

Supplementary material

Fossils reveal late Holocene diversity and post-European decline of the terrestrial mammals of the Murray Darling Depression

Diana A. Fusco^{A,C}, Matthew C. McDowell^A, Graham Medlin^B and Gavin J. Prideaux^A

^ASchool of Biological Sciences, Flinders University, Sturt Road, Bedford Park, SA 5042, Australia.

^BMammal Section, South Australian Museum, North Terrace, Adelaide, SA 5000, Australia.

^CCorresponding author. Email: diana.fusco@flinders.edu.au

1.1 Some small mammal collections in South Australia between 1840s and 1850s

There is strong evidence that a number of the mammals identified from the Light's Roost deposit and now extinct in South Australia, were still present during the 1840s and 1850s because they were collected and sent back to the British Museum of Natural History (BMNH) in London and to other collectors in England. Some of the more important collectors in South Australia included John Gould, Captain George Grey and Frederick Strange. (Grey was Governor of South Australia from 1841 to 1845 and sent numerous natural history specimens back to England.)

1.2 John Gould

Gould reached Australia in September 1838, after a four-month sea voyage from England, arriving first at Hobart Town in Tasmania (then Van Diemen's Land) in September 1838. He spent 11 months collecting mainly birds and a few mammals, before moving on to Sydney Town in February 1839. By the time Gould left Sydney in April 1839 he had collected about 800 birds and 70 mammal specimens (Datta and Gould 1997).

Gould spent nearly eight weeks in South Australia from 27 May to 21 July 1839 (Dawes 1991; Datta and Gould 1997). During this period he explored and collected from seven main locations (Dawes 2011), including a trip through the Murray Scrub via modern-day Birdwood and Palmer. He followed gullies draining into Reedy Creek, south of Palmer and followed the creek to modern day Caloote which is only about 12 km north the Mypolonga owl roost site.

Gould recorded killing a western barred bandicoot *Perameles bougainville* (as *P. fasciata*) 'on the ranges bordering the great scrub on the road to the Murray' on July 1, 1839 (Gould 1863). After opening up the stomach to investigate the diet, he roasted the flesh and found it to be 'delicate and excellent food'.

The western quoll *Dasyurus geoffroii* was also procured by Gould in the Murray Scrub by shooting it out of a tree at midday (Gould 1863; Dawes 2011). According to Krefft (1862), this species of native cat was the most 'bloodthirsty of all the marsupial animals inhabiting the Murray scrub, solitary in its habits, strictly nocturnal [*in this statement he was wrong*], and the terror of the feathered tribe, particularly the yellow-crested cockatoo'. While usually nocturnal the western quoll may forage during the day in cold and/or wet weather and during the breeding season from May to September (Serena & Soderquist 2008).

Gould did not observe the yellow-footed antechinus *Antechinus flavipes* (found in the Mypolonga site) on his trip through the scrub to the Murray River, but he did see it closer to Adelaide recording that 'I frequently saw it running over fallen logs by the creek sides of the plains of Adelaide' (Gould 1863).

Although only in South Australia for a short period, Gould collected about 500 birds and 40 mammals to be sent back to England (Datta and Gould 1997).

1.3. Frederick Strange

A letter dated 27 December 1835 places Strange in Sydney where he records that he has sent three cases of specimens to J. E. Gray at the British Museum and ‘many of the things are from South Australia’. In 1838 and 1839 Strange was working with Captain Sturt’s surveying party and probably met Gould during this time (Datta and Gould 1997).

The Natural History Museum in London has eight specimens of the long-eared mouse *Pseudomys auritus* (Thomas 1910) first illustrated by Gould in ‘The Mammals of Australia’ in 1863 as *Hapalotis murinus*, but not recognised then, as a separate species from the plains mouse *P. australis*. Both Governor George Grey and Frederick Strange collected specimens of *P. auritus* from the region of Lake Albert between 1843 and 1853, and Gould writes in reference to Strange that: ‘He states that he found them in families on the edge of the small salt-water lagoons of the plains and that they did not appear to go far from their habitation (Gould 1863: a male and a female are figured on p. 15). Originally described as a new species, *P. auritus* in 1910 by Oldfield Thomas (Thomas 1910: 607), it was absorbed by Mahoney in 1988 into the *P. australis* group, before being resurrected by Medlin in 2008 (Medlin 2008). Remains of *P. auritus* were more common than any other species in the Light’s Roost deposit.

Between 1843 and 1845 four specimens were donated to the BMNH by Governor George Grey, but the locations within South Australia, are not recorded. The fifth specimen was registered as BMNH 46.4.4.67 from Lake Albert in 1846 and purchased from John Gould, but without the name of the original collector. A letter from Frederick Strange to Gould on 20 Aug 1845 (Datta and Gould 1997) refers to ‘Strange’s expense at Lake Albert’ and suggests that Strange may have been the collector of this specimen. The sixth specimen was donated by Lord Derby and registered as BMNH 46.8.26.16 but without the name of the collector or the locality. The remaining two specimens were collected at Lake Albert in 1853 by Frederick Strange (or one of his collectors in South Australia) and purchased from John Gould. They are registered as BMNH 53.10.22.5 and BMNH 53.10.22.6 (designated as the type by Thomas in 1910). Strange continued to send specimens to Gould until 1854 when he was killed by Aborigines in Queensland.

Table S1. Non-volant terrestrial mammal fauna present in assemblage at Light's Roost, Mypolonga, South Australia

The data show the number of identified specimens (NISP) and relative abundances (Ri %) and maximum adult bodyweight in grams (g)

Genus / Species	NISP	Ri %	Max adult bodyweight (g)
DASYURIDAE			
<i>Dasyercus blythi/cristicauda</i>	14	0.89	185
<i>Dasyurus geoffroii</i>	2	0.13	2186
<i>Antechinus flavipes</i>	35	2.22	79
<i>Antechinus</i> sp. 1.	10	0.63	
<i>Antechinomys laniger</i>	6	0.38	30
<i>Sminthopsis crassicaudata</i>	66	4.19	20
<i>Sminthopsis murina</i>	63	3.99	28
<i>Sminthopsis</i> sp. indet.	9	-	
PERAMELIDAE			
<i>Isoodon</i> sp.	1	0.06	890
<i>Perameles bougainville</i>	71	4.50	379
Peramelidae sp. indet.	3	-	
BURRAMYIDAE			
<i>Cercartetus concinnus</i>	3	0.19	21
MURIDAE			
<i>Notomys mitchellii</i>	175	11.10	60
<i>Pseudomys apodemoides</i>	15	0.95	22
<i>Pseudomys auritus</i>	333	21.12	100
<i>Pseudomys gouldii</i>	67	4.25	50
<i>Pseudomys shortridgei</i>	40	2.54	90
<i>Pseudomys</i> sp. indet.	45	-	
<i>Notomys/Pseudomys</i> sp. indet.	204	-	100
<i>Hydromys chrysogaster</i>	3	0.19	1275
<i>Rattus fuscipes</i>	175	11.10	225
<i>Rattus lutreolus</i>	216	13.70	200

<i>Rattus</i> sp. indet.	21	-
TOTAL NISP	1577	

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