

III MAMMALS OF BUNTINE AND NUGADONG RESERVE

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INTRODUCTION AND METHODS OF SURVEY

The mammal survey of Nugadong (NR), East Nugadong (ENR), Nugadong Forestry (NFR), and Buntine (BUR) reserves is part of an integrated survey of the mammals of the Western Australian wheatbelt involving 25 reserves (Kitchener 1976). Mammal surveys of 10 of these reserves have previously been published by us in earlier parts of this publication series. At conclusion of these separate reports information on each species and the relationships between the mammal assemblages and the size of reserves and their habitat variety will be reported upon. Because of this no attempt is made in these reports to record detailed measurements and summary observations on individual species.

Prior to our surveys there was no information available on the mammals of these reserves. Our surveys were conducted during the following dates: 27 August—6 September 1972, 17-25 May 1973 for BUR; 9-22 June 1975, 27 April—4 May 1976; 15-21 November 1976 for the three Nugadong Reserves. The annotated list below includes mammals sighted, and those collected and lodged in the Western Australian Museum. Registration number of those collected are as follows: M9509-43 (spring 1972), M10267-87 and M18503 (autumn 1973), M13428-59, M13629-97 and M15990-2 (winter 1975), M14549-56 (autumn 1976) and M15993-M16000 (spring 1976).

The types of traps, the manner of positioning small mammal traps as standard traplines, and the bait used are described in Kitchener and Chapman (1976). Sites where traplines were deployed are shown in Figs 3-6 in Muir (this publication). The trapping effort is detailed in Appendix 1. Weight was recorded for all specimens, and body measurements recorded for those specimens made into study skins. All females were dissected and their reproductive organs examined *in situ*. Stomach contents were identified where possible. The numbers of animals captured at each trapline are indicated in brackets in the annotated list.

Detailed descriptions of vegetation, soil and litter at each trapline are presented in Muir (this report). These data are summarised in Appendix 2.

ANNOTATED LIST

Western Grey Kangaroo (*Macropus fuliginosus*)

NR: In April 1976 a skull was collected from the southern boundary. In June 1975 several separate sightings of individuals.

- ENR:** In June 1975 several separate sightings of a group of 3 on the northern edge of the Reserve and several sightings on the road between ENR and NR. In November 1976 an adult male and female were seen in loc. 4.15.
- NFR:** In June 1975, 1 skull was collected on the northern edge of the reserve.
- BUR:** In September 1972 only their sign was recorded. In May 1973, 3 adults and a juvenile were sighted near Buntine Rock.

Euro (*Macropus robustus*)

- ENR:** A male and a female with a pouch young weighing 14 gm were found shot on the western boundary in May 1976.
- NFR:** A skull was collected on the southern boundary in June 1975 and one individual was sighted along the southern boundary.
- BUR:** A skull was collected near trapline 11 in May 1976.

Common Dunnart (*Sminthopsis murina*)

- NR:** A male was collected in June 1975 at trapline 23.
- ENR:** A male was collected in June 1975 at trapline 7.
- NFR:** A damaged, unsexed, specimen was collected in June 1975 at trapline 21.
- BUR:** A male and 2 females were collected in May 1973 at traplines 1(1), 4(1), and from a small Breakback trap placed singly in loc. 2.12(1).

Five of these 6 specimens were caught in shrubland, usually a mixed shrub assemblage with canopy cover ranging from very sparse to dense, and on sandy loam or sandy clay loam. The other specimen was captured in an Open Tree Mallee of *Eucalyptus loxophleba* over mixed Open Scrub on sandy clay.

Both females collected in May 1973 (11 and 16 gms) had poorly developed pouch areas and tiny teats, and were not pregnant.

White-tailed Dunnart (*Sminthopsis granulipes*)

- ENR:** An adult female was collected in June 1975 and another in May 1976 at trapline 6. Three juvenile females and 1 juvenile male were collected in November 1976 at traplines 4(1) and 6(4-1 released).

Six of the 7 captures were from trapline 6 which was in an unstratified and sparse shrub assemblage 0.5m high. The other specimen was from a Thicket of mixed shrubs with *Casuarina campestris* prominent. These captures support the statements in Kitchener *et al.* (1977) and Chapman *et. al* (1978) that this species appears to favour vegetation with low to medium height shrubs.

