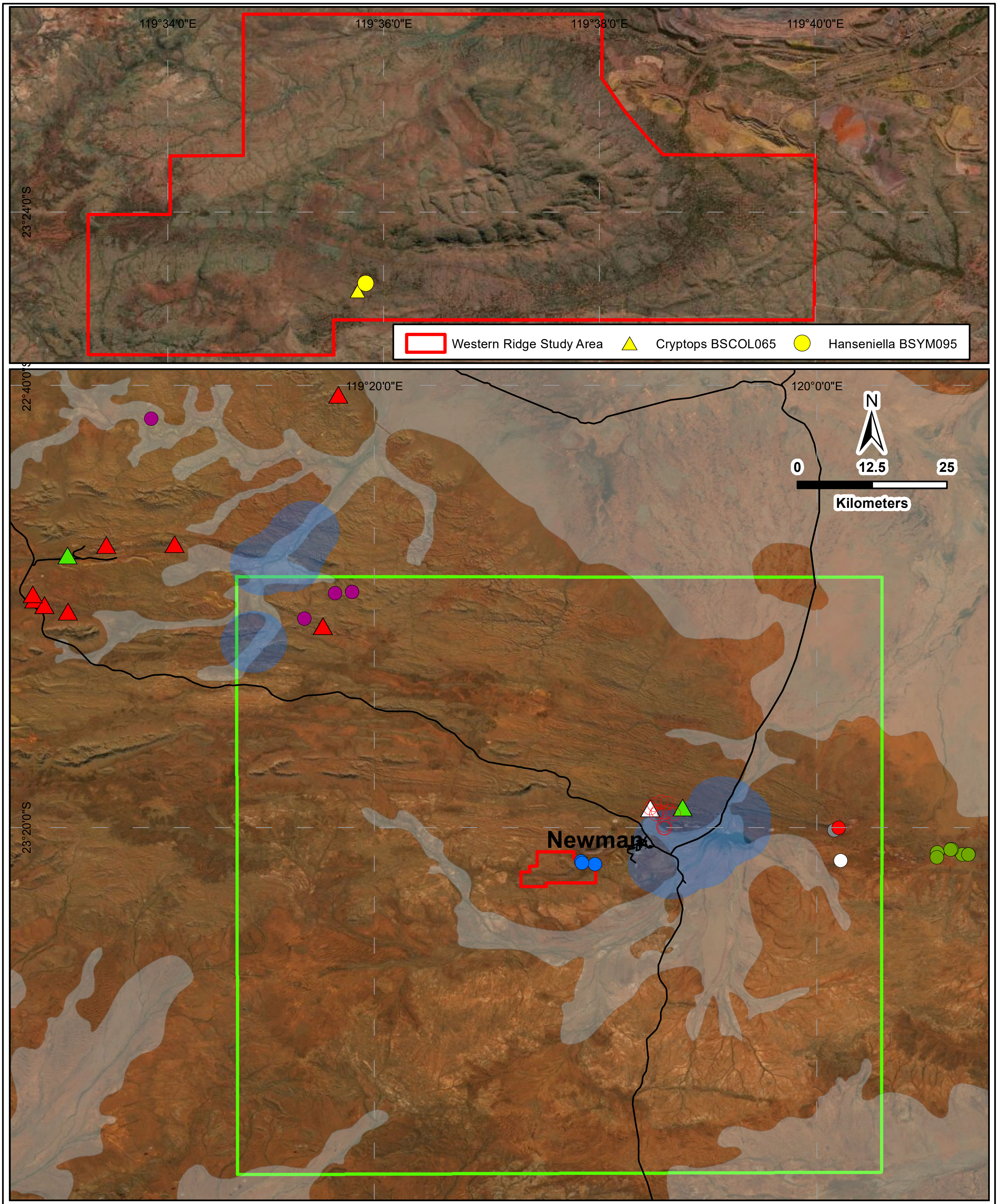
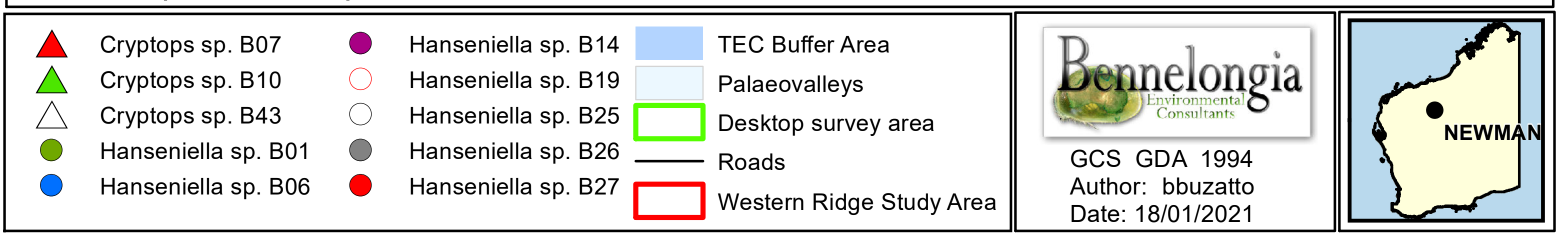


Figure 5: Singletons Cryptops BSCOL065 and Hanseniella BSYM095 (upper panel) and their closest relatives (lower panel) in the area.



5.2. Stygofauna

The 2010 and 2019-2020 sampling yielded only one species of syncarid, three species of earthworms that are relatively widespread in the Pilbara and a number of nematodes that are currently not under the scope of environmental impact assessments in WA. One of the earthworms and the syncarid were sequenced for genetic confirmation of their identifications. This is in contrast to the large number of species listed in the desktop review as potentially occurring in the Study Area as a result of the *Ethel Gorge aquifer stygobiont community* being approximately 11 km to the east and dominating search area results.

Enchytraeidae sp. E12 (Oligochaeta: Enchytraeidae)

The specimen of Enchytraeidae produced a COI sequence that was only 1.9 – 3.3% divergent from existing sequences of Enchytraeidae E12 and is considered to be that species. There are historical records of Enchytraeidae sp. E12 from Ophthalmia, Sylvania Station, Eastern Ridge, Orebody 19, Orebody 39, Mindy, Rhodes Ridge, Coondiner Creek, and Upper Fortescue River, giving it a known linear range of more than 100 km. This species was only collected from a single bore in the study area (Figure 4).

***Pilbaranella* sp. C (Syncarida: Bathynellidae)**

The syncarid specimen collected (Figure 4) could be identified morphologically only to the family Bathynellidae, but the molecular results place it within the previously collected *Pilbaranella* sp. C., diverging from other individuals of this species by 7.7 to 8.3% in the 16S gene. This is more consistent with intraspecific (0 – 10.4%), rather than interspecific (11.3 – 25.1%) divergence, in the genus for 16S (Table 5; see also Perina *et al.* 2018). *Pilbaranella* sp. C has been previously collected only from two other holes, both in Eastern Ridge – one in Orebody 25 and the other one in the Homestead site. These sites are between 15 km and 20 km east of Western Ridge.

Table 5. Intra (bold) and interspecific (not bold) divergences in the 16S gene for species of the syncarid *Pilbaranella*.

	P. ethelensis	*P.* sp. A	*P.* sp. B	*P.* sp. C	*P.* sp. D
Pilbaranella ethelensis	**0 - 6.1**				
Pilbaranella sp. A	20.9 - 25.1	**0 - 10.4**			
Pilbaranella sp. B	15.6 - 18.4	19 - 22.4	**0 - 0.8**		
Pilbaranella sp. C	13.5 - 16.2	18.2 - 22.4	11.3 - 12.8	**0 - 0.8**	
Pilbaranella sp. D	12.3 - 13.9	20.1 - 21.3	17 - 18.4	17 - 17.6	**0.8 - 0.8**
QD89 (*Pilbaranella* sp. C)	16.1 - 18.1	18.7 - 23.7	14.3 - 15.2	**7.7 - 8.3**	16.4 - 16.7

5.3. Species of conservation significance

All stygofauna species collected in the Study Area are widespread. None of the species is potentially conservation-significant and the community is a depauperate one, reflecting the depth to groundwater of approximately 60-110 m across the Study Area. Significant stygofauna communities are rarely found at depth to groundwater much greater than 30 m (Halse *et al.* 2014; Mokany *et al.* 2019) and depth to water in the Ethel Gorge TEC is shallow.

Eleven of the 22 troglofauna species collected are known only from the Study Area (or the adjacent Orebody 35). One further incompletely identified species (Parajapygidae sp.) may also be known only from the Study Area. This high degree of range restriction is common in troglofauna species, although the fact that seven of the 11 species possibly known only from the Study Area were collected as single animals (Table 2) means range restriction may have been substantially over-estimated.

5.4. Habitat characterisation

The extent of habitat suitable for troglofauna in the Study Area was modelled for Bennelongia by AQ2 (2020). Various lithologies and geologies were grouped to recognise five stratigraphic units and their likelihood of supporting troglofauna was assessed. In summary, Tertiary Detritals may provide habitat on hill slopes but usually not in valley floors, unless calcrete is present. Vuggy BIF and associated hardcap are likely to provide habitat. Fresh Brockman and Marra Mamba Iron Formations are unlikely to provide habitat, while the dolomitic Wittenoom Formation does not provide habitat.

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Appendix 1. Complete list of additional troglofauna found within the desktop search area

These species are in addition to what was collected within the Study Area.

