Western Australian Threatened Species and Communities Unit

DEPARTMENT OF Conservation AND LAND MANAGEMENT
Conserving the nature of WA

Project Officer, Threatened Ecological Communities
WA Wildlife Research Centre, Wildlife Place, Woodvale
Postal Address: PO Box 51, Wanneroo, WA 6946

Tel: +61 8 9405 5168 Fax: +61 8 9306 1066
Email: sallybl@calm.wa.gov.au

To: Stephen White, Environmental Protection

WETLANDS CONSERVATION PROJECT 2000 FINAL REPORT

Please find enclosed final report and attachments for the Wetlands Conservation Project (2000) funded project 'Conserving organic mound springs in the Kimberley Region'.

SgBlack

Sally Black
Project Officer, Conserving Threatened Ecological Communities Outside the Southwest
13 November 2001

Adrian is This the report you were after?
Jill ?.. 28/11/05

Department of Conservation and Land Management
Wetlands Conservation Project 2000 Final Report:
Conserving organic mound springs of the Kimberley Region.

1. Where the project as described in the funding application has been completed:-
   - have all of the objectives stated in the project proposal been met? - **Yes**
   - if not, which objectives have not been met and why? - **NA**
   - have you achieved more than intended? Give details. - **No**
   - did you meet the timelines indicated in the application? If no, give details. **Yes, all subcontracted flora and fauna taxonomic work completed by 30 June 2001**

2. If the project as described in the funding application has not been completed:- **NA**
   - why has the project not met the timeline your proposal put forward?
   - what changes to the proposal, if any, have occurred or will occur?
   - will all of the stated objectives be met, if not, which will not be met and why?
   - do you intend to carry any project funds over to next financial year, give details of how and how much?
   - when do you expect the project to be completed? Provide a revised timeline showing both works complete and planned.

3. Has there been any media coverage of the project (including in CALM News)? Give details and copies of articles. Where there has been no media coverage, what is planned and when?

As requested an article was written and forwarded to Nigel Higgs for publication in media of his choice. It is anticipated that an article on conserving the States' organic mound springs as threatened ecological communities will be drafted for publication in Landscope in early 2002.

4. Please provide a description of the work that has been carried out. Where possible, please include quantitative information such as metres of fencing completed, area of weeds treated, samples taken and identified, reports written etc. Where appropriate provide photographs of the work, diagrams, maps and/or reports produced.

The goal of the project was to identify the organic mound springs of the Kimberley Region as threatened ecological communities in order to conserve them. This necessitated obtaining sufficient biological data to clarify the taxonomy and distribution of poorly known groups of flora and fauna considered to be ecologically important (eg rushes and sedges, crustaceans, aquatic insect larvae, diatoms, rotifers). Specific actions were the sorting and identification of sedge plants and invertebrate fauna collected by the Project Officer during field survey. Contracts were let to sort and identify 8 invertebrate samples, and plant collections from eleven sites. Annotated species lists (Attachments 1 and 2) and a report 'Comments on Kimberley Springs sampled by Sally Black' (Attachment 3) are attached.

This data has been used to classify, define and describe the organic mound springs of the Kimberley Region as community types, so they could be added to the Threatened Ecological Communities Database and formally assessed by the WA Threatened Ecological

Communities Scientific Committee. As a result of the work the following communities have been databased and formally assessed:

- **Black Spring organic mound spring community (Endangered) (Attachment 4)**
- **Organic mound spring communities of Big Springs (Vulnerable) (Attachment 5)**
- **Organic mound spring communities of Bunda Bunda (Vulnerable) (Attachment 6)**
- **Organic mound spring community of the southern North Kimberley Bioregion (Mt Elizabeth and Drysdale River Stations) (Vulnerable –near Endangered, to be reassessed within 5 years) (Attachment 7)**
- **Lolly Well Springs organic mound spring wetland complex (Priority 1) (Attachment 8)**
- **Closed canopy rainforest on freshwater swamps on alluvial floodplain soils in the east Kimberley (Point Spring and Long Swamp) (Priority 1 – to be reassessed subsequent to further analysis of floristic survey data) (Attachment 9)**

Listing as threatened ecological communities gives these wetlands priority conservation status and the implementation of management actions has commenced with the Project Officer conducting onsite liaison with pastoral managers, lessees and LCDC members. The results of this WCP Project also provide baseline data required for monitoring purposes.

