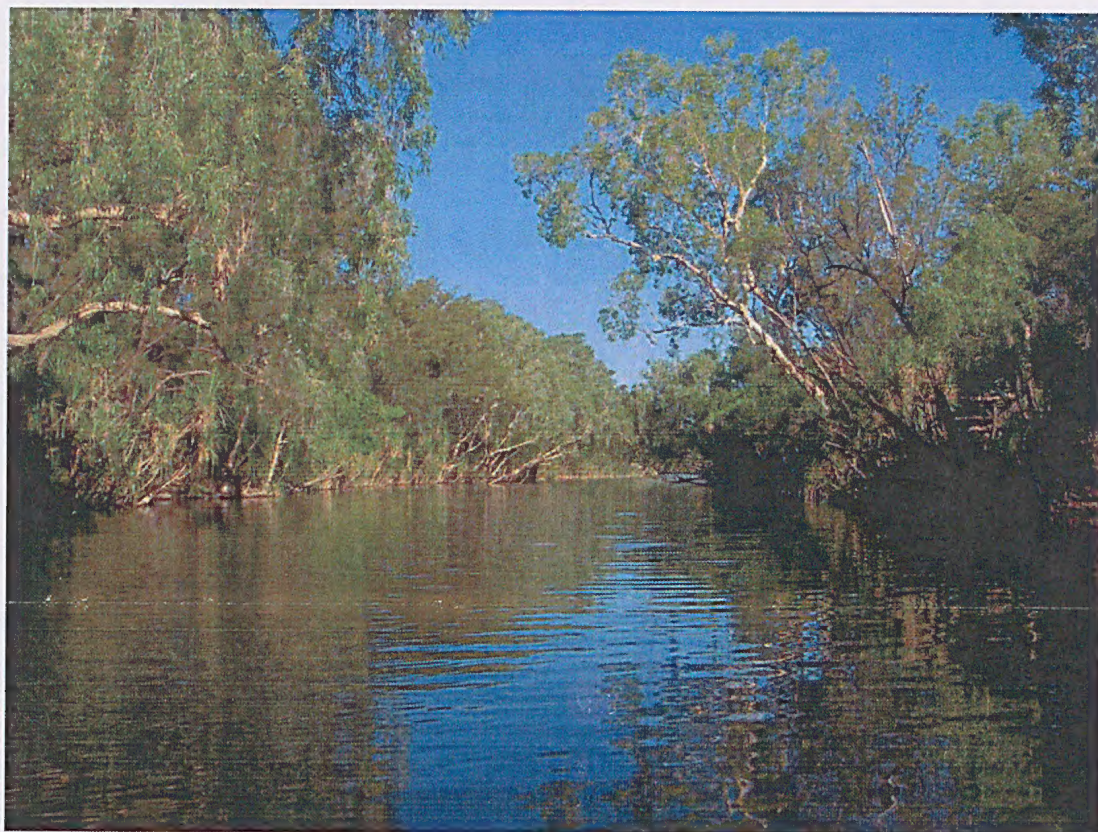


MAGNT RESEARCH REPORT No. 12
NOVEMBER 2008

**ROPER RIVER (ELSEY AND MOROAK STATIONS)
FRESHWATER FISHES SURVEY**

GAVIN DALLY AND HELEN K. LARSON



Northern
Territory
Government

Front cover. View of the Roper River waterhole forming the boundary between Elsey and Moroak Stations, Northern Territory. Photo: G. Dally October, 2008.

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REPORT TO ROPER RIVER LANDCARE GROUP

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INTRODUCTION

The freshwater fishes of the upper Roper River system, which enters the south-western Gulf of Carpentaria on the Northern Territory, have not been well documented. Muggley (1970) reported 27 species of freshwater fishes from the Roper River. Larsen and Martin (1970) recorded 36 freshwater species known to be from the Roper system, including several endemic species.

In 2008, the Roper River Invertebrate Zoology of the Museum and Art Gallery of the Northern Territory (MANT) is undertake a freshwater fish survey of an approximately 4 km long waterhole on the Roper River, including Elsey and Moroak Stations (see figure 1). The aim of the survey was to make an inventory of the resident fish fauna, to determine the presence of any fish which according to anecdotal evidence (i.e. Howkinson, 2008 pers. comm.), have been seen in the area. The freshwater whiting (*Prinia whitensis*) and the dwarf sandfish (*P. minoris*) are both known to occur in other drainage systems in northern Australia. Of these, *P. minoris* is the species usually encountered in freshwaters (Lut and Stevens 1994). It is found throughout the Indo-West Pacific including New Guinea, South-east Asia, India and east Africa; in northern Australian river systems it has been recorded some 400 km inland (Martin *et al.* 2001). The species has been recorded from the Wilson River, a tributary of the Roper, as well as the Louran (Light) River, which directly enters the Gulf of Carpentaria (Muggley, 1970).

