

MAGNT RESEARCH REPORT No. 1
MAY 1998

**WILDLIFE SURVEY IN FRESHWATER ECOSYSTEMS
AND ADJOINING TERRESTRIAL HABITATS ON
MELVILLE ISLAND, NORTHERN TERRITORY
OCTOBER 1996**

Edited by
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REPORT TO THE TIWI LAND COUNCIL AND AUSTRALIAN
HERITAGE COMMISSION

Edited by

PAUL HORNER

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First printed 29 May, 1998

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SUMMARY

The Tiwi Islands, comprising Bathurst and Melville Islands to the north of Darwin, Northern Territory, are of high natural and cultural significance. Narrowly separated by a fast-flowing strait, these large continental islands are approximately 70 kilometres from the mainland and are inhabited by the Tiwi people. Compared to the adjacent mainland, they include mostly pristine habitat, relatively undisturbed by European settlement and the effects of introduced plants and animals.

This report presents the results of a two week field survey (3-17 October 1996) of wildlife in freshwater ecosystems on Melville Island. At the initial planning stage of the project it was intended to carry out surveys of freshwater ecosystems on both Islands, however, a funding reduction restricted field work to the larger Melville Island only. Conducted in collaboration with Aboriginal custodians, the survey aimed to assess wildlife associated with freshwater ecosystems, including the fauna occurring in the various terrestrial habitats bordering the creeks and streams on Melville Island. Results of the survey contribute to the assessment, conservation, documentation and management of the Tiwi Islands' natural values, and also provide baseline data for the determination of faunal distributional patterns. Voucher specimens of most species recorded are lodged in the scientific reference collections of the Museum and Art Gallery of the Northern Territory (NTM).

From the targeted faunal groups, the survey recorded 187 species on Melville Island. These were composed of 80+ aquatic insects, 49 fishes, 10 amphibians, 31 reptiles and 17 mammals. Results of particular interest include that 26 species of aquatic insects were either new or could not be identified to species with certainty. An as yet undescribed odonate (dragonfly) is the first record for the genus *Huonia* in Australia. The freshwater fish survey determined that the two drainage systems on the island (north and south) support different fish faunas, and terapontids (grunters) common elsewhere in the Northern Territory, appear to be absent from the Island. The terrestrial vertebrate survey recorded the Fawn Antechinus (a mouse-like marsupial) from the Tiwi Islands for the first time, and that colour forms of some tree snakes differed from local mainland forms and are biogeographically significant. These results indicate that the fauna of the Tiwi Islands contains many species of conservation significance.

The brevity of the survey (13 days) and the inaccessibility of many potential collecting sites, means that the species lists given are incomplete. Further survey work, on both Bathurst and Melville Islands, will greatly contribute to knowledge of the Tiwi Islands' natural resources.

Paul Horner
MAGNT

ACKNOWLEDGMENTS

Many individuals and organisations contributed to the success of this project. We would like to express our appreciation to the Tiwi Land Council for their support. Matthew Wonaeamirri (Milikapiti) and Cyril Rioli (Pirlangimpi) assisted with the choice of collecting sites. Paul Black and Rex Kerinauia assisted in the field and contributed greatly to collecting success with their local knowledge. Ian Mason and John Wombey (CSIRO) were congenial company in the field, and contributed many specimens from their own sampling sites. Invaluable assistance in the field was provided by Gavin Dally and Melissa Mahoney. Alice Wells (caddisflies) and Tom Weir (waterstriders) identified some specimens.

Without a funding grant from the Australian Heritage Commission, the survey would never have been attempted.

AQUATIC INSECTS

GRAHAM BROWN

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INTRODUCTION

The insect fauna of northern Australia is poorly known. This is especially so of more remote or inaccessible areas such as Melville Island.

There has been no survey of the insects of Melville Island, with most specimens having been collected as occasional curiosities or as the result of other visits. However, the late J.A.L. Watson collected dragonflies and damselflies there in June 1981, and those of the family Protoneuridae have been published (Watson and Theischinger 1984).

The present study surveyed the freshwater insect fauna of Melville Island between 4th and 16th October 1996 at 14 sites covering a number of different habitats. Because of the inaccessibility of much of the island, these sites were mostly limited to the western half of the island.

METHODS

Collecting was primarily with hand-held butterfly nets. These were used to collect individual flying specimens, to sweep plants near water for resting insects, and as dip nets to collect swimming insects.

Additional material was collected as part of fish sampling and, at night, by the use of a mercury vapour lamp (at Andranangoo Creek, Maxwell Creek, Mirikau-Yunga Creek, Pickertaramoor and Taracumbi Falls), to collect flying insects.

COLLECTING SITES

These sites (Fig. 1) can be summarised by habitat as follows (but it should be noted that Pickertaramoor and Taracumbi Falls are listed in several of these).

1. Deep, narrow flowing streams fringed with rainforest growing in dark loam soil

- (i) Taracumbi Falls, 11° 36'S, 130° 43'E, 4 October 1996, (including at mercury vapour lamp).

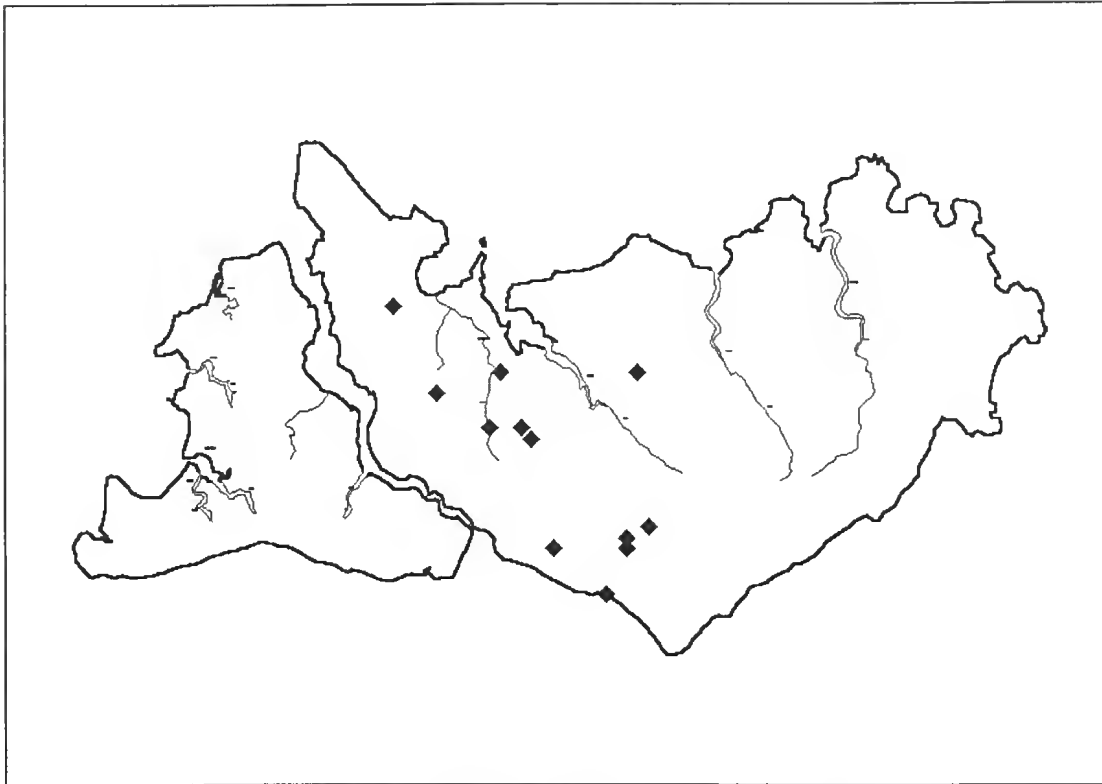


Fig. 1. Sites on Melville Island sampled for aquatic insects.

- (ii) Pickertaramoor, 11°46'S, 130° 53'E, 10-12 October 1996, (including at mercury vapour lamp).
 - (iii) Creek, 1 km SW of Pickertaramoor, 11° 47'S, 130° 53'E, 12 October 1996.
 - (iv) Takamprimili Creek, 11° 47'S, 130° 46'E, 13 October 1996.
 - (v) Maxwell Creek, 11° 33'S, 130° 35'E, 14-16 October 1996, (including at mercury vapour lamp).
- 2. Slow moving shallow broad streams with sandy bottom in woodland, some pools**
- (i) Mirikau-Yunga Creek, 11° 31'S, 130° 41'E, 4 October 1996, 5 October 1996, (including at mercury vapour lamp).
 - (ii) Creek, 3 km E of Taracumbi Falls, 11° 37'S, 130° 44'E, 6 October 1996.
- 3. Slow moving shallow broad streams with peaty bottom in woodland just above tidal and salt influence**
- (i) Creek, 14.1 km S of Taracumbi Falls, 11° 36'S, 130° 40'E, 5 October 1996.
- 4. Large slow moving creek fringed with water lilies etc**
- (i) Andranangoo Creek, 11° 31'S, 130° 54'E, 8-9 October 1996, (including at mercury vapour lamp).
- 5. Deep, narrow slow streams without trees, but with occasional pandanus**
- (i) Creek 3 km NE of Pickertaramoor, 11° 45'S, 130° 55'E, 10-13 October 1996.
 - (ii) Kilu-impini Creek, 9 km E Pirlangimpi, 11° 25'S, 130° 31'E, 15-16 October 1996.

6. Swamps

- (i) Swamp, W of Taracumbi Falls, 11° 36'S, 130° 40'E, 4 October 1996.

7. Small puddles

- (i) Puddles behind beach, 10 km SSW of Pickertaramoor, 11° 51'S, 130° 51'E, 13 October 1996.

8. Waterfalls

- (i) Pickertaramoor, 11° 46'S, 130° 53'E, 10-12 October 1996, (including at mercury vapour lamp).
- (ii) Taracumbi Falls, 11° 36'S, 130° 43'E, 4 October 1996, (including at mercury vapour lamp).

9. Small weir

- (i) Pickertaramoor, 11° 46'S, 130° 53'E, 10-12 October 1996, (including at mercury vapour lamp).

10. Rock platform with rocks and gravel

- (i) Pickertaramoor, 11° 46'S, 130° 53'E, 10-12 October 1996, (including at mercury vapour lamp).

SPECIES LIST

EPHEMEROPTERA - MAYFLIES

Mayflies are small delicate insects with one or two pairs of wings of which the hind is much smaller (when present) than the fore wings, and the apex of the abdomen has two or three long filaments. Adults are short lived but may be relatively abundant on occasions. They do not normally feed. Nymphs are fully aquatic and are predatory on other aquatic organisms.

Peters and Campbell (1991) recognise 84 species in nine families, of which only three families (Baetidae, Caenidae and Leptophlebiidae) are recorded from the Northern Territory. Campbell (1988), in a catalogue of the Australian fauna, recognised only one described species from the Northern Territory, although Suter (1990) in an unpublished report on the mayflies of the Alligator Rivers recognised almost 20 species. This suggests that although the Northern Territory fauna is relatively small, it is still poorly studied.

Relatively few specimens and only five species belonging to two families were collected. All were attracted to the mercury vapour lamp, with most being collected near the weir at Pickertaramoor.

BAETIDAE

Only one species, *Cloeon fluviatile* (Ulmer) was recorded from the Northern Territory by Campbell (1988), although Suter (1990) also records a single undescribed species each for *Baetis* and *Centroptilum* and at least one each for three undescribed genera. Four species were collected during the survey, all of which appear to be undescribed as follows:

***Centroptilum* sp.**

4, Pickertaramoor.

Genus A, sp.1

1, Taracumbi Falls; 7, Pickertaramoor; 1, Maxwell Creek.

Genus A, sp.2

1, Taracumbi Falls.

Genus B, sp.1

12, Pickertaramoor.

LEPTOPHLEBIIDAE

This is the largest family which contains 54 of the 84 Australian species of mayflies (Peters and Campbell 1991). No species were recorded from the Northern Territory by Campbell (1988), although Suter (1990) records at least seven species in the genera *Atalophlebia*, *Bibulmena*, *Jappa*, *Thraululus* and an undescribed genus. Only a single specimen of *Atalophlebia* was collected as follows:

***Atalophlebia* sp.**

1, Pickertaramoor.

CAENIDAE

No specimens of this family were collected, although an undescribed genus and seven species of *Tasmanocoenis* (most of which are undescribed) are known from the Alligator Rivers region, and may also occur on Melville Island.

ODONATA - DAMSELFLIES AND DRAGONFLIES

The Order Odonata contains two groups of insects: the damselflies which are thin-bodied with the fore and hind wings similar shaped; and the dragonflies which are often larger, and have the abdomen broader and the hind wings broader at the base. Adults are predaceous, and catch flying insects on the wing while nymphs are aquatic and prey on other aquatic animals.

Compared to most groups of Australian insects, the damselflies and dragonflies are relatively well known, although some of those in the Northern Territory appear to have limited ranges. It is therefore of particular interest that a new species of dragonfly was collected at Pickertaramoor. This species belongs to the genus *Huonia* which also has not been recorded from Australia previously.

Thirty two species were collected or observed belonging to two damselfly families and four dragonfly families.

COENAGRIONIDAE

Small to large damselflies with a body length ranging from 20-45 mm. Many species, especially the males are brightly coloured in orange, red, blue and/or green. Adults are found in a variety of habitats and are especially abundant around permanent bodies of still water.

This is the largest damselfly family in Australia with 30 species recorded by Watson and O'Farrell (1991). Watson *et al.* (1991) record 20 species from the Northern Territory and the Top End. Nine

species were collected during the survey, the most abundant of which were *Aciagrion fragilis* (Tillyard), *Austroagrion exclamationis* Campion, *Austrocnemis maccullochi* (Tillyard) and *Ceriagrion aeruginosum* (Brauer).

***Aciagrion fragilis* (Tillyard, 1906)**

6 males, 5 females, Andranangoo Creek; 1 male, Taracumbi Falls; 1 male, 2 females, creek 3 km E of Taracumbi Falls; 4 females, Andranangoo Creek.