Higher Order Classification	Lowest Identification
ARACHNIDA	
Araneae	
Gnaphosidae	nr *Encoptarthria* sp. B01
	nr *Encoptarthria* sp. B02
	nr *Encoptarthria* sp. B03
Oonopidae	*Prethopalpus* sp. B05
	Prethopalpus sp. B22
	Prethopalpus sp. B30
	Prethopalpus DNA01
	Prethopalpus boltoni
Linyphiidae	Linyphiidae sp. OP
Opiliones	
Assamiidae	*Dampetrus* sp. B03 (nr *isolatus*)
Family uncertain	Opiliones sp. B05
Palpigradi	
Eukoeneniidae	*Eukoenenia* `Hope Downs`
Family uncertain	Palpigradi sp. B01
	Palpigradi sp. B03
	Palpigradi sp. B16
	Palpigradi sp. B17
	Palpigradi sp. OP
Pseudoscorpiones	
Chthoniidae	*Lagynochthonius* PSE040
	Lagynochthonius PSE097
	Lagynochthonius PSE039
	Tyrannochthonius PSE052
	Tyrannochthonius PSE059
	Tyrannochthonius sp. B28
	Tyrannochthonius sp. OP
Schizomida	
Hubbardiidae	*Draculoides neoanthropus*
	Draculoides BSC024
	Draculoides SCH022
	Draculoides SCH034
	Draculoides SCH055
	Draculoides SCH067
PAUROPODA	
Tetramerocerata	
Pauropodidae	*Decapauropus* sp. B04

Higher Order Classification	Lowest Identification
	Decapauropus sp. B05
	Pauropodidae sp. B01 s.l.
	Pauropodidae sp. B07
	Pauropodidae sp. B28
	Pauropodidae sp. B32
SYMPHYLA	
Cephalostigmata	
Scutigerellidae	*Hanseniella* sp. B01
	Hanseniella sp. B06
	Hanseniella sp. B14
	Hanseniella sp. B19
	Hanseniella sp. B25
	Hanseniella sp. B26
	Hanseniella sp. B27
	Scutigerella sp. B06
	Symphylella sp. B07
	Symphylella sp. B13
CHILOPODA	
Geophilida	
Schendylidae	nr *Australoschendyla* sp. B02
Scolopendrida	
Chilenophilidae	Chilenophilidae sp. B08
Cryptopidae	*Cryptops* sp. B10 (= Scolopendrida sp. S05)
	Cryptops sp. B43
DIPLOPODA	
Polydesmida	
Dalodesmidae	Dalodesmidae sp. B06
Polyxenida	
Lophoproctidae	Polyxenidae DNA01
Spirobolida	
Trigoniulidae	*Speleostrophus* DIP051
MALACOSTRACA	
Isopoda	
Armadillidae	?*Buddelundia* sp. B01
	Armadillidae sp. B12
	Troglarmadillo ISO005
	Troglarmadillo sp.
	Troglarmadillo sp. B
	Troglarmadillo sp. B34
	Troglarmadillo sp. B38
	Troglarmadillo sp. B39
	Troglarmadillo sp. B42
	Troglarmadillo sp. B48

Higher Order Classification	Lowest Identification
Philosciidae	nr Andricophiloscia sp. B17
Stenoniscidae	Stenoniscidae gen. nov. sp. B01
	Stenoniscidae gen. nov. sp. B06
ENTOGNATHA	
Diplura	
Japygidae	Japygidae DPL002
	Japygidae DPL017
	Japygidae sp. B09
Parajapygidae	Parajapygidae sp. B05 (*Parajapyx swani* group)
	Parajapygidae sp. B16
	Parajapygidae sp. B26
Projapygidae	Projapygidae sp. B02
INSECTA	
Blattodea	
Blattidae	Blattidae sp. B06 (= sp. S02)
Nocticolidae	*Nocticola cockingi* s.l.
	Nocticola quartermainei s.l.
Coleoptera	
Carabidae	Carabidae sp. B01
	Typhlozuphium humicolum
Curculionidae	*Zuphiini* sp. B04
	Curculionidae Genus 1 sp. B01
Ptiliidae	*Ptinella* sp. B01 (=MC)
Staphylinidae	Pselaphinae sp. B01
	Pselaphinae sp. B02
Diptera	
Sciaridae	Sciaridae sp. B03
Hemiptera	
Cixiidae	Cixiidae sp. B02
Meenoplidae	*Phaconeura* sp. B02 s.l. (=Meenoplidae sp. S01)
	Phaconeura sp. B03
	Phaconeura sp. B06
Reduviidae	*Ploiaria* sp. B02
Family uncertain	Hemiptera sp.
Zygentoma	
Nicoletiidae	Atelurinae sp. B09
	Trinemura sp. B02 (nr *watsoni*)
	Trinemura sp. B13
	Trinemura sp. B24
	Trinemura sp. B26

Higher Order Classification only (species level ID not possible)	
ARACHNIDA	
Araneae	
Gnaphosidae	Gnaphosidae? sp.
	nr *Encoptarthria* sp.
Linyphiidae	Linyphiidae sp.
Oonopidae	*Prethopalpus* sp.
Opiliones	
Assamiidae	*Dampetrus* sp.
Palpigradi	Palpigradi sp.
Pseudoscorpiones	
Olpiidae	Olpiidae sp.
Chthoniidae	*Tyrannochthonius* sp.
Schizomida	
Hubbardiidae	Hubbardiidae sp.
	Draculoides sp.
Family uncertain	Schizomida sp.
PAUROPODA	
Tetramerocerata	
Pauropodidae	Pauropodidae sp.
SYMPHYLA	
Cephalostigmata	
Scutigerellidae	*Hanseniella* sp.
Family uncertain	Cephalostigmata sp.
Order uncertain	Symphyla sp.
CHILOPODA	
Order uncertain	Chilopoda sp.
Geophilida	Geophilida sp.
Scolopendrida	Scolopendrida sp.
DIPLOPODA	
Polyxenida	
Lophoproctidae	Lophoproctidae sp.
Spirobolida	Spirobolida sp.
MALACOSTRACA	
Isopoda	
Armadillidae	Armadillidae sp.
	Buddelundia sp.
Family uncertain	Isopoda sp.
ENTOGNATHA	
Diplura	
Japygidae	Japygidae sp.
Family uncertain	Diplura sp.
INSECTA	

Blattodea	
Blattidae	Blattidae sp.
Nocticolidae	*Nocticola* sp.
Family uncertain	Blattodea sp.
Coleoptera	
Carabidae	*Zuphiini* sp.
Curculionidae	Curculionidae Genus 1 sp.
Hemiptera	
Enicocephalidae	*Systelloderes* sp.
Meenoplidae	*Phaconeura* sp.
Zygentoma	
Nicoletiidae	Atelurinae sp.
	Atelurinae sp. (=?*Atelurodes* sp.)
	Nicoletiinae sp.
	Trinemura sp.
Family uncertain	Zygentoma sp.

Appendix 2 – Complete list of additional stygofauna found within the desktop search area

These species are in addition to what was collected within the Study Area.

Higher Order Classification	Lowest Identification
POLYCHAETA	
Aphanoneura	
Aeolosomatidae	*Aeolosoma* sp. 1 (PSS)
OLIGOCHAETA	
Tubificida	
Enchytraeidae	Enchytraeidae sp. E12
	Enchytraeus sp. AP PSS1 s.l.
Naididae	*Dero* (*Dero*) *nivea*
Phreodrilidae	Phreodrilidae sp. AP DVC s.l.
	Phreodrilidae sp. AP SVC s.l.
	Phreodrilidae sp. B05
Tubificidae	*Ainudrilus* sp. WA27 (PSS)
	Tubificidae \`stygo type 1A\`
	Tubificidae \`stygo type 4\`
	Tubificidae \`stygo type 5\`
ARACHNIDA	
Trombidiformes	
Mideopsidae	*Guineaxonopsis* sp. S01 group (PSS)
Pezidae	*Peza* ACA001
Family uncertain	Bdelloidea sp.
INSECTA	
Coleoptera	Coleoptera sp.
MALACOSTRACA	
Amphipoda	
Paramelitidae	*Chydaekata* E
	Chydaekata UWA-C
	Chydaekata acuminata
	Chydaekata simulata
	Chydaekata sp. OB1
	Kruptus \`AMP004\`
	Maarrka etheli
	Maarrka weeliwollii
	Paramelitidae gen. nov. 1 AMP001
	Paramelitidae gen. nov. 1 AMP003
	Paramelitidae Genus 2 sp. B02
	Paramelitidae sp. 2 (DEC)
	Paramelitidae sp. nr 2 (DEC)
	Paramelitidae sp. 2 s.l. (PSS)

Higher Order Classification	Lowest Identification
	Paramelitidae sp. AMP001
	Paramelitidae sp. B03
	Paramelitidae sp. OB1 (B33)
	Paramelitidae sp. OB2
	Paramelitidae sp. OB3 (AMP003)
	Pilbarus millsi s.l.
Isopoda	
Microcerberidae	Microceberidae sp. OB
Tainisopidae	*Pygolabis humphreysi*
	Pygolabis sp. 6
	Pygolabis weeliwolli
	Tainisopidae sp.
Syncarida	
Bathynellidae	*Bathynella* sp. B11
	Bathynellidae sp. OB1
	Billibathynella sp. OB1
	Billibathynella cassidis
	Brevisomabathynella pilbaraensis
	Brevisomabathynella cf. *pilbaraensis*
	Pilbaranella sp. A
	Pilbaranella sp. B
	Pilbaranella sp. D
	Pilbaranella ethelensis
Parabathynellidae	*Atopobathynella* sp. B04
	Atopobathynella sp. DNA02
MAXILLOPODA	
Calanoida	
Ridgewayiidae	*Stygoridgewayia trispinosa*
Cyclopoida	
Cyclopidae	*Diacyclops cockingi*
	Diacyclops humphreysi
	Diacyclops humphreysi s.l.
	Diacyclops sobeprolatus
	Mesocyclops brooksi
	Microcyclops varicans
	Orbuscyclops westaustraliensis
	Pescecyclops pilbaricus
	Pilbaracyclops sp. B03 (nr *frustratio*)
	Pilbaracyclops supersensus
	Thermocyclops aberrans
	Thermocyclops decipiens
	Tropocyclops prasinus
Harpacticoida	

Higher Order Classification	Lowest Identification
Ameiridae	*Archinitocrella newmanensis*
	Gordanitocrella trajani
	Inermipes sp. 1 (PSS)
	Nitocrella karanovici
	Nitocrella sp. 1 (PSS)
Canthocamptidae	Australocamptus sp.
Parastenocarididae	*Parastenocaris* sp. OB1 (= P. sp. B02)
	Parastenocaris 'outbacki'
	Parastenocaris jane
OSTRACODA	
Popocopida	
Candonidae	*Areacandona* `7` (PSS)
	Areacandona `outbacki`
	Areacandona newmani
	Areacandona nr *iuno*
	Candonopsis tenuis
	Deminutiocandona stomachosa
	Meridiescandona `3` (PSS)
	Meridiescandona facies
	Meridiescandona lucerna
	Meridiescandona marillanae
	Meridiescandona nr *facies* (PSS)
	Notacandona gratia
	Notacandona modesta
	Notacandona nr *modesta* (PSS)
	Origocandona `BOS099`
	Origocandona gratia
	Origocandona grommike
	Origocandona inanitas
	Pilbaracandona colonia
	Pilbaracandona eberhardi
	Pilbaracandona kosmos
	Pilbaracandona nr *rosa*
	Pilbaracandona rhabdote
	Pilbaracandona temporaria
Cyprididae	*Cypretta seurati*
	Riocypris fitzroyi
	Strandesia `466`
Limnocytheridae	*Gomphodella hirsuta*
	Limnocythere stationis

