

Groote Eylandt Bush Blitz

Freshwater and Estuarine Fishes

14–25 June 2021



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Report submitted to Director of National Parks, 1 November 2021

Contents

Contents.....	2
List of contributors.....	3
Abstract.....	4
1. Introduction.....	5
2. Methods	7
2.1 Site selection.....	7
2.2 Survey techniques.....	7
2.2.1 Methods used at standard survey sites.....	8
2.3 Identifying the collections	8
3. Results and Discussion	9
3.1 Un-named or not formalised taxa	9
3.2 Putative new species (new to science).....	9
3.3 Exotic and pest species.....	9
3.4 Threatened species.....	10
3.5 Range extensions	10
3.6 Genetic information	10
4. Information on species lists	12
5. Information for land managers	12
6. Other significant findings	13
7. Conclusions.....	13
Acknowledgements	13
References.....	15
Appendices	16
Appendix 1. List of fishes and decapod crustaceans recorded during the Groote Eylandt Bush Blitz	16
Appendix 2. Fishes and decapod crustaceans recorded at each site during the Groote Eylandt Bush Blitz	17

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Cover photos: Groote Eylandt escarpment stream habitat (GE21-01) with a Northern Purplespotted Gudgeon (*Mogurnda mogurnda*) collected from the site. Photos Olga Biriukova © MAGNT

Nomenclature and taxonomy used in this report is consistent with:

The Australian Faunal Directory (AFD)

<https://www.environment.gov.au/science/abrs/online-resources/fauna>

Abstract

A two week dedicated freshwater and estuarine fishes sampling trip was undertaken to Groote Eylandt, within the Anindilyakwa Indigenous Protected Area, in the dry season of 2021 as part of a larger Bush Blitz expedition survey team. A total of 13 sites were sampled, ranging from sandstone escarpment streams, lowland freshwater streams and to coastal mangrove habitats (including on North East Island), using a combination of helicopter and vehicle access and appropriate gear types (i.e. mainly compact gear including dip net and bait traps). The survey focus was a baseline assessment of poorly sampled habitats (i.e. remote) and species groups (i.e. cryptobenthic estuarine gobies). The objectives were of species discovery and to provide information for land management, with a specific focus being to support taxonomy and linking Groote Eylandt into the wider picture of northern Australian biodiversity. Nine freshwater fishes were recorded, including replicate samples of Northern Purple-spotted Gudgeon *Mogurnda mogurnda* from most of the larger drainage systems as a key taxonomic focus (known species complex). Additional opportunistic data was also obtained on two species of decapod crustacean. Nine species of estuarine goby were sampled, many of them new records for the region, with several major infill records for northern Australia. Some unique behaviours were observed whereby gobies were recorded resting within woody debris in areas exposed above water at low tide. Specific region and site based management recommendations are made along with additional suggestions to continue to build on survey results to document freshwater and estuarine biodiversity.

1. Introduction

Northern Australia is home to a diverse and significant freshwater fish fauna, and it appears that there is still much to be documented in terms of the species baseline (Pusey et al., 2017). Novel forms continue to be recorded from remote regions, and recent interrogation with genetic techniques suggest that there are likely to be two to three times the number of species present than is currently recognised (Hammer et al., 2013; Hammer et al., 2019). Estuarine habitats also appear to be prime areas for species discovery, especially for small cryptobenthic species (hide in dense cover) like gobies (e.g. seven new species in one genus recently discovered: Hammer et al., 2021; Larson and Hammer, 2021). Hence, detailed surveying and taxonomic review of local fish faunas is likely to provide important and exciting biodiversity updates as the foundation for management and conservation.

The Anindilyakwa Indigenous Protected Area (IPA) covers some one million hectares of land and sea country of the Groote Eylandt Archipelago in the western Gulf of Carpentaria. Groote Eylandt itself is a larger island (2258 km²) with a diversity of monsoon tropical habitats. A low (~100m ASL) sandstone escarpment occupies much of the central eastern land mass, and this is dissected by a series of streams debouching onto lowland areas, and into small coastal mangrove areas. Groote Eylandt is renowned for its mammal and reptile fauna, especially as a stronghold for declining species and the absence of Cane Toads which are otherwise pervasive on the mainland. Less is known of the freshwater and estuarine fishes, with previous survey effort primarily targeted towards marine habitats (Blaber et al., 1992a; Blaber et al., 1992b; Blaber et al., 1994; Australian Institute of Marine Science, 2021) and impact assessment relating to mining activity in the north-west (Webb, 1992; Indo-Pacific Environmental, 2010).