***Argiocnemis pygmaea* (Rambur, 1842)**

1 male, Kilu-impini Creek.

***Argiocnemis rubrescens* Selys, 1877**

1, Mirikau-Yunga Creek.

***Austroagrion exclamationis* Campion, 1915**

3 males, 1 female, Andranangoo Creek; 4 males, 1 female, creek 3 km NE of Pickertaramoor; 3 males, Kilu-impini Creek.

***Austrocnemis maccullochi* (Tillyard, 1926)**

3 females, 2 males, Andranangoo Creek.

***Ceriagrion aeruginosum* (Brauer, 1869)**

2, Taracumbi Falls; 2, Mirikau-Yunga Creek; 5, Andranangoo Creek; 1, creek 3 km NE of Pickertaramoor; 1, Kilu-impini Creek.

***Ischnura heterosticta* (Burmeister, 1839)**

1, Andranangoo Creek; 1, creek 3 km NE of Pickertaramoor.

***Pseudagrion ignifer* Tillyard, 1906**

2, Kilu-impini Creek; 1, creek 1 km SW of Pickertaramoor; 1, creek 3 km NE of Pickertaramoor.

***Pseudagrion microcephalum* (Rambur, 1842)**

1, creek 1 km SW of Pickertaramoor; 2, Andranangoo Creek.

PROTONEURIDAE

Medium sized damselflies with a body length of 30-35 mm. Body colour is mostly black although in the males the wings may be tinged with yellow. In *Nososticta koolpinya* Watson and Theischinger and *N. taracumbi* Watson and Theischinger the thorax is conspicuously striped orange or blue respectively. Watson and O'Farrell record 11 Australian species, all of which are placed in the genus *Nososticta*. Of these, eight are recorded from the Northern Territory, with all but one occurring in the Top End, with many apparently having restricted distributions. Other species may also occur.

The family was revised by Watson and Theischinger (1984) (at subfamily ranking). They recorded only two species, *N. koolpinya* and *N. taracumbi*, from Melville Island, with the specimens they listed being part of the type series. Both species, as well as *N. fraterna* (Liefstinck), were collected.

***Nososticta fraterna* (Lieftinck, 1933)**

1 male, Mirikau-Yunga Creek; 1 male, 1 female, creek 14.1 km S of Taracumbi Falls; 3 males, 2 females, creek 3 km E of Taracumbi Falls; 2 males, 3 females, Andranangoo Creek; 4 males, 3 females, creek 1 km SW of Pickertaramoor; 6 males, 6 females, Takamprimili Creek.

***Nososticta koolpinya* Watson and Theischinger, 1984**

2 females, Taracumbi Falls; 2 males, 4 females, creek, 14.1 km S of Taracumbi Falls; 3 females, creek 3 km E of Taracumbi Falls; 4 males, creek 3 km NE of Pickertaramoor; 4 males, 3 females, Pickertaramoor; 5 males, 7 females, creek 1 km SW of Pickertaramoor; 13 males, 2 females, Maxwell Creek; 12 males, 1 female, Takamprimilli Creek.

***Nososticta taracumbi* Watson and Theischinger, 1984**

4 males, 6 females, Taracumbi Falls; 1 male, 2 females, Pickertaramoor; 7 males, Maxwell Creek; 1 male, Kilu-impini Creek.

AESHNIDAE

Large dragonflies, often drably coloured in complex patterns (although *Anax* species are green and blue). They are found in a wide variety of habitats and are usually fast flying, although some are crepuscular and are slower fliers.

Watson and O'Farrell (1991) record 43 species from Australia while Watson *et al.* (1991) record eight species from the Northern Territory, all of which except *Aeshna brevistyla* (Rambur) occur in the Top End. The most frequently collected (or observed) are *Gynacantha nourlangie* Theischinger and Watson, and *Anax gibbosulus* Rambur and to a lesser extent *A. guttatus* (Burmeister). Only *A. gibbosulus* was collected, although fast flying specimens of *Anax* sp. (probably *A. gibbosulus*) were also observed at Taracumbi Falls, upstream Pickertaramore and at Maxwell Creek. A second species was observed at Taracumbi Falls at dusk, and was possibly *G. nourlangie*.

***Anax gibbosulus* Rambur, 1842**

1 male, Andranangoo Creek; 1 female, Taracumbi Falls.

GOMPHIDAE

Medium to large black and yellow dragonflies, and readily distinguishable from all other dragonflies (but not damselflies) found in the Northern Territory by the eyes being widely separated from each other. Gomphids do not appear to be common in the Northern Territory.

Watson and O'Farrell (1991) record 38 species from Australia while Watson, Theischinger and Abbey (1991) record 11 species from the Northern Territory, eight of which occur in the Top End.

***Austrogomphus turneri* Martin, 1901**

1 male, creek 3 km NE of Pickertaramoor.

CORDULIIDAE

Medium to large dragonflies, usually yellow in colour with dark or metallic markings.

Watson and O'Farrell (1991) record 53 from Australia while Watson, Theischinger and Abbey (1991) record seven species (in the genera *Austrocordulia*, *Hemicordulia*, *Macromia* and *Pentathemis*) from the Northern Territory all of which except *H. australasiae* occur in the Top End.

Only two species were collected, although there were unconfirmed sightings of *Macromia tillyardi* Martin at the creek 3 km E of Taracumbi Falls, and of *Pentathemis membranulata* Karsch from Mirikau-Yunga Creek, and upstream from Pickertaramoor. The latter species was very common in the pine plantation near Maxwell Creek.

***Macromia tillyardi* Martin, 1906**

1 male, creek 3 km NE of Pickertaramoor.

***Pentathemis membranulata* Karsch, 1890**

1 male, Andranangoo Creek; 2 males, 1 female, Maxwell Creek.

LIBELLULIDAE

This is the largest and most diverse family of dragonflies in Australia. They range in size from small to large and adults are often brightly coloured in blues and reds, but are not strongly or complexly patterned.

Watson and O'Farrell (1991) record 55 species from Australia while Watson, Theischinger and Abbey (1991) record 38 species from the Northern Territory and the Top End. Several of these are common and abundant throughout most of the year. These include *Diplacodes* spp., *Nannodiplax rubra* Brauer, *Neurothemis stigmatizans stigmatizans* (Fabricius) and *Orthetrum* spp., while others such as *Hydrobasileus brevistylus* (Brauer), *Lathrecista asiatica festa* (Selys), *Pantala flavescens* (Fabricius), *Rhyothemis* spp. and *Trapezostigma loewii* (Kaup) are seasonally abundant. Most of the remaining species are relatively rare and are usually only encountered in small numbers. At least 16 species were observed or collected, and observations of *Camacina othello* Tillyard were unconfirmed.

***Aethriamanta circumsignata* Selys, 1897**

1 male, creek 3 km NE of Pickertaramoor.

***Brachydiplax denticauda* (Brauer, 1867)**

1 male, Andranangoo Creek (at mercury vapour lamp).

***Camacina othello* Tillyard, 1908**

(Possibly observed at Pickertaramoor and the creek 3 km NE of Pickertaramoor).

***Diplacodes haematodes* (Burmeister, 1839)**

2 males, swamp, W of Taracumbi Falls; 2 males, Pickertaramoor; 1 male, Kilu-impini Creek.

(Also observed at the creek 14.1 km S of Taracumbi, 3 km NE of Pickertaramoor, and at Maxwell Creek).

***Diplacodes trivialis* (Rambur, 1842)**

1 female, Mirikau-Yunga Creek; 1 female, 1 male, Andranangoo Creek.

***Huonia* sp.nov.**

3 males, Pickertaramoor.

***Lathrecista asiatica festa* (Selys, 1879)**

1 male, Taracumbi Falls.

***Nannodiplax rubra* Brauer, 1868**

2 males, 3 females, Andranangoo Creek; 4 females, creek 3 km NE of Pickertaramoor; 1 male, swamp, W of Taracumbi Falls; 1 male, Mirikau-Yunga Creek; 1 male, Kilu-impini Creek.

***Nannophlebia mudginberri* Watson and Theischinger, 1991**

1 male, Pickertaramoor; 1 female, creek 3 km NE of Pickertaramoor; 1 female, Maxwell Creek.

***Neurothemis stigmatizans stigmatizans* (Fabricius, 1775)**

1 male, Mirikau-Yunga Creek; 1 female, creek 3 km E of Taracumbi Falls; 1 female, Andranangoo Creek; 1 female, Maxwell Creek.

***Orthetrum caledonicum* (Brauer, 1865)**

1 male, behind beach 10 km SSW of Pickertaramoor; 1 male, 2 females, Maxwell Creek. (Also observed at the Snake Bay airstrip and Mirikau-Yunga Creek).

***Orthetrum migratum* Lieftinck, 1951**

1 male, Andranangoo Creek; 4 males, Pickertaramoor. (Also observed at the creek 3 km NE of Pickertaramoor).

***Orthetrum sabina sabina* (Drury, 1770)**

1 male, creek 3 km NE of Pickertaramoor.

***Rhyothemis braganza* Karsch, 1890**

1 male, Mirikau-Yunga Creek ; 1 female, Andranangoo Creek. (Also observed at the creek 3 km NE of Pickertaramoor and at Maxwell Creek).

***Rhyothemis phyllis* Lieftinck, 1942**

(Observed at Andranangoo Creek and the creek 3 km NE of Pickertaramoor).

***Trapezostigma loewii* (Kaup, 1866)**

(Observed at the creek 3 km NE of Pickertaramoor, at Pickertaramoor and at Maxwell creek.)

***Urothemis aliena* Selys, 1878**

1 male, creek 3 km NE of Pickertaramoor.

OTHER FAMILIES WHICH MAY OCCUR

Other families of damselflies which may occur are the Isostictidae with five species in the Northern Territory and the Top End, and the Lestidae with four species in the Northern Territory three of which occur in the Top End. None appear to be specifically recorded from Melville Island.

All families of dragonflies recorded from the Northern Territory were recorded from Melville Island during this survey.

HEMIPTERA - BUGS

The Hemiptera contains a diverse group of sucking insects which feed through a proboscis on either plant sap or blood of vertebrates or invertebrates. Adults have two pairs of wings of which the fore wing is often thickened basally. Several families are aquatic, although most of these

contain relatively few Australian species. The most diverse of the aquatic families are the Gerridae, Corixidae and Notonectidae with between 30 and 40 species each (Gross *et al.* 1991).

Sixteen species belonging to six families of predatory bugs were collected on Melville Island: Hydrometridae with one species; Gerridae with five; Nepidae two; Belostomatidae one; Corixidae three (two of which are indeterminate); and Notonectidae four (three of which are indeterminate).

HYDROMETRIDAE

Eight species are recorded from Australia, with all species being placed in the genus *Hydrometra*. Most species are restricted to northern Australia (Gross *et al.* 1991). They are long legged slow moving predatory insects which are found on the surface of slow moving or still water, and the margins of these waters. Only one species was collected.

Hydrometra halei Hungerford and Evans

1, Taracumbi Falls; 1, Mirikau-Yunga Creek; 1, creek 3 km NE of Pickertaramoor; 1, Takamprimili Creek.

GERRIDAE

Thirty two species are recorded from Australia (Gross *et al.* 1991). They are long-legged insects that skate rapidly on the surface of water and occur in aggregations particularly in slower moving parts of streams. Most species occur in fresh water streams, puddles etc., although a few species prefer brackish or marine environments. Five species were collected, all of which were taken from fresh water streams with the exception of a specimen from a muddy pond near the beach 10 km SSW of Pickertaramoor. Streams were typically small flowing clear streams fringed by rainforest trees, although the creek 3 km NE of Pickertaramoor was surrounded by swampier ground and scattered pandanus were also present, while the creek 14.1 km S of Taracumbi was approximately 100 m upstream of mangroves.

The most frequently collected species were *Limnometra lipovskyi* Hungerford and Matsuda and *Limnogonus luctuosus* (Montrouzier). These two species were often collected together (ie. at the same site) or with other species.

Limnometra lipovskyi Hungerford and Matsuda, 1958

7, Taracumbi Falls; 3, Mirikau-Yunga Creek; 4, creek 3 km E of Taracumbi Falls; 5, creek 3 km NE of Pickertaramoor; 4, Takamprimili Creek; 2, Maxwell Creek.

Limnogonus fossarum gilgny Andersen and Weir, 1997

1, creek 3 km NE of Pickertaramoor; 1, behind beach 10 km SSW of Pickertaramoor.

Limnogonus luctuosus (Montrouzier, 1860)

2, creek, 14.1 km S of Taracumbi Falls; 2, Mirikau-Yunga Creek; 1, creek 3 km E of Taracumbi Falls; 4, creek 1 km SW of Pickertaramoor.

Limnogonus hungerfordi Andersen, 1975

1, creek 1 km SW of Pickertaramoor; 1, Takamprimili Creek.

Rhagodotarsus anomalus Polhemus and Karunaratne

7, creek 14.1 km S of Taracumbi Falls.

NEPIDAE (WATER SCORPIONS)

Nepids are long, drably coloured, freshwater insects and are easily recognised by the sharp forelegs and the medium to long siphon at the apex of the abdomen. Both the adults and the similar-looking (but wingless) nymphs of all genera are found just beneath the surface (often amongst water plants) (except *Goondnomdanepa* which is found under rocks in flowing streams) with only the tip of the siphon piercing the water surface and exposed to the air. They remain motionless in this position with the head down until they are able to catch prey such as insects and small fish.

There are only eight described species recorded from Australia, all of which (except *Ranatra dispar* Montandon) are recorded from the Northern Territory. None have been recorded from Melville Island although *Laccotrephes tristis* Stal is widespread throughout much of Australia including the Top End, and *Austronepa angustus* (Hale), *Cercotetus brevipes australis* Lansbury and *Ranatra diminuta* Montandon are probably widespread across the Top End and could be expected to occur on the Island.

