Memoirs of the Queensland Museum | **Culture**

Volume 8
Part 1

Goemulgaw Lagal: Natural and Cultural Histories of the Island of Mabuyag, Torres Strait.

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PUBLISHED BY ORDER OF THE BOARD 2015

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National Library of Australia card number
ISSN 1440-4788

VOLUME 8 IS COMPLETE IN 2 PARTS

COVER

Image on book cover: People tending to a ground oven (*umai*) at Nayedh, Bau village, Mabuyag, 1921. Photographed by Frank Hurley (National Library of Australia: pic-vn3314129-v).

NOTE

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A Queensland Government Project
Design and Layout: Tanya Edbrooke, Queensland Museum
Printed by Watson, Ferguson & Company

The terrestrial vertebrate fauna of Mabuyag (Mabuiag Island) and adjacent islands, far north Queensland, Australia

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Watson, J.J. & Hitchcock, G. 2015: The terrestrial vertebrate fauna of Mabuyag (Mabuiag Island) and adjacent islands, far north Queensland, Australia. *Memoirs of the Queensland Museum – Culture 8(1): 35-54*. Brisbane. ISSN 1440-4788.

Until recently, relatively little was known about the vertebrate fauna of Mabuyag and surrounding islands. This paper presents the results of terrestrial vertebrate surveys undertaken in 2008-2009, and a review of previous literature and museum records, which have added considerably to our knowledge for the area. Ethnotaxonomy, the role of terrestrial vertebrates in the traditional diet, and the importance of birds, mammals and reptiles in Goemulgaw culture are also discussed briefly. The terrestrial vertebrate fauna as presently known comprises 106 species: three frogs; 18 reptiles; 77 birds; and eight mammals.

❑ *Mabuyag (Mabuiag Island), Torres Strait, fauna, terrestrial vertebrates*

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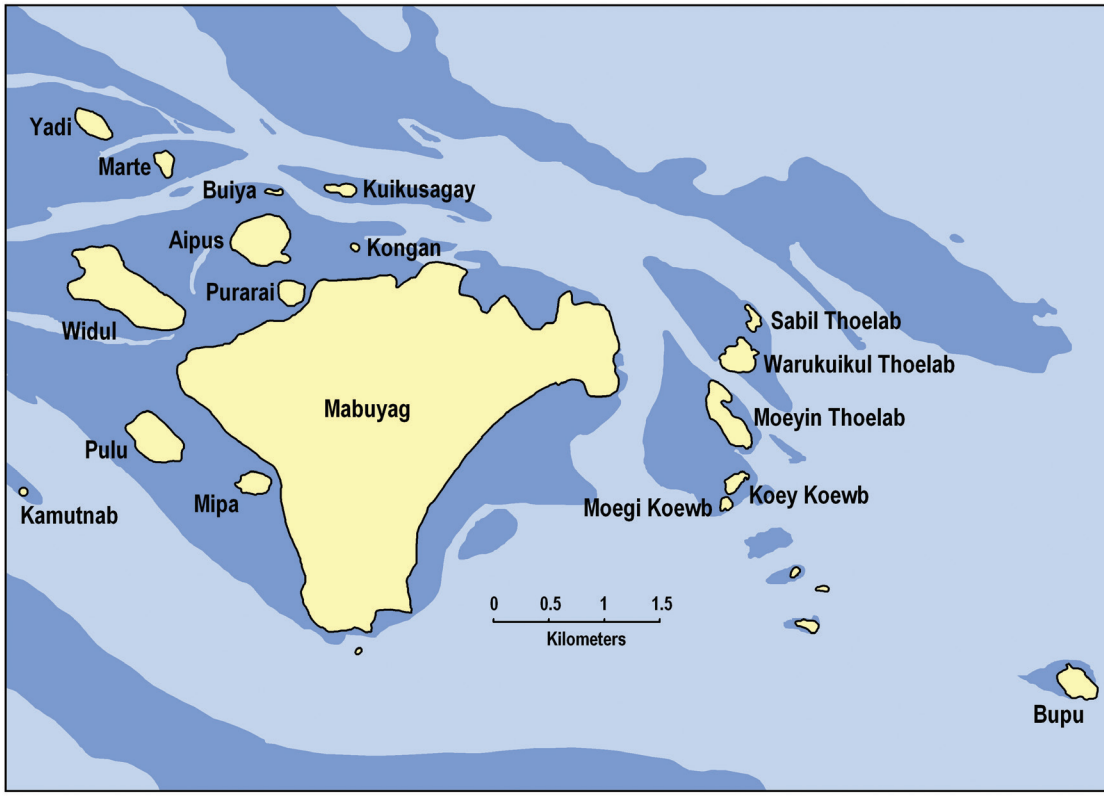

FIG. 1. Mabuyag and surrounding islets.

MABUYAG AND SURROUNDS

Mabuyag (Mabuiag Island) (9°57′S, 142°10′E) is a granitic, continental island, situated in Torres Strait approximately mid-way between the mainlands of Australia and New Guinea. Together with Badu and Mua (Moa Island), it forms the Central Western group or cluster of Torres Strait islands. The island is roughly triangular in shape, and has an area of 6.38 km^2. Mabuyag is surrounded by numerous uninhabited islands, islets and rocks (Figure 1).

As at the 2011 census, there were 260 people living on the island, the majority of whom are Goemulgal, the people of Mabuyag (Australian Bureau of Statistics, 2012). The Goemulgal speak Kala Lagaw Ya, a dialect of the Western-Central Torres Strait Language (see Mitchell, 2015).