Higher Order Classification only (species level ID not possible)	
OLIGOCHAETA	
Tubificida	
Enchytraeidae	Enchytraeidae sp.
	Enchytraeus sp.
Phreodrilidae	Phreodrilidae sp.
Tubificidae	Tubificidae sp.
Order uncertain	Oligochaeta sp.
ARACHNIDA	
Trombidiformes	
Halacaridae	Halacaridae sp.
Philodinidae	Philodinidae sp.
Family uncertain	Bdelloidea sp. 2:2
MALACOSTRACA	
Amphipoda	
Melitidae	Melitidae sp.
Paramelitidae	*Chydaekata* sp.
	Maarrka sp.
	Paramelitidae sp.
Family uncertain	Amphipoda sp.
Isopoda	
Microcerberidae	Microcerberidae sp.
Tainisopidae	*Pygolabis* sp.
Family uncertain	Isopoda sp.
Syncarida	
Bathynellidae	Bathynellidae sp.
	Pilbaranella sp.
Parabathynellidae	*Brevisomabathynella* sp.
	Notobathynella sp.
	nr *Billibathynella* sp.
	Parabathynellidae sp.
Family uncertain	Bathynellacea sp.
	Syncarida sp.
MAXILLOPODA	
Cyclopoida	
Cyclopidae	Cyclopidae sp.
	Diacyclops sp.
	Pilbaracyclops sp.
Family uncertain	Cyclopoida sp.
Harpacticoida	
Parastenocarididae	Parastenocarididae sp.
	Parastenocaris sp.
Family uncertain	Harpacticoida sp.
Order uncertain	Copepoda sp.

OSTRACODA	
Podocopida	
Candonidae	Candonidae sp.
	Areacandona sp.
	Pilbaracandona sp.
	Origocandona sp.
Cyprididae	*Bennelongia* sp.
	Cyprididae sp.
	Ostracoda sp.
Family uncertain	Podocopida sp.
TURBELLARIA	
Class uncertain	Turbellaria sp.
ROTIFERA	
Class uncertain	Rotifera sp.

Appendix 3. Drill holes sampled in the Study Area.

FieldCode	Latitude	Longitude	Visit Date	Sample Name
ES83_019	-23.41264648	119.6084706	31-Jan-20	Scrape
ES83_019	-23.41264648	119.6084706	31-Jan-20	Trap 1
EXP0026	-23.397378	119.626871	15-Apr-10	Scrape
EXP0026	-23.397378	119.626871	21-Jul-10	Scrape
EXP0026	-23.397378	119.626871	15-Apr-10	Trap 1
EXP0026	-23.397378	119.626871	21-Jul-10	Trap 1
EXP0093	-23.407933	119.557513	15-Apr-10	Scrape
EXP0093	-23.407933	119.557513	21-Jul-10	Scrape
EXP0093	-23.407933	119.557513	15-Apr-10	Trap 1
EXP0093	-23.407933	119.557513	21-Jul-10	Trap 1
EXP0094	-23.406557	119.558271	15-Apr-10	Scrape
EXP0094	-23.406557	119.558271	21-Jul-10	Scrape
EXP0094	-23.406557	119.558271	15-Apr-10	Trap 1
EXP0094	-23.406557	119.558271	21-Jul-10	Trap 1
EXP0094	-23.406557	119.558271	15-Apr-10	Trap 2
EXP0098	-23.401791	119.583004	15-Apr-10	Scrape
EXP0098	-23.401791	119.583004	21-Jul-10	Scrape
EXP0098	-23.401791	119.583004	15-Apr-10	Trap 1
EXP0098	-23.401791	119.583004	21-Jul-10	Trap 1
EXP0102	-23.408163	119.608306	14-Apr-10	Scrape
EXP0102	-23.408163	119.608306	20-Jul-10	Scrape
EXP0102	-23.408163	119.608306	14-Apr-10	Trap 1
EXP0102	-23.408163	119.608306	20-Jul-10	Trap 1
EXP0179	-23.419058	119.557595	15-Apr-10	Scrape
EXP0179	-23.419058	119.557595	21-Jul-10	Scrape
EXP0179	-23.419058	119.557595	15-Apr-10	Trap 1
EXP0179	-23.419058	119.557595	21-Jul-10	Trap 1
EXP0182	-23.419588	119.562476	14-Apr-10	Net
EXP0182	-23.419588	119.562476	21-Jul-10	Net
EXP0183	-23.41999	119.562555	14-Apr-10	Net
EXP0183	-23.41999	119.562555	21-Jul-10	Net
EXR0347	-23.407889	119.616195	14-Apr-10	Scrape
EXR0347	-23.407889	119.616195	20-Jul-10	Scrape
EXR0347	-23.407889	119.616195	14-Apr-10	Trap 1
EXR0347	-23.407889	119.616195	20-Jul-10	Trap 1
EXR0348	-23.407902	119.616214	14-Apr-10	Scrape
EXR0348	-23.407902	119.616214	14-Apr-10	Trap 1
EXR0349	-23.40852	119.61745	14-Apr-10	Scrape
EXR0349	-23.40852	119.61745	20-Jul-10	Scrape
EXR0349	-23.40852	119.61745	14-Apr-10	Trap 1
EXR0349	-23.40852	119.61745	20-Jul-10	Trap 1
EXR0349	-23.40852	119.61745	14-Apr-10	Trap 2
EXR0350	-23.409818	119.618588	14-Apr-10	Scrape

FieldCode	Latitude	Longitude	Visit Date	Sample Name
EXR0350	-23.409818	119.618588	20-Jul-10	Scrape
EXR0350	-23.409818	119.618588	14-Apr-10	Trap 1
EXR0350	-23.409818	119.618588	20-Jul-10	Trap 1
EXR0350	-23.409818	119.618588	20-Jul-10	Trap 2
EXR0353	-23.406562	119.636756	15-Apr-10	Scrape
EXR0353	-23.406562	119.636756	19-Jul-10	Scrape
EXR0353	-23.406562	119.636756	15-Apr-10	Trap 1
EXR0353	-23.406562	119.636756	19-Jul-10	Trap 1
EXR0360	-23.399111	119.574424	15-Apr-10	Scrape
EXR0360	-23.399111	119.574424	21-Jul-10	Scrape
EXR0360	-23.399111	119.574424	15-Apr-10	Trap 1
EXR0360	-23.399111	119.574424	21-Jul-10	Trap 1
EXR0360	-23.399111	119.574424	15-Apr-10	Trap 2
EXR0361	-23.398974	119.580305	15-Apr-10	Scrape
EXR0361	-23.398974	119.580305	29-Jul-10	Scrape
EXR0361	-23.398974	119.580305	15-Apr-10	Trap 1
EXR0361	-23.398974	119.580305	29-Jul-10	Trap 1
EXR0361	-23.398974	119.580305	29-Jul-10	Trap 2
EXR0447	-23.402441	119.611385	15-Apr-10	Scrape
EXR0447	-23.402441	119.611385	21-Jul-10	Scrape
EXR0447	-23.402441	119.611385	15-Apr-10	Trap 1
EXR0447	-23.402441	119.611385	21-Jul-10	Trap 1
EXR0447	-23.402441	119.611385	21-Jul-10	Trap 2
EXR0448	-23.401058	119.621729	15-Apr-10	Scrape
EXR0448	-23.401058	119.621729	21-Jul-10	Scrape
EXR0448	-23.401058	119.621729	15-Apr-10	Trap 1
EXR0448	-23.401058	119.621729	21-Jul-10	Trap 1
EXR0448	-23.401058	119.621729	15-Apr-10	Trap 2
EXR0448	-23.401058	119.621729	21-Jul-10	Trap 2
EXR0449	-23.393296	119.631915	21-Jul-10	Scrape
EXR0449	-23.393296	119.631915	21-Jul-10	Trap 1
EXR0647	-23.412205	119.601681	14-Apr-10	Scrape
EXR0647	-23.412205	119.601681	20-Jul-10	Scrape
EXR0647	-23.412205	119.601681	14-Apr-10	Trap 1
EXR0647	-23.412205	119.601681	20-Jul-10	Trap 1
EXR0647	-23.412205	119.601681	20-Jul-10	Trap 2
EXR0648	-23.409672	119.58998	14-Apr-10	Scrape
EXR0648	-23.409672	119.58998	20-Jul-10	Scrape
EXR0648	-23.409672	119.58998	14-Apr-10	Trap 1
EXR0648	-23.409672	119.58998	20-Jul-10	Trap 1
EXR0648	-23.409672	119.58998	14-Apr-10	Trap 2
EXR0648	-23.409672	119.58998	20-Jul-10	Trap 2
EXR0779	-23.413165	119.601684	14-Apr-10	Scrape
EXR0779	-23.413165	119.601684	20-Jul-10	Scrape
EXR0779	-23.413165	119.601684	14-Apr-10	Trap 1

