

**THE WILDLIFE OF SOME EXISTING AND
PROPOSED NATURE RESERVES IN THE
GIBSON, LITTLE SANDY AND
GREAT VICTORIA DESERTS,
Western Australia**

EDITED BY

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THE WILDLIFE OF SOME EXISTING AND PROPOSED NATURE RESERVES IN THE GIBSON, LITTLE SANDY AND GREAT VICTORIA DESERTS, WESTERN AUSTRALIA

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ABSTRACT

The Gibson Desert Nature Reserve and three proposed nature reserves (Lake Disappointment, Carnarvon Range and Yeo Lake Areas) were examined during November and December 1975 and March 1976. Mammals and reptiles were collected and observations made on birds. The environment of each area is described.

Sixteen species of native and four species of introduced mammals were recorded. The known range of *Ningauai ridei* was greatly extended. A number of medium sized mammals which were present in these deserts in the past have apparently disappeared.

One hundred and one species of birds have been recorded from the four areas—46 at Lake Disappointment, 58 at the Gibson Desert Nature Reserve, 66 at Carnarvon Range and 75 at Yeo Lake. Many species are highly nomadic and further trips would add to the lists.

Two species of frog and 58 species of reptile are known from the four areas. The number from each area is: 22 from Lake Disappointment Area, 18 from Gibson Desert Nature Reserve, 30 from Carnarvon Range Area and 40 from Yeo Lake Area. A further 7 species have been collected just outside the Yeo Lake Area. The last area has been more intensively collected than the other sites.

The system of desert conservation reserves proposed by the Conservation Through Reserves Committee in 1974 appears to include the major plant formations of the region and habitats of nearly all vertebrate animals although more work is needed to clarify the situation with respect to a number of mammal species.

PART I

BACKGROUND

by N. L. McKENZIE¹

BACKGROUND

During 1975 and 1976 the Western Australian Wildlife Research Centre organized three wildlife surveys into the desert regions of W.A. Their aim was to collect additional information on the vertebrate fauna of a series of desert conservation reserves proposed by the Conservation Through Reserves Committee (1974). The desert reserves proposed by the Committee were delineated from vegetational, geological and soils data. Knowledge of the fauna of each nature reserve and proposed reserve within the proposed series was inadequate, being derived from a few isolated collections or from an extrapolation of distributional data based on a knowledge of the habitat preferences of individual species.

The results of the first of these surveys have already been published (Burbidge *et al.* 1976); the results of the two subsequent surveys are reported here. The second survey lasted from 18 November to 4 December 1975 and involved five people and two four-wheel drive vehicles. Personnel were: A. A. Burbidge, N. L. McKenzie, W. K. Youngson and R. F. Dear from the Department of Fisheries and Wildlife, C. P. S. de Rebeira from the C.S.I.R.O. Division of Wildlife Research and P. J. Roberts from the National Parks

Board of Western Australia. The third survey again involved two four-wheel drive vehicles. Personnel were: N. L. McKenzie and W. K. Youngson from the Department of Fisheries and Wildlife, A. Chapman, R. E. Johnstone and L. A. Smith from the Western Australian Museum and C. P. S. de Rebeira from the C.S.I.R.O. Division of Wildlife Research.

Four areas were visited (Fig. 1):

1. Carnarvon Range Area—20 to 24 November 1975, 28 to 31 March 1976.
2. Lake Disappointment Area—26 November to 1 December 1975.
3. Yeo Lake Area—18 to 21 March 1976.
4. Gibson Desert Nature Reserve—23 to 27 March 1976.

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- Conservation Through Reserves Committee (1974). "Conservation Reserves in Western Australia. Report of the Conservation Through Reserves Committee to the Environmental Protection Authority". Cyclostyled.