Like the other islands in Torres Strait, the mammal and herpetofauna assemblage (and to a lesser extent, the avifauna) is not well documented, with little research having been undertaken (see Cameron *et al*., 1978: 193; Ingram, 2008: 619; Lavery *et al*., 2012: 180; McNiven & Hitchcock, 2004: 107; Strahan, 1995: 444). This research dearth is surprising given the attention Torres Strait has received in the past as a faunal bridge or barrier (e.g. Heinsohn & Hope, 2006; Kikkawa *et al*., 1981; Schodde & Calaby, 1972).

EARLIER SURVEYS

The German naturalist and traveller Otto Finsch visited Mabuyag in November 1881 during his 1881-1882 voyage to the Pacific (Howes, 2015). While on the island, he collected three specimens of Spotted Monitor (*Varanus scalaris*) and five bird species: Olive-backed Sunbird (*Nectarinia jugularis*), Spangled Drongo (*Dicrurus bracteatus*), Pied Imperial-Pigeon (*Ducula bicolor*), Whimbrel (*Numenius phaeopus*) and Silver Gull (*Chroicocephalus novaehollandiae*)[1] (Finsch, 1884; Howes, pers. comm., 2013).

Terrestrial vertebrate specimens were also collected in the course of the 1898 Cambridge Anthropological Expedition to Torres Straits. During a trip to the nearby islet of Pulu, expedition member C.G. Seligmann collected the Coastal Sheathtail Bat (*Taphozous australis*): 'under another rock got a couple of bats Ap [Goemulgaw[2] name for this species]' (Seligmann, 1898: 69). It is not known what became of these specimens. Expedition leader A.C. Haddon deposited reptile and mammal specimens collected on Mer (Murray Island, 201 km to the east) at the University Museum of Zoology, The University of Cambridge and the British Museum of Natural History, London. No specimens from Mabuyag are among the former collection, and it is not known if any specimens from Mabuyag are in the latter[3].

The Australian Museum sponsored a major herpetological expedition to the region in the 1970s (Cameron *et al*., 1978). As part of this research, Mabuyag was visited in August 1975, with four reptile species collected from the island: Striped Snake-eyed Skink (*Cryptoblepharus virgatus*), House Gecko (*Hemidactylus frenatus*), Translucent Litter-skink (*Lygisaurus macfarlani*) and Spotted Tree Monitor (*Varanus scalaris*) (all collected 3 August 1975, see Table 1).

The only bird specimen from the island in Australian museum collections is a Buff-banded Rail (*Gallirallus philippensis*) in the Queensland Museum (O.13856, unsexed dessicated skin), collected on 3 November 1972.

METHODS

Between 2008-2009 we conducted a number of surveys of vertebrate fauna: on Mabuyag, Pulu, and surrounding islets in June and November 2008, and April 2009 (Hitchcock *et al*., 2009; Watson, 2009); and on Mabuyag in May 2009 (Conics, 2009).

Standard systematic survey techniques were employed in suitable habitats to provide an understanding of the terrestrial vertebrate fauna of Mabuyag. These surveys were supplemented with further active searches, incidental observations and consultations with the Goemulgal with regard to their traditional ecological knowledge. A review of previous literature, databases and museum records was also undertaken.

Standardised survey techniques included: pitfall traps and associated drift fences (buckets placed in the ground with directional fence) for amphibians, small mammals and reptiles; Elliott (aluminium live) Type 'E' and 'B' traps baited with an oats and honey mixture for small mammals; hair traps (traps baited with an oats and honey mixture and adhesive tape) for hair samples of small mammals; funnel traps (collapsible live trap) for small mammals, reptiles and amphibians; and deployment of an AnaBat bat recorder (recording of ultrasonic echolocation calls of microchiropterans). Other methods employed included roost searches (flying-foxes and birds); vocalisation recording (amphibians and birds); spotlighting and active diurnal and nocturnal searches for all fauna groups.

Working with the Mabuyag rangers and other community members, we were able to ascertain many of the Kala Lagaw Ya names of species, through interviews using field guides (Pizzey & Knight, 2007; Wilson, 2005), as well as direct observations of species during collaborative field surveys (Table 1).

Fauna surveys and specimen collections were conducted under Queensland Government scientific research and ethics permits and with the permission of the Goemulgaw (Torres Strait Islander) Registered Native Title Body Corporate. Amphibian, reptile and mammal specimens were stored in a 70% ethanol solution, and later deposited in the collections of the Queensland Museum, Brisbane.

FAUNAL HABITATS

For terrestrial fauna, seven broad habitats were identified on the island, following Stanton *et al*. (2008) and Stanton and Fell (2015): *Welchiodendron* dominant closed to open forests and woodlands; vine forest and thicket; *Melaleuca* dominant and *Pandanus* dominant shrublands and woodlands; grasslands; shrublands/shrubland complexes and rock pavement/pavement complexes; mangroves; and modified environments including built and disturbed areas. Detailed descriptions of these vegetation communities are provided in Stanton *et al*. (2008) and Stanton and Fell (2015).

Welchiodendron dominant closed to open forests and woodlands. This is the most extensive habitat on Mabuyag, with around 32% of land covered by forests and woodlands in which yellow box penda (*Welchiodendron longivalve*) is the dominant species, with wattle (*Acacia polystachya*), scrub turpentine (*Canarium australianum*) and *Terminalia subacroptera* also present. It is also the habitat that is the most species rich on the island. It occurs on footslopes to hilltops, gully lines and other sheltered locations across the island. The understorey ranges from sparse grass cover in some locations, to well-developed vine thicket in others.