Some additional freshwater fish baseline data, supported with museum reference samples, is nonetheless available from (a) the American-Australian Scientific Expedition which included Emerald River (Taylor, 1964), (b) a survey of Lake Angurrkurna in the south-east (Dally, 2010), and (c) recent sampling of some eastern gorge sites (Anindilyakwa Land and Sea Rangers, 2020). Some 20 freshwater fishes have been previously recorded (Table 1 & Figure 1). Records of decapod crustaceans on Groote Eylandt are limited, with a single record for Freshwater Prawn *Macrobrachium spinipes* and three records of Redclaw Crayfish *Cherax quadricarinatus* (Atlas of Living Australia, 2021). Aboriginal knowledge and language names of many plants and animals of the region have been captured in an excellent collaborative publication, including information on akwalya (fish) and amilyungwurra (yabbies and prawns) (Groote Eylandt Linguistics, 1993).

This report presents the fish survey component of a two week Bush Blitz to the Groote Eylandt archipelago during June 2021. The current study builds on fish data and research from previous Bush Blitz surveys across northern Australia (Fish River Station, Wongalara Sanctuary, East Kimberley, Olkola, Judbarra National Park and Bradshaw Field Training Area) and adds in an estuarine fish element (cryptobenthic gobies). Decapod crustaceans were opportunistically targeted as part of freshwater fishes site sampling.

Table 1. Summary of records from previous freshwater fish surveys on Groote Eylandt

Family	Species	Angurugu River ^a	Emerald River ^{a,b}	Lake Angurrkburna ^c	Eastern Gorges ^d
Osteoglossidae	<i>Scleropages jardinii</i>			x	
Megalopidae	<i>Megalops cyprinoides</i>	x		x	
Clupidae	<i>Nematalosa erebi</i>			x	
Plotosidae	<i>Neosilurus ater</i>	x	x		
	<i>Neosilurus hyrtlii</i>	x	x		
Atherinidae	<i>Craterocephalus stercusmuscarum</i>	x		x	
Melanotaenidae	<i>Melanotaenia nigrans</i>	x	x		x
	<i>Melanotaenia splendida inornata</i>	x	x	x	x
Pseudomugilidae	<i>Pseudomugil gertrudae</i>	x	x		
Synbranchidae	<i>Ophisternon bengalense</i>	x			
Ambassidae	<i>Ambassis</i> sp. NW	x	x		
	<i>Ambassis macleayi</i>			x	
	<i>Denarius australis</i>		x		
Latidae	<i>Lates calcarifer</i>	x			
Terapontidae	<i>Amniataba percoides</i>			x	
	<i>Hephaestus fuliginosus</i>				x
Apogonidae	<i>Glossamia aprion</i>	x	x	x	
Eleotridae	<i>Mogurnda mogurnda</i>	x	x		x
	<i>Hypseleotris compressa</i>	x	x		x
Gobiidae	<i>Glossogobius aureus</i>			x	

Data summarised by region [source: a = (Webb, 1992; Indo-Pacific Environmental, 2010), b = (Taylor, 1964), c = (Dally, 2010), d = (Anindilyakwa Land and Sea Rangers, 2020)]. Species included as “freshwater” is subjective given many species can spend part or their life in marine environments for a particular life stage or be comfortable in fresh and salt water.