5. An itemized account of the total expenditure of the project funds **provided by CALM** is required. Please state the flexfields that have been used with a description and the amount spent against each flexfield. See below for an example.

Example of expenditure details required. (Please only include the relevant items, add or remove items as required).

Flexfield	**Description**	**Amount**
145-01-24-017-1621-0000-113	Contracts for invertebrate fauna identification	$7780
145-01-24-017-1621-0000-113	Contract for flora identification	$720
	Total Expenditure	**$8500**

6. Where another organisation has contributed to the project:

   - what has their contribution been?

CALM WATSCU is a major contributor to this WCP project which has been conducted as part of the project 'Conserving threatened ecological communities throughout the State, especially outside the southwest' (jointly funded by CALM WTSCU and an NHT grant). The WATSCU contribution is as follows:
(1)Salary and oncosts for Project Officer for 2000/2001 to coordinate project, to conduct field survey and sampling, to identify, describe, classify and database threatened ecological communities, and to nominate and present the communities for formal assessment by the WA Threatened Ecological Communities Scientific Committee)
(2)Cost of travel, field surveys and sampling.

   - please provide details of funding (how much and used for what) and resourcing (what resources and used for what).

(1)Salary and oncosts: $9743 (equivalent of 2 months)

(2)Field survey: $ 5000
Total: $14743

7. Have volunteers, community groups or CALM Bushrangers etc. been used in the project? Please provide details of the number of volunteer hours/days, number of volunteers involved, name of groups involved, tasks completed etc. Please provide any photographs of these groups carrying out the work.

Yes – the Broome Botanical Society provided assistance during field survey and sampling.

Comments on Kimberley Springs sampled by Sally Black

Stuart Halse (*2 October 2001*)

Seven springs were sampled in 2000 for aquatic invertebrates by Sally Black using a pondnet with 250μm mesh. This biased sampling against micro-invertebrtaes, which usually comprise about half the invertebrate species in a wetland. Nevertheless, a total of 122 species were collected, of which 96 were macro-invertebrates and 26 micro-invertebrates.

A table listing the species collected at each site is attached. Species richness varied from 40 at Big Spring to 12 at Moon Spring. This compares quite favourably with the richness of springs of Mandora Marsh, northern wheatbelt and eastern Gnangara Mound (36-22, 35-9 and 23-19 species, respectively), given that a fuller range of micro-invertebrates was collected from these sites (Jasinska 1998; Pinder and Pennifold 2001; Storey *et al* 2001).

The richness of the springs sampled by Black compares less favourably with Edge swamp, Rainforest swamp and Brolga Spring sampled by Halse et al (1996) on the Victoria-Bonaparte mudflat but the differences are entirely attributable to the large micro-invertebrate lists compiled by Halse *et al.* Detailed comparisons of the Victoria-Bonaparte springs and those sampled by Black are not made in this report but the Victoria-Bonaparte work has been used to provide additional context for interpreting the significance of springs sampled by Black (referred to as Kimberley springs in the remainder of the report).

Two differences were observed between the fauna of the Kimberley springs and those elsewhere in Western Australia. Firstly, there is a strong Indo-Pacific or Asian element in the Kimberley spring fauna, especially in the micro-invertebrates despite under-collecting. The three *Mesocyclops* species collected all have an Indo-Pacific distribution, as do the ostracods *Stenocypris malcolmsi* and *Cyprinotus kimberleyensis* and the hydrophilid beetle *Regimbarta attenuata* (see attached table). A similar pattern was found in the swamps of the Victoria-Bonaparte mudflat (Halse *et al.* 1996).

Secondly, almost one-fifth of the fauna collected in both the Kimberley and Mandora springs were beetles, compared with <10% at Gnangara and in the wheatbelt. The hemipteran fauna exhibited a similar, comprising approx. 10% of the Kimberley and Mandora faunas and being absent from the southern springs. This was repeated for most other insect groups and probably reflects the greater availability of free water at the Kimberley and Mandora sites.