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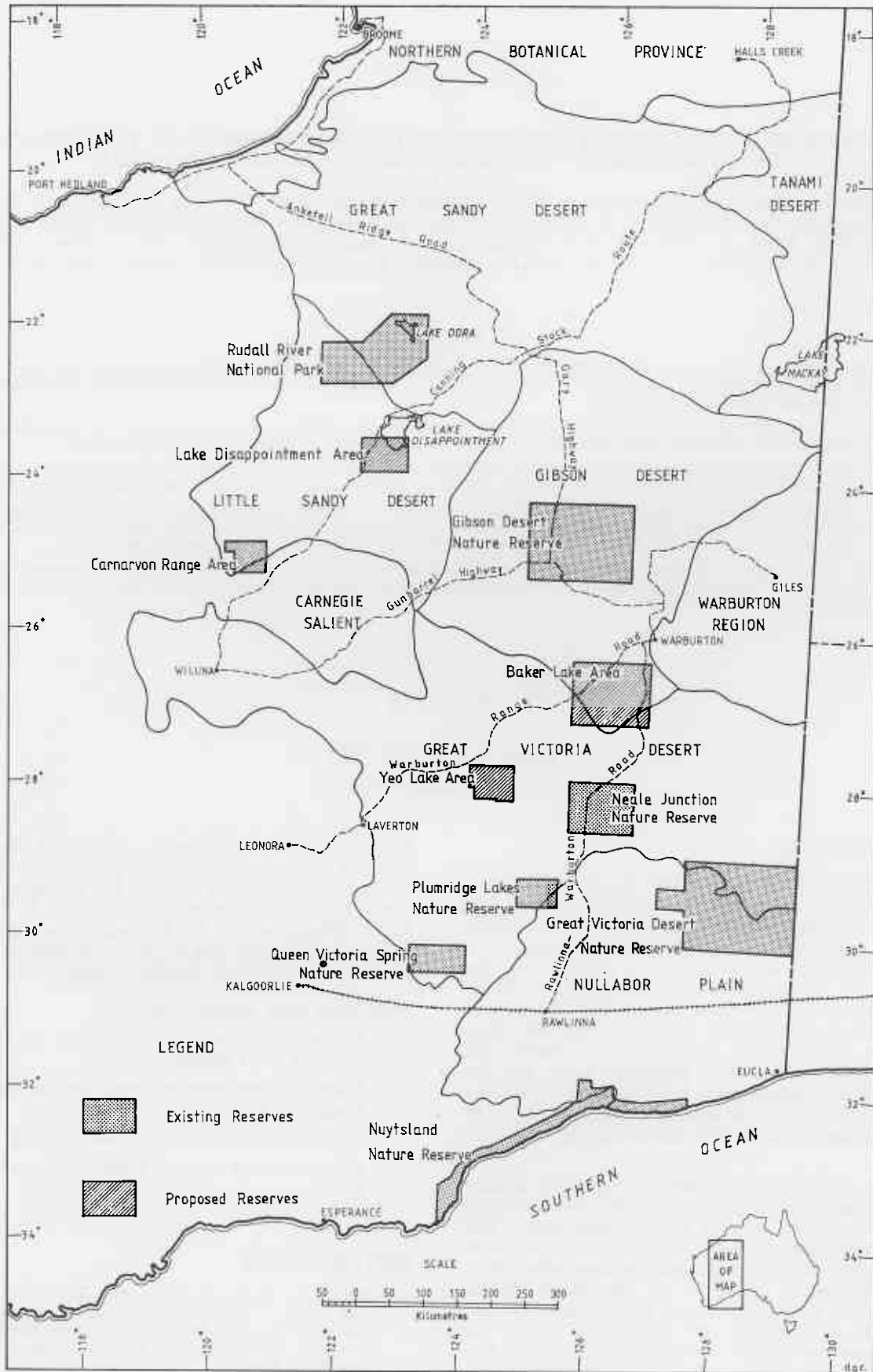


Figure 1—Existing and proposed conservation reserves in Western Australian deserts. Adapted from the Report by the Conservation Through Reserves Committee (1974) Nomenclature of deserts after Beard (1969).

PART II

ENVIRONMENT

by A. A. BURBIDGE¹ and N. L. MCKENZIE¹

INTRODUCTION

The deserts of Western Australia have been described and delineated by Beard (1969). Their geology has been described by the Geological Survey of Western Australia (1975). The Carnarvon Range and the Lake Disappointment Areas lie within the Bangemall Basin, a Precambrian sedimentary basin of the Western Shield. The eastern portion of this basin approximately corresponds to Beard's (1969) "Little Sandy Desert". The Yeo Lake Area and the Gibson Desert Nature Reserve lie within the Officer Basin, a Phanerozoic sedimentary basin (of Permian or Mesozoic marine and continental rocks) included in Beard's "Great Victoria" and "Gibson" deserts.

Soils have been mapped at 1:2 000 000 by Northcote *et al.* (1968). Beard (1974a, 1974b, 1976) has mapped the vegetation at 1:1 000 000. The climate of the region has been described by Beard (*loc. cit.*) and Jackson (1976).

Prior to the work reported here the deserts received unusually high rainfall. Table 1 shows the mean and median rainfall for Warburton, Giles and Glenayle as well as monthly figures from January 1973 to March 1976.

General descriptions of the areas we worked in can be found in the above publications and in Conservation Through Reserves Committee (CTRC) (1974). The detailed descriptions provided below are intended to amplify these data and to provide habitat information for the animal specimens we collected.

Descriptions of vegetation formations use the terminology of Specht (1970) although we describe each layer of vegetation, not only the upper stratum. Each formation is given a number to facilitate cross reference in later papers in this publication.

CARNARVON RANGE AREA

This proposed nature reserve lies on the boundary of the Carnegie Salient and the Little Sandy Desert (terminology of Beard 1969). Mulga (*Acacia aneura* F. Muell. ex Benth.) formations typical of the former are restricted mainly to the southern edge of the Area, the remainder, except for the Range itself, being predominantly sandplain and sand dune country supporting spinifex formations typical of the Little Sandy Desert.

The Area was proposed as a nature reserve by CTCRC (1974). The proposal was supported by the Environmental Protection Authority in 1975 and endorsed by Cabinet in 1976. The boundaries of the Area are: "from the north-east boundary corner of Marymia pastoral lease (approximately 24°52'S, 120°18'E) east to 120°52'E, south to 25°19'S, west to the boundary of Neds Creek pastoral lease (approximately 120°28'E), then north along the east boundary of Neds Creek pastoral lease to its north boundary, then west to approximately 120°18'E, then north to the starting point" (CTRC 1974). It has an area of *ca* 258 000 ha.