Vine thicket: There are a number of small vine thicket patches on Mabuyag, covering approximately 2% of the total land area. This habitat is restricted primarily to gullies on the upper slopes of the island and lies within a mosaic of scrub habitat. The vine thickets on Mabuyag represent a diverse array of floristic and structural variations of semi-deciduous and deciduous species. The ground layer is notably absent although leaf litter, fallen dead wood and bark provide unique resources for many fauna species. Although these discrete remnant patches of vine thicket are relatively isolated their ecological value as part of the

wider landscape provides important habitat and food resources to a number of fauna (e.g. reptiles and predominantly terrestrial birds).

Melaleuca dominant and Pandanus dominant shrublands and woodlands: Approximately 2% of the total land area is covered by seasonally moist or waterlogged shrublands or woodlands, characterised by discrete patches of broad-leafed paperbark (*Melaleuca viridiflora*) or *Pandanus* sp. These communities provide a unique habitat for fauna, including access to fresh water and movement opportunities along drainage lines.

Grasslands: Almost 15% of Mabuyag is comprised of grassland which is dominated by a single species, giant spear grass (*Heteropogon triticeus*). Much of the shrubland vegetation also supports a grassy understorey. This simple composition results in reduced fauna niches, although the groundcover afforded by this community provides a unique environment for some fauna groups (e.g. small mammals, granivorous birds and reptiles).

Shrublands/shrubland complexes and rock pavement/pavement complexes: Approximately 30% of Mabuyag is covered by areas considered to be shrubland, shrubland complex, rock pavement and pavement complexes. This is a variable community with a range of canopy/shrub species and, in the case of shrubland and shrubland complexes, a grassy understory. This habitat supports a diversity of fauna resources and, as such, is considered important for all groups of terrestrial fauna on the island.

Mangroves: There are a number of areas of mangroves or vegetation with a strong marine influence on Mabuyag covering approximately 8% of the total land area. These areas are located in sheltered bays around the island and some relics of larger mangroves systems remain in close proximity to the township. A large unbroken stretch of mangroves occurs along the western coast of the island. This vegetation community provides a range of niche habitats for specialist species, including shelter for roosting and/or breeding and migratory avian species that are known to utilise the adjacent intertidal mudflats, beaches and fringing reefs.

Modified environments: Less than 10% of the island is currently cleared or has historically been cleared, and there are also small areas of regrowth (0.3%) and introduced flora (0.2%). While they may have low floristic value, they still provide resources for generalist fauna.

RESULTS

AMPHIBIANS

Specimens were obtained of *Litoria caerulea* and *Limnodynastes ornatus*, and *Litoria infrafrenata* was identified from vocalization[4] (Table 1). The introduced Cane Toad (*Rhinella marina*) was not reported from the island, although it is known from some other inhabited islands in Torres Strait (Lavery *et al*., 2012: 184-185; Watson & Hitchcock, pers. obs.) and could conceivably be introduced via visiting supply barges.

Table 1. List of Terrestrial Vertebrates recorded from Mabuyag and surrounding islets. Common, scientific and local language names (KLY, Kala Lagaw Ya) are provided and record sources identified.

Scientific name	Common name	Kly name	Record/s
FROGS			
Hylidae			
Litoria caerulea	Common Green Tree Frog	Katube or Kat	QM J87352 (Mabuyag)
Litoria infrafrenata	White-lipped Tree Frog	Katube or Kat	V (Mabuyag)
Myobatrachidae			
Platyplectrun ornatus	Ornate Burrowing Frog	Katube or Kat	QM J87218; QM J87338; QM J87353 (Mabuyag)
REPTILES			
Crocodylidae			
Crocodylus porosus	Saltwater Crocodile	Koedal	P, Hitchcock (Mabuyag)
Gekkonidae			
Gehyra sp.		Sis or Teybak	QM J87340; QM J87346; QM J87351 (Mabuyag) ; QM J87349 (Pulu)
*Hemidactylus frenatus**	House Gecko	Sis or Teybak	AMS R 48571-2; QM J87339 (Mabuyag)
Pygopodidae			
Lialis burtonis	Burton's Legless Lizard	Su	P, Hitchcock (Pulu)
Scincidae			
Bellatorias frerei	Major Skink	Auarrpathaithabu	P, Hitchcock (Kuikusagai or Redfruit Island)
Carlia longipes	Closed-litter Rainbow Skink	Moegay	QM J87348 (Pulu)
Carlia sexdentata	Robust Rainbow Skink	Moegay	QM J87342; QM J87536 (Mabuyag)
Cryptoblepharus virgatus	Striped Snake-eyed Skink	Moegay	AMS R 48564-7; QM J87341 (Mabuyag); QM J87343-4 (Pulu)
Cryptoblepharus litoralis	Coastal Snake-eyed Skink		QM J87345 (Pulu)
Ctenotus spaldingi	Spalding's Ctenotus	Ziziruk	QM J87350; QM J87533 (Mabuyag)
Emoia longicauda	Long-tailed Skink		QM J89282 (Mabuyag)
Eugonglys rufescens	Brown Sheen-skink		QM J87534 (Mabuyag)

