Appendix D.

Subterranean Ecology: File Note 21st February 2011

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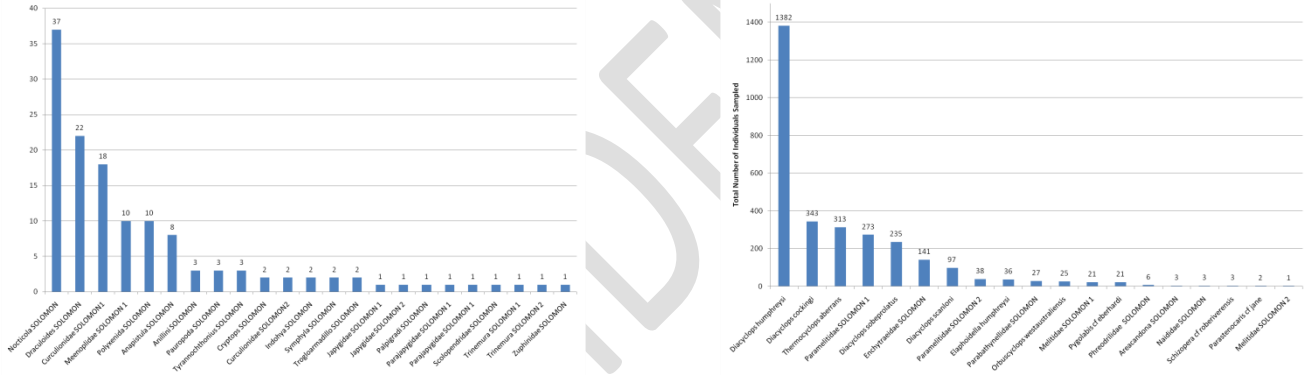
FILE NOTE TO SHAUN GREIN FMG

UPDATED 21th Feb 2011

Invertebrate ecological communities typically comprise a few species that are abundant and a majority of species occurring in low numbers. Pilbara subterranean communities are no exception to this general natural pattern. The abundance histograms for the Kings Baseline Subterranean Fauna Survey illustrates this pattern clearly, with most species known from only from one, two, or three specimens (see graphs below).

Kings Baseline Troglofauna (left) and Stygofauna (right)



For biological surveys, this means it is difficult to detect most of the rare species in a community, and almost impossible to collect all species in the course of one or even several surveys.

In the case of follow-up surveys, it is also difficult to re-collect the rare species.

Despite this practical limitation, the Solomon Regional Subterranean Fauna Survey re-collected 82% of stygofauna species and 35% of troglofauna species recorded during the Kings and Firetail Baseline Subterranean Fauna Surveys.

Considering the inherent rarity of most species, and the practical sampling difficulties involved with subterranean fauna surveys, the Solomon Regional Survey had a good recapture success rate (see graphs below).