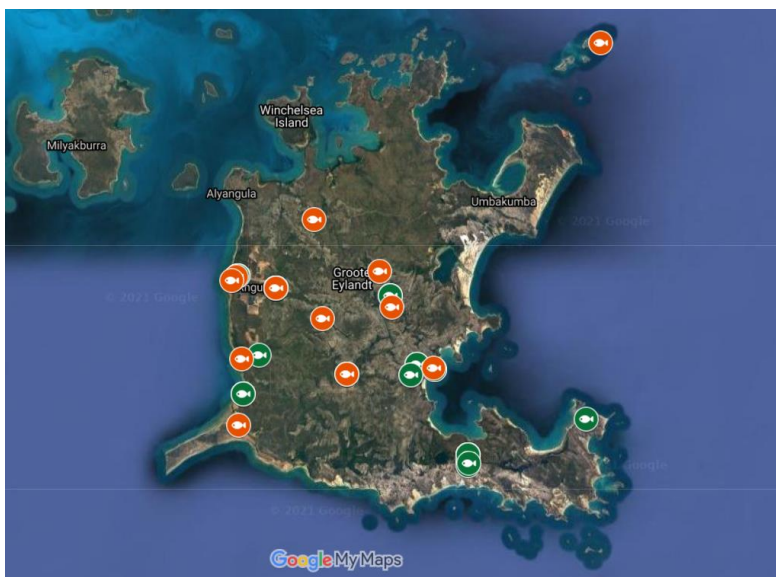


Figure 1. Map of Groote Eylandt showing 2021 Bush Blitz fish sites (orange icons) and previous museum specimens (green icons).

2. Methods

2.1 Site selection

Sites were targeted to parts of the study area where previous minimal survey effort overlapped with unique or interesting habitat that could be included in a rapid survey design; primarily upland areas targeting streams, gorges and permanent pools viewed in aerial imagery during the dry season. Other sites were directed at study species of particular interest in broader taxonomic research and of conservation/management interest as viewed from a review of museum specimens and historical data (see Introduction). The scope of sampling extended to estuarine environments including coastal mangrove creeks. Different teams collaborated on fish sampling concurrently with other target groups (e.g. molluscs, worms, odonates). Overall thirteen sites were sampled between 14–25 June 2021 (Table 1). Sampling occurred after a good wet season, with many streams still flowing at the time of sampling.

2.2 Survey techniques

Sampling employed a rapid assessment design in order to cover as wide a spatial distribution and variety of habitats/environmental conditions as possible, and maximise efficiency with regard to the time window for helicopter access into remote and inaccessible areas:

- 1) **Bait traps** are collapsible mesh nets with conical openings on each end (45 x 25 x 25 cm coming in multiple colours) that were set on strings amongst vegetation cover, flat on the bottom, for 1-2 daylight hours and baited with fish flavoured dry cat food. This passive survey technique was used as the primary survey type in upland pools, and is ideal for ranger deployment. Larger collapsible operahouse style traps were also set at some sites to target decapod crustaceans.
- 2) **Fyke nets** are a passive survey technique that involve wings that funnel fish like a fence towards a conical net. Single wing nets were set in stream habitats where safe to do so (6m wing, 4mm mesh, 90 mm entrance grid to exclude larger animals, float at cod end) set from the bank in the afternoon and checked every 4 hours.
- 3) **Dip netting** is an active technique involving a net on a handle with fine mesh (0.5 m diameter, 4 mm mesh). This is quick and effective within small habitats and amongst vegetation and leaf litter, a preferred habitat of small fishes. Ideal for shallow habitats or edge sampling, especially in mangrove areas. Targeted dip netting with a torch at night was a supplementary method at some sites.
- 4) **Marine pitfall traps** are a passive technique where small buckets (~15 cm diameter opening) are dug into tidal habitats and set over one or more tidal cycles, typically left overnight. Animals shelter in the buckets mimicking a small rock pool and are caught by hand.
- 5) **Hand capture** some fish were recorded resting out of the water opportunistically through active searches for other animal groups in leaf litter and woody debris (e.g. logs are broken up searching for molluscs and worms).

The methods employed at each site are shown in Table 2. As with many northern Australian waterways, danger from Saltwater Crocodiles was carefully considered in survey design and implementation (e.g. active sampling techniques were restricted to sites above waterfalls or shallow pools away from the edge; observers used in larger pools). Environmental data including physical characteristics, habitat components and water quality was recorded (Table 3). Samples of larger crustaceans caught opportunistically as part of fish sampling were also made (Appendix 1). Sampling was conducted under NT Fisheries Permit S17/3418 and with ALC Board approval, in accordance with Charles Darwin University Animal Ethic Committee approval A12009.

2.2.1 Methods used at standard survey sites

Opportunistic sampling of estuarine fishes were made at GE21-11 (=SS2) via dip net in estuarine pools and within moist logs (see Section 6, Table 3).

