

MAGNT RESEARCH REPORT No. 13
JUNE 2010

**FRESHWATER FISHES OF LAKE ANGURRKURNA,
GROOTE EYLANDT, NORTHERN TERRITORY**

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Front cover. View of the southern shoreline of Lake Angurrkburna, Groote Eylandt.
Photo: G. Dally, September 2009.

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REPORT TO BIODIVERSITY CONSERVATION DIVISION, DEPARTMENT OF NATURAL RESOURCES, ENVIRONMENT, THE ARTS AND SPORT (DNRETAS), NORTHERN TERRITORY GOVERNMENT

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INTRODUCTION

Lake Angurrkurna, located at the south-eastern end of Groote Eylandt in the Gulf of Carpentaria, was surveyed over four days in September 2009 during the DNRETAS Biodiversity Conservation “Biodiversity Conservation Values and Management for Northern Territory Islands” field program (funded by the Commonwealth Government’s *Caring for our Country* program). There is very little existing information on the freshwater fishes of Groote Eylandt and it is highly likely that the lake had never previously been surveyed. Several small waterholes and a paperbark swamp at the south-eastern end of the island were also opportunistically sampled (Figure 1).

The only previously published data on the freshwater fishes of Groote Eylandt are in the records of the American-Australian Expedition of 1948 (Taylor 1964) where 15 freshwater species were recorded from the Emerald River drainage on the west coast (Table 1). The CSIRO Marine Laboratories conducted inshore waters surveys of northern Groote Eylandt during 1989 and 1990 (Blaber 1992) but freshwater habitats were not sampled. Allen (2003) indicated the presence of 16 freshwater species on Groote Eylandt, not including several estuarine-freshwater species that may also occur in the lower reaches of rivers.

MATERIALS AND METHODS

The lake survey was undertaken by Museum and Art Gallery Northern Territory (MAGNT) staff member Gavin Dally with assistance from local traditional owners from 5-8 September 2009; the other small waterholes were sampled on 10 September 2009. Methods used were multipanel gill-net, scoop-net, dip-nets, prawn traps, cathedral turtle trap, hook and line (both trolled and set baited) and cast nets. Due to the possible presence of saltwater crocodiles in the lake (which was confirmed on the last day on site!), methods such as snorkelling and hand-pulled seine nets were not used.

The multipanel gill-net is 35 m long, with a drop of 2 m and 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 small rainbowfish to adult barramundi). The gill-net was initially set for one hour, to prevent drowning any freshwater crocodiles and killing too many fish. The set time was gradually increased to several hours after it was determined that large fish kills were not occurring. The net was set either at right angles to the shore or parallel and close to the reeds or lillies at the edge of the lake. The particular net used was designed to be bottom set and was anchored and buoyed in numerous different locations in the lake, at various times throughout the day.

The scoop-net, dip-nets and prawn traps also captured several crustaceans and molluscs. The baited cathedral turtle trap was used regularly at various sites in the lake. It was set under overhanging paperbark trees up against the reeds and checked every few hours during the day and left overnight to be checked in the morning.

Figure 1. South-eastern end of Groote Eylandt indicating Lake Angurkburna, other waterholes and swamp collecting stations.



Fish specimens were tissue sampled and formalin fixed in the field before being brought back to the MAGNT in Darwin for confirmation of identifications, and deposition in the MAGNT reference collection. Specimens deposited in the collection are registered with habitat, physical and chemical data and are included in the MAGNT Natural Science database.

Localities were fixed using a Magellan hand-held GPS. Temperature, salinity and conductivity were recorded by a YSI system.

DESCRIPTION OF COLLECTING STATIONS

Lake Angurrkburna, with an area of approximately 350 hectares, is characterised by a silty-sand bottom with a shoreline of predominately reeds and small *Melaleuca* sp. paperbark trees. At the time of survey there was a narrow zone of water lillies along the south-eastern shoreline. Depth measurements were recorded from 6 sites in the lake, which ranged from 4-5.5 m deep with an average depth of 4.9 m. A sandstone ridge runs up to the eastern and western shores of the lake (Figure 2). The lake was observed to be completely land locked with no open connection to the sea.