Scientific name	Common name	Kly name	Record/s
Lygisaurus macfarlani	Translucent Litter-skink	Moegay	AMS R 48562 (Mabuyag); QM J87347 (Pulu)
Pythonidae			
Morelia sp.	Python	Thabu	Pers. obs. 2009, Watson (Mabuyag)
Typhlopidae			
Ramphotyphlops leucoproctus	Cape York Blind Snake		QM J87535 (Mabuyag)
Varanidae			
Varanus indicus	Mangrove Monitor		P, Hitchcock (Mabuyag)
Varanus panoptes	Yellow-spotted Monitor	Karum	QM J87337 (Mabuyag)
Varanus scalaris	Spotted Tree Monitor	Thamay	AMS R 48581; ZMB 10557, 53542 (Mabuyag); P (Pulu)
BIRDS			
Accipitridae			
Elanus axillaris	Black-shouldered Kite		Mabuyag
Accipiter fasciatus	Brown Goshawk		Mabuyag
Haliaeetus leucogaster	White-bellied Sea-eagle	Ngagalaig	D; Mabuyag; Pulu
Anatidae			
Anas superciliosa	Pacific Black Duck	Ad [general name for ducks]	D; Mabuyag
Apodidae			
Apus pacificus	Fork-tailed Swift		Mabuyag
Ardeidae			
Ardea ibis	Cattle Egret	Karbai ?	Mabuyag
Ardea modesta	Eastern Great Egret	Karbai ?	Mabuyag
Egretta sacra	Eastern Reef Egret	Karbai	D; Mabuyag; Pulu
Ardea intermedia	Intermediate Egret	Karbai ?	Mabuyag
Nycticorax caledonicus	Nankeen Night-heron	Gawt ?	Mabuyag
Egretta picata	Pied Heron	Kiapit	D; Mabuyag
Butorides striata	Striated Heron		Mabuyag; Pulu
Artamidae			
Artamus leucorynchus	White-breasted Woodswallow	Poesay	D; Mabuyag; Pulu

Table 1. List of Terrestrial Vertebrates recorded from Mabuyag and surrounding islets. Common, scientific and local language names (KLY, Kala Lagaw Ya) are provided and record sources identified (continued)

Scientific name	Common name	Kly name	Record/s
Burhinidae			
Esacus magnirostris	Beach Stone-curlew		Mabuyag; Pulu
Campephagidae			
Coracina novaehollandiae	Black-faced Cuckoo-shrike	Mowk	Mabuyag
Charadriidae			
Charadrius leschenaultii	Greater Sand Plover		Mabuyag
Charadrius mongolus	Lesser Sand Plover		D; Mabuyag; Pulu
Vanellus miles	Masked Lapwing	Kerkere	D; Mabuyag
Pluvialis fulva	Pacific Golden Plover		D; Mabuyag
Cisticolidae			
Cisticola exilis	Golden-headed Cisticola		D; Mabuyag; Pulu
Columbidae			
Geopelia humeralis	Bar-shouldered Dove	Kuduluk	D; Mabuyag; Pulu
Ducula bicolor	Pied-imperial Pigeon	Goeynaw	D; Mabuyag; Pulu
Ptilinopus regina	Rose-crowned Fruit-dove		Mabuyag
Coraciidae			
Eurystomus orientalis	Dollarbird		Mabuyag
Cuculidae			
Eudynamys orientalis	Eastern Koel		D
Cacomantis variolosus	Brush Cuckoo		D
Urodynamys taitensis	Long-tailed Cuckoo		Mabuyag
Dicruridae			
Dicrurus bracteatus	Spangled Drongo	San	Mabuyag
Estrildidae			
Lonchura castaneothorax	Chestnut-breasted Mannikin	Baibai baimut	D; Mabuyag; Pulu
Eurostopodidae			
Eurostopodus mystacalis	White-throated Nightjar	Roega	Mabuyag
Falconidae			
Falco longipennis	Australian Hobby	Awb ?	Mabuyag
Frigatidae			

Scientific name	Common name	Kly name	Record/s
Fregata minor	Great Frigatebird	Waumer	Mabuyag
Fregata ariel	Lesser Frigatebird	Waumer	Mabuyag; Pulu
Glareolidae			
Stiltia isabella	Australian Pratincole		Mabuyag
Halcyonidae			
Todiramphus chloris	Collared Kingfisher		Mabuyag
Todiramphus macleayii	Forest Kingfisher		Mabuyag
Todiramphus sanctus	Sacred Kingfisher	Zaikas	D; Mabuyag; Pulu
Hirundinidae			
Petrochelidon nigrans	Tree Martin		Mabuyag
Hirundo neoxena	Welcome Swallow		Mabuyag
Laridae			
Sterna sumatrana	Black-naped Tern	Sara ?	D; Mabuyag; Pulu
Hydroprogne caspia	Caspian Tern		Mabuyag
Anous stolidus	Common Noddy		Mabuyag; Pulu
Thalasseus bergii	Crested Tern	Sara ?	Mabuyag; Pulu
Gelochelidon nilotica	Gull-billed Tern		Mabuyag
Chroicocephalus novaehollandiae	Silver Gull	Kekey	D; Mabuyag; Pulu
Childonias leucopterus	White-winged Black Tern	Sara ?	Mabuyag; Pulu
Megapodidae			
Megapodius reinwardt	Orange-footed Scrubfowl	Surka	Widul
Meliphagidae			
Lichmera indistincta	Brown Honeyeater		Mabuyag; Pulu
Ramsayomis modestus	Brown-backed Honeyeater		D; Mabuyag
Meropidae			
Merops ornatus	Rainbow Bee-eater	Birubiru	D; Mabuyag; Pulu
Monarchidae			
Myiagra ruficollis	Broad-billed Flycatcher		Mabuyag
Myiagra rubecula	Leaden Flycatcher		D; Mabuyag; Pulu
Myiagra cyanoleuca	Satin Flycatcher		Mabuyag; Pulu

