

# Notes on a collection of bats and observations on other vertebrates from the Macquarie Marshes, New South Wales

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From 25 to 31 March, 1989, the Mammal Section of the Royal Zoological Society of NSW conducted a fauna survey of part of the Macquarie Marshes Nature Reserve. The primary purpose of our survey was to add to the knowledge of the mammalian fauna of the Marshes since the avifauna and herpetofauna have been well surveyed (Brooker and Wombey 1986; Cooper 1954). This note presents a summary of bat captures and incidental observations of other vertebrates made during the recent Mammal Section survey.

Macquarie Marshes Nature Reserve is situated approximately 100 km north of Warren in central western New South Wales (Fig. 1). The reserve is covered by large areas of wetland vegetation, and significant areas of eucalypt woodland dominated by River Red Gum *Eucalyptus camaldulensis*. There are also extensive areas of dead standing and fallen timber in former woodland apparently killed by changes in water regime associated with the construction of irrigation works. A more detailed description can be found in Pajmans (1981) and NPWS (1990).

The trapping period was characterized by heavy rainfall and localized flooding. The associated cloud cover resulted in low temperatures and high humidity. Flooding meant that live trapping using Elliott traps was abandoned after two nights, with only introduced rodents being captured. Spotlighting was similarly limited in extent and duration, but did reveal Common Brushtail Possums *Trichosurus vulpecula*.

Bat traps and mistnets were set in an area of River Red Gum woodland flanked on one side by a man-made irrigation channel, and on the other by natural waterways. Four harp-type bat traps and one mistnet were set for two nights. All traps were set on an access road, and the mistnet was set along the margin of a large open marsh area. An additional net, set under a large Black Box *E. largiflorens*, was maintained for three nights. All bat captures were made within 1 000 m of 30°45'28"S 147°32'28"E. The location of all trapping sites is shown in Figure 2.

A spotlighting transect was run for one night and ran from the bat trapping site to the Elliott trapping site (Fig. 2).

The species captured, detailed live measurements, and method of capture are listed in Table 1. Also included are the Australian Museum accession numbers of voucher specimens taken from the field. A list of all other terrestrial vertebrate species recorded from the Marshes during the survey is given in Appendix 1. The data have been supplied to the NSW NPWS "Atlas of NSW Wildlife", described by Ellis (1992), and confirms the continued presence of many species previously recorded from the Macquarie Marshes.

The most notable captures were a number of specimens of Gould's Long-eared Bat *Nyctophilus gouldi*. This represents a significant westward range extension for this species of approximately 180 km (Ellis *et al.* 1989). The identity of three voucher specimens lodged with the Australian Museum was kindly confirmed by Dr. Harry Parnaby.

Based on our field observations, the western form of *N. gouldi* can be distinguished from sympatric Lesser Long-eared Bat *N. geoffroyi* by the same characters that are of value in separating eastern specimens of these species. That is, relatively longer ears in *N. geoffroyi*, and tall, slender Y-shaped posterior noseleaf element in *N. geoffroyi*. With respect to the noseleaf types defined by Thomas (1915), and refined by Churchill *et al.* (1984), *N. geoffroyi* is Type 3, and *N. gouldi* is Type 1. They are, however, very similar in size in western NSW (Ellis *et al.* 1989; Table 1, this study). These new specimens are further evidence of the wide degree of intraspecific variation in *N. gouldi* noted by Parnaby (1987 and pers. comm.).

The similarity in size noted above suggests that absolute size might not be a significant factor determining the niche of each species at the western limit of their zone of sympatry. Larger sample sizes and detailed ecological study will be required to examine this possibility. Interestingly, studies have shown the two species to have remarkably similar echolocation calls

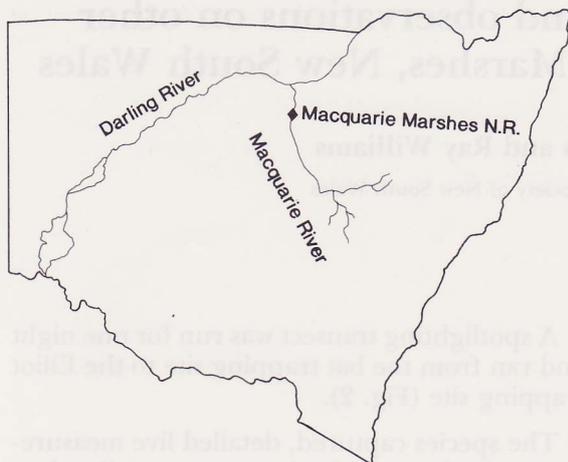


Fig. 1. Location of Macquarie Marshes Nature Reserve.