2.3 Identifying the collections

Captured fishes were sorted to species on site with the majority returned to the point of capture. Subsamples retained as vouchers were held in a bucket with aeration and transported back to the field laboratory. Retained fish were ultimately euthanased using AQUI-S, and vouchers were either (a) fixed in 10% formalin solution with a matching genetic tissue sample preserved in both 80% analytical grade (AR) ethanol or (b) for smaller specimens fixed whole in 80% AR grade ethanol. On return to MAGNT, all material was sorted and re-examined to provide final confirmation of identifications after Allen et al. (2002) and primary literature keys where applicable (e.g. Short, 2004; Larson and Hammer, 2021).

Fish station	Date	Specific Locality	Longitude (E)	Latitude (S)
GE21-01	16/6/2021	Yinuma/Angurugu Creek tributary	136.54868	-14.02595
GE21-02	18/6/2021	Burriyangmurrumanja Creek, Umbakumba Road	136.536362	-13.88698
GE21-03	18/6/2021	Enungwadena/King Crossing, Amagula River	136.58420	-14.10302
GE21-04	19/6/2021	Eastern escarpment river	136.64873	-14.00963
GE21-05	20/6/2021	Second Creek (estuarine)	136.42842	-14.17549
GE21-06	20/6/2021	Top Crossing, Yinuma/Angurugu Creek tributary	136.48129	-13.98353
GE21-06B	19/6/2021	Creek in northern gorge	136.71013	-14.09569
GE21-07	21/6/2021	Minyerra River tributary	136.63173	-13.96000
GE21-08	21/6/2021	Lower Angurugu Creek	136.426044	-13.96702
GE21-08B	21/6/2021	Lower Angurugu Creek (estuarine)	136.419057	-13.97285
GE21-09	23/6/2021	Enungwadena/King Crossing, Amagula River	136.58420	-14.10302
GE21-10	22/6/2021	North East Island mangroves	136.95045	-13.63998
GE21-11	16/6/2021	Emerald River mouth	136.43243	-14.08178

Fish station	Method	Ecosystem	Conductivity (uScm ⁻¹)	Temperature (°C)	pH
GE21-01	Bait trap	Fresh	37	27.2	6
GE21-02	Bait and operahouse traps	Fresh			
GE21-03	Bait trap	Fresh			
GE21-04	Bait trap	Fresh	54	25.9	6
GE21-05	Dip net	Estuarine			
GE21-06	Fyke net	Fresh	36	25.8	6
GE21-06B	Dip net and torch	Fresh			6
GE21-07	Dip net and bait trap	Fresh	34	23.1	6
GE21-08	Dip net	Fresh/Estuarine	1000	25.6	
GE21-08B	Dip net and hand	Fresh/Estuarine			
GE21-09	Bait and operahouse traps	Fresh	45	25.7	6
GE21-10	Dip net	Estuarine			
GE21-11	Hand and pitfall trap	Estuarine			

3. Results and Discussion

Appendix 1 lists all fishes and decapod crustaceans recorded during the Bush Blitz, with species recorded by site listed in Appendix 2. This included nine freshwater fish species, two freshwater decapod crustaceans and nine mangrove gobies.

3.1 Un-named or not formalised taxa

The widespread Northwest Glassfish previously known as *Ambassis muelleri* is now a distinctive species left without a name as ‘muelleri’ was earlier applied as a synonym of *Ambassis agassizii* occurring in eastern Australia (Allen et al., 2002). Other now incorrect names applied to this taxon appear in historic data and on museums records (*A. agassizii* and *A. agrammus*).

Purplespotted Gudgeons of the genus *Mogurnda* have been highlighted to be taxonomically problematic including high rates of cryptic speciation (Adams et al., 2013). Several distinct lineages are known in the Northern Purplespotted Gudgeon *Mogurnda mogurnda* and it is unknown which forms/s are present on Groote Eylandt. Bush Blitz material collected will aid a broader revision in the genus.

Mangrove gobies of the genus *Mugilogobius* are a diverse group, being poorly known due to cryptobenthic behaviour and general similarity in appearance. A systematic revision greatly enhanced available information on identification and distribution (Larson, 2001), however recent work indicates additional species are present in northern Australia (Hammer and Larson, in prep.). One dwarf species known as *Mugilogobius* sp. (yellow) was recorded on Groote Eylandt. Two very recently described species of *Pseudogobius* were also recorded, namely *Pseudogobius aquilonius* and *Pseudogobius hoesei* (Larson and Hammer, 2021).