Figure 2. Sandstone ridge on western shore of lake.

The water had a recorded conductivity of 224.4 μS (natural freshwater ranges from 0-800 μS) and water temperature was measured at 29.9° C. Water turbidity was high with a Secchi disc reading of 1.5 m.

Four freshwater holes, located behind low foredunes at the south-eastern end of the island were also sampled, albeit briefly (Figures 1 and 4). A paperbark swamp, station GD09-GE10 (Figure 5), was also briefly sampled; however only the shallow edge could be surveyed due to difficult access, a very muddy bottom and crocodile danger. This swamp may support numerous fish species however the aforementioned issues prevented a comprehensive survey.

The multipanel gill-net was used in 11 different locations across Lake Angurrkburna, only those sets that captured a different species have been recorded as a new station.

Station GD09-GE01 (Figure 3)

Lake Angurrkburna, Groote Eylandt. Cast-net, prawn traps and cathedral turtle trap used in shallows and amongst reeds at lake edge. 14°13.012'S 136°45.542'E. 5 September 2009.



Figure 3. GD09-GE01 Lake Angurrkburna shoreline

Station GD09-GE02

Lake Angurrkburna, Groote Eylandt. Multipanel gill-net set in 3 m next to reeds. 14°13.467'S 136°45.531'E. 5 September 2009.

Station GD09-GE03

Lake Angurrkburna, Groote Eylandt. Multipanel gill-net set in 3 m next to reeds. 14°13.865'S 136°45.543'E. 6 September 2009.

Station GD09-GE04

Lake Angurrkburna, Groote Eylandt. Dip-net and scoop-net used in shallows at lake edge. 14°13.014'S 136°45.547'E. 7 September 2009.

Station GD09-GE05

Lake Angurrkburna, Groote Eylandt. Multipanel gill-net set in 2 m next to sandstone outcrops on lake edge. 14°13.648'S 136°45.597'E. 7 September 2009.

Station GD09-GE06

Freshwater waterhole, behind low beach dune, east of Ungwariba Point, Groote Eylandt. Dip-nets and scoop-net used in shallows amongst reeds at edge. 14°09.869'S 136°55.981'E. 10 September 2009.

Station GD09-GE07

Freshwater waterhole, behind low beach dune, east of Ungwariba Point, Groote Eylandt. Dip-nets and scoop-net used in shallows amongst reeds at edge. 14°09.954'S 136°55.784'E. 10 September 2009.

Station GD09-GE08

Freshwater waterhole, behind low beach dune, east of Ungwariba Point, Groote Eylandt. Dip-nets and scoop-net used in silty shallows at edge. 14°09.772'S 136°55.328'E. 10 September 2009.

Station GD09-GE09 (Figure 4)

Freshwater waterhole, behind low beach dune, south-eastern end of Groote Eylandt. Dip-nets, cast-net and scoop-net used in silty shallows at edge. 14°12.684'S 136°52.468'E. 10 September 2009.



Figure 4. GD09-GE09 freshwater waterhole behind foredune on beach

Station GD09-GE10 (Figure 5)

Paperbark swamp, soft mud bottom. Baited prawn traps set overnight. 14°13.567'S 136°51.976'E. 11 September 2009. Due to difficult access, a very muddy bottom and saltwater crocodile risk this site could not be thoroughly surveyed. It is likely that more species are present than were captured.



Figure 5. GD09-GE10 paperbark swamp

FISH SPECIES

The nine species listed here are based on actual fish collected during the survey. Station numbers are given for where a specimen of each species was first collected and retained from the lake. At least one individual of all species collected have been tissue sampled and the whole fish kept and registered into the MAGNT collections (MAGNT registration number and standard length in mm indicated). All specimens have been identified by the author and confirmed by Rex Williams, MAGNT.