The Carnarvon Range (Colour Plate 2) consists of cross bedded sandstones, thought to be of Middle to Upper Proterozoic age. The sandstones form low, gently undulating hills with occasional steep cliffs and gullies containing a few semi-permanent pools.

Beard (1974a, 1974b) mapped the vegetation of the proposed Nature Reserve into six categories (Table 2).

Our campsite was at the mouth of a gully on the southern side of the Carnarvon Range, *ca* 2 km at 110° from Trig M6 (25°17'S, 120°41'E).

Habitats we collected in are as follows:

- 1.1 The vegetation of the range is a tall open-shrubland to tall shrubland of *Acacia aneura* F. Muell. ex Benth. var. *latifolia* J. M. Black to 4-5 m with *Grevillea* sp. (unnamed) and *Hakea* sp. (Figure 1; Colour Plate 1). Below the shrubs are scattered areas of hummock grassland (*Triodia basedowii* and *Plectrachne melvillei*) of up to 50 per cent projective foliage cover. There are scattered emergent *Eucalyptus camaldulensis* Dehn. and *Callitris columellaris* F. Muell. Many areas of bare rock are present.



Figure 1—Tall open-shrublands of mulga and *Grevillea* on top of the Carnarvon Range (1.1). The tree is *Eucalyptus camaldulensis*.

- 1.2 In the gullies which contain pools and ephemeral streams, *Eucalyptus microtheca* F. Muell. (Coolabah) to 15 m forms fringing formations (Figure 2) although *Callitris columellaris* is also common and *Ficus platypoda* A. Cunn. is present, especially on steep areas. Other species noted in the gullies include *Eucalyptus setosa* Schau., *Pittosporum phillyraeoides* DC. and *Melaleuca nervosa* (Lindl.) Cheel.
- 1.3 Against the base of the southern side of the range are screes and gibbers with a tall shrubland to low woodland of mulga (*Acacia aneura*) and Gidgee (*A. pruinocarpa* Tindale) or, sometimes, low open-woodlands of *Eucalyptus setosa* Schau. over low shrubs, including *Eremophila* sp. and *Cassia sturtii* R.Br., with hummock and tussock grasses (*Triodia* sp. and *Eragrostis eriopoda* Benth.). Figure 3; Colour Plate 1).

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Figure 2—A fringing formation of *Eucalyptus microtheca* along a gully in the Carnarvon Range (1.2). Note the tall open-shrubland of mulga on the slopes.



Figure 3—Low woodland of mulga and Gidgee immediately south of the Carnarvon Range (1.3).

To the south of the range are extensive red sandplains with occasional low dunes.

- 1.4 A low open-woodland of Corkwood (*Hakea lorea* R.Br.) and scattered *Acacia* spp. over a hummock grassland of *Triodia basedowii* covers the plains (Figure 4).
- 1.5 Where the sandplains approach the range the soil is firmer and a low open-mallee-woodland over mulga and spinifex occurs (Figure 5).
- 1.6 The dunes have a low open-woodland of *Eucalyptus* sp. (an unnamed bloodwood) with a scattered shrub layer of *Acacia* sp. and *Thryptomene maisonneuvii* F. Muell. over a hummock grassland (*Triodia* sp.) (Colour Plate 2). The desert black-boy *Xanthorrhoea thorntoni* Tate occurs in patches on the plains and on some low dunes.
- 1.7 South of Mt Methwin is another area of red sandplains and low dunes. In this region the vegetation is predominantly an open-heath to low shrubland of *Thryptomene maisonneuvii* over *Triodia* sp.

LAKE DISAPPOINTMENT AREA

The proposed Lake Disappointment Nature Reserve lies in the Little Sandy Desert. The first recommendation for a reserve in this region was made in 1962 by the Western Australian Sub-Committee of the Australian Academy of Science Committee on National



Figure 4—*Triodia basedowii* hummock grassland on red sandplains in the Carnarvon Range Area. The emergent tree is *Hakea lorea* (1.4).



Figure 5—Low open-woodland of mallee and mulga over spinifex near the Carnarvon Range (1.5).

Parks (Anon. 1965). Their recommendation, which was for a large reserve encompassing the whole of the Lake and extending westward to the No. 1 Rabbit Proof Fence, did not receive official approval.

The Area under discussion here was proposed as a nature reserve by CTCRC (1974). It lies within 23°31'–24°00'S and 123°00'–124°00'E. Its area is ca 367 000 ha. The proposal was supported by the Environmental Protection Authority in 1975 and was endorsed by Cabinet in 1976.

Much of the proposed reserve consists of red sand dunes with spinifex formations but it also includes part of the saline and usually dry Lake Disappointment and the Durba Hills, a flat topped, steep sided range of Middle Proterozoic sandstones heavily incised with water eroded valleys.