Another objective was to collect fresh specimens of the northern Australian snapping baitfish (*Eleotris debilis*) to contribute to further genetic and morphological analyses by other researchers. *Eleotris debilis* has long been suspected to be a species complex and populations in the Roper drainage have been provisionally distinguished as a genetically separate form (Gillespie and Adams, 1972). However, the taxonomic status of *Eleotris* from the Roper population is still unclear as the new form is yet to be formally described and published.

ACKNOWLEDGMENTS

The following MAGNT staff undertook the taxonomic identifications of fauna collected during the survey: Helen Larson and Rex Williams (fish), Richard Willan (molluscs), Paul Horner (reptiles and amphibians) and Suzanne Horner (crustaceans).

Invaluable field assistance was provided by Steven Gregg (MAGNT), Ian and Joe Rowbottom (Roper River Landcare Group) and Matt Daniel (Greening Australia).

**ROPER RIVER (ELSEY AND MOROAK STATIONS)
FRESHWATER FISHES SURVEY**

REPORT TO ROPER RIVER LANDCARE GROUP
OCTOBER, 2008

GAVIN DALLY AND HELEN K. LARSON

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INTRODUCTION

The freshwater fishes of the upper Roper River system, which enters the south-western Gulf of Carpentaria in the Northern Territory, have not been well documented. Midgley (1979) reported 28 species of freshwater fishes from the Roper River. Larson and Martin (1990) recorded 36 freshwater species known to be from the Roper system, including several estuarine species.

In 2008, the Roper River Landcare Group engaged the Museum and Art Gallery of the Northern Territory (MAGNT) to undertake a freshwater fish survey of an approximately 4 km long waterhole on the Roper River bordering Elsey and Moroak Stations (see figure 5). The aims of the survey were to make an inventory of the residential fish fauna and to confirm the presence of sawfish which, according to anecdotal evidence (I. Rowbottom, 2008 pers. comm.), have been seen in the area. The freshwater sawfish (*Pristis microdon*) and the dwarf sawfish (*P. clavata*) are both known to occur in other drainage systems in northern Australia. Of these, *P. microdon* is the species usually encountered in freshwaters (Last and Stevens 1994). It is found throughout the Indo-west Pacific including New Guinea, South-east Asia, India and east Africa; in northern Australian river systems it has been recorded some 400 km inland (Morgan *et al.* 2004). The species has been recorded from the Wilton River, a tributary of the Roper, as well as the Limmen Bight River, which directly enters the Gulf of Carpentaria (Midgley, 1979).

Another objective was to collect fresh specimens of the northern Australian snapping turtle (*Elseya dentata*) to contribute to further genetic and morphological analyses by other researchers. *Elseya dentata* has long been suspected to be a species complex and populations in the Roper drainage have been previously distinguished as a genetically separate form (Georges and Adams, 1992). However, the taxonomic status of *Elseya* from the Roper population is still unclear as the new species is yet to be formally described and published.



Figure 1. Baited cathedral turtle trap set under *Pandanus aquaticus*.



Figure 2. Multipanel gill-net bottom set at Station GD08-02.

METHODS

The survey was carried out by two MAGNT staff members (Gavin Dally and Steven Gregg) with assistance from the Roper River Landcare Group (Ian and Joe Rowbottom) and Greening Australia (Matt Daniel), from 22-25 September 2008 (3 full days of collecting). Methods used were multipanel gill-net (Fig. 2), scoop-net, dip-nets, prawn traps, cathedral turtle traps (Fig. 1), hook and line (heavy set lines and casting rods) and sight observations. Due to the possible presence of estuarine crocodiles in the river, methods such as snorkelling, hand-pulled seine nets or scoop netting in the main waterhole 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 set for one hour, to prevent drowning any freshwater crocodiles and killing too many fish. The net was set either at right angles to the bank, in many cases completely covering the whole width of the waterhole, or parallel and close in to the bank. The particular net used was designed to be bottom set to maximise the chances of capturing sawfish, sharks and rays and was anchored and buoyed to remain stationary, at various times throughout the day.