Taxon	Comment
<i>Ambassis</i> sp. (north west)	Species complex known across northern Australia (not formalised) requiring a new name/s
<i>Mogurnda mogurnda</i> (complex)	A known species complex across northern Australia, it is not known which form/s occur on Groote Eylandt
<i>Mugilogobius</i> sp. (yellow)	A known undescribed species recorded across northern Australia (Hammer and Larson in prep.)

3.2 Putative new species (new to science)

In this report, ‘putative new species’ means an unnamed species that, as far as can be ascertained, was identified as a new species as a direct result of this Bush Blitz. No obviously new species to western science were observed on the survey, but future taxonomic investigation may yield such species.

3.3 Exotic and pest species

No alien or translocated native species were recorded.

3.4 Threatened species

No listed threatened species were recorded during the fish surveys.

3.5 Range extensions

Northern Purplespotted Gudgeon were recorded from additional drainages on the north of Groote Eylandt and Northern River Prawn *Macrobrachium bullatum* was a new record for the island.

Prior to the survey there were very few documented records of estuarine gobies. The number of *Mugilogobius* known to science from Groote Eylandt was subsequently increased from one to five as part of seven infill records for estuarine gobies.

Species	Location sighted/observed	Distance from nearest known record (km)	Comments
<i>Chlamydogobius ranunculus</i>	Two estuarine sites	~100 km from SW Gulf of Carpentaria	New record for Groote Eylandt
<i>Mogurnda mogurnda</i>	Burriyangmurrumanja Creek	Minor range extension but additional northern drainage	
<i>Mugilogobius filifer</i>	Three estuarine sites	~100 km from SW Gulf of Carpentaria	New record for Groote Eylandt
<i>Mugilogobius mertoni</i>	North East Island	150 km from Nhulunbuy, 1000 km from eastern Australia	New record for Groote Eylandt
<i>Mugilogobius platystoma</i>	Lower Angurugu Creek	300 km from Wessel Islands, 600 km from Weipa	New record for Groote Eylandt
<i>Mugilogobius wilsoni</i>	Two estuarine sites	~100 km from SW Gulf of Carpentaria	New record for Groote Eylandt
<i>Mugilogobius</i> sp. (yellow)	Emerald River mouth	500 km from Maningrida, 600 km from Weipa	New record for Groote Eylandt
<i>Pseudogobius aquilonius</i>	Second Creek	~100 km from SW Gulf of Carpentaria	New record for Groote Eylandt
<i>Macrobrachium bullatum</i>	Freshwater streams	~100 km from SW Gulf of Carpentaria	New record for Groote Eylandt

3.6 Genetic information

Tissue samples were taken from all species collected and for multiple individuals and locations of each. These have been accessioned into the MAGNT collection available for future taxonomic and phylogenetic studies to better understand the biodiversity and significance of the Groote Eylandt fauna.



Examples of freshwater fishes and decapod crustaceans recorded on the Groote Eylandt Bush Blitz 2021: (top) Chequered Rainbowfish *Melanotaenia splendida inornata*, (mid) Northern Purplespotted Gudgeon *Mogurnda mogurnda* and (lower) Redclaw Yabby *Cherax quadricarinatus*. Photos O. Biriukova © MAGNT

4. Information on species lists

All of the freshwater fishes sampled during the Bush Blitz have previously been recorded from Groote Eylandt (Table 1), however the survey adds additional catchments, locations, and genetic material for species to help build on knowledge of freshwater biodiversity. Overall there are quite interesting patterns within the freshwater fish fauna, where some species have very patchy or restricted distributions (e.g. Sooty Grunter *Hephaestus fuliginosus*), and other species are conspicuously absent so far despite being widespread and common across northern Australia (e.g. Spangled Grunter *Leiopotherapon unicolor*, Rendahl's Catfish *Porochilus rendahli*). These patterns likely represent a combination of habitat suitability and island effects that act to filter species that can successfully colonise over time depending on drainage patterns and chance. The south-eastern part of Groote does seem to have higher species diversity likely relating to habitat diversity commitment to greater drainage connectivity with Gulf of Carpentaria systems.