Beard (1974a) has mapped the vegetation of the proposed reserve into three categories (Table 3). Habitats we collected in are as follows:

- 2.1 On top of the range is a low open-woodland of *Eucalyptus* ? *setosa* Schau. with a scattered shrub layer of *Thryptomene maisonneuvii* F. Muell. and *Acacia* spp. The sparse ground cover (less than 10 per cent projective foliage cover) is of *Triodia* and *Plectrachne*. There are extensive areas of bare rock (Colour Plate 3).
- 2.2 The massive screes on the steep sides of the range (Figure 6) support occasional *Eucalyptus* ? *setosa* Schau. up to 10 m and patches of *Ficus platypoda* A. Cunn. to 3 m over sparse *Plectrachne* and *Ptilotus obovatus* (Gaud.) F. Muell. (10 to 20 per cent) to 1 m.



Figure 6—Sparse vegetation on the massive scree slopes of the Durba Hills (2.2).

- 2.3 In the water eroded valleys are pools and ephemeral streams with fringing formations of *Eucalyptus camaldulensis* Dehn., and shrubs such as *Grevillea wickhamii* Meisn., *Eremophila* ? *latrobei* F. Muell. and *Ptilotus obovatus* (Gaud.) F. Muell. (Figure 7). *Ficus platypoda* A. Cunn. occurs on screes. Durba Springs are situated near the mouth of a major valley (Colour Plate 5).
- 2.4 The campsite was adjacent to the springs in an area of *E. camaldulensis* woodland with a ground cover of couch grass (? *Cynodon dactylon* L.) (Figure 8). Around the springs are stands of *Cyperus vaginatus* R.Br. Killagurra Rock Hole, in a narrow section of another such valley, is surrounded by a small area of *E. camaldulensis* woodland over *Cyperus*.

To the north of the range are extensive red sand dunes with sandplains between.

- 2.5 The dunes are covered with a low open-woodland of *Eucalyptus* sp. (un-named, same species as at the Carnarvon Range) with shrubs to 3 m including *Grevillea stenobotrya* F. Muell., *Acacia dictyophleba* F. Muell., *Eremophila longifolia* F. Muell. and a scattered groundcover of *Triodia* and *Plectrachne*.



Figure 7—Water eroded valley in the Durba Hills. Scattered trees and shrubs include *Eucalyptus camaldulensis*, *E.* ? *setosa*, *Grevillea wickhamii* and *Ptilotus obovatus* (2.3).



Figure 8—*Eucalyptus camaldulensis* woodland over couch grass (? *Cynodon dactylon*) near the Durba Springs (2.4).

- 2.6 A low open-shrubland covers the inter-dune plains with *Acacia* sp., *Grevillea* "eristachya Lindl." and *Hakea lorea* R.Br. being the common species. *Thryptomene maisonneuvii* occurs as a sparse understorey with *Triodia* sp. (30–50 per cent) as a ground cover (Figure 9).
- 2.7 To the west of the hills is an area of *Acacia* sp. tall shrubland with patches of *Triodia*.



Figure 9—Red sandplain supporting low open-shrubland over *Triodia* hummock grassland (2.6). Part of the steep scree slope surrounding the plateau of the Durba Hills is visible in the background.

YEO LAKE AREA

The proposed Yeo Lake Nature Reserve lies in the Great Victoria Desert. The Area was proposed as a reserve by CTRC (1974). The proposal was supported by the Environmental Protection Authority in 1975 and endorsed by Cabinet in 1976. Boundaries are: from 27°46'S, 124°00'E east to 124°40'E, south to 28°15'S, west to 124°25'E, north to 28°14'S, west to 124°05'E, north to 28°04'S, west to 124°00'E, and north to the starting point. The area is *ca* 330 000 ha.

The proposed nature reserve includes relatively ungrazed mulga formations, sandplain with poorly developed dunes and the saline basin of Yeo Lake with its associated drainage channels. A number of isolated breakaways and quartzite hills provide minor relief.

The geology of the south-eastern portion of the Area has been described and mapped at 1:250 000 by Van de Graaf and Bunting (1975). Beard (1974b) has mapped the vegetation into four categories (Table 4). The mulga country mapped by Beard as "a₁Li" is variable (Fig. 10). It ranges from low open-woodlands of mulga (*Acacia aneura* F. Muell.) to low open-shrublands of bluebush (*Maireana* spp.) and saltbush (*Atriplex* spp.) with occasional stands of stunted mulga on slight rises in the drainage channels associated with Yeo Lake.



Figure 10—View southwards from Stony Point (Yeo Lake Area) across low open-woodlands of *Acacia aneura* interspersed with low shrublands of bluebush and saltbush.

Habitats we collected in are as follows:

- 3.1 The low open-woodlands were mainly mulga (*Acacia aneura* F. Muell. ex Benth) (3–5 m) with some scattered *Eucalyptus oleosa* F. Muell. to 5 m over a low shrubland of such species as *Eremophila latrobei* F. Muell. and *Acacia* sp. over a tussock grassland of *Eragrostis eriopoda* Benth. and occasional *Triodia basedowii* E. Pritzel. (Colour Plate 4).
- 3.2 In slight depressions the upperstorey disappears and bluebush (*Maireana pyramidata* (Benth.) P. G. Wilson) and saltbush (*Atriplex* sp.) form low shrublands to 1 m over open-tussock grasslands of *Aristida browniana* Henr. and *Eragrostis eriopoda* Benth. (Figure 11).
- 3.3 In extensive depressions such as the drainage channels associated with Yeo Lake, small species of bluebush and saltbush form low open-shrublands along with species of pigface and samphire (*Arthrocnemum* spp.).