FieldCode	Latitude	Longitude	Visit Date	Sample Name
EXR0779	-23.413165	119.601684	20-Jul-10	Trap 1
EXR0780	-23.410146	119.590036	14-Apr-10	Scrape
EXR0780	-23.410146	119.590036	20-Jul-10	Scrape
EXR0780	-23.410146	119.590036	14-Apr-10	Trap 1
EXR0780	-23.410146	119.590036	20-Jul-10	Trap 1
EXR0781	-23.405964	119.578373	14-Apr-10	Scrape
EXR0781	-23.405964	119.578373	20-Jul-10	Scrape
EXR0781	-23.405964	119.578373	14-Apr-10	Trap 1
EXR0781	-23.405964	119.578373	20-Jul-10	Trap 1
EXR0781	-23.405964	119.578373	14-Apr-10	Trap 2
EXR0782	-23.406414	119.578425	14-Apr-10	Scrape
EXR0782	-23.406414	119.578425	20-Jul-10	Scrape
EXR0782	-23.406414	119.578425	14-Apr-10	Trap 1
EXR0782	-23.406414	119.578425	20-Jul-10	Trap 1
EXR0783	-23.406925	119.578398	14-Apr-10	Scrape
EXR0783	-23.406925	119.578398	20-Jul-10	Scrape
EXR0783	-23.406925	119.578398	14-Apr-10	Trap 1
EXR0783	-23.406925	119.578398	20-Jul-10	Trap 1
EXR0784	-23.406833	119.566504	15-Apr-10	Scrape
EXR0784	-23.406833	119.566504	20-Jul-10	Scrape
EXR0784	-23.406833	119.566504	15-Apr-10	Trap 1
EXR0784	-23.406833	119.566504	20-Jul-10	Trap 1
EXR0784	-23.406833	119.566504	20-Jul-10	Trap 2
EXR0785	-23.406213	119.56641	15-Apr-14	Net
EXR0786	-23.413425	119.613514	13-Apr-10	Scrape
EXR0786	-23.413425	119.613514	20-Jul-10	Scrape
EXR0786	-23.413425	119.613514	13-Apr-10	Trap 1
EXR0786	-23.413425	119.613514	20-Jul-10	Trap 1
EXR0787	-23.414291	119.613628	14-Apr-10	Net
EXR0787	-23.414291	119.613628	20-Jul-10	Net
EXR0989	-23.412858	119.613379	14-Apr-10	Scrape
EXR0989	-23.412858	119.613379	20-Jul-10	Scrape
EXR0989	-23.412858	119.613379	14-Apr-10	Trap 1
EXR0989	-23.412858	119.613379	20-Jul-10	Trap 1
EXR0990	-23.413848	119.613545	14-Apr-10	Scrape
EXR0990	-23.413848	119.613545	20-Jul-10	Scrape
EXR0990	-23.413848	119.613545	14-Apr-10	Trap 1
EXR0990	-23.413848	119.613545	20-Jul-10	Trap 1
EXR0990	-23.413848	119.613545	20-Jul-10	Trap 2
EXR0992	-23.414107	119.624994	14-Apr-10	Scrape
EXR0992	-23.414107	119.624994	22-Jul-10	Scrape
EXR0992	-23.414107	119.624994	14-Apr-10	Trap 1
EXR0992	-23.414107	119.624994	22-Jul-10	Trap 1
EXR0992	-23.414107	119.624994	14-Apr-10	Trap 2
EXR0993	-23.413252	119.624899	14-Apr-10	Net

FieldCode	Latitude	Longitude	Visit Date	Sample Name
EXR0993	-23.413252	119.624899	22-Jul-10	Net
EXR0994	-23.41294	119.636933	14-Apr-10	Net
EXR0994	-23.41294	119.636933	22-Jul-10	Net
EXR0995	-23.412293	119.636802	14-Apr-10	Scrape
EXR0995	-23.412293	119.636802	22-Jul-10	Scrape
EXR0995	-23.412293	119.636802	14-Apr-10	Trap 1
EXR0995	-23.412293	119.636802	22-Jul-10	Trap 1
EXR0996	-23.413826	119.636862	14-Apr-10	Scrape
EXR0996	-23.413826	119.636862	22-Jul-10	Scrape
EXR0996	-23.413826	119.636862	14-Apr-10	Trap 1
EXR0996	-23.413826	119.636862	22-Jul-10	Trap 1
EXR0996	-23.413826	119.636862	14-Apr-10	Trap 2
EXR0998	-23.407938	119.648247	19-Jul-10	Scrape
EXR0998	-23.407938	119.648247	19-Jul-10	Trap 1
EXR1080	-23.401427	119.60175	15-Apr-10	Scrape
EXR1080	-23.401427	119.60175	21-Jul-10	Scrape
EXR1080	-23.401427	119.60175	15-Apr-10	Trap 1
EXR1080	-23.401427	119.60175	21-Jul-10	Trap 1
EXR1082	-23.402146	119.649159	15-Apr-10	Scrape
EXR1082	-23.402146	119.649159	19-Jul-10	Scrape
EXR1082	-23.402146	119.649159	15-Apr-10	Trap 1
EXR1082	-23.402146	119.649159	19-Jul-10	Trap 1
EXR1082	-23.402146	119.649159	15-Apr-10	Trap 2
EXR1086	-23.395296	119.651223	25-Sep-09	Net
EXR1086	-23.395296	119.651223	22-Jan-10	Net
EXR1086	-23.395296	119.651223	12-Apr-10	Net
EXR1086	-23.395296	119.651223	19-Jul-10	Scrape
EXR1086	-23.395296	119.651223	19-Jul-10	Trap 1
EXR1164	-23.399844	119.627793	21-Jul-10	Net
EXR1164	-23.399844	119.627793	15-Apr-10	Scrape
EXR1164	-23.399844	119.627793	15-Apr-10	Trap 1
EXR1165	-23.399958	119.626377	15-Apr-10	Scrape
EXR1165	-23.399958	119.626377	21-Jul-10	Scrape
EXR1165	-23.399958	119.626377	15-Apr-10	Trap 1
EXR1165	-23.399958	119.626377	21-Jul-10	Trap 1
EXR1240	-23.402117	119.624121	15-Apr-10	Scrape
EXR1240	-23.402117	119.624121	21-Jul-10	Scrape
EXR1240	-23.402117	119.624121	15-Apr-10	Trap 1
EXR1240	-23.402117	119.624121	21-Jul-10	Trap 1
EXR1241	-23.402663	119.61577	15-Apr-10	Scrape
EXR1241	-23.402663	119.61577	15-Apr-10	Trap 1
EXR1343	-23.401971	119.596646	15-Apr-10	Net
EXR1343	-23.401971	119.596646	21-Jul-10	Net
EXR1346	-23.403012	119.600315	15-Apr-10	Scrape
EXR1346	-23.403012	119.600315	15-Apr-10	Trap 1

FieldCode	Latitude	Longitude	Visit Date	Sample Name
EXR1432R	-23.40030062	119.5798952	31-Jan-20	Scrape
EXR1432R	-23.40030062	119.5798952	31-Jan-20	Trap 1
EXR1432R	-23.40030062	119.5798952	31-Jan-20	Trap 2
EXR1433R	-23.400742	119.57989	15-Apr-10	Scrape
EXR1433R	-23.400742	119.57989	21-Jul-10	Scrape
EXR1433R	-23.400742	119.57989	15-Apr-10	Trap 1
EXR1433R	-23.400742	119.57989	21-Jul-10	Trap 1
EXR1446R	-23.404998	119.600213	15-Apr-10	Scrape
EXR1446R	-23.404998	119.600213	21-Jul-10	Scrape
EXR1446R	-23.404998	119.600213	15-Apr-10	Trap 1
EXR1446R	-23.404998	119.600213	21-Jul-10	Trap 1
EXR1446R	-23.404998	119.600213	15-Apr-10	Trap 2
EXR1446R	-23.404998	119.600213	21-Jul-10	Trap 2
EXR1549R	-23.399794	119.578037	15-Apr-10	Net
EXR1549R	-23.399794	119.578037	21-Jul-10	Net
EXR1549R	-23.399794	119.578037	15-Apr-10	Scrape
EXR1549R	-23.399794	119.578037	15-Apr-10	Trap 1
EXR1550R	-23.400978	119.584067	15-Apr-10	Scrape
EXR1550R	-23.400978	119.584067	22-Jul-10	Scrape
EXR1550R	-23.400978	119.584067	15-Apr-10	Trap 1
EXR1550R	-23.400978	119.584067	22-Jul-10	Trap 1
EXR1550R	-23.400978	119.584067	15-Apr-10	Trap 2
EXR1551R	-23.39992	119.584177	15-Apr-10	Net
EXR1551R	-23.39992	119.584177	21-Jul-10	Net
EXR1659R	-23.412673	119.59603	12-Apr-10	Net
EXR1659R	-23.412673	119.59603	20-Jul-10	Net
EXR1660R	-23.412215	119.595957	12-Apr-10	Net
EXR1660R	-23.412215	119.595957	20-Jul-10	Net
EXR1661R	-23.40839	119.584254	14-Apr-10	Scrape
EXR1661R	-23.40839	119.584254	20-Jul-10	Scrape
EXR1661R	-23.40839	119.584254	14-Apr-10	Trap 1
EXR1661R	-23.40839	119.584254	20-Jul-10	Trap 1
EXR1661R	-23.40839	119.584254	20-Jul-10	Trap 2
EXR1662R	-23.407506	119.584263	14-Apr-10	Scrape
EXR1662R	-23.407506	119.584263	20-Jul-10	Scrape
EXR1662R	-23.407506	119.584263	14-Apr-10	Trap 1
EXR1662R	-23.407506	119.584263	20-Jul-10	Trap 1
EXR1663R	-23.406945	119.584312	12-Apr-10	Net
EXR1663R	-23.406945	119.584312	20-Jul-10	Scrape
EXR1663R	-23.406945	119.584312	20-Jul-10	Trap 1
EXR1664R	-23.406573	119.584273	12-Apr-10	Net
EXR1664R	-23.406573	119.584273	20-Jul-10	Net
EXR1666R	-23.410734	119.596023	14-Apr-10	Scrape
EXR1666R	-23.410734	119.596023	20-Jul-10	Scrape
EXR1666R	-23.410734	119.596023	14-Apr-10	Trap 1