Several of the described species collected in the Kimberley springs were first records for Western Australia, although this probably reflects the fact that many of the species are restricted to northern partsof the State where there has been little previous northern collecting, rather than implying rarity of the fauna and high conservation significance of the Kimberley springs. Among the first records were the ostracod *Stenocypris malcolmsi*, the cyclopoid copepods *Mesocyclops papuensis* and *M. woutersi*, the hemipteran *Naucoris australicus*, the dragonflies *Hemicordulia australiae* and *Orthetrum villsovittatum*, and the worm *Pristina probiscidae.*

Many of the species found in the Kimberley springs are restricted to northern Australia (see attached table). This trend is not as pronounced at the Mandora springs, where a greater proportion of species occur across the continent or have southern affinities (see Storey *et al.* 2001). Together with the Indo-Pacific faunal element, however, it suggests that the Kimberley springs do contain a different community from that at Mandora.

In terms of biogeography and conservation significance, the following can be hypothesised:

- Despite unevenness in collecting effort and taxonomic treatment, there appears to be a gradation in species composition of springs from south to north, with distinct Kimberley (including Victoria-Bonaparte), Mandora and southern communities.
- The amount of free water at a site affects species richness and faunal composition (free water increases richness and the proportion of surface water macro-invertebrates, especially larger

flying insects) and this may be largely responsible for the different types of animals (as opposed to species) in the northern and southern springs.

- Kimberley springs appear to be relatively rich aquatic habitats. Big Spring and Black Spring stand out as important because of their richness and the high proportion of northern species they contain and warrant conservation. Based on the particular taxa present and their importance, Mt Elizabeth Spring is probably the next most worthy of protection.

The above comments are preliminary because of the lack of work on springs in Western Australia, the different sampling methods employed in different studies and the fact that no site has a complete list. Further work may change our perceptions of the importance of sites. In particular, it will be interesting to see how collections recently made by Halse, Scanlon and Cocking, at flowing spring sites in the Pilbara, fit into the picture above. It would also be rewarding to undertake micro-invertebrate sampling with finer mesh nets at the Kimberley Springs.

References

Halse, S.A., Shiel, R.J. and Pearson, G.B. 1996. Waterbirds and aquatic invertebrates of swamps on the Victoria Bonaparte mudflat, northern Western Australia. *Journal of the Royal Society of Western Australia* **79**, 31-38.

Jasinska, E.J. 1996. Monitoring of tumulus spring invertebrates. Unpublished report to WATSCU and WRC.

Pinder, A.M. & Pennifold, M.G. 2001. A survey of the aquatic invertebrates of some organic mound springs in the Shire of Three Springs, Western Australia. Unpublished report to WATSCU.

Storey, A.W., Halse, S.A. & Shiel, R.J. 2001. Aquatic fauna and water chemistry *in* A land assessment of Mandora Marsh and its immediate surrounds - October 1999. Unpublished report, department of Conservation and Land Management.

Attachment Z:

Invertebrate fauna species list from Kimberley ~~Region~~ organic mound springs. 2000/2001.