***Cercometus brevipes australis* Lansbury, 1975**

This species was described from 6 specimens from Birraduk Creek (12°16'S, 133°13'E - holotype), Cooper Creek (12°0'6S, 133°0'4E and 12°17'S, 133°20'E), Berry Springs, all in the Northern Territory, from Hann River, Queensland by Lansbury in 1975(a).

1, Taracumbi Falls; 2, Mirikau-Yunga Creek; 1, creek 3 km NE of Pickertaramoor.

***Ranatra diminuta* Montandon, 1907**

This species was originally described as *Ranatra longipes* var *diminuta* Montandon based on specimens from Fiji and eastern Australia although the Fiji records may be an error (Lansbury 1972). Other records published are from eastern and northern Australia (although none for the Northern Territory).

5, Mirikau-Yunga Creek; 2, creek 1 km SW of Pickertaramoor; 4, Kilu-impini Creek, 9 km E Pirlangimpi.

BELOSTOMATIDAE

Four species are recorded for Australia, with two species each of *Lethocerus* and *Diplonychus* (Gross *et al.* 1991; Menke 1960). The former are large and similar to nepids, but without the long respiratory siphon. Only *Lethocerus* was collected.

***Lethocerus distinctifemur* Menke, 1960**

1, creek 3 km NE of Pickertaramoor.

CORIXIDAE (WATER BOATMEN)

Water boatmen are flattened insects with the hind legs fringed with setae. They are predacious and feed mainly on insect larvae on the bottom of ponds, etc. Thirty one species are recorded from Australia and these are placed in five genera. Of these, only two genera are recorded from the Northern Territory: *Agraptocorixa* with a body length greater than 6 mm, and the smaller *Micronecta*. Only the latter genus was collected and this was last revised in 1965 (Chen 1965). Only one species, *Micronecta adelaidae* Chen, was recorded by Chen from the Northern Territory. Three species were collected during the survey.

***Micronecta adelaidae* Chen, 1965**

10, Andranangoo Creek; 3, Pickertaramoor.

***Micronecta* sp.A (hemilytron black)**

1, Andranangoo Creek.

***Micronecta* sp.B (pronotum pale)**

1, Pickertaramoor.

NOTONECTIDAE (BACKSWIMMERS)

Elongate, convex bugs with long strongly fringed hindlegs, that usually swim close to the water surface. Forty species are recorded from Australia and these are placed in six genera. Most are placed in the genus *Anisops*, and although this genus has been revised by Brooks (1951) and Lansbury (1969), species are still being described and keys to species are now outdated. The only genus collected was *Anisops*, although the genera *Enithares* and *Walambianisops* are also recorded from the Top End. Four species were collected, of which only *Anisops nasuta* Fieber was identified to species. This is a widespread species which occurs throughout northern Australia.

***Anisops nasuta* Fieber, 1851**

4, behind beach 10 km SSW of Pickertaramoor.

***Anisops* sp.A**

1, behind beach 10 km SSW of Pickertaramoor.

***Anisops* sp.B**

2, creek 3 km NE of Pickertaramoor; 1, behind beach 10 km SSW of Pickertaramoor.

***Anisops* sp.C**

10, Takamprimili Creek.

OTHER FAMILIES WHICH MAY OCCUR

Other families of aquatic Hemiptera which may occur include the Hebridae, Veliidae, Leptopodidae, Gelastocoridae, Pleidae, although most of these families contain only a small number of species.

COLEOPTERA- BEETLES

The Coleoptera is the largest group of insects. The group as a whole varies considerably in size, shape and biology. Despite this only eleven species were collected. These belong to the families Dytiscidae, Hydrophilidae and Gyrinidae. Adults will fly short distances to mercury vapour lamps.

DYTISCIDAE (PREDACEOUS DIVING BEETLES)

Usually smooth, polished streamlined beetles that are relatively flat with the lateral margins of the body curved. They are aquatic, although adults fly, and are commonly found in a wide variety of situations ranging from temporary puddles to lakes (especially near the edges) and slow moving streams. Both adults and larvae are aquatic and predaceous on other small animals including insects and small fish.

The family is one of the largest aquatic families, and many of the species it contains are common. There are 185 species recorded from Australia (Lawrence and Britton 1991), of which at least 54 are recorded from the Northern Territory, and most of these occur in the Top End. Only one species, *Copelatus daemeli* Sharp, is recorded from Melville Island. The family has been revised

by Watts (1978) and catalogued by Lawrence *et al.* (1987). Despite this, the family contains undescribed species.

Despite the comments made above only five species were collected. All except two were represented by a single specimen, and only one was attracted to ultraviolet light. This poor collecting may be a reflection of the time of the year at which it was undertaken, or the family may be poorly represented on Melville Island.

***Cybister godeffroyi* Wehnecke, 1876**

One of the largest dytiscids with a body length of 36 mm, and green-black in colour with the lateral margins of the body narrowly yellow. This species occurs across the extreme north of Australia, and New Guinea. Two other slightly smaller species also occur in the Top End.

7, creek 3 km NE of Pickertaramoor.

***Eretes australis* (Erichson, 1842)**

A very common and widespread species found throughout most of Australia except the south-west. It is yellow in colour covered with small black punctures and 12-16 mm in length. It is the only Australian species.

1, behind beach 10 km SSW of Pickertaramoor.

***Hydaticus ?bihamatus* Aubé, 1838**

Black beetles with pale transverse lines on the elytra (wing covers), and pale head and thorax. Body length is 12 mm. *H. bihamatus* is recorded from Darwin area, the east coast of Queensland, New Guinea and the islands to the north.

1, Maxwell Creek .

***Hydaticus vittatus* (Fabricius, 1775)**

This is similar to *Hydaticus bihamatus* except the transverse lines on the elytra are replaced by yellow lateral margins to the body.

1, Pickertaramoor; 1, Maxwell Creek.

***Hydrovatus* sp.**

Red-brown with black markings on the elytra. Body length 4 mm. Probably a new species.

2, Takamprimili Creek.

HYDROPHILIDAE

A large family of predaceous water beetles similar to the dytiscids. They are distinguished from that family by long maxillary palps (usually longer than the antennae), and the body is more convex.

175 Australian species are recorded, although the family is badly in need of revision. As there have been no recent comprehensive papers on the Australian fauna it is not possible to comment in any detail on the material collected.

***Berosus* sp.**

A strongly convex brown species 3 mm in length.

1, Andranangoo Creek.

***Helochares* sp.**

A dark brown species 4 mm in length.

1, Takamprimili Creek.

***Sternolophus marginicollis* Hope**

A polished black species 10 mm in length.

1, Andranangoo Creek; 1, Pickertaramoor, creek 3 km NE; 1, Takamprimili Creek; 2, Maxwell Creek.

GYRINIDAE

Dark streamlined beetles with the eyes divided in two. They often form aggregations on the surface of the water where they actively swim with a gyrating motion.

Lawrence and Britton (1991) record 25 Australian species, of which seven are recorded from the Northern Territory including five from the Top End. The two of this five species not collected were the widespread species *Gyrinus convexiusculus* Macleay and *Macrogyrus paradoxus* Régimbart.

***Dineutus australis* (Fabricius, 1775)**

This is a common species and is widespread throughout Australia, Asia and the South Pacific. It is a medium sized gyrid (body length 8 mm), uniformly shiny green-black, not strongly convex with truncated elytra, with or without a small spine on the outer margin near the apex.

1, behind beach 10 km SSW of Pickertaramoor.

***Dineutus neohollandicus* Ochs, 1926**

Recorded from the Top End and northern and eastern Queensland, but not as well represented in the NTM as the previous species of *Dineutus*. It is 8 mm in length, strongly convex, shiny black with the lateral margins yellow and the elytra with an acute spine near the apex and another on the outer margin near the apex.

2, Andranangoo Creek.

***Macrogyrus gouldi* (Hope, 1842)**

A common species described from Port Essington, but also recorded from Adelaide River. It is similar in appearance to *D. neohollandicus* although slightly smaller (body length 7 mm), and the elytra have an additional spine at the apex of the elytra. (It is also similar to *M. paradoxus* which is slightly smaller still (body length 6 mm) and has the apex of the elytra rounded with small apical and small lateral spines only).

16, Taracumbi Falls; 1, creek 14.1 km S of Taracumbi Falls; 3, Mirikau-Yunga Creek; 2, creek 3 km E of Taracumbi Falls; 12, creek 3 km NE of Pickertaramoor; 3, creek 1 km SW of Pickertaramoor; 2, Takamprimili Creek; 2, behind beach 10 km SSW of Pickertaramoor; 7, Maxwell Creek.

OTHER FAMILIES WHICH MAY OCCUR

The families Carabidae, Haliplidae, Heteroceridae, Hydracnidae, Hygrobiidae, Limnichidae, Noteridae and Scirtidae were not collected, but occur on the mainland.

TRICHOPTERA - CADDISFLIES

Caddisflies are setose (hairy) moth-like insects, with long filament-like antennae. They are usually small and often drably coloured, and differ from moths by the absence of scales and (except for a few primitive moths) by the presence of small mandibles.

Larvae are aquatic and often construct cases which may be fixed or portable. Larval feeding habits range from filter-feeders to herbivores and predators. Adults normally do not feed, although they may occasionally feed on nectar.

Neboiss (1991) recognised 478 species (both described and undescribed) from Australia with these being placed in 25 families. The described Australian species were catalogued by Neboiss (1988) and illustrated by Neboiss (1986). The latter reference also included species from Indonesia, New Guinea and the south-west Pacific and recorded only 335 species from Australia. Despite these numbers, Neboiss (1991) indicates that there may be considerably more species to be recognised. This may also be suggested by the number of specimens collected from Melville Island that could not be identified to species level. All caddisfly identifications are by Dr Alice Wells, Bureau of Flora and Fauna, Canberra.

At least 16 species were collected (all attracted to a mercury vapour lamp), belonging to 5 families.

CALAMOCERATIDAE

A small family of medium sized caddisflies with broad triangular wings. Larvae construct flattened cases from pieces of leaves and are detritus feeders. According to Neboiss (1991) they inhabit sluggish parts of rivers, lakes and swamps. However, all specimens were collected near flowing streams, although the Pickertaramoor site was also near a small weir. Only one genus, *Anisocentropus*, is recorded from Australia with two species occurring in the Northern Territory. Most records are for *A. muricatus* Neboiss which occurs between Borroloola and the Kimberleys, and was the only species collected during the survey. The other species recorded from the Northern Territory, is the widely distributed *A. banghassi* Ulmer which ranges from New Britain to near Timor. There are however, very few published Northern Territory records for this species, and all are from the Darwin area (Neboiss 1980).

Anisocentropus muricatus Neboiss, 1980

1 male, 1 female, Taracumbi Falls; 3 males, Pickertaramoor; 2 males, Maxwell Creek.

ECNOMIDAE

Small to medium sized caddisflies which are usually mottled with grey. Larvae live in tubes covered with sand and plant material, and feed on organic particles. Neboiss (1991) records 57 species in 2 genera as occurring in Australia, while Cartwright (1990), in revising the genus *Ecnomus*, records 22 species from the Northern Territory, with most occurring in the Top End.

Ecnomus sp.

4 females, Taracumbi Falls; 1 female, Pickertaramoor.

HYDROPSYCHIDAE

Small to large caddisflies. Neboiss (1991) records 27 species in 10 genera occurring in Australia. Larvae occur in flowing streams and live in shelters covered with sand and plant material. They feed by straining food from the water. No species were recorded from the Northern Territory by Neboiss (1988) although the north Queensland species *Macrostemum saundersii* (McLachlan) is known to occur here. It, and an undescribed species of *Cheumatopsyche*, were collected.

***Cheumatopsyche* sp. 10**

1 male, 3 females, Taracumbi Falls; 8 males, 8 females, Pickertaramoor.

***Macrostemum saundersii* (McLachlan, 1866)**

11 males, 2 females, Maxwell Creek.

LEPTOCERIDAE

This is one of the largest and most diverse families of caddisflies recorded from Australia, with 83 species in 14 genera being recorded by Neboiss (1991). Adults have long antennae, and the wings long and slender. Larvae are case dwellers and may occur in streams, lakes or saline lakes and may be omnivorous or predatory.

Neboiss (1988) lists *Leptocerus atsou* Schmid, *Oecetis pechana* Mosely and four species of *Triplectides* as occurring in the Northern Territory. Of these only *Oecetis pechana* and *T. ciuskus* Mosely were collected, together with eight species of *Oecetis* and *Triaenodes*, most of which are undescribed. Of the 10 species collected seven are as yet unnamed.

***Oecetis laustra* Mosely, 1953**

1 male, Andranangoo Creek.

***Oecetis pechana* Mosely, 1953**

1 male, 1 female, Pickertaramoor; 1 female, Maxwell Creek.

***Oecetis* sp. nov. ("quadrula")**

1 male, Andranangoo Creek; 2 males, Maxwell Creek.

***Oecetis* sp. C**

1 male, 2 females, Pickertaramoor.

***Oecetis* sp. E**

1 male, Pickertaramoor.

***Oecetis* sp. H**

1 male, 1 female, Taracumbi Falls.

***Triaenodes* sp. nov. (volda group)**

1 male, Pickertaramoor.

***Triaenodes* sp. nov.**

3 males, 4 females, Maxwell Creek.

***Triaenodes* sp.**

1 female, Taracumbi Falls; 3 females, Pickertaramoor.

***Triplectides ciuskus* Mosely, 1953**

3 males, 4 females, Andranangoo Creek; 5 males, Maxwell Creek.

PHILOPOTAMIDAE

A small family of dark or mottled species with a wing span of 12-20 mm. No species were recorded from the Northern Territory by Neboiss (1988), although the north Queensland species *Chimarra uranka* Mosely is known to occur. Larvae live in silken retreats under rocks and feed on organic particles. Three species were collected, of which an undescribed species of *Chimarra* ("windows") was the commonest. This species is also known to occur in Litchfield National Park (Alice Wells, pers. comm.)