FieldCode	Latitude	Longitude	Visit Date	Sample Name
EXR1666R	-23.410734	119.596023	20-Jul-10	Trap 1
EXR1666R	-23.410734	119.596023	14-Apr-10	Trap 2
EXR1668R	-23.411655	119.595934	14-Apr-10	Scrape
EXR1668R	-23.411655	119.595934	20-Jul-10	Scrape
EXR1668R	-23.411655	119.595934	14-Apr-10	Trap 1
EXR1668R	-23.411655	119.595934	20-Jul-10	Trap 1
HWSR0002	-23.40067122	119.6402097	19-Sep-19	Net
HWSR0002	-23.40067122	119.6402097	02-Feb-20	Net
MH83_002	-23.40074888	119.5689165	17-Sep-19	Scrape
MH83_002	-23.40074888	119.5689165	17-Sep-19	Trap 1
MH83_007	-23.39973499	119.5739736	17-Sep-19	Scrape
MH83_007	-23.39973499	119.5739736	17-Sep-19	Trap 1
MH83_037	-23.39795397	119.5830108	17-Sep-19	Scrape
MH83_037	-23.39795397	119.5830108	17-Sep-19	Trap 1
MH83_046	-23.4010483	119.5971966	17-Sep-19	Scrape
MH83_046	-23.4010483	119.5971966	17-Sep-19	Trap 1
WSR0007R	-23.415865	119.559899	15-Apr-10	Scrape
WSR0007R	-23.415865	119.559899	21-Jul-10	Scrape
WSR0007R	-23.415865	119.559899	15-Apr-10	Trap 1
WSR0007R	-23.415865	119.559899	21-Jul-10	Trap 1
WSR0007R	-23.415865	119.559899	21-Jul-10	Trap 2
WSR0009R	-23.413654	119.565642	15-Apr-10	Net
WSR0009R	-23.413654	119.565642	21-Jul-10	Net
WSR0011R	-23.41759	119.565486	15-Apr-10	Scrape
WSR0011R	-23.41759	119.565486	21-Jul-10	Scrape
WSR0011R	-23.41759	119.565486	15-Apr-10	Trap 1
WSR0011R	-23.41759	119.565486	21-Jul-10	Trap 1
WSR0014R	-23.41724	119.570987	15-Apr-10	Scrape
WSR0014R	-23.41724	119.570987	21-Jul-10	Scrape
WSR0014R	-23.41724	119.570987	15-Apr-10	Trap 1
WSR0014R	-23.41724	119.570987	21-Jul-10	Trap 1
WSR0017R	-23.414462	119.570986	15-Apr-10	Scrape
WSR0017R	-23.414462	119.570986	21-Jul-10	Scrape
WSR0017R	-23.414462	119.570986	15-Apr-10	Trap 1
WSR0017R	-23.414462	119.570986	21-Jul-10	Trap 1
WSR0017R	-23.414462	119.570986	15-Apr-10	Trap 2
WSR0171DT	-23.41298848	119.6388082	30-Jan-20	Scrape
WSR0171DT	-23.41298848	119.6388082	30-Jan-20	Trap 1
WSR0171DT	-23.41298848	119.6388082	30-Jan-20	Trap 2
WSR0296R	-23.40281752	119.5716174	19-Sep-19	Net
WSR0296R	-23.40281752	119.5716174	02-Feb-20	Net
WSR0298R	-23.40230181	119.5776713	19-Sep-19	Net
WSR0298R	-23.40230181	119.5776713	03-Feb-20	Net
WSR0299R	-23.40255333	119.5835296	19-Sep-19	Net
WSR0299R	-23.40255333	119.5835296	03-Feb-20	Net

FieldCode	Latitude	Longitude	Visit Date	Sample Name
WSR0300R	-23.40376262	119.5894302	19-Sep-19	Net
WSR0300R	-23.40376262	119.5894302	03-Feb-20	Net
WSR0303R	-23.41461878	119.6041374	17-Sep-19	Scrape
WSR0303R	-23.41461878	119.6041374	31-Jan-20	Scrape
WSR0303R	-23.41461878	119.6041374	17-Sep-19	Trap 1
WSR0303R	-23.41461878	119.6041374	31-Jan-20	Trap 1
WSR0305R	-23.41363144	119.6042211	31-Jan-20	Scrape
WSR0305R	-23.41363144	119.6042211	31-Jan-20	Trap 1
WSR0324R	-23.41505503	119.6134428	31-Jan-20	Scrape
WSR0324R	-23.41505503	119.6134428	31-Jan-20	Trap 1
WSR0328R	-23.41497041	119.6158692	17-Sep-19	Scrape
WSR0328R	-23.41497041	119.6158692	17-Sep-19	Trap 1
WSR0350R	-23.41252053	119.6305727	17-Sep-19	Scrape
WSR0350R	-23.41252053	119.6305727	31-Jan-20	Scrape
WSR0350R	-23.41252053	119.6305727	17-Sep-19	Trap 1
WSR0350R	-23.41252053	119.6305727	31-Jan-20	Trap 1
WSR0350R	-23.41252053	119.6305727	31-Jan-20	Trap 2
WSR0356R	-23.41433004	119.6344789	31-Jan-20	Scrape
WSR0356R	-23.41433004	119.6344789	31-Jan-20	Trap 1
WSR0368R	-23.41400146	119.6382924	16-Sep-19	Scrape
WSR0368R	-23.41400146	119.6382924	16-Sep-19	Trap 1
WSR0381R	-23.41244752	119.6425192	30-Jan-20	Scrape
WSR0381R	-23.41244752	119.6425192	30-Jan-20	Trap 1
WSR0391R	-23.41306937	119.6447498	30-Jan-20	Scrape
WSR0391R	-23.41306937	119.6447498	30-Jan-20	Trap 1
WSR0396R	-23.41217086	119.6452035	30-Jan-20	Scrape
WSR0396R	-23.41217086	119.6452035	30-Jan-20	Trap 1
WSR0414R	-23.39144088	119.6492646	03-Feb-20	Net
WSR0415R	-23.39505382	119.6498031	16-Sep-19	Scrape
WSR0415R	-23.39505382	119.6498031	16-Sep-19	Trap 1
WSR0420R	-23.39420871	119.6503816	19-Sep-19	Net
WSR0420R	-23.39420871	119.6503816	03-Feb-20	Net
WSR0423R	-23.40853094	119.6506911	16-Sep-19	Scrape
WSR0423R	-23.40853094	119.6506911	16-Sep-19	Trap 1
WSR0425R	-23.40326174	119.6506095	16-Sep-19	Scrape
WSR0425R	-23.40326174	119.6506095	16-Sep-19	Trap 1
WSR0425R	-23.40326174	119.6506095	16-Sep-19	Trap 2
WSR0546R	-23.40033675	119.5719438	19-Sep-19	Net
WSR0546R	-23.40033675	119.5719438	04-Feb-20	Net
WSR0569R	-23.39946194	119.5807999	19-Sep-19	Net
WSR0569R	-23.39946194	119.5807999	04-Feb-20	Net
WSR0663R	-23.4095322	119.6011999	19-Sep-19	Net
WSR0663R	-23.4095322	119.6011999	03-Feb-20	Net
WSR0765R	-23.41188877	119.6149091	19-Sep-19	Net
WSR0765R	-23.41188877	119.6149091	03-Feb-20	Net

FieldCode	Latitude	Longitude	Visit Date	Sample Name
WSR0784R	-23.39332464	119.6492983	16-Sep-19	Scrape
WSR0784R	-23.39332464	119.6492983	16-Sep-19	Trap 1
WSR0796R	-23.40956348	119.649644	30-Jan-20	Scrape
WSR0796R	-23.40956348	119.649644	30-Jan-20	Trap 1
WSR0805R	-23.39185753	119.6507104	30-Jan-20	Scrape
WSR0805R	-23.39185753	119.6507104	30-Jan-20	Trap 1
WSR0844R	-23.40687877	119.653135	16-Sep-19	Scrape
WSR0844R	-23.40687877	119.653135	16-Sep-19	Trap 1
WSR0911R	-23.40009507	119.6585786	19-Sep-19	Net
WSR0911R	-23.40009507	119.6585786	03-Feb-20	Net
WSR0938R	-23.39778363	119.6578364	16-Sep-19	Scrape
WSR0938R	-23.39778363	119.6578364	16-Sep-19	Trap 1
WSR1029R	-23.40273096	119.6535271	20-Sep-19	Net
WSR1029R	-23.40273096	119.6535271	04-Feb-20	Net
WSR1043R	-23.40336332	119.659267	16-Sep-19	Scrape
WSR1043R	-23.40336332	119.659267	16-Sep-19	Trap 1
WSR1049R	-23.40374681	119.6594747	30-Jan-20	Scrape
WSR1049R	-23.40374681	119.6594747	30-Jan-20	Trap 1
WSR1085R	-23.41123209	119.6487605	18-Sep-19	Scrape
WSR1085R	-23.41123209	119.6487605	18-Sep-19	Trap 1
WSR1085R	-23.41123209	119.6487605	18-Sep-19	Trap 2
WSR1087R	-23.41483244	119.6393591	30-Jan-20	Scrape
WSR1087R	-23.41483244	119.6393591	30-Jan-20	Trap 1
WSR1103DTM	-23.39317717	119.6517048	30-Jan-20	Scrape
WSR1103DTM	-23.39317717	119.6517048	30-Jan-20	Trap 1
WSR1139R	-23.42138822	119.5599885	18-Sep-19	Net
WSR1139R	-23.42138822	119.5599885	04-Feb-20	Net
WSR1153R	-23.40557756	119.5601054	18-Sep-19	Net
WSR1153R	-23.40557756	119.5601054	02-Feb-20	Net
WSR1193R	-23.42069264	119.5713301	18-Sep-19	Net
WSR1193R	-23.42069264	119.5713301	04-Feb-20	Net
WSR1219R	-23.40563554	119.5748774	18-Sep-19	Net
WSR1219R	-23.40563554	119.5748774	03-Feb-20	Net
WSR1241R	-23.40579156	119.5841215	18-Sep-19	Net
WSR1241R	-23.40579156	119.5841215	03-Feb-20	Net
WSR1270R	-23.41130003	119.5982651	19-Sep-19	Net
WSR1270R	-23.41130003	119.5982651	03-Feb-20	Net
WSR1321R	-23.39737324	119.5800258	17-Sep-19	Scrape
WSR1321R	-23.39737324	119.5800258	17-Sep-19	Trap 1
WSR1507R	-23.39820297	119.6324199	19-Sep-19	Net
WSR1507R	-23.39820297	119.6324199	02-Feb-20	Net
WSR1585R	-23.39897993	119.5924605	17-Sep-19	Scrape
WSR1585R	-23.39897993	119.5924605	17-Sep-19	Trap 1
WSR1585R	-23.39897993	119.5924605	17-Sep-19	Trap 2
WSR1586DTM	-23.41224378	119.5959976	31-Jan-20	Scrape