Neither adult female collected in May or June (weights 17.0 and 15.5 gms respectively) was pregnant or showed marked pouch development. The capture of 4 subadults in November weighing 6.0 and 9.0 gms, combined with the observation that females in Bending and Dongolocking Reserves in September and early October appeared to be nursing or to have recently weaned young (Kitchener & Chapman 1977, 1978), indicates that young emerge from the pouch in late winter or very early spring.

Mitchell's Hopping Mouse (*Notomys mitchellii*)

- NR:** June 1975: Three females were collected at traplines 11(1) and 23(2).
April/May 1976: A male was collected at trapline 11.
November 1976: A female was collected at trapline 23.
- ENR:** June 1975: Three females, 16 males and 1 damaged, unsexed animal, were collected at traplines 1(4), 2(4), 3(5), 4(2), 5(1), 7(2), and 9(2).
April/May 1976: One female and 1 male were collected at trapline 3(1) and 4(1).
November 1976: Two females and 2 males were collected at traplines 3(1), 4(1) and 7(2).
- NFR:** June 1975: One female and 5 males were collected at traplines 13(2), 20(1) and 21(3).
- BUR:** August/September 1972: Ten females and 4 males were collected at traplines 3(2- released), 4(5-3 released), 7(5-2 released), 8(1- released) and 10(1- released). Also 2 adult males (weights 32.6 and 38.1 gm) were dug from separate burrows in loc. 3.23 and released. Two subadult males and 2 partially furred juveniles were dug from a single burrow system in loc. 3.42; these were retained as specimens.
- May 1973: Eleven females and 5 males were collected at traplines 3(2), 4(1), 5(4), 7(5) and 3 animals from a "miscellaneous" trapline of small breakback traps in mallee at loc. 2.10 and 1 from a pit trap in sedge near trapline 8.

When populations of *Notomys* were large, as they appeared to be at **BUR** during both surveys and at **ENR** in June 1975, they were widespread but with a preference for shrubland and heath on clayey loam soil; they were less frequently collected in mallee and not at all in woodland. When populations were low, as they appeared to be in **NR** and **NFR** on all surveys, and in **ENR** in spring and autumn, they appear to prefer shrubland with a preference for Thicket.

Three burrows, two of which were occupied, were excavated and mapped. The extent and depth of these burrows appears to be influenced by soil characteristics. In soft sand near trapline 7, where the soil was of uniform profile to at least one metre,

an extensive and deep burrow system was excavated. This system had a maximum horizontal dimension of 10 m and a depth of *ca* 60 cm (**Fig. 7a**); one of its several chambers contained a nest of shredded fibrous plant material and two lightly furred juveniles. These juveniles had total body lengths of 59.5 and 65.7 mm and weighed 3.4 and 4.0 gms respectively. In loc. 4.13, where the soil was shallow and had *ca* 20% laterite pebbles, two burrows were excavated; these were shallower and less extensive with a chamber containing a nest similar to the one above (**Fig. 7b**). The other excavated *Notomys* burrow contained a Gwardar (*Demansia nuchalis*).

The autumn surveys of **BUR** (May 1973), **NR** and **ENR** (April/May 1976) collected 12 adult females and 7 adult males. These had a mean weight of 38.8 (31.0-42.0) gms. The June 1975 surveys of **NR**, **ENR** and **NFR** collected 4 adult females and 22 adult males. These had a mean weight of 39.7 (35.0-47.5) gms. The late winter/spring surveys of **BUR** (August/September 1972), **NR** and **ENR** (November 1976) collected 9 adult females and 10 adult males. Excluding pregnant females, these had a mean weight of 38.7 (33.6-44.0) gms. The similarity in the mean weights of adult *Notomys* collected in autumn, winter, and spring, suggest that no pronounced changes in general body condition occur throughout the year. On 30 August 1972, 3 pregnant females and a recently parturient female (with 3 implantation scars, enlarged mammarys and teats) were collected at **BUR**. On 19 November 1976, 1 pregnant female with 3 fetuses (crown to rump lengths *ca* 18.2 mm) was collected at **ENR** and 2 recently parturient females, both with 3 implantation scars and developed mammae, at **ENR**. Combined, these observations suggest that the period of births on these Reserves extends at least from August to December but with little female reproductive activity from autumn through to mid-winter.

Stomachs of the **BUR** specimens contained masticated seeds; some also had insects and small quantities of sand and fur—probably ingested incidentally.

Ashy Grey Mouse (*Pseudomys albocinereus*)

ENR: An adult female collected on 3 May 1976 from trapline 6; it was neither pregnant nor lactating when collected but had uterine implantation scars. This was from a 9 year old fire regeneration vegetation of Dwarf Scrub D on sandy loam.