Table 1. List of Terrestrial Vertebrates recorded from Mabuyag and surrounding islets. Common, scientific and local language names (KLY, Kala Lagaw Ya) are provided and record sources identified (continued)

Scientific name	Common name	Kly name	Record/s
Myiagra alecto	Shining Flycatcher		D; Mabuyag
Nectariniidae			
Dicaeum hirundinaceum	Mistletoebird		Mabuyag
Nectarinia jugularis	Olive-backed Sunbird	Baimut or Mut	D; Mabuyag; Pulu
Pachycephalidae			
Pachycephala melanura	Mangrove Golden Whistler		Mabuyag
Passeridae			
*Passer domesticus**	House Sparrow	N/A; introduced	Mabuyag
Pelicanidae			
Pelicanus conspicillatus	Australian Pelican	Away	Mabuyag
Phalacrocoracidae			
Microcarbo melanoleucos	Little Pied Cormorant		Mabuyag
Rallidae			
Gallirallus philippensis	Buff-banded Rail		Q [Mabuyag]; Mabuyag
Porphyrio porphyrio	Purple Swamphen	Milu	Mabuyag
Recurvirostridae			
Himantopus himantopus	Black-winged Stilt		Mabuyag
Rhipiduridae			
Rhipidura rufifrons	Rufous Fantail	Panadth urui	Widul
Scolopacidae			
Tringa nebularia	Common Greenshank		D; Mabuyag; Pulu
Tringa brevipes	Grey-tailed Tattler		Mabuyag; Pulu
Calidris ruficollis	Red-necked Stint		D; Mabuyag; Pulu
Arenaria interpres	Ruddy Turnstone		Mabuyag
Calidris acuminata	Sharp-tailed Tattler		Mabuyag
Xenus cinereus	Terek Sandpiper		Mabuyag
Numenius phaeopus	Whimbrel	Kalu ?	D; Mabuyag; Pulu
Threskiornithidae			
Plegadis falcinellus	Glossy Ibis	Gamay	Mabuyag
Threskiornis molucca	Australian White Ibis	Bukari	Mabuyag
Threskiomis spinicollis	Straw-necked Ibis	Bukari	Mabuyag
Platalea regia	Royal Spoonbill		Mabuyag
Timaliidae			

Scientific name	Common name	Kly name	Record/s
Zosterops citrinella	Pale White-eye		Mabuyag
Turnicidae			
Turnix maculosus	Red-backed Button - Quail	Gururu	Mabuyag
MAMMALS			
Pteropodidae			
Pteropus alecto	Black Flying-fox	Sapur	P, Watson (Mabuyag)
Canidae			
Canis familiaris	Domestic Dog	Umay	P, Hitchcock (Mabuyag, Pulu)
Equidae			
*Equus caballus**	Horse	--	P, Hitchcock (Mabuyag)
Felidae			
*Felis catus**	Domestic Cat	--	P, Watson (Mabuyag)
Emballonuridae			
Taphozous australis	Coastal Sheathtail Bat	Ap	P, Hitchcock (Pulu)
Mollosidae			
Mormopterus beccarii	Beccari's Free-tailed Bat		AB (Mabuyag)
Muridae			
Melomys burtoni	Grassland Melomys	Makas	QM JM18926-27 (Mabuyag)
Suidae			
*Sus scrofa**	Pig	Burum?	P, Hitchcock (Mabuyag)

ABBREVIATIONS. AMS = Australian Museum database, AB = AnaBat recording, D = Draffan *et al*. (1983), KLY = Kala Lagaw Ya (where known), P = photograph by authors, Q = Queensland Museum database, V = vocalization, ZMB = Museum für Naturkunde, Berlin, * = introduced species.

Nomenclature follows that of Cogger (2014) for amphibians and reptiles, Van Dyck *et al*. (2013) for mammals and Pizzey and Knight (2012) for birds. Vanderduys (2012) and Wilson and Swan (2013) are also referred for amphibians and reptiles, respectively.

REPTILES

Our surveys have increased the number of reptiles known on Mabuyag from four to 18 species (Table 1). *Hemidactylus frenatus* is the only introduced reptile on the island. Photographs of species which were identified, but for which voucher specimens were not obtained, appear in Figures 2-4.

According to local people, several species of reptiles known from nearby (and far larger) Badu and Mua are not present on Mabuyag. These include the Emerald Monitor (*Varanus prasinus*), known from Mua (Whittier & Moeller, 1983), the Northern Death Adder (*Acanthopus praelongus*) and Black Whip Snake (*Demansia atra*), which have been collected on Badu (Atlas of Living Australia, 2012) and the Frill-necked Lizard (*Chlamydosaurus kingii*), said to occur on both Badu and Mua (Ingram, 2008: 623; Lawrie, 1970: 83).

FIG. 2. *Varanus indicus* at Mabuyag, 31 May 2010. Photograph: Garrick Hitchcock.

FIG. 3. *Bellatorias frerei* at Kuikusagay (Redfruit Island), 18 April 2009. Photograph: Garrick Hitchcock

BIRDS

Previously, only 24 species of birds were known from Mabuyag (Draffan *et al*., 1983); this number has now been increased to 77 species (Table 1). The House Sparrow (*Passer domesticus*) is the only introduced bird species on the island. Draffan *et al*. (1983) note that it was introduced onto several islands in the Torres Strait in the late 1970s-early 1980s; it has since become relatively widespread (Watson *et al*., 2010).