Species listings from “Freshwater Fishes of Australia” (Allen 2003), “Fishes of Arnhem Land” (Taylor 1964) and Dr Helen Larson (pers. comm.) have been used to determine Groote Eylandt new record status. Common names follow the convention in “Standard names of Australian fishes” (Yearsley 2006).

Megalopidae - Tarpons

Megalops cyprinoides (Broussonet, 1782) – Oxeye Herring (Figure 6)

GD09-GE05, S.16924-001 (1 specimen, 390 mm). 5 other individuals also caught and released in lake during survey.



Figure 6. *Megalops cyprinoides* specimen caught in gill-net, Lake Angurrkburna.

Clupeidae – Herrings

Nematalosa erebi (Gunther, 1868) – Bony Bream

GD09-GE02, S.16921-003 (1 specimen, 228 mm). 9 other individuals also caught and released in lake during survey. New record for Groote Eylandt.

Osteoglossidae – Bonytongues

Scleropages jardinii (Saville-Kent, 1892) - Northern Saratoga (Figure 7)

GD09-GE02, S.16921-001 (1 specimen, 350 mm); GD09-GE02, S.16921-002 (tissue sample only). 22 other individuals also caught and released in lake during survey. New record for Groote Eylandt.



Figure 7. *Scleropages jardinii* specimen caught on hook and line, Lake Angurrkburna.

Melanotaeniidae – Rainbowfish

Melanotaenia solata Taylor, 1964 – Northern Rainbowfish

GD09-GE01, S.16920-001 (3 specimens, 54-68 mm); GD09-GE06, S.16925-001 (4 specimens, 23-48 mm); GD09-GE07, S.16926-001 (15 specimens, 21-59 mm); GD09-GE08, S.16927-001 (1 specimen, 55 mm); GD09-GE09, S.16928-001 (1 specimen, 24 mm); GD09-GE10, a post-larval *Melanoteania* sp. was collected, not kept.

Melanotaenia species are characterised by hybridisation and high local endemism, with some species restricted to a single drainage system (Larson pers. comm.). Ongoing molecular work that underpins taxonomic reviews of the genus will be supported by tissue samples collected during this survey.

The taxonomic status of *M. solata* is unresolved; Larson (pers. comm.) considers it a junior synonym of *M. australis* Castelnau, 1875.

Atherinidae – Hardyheads

Craterocephalus stercusmuscarum (Gunther, 1867) – Flyspecked Hardyhead

GD09-GE04, S.16923-003 (4 specimens, 21-32 mm). New record for Groote Eylandt.

Ambassidae – Glass-perchlets

***Ambassis macleayi* (Castelnau, 1878) – Macleay's Glassfish**

GD09-GE01, S.16920-002 (1 specimen, 39 mm); GD09-GE04, S.16923-002 (2 specimens, 30-55mm). New record for Groote Eylandt.

Terapontidae – Grunters

***Amniataba percoides* (Gunther, 1864) – Barred Grunter**

GD09-GE03, S.16922-001 (3 specimens, 94-119 mm). 15 other individuals also caught and released in lake during survey. New record for Groote Eylandt.

Apogonidae – Cardinalfishes

***Glossamia aprion* (Richardson, 1842) – Mouth Almighty**

GD09-GE01, S.16920-003 (2 specimens, 74-110 mm). 7 other individuals also caught and released in lake during survey.

Gobiidae – Gobies

***Glossogobius aureus* Akihito and Meguro, 1975 – Golden Flathead Goby**

GD09-GE01, S.16920-004 (tissue sample only); GD09-GE04, S.16923-001 (1 specimen, 35 mm). New record for Groote Eylandt.