Figure 11—Low shrublands of bluebush (*Maireana pyramidata*) and saltbush (*Atriplex* sp.) in the Yeo Lake Area (3.2). Small tussocks of *Aristida browniana* are also present.

- 3.4 Near the abandoned Yeo Lake Homestead (*ca* 28°05'S, 124°17'E) were a series of fresh-water pools in an otherwise dry watercourse. The watercourse meanders through a low open-shrubland of saltbush and bluebush over *Aristida browniana* Henr. In the watercourse are small patches of the grass *Diplachne muelleri* Benth. and the shrub *Rutidosis helichrysoides* DC.
- 3.5 Isolated rocky hills and breakaways such as Stony Point and Point Sunday are covered with low shrublands of *Acacia* spp. including *A. aneura* (Figure 12). Beneath one such breakaway was a pool of water, known as Miller Soak, and an ephemeral watercourse surrounded by a dense thicket of *Acacia* spp. and *Eremophila longifolia* F. Muell. to 4 m.
- 3.6 The outlying pans south of Yeo Lake are covered with a low open-shrubland of samphire (*Arthrocnemum* spp.), saltbush (*Atriplex*) and species of pigface (Figure 13).
- 3.7 Between the pans are gypsum dunes supporting low open-woodlands of *Callitris columellaris* F. Muell. and *Casuarina cristata* Miq. to 7 m over scattered *Atriplex* and tufts of native grass (Figure 13).
- 3.8 Seventeen km ENE of Stony Point is an area between two pans where sand overlies gypsum. The resulting red sandplain supports a low



Figure 12—Low shrublands to low open-woodlands of *Acacia* spp. at Stony Point (3.5). Note the *Arthrocnemum* and pigface at the foot of the slope (3.3).



Figure 13—An outlying pan of Yeo Lake. In the background is a gypsum dune supporting *Callitris columellaris* and *Casuarina cristata* (3.6, 3.7).



Figure 14—Sandplain, supporting a low open-woodland of *Eucalyptus concinna* over *Triodia* hummock grassland (3.8), between two pans of Yeo Lake.



Figure 15—Low open-woodland of *Eucalyptus youngiana* over *Triodia* hummock grassland on red sandplain east of Stony Point (3.11).

open-woodland of *Eucalyptus concinna* Maiden and Blakely to 12 m over *Triodia* hummock grassland and occasional *Acacia aneura* F. Muell. ex Benth. (Figure 14).

Triodia hummock grasslands on sandplains are a prominent feature of the proposed nature reserve.

3.9 In the south-western corner of the proposal the *Triodia* formations of the sandplains are associated with low open-woodlands of *Eucalyptus*

gongylocarpa Blakely and/or *E. youngiana* F. Muell. with occasional *Pittosporum* sp. and *Acacia* spp.

3.10 Occasional weak sand dunes occur. These support low shrublands of *Acacia* spp., *Eremophila* and *Thryptomene* over spinifex although some *Eucalyptus gongylocarpa* Blakely and *E. youngiana* F. Muell. occur.

3.11 Twenty-one km east of Stony Point another area of red sandplain supports a more variable upper storey. Here, the low open-woodlands included several other mallee species (*Eucalyptus* sp, *E. concinna* Maiden and Blakely and *E. oleosa* F. Muell.) although *E. youngiana* F. Muell. (Figure 15) and patches of *E. gongylocarpa* Blakely are still present. Occasionally, *Acacia aneura* tall open-shrublands over *Triodia* hummock grasslands occur but these are probably interface situations.

GIBSON DESERT NATURE RESERVE

This Nature Reserve lies entirely within the Gibson Desert. It was proposed as a reserve by the CTCR (1974). The proposal was supported by the Environmental Protection Authority (1975) and endorsed by Cabinet in 1976. The Reserve (No. 34606) was gazetted on 22 April 1977 for the purpose of Conservation of Flora and Fauna, proclaimed Class A and vested in the Western Australian Wildlife Authority. Boundaries are 24°25'–25°25'S and 124°40'–126°20'E but excluding Reserve No. 29452. It has an area of 1 859 286 ha.

The Gibson Desert Nature Reserve includes the major plant formations typical of the Gibson Desert—extensive Mulga formations on laterite and lateritic sands, *Acacia* shrublands between sandhills and Desert Oak (*Casuarina decaisneana* F. Muell.) woodlands. Smaller areas of Coolabah (*Eucalyptus microtheca* F. Muell.) woodland, salt lakes and saltbush and samphire vegetation also occur (Table 5). Much of the geology of the Reserve has been described and mapped at 1:250 000 by Van de Graaf (1974) and Jackson (1976).