The record of Long-tailed Cuckoo (*Urodynamys taitensis*), a visual sighting in 2009 by the authors, is of interest as it is regarded as an irregular migrant to Lord Howe and Norfolk Islands (and probably outer great Barrier Reef islands) with possible records from northern Queensland and the Northern Territory (Pizzey & Knight, 2012). This species is recorded breeding in New Zealand and is widely known in the central and south tropical Pacific (Dutson, 2011: 332; Higgins, 1999: 774-777).

FIG. 4. *Lialis burtonis* at Pulu, 28 November 2008. Photograph: Garrick Hitchcock.

MAMMALS

The only native species known from Mabuyag are the Grassland Melomys (*Melomys burtoni*)[5] and two species of bats: Black Flying-fox (*Pteropus alecto*) and Beccari's Freetail-bat (*Mormopterus beccarii*); the Coastal Sheathtail-bat (*Taphozous australis*)[6] has also been observed by the authors roosting among boulders at a number of locations on Pulu, and likely occurs on Mabuyag and other surrounding islets (Table 1). One *Melomys* specimen (captured in grassland habitat in the eastern part of the island) displayed an unusual brown and white pattern and was confirmed by the Queensland Museum to be *M. burtoni* (Figure 5).

Introduced mammal species seen on Mabuyag during our surveys were: dog, cat, a single pig and a single horse. The horse had been translocated by local people from neighbouring Badu. Haddon (1912c: 230) notes that the dingo was present at contact, and by the 1890s had interbred with introduced dogs to create a mongrel breed. Cats and domestic fowls had also been adopted by this time. Mabuyag elders told members of the Cambridge Anthropological Expedition to Torres Straits that prior to the arrival of Europeans in the 1870s, pigs and fowls were not present (Wilkin, 1904: 290; see also Haddon 1912a: 137; McNiven, 2008; McNiven & Hitchcock, 2004: 112-114). The dingo was probably introduced to the Torres Strait Islands some 2,500-3,500 years ago, and while its exact impact on local terrestrial vertebrates is not known, it is likely that its presence contributed to the depauperate animal resource base of many of the islands in the region (McNiven & Hitchcock, 2004: 120-122; see also McNiven, 2008: 455). In 1898 Haddon observed and photographed a Spotted Cuscus (*Spilocuscus maculatus*), kept caged as a pet on Mabuyag, which had been imported from New Guinea (McNiven & Hitchcock, 2004: 111). Quarantine

FIG. 5. Pied *Melomys burtoni* at Mabuyag, 27 May 2009. Photograph: Justin Watson.

restrictions make such imports impossible today. It is likely that the introduced Black Rat (*Rattus rattus*) is also present, as it is found on other inhabited (Lavery *et al*., 2012: 184-185) and unihabited (Watson, 2013) islands within the region.

According to Goemulgal, the Short-beaked Echidna (*Tachyglossus aculeatus*) and Northern Brown Bandicoot (*Isoodon macrourus*), known from Mua (Hitchcock *et al*., 2014), are not present on the island. Further research may add to the number of mammals (e.g. rodents and particularly microbats) found on Mabuyag.

GOEMULGAW ETHNOTAXONOMY

Very little information exists on the ethnotaxonomy (local system of classifying the natural world) of Torres Strait Islanders. Haddon (1912c: 229-230) provides a very brief section on Islander folk classification, stating that:

> It is important to note that terms are classified (more particularly perhaps among the Miriam [people of Mer]) into those which signify a group or general term, *koi nel* (W. [Kala Lagaw Ya or Western-Central Torres Strait Language]), *au nei* (E. [Meriam Mir,

> the language of the Meriam]), or big name, and those which denote a special name, *magi nel* (W.), *kebi nei* (E.), or little name.

With respect to folk classification, these terms roughly equate to genera and specifics respectively.

At the lifeform level, there are fish (*whapi*) and birds (*urui*). There is no lifeform term corresponding to 'animal' in Torres Strait, which may reflect the paucity and/or lesser value of terrestrial fauna when compared to marine fauna (see McNiven & Hitchcock, 2004).

Nonetheless, contemporary Goemulgal are intimately acquainted with the fauna and flora of their ancestral domain, including terrestrial vertebrates, as were their ancestors:

> The natives are good field naturalists and have names for a large number of plants and animals. A considerable number of plants are utilised in one way or another, more so than we have mentioned in these Reports. Although the land fauna is deficient in forms of economic importance, the natives have names for animals which are not of value to them, and are acquainted with their habits; their knowledge of the natural history of marine animals being very extensive. The uses and properties of most of the plants are known to them (Haddon, 1912c: 230).
>
> A large number of animals have separate names, but in some instances the same name is given to different species, mainly, I believe, because they are used for a similar purpose and possibly any special designation may be of no consequence (Haddon, 1912c: 230).
>
> The Mabuiag colour vocabulary illustrates very well the extensive knowledge which the savage possesses of the concrete things around him and the powers of observation which are associated with this knowledge. Some of the men in Mabuiag seemed to have some natural object in mind to compare with every shade of colour shown to them, and in the discussions which often ensued it was obvious that most of the natives were intimately acquainted with the objects in question. This intimate acquaintance is also shown by the existence of a definite name for nearly every species of animal and plant, and for the individual parts of many animals and plants, for every condition of earth and water, for every feature of the landscape, and for every reef and sandbank of the sea (Rivers, 1901: 64).