Several freshwater fish groups are known to represent a cryptic species complex (similar looking but comprising two or more distinct species), and so without broader resolution and comparison of genetics and morphology it is difficult to confidently identify some species patterns like for Purplespotted Gudgeons. Swamp eels *Ophisternon* spp, previously recorded from western Groote Eylandt, represent another group for priority taxonomic investigation, and more material is required from the island and neighbouring systems for this. The identity of rainbowfishes on the island has been the subject of some historical confusion for various reasons, with reports of Banded Rainbowfish *Melanotaenia trifasciata* and Northern Rainbowfish *Melanotaenia solata* both attributable to a slightly more slender local form of Eastern Rainbowfish *Melanotaenia splendida inornata* based on review of historical material and examination of material and photos from this survey.

The estuarine goby fauna of Groote Eylandt had not previously been examined as historic survey effort was targeted at larger species or freshwater habitat, leaving a data gap for these small, behaviourally cryptobenthic species. As a result the survey unearthed a large amount of new information including new records and species range infill data, from a limited number of survey sites relative to the amount of mangrove/estuarine habitats available. The material collected will provide important material to better understand and study estuarine gobies across northern Australia. Additional sampling will more than likely extend the species list.

5. Information for land managers

Groote Eylandt is a remote region with unregulated stream catchments, an important landscape feature when considering development elsewhere in Australia. The area of sandstone escarpment has high conservation value due to the outlying nature of this refuge habitat, and while the fish species diversity is low, the species represented are significant from a science and conservation perspective. The outlying and restricted population of Sooty Grunter in the eastern escarpment is a significant species for environmental monitoring and management (likely also for cultural reasons); a program to fully map the distribution and to monitor the presence and abundance of this species is thus a key recommendation for land managers. Sooty Grunter was a species newly recorded for Groote Eylandt as part of recent Land and Sea Ranger surveys in collaboration with MAGNT (Anindilyakwa Land and Sea Rangers, 2020), and additional surveys using simple gear (bait traps), angling and observation would help to document species occurrence at many other as yet to be sampled areas (e.g. lakes and catchments in the north-east, additional gorges sites in the east and south, see Figure 1). This is especially so for the taxonomic priority group Purplespotted Gudgeons (e.g. the hard to physically access upper Amagula River).

Maintaining the pest fish free status of Groote Eylandt is also a high management priority, and can take example from the excellent Cane Toad awareness and biosecurity program currently in place. Future watch should be maintained for *Tilapia Oreochromis mossambicus* recently established in the Gulf of Carpentaria, and for other ornamental species sometimes kept in home aquaria/ponds (e.g. Guppies, *Poecilia reticulata*) and which have become pests in areas like Nhulunbuy Lagoon. It is illegal to keep exotic aquarium fish on Groote, and ongoing vigilance and proactive campaigns would assist to limit this risk to native fish and frog species.

6. Other significant findings

Some unique behaviours by gobies were observed within Groote Eylandt mangrove ecosystems. Two species were recorded resting within woody debris in areas exposed to the air well above the low tide water level, for what would have been considerable periods. Both the Island Mangrove Goby *Mugilogobius platystoma* (Angurugu River estuary) and Threadfin Mangrovegoby *Mugilogobius filifer* (Emerald River mouth mangroves) were found inside cavities in small logs in areas with absolutely no standing water in the habitat. These sorts of gobies are known to live down burrows and crab holes allowing them to access the water table, but resting in woody debris is a new observation, and an adaptation that can assist survival with the sometimes irregular tidal movements in the area.

7. Conclusions

The targeted survey for fishes during the 2021 Bush Blitz added significant spatial information on species distributions in the Anindilyakwa IPA, from escarpment habitats, mangroves and to the near shore North East Island. The habitat is remote and without the major threats of river regulation and alien fishes. Freshwater fish diversity is high for an island, with unusual chaotic patterns of species distribution (or absence) typical of such refuges. The overall presence and health of mangrove ecosystems undoubtedly supports a range of unique species associations and behaviours. Indeed some isolated populations should be the focus of specific land management (e.g. Sooty Grunter). There is scope for further Land and Sea Ranger lead surveys of additional catchments and areas, and ongoing collaborative research efforts to resolve taxonomy on problematic groups may infer additional uniqueness to Groote Eylandt freshwater and mangrove systems.