The baited set lines consisted of a 6/0 size fishing hook attached to a line of 3 m of 80 kg monofilament and 2 m of heavy cord. The rig was tied to an anchor so as to remain on the bottom, with a visible surface float also attached. Three set lines were constantly used at various sites in the waterhole and were left overnight to be checked in the morning and also rebaited several times during the day.

The baited cathedral turtle traps were used constantly at various sites in the waterhole. They were mostly set under overhanging *Pandanus aquaticus* and checked every few hours during the day and left overnight to be checked in the morning. They were also successful in catching fish unharmed, which enabled unwanted specimens to be returned to the water after identification.

The scoop-net, dip-net and prawn traps sampling techniques also captured macroinvertebrates such as crustaceans, aquatic insects and molluscs. There was also very limited opportunistic hand collecting of reptiles and amphibians from terrestrial habitats adjoining the watercourse.

Fish specimens were tissue sampled and formalin fixed in the field before being brought back to the MAGNT in Darwin for further sorting and identification confirmation, and deposited as vouchers in the MAGNT reference collection. Specimens deposited in the collection will be registered with habitat, physical and chemical data 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.

DESCRIPTIONS OF COLLECTING STATIONS

The 4 km long stretch of the Roper River sampled during this survey forms part of the northern boundary of Elsey Station and the southern boundary of Moroak Station, south-east of Mataranka off the Roper Highway (see figure 5). This river section is a permanent, deep, main channel waterhole and is characterised by steep, high banks along most of the northern side with steep, low banks with some gentler sloping sections along the southern side. The river substrate generally consisted of sand, rocks, leaf litter and logs with large boulders occurring midstream near the eastern end of the waterhole. During the survey the current was very slow with very high turbidity. The riparian vegetation consisted of *Melaleuca*, *Pandanus*, *Allocasuarina* and *Eucalyptus* species with a heavily grazed understorey and open woodland behind.

Station GD 08-01.

Roper River, Elsey/Moroak Stations, western end of waterhole. 14°49.514'S 133°41.048'E. Depth 3-5 m, water temp 28.1° C, salinity 0.7 parts per thousand (ppt), water colour green, river width 30 m. 22 September 2008. Collectors G. Dally, S. Gregg and M. Daniel. Three baited set lines and two baited cathedral turtle traps (positioned under *Pandanus aquaticus*) set at 1700 hr over a 300 m section of river and left overnight.



Figure 3. Western end of waterhole, Station GD08-01

Station GD 08-02.

Roper River, Elsey/Moroak Stations, near western end of waterhole. 14°49.669'S 133°41.264'E. Depth 4-5 m, water temp 27.9° C, salinity 0.7 ppt, conductivity 1529 µS, pH 8.04, water colour green, river width 30 m. 23 September 2008. 0820-0920 hrs. Collectors G. Dally and S. Gregg, by multipanel gill-net bottom set across width of river.

Station GD 08-03.

Roper River, Elsey/Moroak Stations, near eastern end of waterhole. 14°49.723'S 133°41.884'E. Depth 6-8 m, water temp 28.6° C, salinity 0.7 ppt, conductivity 1543 µS, water colour green, river width 40 m. 23 September 2008. 1325-1425 hrs. Collectors G. Dally and S. Gregg, by multipanel gill-net bottom set across width of river.



Figure 4. Near eastern end of waterhole, Station GD08-03

Station GD 08-04.

Roper River, Elsey/Moroak Stations, eastern end of waterhole. 14°49.505'S 133°42.775'E. Depth 5-6 m, water temp 28.8° C, salinity 0.7 ppt, conductivity 1545 µS, water colour green, river width 30 m, larger rocks present. 23 September 2008. 1605-1705 hrs. Collectors G. Dally and S. Gregg, by multipanel gill-net bottom set across width of river and 3 baited set lines (net became irretrievably snagged after entangling a 2 m freshwater crocodile and the collectors had to cut off the small mesh end to free it).



Figure 5. Locality map of the surveyed waterhole, Roper River. Adapted from 1:100,000 sheet 5668 Moroak.

Station GD 08-05.