Our campsite was beside a drainage line which crosses the "Gary Highway" ca 4 km south of Charlies Knob (25°02'S, 124°59'E) a westward extension of the Young Range. Habitats we collected in are as follows:

4.1 The country around Everard Junction (25°11'S, 124°58'E) is a gravelly sandplain (Figure 16). The vegetation is a low open-hummock grassland



Figure 16—Spinifex on gravelly sandplain at Everard Junction, Gibson Desert Nature Reserve (4.1).

of *Plectrachne* and *Triodia*, with patches of soft grass, growing on red sand covered with fine black gravel. Emergent *Hakea lorea* R.Br. along with occasional low mulga occur.

- 4.2 Two kilometres north of Everard Junction are some low red sand dunes around the base of which is an open-hummock grassland of spinifex with emergent *Acacia* spp. to 2 m and *Hakea lorea* R.Br. to 3 m and occasional desert bloodwoods (*Eucalyptus* sp.). On top of the dune is a low open-shrubland of *Grevillea stenobotrya* F. Muell. and *Sida* sp. over bare red sand with some large tussocks of *Plectrachne schinzii* Henr.
- 4.3 The slopes of the Browne Range near Mt Everard are covered with a low open-shrubland to low open-shrubland of *A. aneura* F. Muell. ex Benth. over soft grasses with occasional patches of spinifex.
- 4.4 The top of the Young Range near Charlies Knob is flat to undulating sandstone and pebble conglomerate with areas of shallow soil supporting a low open-shrubland of *Acacia aneura* F. Muell. ex Benth., *A. grasbyi* Maiden and *Eremophila exilifolia* F. Muell. Along a rocky watercourse on top of the range is a fringing community of *Eucalyptus papuana* F. Muell., *Acacia aneura*, *Sarcostemma australe* R.Br. and *Dodonaea petiolaris* F. Muell.



Figure 17—Low open-woodland of *Acacia* spp. on slopes of the Young Range (4.5).



Figure 18—Open-hummock grassland of spinifex on heavy gravel; Young Range in the background (4.6). The mallee is *Eucalyptus pachyphylla*.

- 4.5 The southern face of the range near Charlies Knob is mostly mesaform, with occasional deep caves extending back into Mesozoic claystones and sandstones. Steep slopes of light scree and gravel beneath the breakaway support a low open-woodland of *Acacia aneura* to 5 m over *Acacia* spp. and *Eremophila exilifolia* F. Muell. (Figure 17).
- 4.6 As the gradient of the slope eases it becomes covered with an open hummock grassland of spinifex on gravel (Figure 18), with *Eremophila* sp. in rocky drainage lines and trends towards soils which are more sandy and on which the spinifex tussocks become larger. Here *Eucalyptus pachyphylla* F. Muell. (mallee), mulga and very dense spinifex fringe the drainage lines.



Figure 19—Tall shrubland of *Acacia kempeana* and *A. aneura* (in flower) with some *Acacia pruinocarpa* over *Triodia pungens* in gently undulating country approximately 4 km south of Charlies Knob, Gibson Desert Nature Reserve (4.7).

- 4.7 Fringing the range south of Charlies Knob is a band, several kilometres wide, of gently undulating country with occasional low stony hills, supporting low open-woodlands of *Acacia aneura* to 3 m with occasional *A. grasbyi* and *A. pruinocarpa* (Gidgee) to 6 m, and stunted mallee (*Eucalyptus pachyphylla* F. Muell.) over low *Acacia* shrubs and patches of soft grasses and *Triodia pungens* R.Br. on pebbly reddish loamy sand. In low lying areas stands of Gidgee to 5 m occur along with other *Acacia* spp. (Figure 19) some of which were in flower at the time of our visit. About 6 km south of camp is an area of *Acacia grasbyi*



Figure 20—Campsite, approximately 2.5 km south of Charlies Knob on a dry drainage line. Fringing community includes *Eucalyptus* sp. to 12 m over low woodland of *Acacia* spp. over spinifex (4.7).

to 2 m and 20 per cent projective foliage cover over *Triodia* to 0.5 m and 30 per cent. In a larger drainage line there is some *Eucalyptus* sp. to 12 m (Figure 20) although the fringing community is mostly *Acacia kempeana* F. Muell. and *A. aneura* (3-4 m), with occasional Gidgee, *Sarcostemma australe* R.Br., *Acacia* spp. (shrubs to 2 m) and *Canthium latifolium* F. Muell. over thick spinifex including *Triodia pungens* R.Br. The campsite was on this drainage line.

The country immediately north of Charlies Knob is similar to that south of it.

4.8 North of Charlies Knob the vegetation is mulga low open-woodland with scattered Gidgee (2-6 m) over occasional *Acacia* shrubs and spinifex hummocks on bare clayey sand with rock fragments.

4.9 Interspersed are areas of spinifex (including *Triodia*) hummock grassland on sandplain with gravel. A few weak sand dunes occur.