(Woodside and Taylor 1985), and methods of prey capture (Grant 1991).

Although no specimens were captured, incidental evidence suggests the presence of at least three other species of microchiropterans in the Marshes. A probable specimen of *Chalinolobus picatus* escaped from a mistnet before it was secured. The range of this species includes the Marshes area, and it was recently captured north of Bourke, NSW (Ellis and Wilson 1992). On several occasions in one night, spotlighting revealed the presence of a high-flying, very large pale-bellied bat that was probably the Yellow-bellied Sheat-tail Bat *Saccolaimus flaviventris*. Spotlighting also revealed a large fast-flying bat whose call was clearly audible, probably the White-striped Mastiff Bat *Tadarida australis* or possibly Gould's Wattled Bat *Chalinolobus gouldii*, flying above the River Red Gum woodland.

Other bat species expected from the area, but not captured during this survey include *Eptesicus baverstocki*, *Scotorepens balstoni* and *Nyctophilus timoriensis*.

General observations and spotlighting indicate that greatest bat activity occurred around the Red Gum woodland and adjacent water bodies. These areas represent zones of relatively high productivity in arid and semi-arid western NSW. Together with the captures, these observations suggest that the woodlands associated with major drainage channels in western NSW are significant habitat for microchiropterans, and should be subjected to more intensive survey. Furthermore, the conservation of the woodlands is apparently a necessary condition for the conservation of the microchiropteran fauna of the region.

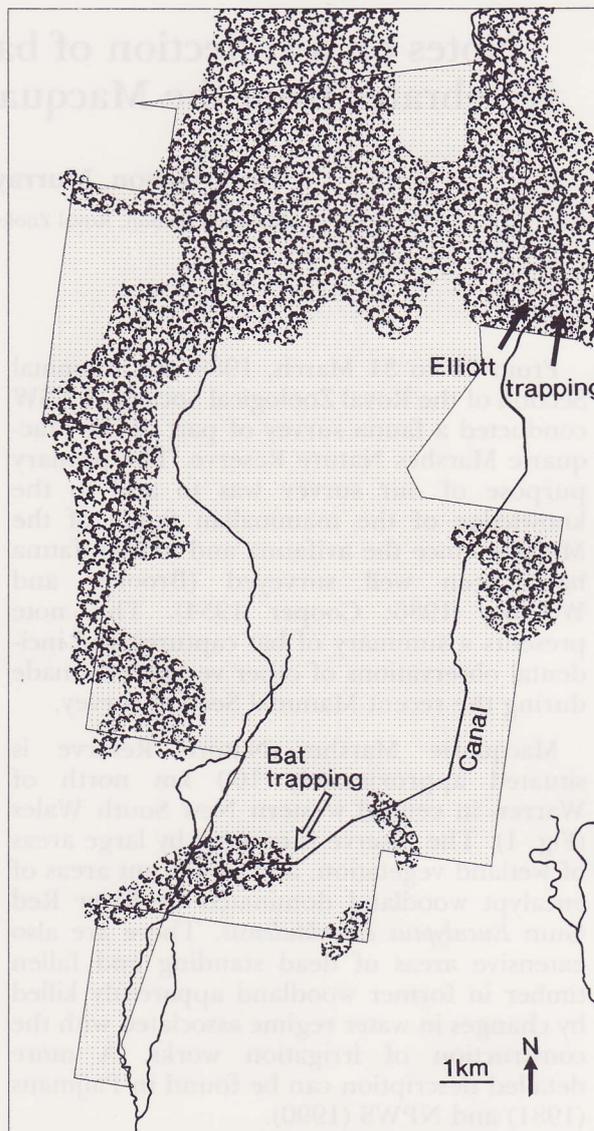


Fig. 2. Northern section of Macquarie Marshes Nature Reserve (light stippling) showing the location of trapping sites and the spotlighting transect in relation to woodland (stippled).

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Table 1. Bat captures at Macquarie Marshes Nature Reserve, March 1989. Abbreviations used: FA = Forearm in millimetres, BM = Body mass in grams, HB = Head and body in millimetres, T = Tail in millimetres, Ear = Ear in millimetres, WS = Wingspan in millimetres. All measurements are from live specimens.