Roper River, Elsey/Moroak Stations, near western end of waterhole. 14°49.713'S 133°41.352'E. Depth 3 m, water temp 28.2° C, salinity 0.7 ppt, water colour green, river width 40 m. 24 September 2008. Collectors G. Dally and S. Gregg, by two baited cathedral turtle traps (positioned under *Pandanus aquaticus*) and 3 baited set lines that were left overnight and pulled at 0830 hr.

Station GD 08-06.

Roper River, Elsey/Moroak Stations, near eastern end of waterhole. 14°49.522'S 133°42.678'E. Depth 5-6 m, water temp 28.2° C, salinity 0.7 ppt, conductivity 1529 µS, water colour green, river width 40 m. 24 September 2008. Collectors G. Dally, S. Gregg and M. Daniel, by multipanel gill-net bottom set parallel to bank (1036-1140 hr) and two baited cathedral turtle traps set under *Pandanus aquaticus* (0930-1330 hr).

Station GD 08-07.

Roper River, Elsey/Moroak Stations, isolated, shallow, drying pools at western end of waterhole. 14°49.454'S 133°40.956'E. Depth <0.5 m, water colour green, current nil. Substrate sand, leaf litter and sticks. 24 September 2008. 1600-1730 hr. Collectors G. Dally, S. Gregg and J. Rowbottom, by dip-nets.

Station GD 08-08.

Roper River, Elsey/Moroak Stations, near eastern end of waterhole. 14°49.456'S 133°42.578'E. Depth 5-6 m, water temp 27.6° C, salinity 0.7 ppt, conductivity 1483 µS, water colour green, river width 50 m, large boulders in mid-stream. 25 September 2008. 0935-1035 hrs. Collectors G. Dally, S. Gregg and M. Daniel, by multipanel gillnet (shortened to large mesh end only) bottom set across stream near boulders.

Station GD 08-09.

Roper River, Elsey/Moroak Stations, near eastern end of waterhole. 14°49.529'S 133°42.422'E. Depth 4-5 m, water temp 28.0° C, salinity 0.7 ppt, conductivity 1528 µS, water colour green, river width 40 m. 25 September 2008. 1100-1200 hrs. Collectors G. Dally, S. Gregg and M. Daniel, by multipanel gill-net (shortened to large mesh end only) bottom set from bank to midstream.



Figure 6. Gill-net set near eastern end of waterhole, Station GD08-09

Station GD 08-10.

Roper River, Elsey/Moroak Stations, a drying channel, west of and cut off from main waterhole. 14°49.195'S 133°39.343'E. Depth 0.3 m, water colour green, width 5-10 m. 25 September 2008. 1500 hrs. Collector G. Dally, by scoop-net.

Station GD 08-11.

Roper River, Elsey/Moroak Stations, near western end of waterhole. 14°49.766'S 133°41.508'E. Depth 4 m, water colour green, river width 40 m. 25 September 2008. Collectors G. Dally and S. Gregg, by two baited cathedral turtle traps (positioned under *Pandanus aquaticus*) that were left overnight and pulled out at 0830 hr.

FISH SPECIES

The species listed here are based on actual fish collected during the survey and sight records. Station numbers are given in those instances where each species was collected, followed by number of specimens and, if retained, their size range (standard length, in mm) in parentheses. All specimens that were retained are registered in the MAGNT Natural Science fish collection.

CARCHARHINIDAE – WHALER SHARKS

Carcharhinus leucas (Muller and Henle, 1839) – bull shark

GD 08-10, approx. 1 m in length, sight record only.

CLUPEIDAE – HERRINGS

Nematalosa erebi (Gunther, 1868) – bony bream

GD 08-02, 1 (skeletonised); GD 08-03, 1 (skeletonised); GD 08-04, 1(145); GD 08-06, 1 caught and released.

OSTEOGLOSSIDAE – BONYTONGUES

Scleropages jardini (Saville-Kent, 1892) – saratoga

GD 08-09, sight record only (in feeder creek near this site).

ARIIDAE – FORK-TAILED CATFISH

Neoarius graeffei (Kner and Steindachner, 1867) – blue catfish

GD 08-02, 18 caught, retained 3 (skeletonised); GD 08-03, 22 caught and released; GD 08-04, 12 caught and released; GD 08-06, 25 caught and released; GD 08-09, 20 caught, retained 1(225).

Neoarius midgleyi (Kailola and Pierce, 1988) – Midgley's catfish

GD08-06, 1(310).

Cinetodus froggatti Ramsay and Ogilby, 1886 – small-mouthed catfish

GD 08-04, 5 caught, retained 1(330).