FieldCode	Latitude	Longitude	Visit Date	Sample Name
WSR1586DTM	-23.41224378	119.5959976	31-Jan-20	Trap 1
WSR1587DTM	-23.40975	119.5899265	31-Jan-20	Scrape
WSR1587DTM	-23.40975	119.5899265	31-Jan-20	Trap 1
WSR1597R	-23.41798542	119.5550271	18-Sep-19	Scrape
WSR1597R	-23.41798542	119.5550271	18-Sep-19	Trap 1
WSR1598R	-23.41740778	119.5551176	01-Feb-20	Scrape
WSR1598R	-23.41740778	119.5551176	01-Feb-20	Trap 1
WSR1598R	-23.41740778	119.5551176	01-Feb-20	Trap 2
WSR1600R	-23.41649686	119.555263	01-Feb-20	Scrape
WSR1600R	-23.41649686	119.555263	01-Feb-20	Trap 1
WSR1602R	-23.41561329	119.5551918	01-Feb-20	Scrape
WSR1602R	-23.41561329	119.5551918	01-Feb-20	Trap 1
WSR1603R	-23.41012639	119.5557879	02-Feb-20	Scrape
WSR1603R	-23.41012639	119.5557879	02-Feb-20	Trap 1
WSR1606R	-23.40837279	119.5557934	02-Feb-20	Scrape
WSR1606R	-23.40837279	119.5557934	02-Feb-20	Trap 1
WSR1608R	-23.40748818	119.5558093	02-Feb-20	Scrape
WSR1608R	-23.40748818	119.5558093	02-Feb-20	Trap 1
WSR1613R	-23.40522322	119.5558032	02-Feb-20	Scrape
WSR1613R	-23.40522322	119.5558032	02-Feb-20	Trap 1
WSR1614R	-23.40477333	119.5558047	02-Feb-20	Scrape
WSR1614R	-23.40477333	119.5558047	02-Feb-20	Trap 1
WSR1615R	-23.40923179	119.5558907	02-Feb-20	Scrape
WSR1615R	-23.40923179	119.5558907	02-Feb-20	Trap 1
WSR1619R	-23.41328459	119.5561678	18-Sep-19	Scrape
WSR1619R	-23.41328459	119.5561678	02-Feb-20	Scrape
WSR1619R	-23.41328459	119.5561678	18-Sep-19	Trap 1
WSR1619R	-23.41328459	119.5561678	02-Feb-20	Trap 1
WSR1620R	-23.41691697	119.5565213	01-Feb-20	Scrape
WSR1620R	-23.41691697	119.5565213	01-Feb-20	Trap 1
WSR1622R	-23.41604255	119.5565299	01-Feb-20	Scrape
WSR1622R	-23.41604255	119.5565299	01-Feb-20	Trap 1
WSR1623R	-23.41559335	119.556551	18-Sep-19	Scrape
WSR1623R	-23.41559335	119.556551	18-Sep-19	Trap 1
WSR1624R	-23.41084701	119.5568918	02-Feb-20	Scrape
WSR1624R	-23.41084701	119.5568918	02-Feb-20	Trap 1
WSR1624R	-23.41084701	119.5568918	02-Feb-20	Trap 2
WSR1626R	-23.40915131	119.5572551	02-Feb-20	Scrape
WSR1626R	-23.40915131	119.5572551	02-Feb-20	Trap 1
WSR1627R	-23.40830007	119.557303	18-Sep-19	Scrape
WSR1627R	-23.40830007	119.557303	18-Sep-19	Trap 1
WSR1627R	-23.40830007	119.557303	18-Sep-19	Trap 2
WSR1628R	-23.40780431	119.5572781	02-Feb-20	Scrape
WSR1628R	-23.40780431	119.5572781	02-Feb-20	Trap 1
WSR1644R	-23.41374765	119.5586635	17-Sep-19	Scrape

FieldCode	Latitude	Longitude	Visit Date	Sample Name
WSR1644R	-23.41374765	119.5586635	17-Sep-19	Trap 1
WSR1644R	-23.41374765	119.5586635	17-Sep-19	Trap 2
WSR1645R	-23.41293984	119.5586905	01-Feb-20	Scrape
WSR1645R	-23.41293984	119.5586905	01-Feb-20	Trap 1
WSR1645R	-23.41293984	119.5586905	01-Feb-20	Trap 2
WSR1647R	-23.40932204	119.5586707	18-Sep-19	Scrape
WSR1647R	-23.40932204	119.5586707	18-Sep-19	Trap 1
WSR1648R	-23.40837547	119.5587576	01-Feb-20	Scrape
WSR1648R	-23.40837547	119.5587576	01-Feb-20	Trap 1
WSR1650R	-23.40769333	119.5587508	01-Feb-20	Scrape
WSR1650R	-23.40769333	119.5587508	01-Feb-20	Trap 1
WSR1650R	-23.40769333	119.5587508	01-Feb-20	Trap 2
WSR1658R	-23.40982571	119.5588264	01-Feb-20	Scrape
WSR1658R	-23.40982571	119.5588264	01-Feb-20	Trap 1
WSR1659R	-23.41420043	119.5588757	01-Feb-20	Scrape
WSR1659R	-23.41420043	119.5588757	01-Feb-20	Trap 1
WSR1661R	-23.41110213	119.5591179	01-Feb-20	Scrape
WSR1661R	-23.41110213	119.5591179	01-Feb-20	Trap 1
WSR1682R	-23.41792108	119.561464	17-Sep-19	Scrape
WSR1682R	-23.41792108	119.561464	17-Sep-19	Trap 1
WSR1697R	-23.40751938	119.5616154	01-Feb-20	Scrape
WSR1697R	-23.40751938	119.5616154	01-Feb-20	Trap 1
WSR1701R	-23.40581115	119.5616285	01-Feb-20	Scrape
WSR1701R	-23.40581115	119.5616285	01-Feb-20	Trap 1
WSR1702R	-23.40527791	119.5616479	01-Feb-20	Scrape
WSR1702R	-23.40527791	119.5616479	01-Feb-20	Trap 1
WSR1729R	-23.4150779	119.5639902	01-Feb-20	Scrape
WSR1729R	-23.4150779	119.5639902	01-Feb-20	Trap 1
WSR1730R	-23.41463759	119.563993	01-Feb-20	Scrape
WSR1730R	-23.41463759	119.563993	01-Feb-20	Trap 1
WSR1730R	-23.41463759	119.563993	01-Feb-20	Trap 2
WSR1731R	-23.41402189	119.564063	01-Feb-20	Scrape
WSR1731R	-23.41402189	119.564063	01-Feb-20	Trap 1
WSR1735R	-23.40795866	119.5640304	17-Sep-19	Scrape
WSR1735R	-23.40795866	119.5640304	17-Sep-19	Trap 1
WSR1749R	-23.41616165	119.5667849	01-Feb-20	Scrape
WSR1749R	-23.41616165	119.5667849	01-Feb-20	Trap 1
WSR1757R	-23.41656753	119.5669472	01-Feb-20	Scrape
WSR1757R	-23.41656753	119.5669472	01-Feb-20	Trap 1
WSR1758R	-23.41569689	119.5669136	17-Sep-19	Scrape
WSR1758R	-23.41569689	119.5669136	17-Sep-19	Trap 1
WSR1768R	-23.41562538	119.5683414	01-Feb-20	Scrape
WSR1768R	-23.41562538	119.5683414	01-Feb-20	Trap 1
WSR1768R	-23.41562538	119.5683414	01-Feb-20	Trap 2
WSR1781R	-23.40988122	119.5699462	17-Sep-19	Scrape

FieldCode	Latitude	Longitude	Visit Date	Sample Name
WSR1781R	-23.40988122	119.5699462	17-Sep-19	Trap 1
WSR1785R	-23.40625688	119.5699628	01-Feb-20	Scrape
WSR1785R	-23.40625688	119.5699628	01-Feb-20	Trap 1
WSR1787R	-23.40805814	119.5700447	01-Feb-20	Scrape
WSR1787R	-23.40805814	119.5700447	01-Feb-20	Trap 1
WSR1787R	-23.40805814	119.5700447	01-Feb-20	Trap 2
WSR1790R	-23.40895588	119.5702386	01-Feb-20	Scrape
WSR1790R	-23.40895588	119.5702386	01-Feb-20	Trap 1
WSR1797R	-23.40675817	119.571403	17-Sep-19	Scrape
WSR1797R	-23.40675817	119.571403	17-Sep-19	Trap 1
WSR1799R	-23.41756584	119.5722318	18-Sep-19	Scrape
WSR1799R	-23.41756584	119.5722318	18-Sep-19	Trap 1
WSR1800R	-23.41712314	119.5722301	01-Feb-20	Scrape
WSR1800R	-23.41712314	119.5722301	01-Feb-20	Trap 1
WSR1805R	-23.41485658	119.5722628	01-Feb-20	Scrape
WSR1805R	-23.41485658	119.5722628	01-Feb-20	Trap 1
WSR1813R	-23.41401426	119.5761457	18-Sep-19	Scrape
WSR1813R	-23.41401426	119.5761457	18-Sep-19	Trap 1
WSR1824R	-23.40644172	119.5777618	31-Jan-20	Scrape
WSR1824R	-23.40644172	119.5777618	31-Jan-20	Trap 1
WSR1827R	-23.41491562	119.5791298	18-Sep-19	Scrape
WSR1827R	-23.41491562	119.5791298	18-Sep-19	Trap 1
WSR1827R	-23.41491562	119.5791298	18-Sep-19	Trap 2
WSR1828R	-23.40806862	119.5791959	17-Sep-19	Scrape
WSR1828R	-23.40806862	119.5791959	17-Sep-19	Trap 1
WSR1856R	-23.40730707	119.5850648	31-Jan-20	Scrape
WSR1856R	-23.40730707	119.5850648	31-Jan-20	Trap 1
WSR1860R	-23.4090909	119.5853597	31-Jan-20	Scrape
WSR1860R	-23.4090909	119.5853597	31-Jan-20	Trap 1
WSR1862R	-23.40896684	119.5864657	31-Jan-20	Scrape
WSR1862R	-23.40896684	119.5864657	31-Jan-20	Trap 1
WSR1863R	-23.40823002	119.5864899	17-Sep-19	Scrape
WSR1863R	-23.40823002	119.5864899	17-Sep-19	Trap 1
WSR1863R	-23.40823002	119.5864899	17-Sep-19	Trap 2
WSR1875R	-23.41146988	119.5894831	31-Jan-20	Scrape
WSR1875R	-23.41146988	119.5894831	31-Jan-20	Trap 1
WSR1875R	-23.41146988	119.5894831	31-Jan-20	Trap 2
WSR1882R	-23.40777806	119.5894193	31-Jan-20	Scrape
WSR1882R	-23.40777806	119.5894193	31-Jan-20	Trap 1
WSR1882R	-23.40777806	119.5894193	31-Jan-20	Trap 2
WSR1883R	-23.4118158	119.5909614	31-Jan-20	Scrape
WSR1883R	-23.4118158	119.5909614	31-Jan-20	Trap 1
WSR1892R	-23.4109513	119.5923471	31-Jan-20	Scrape
WSR1892R	-23.4109513	119.5923471	31-Jan-20	Trap 1
WSR1893R	-23.41265773	119.5923783	31-Jan-20	Scrape