✓ ✓ Lolly

Class	Order	Family	Genus	Comment	Mt Elizabeth.	Black Spring	ollywell Sprii	Moon Spring	Enigma Spring	Big Spring	Drysdale River	o. sites taxa occurred at
Gastropoda	Gastropoda	Ancylidae	*Ferrissia (Pettancylus) petterdi.*	Worldwide distribution. Confirmed by Shirley Slack Smitl	0	0	0	0	1	0	0	1
Gastropoda	Gastropoda	Planorbidae	*Gyraulus sp. 2*	Confirmed by Shirley Slack Smitl	0	1	0	0	1	1	1	4
Gastropoda	Gastropoda	Planorbidae	*Leichhardtia sp.*	Possibly *sinuvius* (Shirley Slack Smith)	0	0	0	0	1	0	0	1
Gastropoda	Gastropoda	Planorbidae	*Glytophysa sp.*	Possibly *egregia* (Shirley Slack Smith)	0	0	0	0	0	1	0	1
Gastropoda	Gastropoda	Lymnaeidae	*Austropeplea lessoni*	Large native species. Confirmed by Shirley Slack Smitl	0	1	0	0	0	0	0	1
Oligochaeta	Oligochaeta	Naididae	*Allonais paraguayensis*	Typically northern Australian species	0	1	1	1	1	0	0	4
Oligochaeta	Oligochaeta	Naididae	*Dero proboscidea*	Typically northern Australian species	0	1	0	0	0	0	0	1
Oligochaeta	Oligochaeta	Naididae	*Pristina proboscidae*	Common in Nth Australia but new record from Nth W.A	0	1	.1	0	0	0	0	2
Oligochaeta	Oligochaeta	Naididae	*Nais communis*	Tentitive ID but new record from Nth W.A	0	0	0	0	0	0	1	1
Oligochaeta	Oligochaeta	Tubificidae		Typically northern Australian species	0	0	0	0	1	0	0	1
Arachnida	Acarina	Oribatidae	*Oribatidae sp.*	No key available.	1	1	0	0	1	0	1	4
Arachnida	Acarina	Acarina	*Acarina sp.*		0	1	0	0	1	0	0	2
Crustacea	Cladocera	Sididae	*Diaphanosoma/Latonopsis sp.*	Waiting for species I.D	0	0	0	0	0	1	0	1
Crustacea	Cladocera	Chydoridae	*Alona cf. longinqua*	Widespread pancontinental.	1	0	0	0	0	0	0	1
Crustacea	Cladocera	Chydoridae	*Alona cf. rigidicaudis*	Widespread pancontinental.	1	0	0	0	0	0	0	1
Crustacea	Cladocera	Chydoridae	*Kurzia cf. longirostris*	WA, NT, QLD, NSW not common	0	0	0	0	0	1	0	1
Crustacea	Cladocera	Chydoridae	*Leydigia sp.*	Waiting for species I.D	0	0	0	0	0	1	0	1
Crustacea	Cladocera	Chydoridae	*Rak sp.*	Probably recently discovered species but remains unnamed, probably more widespread in WA than sparse records indical	1	0	0	0	0	0	0	1
Crustacea	Cladocera	Macrothricidae	*Macrothrix sp. a*	Waiting for species I.D	1	0	0	0	0	0	0	1
Crustacea	Cladocera	Macrothricidae	*Macrothrix sp. b*	Waiting for species I.D	0	0	0	0	0	1	0	1
Crustacea	Cladocera	Ilyocryptidae	*Ilyocryptus sp.*	Waiting for species I.D	1	0	0	0	0	0	1	2
Crustacea	Cladocera	Daphnidae	*Ceriodaphnia cornuta*	Pancontinental.	0	0	0	0	0	1	0	1
Crustacea	Cladocera	Daphnidae	*Ceriodaphnia sp.*	This species not yet seperated or described within this complex	0	0	0	0	0	1	0	1
Crustacea	Ostracoda	Candonidae	*Candonopsis tenuis*	Widespread epigean species in Australia	0	0	0	0	0	0	1	1
Crustacea	Ostracoda	Cyprididae	*Cyprinotus kimberleyensis*	Occurs NW Australia and Asia	0	0	1	0	1	0	0	2