***Chimarra uranka* Mosely, 1953**

4 males, 11 females, Maxwell Creek.

***Chimarra* sp. C**

2 males, 1 female, Taracumbi Falls.

***Chimarra* sp. "windows"**

6 males, 5 females, Taracumbi Falls; 24 males, 10 females, Pickertaramoor; 5 males, 4 females, Maxwell Creek.

DISCUSSION

The aquatic insect fauna was sampled on Melville Island at 14 sites during October 1996. Of the 81 species collected, five were species of Ephemeroptera, 32 were species of Odonata, 16 were species of Hemiptera, 11 were species of Coleoptera and 16 were species of Trichoptera. Of these five, one, five, four and eleven respectively were either new or could not be identified to species with certainty. The as yet undescribed odonate is the first record for the genus *Huonia* in Australia (Brown and Theischinger, in press).

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FISHES

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INTRODUCTION

Almost nothing is known of the freshwater fish fauna of the Tiwi Islands. For example, only three freshwater fishes are recorded in the literature as occurring on Melville Island (Larson and Martin, 1990). The mangrove and coastal marine fishes are slightly better known, as a result of work done by the Museum and Art Gallery of the Northern Territory (NTM), and NT Fisheries. Of these estuarine fishes, there are about 40 species referred to in the literature as being from Melville Island. There are 426 lots of fishes from the area, mostly from offshore waters, held in the fish reference collection at NTM.

METHODS

Collecting methods used were limited to dip- and scoopnets, small seines, hook and line (casting rod), and multipanel gillnets. Upon arrival at a particular locality, most sampling was done with scoopnets, which resemble small one-person seine nets. If the habitat was suitable, a small fine-mesh seine and one or two gillnets would be used.

The gillnets were each 35 m long, with a drop of 2 m, and were composed of seven 5 m long panels each of a different mesh size: 26, 44, 58, 76, 100, 126, and 150 mm, knot to knot. The differing mesh sizes allows sampling of a wide range of fish species and sizes (e.g. from rainbowfish to barramundi). Gillnets were normally set for one hour; on one occasion the net was left for three hours in a freshwater creek (due to a logistical problem).

COLLECTING SITES

The sites (Fig. 2) visited on Melville Island are listed below, including habitat and water quality descriptions. Stations are numbered consecutively. Note that the first station is 96-3, not 96-1.

HL 96-3

Taracumbi Falls. Narrow stream and small waterfall over large rocks in small gully, surrounded by ferns and "soft" trees, open woodland on either side of gully. 11° 36.31'S, 130° 42.69'E.

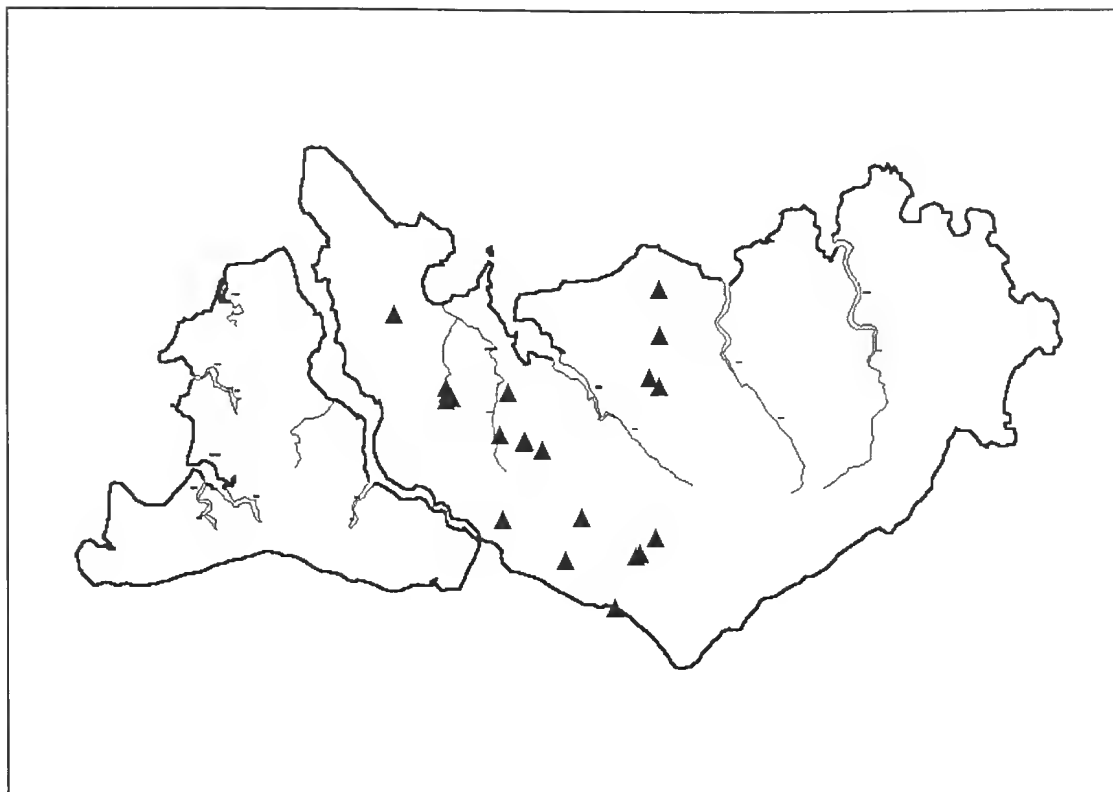


Fig. 2. Sites on Melville Island sampled for freshwater fishes.

Depth 0-2 m. Swift current. Water temperature 27°C. Conductivity 68.9 μs on 3 October (water rather turbid due to bridge construction just upstream); on 4 October water clearer, conductivity 14.9 μs .

Substrate: rocks, logs.

3-4 October 1996. 1810-1900 hrs. Coll. H. Larson and R. Kerinaiaua. Scoopnet, hand and gillnet.

HL 96-4

Taracumbi Creek. Upstream of Taracumbi Falls, near Bernie Tipiloura's house, just above new cement culvert. Open woodland, partly cleared, around creek. 11° 36.47'S, 130° 42.53'E.

Depth 0-1.5 m. Swift to medium current. Water clear, temperature 26.3°C. Conductivity 15.7 μs .

Substrate: sand and silty sand, logs and leaf litter.

4 October 1996. 0800-0930 hrs. Coll. H. Larson and G. Dally. Scoopnets.

HL 96-5

Tjipripu River drainage. Buffalo wallow in monsoon vine thicket W of cypress pine plantation on right side of road. Pools and wallows spring-fed, boggy. 11° 35.72'S, 130° 40.29'E.

Depth 0-2.5 m. Current swift in thicket, slow in wallow. Water clear, temperature 20°C in thicket, 29.5°C in wallow. Conductivity 14.5 μs in thicket, 19.9 μs in wallow.

Substrate: mud and leaf litter in wallow.

4 October 1996. 1400-1435 hrs. Coll. H. Larson. Scoopnet.

HL 96-6

9½-Mile Waterhole, Mirikau-yunga Creek. Very slowly-flowing deep and narrow creek, formed into series of small and medium pools. Main pool (swimming hole) wide, with sand substrate. 11° 31.94'S, 130° 41.05'E. Sandy banks lined with *Banksia* and *Pandanus*.

Depth 0-2.5 m. Current very slow. Water variable, clear to clear with surface scum, temperature 26.3°C. Conductivity 16.3 µs.

Substrate: sand, logs, leaf litter. Vegetation: mostly *Eriocaulon setaceum* and *Limnophylla indica*, some *Vallisneria*, *Eleocharis* and *Ceratophyllum demersum*.

5 October 1996. 0900-1030 hrs. Coll. H. Larson and G. Dally. Scoopnets and gillnet (gillnet set at 1745, removed at 2030 hrs).

HL 96-7

Unnamed creek (14-kilometre Creek) draining south, flowing into unnamed creek just east of Paru. Creek sampled at bridge just south of Threeways Crossing (14 km south of Taracumbi Falls). 11° 43.40'S, 130° 40.50'E. Banks with *Melaleuca* and open woodland. Mangroves downstream, not far from bridge.

Depth 0-1 m. Current slow. Water clear, temperature 26.2°C. Conductivity 48.4 µs; 0 ppt.

Substrate: sand, gravelly sand, muddy sand, logs, leaf litter.

5 October 1996. 1330-1500 hrs. Coll. H. Larson. Scoopnet.

HL 96-8

Pulampuli Creek; 1-3 m wide, shallow, with almost no aquatic vegetation. Feeds into same river as Taracumbi Creek. 11° 37.00'S, 130° 44.23'E. Monsoon vine thicket along creek, surrounded by low open woodland.

Depth 0-1.5 m. Current medium flow. Water very clear, temperature 25.6°C. Conductivity 14.6 µs.

Substrate: fine sand, scattered gravel patches, logs, leaf litter. Vegetation: some *Eriocaulon setaceum* (non-aquatic), grasses, a little *Chara*, *Blyxa* and small *Vallisneria* along banks.

6 October 1996. 0900-1015 hrs. Coll. H. Larson and G. Dally. Scoopnets.

HL 96-9

14-kilometre Creek, same locality as **HL 96-7**, but sampling downstream from where mangroves begin. 11° 43.40'S, 130° 40.50'E. Banks with *Melaleuca* and open woodland. Mangroves downstream, not far from bridge.

Depth 0-1 m. Current slow. Water clear to slightly turbid, temperature 27.1°C. Salinity 0.1 ppt.

Substrate: sand, silty sand and fine mud over sand base, leaf litter and logs. Mangrove vegetation in and along creek bank: *Acanthus ilicifolius*, *Acrosticum speciosum*, *Avicennia marina*, *Bruguiera* sp., *Cerriops* sp., *Lumnitzera racemosa*, *Rhizophora* sp.

6 October 1996. 1600-1730 hrs. Coll. H. Larson and G. Dally. Scoopnets.

HL 96-10

Pulampuli - old water-buffalo wallows on other side of bridge over sandy creek. 11° 37.00'S, 130° 44.23'E. Wallows fed by seepage, surrounded by low open woodland and tall *Melaleuca*.

Depth 0-5 cm. Current nil. Water turbid and muddy. Salinity 0 ppt.

Substrate: fine sand under mud layer. Vegetation: absent except for one *Nymphaea*.

HL 96-11

Goose Creek Camp, Andranangoo Creek. 11° 30.55'S, 130° 54.32'E. Creek about 25 m wide. Low open woodland on either side.

Depth 0-1 m. Current slow. Water clear, temperature 29°C. Salinity 0 ppt.

Depth: near surface.

Substrate: muddy sand. Vegetation: reeds, few *Nymphaea* lilies.

7-8 October 1996. 1845 hrs. Coll. H. Larson and G. Dally. Rod and lure; scoopnet.

HL 96-12

Andranangoo Creek, upstream of Goose Creek Camp. 11° 30.55'S, 130° 54.32'E to 11° 31.35'S, 130° 55.19'E. Creek steep-sided, deep, with several shallows and log-jams. Many crocodile "slides" on reedy banks. Shore with thick reeds, open grassy plains and low scattered *Melaleuca*.

Depth: 3 m plus. Current slow. Water clear brown, temperature 28.2°C. Conductivity 20.3 μ s.

Substrate: muddy sand. Vegetation: reeds, unidentified aquatic "grass".

8 October 1996. 0900-1000 hrs. Coll. H. Larson, G. Dally and P. Black. Multipanel gillnet.

HL 96-13

Andranangoo Creek, downstream of Goose Creek Camp as far as 11° 22.54'S, 130° 55.24'E. First set at 11° 26.63'S, 130° 55.20'E (where gillnet was set for one hour but no fish obtained). Well-developed *Melaleuca* forest behind tall mangroves lining creek.

Depth: 3 m plus. Current medium flow. Water slightly turbid, temperature 30.2°C. Salinity 20.6 ppt.

Substrate: mud and logs. Vegetation: diverse thick mangrove stands.

9 October 1996. 1045-1130 hrs. Coll. H. Larson, G. Dally and G. Kerinaiaua. Multipanel gillnet.

HL 96-14

Takamprimili Creek, at Pickertaramoor, at main road crossing by forestry camp. Rock-bed creek with small falls and pools. 11° 46.24'S, 130° 53.39'E.

Depth: 2.5 m. Stream width 1-10 m. Open woodland and patches of vine thicket around creek. Current moderate. Water clear but slightly brownish, temperature 25.8°C. Conductivity 21.6 μ s.

Substrate: rock, sand, gravel, logs and leaf litter. Vegetation: *Eriocaulon setaceum* and *Enteromorpha* sp.

10 October 1996. 1530-1630 hrs. Coll. H. Larson and G. Dally. Scoopnets and multipanel gillnet.

HL 96-15

Same locality as **HL 96-14**, but further downstream, where creek becomes narrow, deeper and steep-sided, open and lacking aquatic vegetation.

Current moderate. Water light brown, clear. Depth 2-3 m. Vine thicket surrounding creek.

Substrate: sand, gravel, rock outcrops, logs and leaf litter. Vegetation: almost none; few specimens of *Eriocaulon setaceum* and unidentified reedy plants.

11 October 1996. 0900-1030 hrs. Coll. H. Larson and G. Dally. Scoopnets.

HL 96-16

North-west of Pickertaramoor, spring-fed soak in forestry reserve. 11° 43.09' S, 130° 47.80' E. *Melaleuca*, *Gleichenia* and *Lycopodium* growing in and around soak, surrounded by low open woodland.

Depth 0-1.5 m. Current nil to very slight. Water clear brown to muddy, temperature 28.3°C. Conductivity 20.8 µs.

Substrate: mud, rotting vegetation, logs and sticks. Vegetation: almost none; few specimens of *Eriocaulon setaceum* and unidentified reedy plants.