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TABLE 1
RAINFALL (mm) FROM THREE LOCALITIES RELEVANT TO SURVEY AREAS

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
WARBURTON													
Mean	26	28	23	20	19	21	12	11	4	10	17	23	214
Median	10	9	3	6	13	12	4	3	1	4	9	15	168
(1940-1973)													
1973	136	0	60	10	22	54	51	36	24	5	7	....	405*
1974 ....	....	....	....	....	....	....	....	....	24	102	28	9	....
1975	0	67	61	37	1	....	....	....	....	....	....	....	....
1976 ....	....	....	....	....	....	....	....	....	....	....	....	....	....
GILES													
Mean	30	56	19	16	18	20	12	15	7	10	19	29	251
Median	19	15	15	6	16	7	1	5	1	3	10	21	238
(1955-1975)													
1973	122	169	34	4	16	40	42	37	18	....	10	29	521*
1974	121	312	53	100	3	0	1	18	38	75	56	6	783
1975	24	37	6	1	1	0	7	21	28	98	63	18	304
1976	6	43	4	....	....	....	....	....	....	....	....	....	....
GLENAYLE													
Mean	37	34	31	20	27	24	13	7	3	2	9	22	229
Median	26	8	6	7	20	8	3	3	0	0	6	9	203
(1950-1974)													
1973	119	0	145	45	16	33	47	24	0	0	0	136	565
1974	153	8	7	24	28	7	27	25	4	7	14	55	359
1975	10	52	24	38	0	4	5	3	0	40	94	35	305
1976 (Era- heedy)†	0	46	26	....	....	....	....	....	....	....	....	....	....

.... No data.

* Incomplete total.

† Eraheedy is 60 km south-west of Glenayle.

TABLE 2
CARNARVON RANGE AREA, VEGETATION
Calculated from Beard (1974a, 1974b)

Beard-Webb Formula (Beard and Webb 1974)	Equivalent Specht Formation (Specht 1970)	Area (ha)	Per cent
a ₁₀ Sr, t ₂ Hi	Tall open-shrubland (<i>Acacia</i> spp.) over open-hummock grassland (<i>Triodia basedowii</i>)	158 000	61.2
a ₁ Li	Low woodland (<i>Acacia aneura</i>)	28 000	10.9
t ₂ Hi	Open-hummock grassland (<i>Triodia basedowii</i>)	31 000	12.0
a ₁ Lp, t ₂ Hi	Low open-woodland (<i>Acacia aneura</i>) over open-hummock grassland (<i>Triodia basedowii</i>)	24 000	9.3
a ₁ Lp	Low open-woodland (<i>Acacia aneura</i>)	16 000	6.2
a ₁ Si	Tall shrubland (<i>Acacia aneura</i>)	1 000	0.4
Totals		258 000	100.0

TABLE 3
LAKE DISAPPOINTMENT AREA, VEGETATION
Calculated from Beard (1974a)

Beard-Webb Formula (Beard and Webb 1974)	Equivalent Specht Formation (Specht 1970)	Area (ha)	Per cent
a ₈ Sr, t ₁ Hi between sandhills	Tall open-shrubland (<i>Acacia</i> spp.) over open-hummock grassland of <i>Triodia pungens</i> and <i>Plectrachne schinzii</i>	169 000	73.3
a ₃ hSr t ₂ Hi	Tall open-shrubland of <i>Acacia coriacea</i> and <i>Hakea</i> over open-hummock grassland of <i>Triodia basedowii</i>	31 000	8.5
t ₁ Hi	Open-hummock grassland of <i>Triodia pungens</i> and <i>T. wiseana</i>	18 000	4.9
Salt Lake		49 000	13.3
Totals		367 000	100.0

TABLE 4
YEO LAKE AREA, VEGETATION
Calculated from Beard (1974b)

Beard-Webb Formula (Beard and Webb 1974)	Equivalent Specht Formation (Specht 1970)	Area (ha)	Per cent
e ₁₉ Lr, e ₂₀ Sr, t ₂ Hi	Low open-woodland (<i>Eucalyptus gongylocarpa</i>) over tall shrubland (<i>E. youngiana</i>) over open-hummock grassland (<i>Triodia basedowii</i>)	168 000	50.9
a ₁ Li	Low woodland (<i>Acacia aneura</i>)	100 000	30.3
Salt Lakes		39 000	11.8
xCi	Low open-shrubland (saltbush and samphire)	13 000	4.0
eSi	Tall shrubland (mallee)	10 000	3.0
Totals		330 000	100.0

TABLE 5
GIBSON DESERT NATURE RESERVE, VEGETATION
Calculated from Beard (1974b)

Beard-Webb Formula (Beard and Webb 1974)	Equivalent Specht Formation (Specht 1970)	Area (ha)	Per cent
a ₁ Sp. t ₂ Hi	Tall open-shrubland (<i>Acacia aneura</i>) over open-hummock grassland (<i>Triodia basedowii</i>)	1 130 000	60·8
a ₁ Si	Tall shrubland (<i>Acacia anura</i>)	384 000	20·7
C ₁ Mp. t ₂ Hi	Woodland (<i>Casuarina decasneana</i>) over open-hummock grassland (<i>Triodia basedowii</i>)	126 000	6·8
a ₄ Sr. t ₂ Hi between sandhills	Tall open-shrubland (<i>Acacia</i> spp.) over open-hummock grassland (<i>T. basedowii</i>) between sandhills	92 000	4·9
a ₂ Sr. t ₂ Hi	Tall open-shrubland (<i>Acacia</i> spp.) over open-hummock grassland (<i>T. basedowii</i>)	23 000	1·2
e ₁₇ Mi. xGi	Woodland (<i>Eucalyptus microtheca</i>) over mixed grasses	74 000	4·0
xCi	Low open-shrubland (saltbush and samphire)	12 000	0·6
Salt Lakes ....	.....	18 000	1·0
Totals		1 859 000	100·0

PART III

MAMMALS

by N. L. McKENZIE¹, W. K. YOUNGSON¹, A. A. BURBIDGE¹ and A. CHAPMAN².