On Mabuyag we found that most species do indeed have a single name. Where different species are known by the same name, this may relate to where they have no special economic or other significance, for example, skinks such as *Carlia* sp., and the very different Wall Skink, are both called *mogai*. Rats and mice are known by the one term, *makas*, reflecting perhaps their lack of importance in the pre-contact diet. Frogs (*kutabe*, or the short form, *kut*) similarly have only one name.

Thabu is the general name for snake, but also a specific for the python (*Morelia* sp., probably *M. amethistina* complex). An intermediate taxonomic category exists for snakes, depending on whether they are venomous or not: *kasa thabu* (literally 'just snakes', i.e., non-venomous species) and *emar thabu* (literally 'death snake', i.e., venomous snakes). No venomous snakes occur on Mabuyag, but local people are aware of the presence of such snakes on Badu, including the Northern Death Adder and Black Whip Snake.

TERRESTRIAL VERTEBRATES IN THE GOEMULGAW DIET

Owing to the depauperate terrestrial animal fauna and abundant marine resources, it is not surprising that, with the exception of birds, terrestrial vertebrates were not a significant component of the diet on Mabuyag, perhaps more so than other islands in the region on account of its proximity to expansive dugong feeding grounds (Haddon, 1912a: 137-139; McNiven & Hitchcock, 2004: 106-109).

Haddon's Mabuyag informants in 1898 identified a number of local food proscriptions, stating that the dingo, varanids, snakes and frogs were not eaten (Haddon, 1912a: 138-139).[7] Some people, however, ate the Black Flying-fox, although this was apparently a recent practice:

> Dr Seligmann found a few old men in Mabuiag who had recently learnt in New Guinea to eat the *sapur*, [Black] flying-fox (*Pteropus* [*alecto*]), but this was considered a somewhat objectionable practice; [Goemulgaw man] Waria informed me that "big men" eat it in Mabuiag (Haddon 1912a: 137).

Flying-fox is not eaten today. Haddon also noted that birds could not be eaten by women: '[they] may not eat any kind of bird in Mabuiag, as birds are believed to be aphrodisiacs; for as pigeons fly from tree to tree so the woman would desire one man after another' (Haddon, 1912a: 140).

TERRESTRIAL VERTEBRATES IN GOEMULGAW CULTURE

Terrestrial vertebrates were and continue to be an integral part of Mabuyag customary beliefs and practices, art, story and song, and traditional ecological knowledge.

All people on Mabuyag are members of a patrilineal clan, with each clan having its own totem (*augud*). Six of the eleven extant clan totems recorded by Rivers and Haddon (1904: 154) on Mabuyag in the late nineteenth century were terrestrial vertebrates: crocodile (*kodal*), cassowary (*sam*)[8], Black Flying-fox (*sapur*), snake (*tabu*), dog (*umay*) and frigatebird (*waumer*); the remaining five are the dugong, green turtle, a shark and two species of fish. People express affinity with their totem animal, embodying characteristics of the particular species (e.g. crocodile clan people are said to be strong and to have no pity; while cassowary clan people were said to have long and thin legs, like those of the bird, and were fast runners) (see Rivers & Haddon, 1904: 162-169). When dying, people are said to unconsciously make movements typical of their totem animal (see Laade, 1969: 34-35).

Haddon also noted that the clans on Mabuyag were formerly grouped into two divisions, *Kai augudau kazi* and *Mugi augudau kazi*. These were not exogamous moieties however, although Haddon thought they were previously functioned as 'phratries', i.e. a dual grouping of clans, important to marriage regulation (Rivers & Haddon, 1904: 177-179).

> The *Kai augudau kazi* were *Kodal*, *Sam*, and *Tabu*, with whom were associated *Umai*.
>
> The *Mugi augudau kazi* were *Dangul* and *Kaigas*, with these were associated *Baidam*, *Tapimul*, and *Surlal* (or *Waru*).
>
> It is interesting to note that this grouping corresponds with the mode of life of the totem animals. Those of the first group are all land animals, the four legs of the crocodile evidently outweighing in the native mind the amphibious habits of that reptile. Whereas the members of the second group are all marine animals; or, to quote the words of an informant, "They all belong to the water, they are all friends" (Rivers & Haddon, 1904: 172).

A number of stories of the Goemugal reference animals and birds. *Walek* (Frill-necked Lizard, *Chlamydosaurus kingii*)[9], *karum* (Yellow-spotted Monitor, *Varanus panoptes*) and *surka* (Orange-footed Scrub-fowl, *Megapodius reinwardt*) feature in the story 'How fire was brought to Torres Strait'; the legendary warrior-hero Kuyam turns into a *katakuik* ('a swallow', unidentified) and his aunt turns into a *kwoka* (probably a friarbird) in the 'Saga of Kuiam'; and an *away* (Australian Pelican, *Pelecanus conspillatus*) features in the tale of 'Amipuru' (Haddon, 1904a: 77-78, 99-100; Lawrie, 1970: 83-84, 98-99, 109).

Several birds are recognised as calendar, omen or messenger birds:

Birubiru (Rainbow Bee-eater) – when seen moving north to south, the people know that this marks the start of *soelal*, the turtle-mating season. During this season, *away* (Australian Pelican) also make the soaring, circling flight called *thamay*.

Panadth urui (Rufous Fantail) – when seen and heard, people know that the Christmas season is approaching, i.e. it appears around the season known as *naigai*, November-December. This bird starts singing at this time, during the day, and other birds join in, e.g. *mut*.