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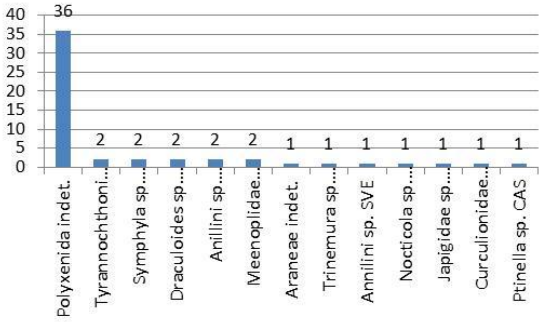
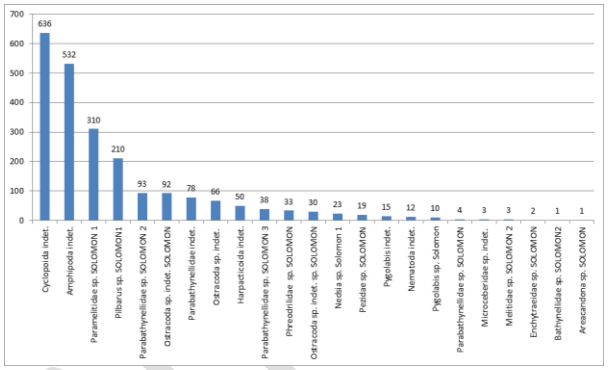
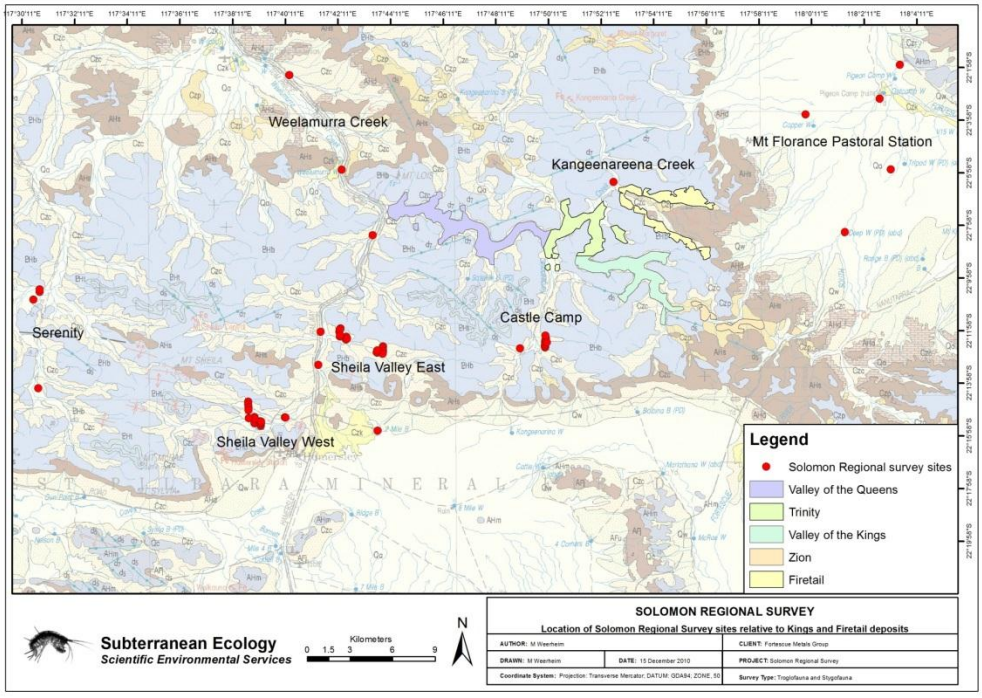
Solomon Regional Subterranean Fauna Abundance Troglofauna (left) and Stygofauna (right)





The Solomon Regional Subterranean Fauna Survey sampled seven reference areas situated in similar geological and/or hydrological settings within 25 km of the Kings and Firetail deposits, including Castle Camp, Mt Florence, Sheila Valley East and West, Serenity, Kangeenareena Creek, and Weelamurra Creek (see figure below).



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Other factors limiting the capture success during the Solomon Baseline Subterranean Fauna Survey were:

1. Access to suitable sampling sites – eg. drill holes in similar CID geology at Serenity were limited;
2. CID Deposits at Sheila Valley are smaller and more fragmented than at Kings;
3. BIF deposits (at Sheila Valley and Castle Camp) provide less optimum habitat for subterranean fauna than CID.
4. Season – The October-December regional survey timing was not optimum survey season for troglofauna which is typically late wet season.

The regional results support the conclusion made in the Solomon Baseline Subterranean Fauna Survey, that, the sampling evidence suggests it is probable that species of subterranean fauna collected in the Kings CID palaeochannel deposits will also be found to occur outside the proposed mine impact zones, in suitable porous geological strata and connected hydrologic catchments, however the possible existence of locally restricted SRE species cannot be discounted. Determining the distribution range of all potential SRE species will be difficult owing to practical limitations in sampling.

Dr Stefan Eberhard
Director
Subterranean Ecology Pty Ltd
21st February 2011