FieldCode	Latitude	Longitude	Visit Date	Sample Name
WSR1893R	-23.41265773	119.5923783	31-Jan-20	Trap 1
WSR1895R	-23.41280219	119.5935305	18-Sep-19	Scrape
WSR1895R	-23.41280219	119.5935305	31-Jan-20	Scrape
WSR1895R	-23.41280219	119.5935305	18-Sep-19	Trap 1
WSR1895R	-23.41280219	119.5935305	31-Jan-20	Trap 1
WSR1895R	-23.41280219	119.5935305	31-Jan-20	Trap 2
WSR1897R	-23.4123577	119.5937991	31-Jan-20	Scrape
WSR1897R	-23.4123577	119.5937991	31-Jan-20	Trap 1
WSR1911R	-23.41371089	119.5972475	31-Jan-20	Scrape
WSR1911R	-23.41371089	119.5972475	31-Jan-20	Trap 1
WSR1911R	-23.41371089	119.5972475	31-Jan-20	Trap 2
WSR1914R	-23.41235232	119.5972868	31-Jan-20	Scrape
WSR1914R	-23.41235232	119.5972868	31-Jan-20	Trap 1
WSR1917R	-23.41105507	119.5972815	31-Jan-20	Scrape
WSR1917R	-23.41105507	119.5972815	31-Jan-20	Trap 1
WSR1940R	-23.41277641	119.6114089	17-Sep-19	Scrape
WSR1940R	-23.41277641	119.6114089	17-Sep-19	Trap 1
WSR1948R	-23.41270682	119.6129112	31-Jan-20	Scrape
WSR1948R	-23.41270682	119.6129112	31-Jan-20	Trap 1
WSR1948R	-23.41270682	119.6129112	31-Jan-20	Trap 2
WSR1953R	-23.41243726	119.6143878	31-Jan-20	Scrape
WSR1953R	-23.41243726	119.6143878	31-Jan-20	Trap 1
WSR1956R	-23.4146127	119.6144611	31-Jan-20	Scrape
WSR1956R	-23.4146127	119.6144611	31-Jan-20	Trap 1
WSR1967R	-23.41349203	119.6202838	17-Sep-19	Scrape
WSR1967R	-23.41349203	119.6202838	17-Sep-19	Trap 1
WSR1967R	-23.41349203	119.6202838	17-Sep-19	Trap 2
WSR1971R	-23.41190724	119.6419289	18-Sep-19	Scrape
WSR1971R	-23.41190724	119.6419289	18-Sep-19	Trap 1
WSR1974R	-23.41127109	119.644336	30-Jan-20	Scrape
WSR1974R	-23.41127109	119.644336	30-Jan-20	Trap 1
WSR1974R	-23.41127109	119.644336	30-Jan-20	Trap 2
WSR1982R	-23.40986574	119.6462839	30-Jan-20	Scrape
WSR1982R	-23.40986574	119.6462839	30-Jan-20	Trap 1
WSR1987R	-23.41017058	119.6471149	16-Sep-19	Scrape
WSR1987R	-23.41017058	119.6471149	16-Sep-19	Trap 1
WSR1987R	-23.41017058	119.6471149	16-Sep-19	Trap 2
WSR1994R	-23.40824372	119.6487639	30-Jan-20	Scrape
WSR1994R	-23.40824372	119.6487639	30-Jan-20	Trap 1
WSR1994R	-23.40824372	119.6487639	30-Jan-20	Trap 2
WSR2005R	-23.40911608	119.650948	30-Jan-20	Scrape
WSR2005R	-23.40911608	119.650948	30-Jan-20	Trap 1
WSR2035DTM	-23.41253138	119.6442727	16-Sep-19	Scrape
WSR2035DTM	-23.41253138	119.6442727	16-Sep-19	Trap 1
WSR2037DTM	-23.41338539	119.6363491	31-Jan-20	Scrape

FieldCode	Latitude	Longitude	Visit Date	Sample Name
WSR2037DTM	-23.41338539	119.6363491	31-Jan-20	Trap 1
WSR2050R	-23.39968307	119.6056986	17-Sep-19	Scrape
WSR2050R	-23.39968307	119.6056986	17-Sep-19	Trap 1
WSR2054R	-23.40148145	119.6086747	17-Sep-19	Scrape
WSR2054R	-23.40148145	119.6086747	17-Sep-19	Trap 1
WSR2056R	-23.39783911	119.6209622	18-Sep-19	Scrape
WSR2056R	-23.39783911	119.6209622	18-Sep-19	Trap 1
WSR2074R	-23.39689976	119.6248558	18-Sep-19	Scrape
WSR2074R	-23.39689976	119.6248558	18-Sep-19	Trap 1
WSR2091R	-23.39619824	119.6284556	18-Sep-19	Scrape
WSR2091R	-23.39619824	119.6284556	18-Sep-19	Trap 1
WSR2095R	-23.39549568	119.6280023	18-Sep-19	Scrape
WSR2095R	-23.39549568	119.6280023	18-Sep-19	Trap 1
WSR2095R	-23.39549568	119.6280023	18-Sep-19	Trap 2
WSR2112R	-23.4017151	119.6301553	17-Sep-19	Scrape
WSR2112R	-23.4017151	119.6301553	17-Sep-19	Trap 1
WSR2215R	-23.39543929	119.6356331	17-Sep-19	Scrape
WSR2215R	-23.39543929	119.6356331	17-Sep-19	Trap 1
WSR2215R	-23.39543929	119.6356331	17-Sep-19	Trap 2
WSR2276DTM	-23.40430421	119.6040728	17-Sep-19	Scrape
WSR2276DTM	-23.40430421	119.6040728	17-Sep-19	Trap 1
WSR2276DTM	-23.40430421	119.6040728	17-Sep-19	Trap 2
XAN0016R	-23.38909498	119.6367223	04-Feb-20	Scrape
XAN0019R	-23.38904562	119.6349073	04-Feb-20	Scrape
XAN0024R	-23.3910023	119.6364279	17-Sep-19	Scrape
XAN0024R	-23.3910023	119.6364279	17-Sep-19	Trap 1
XAN0025R	-23.39072754	119.6369967	04-Feb-20	Scrape
XAN0026R	-23.39036465	119.6370853	04-Feb-20	Scrape
XAN0027R	-23.38979477	119.6365515	04-Feb-20	Scrape

Appendix 4. Species of troglofauna and stygofauna collected in the Study Area.

SWL, depth to watertable; EOH, depth to bottom of hole, TDepth, depth at which trap set. All in metres.

Hole	VisitDate	Method	SWL	EOH	TDepth	Species	No.
EXP0182	21-Jul-10	Net	100	110		Enchytraeus sp. AP PSS2 s.l.	5
EXR0993	14-Apr-10	Net	63	83		Polyxenidae sp.	4
EXR0993	22-Jul-10	Net	63	83		Parajapygidae sp.	1
EXR0993	22-Jul-10	Net	63	83		Chilopoda sp.	1
EXR0993	22-Jul-10	Net	63	83		Polyxenidae sp.	2
EXR0994	22-Jul-10	Net	59	77		Japygidae `DPL002` s.l.	1
EXR1343	15-Apr-10	Net	116	128		Enchytraeus sp. AP PSS2 s.l.	4
EXR1659R	12-Apr-10	Net	88	128		Phaconeura sp.	4
EXR1659R	12-Apr-10	Net	88	128		Enchytraeus sp. AP PSS2 s.l.	10
EXR1659R	12-Apr-10	Net	88	128		Palpigradi sp. B07	1
EXR1659R	20-Jul-10	Net	80	112		Tyrannochthonius `PSE053`	1
EXR1659R	20-Jul-10	Net	80	112		Palpigradi sp. B07	2
EXR1659R	20-Jul-10	Net	80	112		Enchytraeus sp. AP PSS2 s.l.	10
EXR1660R	20-Jul-10	Net	85	117		Enchytraeus sp. AP PSS2 s.l.	4
WSR0546R	04-Feb-20	Net	124	127		Nematoda spp.	1
WSR1219R	03-Feb-20	Net	110	113		Nematoda spp.	2
EXP0102	14-Apr-10	Scrape		15		Polyxenidae sp.	1
EXR0347	14-Apr-10	Scrape		13		Polyxenidae sp.	1
EXR0347	14-Apr-10	Scrape		13		Lophoturus madecassus	1
EXR0347	20-Jul-10	Scrape		15		Polyxenidae sp.	5
EXR0347	20-Jul-10	Scrape		15		Lophoturus madecassus	1
EXR0349	14-Apr-10	Scrape		25		Polyxenidae sp.	1
EXR0350	14-Apr-10	Scrape		21		Sciaridae sp. B01	3
EXR0350	14-Apr-10	Scrape		21		Lophoturus madecassus	1
EXR0350	14-Apr-10	Scrape		21		Oligochaeta sp.	10
EXR0350	20-Jul-10	Scrape		29		Oligochaeta sp.	5
EXR0350	20-Jul-10	Scrape		29		Lophoturus madecassus	4
EXR0350	20-Jul-10	Scrape		29		Sciaridae sp. B01	1
EXR0353	15-Apr-10	Scrape		60		Lechytia `PSE019`	1
EXR0360	15-Apr-10	Scrape		60		Polyxenidae sp.	1
EXR0360	21-Jul-10	Scrape		60		Oligochaeta sp.	1
EXR0448	15-Apr-10	Scrape		95		Pseudoscorpiones sp.	1
EXR0647	14-Apr-10	Scrape		25		Japygidae `DPL002` s.l.	3
EXR0647	14-Apr-10	Scrape		25		Dodecastyla sp. B02 (=Atelurodes sp. S02)	20
EXR0647	14-Apr-10	Scrape		25		Decapauropus tenuis	4
EXR0647	20-Jul-10	Scrape		25		Dodecastyla sp. B02 (=Atelurodes sp. S02)	8
EXR0647	20-Jul-10	Scrape		25		Lophoturus madecassus	7
EXR0647	20-Jul-10	Scrape		25		Armadillidae sp.	1
EXR0647	20-Jul-10	Scrape		25		Pauropodidae sp. B09	2
EXR0647	20-Jul-10	Scrape		25		Oligochaeta sp.	1
EXR0648	14-Apr-10	Scrape		52		Palpigradi sp. B07	1
EXR0648	20-Jul-10	Scrape		52		Palpigradi sp. B07	1
EXR0780	14-Apr-10	Scrape		53		Trinemura sp. B04	1
EXR0783	20-Jul-10	Scrape		100		Polyxenidae sp.	1
EXR0784	20-Jul-10	Scrape		60		Symphylella sp. B02 (BHP)	1
EXR0786	13-Apr-10	Scrape				Polyxenidae sp.	1