Table 1. Summary table for Groote Eylandt freshwater fish species.

| Family | Taylor (1964) Fishes of Arnhem Land | Allen (2003) Freshwater fishes of Australia | Present survey |
|-----------------|--------------------------------------------|----------------------------------------------------|----------------------------------------|
| Megalopidae | <i>Megalops cyprinoides</i> * | <i>Megalops cyprinoides</i> * | <i>Megalops cyprinoides</i> * |
| Ophichthidae | <i>Ophichthus</i> sp. | | |
| Clupeidae | | | <i>Nematalosa erebi</i> |
| Osteoglossidae | | | <i>Scleropages jardinii</i> |
| Plotosidae | <i>Neosilurus ater</i> | <i>Neosilurus ater</i> | |
| | <i>Porochilus rendahli</i> | <i>Porochilus rendahli</i> | |
| Melanotaeniidae | <i>Melanotaenia nigrans</i> | <i>Melanotaenia nigrans</i> | <i>Melanotaenia solata</i> |
| | <i>Melanotaenia splendida</i> | <i>Melanotaenia solata</i> | |
| | | <i>Melanotaenia trifasciata</i> | |
| Pseudomugilidae | <i>Pseudomugil gertrudae</i> | <i>Pseudomugil gertrudae</i> | |
| Atherinidae | | | <i>Craterocephalus stercusmuscarum</i> |
| Centropomidae | <i>Lates calcarifer</i> * | | |
| Ambassidae | <i>Ambassis agrammus</i> | <i>Ambassis agrammus</i> | <i>Ambassis macleayi</i> |
| | | <i>Ambassis interruptus</i> | |
| | <i>Denarius bandata</i> | | |
| Terapontidae | | <i>Leiopotherapon unicolor</i> | <i>Amniataba percoides</i> |
| Apogonidae | <i>Glossamia aprion</i> | <i>Glossamia aprion</i> | <i>Glossamia aprion</i> |
| Lutjanidae | <i>Lutjanus argentimaculatus</i> * | <i>Lutjanus argentimaculatus</i> * | |
| Gerreidae | <i>Gerres filamentosus</i> * | <i>Gerres filamentosus</i> * | |
| Scatophagidae | <i>Scatophagus argus</i> * | <i>Scatophagus argus</i> * | |
| Mugilidae | <i>Valamugil buchani</i> * | | |
| Gobiidae | | | <i>Glossogobius aureus</i> |
| Eleotridae | | <i>Mogurnda mogurnda</i> | |
| | | <i>Oxyeleotris selheimi</i> | |

* Indicates fishes that are not obligate freshwater species (after Larson, 1990)

MOLLUSCA

BIVALVIA: PALAEOHETERODONTA Hyriidae – Freshwater Mussels

Velesunio angasi (Sowerby, 1867) – Angas' Freshwater Mussel

GD09-GE01, shoreline of Lake Angurrkburna; (2 complete specimens; P.43248).

GASTROPODA: PULMONATA Lymnaeidae – Pond Snails

Austropeplea lessoni (Deshayes, 1830) – Lesson's Pond Snail

GD09-GE06, reedy waterhole behind dune; (5 specimens; P.43247).

Mollusc identifications by Dr Richard Willan, MAGNT.

CRUSTACEA

DECAPODA Palaemonidae – Shrimp

Macrobrachium rosenbergii? – Giant Freshwater Prawn

GD09-GE01 (1 juvenile specimen; Cr.16883). Uncertain identification-specimen has been tissue sampled for future confirmation of species.

Parastacidae – Freshwater Crayfish

Cherax cf. quadricarinatus – Redclaw Crayfish

GD09-GE01, shoreline of Lake Angurrkburna, collector T. Mahney, 11 September 2009; (1 specimen; Cr.16884). Uncertain identification-specimen has been tissue sampled for future confirmation of species.

GD09-GE10, paperbark swamp (several specimens; Cr.16885).

Uncertain identification-specimen has been tissue sampled for future confirmation of species.

REPTILIA

CROCODYLIA: CROCODYLIDAE

Crocodylus porosus (Schneider, 1801) – Saltwater Crocodile

GD09-GE01, shoreline of Lake Angurrkburna. Sight record (by T. Mahney, pers. comm.). Substantial damage to the baited cathedral turtle trap also indicative of presence of crocodiles.

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