Baimut or *mut* (Olive-backed Sunbird) – if this bird, or a butterfly, comes into a house, the occupants will know that good news or bad news is coming.

Zaikas (Sacred Kingfisher) – if *zaikas* flies close to an individual, e.g. in a yard or while out working, it is telling that person that someone has or will soon pass away.

Terrestrial vertebrates also featured in traditional rock-art, material culture and forms of personal adornment. On Pulu, Haddon (1904b: 4) recorded images of cassowary, spoonbill and curlew painted on boulders. Images of quadrapeds on Pulu boulders likely represent dogs (Brady, 2010: 410, 418). Dog's teeth were used to decorate necklaces and coronets, on Mabuiag and throughout the region (Haddon, 1912b: 41, pl. 9.4). Feathers, of the Cassowary and Eastern Reef Heron, were made into headdresses (Haddon, 1912b: 34, 36-37). Cassowary and snake clan members were known to scarify themselves with representations of their totem, while dog clan members might ornament their bows and tobacco pipes with representations of the animal (Rivers & Haddon, 1904: 166, 169-169).

CONCLUSION

The fauna survey results presented here have significantly expanded our knowledge of Mabuyag's terrestrial vertebrates. Given the smaller size of this island (and less complex habitats) compared to nearby (and far larger) Badu and Mua, it is not unexpected that fewer terrestrial vertebrate species occur on Mabuyag.

The habitats across the island offer resources for a range of vertebrate fauna, particularly native reptiles and birds. The relatively diverse terrestrial vertebrate community highlights the importance of the island from a biodiversity conservation perspective and justifies current and future management practices to retain these values. It is evident that birds use the island as 'stepping stones' during migrations, including journeys along the East Asian-Australasian Flyway (e.g. migratory waders) and movements between New Guinea and mainland Australia. The forage and roost resources (e.g. intertidal flats) available for these species, recorded in large numbers on the island, highlights the conservation importance of the area for species of international significance (i.e. those listed under international and Australian Government conventions).

Although *Rhinella marina* and *Rattus rattus* were not reported from Mabuyag, they are known from some other inhabited islands in Torres Strait (Lavery *et al*., 2012: 184-185; Watson & Hitchcock, pers. obs.) and attempts should be made to prevent them from arriving with supplies being delivered to the island by barge and aircraft. These species have the potential to significantly impact on the native fauna and biodiversity of Mabuyag and surrounding islets.

The store of knowledge that Islanders possess about birds and other terrestrial vertebrates is an invaluable component of land and sea management in the region. This is all the more important given the potential for infrastructure developments and introduced pest species to impact deleteriously on Mabuyag's habitats in the future.

ACKNOWLEDGEMENTS

We wish to thank the Goemulgal for their assistance with surveys, in particular, Mabuygiw Rangers Terrence Whap, Charlie Hankin and the late David Amber. Thanks also to Sarah Drayton for field support and Andrew Amey, Patrick Couper and Steve Van Dyck (Queensland Museum) for identifications of collected specimens and photographs, and Greg Ford (Balance Environmental) for analysis of AnaBat data. We are indebted to Hilary Howes for drawing our attention to the collecting efforts of Otto Finsch and liaising with staff of the Museum für Naturkunde, Berlin, who kindly made specimen data available: Sylke Frahnert (ornithology) and Frank Tellick (herptology). Helpful comments on an earlier draft of this paper were provided by David Fell, Ian McNiven and two anonymous referees.

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❑ ENDNOTES

1. The reptile and bird specimens were sent to the Royal Zoological Museum in Berlin (now Museum für Naturkunde, Berlin), however the specimen of *Ducula bicolor* was not incorporated into the collections, possibly because it had been poorly preserved. In the museum's records all five specimens are mistakenly identified as having been collected in New Britain (Sylke Frahnert, pers. comm., 2013).
2. Goemulgaw is the possessive form of Goemulgal.
3. The collections are ordered systematically and not geographically, and hence searching for specimens by locality is not possible at this time (Roberto Portela Miguez, Mammal Section Curator, Natural History Museum, pers. comm., 2010).
4. There are no specimens of *Litoria infrafrenata* from Torres Strait in Australian museums. The Australian Museum Herpetology Collection hold seven specimens collected in the 1970s at two locations near the tip of Cape York Peninsula (one specimen from Bamaga and six from the vicinity of Somerset) (Atlas of Living Australia, 2012).
5. Rodent remains in archaeological deposits at Tigershark Rockshelter on Pulu were identified by staff of the Queensland Museum as *Melomys* cf. *capensis* (McNiven *et al*., 2008: 25).
6. A search of Australian museum collections (Atlas of Living Australia, 2012) shows there is one specimen of *Mormopterus beccarii* from Torres Strait in the CSIRO's Australian National Wildlife Collection, collected from Muralug (Prince of Wales Island) (M00395). Fifteen specimens of *Taphozous australis* in the Australian Mammalogy Collection, Australian Museum, Sydney, were collected from Possession Island in August 1928 by Melbourne Ward (AMS M.4411-4425).
7. Haddon mentions that Waria informed him that the Muralug, Mua, Saibai, Dauan and Boigu people ate varanids (1912a: 138).
8. Cassowaries (Southern Cassowary, *Casuarius casuarius*) did not occur naturally on Mabuyag but were probably imported from time to time from New Guinea (see McNiven & Hitchcock, 2004:114-115).
9. This story notes that Frill-necked Lizards are found on Badu and Mua; they are not present on Mabuyag.