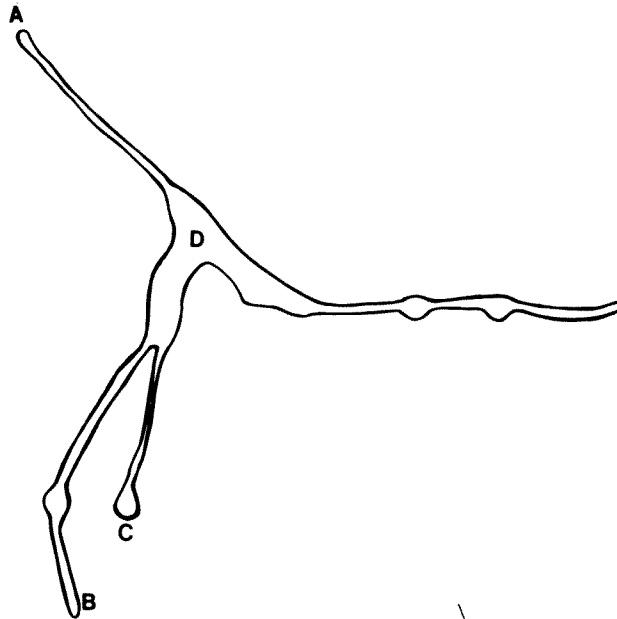
Lesser Long-eared Bat (*Nyctophilus geoffroyi*)

NR: An adult female mist-netted in June 1975 at dusk on the side of a dam. This female showed no indication of reproductive activity.

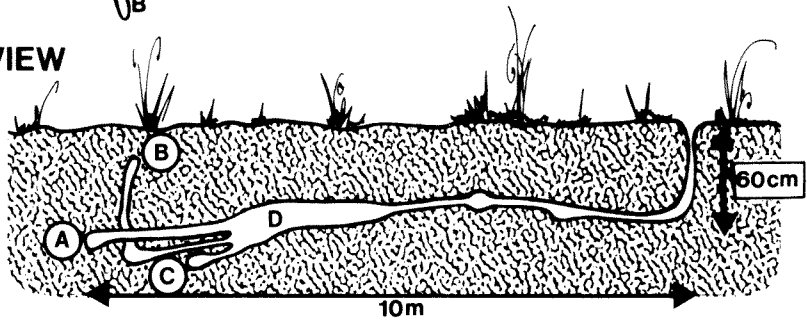
Gould's Wattled Bat (*Chalinolobus gouldii*)

BUR: Two males collected September 1972: one from a dead eucalypt tree in an

1) TOP VIEW



2) SIDE VIEW



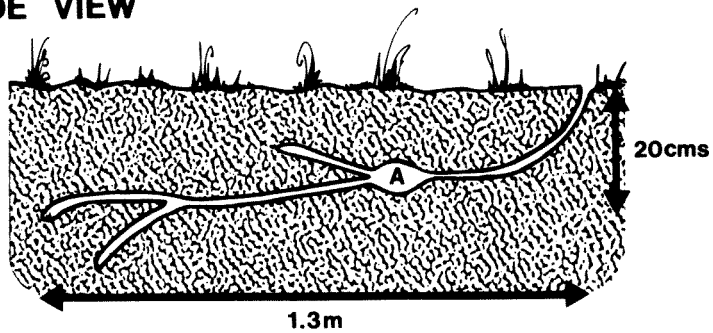
- A) Blind ending horizontal shaft
- B) Blind ending vertical shaft
- C) Nest chamber with juveniles
- D) Central chamber

Fig. 7a: Burrow system of *Notomys mitchellii* in deep sandy clay loam soils.

1) TOP VIEW



2) SIDE VIEW



A) Unoccupied nest chamber

Fig. 7b: Burrow system of *Notomys mitchellii* in shallow fine sandy loam soils with laterite pebbles throughout.

open forest *ca* 6 m from the ground; the other shot in flight at 2200 hours. Stomach contents were mainly microlepidopterans.

Little Broad-nosed Bat (*Nycticeius greyi*)

NR: An adult female (M18501) shot over woodland at dusk by S.A. Halse in November 1977.

White Striped Mastiff Bat (*Tadarida australis*)

BUR: Two males were collected in September 1973 from a hollow in a dead Salmon Gum (*Eucalyptus salmonophloia*) *ca* 7 m above the ground. A female was similarly collected from an adjacent tree.