Crustacea	Ostracoda	Cyprididae	*Cypretta baylyi*	Widespread Australian species	0	1	0	0	0	1	0	2
Crustacea	Ostracoda	Cyprididae	*Cypretta sp.654*	Possibly undescribed species.	0	0	0	0	0	1	0	1
Crustacea	Ostracoda	Cyprididae	*Sternocypris malcolmsi*	Occurs NW WA, NT and Asia (some taxonomic problems	0	0	0	0	0	1	0	1
Crustacea	Ostracoda	Cyprididae	*Herpetocypris sp.652*	Possibly undescribed species.	0	1	0	0	0	1	0	2
Crustacea	Ostracoda	Cyprididae	*Strandesia sp. 653*	Possibly undescribed species.	0	0	0	0	0	1	0	1
Crustacea	Ostracoda	Cyprididae	*Ilyodromus viridulus*	Fairly widespread, first recorded in NW WA	1	1	0	0	0	1	1	4
Crustacea	Ostracoda	Cyprididae	*Ampullocypris oblongata*	NW Australia and perhaps more widely distribute	0	1	0	0	0	0	0	1
Crustacea	Copepoda	Cyclopoida	*Mesocyclops papuensis*	Recorded in Qld, New Guinea, Borneo, Java	1	0	0	0	0	0	0	1
Crustacea	Copepoda	Cyclopoida	*Mesocyclops darwini*	Of possible significance, more material needed	1	0	0	0	0	0	0	1
Crustacea	Copepoda	Cyclopoida	*Mesocyclops woutersi*	Recorded in Qld, New Guinea, Laos, Vietnam, Sth China	0	0	0	0	0	1	0	1
Crustacea	Copepoda	Cyclopoida	*Ectocyclops rubescens*	Northern species, Gondwanan relic	0	1	0	0	0	1	0	2
Crustacea	Copepoda	Cyclopoida	*Eucyclops australiensis*	Common throughout Australia	0	0	0	1	0	0	0	1
Crustacea	Copepoda	Cyclopoida	*Microcyclops varicans*	Common throughout Australia	0	0	0	0	0	0	1	1
Crustacea	Decapoda	Atyidae	*Caridina serratirostris*	Coastal areas of tropical areas	1	0	0	0	0	0	0	1
Insecta	Ephemeroptera	Caenidae	*Tasmanocoenis sp.*	Poorly preserved specimens therefore unable to ID to specie	1	0	0	0	0	0	1	2
Insecta	Ephemeroptera	Caenidae	*Tasmanocoenis arcuata*	Found in Kimberley.	1	1	0	0	0	0	1	3
Insecta	Ephemeroptera	Baetidae	*Cloeon sp.*	No key available	0	1	1	1	0	1	1	5
Insecta	Zygoptera	Coenagrionidae	*Xanthagrion erythroneurum*	Common throughout Australia except Cape York. Confirmed by Gunthe	1	1	0	0	0	0	1	3
Insecta	Zygoptera	Coenagrionidae	*Coenagrionidae aeruginosum.*	Confirmed by Gunther	1	0	0	1	0	1	0	3
Insecta	Zygoptera	Coenagrionidae	*Ischnura rubescens*	Confirmed by Gunther	0	0	1	0	0	0	0	1
Insecta	Zygoptera	Coenagrionidae	*Pseudagrion sp.*	Confirmed by Gunther	0	0	0	0	1	0	0	1
Insecta	Zygoptera	Coenagrionidae	*Agriocnemis rubescens*	Distribution NSW to Nth WA , South East Asia, Indonesia & New Guinea. Confirmed by Gunth	0	0	0	0	1	0	0	1
Insecta	Zygoptera	Coenagrionidae	*Agriocnemis sp.*	Confirmed by Gunther	0	0	0	0	0	1	0	1
Insecta	Epiproctophora	Lindeniidae	*Ictinogomphus australis*	Found in Kimberley.	0	0	0	0	1	0	0	1
Insecta	Epiproctophora	Hemicorduliidae	*Hemicordulia australiae*	New record for Nth W.A. Confirmed by Gunthe	0	0	0	0	1	0	0	1
Insecta	Epiproctophora	Hemicorduliidae	*Hemicordulia sp.*		1	1	0	0	0	1	0	3