11 October 1996. 1700-1730 hrs. Coll. H. Larson and M. Mahoney. Scoopnets.

HL 96-17

Takamprimili Creek, 3.5 km upstream from main road crossing at Pickertaramoor, nearly at headwaters. Soak and small interconnected deep pools on N side of creek. 11° 44.93' S, 130° 54.85' E. Surrounds open woodland, including *Melaleuca*, and grasses.

Depth 2 m. Current nil to slight. Water clear, temperature 26.5°C. Conductivity 20.8 µs.

Substrate: mud, sandy mud, leaf litter. Vegetation: reeds, grasses, slimy green algae (no submerse aquatic plants).

12 October 1996. 0900-1015 hrs. Coll. H. Larson, P. Horner, and M. Mahoney. Scoopnets, dipnets, and tortoise trap at night.

HL 96-18

Takamprimili Creek, south tributary of headwaters, E of Pickertaramoor, creek narrow and shallower. 11° 46.59' S, 130° 52.92' E. Monsoon vine thicket around creek.

Depth 0-1.5 m. Current moderate to slow. Water clear brown, temperature 25.4°C. Conductivity 21.1 µs.

Substrate: sand, gravel, leaf litter and logs, rocks. Vegetation: almost none, some *Eriocaulon setaceum* and green algae.

12 October 1996. 1400-1530 hrs. Coll. H. Larson and M. Mahoney. Scoopnets.

HL 96-19

Beach south of Pickertaramoor, at end of N/S road; small mangrove and pool to west at end of road. Mangroves behind beach dune, with no streamlet connecting to sea. 11° 51.13' S, 130° 51.00' E.

Depth 0-0.25 m. Current nil. Water clear, temperature 30.3°C. Salinity 37.3 ppt.

Substrate: sand, muddy sand, mangrove litter. Vegetation: mostly *Rhizophora* and *Lumnitzera*, some *Avicennia* and *Ceriops decandra*.

13 October 1996. 1130-1245 hrs. Coll. H. Larson and M. Mahoney. Scoopnets, dipnets, and hand.

HL 96-20

Takamprimili Creek, well downstream of Pickertaramoor, by new outstation's water-level and weir. Creek shallow, with many gravelly shoals. 11° 46.92' S, 130° 46.39' E. Open woodland and patches of monsoon vine thicket around creek.

Depth 0-1 m. Current moderate. Water clear, temperature 27.4°C. Conductivity 28.6 μ s.

Substrate: sand, gravel, leaf litter and logs. Vegetation: almost none.

13 October 1996. 1330-1430 hrs. Coll. H. Larson and M. Mahoney. Scoopnets.

HL 96-21

Maxwell Creek, downstream of *Vermes* temporary boatramp. 11° 32.01' S, 130° 35.40' E.

Depth 0-2 m. Current swift to moderate. Water clear, temperature 28.4°C. Salinity 17.8 ppt. Tide ebbing fast.

Substrate: sand, muddy sand. Vegetation: diverse mangrove, mostly *Avicennia*.

15 October 1996. 0930-1430 hrs. Coll. H. Larson and P. Horner. Gillnet and scoopnet.

HL 96-22

Maxwell Creek, downstream of *Vermes* temporary boatramp, in small *Avicennia*-lined creeklet filled with fine mud. 11° 31.53' S, 130° 35.34' E.

Depth 0-0.25 m. Current slight. Water turbid, temperature 30°C. Salinity 24.1 ppt. Tide ebbing fast.

Substrate: thick mud, logs. Vegetation: open *Avicennia* mangrove.

15 October 1996. 1030-1100 hrs. Coll. H. Larson. Scoopnet.

HL 96-23

Maxwell Creek, at riverbank below *Vermes* temporary boatramp. 11° 32.50' S, 130° 35.87' E.

Depth 0-0.5 m. Current slow. Tide ebbing.

Substrate: muddy sand. Vegetation: diverse mangrove and tall forest.

15 October 1996. 1145 hrs. Coll. H. Larson. Scoopnet.

HL 96-24

Kilu-impini Creek, at the "Swimming Hole", near Garden Point; white clay pool partly artificially enlarged by bags of cement. 11° 25.04' S, 130° 30.42' E. Shore of grassy banks and *Melaleuca* forest.

Depth 0-2 m. Current slow to moderate. Water crystal clear, temperature 30.1°C. Conductivity 20.1 μ s.

Substrate: white clay, sandy clay, leaf litter. Vegetation: *Eriocaulon setaceum* and some *Nymphaea*.

15-16 October 1996. 1700-1800 hrs. Coll. H. Larson and M. Mahoney. Seine and scoopnets.

HL 96-25

Tributary of Maxwell Creek (walking upstream from campsite); creek 1-4 m wide, deep, running through open woodland and low scrub, with very narrow strip of monsoon vine thicket along creek banks. 11° 32.68' S, 130° 35.26' E.

Depth 0.25-2.5 m. Current moderate to slow. Water clear, temperature 27.3°C. Conductivity 17.0 µs.

Substrate: mud and sand, fibrous roots, logs. Vegetation: almost no aquatic vegetation; few patches of *Eriocaulon setaceum*.

16 October 1996. 1145 hrs. Coll. H. Larson and M. Mahoney. Scoopnets.

HL 96-26

Mouth of Maxwell Creek, 1½ hours downstream from *Vermes* temporary boatramp. Among mangroves.

16 October 1996. Coll. G. Dally and I. Mason. Hook and line.

SPECIES LIST

The species listed here are based on the survey collections and sight records or literature records. Station numbers are given at which each species was collected. Fish lengths, where given, are standard length (snout tip to base of caudal fin), in millimetres.

MEGALOPIDAE -TARPONS

***Megalops cyprinoides* (Broussonet, 1782)**

Clupea cyprinoides Broussonet, 1782: 39 (Tanna, New Hebrides)

HL 96-12, 1 (295, specimen skeletonised); HL 96-13, sight record.

OSTEOGLOSSIDAE - BONY-TONGUES (SARATOGA)

***Scleropages jardini* (Saville-Kent, 1892)**

Osteoglossum jardinii Saville-Kent, 1892: 105 (Batavia River, Cape York)

HL 96-11, 1 (skull skeletonised); HL 96-12, 2 (450-510, skeletonised).

CHANIDAE - MILKFISH

***Chanos chanos* (Forster, 1801)**

Mugil salmoneus Forster in Bloch and Schneider, 1801: 121 (no locality).

HL 96-21, 1 (490, skeletonised).

ARIIDAE - FORK-TAILED CATFISH

***Arius graeffei* Kner and Steindachner, 1866**

Arius graeffei Kner and Steindachner, 1866: 383 (Samoa, locality doubtful).

HL 96-13.

?*Arius macronotacanthus* Bleeker, 1846

Arius macronotacanthus Bleeker, 1846: 159 (Batavia).

HL 96-13, 1 speimen (skeletonised). This species has not previously been recorded from the Northern Territory.

***Arius proximus* Ogilby, 1898**

Arius proximus Ogilby, 1898: 280 (Port Darwin, NT).

HL 96-21.

PLOTOSIDAE - EEL-TAILED CATFISH

***Neosilurus ater* (Perugia, 1894)**

Lambertia atra Perugia, 1894: 551 (Inawai, Papua).

HL 96-6; HL 96-8 - sight record; HL 96-12; HL 96-14.

BELONIDAE - LONGTOMS

***Strongylura* sp.**

HL 96-23 - sight record.

MELANOTAENIIDAE - RAINBOWFISH

***Melanotaenia nigrans* (Richardson, 1843)**

Atherina nigrans Richardson, 1843: 180 (King River, Port Essington, NT).

HL 96-3; HL 96-4; HL 96-5; HL 96-6; HL 96-7; HL 96-8; HL 96-9; HL 96-10; HL 96-11; HL 96-14; HL 96-15 - released; HL 96-16; HL 96-17; HL 96-18; HL 96-20; HL 96-24; HL 96-25.

***Melanotaenia splendida australis* (Castelnau, 1875)**

Neoatherina australis Castelnau, 1875: 32 (Swan River Colony, WA).

HL 96-14; HL 96-18; HL 96-20.

***Melanotaenia trifasciata* (Rendahl, 1922)**

Rhombosoma trifasciata Rendahl, 1922: 182 (Mary River, NT).

HL 96-3; HL 96-6; HL 96-8; HL 96-24; HL 96-25.

PSEUDOMUGILIDAE - BLUE-EYES

***Pseudomugil cyanodorsalis* Allen and Sarti, 1983**

Pseudomugil cyanodorsalis Allen and Sarti, 1983: 48 (Broome, WA).

HL 96-22.

***Pseudomugil gertrudae* Weber, 1913**

Pseudomugil gertrudae Weber, 1913: 23 (Aru Islands).

HL 96-5; HL 96-6; HL 96-10; HL 96-15; HL 96-16; HL 96-17 (15 specimens retained alive and flown back to Darwin for further observations, to determine if the Melville population differs from that on the mainland); HL 96-24; HL 96-25.

ATHERINIDAE - HARDYHEADS

***Craterocephalus stercusmuscarum* (Gunther, 1867)**

Atherina stercusmuscarum Gunther, 1867: 64 (Cape York).

HL 96-6; HL 96-11; HL 96-25.

AMBASSIDAE - GLASS-PERCHLETS

***Ambassis* sp.**

HL 96-21 - very tiny juveniles; unable to identify to species.

***Ambassis interruptus* Bleeker, 1852**

Ambassis interruptus Bleeker, 1852: 696 (Celebes).

HL 96-7; HL 96-9.

***Ambassis vachellii* Richardson, 1846**

Ambassis vachellii Richardson, 1846: 221 (Canton).

HL 96-19.

***Denariusa bandata* Whitley, 1948**

Denariusa bandata Whitley, 1948: 92 (coastal plain of Arnhem Land, NT).

HL 96-24.

CENTROPOMIDAE - BARRAMUNDI

***Lates calcarifer* (Bloch, 1790)**

Holocentrus calcarifer Bloch, 1790: 100 (Japan).

HL 96-11 - not retained; HL 96-12; HL 96-13 - not retained.

SERRANIDAE - GROUPERS

***Epinephelus coioides* Hamilton, 1822.**

Bola? coioides Hamilton, 1822: 82 (Ganges estuaries).

HL 96-26.

TERAPONTIDAE - GRUNTERS

***Therapon jarbua* (Forsskal, 1775)**

Sciaena jarbua Forsskal, 1775: 12 (Djeddah, Red Sea.).

HL 96-19.

APOGONIDAE - CARDINALFISH (MOUTH ALMIGHTY)

***Glossamia aprion* (Richardson, 1842)**

Apogon aprion Richardson, 1842: 16 (King River, Victoria, Port Essington, NT).

HL 96-6; HL 96-7; HL 96-24.

LUTJANIDAE - SNAPPERS

***Lutjanus argentimaculatus* (Forsskal, 1775)**

Sciaena argentimaculata Forsskal, 1775: 47 (Red Sea).

HL 96-23 - sight record.

GERREDIDAE - SILVER-BIDDIES

Gerres sp.

HL 96-19; HL 96-23.

Gerres filamentosus Cuvier, 1829

Gerres filamentosus Cuvier in Cuvier and Valenciennes, 1829: 188 (Vizagapatam).

HL 96-23 - sight record.

SPARIDAE - BREAM

Acanthopagrus berda (Forsskal, 1775)

Sparus berda Forsskal, 1775: 32 (Red Sea)

HL 96-23.

MONODACTYLIDAE - MOONFISH

Monodactylus argenteus (Linnaeus, 1758)

Chaetodon argenteus Linnaeus, 1758: 272 (Habitat in Indiis).

HL 96-23 - sight record.

POLYNEMIDAE - THREADFINS

Polynemus sheridani Macleay, 1884

Polynemus sheridani Macleay, 1884: 21 (Mary River, Queensland).

HL 96-13, 1 (420 skeletonised).

Eleutheronema tetradactylum (Shaw, 1804)

Polynemus tetradactylum Shaw, 1804: 155 (India).

HL 96-13.

TOXOTIDAE - ARCHERFISH

Toxotes chatareus (Hamilton Buchanan, 1822)

Coius chatareus Hamilton Buchanan, 1822: 101, 370 (mouthes of the Ganges).

HL 96-7 - sight record; HL 96-13 - sight record; HL 96-23 - sight record.

MUGILIDAE - MULLET

Liza sp.

HL 96-19.

Liza alata (Steindachner, 1892)

Mugil alata Steindachner, 1892: 133 (Madagascar).

Literature record only, as *Liza diadema* (Thomson 1954: 106-108 (Melville I.)).

***Liza diadema* (Gilchrist and Thompson, 1911)**

Mugil diadema Gilchrist and Thompson, 1911: 42 (Natal)

Literature record only, as *Liza vaigiensis* (Thomson 1954: 105 (Melville I.)).

***Oedalechilus labiosus* (Valenciennes, 1836)**

Mugil labiosus Valenciennes, 1836: 125 (Red Sea).

Literature record only. Despite Thomson's statement that the Melville Island specimen he examined is the only record of this species from Australian waters (Thomson 1997: 544 (Melville I.)), Taylor (1964: 121) reported the species from Yirrkala in Arnhem Land.

***Valamugil buchanani* (Bleeker, 1853)**

Mugil buchanani Bleeker, 1853: 99 (Hooghly River).

HL 96-21.

Gobiidae, Eleotridinae - Gudgeons

***Butis butis* (Hamilton-Buchanan, 1822)**

Cheilodipterus butis Hamilton-Buchanan, 1822: 57, 367 (Ganges River, below Calcutta, India).

HL 96-7; HL 96-9; HL 96-19; HL 96-22.

***Hypseleotris compressa* (Krefft, 1864)**

Eleotris compressus Krefft, 1864: 184 (Clarence River, New South Wales and creeks near Port Denison (Bowen), Queensland, Australia).

HL 96-7; HL 96-20; HL 96-24 - sight record.

***Mogurnda mogurnda* (Richardson, 1844)**

Eleotris mogurnda Richardson, 1844: 4 (Port Essington).