Species	Sex	FA	BM	HB	T	Ear	WS	Trap site	Australian Museum Number
<i>Chalinolobus gouldii</i>	M	43.7	12.2	—	—	—	317	RGT	
	M	41.2	10.0	—	—	—	300	RGT	
	M	42.8	12.0	—	—	—	310	RGT	
	M	42.9	12.0	58.0	46.0	15.8	310	RGT	M20380
	F	46.1	13.8	60.4	49.6	15.6	328	RGT	M20379
<i>Eptesicus vulturinus</i>	M	26.0	3.0	—	—	—	192	RGT	M20381
	M	25.8	3.5	39.4	32.5	9.6	195	RGT	M20378
<i>Nyctophilus geoffroyi</i>	M	33.7	6.0	—	—	—	—	UB	M20367
	M	34.4	6.0	—	—	—	—	BB	
	M	34.6	5.8	48.9	42.8	25.9	248	RGT	M20371
	M	33.2	6.2	46.5	47.0	25.9	248	RGT	M20372
	M	31.9	5.0	43.6	48.0	24.1	227	RGT	M20373
	M	34.0	5.2	45.0	39.0	25.4	250	RGT	M20376
	M	34.2	5.5	43.0	39.5	25.2	243	RGT	M20377
	F	36.0	6.2	49.0	39.0	—	256	BB	
	F	36.8	7.0	45.9	44.5	26.2	265	RGT	M20374
	F	35.3	6.0	43.3	40.3	25.4	256	RGT	M20375
<i>Nyctophilus gouldi</i>	M	35.2	6.5	50.0	35.5	26.0	250	RGT	M20382
	M	36.8	6.5	46.8	43.6	27.0	261	RGT	M20369
	F	39.6	7.5	47.4	43.7	26.9	275	RGT	M20370
<i>Scotorepens greyii</i>	M	29.2	6.0	—	—	—	220	RGT	M20386
	M	27.2	6.2	—	—	—	213	RGT	M20385
<i>Mormopterus planiceps</i>	M	32.4	10.0	—	—	—	242	RGN	M20383

SITES: BB: Mist net set under Black Box for three nights.

UB: Caught by hand, found under the bark of a dead tree.

RGN: Mist net set between two River Red Gums adjacent to open marsh area.

RGT: Bat trap set on access road in River Red Gum woodland.

## APPENDIX

List of all terrestrial vertebrate species except bats (Order Chiroptera) recorded from the Macquarie marshes during the survey period, and held in the NSW NPWS "Atlas of NSW Wildlife". Seventy-two terrestrial vertebrate species are listed below.