Insecta	Epiproctophora	Libellulidae	*Orthetrum villsovittatum*	New record for Nth W.A. Confirmed by Gunthe	1	1	0	1	0	1	0	4
Insecta	Epiproctophora	Libellulidae	*Orthetrum caledonicum*	Common throughout Australia except Tasmania. Confirmed by Gunthe	0	1	0	0	0	0	0	1
Insecta	Epiproctophora	Libellulidae	*Rhodothemis lieftincki*	Northern Australian species.Confirmed by Gunthe	0	0	0	0	1	0	0	1
Insecta	Hemiptera	Hydrometridae	*Hydrometra sp.*	No key available.	0	0	1	0	1	0	0	2
Insecta	Hemiptera	Gerridae	*Lymnogonus luctuosus*	Widely distributed in Nth Australia	0	1	0	0	0	0	0	1
Insecta	Hemiptera	Veliidae	*Microvelia sp.*	Juveniles therefore unable to ID further	1	1	1	0	0	0	1	4
Insecta	Hemiptera	Hebridae	*Merragata hackeri*	Recorded previously in Durack River. Also NT & QLD	0	0	0	0	0	1	0	1
Insecta	Hemiptera	Mesoveliidae	*Mesovelia sp.*		0	0	1	0	0	0	0	1
Insecta	Hemiptera	Corixidae	*Micronecta sp.*	Possibly new or may be australiensis - doesn't match any of the common specie	0	0	1	0	0	1	1	3
Insecta	Hemiptera	Corixidae	*Agraptocorixa sp.*		0	0	0	0	0	1	0	1
Insecta	Hemiptera	Naucoridae	*Naucoris subopacus*	Endemic species has northern Australian distribution	1	0	0	0	0	1	1	3
Insecta	Hemiptera	Naucoridae	*Naucoris australicus*	New record for Nth W.A. Sent off for confirmation	0	0	0	0	0	1	0	1
Insecta	Hemiptera	Nepidae	*Austronepa angusta*	Northern species	0	0	1	0	0	0	0	1
Insecta	Hemiptera	Notonectidae	*Anisops sp poss nasuta*	Northern distribution, Nth West Cape, NT & Nth QLD	1	0	1	1	0	1	0	4
Insecta	Hemiptera	Notonectidae	*Enithares loria*	Widespread Australasian species	0	0	1	0	0	0	0	1
Insecta	Hemiptera	Notonectidae	*Paranisops endymion*		0	0	0	0	0	1	0	1
Insecta	Hemiptera	Pleidae	*Plea sp.*	No key available.	0	0	1	1	1	1	1	5
Insecta	Diptera	Culicidae	*Culex sp.*		1	1	0	0	0	0	1	3
Insecta	Diptera	Culicidae	*Anopheles sp.*		0	0	1	0	0	0	0	1
Insecta	Diptera	Culicidae	*Anopheles novaguinesis*	Common	0	1	0	0	0	0	0	1
Insecta	Diptera	Tanypodinae*	*Procladius paludicola*	Common in Western Australia	1	0	1	1	0	0	1	4
Insecta	Diptera	Tanypodinae*	*Pentaneurini sp.*		1	1	1	0	0	1	1	5
Insecta	Diptera	Chironominae*	*Tanytarsus fuscithorax*	Widespread Australia species	1	0	0	0	0	0	0	1
Insecta	Diptera	Chironominae*	*Tanytarsus bispinosus*	Two records in NSW otherwise NT and Nth WA	0	1	0	0	0	0	0	1
Insecta	Diptera	Chironominae*	*Paraborniella sp.*		1	0	0	0	0	0	0	1
Insecta	Diptera	Chironominae*	*Chironomus aff. alternans*	Widespread Australia species	0	0	1	1	1	1	0	4
Insecta	Diptera	Chironominae*	*Chironomus oppeni*	Widespread Australia species	0	0	0	1	0	0	0	1
Insecta	Diptera	Chironominae*	*Kiefferulus intertinctus*	Previously recorded from Hamersley Range north through to the NT and Eastern Austral	0	0	1	0	0	1	0	2
Insecta	Diptera	Chironominae*	*Paratanytarsus sp.*		0	0	1	0	0	0	0	1