HL 96-3; HL 96-4 - sight record; HL 96-6; HL 96-10; HL 96-14; HL 96-15; HL 96-16; HL 96-17; HL 96-18; HL 96-20; HL 96-24 - sight record; HL 96-25.

***Ophiocara porocephala* (Valenciennes, 1837)**

Eleotris porocephala Valenciennes, 1837: 237 (Seychelles and New Ireland).

HL 96-22.

***Oxyeleotris nullipora* Roberts, 1978**

Oxyeleotris nullipora Roberts, 1978: 67-68 (Fly River, PNG)

HL 96-8; HL 96-10; HL 96-16; HL 96-17.

Gobiidae, Gobiionellinae - Estuarine Gobies

***Gobiopterus* sp.**

HL 96-22; HL 96-23.

***Mugilogobius* sp. 9**

HL 96-7; HL 96-9.

***Mugilogobius* sp. 13**

HL 96-19; HL 96-22.

***Mugilogobius* sp. 16**

HL 96-9; HL 96-22.

***Pandaka rouxi* (Weber, 1911)**

Gobius rouxi Weber, 1911: 40, fig. 9 (Panua Bori River near Sungai Manumbai, Wokam; Waskai River near Sungai Manumbai, Wokam; Sungai, Waskai, Wokam; Dungi Kololobo, Kobroor; near Seltutti, Kobroor, Aru Island, Indonesia)

HL 96-9 - specimens lost; HL 96-22; HL 96-23.

***Pseudogobius* sp. 2**

HL 96-9; HL 96-22; HL 96-23.

***Redigobius bikolanus* (Herre,)**

Vaimosa bikolanus Herre,

HL 96-9 - specimens lost.

***Redigobius chrysosoma* (Bleeker, 1875)**

Lophogobius chrysosoma Bleeker, 1875: 114-116 (Borneo (Bandjermasin), Amboina, in rivers and sea).

HL 96-7; HL 96-9; HL 96-23.

GOBIIDAE, GOBIINAE - TRUE GOBIES

***Acentrogobius janthinopterus* (Bleeker, 1852)**

Gobius janthinopterus Bleeker, 1852: 702 (Wahia, Ceram).

HL 96-22.

Drombus* cf. *ocyurus

HL 96-22; HL 96-23.

GOBIIDAE, OXUDERCINAE - MUDSKIPPERS

***Perioplthalmus kalolo* Lesson, 1830**

Periophthalmus kalolo Lesson, 1830: 146 (Waigiou, Irian Jaya, Indonesia).

HL 96-19.

DISCUSSION

The survey produced 49 species of fishes from 22 families. A number of these species, although collected from water that tasted fresh (e.g. station HL 96-7), are actually estuarine fish able to tolerate fresh water for considerable lengths of time. Melville Island's mangroves, in which these fishes occur, are diverse and extensive. The fish fauna warrants closer study, with some mangrove fish species being found well inland into pure fresh water.

Limited collecting time (13 days) and the inaccessibility of many potential collecting sites means that the list of species given above is incomplete. However, it is a beginning for further work.

The island is unique in having among its fauna a primary freshwater fish, the saratoga (*Scleropages jardini*). The presence of this fish indicates that Melville was included as part of a major continental river system for some time, before the island separated from the mainland.

The two drainage systems on the island support different fish faunas, exemplified by rainbowfish. The major system is the northern drainage, in which are found the largest rivers and streams. The southern drainage has shorter, smaller streams. The black-striped rainbowfish (*Melanotaenia nigrans*) occurs in both drainages, the banded rainbowfish (*M. trifasciata*) is restricted to the northern drainage, while the chequered rainbowfish (*M. splendida australis*) is restricted to the southern drainage, as far as is known.

There may be several colour forms of the spotted blue-eye, *Pseudomugil gertrudae*, and these may differ from known mainland forms. These fish are under study by Ron Bowman, of the Australia New Guinea Fishes Association (ANGFA). The colour form of the fly-specked hardyhead, *Craterocephalus stercusmuscarum*, also seems to differ from that of the nearest mainland form.

The apparent lack of terapontids (grunters) is most unusual. The habitats available indicate that spangled grunters (*Leiopotherapon unicolor*) and sooty grunters (*Hephaestus fuliginosus*) would normally be present. These two species are common elsewhere in the NT, with the spangled grunter especially being an inhabitant of all river systems. Searching day and night during this survey produced no grunter specimens, and our informants did not recognise freshwater grunters from book illustrations. Grunters may indeed be present on the island, but in small numbers or in areas not sampled during this survey.

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VERTEBRATE FAUNA OF TERRESTRIAL HABITATS ADJOINING FRESHWATER ECOSYSTEMS

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INTRODUCTION

Terrestrial vertebrates of habitats adjoining freshwater ecosystems on Melville Island, were surveyed between 3 and 17 October 1996. Objectives of the survey were to identify, assess and document the terrestrial fauna associated with freshwater ecosystems. Birds were not surveyed during this project, being delegated to an accompanying collaborative survey (Mason and Schodde 1997) carried out by ornithologists from CSIRO's Department of Wildlife and Ecology, Canberra.

The terrestrial fauna of Melville Island has received some previous attention. Tyler *et al.* (1991) surveyed the frogs and Fensham and Woinarski (1992) reported on the vertebrate fauna of rainforests on the Tiwi Islands. The only comprehensive documentation of wildlife for the area is an unpublished manuscript by J. Woinarski (pers. comm.), which lists all frogs, reptiles, birds and mammals currently known from the Tiwi Islands.

METHODS

Sampling methods for terrestrial vertebrates included pitfall traps, elliot traps, cage traps, spotlighting and wide-ranging searches. At least two quadrats (50 m x 50 m) were utilised at each general locality. These were bounded by 20 small elliot traps, with four large cage traps in each corner. Placed within each quadrat was a pitfall trap line of five 20 litre buckets connected by a 35 metre length of mesh drift fence. All traps were checked and cleared early in the morning, and re-baited and checked in the late afternoon over a period of three consecutive nights. Quadrat sites were chosen for their proximity to freshwater and differing habitat types. Further sites adjoining freshwater habitats were collected opportunistically, as were several other sites independent of freshwater influence.

At capture, each specimen had the following data recorded: time and date of capture; location; habitat; and method of capture. Specimens retained as vouchers had heart and liver tissue samples taken to maximise their scientific value. Tissues sampled were snap frozen and stored in liquid nitrogen for future molecular analyses. Specimens not retained as vouchers were released at the time and site of capture. Voucher specimens of most species recorded are lodged in the terrestrial vertebrates collections of the Museum and Art Gallery of the Northern Territory.

COLLECTING SITES

Sites at which terrestrial specimens were collected are shown in Figure 3 and detailed below. Presented for each site is general locality and dates, specific locality, co-ordinates, land form and habitat description.

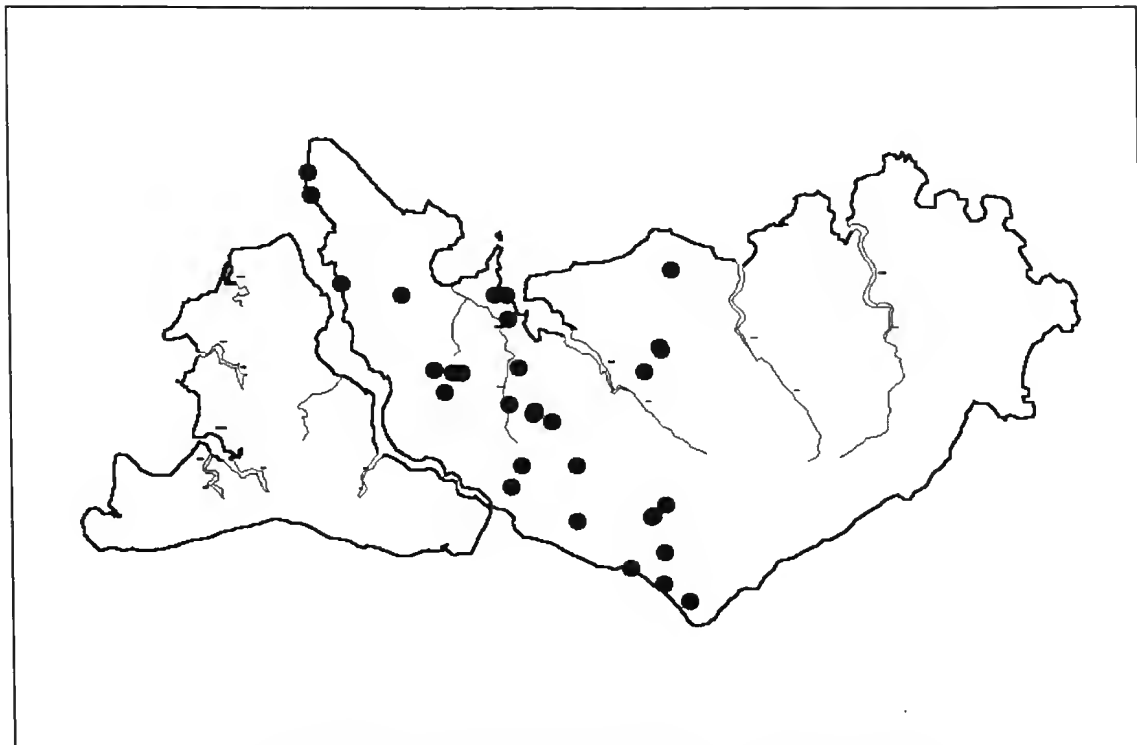


Fig. 3. Sites on Melville Island sampled for terrestrial vertebrates.

AREA 1. TARACUMBI CREEK. 4-7 OCTOBER, 1996

Site 1.1

Taracumbi Falls, 11°36'19"S, 130°42'43"E; gentle slope above narrow stream and low waterfall in small gully. Habitat: low open forest on humic soil. Dominant vegetation: *Callitris intratropica*, with ground storey of low grasses, bordering dense riverine vegetation.

Site 1.2

Creek bank upstream of Taracumbi Falls, 11°36'26"S, 130°42'37"E; 50 x 50 metre quadrat containing five pitfall and 24 mammal traps. Habitat: low forest on humic soil. Dominant vegetation: scattered clumps of *Pandanus spiralis* among dense ground storey of grasses and ferns.

Site 1.3

Creek bank upstream of Taracumbi Falls, 11°36'33"S, 130°42'31"E; 50 x 50 metre quadrat containing five pitfall and 24 mammal traps. Habitat: open forest on sandy soil. Dominant vegetation: *Eucalyptus miniata*, with little or no ground storey (site recently burnt).

Site 1.4

Downstream of Taracumbi Falls, 11°36'11"S, 130°42'45"E; 50 x 50 metre quadrat containing five pitfall and 24 mammal traps. Habitat: closed monsoon forest on saturated black soil.

Site 1.5

Laterite outcrop, 1.5 km W of Taracumbi Falls, 11°36'01"S, 130°42'44"E. Habitat: open forest on lateritic substrate. Dominant vegetation: *Eucalyptus miniata* and *E. tetradonta* with lower storey of *Acacia* shrubs, sparse ground storey of seedlings and grasses.

Site 1.6

Swamp, 3 km W of Taracumbi Falls, 11°35'42"S, 130°40'19"E. 50 x 50 metre quadrat containing five pitfall and 24 mammal traps. Habitat: spring-fed swamp in shallow valley. Dominant vegetation: closed monsoon forest on centre creek line, bordered by lush grassland on saturated black soil.

Site 1.7

Creek bank, 9 km S of Taracumbi Falls, 11°41'21"S, 130°41'21"E. Habitat: open forest on sandy soil. Dominant vegetation: *Eucalyptus miniata* and *E. tetradonta* with lower storey of *Acacia* shrubs and ground storey of tussock grasses and seedlings.

Site 1.8

Creek bank, 14 km S of Taracumbi Falls, 11°43'21"S, 130°40'26"E. Habitat: riparian vegetation on sandy soil. Dominant vegetation: *Melaleuca leucadendra*.

Site 1.9

Swamp near Pulampuli Creek, 11°37'02"S, 130°44'13"E. Habitat: Paperbark swamp on black soil. Dominant vegetation: *Melaleuca leucadendra* and *Pandanus spiralis*.

Site 1.10

Nine Mile Waterhole, 11°31.94'S, 130°41.05'E. Habitat: riparian vegetation on sandy soil. Dominant vegetation: *Banksia dentata* and *Pandanus aquaticus*.

AREA 2. ANDRANANGOO CREEK. 7-10 OCTOBER, 1996**Site 2.1**

Goose Creek Camp, 11°30'32"S, 130°54'19"E; Habitat: low open woodland on white clay soil. Dominant vegetation: *Melaleuca leucadendra* and *Pandanus spiralis* with a ground story of low grasses and scattered sedges.

Site 2.2

Edge of swamp, 11°30'31"S, 130°54'18"E; 50 x 50 metre quadrat containing five pitfall and 24 mammal traps. Habitat: swamp on saturated white clay soil. Dominant vegetation: *Banksia dentata* with dense ground storey of grasses and sedges.

Site 2.3

Edge of swamp, 11°30'29"S, 130°54'16"E; 50 x 50 metre quadrat containing five pitfall and 24 mammal traps. Habitat: Monsoon forest on white clay soil. Dominant vegetation: wet monsoon forest with a ground storey of ferns and seedlings.

Site 2.4

Plain bordering Andranangoo Creek, 11°30'28"S, 130°54'10"E; 50 x 50 metre quadrat containing five pitfall and 24 mammal traps. Habitat: open woodland on black soil. Dominant vegetation: *Eucalyptus* spp., with ground storey of scattered seedlings (site recently burnt).

Site 2.5

Downstream of Goose Creek Camp, 11°22.54'S, 130°55.24'E. Habitat: tall mangroves bordering creek. Dominant vegetation: mangroves.