Echidna (*Tachyglossus aculeatus*)

NR: One seen in loc. 1.1 in June 1975 and May 1976

ENR: Scratchings and scats at traplines 2, 5, 7 and loc. 2.10.

NFR: Scats seen in loc. 2.4.

BUR: Scratchings and scats at traplines 1, 2, 3, 4, and 6.

House Mouse (*Mus musculus*)

NR: In June 1975, seventeen were collected at traplines 10(5), 11(5), 12(2), 22(1), and 24(4).

In April/May 1976, eight were collected at traplines 11(4), 12(2), and 24(2). In November 1976, one was collected at trapline 23.

ENR: In June 1975, twenty-five were collected at traplines 1(6), 2(1), 3(3), 4(4), 5(2), 6(2), 7(6), and 8(1).

In April/May 1976, seven were collected at traplines 2(1), 3(2), 4(2), and 9(2).

NFR: In June 1975, twenty-five were collected at traplines 13(2), 14(4), 15(2), 16(2), 17(6), 19(2), 20(3), and 21(4).

BUR: In August/September 1972, twenty-two were collected at traplines 1(7), 2(6), 5(1), 6(7-2 escaped), and 7 (2) and 2 from miscellaneous small Breakback traps in loc. 2.12.

In May 1973, two were collected at trapline 1.

Fox (*Vulpes vulpes*)

NR: One was seen in November 1976 at trapline 23, and one in loc. 3.14. A skull was collected on the northern boundary.

ENR: One was seen at locs. 4.15 and 3.3 in November 1976.

BUR: Abandoned lairs were found in gravel pits in loc. 4.16.

Domestic Cat (*Felis catus*)

ENR: One seen at night on 28 April 1976 at loc. 3.7.

NFR: One seen entering northern boundary in June 1975.

BUR: One seen in May 1973 in loc. 4.16 (burnt area) near abandoned fox lairs in gravel pit.

European Rabbit (*Oryctolagus cuniculus*)

ENR: Several sightings in June 1976.

NR: One seen in April 1976 at trapline 10 and 12.

BUR: Two seen in September 1972 along southern boundary.

DISCUSSION

Combined, the surveys of Buntine, Nugadong, East Nugadong, and Nugadong Forest Reserve recorded 11 native and 4 introduced species of mammals.

Five of these species of mammals were recorded on the Nugadong reserves but not from the larger Buntine Reserve. These were *Macropus robustus* (**NR, ENR, NFR**), *Sminthopsis granulipes* (**ENR**), *Pseudomys albocinereus* (**ENR**), *Nyctophilus geoffroyi* (**NR**) and *Nycticeius greyi* (**NR**); no obvious explanation suggests itself for their apparent absence from Buntine Reserve, although perhaps the drought in the year of the survey of **BUR** was a factor.

Apart from **ENR**, the number of mammal species on these four reserves was less than we expected from our surveys of other wheatbelt reserves. No doubt the absence of large areas of mallee or woodland contributed to the paucity of mammals, particularly the arboreal species such as the Brush-tailed Possum (*Trichosurus vulpecula*), and Red-tailed Wambenger (*Phascogale calura*).

With the exception of Little Broad-nosed Bat (*Nycticeius greyi*) which is recorded from only one other locality in the wheatbelt (Wongan Hills), the other species have a wide, but mostly patchy distribution in the region.

APPENDIX 1

Number of trapnights for each trapline at Buntine Reserve in (a) August 1972 and (b) May 1973 and at Nugadong, East Nugadong and Nugadong Forest reserves in (c) June 1975, (d) April/May 1976 and (e) November 1976

(B = Breakback, E = Elliott, C = cage, and P = pit traps). A trapnight is one trap set for 24 hours.

Number of Trapnights

	Trapline No.	BB		E		C		P	
		(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
		Buntine Nature/Water Reserve	1	90	70	18	70	18	14
	2	90	60	18	60	18	12	0	0
	3	90	70	0	70	0	14	0	0
	4	80	70	8	70	8	14	0	0
	5	90	70	18	70	18	14	0	0
	6	90	70	0	70	0	24	0	0
	7	90	70	18	70	18	14	0	0
	8	0	0	0	0	0	0	15	0
	9	0	0	0	0	0	0	105	0
	10	0	0	0	0	0	0	30	0
	11	48	160	18	36	18	0	0	36