Acknowledgements

We would like to acknowledge the Traditional Owners of the Groote Eylandt Archipelago, and recognise their ongoing cultural connection to land and sea country. We pay our respects to Elders past, present and emerging. We thank Traditional Owners and the Anindilyakwa Land Council for allowing us to conduct our survey, and also thank the Anindilyakwa Land and Sea Rangers for their help and involvement, with a special thanks to Katie Oxenham for her organising efforts. The field assistance and enthusiasm of teachers participating in TeachLive and of David Webb was also gratefully received. Last but not least, we wish to thank the helicopter pilots, catering staff and Bush Blitz team for their help on the survey.



Mangrove habitat at Angurugu River estuary showing typical habitat exposed at low tide where the Island Mangrove Goby *Mugilogobius platystoma* was found resting in the cavity of woody debris awaiting the next tidal inundation. Photos © Adam Bourke.

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Appendices

Appendix 1. List of fishes and decapod crustaceans recorded during the Groote Eylandt Bush Blitz

Family	Species	Common name
Freshwater Fishes		
Ambassidae	<i>Ambasis</i> sp. NW	Northwest Glassfish
Apogonidae	<i>Glossamia aprion</i>	Mouth Almighty
Eleotridae	<i>Hypseleotris compressa</i>	Empire Gudgeon
Eleotridae	<i>Mogurnda mogurnda</i>	Northern Purplespotted Gudgeon
Melanotaeniidae	<i>Melanotaenia nigrans</i>	Blackbanded Rainbowfish
Melanotaeniidae	<i>Melanotaenia splendida inornata</i>	Chequered Rainbowfish
Plotosidae	<i>Neosilurus ater</i>	Black Catfish
Terapontidae	<i>Amniataba percoides</i>	Barred Grunter
Terapontidae	<i>Hephaestus fuliginosus</i>	Sooty Grunter
Freshwater Decapod Crustaceans		
Palaemonidae	<i>Macrobrachium bullatum</i>	Northwest Australian River Prawn
Parastacidae	<i>Cherax quadricarinatus</i>	Redclaw Yabby
Estuarine Fishes		
Gobiidae	<i>Chlamydogobius ranunculus</i>	Tadpole Goby
Gobiidae	<i>Mugilogobius filifer</i>	Threadfin Mangrovegoby
Gobiidae	<i>Mugilogobius littoralis</i>	Beachrock Mangrovegoby
Gobiidae	<i>Mugilogobius mertoni</i>	Chequered Mangrovegoby
Gobiidae	<i>Mugilogobius platystoma</i>	Island Mangrovegoby
Gobiidae	<i>Mugilogobius</i> sp. (yellow)	Unnamed mangrovegoby
Gobiidae	<i>Mugilogobius wilsoni</i>	Wilson's Mangrovegoby
Gobiidae	<i>Pseudogobius aquilonius</i>	Northern Snubnose Goby
Gobiidae	<i>Pseudogobius hoesei</i>	Bandtail Snubnose Goby

Appendix 2. Fishes and decapod crustaceans recorded at each site during the Groote Eylandt Bush Blitz

Species by site	GE21-01	GE21-02	GE21-03	GE21-04	GE21-05	GE21-06	GE21-06B	GE21-07	GE21-08	GE21-08B	GE21-09	GE21-10	GE21-11
Freshwater Fishes													
<i>Neosilurus ater</i>						X					X		
<i>Melanotaenia nigrans</i>	X	X		X		X		X					
<i>Melanotaenia splendida inornata</i>	X	X	X	X		X	X				X		
<i>Ambassis</i> sp. NW		X									X		
<i>Amniataba percoides</i>											X		
<i>Hephaestus fuliginosus</i>				X									
<i>Glossamia aprion</i>						X					X		
<i>Hypseleotris compressa</i>							X						
<i>Mogurnda mogurnda</i>	X	X		X				X					
Freshwater Decapod Crustaceans													
<i>Cherax quadricarinatus</i>						X		X					
<i>Macrobrachium bullatum</i>	X			X		X		X					
Estuarine Fishes													
<i>Chlamydogobius ranunculus</i>					X								X
<i>Mugilogobius filifer</i>					X				X				X
<i>Mugilogobius littoralis</i>												X	
<i>Mugilogobius mertoni</i>											X		
<i>Mugilogobius platystomus</i>										X			
<i>Mugilogobius wilsoni</i>					X								X
<i>Mugilogobius</i> sp. Y													X
<i>Pseudogobius aquilonius</i>					X								
<i>Pseudogobius hoesei</i>									X				