Site 2.6

Laterite outcrop, 6 km W Goose Creek Camp, 11°32'35"S, 130°52'59"E. Habitat: open forest on lateritic substrate. Dominant vegetation: *Eucalyptus miniata*, *E. tetradonta* and *Livistona* sp. with sparse ground storey of grasses and herbs.

AREA 3. PICKERTARAMOOR. 10-14 OCTOBER, 1996

Site 3.1

Takamprimili Creek by forestry camp, 11°46.19'S, 130°53.14'E; 50 x 50 metre quadrat containing five pitfall and 24 mammal traps. Habitat: closed forest on dry loamy soil, bordering creek. Dominant vegetation: monsoon vine forest with sparse ground storey of ferns and seedlings.

Site 3.2

Takamprimili Creek by road crossing, 11°46.11'S, 130°53.20'E; 50 x 50 metre quadrat containing five pitfall and 24 mammal traps. Habitat: shrubland on saturated black soil, bordering creek. Dominant vegetation: dense ground storey of tall tussock grasses and ferns.

Site 3.3

Pickertaramoor airstrip, 11°30'S, 130°54'E. Habitat: open woodland on lateritic substrate. Dominant vegetation: *Eucalyptus* spp. with sparse to no ground storey of low tussock grasses.

Site 3.4

Laterite outcrop, 6 km SSE Pickertaramoor, 11°49'46"S, 130°54'31"E. Habitat: open woodland on lateritic substrate. Dominant vegetation: *Eucalyptus miniata*, *E. tetradonta* and *Livistona* sp. with sparse ground storey of tussock grasses and seedlings.

Site 3.5

Creek bank 3 km upstream of Pickertaramoor, 11°45'05"S, 130°54'46"E. Habitat: open woodland on black soil. Dominant vegetation: riparian, bordered by scattered *Melaleuca* spp. with a low ground storey of grasses and seedlings.

Site 3.6

16 km SE Pickertaramoor, 11°54'31"S, 130°56'55"E. Habitat: open woodland on loamy soil. Dominant vegetation: *Eucalyptus miniata*, *E. tetradonta* and *Livistona* sp. with ground storey of tussock grasses and seedlings.

Site 3.7

Coast, near Point Elly, 11°52'58"S, 130°54'14"E. Habitat: shrubland on sandy soil. Dominant vegetation: *Acacia* spp. with sparse ground story of scattered tussock grasses.

Site 3.8

Coast, 10 km S Pickertaramoor, 11°51'08"S, 130°51'09"E. Habitat: shrubland on sandy soil. Dominant vegetation: *Acacia* spp. with sparse ground story of scattered tussock grasses.

Site 3.9

Takamprimili Creek, 12 km downstream of Pickertaramoor, 11°46'56"S, 130°46'28"E. Habitat: closed forest on black soil. Dominant vegetation: riparian, bordered by open woodland.

Site 3.10

17 km NW Pickertaramoor, 11°41'19"S, 130°46'23"E. Habitat: open woodland on loamy soil. Dominant vegetation: *Eucalyptus miniata*, *E. tetradonta* and *Livistona* sp. with ground storey of tussock grasses and seedlings.

AREA 4. MAXWELL CREEK. 14-17 OCTOBER, 1996**Site 4.1**

Tributary of Maxwell Creek, 11°32'39"S, 130°35'15"E; 50 x 50 metre quadrat containing five pitfall and 24 mammal traps. Habitat: small spring-fed creek, lined with monsoon vine forest which is bordered by shrubland on humic soil. Dominant vegetation: riparian, bordered by *Acacia/Grevillea* shrubland.

Site 4.2

Bank of Maxwell Creek, 11°32.50'S, 130°35.87'E. Habitat: open woodland bordering mangrove-lined creek. Dominant vegetation: *Eucalyptus* spp. on sandy soil, with sparse ground story of scattered grasses and seedlings.

Site 4.3

Pine plantation, near Maxwell Creek, 11°32'15"S, 130°33'28"E. Habitat: closed forest on humic soil. Dominant vegetation: *Callitris intratropica* with ground cover of dense needle-mat.

Site 4.4

Maxwell Creek airstrip, 11°32'45"S, 130°35'05"E. Habitat: open woodland on lateritic substrate. Dominant vegetation: *Callitris intratropica* and scattered *Eucalyptus* spp. with sparse to no ground storey of low tussock grasses.

Site 4.5

Kilu-impini Creek, "swimming hole", 11°25'04"S, 130°30'42"E. Habitat: open woodland on white clay soil. Dominant vegetation: *Eucalyptus* spp. and *Pandanus aquaticus* with low ground storey of grasses.

Site 4.6

4.7 km WSW of Maxwell Creek forestry camp, 11°34'22"S, 130°34'23"E. Habitat: tall open forest on humic soil. Dominant vegetation: *Eucalyptus miniata*, *E. tetradonta* and *Livistona* sp. with ground storey of scattered tussock grasses and seedlings.

OTHER LOCALITIES (COLLECTED OPPORTUNISTICALLY)

Site 5.1

Garden Point barge landing, 11°24'S, 130°25'E. 3 October 1996.

Site 5.2

Milikapiti Town area, 11°25'S, 130°40'E. 5 and 11 October 1996.

Site 5.3

Milikapiti airstrip, 11°25'S, 130°39'E. 11 October 1996.

Site 5.4

5 km S Milikapiti, 11°27'32"S, 130°40'11"E. 10 October 1996.

Site 5.5

Piper Head, 11°13'30"S, 130°22'03"E. 15 October 1996; open woodland.

Site 5.6

Piper Head, 11°15'52"S, 130°22'26"E. 15 October 1996; coastal dune scrub.

SPECIES LIST

Following is a checklist of amphibian, reptile and mammal species recorded during the Melville Island survey. Presented are scientific names with author and date, common names, registration numbers (MAGNT) of voucher specimens, sites at which species were recorded and any field notes relating to the species.

AMPHIBIA

HYLIDAE - TREE FROGS

Litoria bicolor (Gray, 1842)

Northern Dwarf Tree-Frog

Specimens. NTM R.23080; 23082; 23084; 23086; 23091.

Sites. 2.1; 2.2.

Notes. Found in *Pandanus* and sedges near Goose Creek Camp.

***Litoria inermis* (Peters, 1867)** Peter's Frog

Specimens. NTM R.23071-72; 23074-76; 23078.

Sites. 1.8; 3.5.

Notes. Found on creek banks at night.

***Litoria microbelos* (Cogger, 1966)** Javelin Frog

Specimens. NTM R.23046; 23048; 23050-52; 23055; 23060-62; 23064; 23083.

Sites. 1.9; 2.1.

Notes. Common in saturated litter along swamp edges.

***Litoria nasuta* (Gray, 1842)** Rocket Frog

Specimens. NTM R.22864-65; 22988-89; 23002; 23077; 23105; 23107.

Sites. 1.8; 1.10; 3.5; 3.9.

Notes. Found on creek banks at night.

***Litoria pallida* Davies, Martin and Watson, 1983** Pale Frog

Specimens. NTM R.23103; 23106.

Sites. 1.8.

Notes. Found on creek banks at night.

***Litoria rothii* ((De Vis, 1884)** Roth's Tree Frog

Sites. 1.10.

Notes. Not collected, but heard calling at Nine Mile Waterhole.

***Litoria tornieri* (Nieden, 1923)** Tornier's Frog

Specimens. NTM R.22972-73; 23073; 23090.

Sites. 1.8; 2.1; 3.2.

Notes. Found on creek banks at night.

MYOBATRACHIDAE - GROUND FROGS

***Criuia remota* (Tyler and Parker, 1974)** Remote Froglet

Specimens. NTM R.23043-45; 23047; 23049; 23053; 23056-59; 23063; 23081; 23097.

Sites. 1.9; 2.1; 3.5.

Notes. Common in saturated litter along swamp edges.

***Limnodynastes ornatus* (Gray, 1842)** Ornate Burrowing Frog

Specimens. NTM R.22866; 23024; 23041; 23104.

Sites. 1.3; 1.10; 3.1; 4.1.

Notes. Found active at night.

MICROHYLIDAE - MICROHYLID FROGS

Sphenophryne adelphe Zweifel, 1985 Northern Territory Frog

Specimens. NTM R. R.18476-78; 22863; 22974; 23042; 23054; 23065-70; 23079; 23085; 23087-89; 23092-96; 23098-102; 23144.

Sites. 1.1; 1.2; 1.3; 1.4; 1.9; 2.2; 2.3; 3.1; 3.2; 4.1.

Notes. Common in most habitats.

REPTILIA

CHELIDAE - FRESHWATER TURTLES

Chelodina rugosa Ogilby, 1890 Northern Snake-Necked Turtle

Notes. Not collected; record based on a single dry shell seen in Pirlangimpi Craft Centre.

Emydura victoriae (Gray, 1842) Northern Short-Necked Turtle

Sites. 3.5.

Notes. Not collected; a single specimen observed by Helen Larson in headwaters of Takamprimili Creek.

GEKKONIDAE - GECKOS

Gehyra australis Gray, 1845 Northern Dtella

Specimens. NTM R.22896; 22956-58; 22992; 23127.

Sites. 2.6; 3.4; 3.8.

Notes. Found under bark of standing dead trees.

Hemidactylus frenatus Duméril and Bibron, 1836 House Gecko

Specimens. NTM R.22862; 22971; 22976-80; 22993-94.

Sites. 3.2; 3.8; 5.2.

Notes. An introduced species which was found only in the vicinity of man-made structures.

Heteronotia binoei (Gray, 1845) Bynoe's Gecko

Specimens. NTM R.22851-52; 22861; 22874; 22961; 22995; 23000-01; 23003; 23119-22; 23128; 23139.

Sites. 1.1; 1.5; 1.7; 1.8; 3.3; 3.4; 3.8; 3.9; 5.6.

Notes. Common under ground litter at most sites.

Oedura rhombifer Gray, 1845 Zigzag Velvet Gecko

Specimens. NTM R.22853; 22855; 22878-79; 22959-60.

Sites. 1.1; 3.4.

Notes. Found under tree bark and on man-made structures.

PYGOPODIDAE - LEGLESS LIZARDS

Lialis burtonis Gray, 1835 Burton's Snake-Lizard

Specimens. NTM R.23129.

Sites. 3.3.

Notes. Single specimen found under discarded drum at Pickertaramoor airstrip.

AGAMIDAE - DRAGON LIZARDS

Chlamydosaurus kingii Gray, 1825 Frilled Lizard

Specimens. NTM R.22981; 23039.

Sites. 2.1; 3.6.

Notes. Common in woodland habitats.

Diporiphora bilineata Gray, 1842 Northern Two-Line Dragon

Specimens. NTM R.22880; 22954; 23017-18; 23118; 23126; 23140-41.

Sites. 1.1; 3.3; 3.7; 5.5; 5.6.

Notes. Most common in woodland and coastal habitats.

Lophognathus temporalis (Günther, 1867) Swamp Dragon

Specimens. NTM R.22983; 23035; 23040; 23124-25; 23142-43.

Sites. 1.1; 1.5; 1.9; 2.1; 2.5; 2.6; 3.2; 3.6; 3.8.

Notes. Common in woodland habitats, one specimen collected among mangroves.

SCINCIDAE - SCINCID LIZARDS

Carlia gracilis Storr, 1974 Slender Rainbow Skink

Specimens. NTM R.22870-72; 22875; 22952; 22985-86; 22999; 23005; 23009-11; 23022-23; 23028-30; 23032; 23038.

Sites. 1.6; 1.8; 1.9; 2.1; 2.3; 3.1; 3.5; 3.8; 3.9; 4.1; 4.4; 4.5.

Notes. Found at most sites, but shows preference for moist habitats.

Carlia munda (De Vis, 1885) Striped Rainbow Skink

Specimens. NTM R.22848-49; 22858-60; 22894; 22897-99; 22955; 22962-66; 23027; 23114; 23116; 23132.

Sites. 3.2; 4.4; 5.5; 5.6.

Notes. Found in woodland and coastal sites.

Carlia rufilatus Storr, 1974 Red-Sided Rainbow Skink

Specimens. NTM R.22846-47; 22850; 23113; 23115; 23133.

Sites. 1.1; 1.2; 1.3; 1.5; 1.9; 2.1; 2.6; 3.4.

Notes. Common among litter at most sites.

***Carlia triacantha* (Mitchell, 1953)** Three-Spined Rainbow Skink

Specimens. NTM R.22990; 22998; 23006; 23123; 23137.

Sites. 2.6; 3.3; 3.8; 4.2.

Notes. Found at mostly dry sites.

***Cryptoblepharus plagiocephalus* (Cocteau, 1836)** Arboreal Snake-Eyed Skink

Specimens. NTM R.22854; 22867-69; 22877; 22881; 22884-88; 22891-93; 22900; 22904; 22987; 22997; 23025-26.

Sites. 1.1; 1.3; 1.5; 2.1; 2.2; 2.3; 2.4; 2.5; 2.6; 3.5; 3.8; 4.4; 5.1.

Notes. Common on tree trunks at most sites.

***Ctenotus borealis* Horner and King, 1986** Northern Ctenotus

Specimens. NTM R.22996; 23004.

Sites. 3.8; 3.9; 5.3.

Notes. Found at mostly dry sites.

***Ctenotus essingtonii* (Gray, 1842)** Port Essington Ctenotus

Specimens. NTM R.22856-57; 22876; 23012-13; 23134-36.

Sites. 1.3; 2.1; 4.1; 4.2; 5.5; 5.6.

Notes. Common in woodland and coastal sites.

***Glaphyromorphus darwiniensis* (Storr, 1967)** Darwin Skink

Specimens. NTM R.22883; 22895; 22903; 22967; 22968-70.

Sites. 2.2; 2.3; 3.2; 3.4.

Notes. Most common at sites adjoining monsoon forest.

***Glaphyromorphus douglasi* (Storr, 1967)** Douglas's Skink

Specimens. NTM R.22873; 22882; 22953; 22982; 23007-08; 23014-16; 23138.