Number of Trapnights

Reserve	Trapline No.	BB			E			C			P		
		(c)	(d)	(e)	(c)	(d)	(e)	(c)	(d)	(e)	(c)	(d)	(e)
East Nugadong N.R.	1	60	60	50	60	60	50	10	12	10	12	0	0
	2	60	60	50	60	60	50	10	12	10	24	18	10
	3	60	60	50	60	60	50	10	12	10	18	12	10
	4	60	60	50	60	60	50	10	12	10	18	18	10
	5	60	60	50	60	60	50	10	12	10	24	0	10
	6	60	60	50	60	60	50	10	12	10	24	18	10
	7	50	60	50	50	60	50	10	12	10	0	0	10
	8	50	60	50	50	60	50	10	12	10	0	0	0
	9	50	60	50	50	60	50	10	12	10	10	0	0
Nugadong N.R.	10	50	60	50	50	60	50	10	12	10	0	0	0
	11	50	60	50	50	60	50	10	12	10	0	12	10
	12	50	60	50	50	60	50	10	12	10	0	0	0
	22	50	50	50	50	50	50	15	10	10	0	0	0
	23	25	50	50	50	50	50	0	10	10	0	0	0
24	0	50	0	75	50	0	0	10	0	0	0	0	0
Nungadong Forest Reserve	13	50	0	0	50	0	0	10	0	0	20	0	0
	14	50	0	0	50	0	0	10	0	0	5	0	0
	15	50	0	0	50	0	0	10	0	0	0	0	0
	16	50	0	0	50	0	0	10	0	0	0	0	0
	17	50	0	0	50	0	0	10	0	0	15	0	0
	18	50	0	0	50	0	0	0	0	0	0	0	0
	19	50	0	0	50	0	0	0	0	0	10	0	0
	20	50	0	0	50	0	0	0	0	0	0	0	0
21	50	0	0	50	0	0	10	0	0	20	0	0	

APPENDIX 2

Codified vegetation and soil descriptions and leaf litter density, and vegetation location numbers for each trapline at Buntine Nature/Water, Nugadong Nature, East Nugadong Nature, and Nugadong Forest Reserve (see Muir, this report for details).

Reserve	Trapline No.	Vegetation Loc. No.	Vegetation and Soil Code	Leaf Litter
Buntine Nature/Water Reserve	1	5.2	lithic complex	sparse
	2	1.2	eLAI.aLAr.xSCr/SC	abundant, clumped
	3	2.9	eKSr.xSi.nVLC.nJr/CL	sparse, clumped
	4	3.23	xSr.nVLI/SCL	mod. abundant, clumped
	5	3.35	mSc/SCL	mod. abundant
	6	1.5	eLAr.aSCr/LC	moderate
	7	3.42	cSr.xSBc.xSDr/SCL	sparse-mod. abundant, clumped
	8	4.3	mSBI.nVLI/SCL	sparse
	9	3.23	xSr.nVLI/SCL	mod. abundant, clumped
	10	3.40	xSr.xSBI.xSDi/SCL	sparse, clumped
	11	4.12	mSBI.xSDr/SCL	sparse, clumped
East Nugadong N.R.	1	3.19	scrub/heath mosaic	variable
	2	2.7	eKSr.xSCi/SCL	mod. abundant, clumped
	3	4.11	eSBI.xSDc/K-CL	sparse—absent
	4	3.12	xSc.xSDr/FSL	sparse-mod. abundant, clumped
	5	2.2	eKTr/SCL	sparse
	6	4.1	xSDi/SL	sparse—absent
	7	3.3	xSr.xSBr.xSDr/LSCL	abundant
	8	2.10	eKSr.mSi/SCL	abundant
	9	3.18	aSd.nSDr/SCL	mod. abundant, clumped
Nugadong N.R.	10	1.3	eLAr.xSr/LMC	mod. abundant, clumped
	11	4.2	xSDi/LSCL	sparse
	12	3.3	aSc.xSDr/SCL	mod. abundant
	22	2.6	eKSr/FSL	mod. abundant, clumped
	23	3.11	xSd/FSL	abundant
	24	3.9	aSr.nVLC/FSL	sparse, clumped
Nugadong Forest Reserve	13	3.1	aSd.nSCi/CL	abundant
	14	5.1	lithic complex	sparse
	15	2.2	ecotone	abundant, clumped
	16	3.2	xSr.xSc/CL	mod. abundant
	17	1.8	eLAI.xSBI/SCL	abundant, clumped
	18	1.8	eLAI.xSBI/SCL	abundant, clumped
	19	3.12	mSc/FSL	moderate, clumped
	20	3.11	mosaic	variable
	21	3.10	mSd/SCL	moderate, clumped