BELONIDAE – LONGTOMS

Strongylura krefftii (Günther, 1866) – freshwater longtom

GD 08-03, sight record only; GD 08-09, sight record only.

MELANOTAENIIDAE – RAINBOWFISH

Melanotaenia splendida inornata (Castelnau, 1875) – chequered rainbowfish

GD 08-07, 16(21-67); GD 08-10, sight record only.

ATHERINIDAE – HARDYHEADS

Craterocephalus stercusmuscarum (Günther, 1867) – fly-specked hardyhead

GD 08-02, sight record only; GD 08-07, 42(8-37); GD 08-10, 11(22-40).

AMBASSIDAE – GLASS-PERCHLETS

Ambassis macleayi (Castelnau, 1878) – reticulated glassfish

GD 08-07, 3(47-63).

Ambassis agrammus Günther, 1867 – sailfin glassfish

GD 08-07, 9(19-33).

CENTROPOMIDAE – BARRAMUNDI

Lates calcarifer (Bloch, 1790) – barramundi

GD 08-02, 2 by hook and line, released; GD 08-08-04, 1 by hook and line, released;
GD 08-09, 1 by hook and line, released.

TERAPONTIDAE – GRUNTERS

Amniataba percoides (Günther, 1864) – banded grunter

GD 08-02, 1 (skeletonised); GD 08-03, sight record only; GD 08-08, sight record only.

Hephaestus fuliginosus (Macleay, 1883) – sooty grunter

GD 08-01, 1 caught and released; GD 08-05, 31 caught, retained 3(175-194); GD 08-06, 17 caught and released.

APOGONIDAE – CARDINALFISH

***Glossamia aprion* (Richardson, 1842) – mouth almighty**

GD 08-07, 3(52-60).

TOXOTIDAE – ARCHERFISH

***Toxotes chatareus* (Hamilton-Buchanan, 1822) – spotted archerfish**

GD 08-02, sight record only; GD 08-03, sight record only; GD 08-04, 1(210); GD 08-06, sight record only; GD 08-07, 3(43-70).

ELEOTRIDIDAE – GUDGEONS

***Oxyeleotris selheimi* (Macleay, 1884) – black-banded gudgeon**

GD 08-07, 1(48); GD 08-11, 1(337).

GOBIDAE – GOBIES

***Glossogobius aureus* (Akihito and Meguro, 1975) – golden goby**

GD 08-07, 1(41).

REPTILIA

TESTUDINES: CHELIDAE

Emydura subglobosa worrelli (Krefft, 1876) – short-necked turtle

GD 08-06, 2 retained; GD 08-11, 1 caught and released.

Elseya aff. dentata – snapping turtle

GD 08 08-01, 1 caught and released; GD 08-05, 7 caught, retained 3; GD 08-06, 1 caught and released; GD 08-11, 5 caught and released.

CROCODILIA: CROCODYLIDAE

Crocodylus johnstoni Krefft, 1873 – freshwater crocodile (or Johnston's crocodile)

GD 08-02, 1 caught and released, 1 other sight record; GD 08-04, 1 caught and released.

SQUAMATA: SCINCIDAE

Cryptoblepharus metallicus (Boulenger, 1887) – metallic snake-eyed skink

GD 08-06, 2 hand caught on riverbank and retained.

SQUAMATA: PYGOPODIDAE

Delma borea Kluge, 1974 – legless lizard

Near GD 08-02, caught swimming across river and retained.

AMPHIBIA

ANURA: HYLIDAE

Litoria rothii (De Vis, 1884) – Roth's tree frog

GD 08-07, 1 hand caught on riverbank and retained.

CRUSTACEA

DECAPODA

PALAEMONIDAE – SHRIMP

Macrobrachium rosenbergii (de Man, 1879) – giant freshwater prawn

GD 08-07, many caught, retained 14 individuals of various sizes.

ATYIDAE – FRESHWATER SHRIMP

Caridinia sp.a

GD 08-07 many caught, 18 retained.

Caridinia sp.b

GD 08-07 1 retained.

MOLLUSCA

GASTROPODA, PROSOBRANCHIA

THIARIDAE – SWAMP CERITHS

Sermyla onca (A. Adams and Angas, 1863) — spotted thiara snail

GD 08-07, 19 collected and retained; GD 08-10, 8 collected and retained

Thiara australis Lea and Lea, 1850 — southern thiara snail

GD 08-07, 8 collected and retained; GD 08-10, 6 collected and retained.