Sites. 1.4; 1.7; 1.8; 2.1; 3.2; 3.4; 4.1; 5.6.

Notes. Found at a variety of sites, but most common in those adjoining monsoon forest.

***Lygisaurus macfarlani* (Günther, 1877)** Macfarlane's Skink

Specimens. NTM R.22889-90; 22901; 23021; 23031; 23034.

Sites. 2.2; 2.3; 4.1.

Notes. Only found at sites in or adjoining monsoon forest. In the Northern Territory this species is only been known from the Tiwi Islands and far north-eastern Arnhem Land. Extralimital in far north-eastern Queensland.

***Morethia storri* Greer, 1980** Storr's Snake-Eyed Skink

Specimens. NTM R.23117.

Sites. 1.1.

Notes. A single specimen found among *Callitris* litter at Taracumbi Falls.

Tiliqua scincoides (White, 1790) Common Blue-Tongued Lizard

Specimens. NTM R.22991.

Sites. 3.5.

Notes. A single specimen found under debris near the headwaters of Takamprimili Creek.

VARANIDAE - GOANNAS OR MONITOR LIZARDS

Varanus gouldii (Gray, 1838) Gould's Monitor

Specimens. NTM R.23111.

Sites. 5.4.

Notes. Record based on a road-killed specimen, found 5 km south of Milikapiti.

Varanus mertensi Glauert, 1951 Merten's Water Monitor

Specimens. NTM R.23110; 23112.

Sites. 1.9; 2.1; 3.2.

Notes. Observed at most permanent freshwater creeks.

Varanus scalaris Mertens, 1941 Spotted Tree Monitor

Specimens. NTM R.23036.

Sites. 1.1.

Notes. A single specimen collected at Taracumbi Falls.

TYPHLOPIDAE - BLIND SNAKES

Ramphotyphlops braminus (Daudin, 1803) Flowerpot Blind Snake

Specimens. NTM R.22902; 22975; 23130-31.

Sites. 2.3; 3.1; 3.2.

Notes. An introduced parthenogenetic species which was found in the vicinity of Pickertaramoor and at Andranangoo Creek, which is far removed from any human habitation.

BOIDAE - PYTHONS

Liasis childreni Gray, 1842 Children's Python

Specimens. NTM R.23020.

Sites. 4.3.

Notes. A single specimen found on a forestry track at night.

Morelia spilota (Lacépède, 1804) Carpet Python

Specimens. NTM R.23019.

Sites. 4.3.

Notes. A single specimen found on a forestry track at night.

COLUBRIDAE - COLUBRID SNAKES

***Boiga irregularis* (Merrem, 1802)** Brown Tree Snake

Specimens. NTM R.23033.

Sites. 4.6.

Notes. A single specimen found on a forestry track at night.

***Dendrelaphis punctulata* (Gray, 1826)** Common Tree Snake

Sites. 3.2.

Notes. Not collected; record based on a sighting at Takamprimili Creek, near road crossing.

***Tropidonoplis mairii* (Gray, 1841)** Keelback Snake

Specimens. NTM R.22984; 23037.

Sites. 2.1; 3.2.

Notes. Two individuals found at sites close to permanent water.

ELAPIDAE - ELAPID SNAKES

***Pseudechis australis* (Gray, 1842)** Mulga Or King Brown Snake

Specimens. NTM R.23108.

Sites. 3.10.

Notes. Record based on a road-killed specimen, found 17 km north-west of Pickertaramoor.

MAMMALIA

DASYURIDAE - DASYURID MARSUPIALS

***Antechinus bellus* (Thomas, 1904)** Fawn Antechinus

Specimens. NTM U.4405.

Sites. 1.2.

Notes. One individual collected in woodland by Taracumbi Creek. This is believed to be the first record of this species from the Tiwi Islands (J. Woinarski, pers. comm.).

***Sminthopsis virginiae* (Tarragon, 1847)** Red-Cheeked Dunnart

Specimens. NTM U.4417.

Sites. 2.2.

Notes. A single specimen found near swamp by Andranangoo Creek.

PERAMELIDAE - BANDICOOTS

***Isodon macroura* (Gould, 1842)** Northern Brown Bandicoot

Sites. 2.3; 4.1.

Notes. Not collected; specimens observed on woodland sites adjoining monsoon forest.

PHALANGERIDAE - POSSUMS

Trichosurus arnhemensis Collett, 1897 Northern Brushtail Possum

Specimens. NTM U.4626.

Sites. 1.3; 2.6; 3.1; 3.2.

Notes. Found in hollow eucalypts in woodland sites.

PETAURIDAE - GLIDING POSSUMS

Petaurus breviceps Waterhouse, 1839 Sugar Glider

Specimens. NTM U.4403.

Sites. 1.1.

Notes. A single specimen collected by Tipiloura family at Taracumbi Creek.

MACROPODIDAE - KANGAROOS AND WALLABIES

Macropus agilis (Gould, 1842) Agile Wallaby

Sites. 2.1; 3.1; 4.1.

Notes. Not collected; individuals observed at most woodland sites.

PTEROPODIDAE - FRUIT BATS

Macroglossus minimus (Geoffroy, 1810) Northern Blossom-Bat

Specimens. NTM U.4404.

Sites. 1.4.

Notes. A single specimen collected in monsoon forest downstream of Taracumbi Falls.

Pteropus scapulatus Peters, 1862 Little Red Flying-Fox

Sites. 1.8.

Notes. Not collected; specimens observed flying over most sites at night.

EMBALLONURIDAE - BATS

Saccolaimus flaviventris (Peters, 1867) Yellow-Bellied Sheathtail-Bat

Specimens. NTM U.4413.

Sites. 1.10.

Notes. A single specimen collected at Nine Mile Waterhole.

VESPERTILIONIDAE - BATS

Pipistrellus westralis Koopman, 1984 North-Western Pipistrelle

Specimens. NTM U.4414.

Sites. 1.8.

Notes. A single specimen collected near an unnamed creek, 14 km south of Taracumbi Falls.

MURIDAE - RATS AND MICE

Mesembriomys gouldii (Gray, 1843) Black-Footed Tree-Rat

Specimens. NTM U.4410.

Sites. 1.2; 1.3; 2.4.

Notes. Individuals were observed in most woodland sites.

Pseudomys delicatulus (Gould, 1842) Delicate Mouse

Specimens. NTM U.4415; 4418.

Sites. 1.2; 2.4.

Notes. Two specimens collected in open woodland close to watercourses.

Melomys burtoni (Ramsay, 1887) Grassland Melomys

Specimens. NTM U.4406-09; 4412; 4416.

Sites. 1.2; 1.6; 1.8; 2.2; 2.3; 2.4; 3.1; 3.2

Notes. Common. Usually found at sites in or adjacent to monsoon forest.

Rattus tunneyi (Thomas, 1904) Pale Field-Rat

Specimens. NTM U.4411.

Sites. 2.1.

Notes. A single specimen taken from a burrow under *Pandanus* at Goose Creek Camp.

CANIDAE - DOGS

Canis familiaris dingo Meyer, 1793 Dingo

Sites. 2.1.

Notes. Not collected; observed in woodland adjacent to Andranangoo Creek.

EQUIDAE - HORSES

Equus caballus Linnaeus, 1758 Horse

Sites. 2.1.

Notes. Not collected; observed in woodland adjacent to Andranangoo Creek.

BOVIDAE - BUFFALOS

Bubalus bubalis (Linnaeus, 1758) Water Buffalo

Sites. 2.1; 4.3.

Notes. Not collected; observed in woodland adjacent to Andranangoo Creek and in monsoon forest near Maxwell Creek.

DISCUSSION

The survey of terrestrial habitats adjoining freshwater ecosystems produced 58 species, composed of 10 amphibians, 31 reptiles and 17 mammals (summarised in Table 1). None of the species recorded is endemic to Melville Island, and most range widely throughout the Top End (Cogger 1992; Horner 1992; Strahan 1992). One species, Macfarlane's Skink *Lygisaurus macfarlani*, has a relatively restricted distribution, occurring in three disjunct populations (Tiwi Islands, far north-eastern Arnhem Land and far north-eastern Queensland). It may also occur in New Guinea (Cogger 1992). The Fawn Antechinus *Antechinus bellus* has not previously been recorded from the Tiwi Islands (J. Woinarski, pers. comm.), and is a new species record for Melville Island.

Contrary to expectations, the influence of feral animal populations on Melville Island was greater than expected. Horses and Water Buffalo were common and the wallowing behaviour of buffalo has had a significant detrimental impact on aquatic habitats at the headwaters of Takamprimili Creek. Two reptiles, introduced into north Australia from South-east Asia, were relatively common on Melville Island. The House Gecko *Hemidactylus frenatus* appears to be restricted to areas of human habitation. Of some cause for concern, however, is the finding of the parthenogenetic Flowerpot Blind Snake *Ramphotyphlops braminus* at Andranangoo Creek, which is far removed from any human habitation. Though possibly transported to the site among camping equipment, this record indicates that feral populations of this species are not restricted to areas of human habitation and they may be exploiting environmental niches normally occupied by native Blind Snakes.

Of some interest, from a biogeographic perspective, is that the Brown Tree Snake, collected near Maxwell Creek, exhibits a russet colour and flecked body pattern that is more indicative of east coast populations than of local mainland Top End forms, which are typically cream in colour with distinct brick-red bands. This finding is supported by the collection of a green form of the Common Tree Snake *Dendrelaphis punctulata* (NTM R.17011) on Bathurst Island, by Nic Gambold in December 1991. Again, this specimen more closely resembles east coast populations of this species than the golden-yellow form common in the Top End.

Fourteen species of frog have been previously recorded from Melville Island (Tyler *et al.* 1991), five more than found during this survey. The difference in survey results are attributable to environmental conditions with Tyler's survey being carried out during January, a wetter month more likely to have increased frog activity.

Table 1. Terrestrial vertebrates observed on Melville Island and the sites from which they were recorded.

Species	Sites
<i>Litoria bicolor</i>	2.1 2.2
<i>Litoria inermis</i>	1.8 3.5
<i>Litoria microbelos</i>	1.9 2.1
<i>Litoria nasuta</i>	1.8 1.10 3.5 3.9
<i>Litoria pallida</i>	1.8
<i>Litoria rothii</i>	1.10
<i>Litoria tornieri</i>	1.8 2.1 3.2
<i>Crinia remota</i>	1.9 2.1 3.5
<i>Limnodynastes ornatus</i>	1.3 1.10 3.1 4.1
<i>Sphenophryne adelphe</i>	1.1 1.2 1.3 1.4 1.9 2.2 2.3 3.1 3.2 4.1
<i>Emydura victoriae</i>	3.5
<i>Gehyra australis</i>	2.6 3.4 3.8
<i>Hemidactylus frenatus</i>	3.2 5.2 3.8
<i>Heteronotia binoei</i>	1.1 1.5 1.7 1.8 3.3 3.4 3.8 3.9 5.6
<i>Oedura rhombifer</i>	1.1 3.4
<i>Lialis burtonis</i>	3.3
<i>Chlamydosaurus kingii</i>	2.1 3.6
<i>Diporiphora bilineata</i>	1.1 3.3 3.7 5.5 5.6
<i>Lophognathus temporalis</i>	1.1 1.5 1.9 2.1 2.5 2.6 3.2 3.6 3.8
<i>Carlia gracilis</i>	1.6 1.8 1.9 2.1 2.3 3.1 3.5 3.8 3.9 4.1 4.4 4.5
<i>Carlia munda</i>	3.2 4.4 5.5 5.6
<i>Carlia rufilatus</i>	1.1 1.2 1.3 1.5 1.9 2.1 2.6 3.4
<i>Carlia triacantha</i>	2.6 3.3 3.8 4.2
<i>Cryptoblepharus plagiocephalus</i>	1.1 1.3 1.5 5.1 2.1 2.2 2.3 2.4 2.5 2.6 3.5 3.8 4.4
<i>Ctenotus borealis</i>	3.8 3.9 5.3
<i>Ctenotus essingtonii</i>	1.3 2.1 4.1 4.2 5.5 5.6
<i>Glaphyromorphus darwiniensis</i>	2.2 2.3 3.2 3.4
<i>Glaphyromorphus douglasi</i>	1.4 1.7 1.8 2.1 3.2 3.4 4.1 5.6
<i>Lygisaurus macfarlani</i>	2.2 2.3 4.1
<i>Morethia storri</i>	1.1
<i>Tiliqua scincoides</i>	3.5
<i>Varanus gouldii</i>	5.4
<i>Varanus mertensi</i>	1.9 2.1 3.2
<i>Varanus scalaris</i>	1.1
<i>Ramphotyphlops braminus</i>	2.3 3.1 3.2
<i>Liasis childreni</i>	4.3
<i>Morelia spilota</i>	4.3
<i>Boiga irregularis</i>	4.6
<i>Dendrelaphis punctulata</i>	3.2
<i>Tropidonophis mairii</i>	2.1 3.2
<i>Pseudechis australis</i>	3.10
<i>Antechinus bellus</i>	1.2
<i>Sminthopsis virginiae</i>	2.2
<i>Isodon macroura</i>	2.3 4.1
<i>Trichosurus arnhemensis</i>	2.6 3.1 3.2
<i>Petaurus breviceps</i>	1.1
<i>Macropus agilis</i>	2.1 3.1 4.1
<i>Macroglossus minimus</i>	1.4
<i>Pteropus scapulatus</i>	1.8
<i>Saccolaimus flaviventris</i>	1.10
<i>Pipistrellus westralis</i>	1.8
<i>Mesembriomys gouldii</i>	1.2 1.3 2.4
<i>Pseudomys delicatulus</i>	1.2 2.4
<i>Melomys burtoni</i>	1.2 1.6 1.8 2.2 2.3 2.4 3.1 3.2
<i>Rattus tunneyi</i>	2.1
<i>Canis familiaris dingo</i>	2.1
<i>Equus caballus</i>	2.1
<i>Bubalus bubalis</i>	2.1

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