Attach Waterfall

02/03 (Black Roe Mt Eliz

Austrokiltoria rubatteras

Insecta	Diptera	Chironominae*	*Polypedilum nubifer*	Widespread Australian species	0	1	0	0	0	0	0	1
Insecta	Diptera	Chironominae*	*Polypedilum sp.*		0	0	0	1	0	0	0	1
Insecta	Diptera	Chironominae*	*Zavrelia marmorata*	Previous records from the NT & NSW	0	0	0	0	1	0	0	1
Insecta	Diptera	Chironominae*	*Dicrotendipes jobetus*	Previously recorded from NT & Nth Kimberley but extends into wheatbe	0	0	0	0	1	0	0	1
Insecta	Diptera	Chironominae*	*Dicrotendipes sp.*		0	0	0	0	1	0	0	1
Insecta	Diptera	Orthocladiinae*	*Parakiefferiella sp.*		0	1	0	0	0	0	0	2
Insecta	Diptera	Orthocladiinae*	*Orthocladinae sp s03*		0	0	0	0	0	0	0	1
Insecta	Diptera	Ceratopogonidae	*Atrichopogon sp.*	No key available	1	1	0	0	0	0	1	1
Insecta	Diptera	Ceratopogonidae	*Bezzia sp.*		1	1	1	0	0	0	0	2
Insecta	Diptera	Ceratopogonidae	*Nilobezzia sp.*		0	0	1	0	1	1	0	5
Insecta	Diptera	Ceratopogonidae	*Culicoides sp.*		0	1	0	0	0	0	0	1
Insecta	Diptera	Ceratopogonidae	*Forcipomyiinae sp.*		0	0	0	0	1	0	0	1
Insecta	Diptera	Stratiomyidae	*Stratiomyidae sp.*	No key available	0	0	1	0	0	0	0	1
Insecta	Diptera	Tabanidae	*Tabanidae sp.*	No key available	0	0	0	0	1	0	0	2
Insecta	Diptera	Dolichopodidaea	*Dolichopodidae sp.*	No key available	0	1	0	0	0	0	0	1
Insecta	Trichoptera	Leptoceridae	*Triplectides ciuskus seductus*	Found in northen WA and Northern Territory	0	0	0	0	0	0	1	1
Insecta	Trichoptera	Leptoceridae	*Triplectides helvolus*	Found in northen WA, northern Queensland and Northern Territor	1	0	0	0	0	1	0	1
Insecta	Trichoptera	Leptoceridae	*Trianodes sp.*	No case for ID to species level	0	0	1	0	0	0	1	3
Insecta	Coleoptera	Noteridae	*Noteridae sp.*		0	1	0	0	0	0	0	1
Insecta	Coleoptera	Dytiscidae	*Neohydrocoptus subfasciatus*	Confirmed by C Watts	0	0	0	0	0	0	1	1
Insecta	Coleoptera	Dytiscidae	*Hydrovatus ovalis*	Northern Australian species. Confirmed by C Watt	0	1	0	0	0	0	0	1
Insecta	Coleoptera	Dytiscidae	*Copelatus clarki*	Qld NT and Northern WA distribution. Confirmed by C Watt	1	0	0	0	0	0	1	2
Insecta	Coleoptera	Dytiscidae	*Liodessus inornatus*	Common.	0	0	0	0	1	0	0	2
Insecta	Coleoptera	Dytiscidae	*Megaporus ruficeps*	Common	0	0	0	0	1	0	0	1
Insecta	Coleoptera	Dytiscidae	*Laccophilus clarki*	Northern Australian species	0	0	0	0	1	0	0	1
Insecta	Coleoptera	Dytiscidae	*Laccophilus sharpi*	Northern Australian species	0	0	0	0	1	0	0	1
Insecta	Coleoptera	Dytiscidae	*Hydrogluphus godeffroyi (Sharp,*	Confirmed by C Watts	0	0	0	0	0	1	0	1
Insecta	Coleoptera	Dytiscidae	*Hydrogluphus lesi (Guignot,*	Confirmed by C Watts	0	0	1	0	0	0	0	1
Insecta	Coleoptera	Dytiscidae	*Onychohydrus stratus*	Confirmed by C Watts	0	0	1	0	0	0	0	1
	Coleoptera	Hydrophilidae	*Hydrobiomorpha helenae*	Still water tropical species ← sternolophys	0	0	1	0	0	0	0	1
Insecta	Coleoptera	Hydrophilidae	*Paracymus pygmaeus*	Common.	0	1	0	0	0	0	0	1
Insecta	Coleoptera	Hydrophilidae	*Enochrus eburiens*	Northern Australian species ←	1	1	1	0	1	0	1	5
Insecta	Coleoptera	Hydrophilidae	*Enochrus deserticola*	Widespread Australian species	0	1	0	0	0	1	0	2
Insecta	Coleoptera	Hydrophilidae	*Regimbartia attenuata*	Distribution from northern NSW to the Kimberley, South East Asia to Sri Lan	0	1	1	0	0	0	0	2
Insecta	Coleoptera	Hydrophilidae	*Paranacaena horni (Blackburn,*	Confirmed by C Watts	0	0	0	0	1	1	0	2
Insecta	Coleoptera	Hydrophilidae	*Berosus sp.*	No key available.	0	0	0	0	0	0	1	1
Insecta	Coleoptera	Hydrophilidae	*Hydrocus sp.*	No key available.	0	0	1	0	0	0	0	1
Insecta	Coleoptera	Hydrophilidae	*Hydrophilidae sp.*		0	0	1	0	1	1	0	3
Insecta	Coleoptera	Scirtidae	*Scirtidae*	No key available	0	0	0	0	0	0	1	1
Insecta	Coleoptera	Brentidae	*Nanophyes sp.*	No key available	0	1	1	0	0	1	0	3
TOTAL TAXA @ EACH SITE					0	0	1	1	0	0	0	2
					29	37	32	11	28	40	27	204

KMS001 Big Spring 7/09/1999

KMS002 Mt. Elizabeth 14/9/99

KMS003 Moon Spring 4 14/9/99

KMS004 Black Spring 18/9/1999.

KMS005 Native Wells/Drysdale 19/9/1999

KMS006 Lollywell Spring 18/7/99

KMS007 Enigma Spring 1/10/2000

KMS008 Bunda Bunda 27/7/2001

KMS009 Kachana Mound Spring 6/9/2003