GASTROPODA, PULMONATA

LYMNAEIDAE – POND SNAILS

Austropeplea lessoni (Deshayes, 1830) — Lesson's pond snail

GD 08-07, 7 collected and retained.

BIVALVIA, PALAEOHETERODONTA

HYRIIDAE – FRESHWATER MUSSELS

Velesunio angasi (Sowerby, 1867) — Angas' freshwater mussel

GD 08-10, 4 collected and retained (from mud at base of *Pandanus aquaticus*).

BIVALVIA, HETERODONTA

CORBICULIDAE – MANILA CLAMS

Corbicula australis (Deshayes, 1830) — Australian Manila Clam

GD 08-10, 2 collected and retained.

This collection contains five species of molluscs; three species of gastropods and two species of bivalves. MAGNT has five additional species of gastropods from the Roper River in its Natural Science (Mollusca) collections, all of which could be expected to be living in freshwater habitats at Elsey/Moroak Stations:

Amerianna bonushenricus (A. Adams and Reeve, 1864) (Planorbidae);

Gabbia adusta Ponder, 2003 (Bithyniidae);

Gyraulus sp. (Planorbidae);

Notopala essingtonensis (Frauenfeld, 1862) (Viviparidae);

Sermyla venustula Lea and Lea, 1850 (Thiaridae).

DISCUSSION

Eighteen species of fishes were recorded during the three days' sampling. Due to the constraints on methodology imposed by the possibility of the presence of estuarine crocodiles, not all species potentially present were recorded. Midgley (1979) recorded 21 species from the Roper, Wilton and Mainoru (the latter two rivers are tributaries of the Roper), using dipnets, gill and seine nets with a range of mesh sizes, set lines and fishing rod, by day and night. Fish reported by Midgley but not recorded during the Elsey survey include the northern purple-spotted gudgeon (*Mogurnda mogurnda*), which is often cryptic but usually easily obtained at night, and the eel-tailed catfish family, Plotosidae (expected taxa include *Anodontiglanis dahli* and one or more *Neosilurus* species). The ox-eye herring or tarpon (*Megalops cyprinoids*), well known from Top End river systems, was not obtained by this survey nor by Midgley in 1979 from any of the Gulf of Carpentaria rivers he surveyed (and it was not recorded by Larson (1996) from the Roper River estuary either). On the other hand, Midgley did not report any sharks from his 1979 sampling sites. Both surveys recorded similar expected families of fishes (apart from the plotosid catfish).

The difference in species of terapontids (grunters) obtained by Midgley and the present survey is interesting. Midgley (1979) reported barred grunter (*Amniataba percoides*), spangled grunter (*Leiopotherapon unicolor*) and Barcoo grunter (*Scortum barcoo*), while the present survey recorded barred grunter and sooty grunter (*Hephaestus fuliginosus*). *Leiopotherapon unicolor* is one of the most widespread and abundant freshwater fishes in the country, so it is unusual that this species was not observed at Elsey. *Scortum barcoo*, on the other hand, is a poorly known species, with scattered records from the Barkly Tablelands, so additional information on this species would have been welcome.

No sawfish (*Pristis*) were obtained during this survey, with the only cartilaginous fish observed being a young bull shark (*Carcharhinus leucas*) seen but not captured. The absence of any *Pristis* does not mean the species is not present in the waterbody, as is true for the other species not recorded. Midgley carried out his survey of sites on the Wilton, Mainoru and Roper rivers over a period of 14 sampling days, considerably more sampling effort over a far wider geographic range than the present survey, so it is not surprising that his species list is greater. Additional survey work at Elsey will undoubtedly reveal more species and more information about their seasonal presence and abundance.

The simplest way to survey fish, whether freshwater or marine, is to get into the water and observe them directly by snorkel or scuba; unfortunately estuarine crocodiles make this method unsuitable for most Top End locations. A substitute method was invented by Keith Bishop (who worked for what is now the Environmental Research Institute of the Supervising Scientist), in the form of a modified (perspex-fronted) punt, so that fish could be directly observed and identified with safety (see NCTWR 2005). If community groups wish to monitor waterbodies, this is one simple way of doing so, combined with line fishing and traps. The initial expense is in making the boat, then several people will need to learn to identify the fishes by sight (as lying prone in a small boat is uncomfortable, the task should be shared).

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