Hole	VisitDate	Method	SWL	EOH	TDepth	Species	No.
EXR0786	20-Jul-10	Scrape		15		Lophoturus madecassus	3
EXR0989	14-Apr-10	Scrape		26		Lophoturus madecassus	10
EXR0989	20-Jul-10	Scrape		26		Lophoturus madecassus	4
EXR0990	14-Apr-10	Scrape		78		Polyxenidae sp.	1
EXR0990	20-Jul-10	Scrape		76		Lophoturus madecassus	1
EXR0992	22-Jul-10	Scrape		52		Lophoturus madecassus	3
EXR0996	14-Apr-10	Scrape		42		Polyxenidae sp.	1
EXR0996	22-Jul-10	Scrape		42		Phaconeura sp.	1
EXR1080	15-Apr-10	Scrape		18		Polyxenidae sp.	1
EXR1240	15-Apr-10	Scrape		150		Phaconeura sp.	1
EXR1240	21-Jul-10	Scrape		150		Phaconeura sp.	1
EXR1433R	15-Apr-10	Scrape		27		Phaconeura sp.	2
EXR1433R	15-Apr-10	Scrape		27		Dodecastyla sp. B02 (=Atelurodes sp. S02)	1
EXR1433R	21-Jul-10	Scrape		27		Phaconeura sp.	2
EXR1446R	15-Apr-10	Scrape		69		Palpigradi sp. B07	1
EXR1446R	21-Jul-10	Scrape		69		Polyxenidae sp.	8
EXR1661R	14-Apr-10	Scrape		101		Polyxenidae sp.	1
EXR1666R	14-Apr-10	Scrape		35		Palpigradi sp. B07	2
EXR1666R	14-Apr-10	Scrape		35		Decapauropus tenuis	1
EXR1666R	14-Apr-10	Scrape		35		Tyrannochthonius `PSE053`	1
EXR1666R	20-Jul-10	Scrape		35		Palpigradi sp. B07	1
EXR1666R	20-Jul-10	Scrape		35		Decapauropus tenuis	8
MH83_002	17-Sep-19	Scrape		46		Nematoda spp.	1
MH83_037	17-Sep-19	Scrape		110		Unixenus sp.	1
WSR0017R	21-Jul-10	Scrape		25		Polyxenidae sp.	12
WSR0305R	31-Jan-20	Scrape		75		Phaconeura sp.	1
WSR0350R	17-Sep-19	Scrape		38		Unixenus sp.	3
WSR1043R	16-Sep-19	Scrape		45		Phaconeura sp.	1
WSR1606R	02-Feb-20	Scrape		36		Phaconeura sp. B04	5
WSR1647R	18-Sep-19	Scrape		31		Phaconeura sp. B04	1
WSR1659R	01-Feb-20	Scrape		46		Phaconeura sp.	1
WSR1659R	01-Feb-20	Scrape		46		Eukoenenia `BPAL046`	1
WSR1661R	01-Feb-20	Scrape		45		Eukoenenia `BPAL046`	1
WSR1749R	01-Feb-20	Scrape		20		Eukoenenia `BPAL046`	1
WSR1800R	01-Feb-20	Scrape		33		Nocticola `BBL040` (quartermaini s.l.)	3
WSR1827R	18-Sep-19	Scrape		45		Nematoda spp.	1
WSR1883R	31-Jan-20	Scrape		40		Nematoda spp.	2
WSR1911R	31-Jan-20	Scrape	35			Bathynellidae `BSY206`	12
WSR1917R	31-Jan-20	Scrape		46		Hanseniella `BSYM095`	1
XAN0026R	04-Feb-20	Scrape		32		Nocticola sp.	1
ES83_019	31-Jan-20	Trap 1		20	18	Enchytraeidae `2 bundle` s.l.	6
EXP0098	21-Jul-10	Trap 1		9	8	Gastrocoptinae sp.	2
EXP0179	21-Jul-10	Trap 1		40	40	Oligochaeta sp.	2
EXR0347	20-Jul-10	Trap 1		15	14	Lophoturus madecassus	6
EXR0348	14-Apr-10	Trap 1		7		Troglarmadillo `ISO005`	2
EXR0350	14-Apr-10	Trap 1		21		Oligochaeta sp.	20
EXR0350	14-Apr-10	Trap 1		21		Sciaridae sp. B01	4
EXR0350	20-Jul-10	Trap 1		29	12	Lophoturus madecassus	3
EXR0447	21-Jul-10	Trap 1		140	30	Armadillidae sp.	1

Hole	VisitDate	Method	SWL	EOH	TDepth	Species	No.
EXR0449	21-Jul-10	Trap 1		47	40	Armadillidae sp.	1
EXR0647	14-Apr-10	Trap 1		25		Oligochaeta sp.	1
EXR0647	14-Apr-10	Trap 1		25		Dodecastyla sp. B02 (=Atelurodes sp. S02)	12
EXR0647	14-Apr-10	Trap 1		25		Lophoturus madecassus	1
EXR0647	20-Jul-10	Trap 1		25	15	Dodecastyla sp. B02 (=Atelurodes sp. S02)	28
EXR0647	20-Jul-10	Trap 1		25	15	Lophoturus madecassus	1
EXR0648	20-Jul-10	Trap 1		52	30	Gastrocoptinae sp.	1
EXR0648	20-Jul-10	Trap 1		52	30	Polyxenidae sp.	1
EXR0782	14-Apr-10	Trap 1		25		Troglarmadillo `ISO005`	1
EXR0989	14-Apr-10	Trap 1		26		Lophoturus madecassus	6
EXR0989	20-Jul-10	Trap 1		26	10	Lophoturus madecassus	22
EXR0992	22-Jul-10	Trap 1		52	30	Oligochaeta sp.	10
EXR0992	22-Jul-10	Trap 1		52	30	Japygidae `BDP165`	1
EXR0992	22-Jul-10	Trap 1		52	30	Lathrobiina sp. B01	4
EXR0995	14-Apr-10	Trap 1		8		Oligochaeta sp.	10
EXR0995	22-Jul-10	Trap 1		8	7	Oligochaeta sp.	20
EXR1661R	20-Jul-10	Trap 1		91	30	Polyxenidae sp.	1
EXR1668R	20-Jul-10	Trap 1		28	15	Lophoturus madecassus	1
WSR0305R	31-Jan-20	Trap 1		75	54	Lophoturus madecassus	5
WSR0423R	16-Sep-19	Trap 1		51	10	Lophoturus madecassus	3
WSR1586DTM	31-Jan-20	Trap 1		57	15	Sciaridae sp. B01	3
WSR1586DTM	31-Jan-20	Trap 1		57	15	Cryptops `BSCOL065`	1
WSR1608R	02-Feb-20	Trap 1	15		60	Lophoturus madecassus	1
WSR1644R	17-Sep-19	Trap 1		51	15	Cryptops `BSCOL064`	1
WSR1658R	01-Feb-20	Trap 1		45	25	Lophoturus madecassus	4
WSR1659R	01-Feb-20	Trap 1		46	20	Indohya sp.	1
WSR1729R	01-Feb-20	Trap 1	85		12	Lophoturus madecassus	1
WSR1800R	01-Feb-20	Trap 1		33	30	Nocticola sp.	2
WSR1863R	17-Sep-19	Trap 1	71	75	10	Lophoturus madecassus	1
WSR1967R	17-Sep-19	Trap 1		81	10	Lophoturus madecassus	2
WSR1974R	30-Jan-20	Trap 1		32	10	Dodecastyla sp.	1
WSR1982R	30-Jan-20	Trap 1		24	16	Lophoturus madecassus	3
WSR1982R	30-Jan-20	Trap 1		24	16	Sciaridae sp. B01	1
WSR1994R	30-Jan-20	Trap 1		30	10	Lophoturus madecassus	2
WSR2037DTM	31-Jan-20	Trap 1		20	18	Sciaridae sp. B01	1
EXR0350	20-Jul-10	Trap 2		29	20	Sciaridae sp. B01	13
EXR0350	20-Jul-10	Trap 2		29	20	Oligochaeta sp.	5
EXR0350	20-Jul-10	Trap 2		29	20	Lophoturus madecassus	1
EXR0447	21-Jul-10	Trap 2		140	60	Armadillidae sp.	1
EXR0647	20-Jul-10	Trap 2		25	25	Dodecastyla sp. B02 (=Atelurodes sp. S02)	12
EXR0647	20-Jul-10	Trap 2		25	25	Lophoturus madecassus	1
WSR0171DT	30-Jan-20	Trap 2		48	35	Lophoturus madecassus	15
WSR1598R	01-Feb-20	Trap 2		60	30	Lophoturus madecassus	7