<b>Class Amphibia</b>	Family Rallidae	Order Strigiformes
Order Salientia	<i>Gallinula ventralis</i> (Black-tailed Native-hen)	Family Strigidae
Family Hylidae		<i>Ninox novaeseelandiae</i> (Southern Booboo)
<i>Litoria caerulea</i> (Green Tree Frog)	Order Passeriformes	<b>Class Mammalia</b>
<i>Litoria peronii</i> (Peron's Tree Frog)	Family Acanthizidae	Order Artiodactyla
Family Myobatrachidae	<i>Acanthiza reguloides</i> (Buff-rumped Thornbill)	Family Bovidae
<i>Limnodynastes fletcheri</i> (Long-thumbed Frog)	Family Campephagidae	<i>Bos taurus</i> (Cattle (feral))
<i>Limnodynastes tasmaniensis</i> (Spotted Grass Frog)	<i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)	Family Suidae
<b>Class Aves</b>	Family Climacteridae	<i>Sus scrofa</i> (Pig (feral))
Order Anseriformes	<i>Climacteris picummus</i> (Brown Treecreeper)	Order Carnivora
Family Anatidae	Family Corvidae	Family Canidae
<i>Anas superciliosa</i> (Pacific Black Duck)	<i>Corvus coronoides</i> (Australian Raven)	<i>Vulpes vulpes</i> (Fox)
<i>Cygnus atratus</i> (Black Swan)	Family Cracticidae	Order Diprotodonta
Order Caprimulgiformes	<i>Cracticus nigrogularis</i> (Pied Butcherbird)	Family Macropodidae
Family Aegothelidae	<i>Cracticus torquatus</i> (Grey Butcherbird)	<i>Macropus giganteus</i> (Eastern Grey Kangaroo)
<i>Aegotheles cristatus</i> (Australian Owllet-nightjar)	<i>Gymnorhina tibicen</i> (Australian Magpie)	Family Phalangeridae
Family Podargidae	Family Grallinidae	<i>Trichosurus vulpecula</i> (Common Brushtail Possum)
<i>Podargus strigoides</i> (Tawny Frogmouth)	<i>Grallina cyanoleuca</i> (Australian Magpie Lark)	Order Lagomorpha
Order Charadriiformes	Family Hirundinidae	Family Leporidae
Family Charadriidae	<i>Cecropis nigricans</i> (Tree Martin)	<i>Lepus capensis</i> (Brown Hare)
<i>Vanellus miles</i> (Masked Lapwing)	<i>Hirundo neoxena</i> (Welcome Swallow)	Order Rodentia
Order Ciconiiformes	Family Meliphagidae	Family Muridae
Family Ardeidae	<i>Entomyzon cyanotis</i> (Blue-faced Honeyeater)	<i>Hydromys chrysogaster</i> (Water Rat)
<i>Ardea novaehollandiae</i> (White-faced Heron)	<i>Lichenostomus penicillatus</i> (White-plumed Honeyeater)	<i>Mus musculus</i> (House Mouse)
Family Plataleidae	<i>Manorina flavigula</i> (Yellow-throated Miner)	<i>Rattus rattus</i> (Black Rat)
<i>Platalea flavipes</i> (Yellow-billed Spoonbill)	<i>Manorina melanocephala</i> (Noisy Miner)	<b>Class Reptilia</b>
<i>Platalea regia</i> (Royal Spoonbill)	Family Muscicapidae	Order Squamata
<i>Threskiornis aethiopicus</i> (Sacred Ibis)	<i>Myiagra inquieta</i> (Restless Flycatcher)	Family Agamidae
<i>Threskiornis spinicollis</i> (Straw-necked Ibis)	<i>Rhipidura leucophrys</i> (Willie Wagtail)	<i>Pogona barbata</i> (Bearded Dragon)
Order Columbiformes	Family Ploceidae	Family Elapidae
Family Columbidae	<i>Aidemosyne modesta</i> (Plum-headed Finch)	<i>Pseudechis porphyriacus</i> (Red-bellied Black Snake)
<i>Geopelia placida</i> (Peaceful Dove)	Order Pelecaniformes	Family Gekkonidae
Order Coraciiformes	Family Anhingidae	<i>Gehyra dubia</i>
Family Alcedinidae	<i>Anhinga melanogaster</i> (Darter)	<i>Gehyra variegata</i> (Tree Dтеля)
<i>Dacelo novaeguineae</i> (Laughing Kookaburra)	Family Pelecanidae	Family Scincidae
<i>Halcyon sancta</i> (Sacred Kingfisher)	<i>Pelecanus conspicillatus</i> (Australian Pelican)	<i>Cryptoblepharus carnabyi</i>
Order Cuculiformes	Family Phalacrocoracidae	<i>Egernia striolata</i> (Tree Skink)
Family Cuculidae	<i>Phalacrocorax carbo</i> (Great Cormorant)	<i>Morethia boulengeri</i> (Boulenger's Skink)
<i>Cuculus pallidus</i> (Pallid Cuckoo)	<i>Phalacrocorax melanoleucos</i> (Little Pied Cormorant)	<i>Tiliqua scincoides</i> (Eastern Blue-tongued Lizard)
Order Falconiformes	<i>Phalacrocorax varius</i> (Pied Cormorant)	Family Varanidae
Family Accipitridae	Order Psittaciformes	<i>Varanus varius</i> (Lace Monitor)
<i>Circus aeruginosus</i> (Marsh Harrier)	Family Cacatuidae	Order Testudines
<i>Haliastur sphenurus</i> (Whistling Kite)	<i>Cacatua roseicapilla</i> (Galah)	Family Chelidae
Family Falconidae	Family Platycercidae	<i>Chelodina longicollis</i> (Eastern Long-necked Tortoise)
<i>Falco berigora</i> (Brown Falcon)	<i>Barnardius barnardi</i> (Mallee Ringneck)	
<i>Falco cenchroides</i> (Australian Kestrel)	<i>Psephotus haematonotus</i> (Red-rumped Parrot)	
<i>Falco longipennis</i> (Australian Hobby)	<i>Psephotus varius</i> (Mulga Parrot)	
Order Gruiformes	Family Polytelidae	
Family Gruidae	<i>Aprosmictus erythropterus</i> (Red-winged Parrot)	
<i>Grus rubicundus</i> (Brolga)	<i>Nymphicus hollandicus</i> (Cockatiel)	