INTRODUCTION

This paper is based on information collected during visits to four areas in arid Western Australia (see McKenzie, this publication). All mammals collected have been lodged in the Western Australian Museum with accession numbers: M14384–14425 (November 1975 collection), M14618–14676 (March 1976 collection).

Techniques of mammal survey were similar to those listed in Burbidge *et al.* (1976) although only four types of trap were used: Large Elliott, Medium Elliott, Break-back and Dug Pit. Approximately 800 trap-nights were effected in each of the four areas visited. Within each area, trapping effort was approximately equally divided between the following habitats (see Burbidge and McKenzie, this publication): 1.1–1.6, 2.1–2.6, 3.1–3.10 (except 3.3 and 3.7), 4.1–4.7.

Bats were collected by means of a floodlighting technique (Youngson and McKenzie 1977), mist nets, foraging in caves, shooting at dusk, and spotlight shooting after dark.

In the annotated species list, data are presented in the following order:

1. Number of male and female specimens collected at each site. Sites outside the proposed/existing reserves are given in brackets.
2. Description of habitats in which the species was collected. These have been indexed into the area descriptions (Burbidge and McKenzie, this publication).
3. Female breeding information. For rodents and bats this is summarized in Table 1.
4. Method of capture.
5. Notes on behaviour and ecology.

ANNOTATED SPECIES LIST

FAMILY MACROPODIDAE

Megaleia rufa (Desmarest) **Red Kangaroo**

Carnarvon Range Area—Reported by Agriculture Protection Board Staff. (One seen 15 km south of the proposed reserve; 25°28'S, 120°37'E).

Yeo Lake Area—Many seen; 16 (7♂, 9♀) recorded during one 18 km daytime transect. One cranium collected.

Saltbush and bluebush plains (3.2); samphire flats (3.3); sandplain with spinifex (3.9); sand dunes with shrubs (3.10).

Individuals, pairs and groups of five or six.

Macropus robustus Gould **Euro**

Carnarvon Range Area—Two seen, many scats in range.

Yeo Lake Area—One seen at Stony Point, scats in breakaways.

Gibson Desert Nature Reserve—Hairs identified in dingo scats.

Ranges with mulga (1.1); breakaways and stony hills with mulga (3.5).

Petrogale sp.

Lake Disappointment Area—Old scats in the Durba Hills.

FAMILY DASYURIDAE

Antechinus macdonnellensis (Spencer) **Red-eared Antechinus**

Gibson Desert Nature Reserve—2 (1♂, 1♀); cranial fragments in owl pellets.

(Todd Range; 25°45'S, 126°12'E—1♀)

Breakaways with mulga (4.5).

One female (M14670; 24 March 1976) had much larger uterine horns than the other (M14669; 22 March 1976) and comparatively enlarged teats. Additional comparative material needs to be examined.

Caught by hand. Trapped.

The Todd Range specimen came from similar habitat.

Ningauia ridei Archer **Ride's Ningauia** (Colour Plate)

Carnarvon Range Area—1♀.

Gibson Desert Nature Reserve—1♀.

(12km NNW of Mount Beadell; 25°28'S, 125°13'E—1♂.)

Sandplains with spinifex (1.4); plains and slopes with mulga and spinifex (4.8).

The specimen from the Gibson Desert Nature Reserve (M14674; March 1976) is a sub-adult female. Neither the pouch nor the teats of the adult female from the Carnarvon Range (M14673; 29 March 1976) are visibly developed and its uterine horns are not visibly enlarged. Specimens of pregnant *N. ridei* are not available for comparison.

Caught by hand in daytime; burnt from spinifex tussocks at night.

The Mt Beadell male was collected in a low open-hummock grassland of spinifex with sparse shrubs of Cork-wood (*Hakea lorea*) and Gidgee (*Acacia Pruino-carpa*) on red sandplain with a superficial cover of fine gravel (this country was similar to 4.1). The specimen was first seen crossing the "Gunbarrel Highway" at 1230 hrs on 23 March 1976.

FAMILY MURIDAE

Leporillus sp.

Remains of old sticknests were found in a breakaway near Charlies Knob (4.5) in the Gibson Desert Nature Reserve, in caves in the Carnarvon Range Area (1.2), and near Point Sunday and Stony Point in the Yeo Lake Area (3.5).

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A. M. Douglas (pers. comm.) identified *Leporillus apicalis* bone material from similar concretions in Western Australia.

Notomys alexis Thomas **Spinifex Hopping-Mouse**

Carnarvon Range Area—5 (1♂, 4♀).
Lake Disappointment Area—2 (1♂, 1♀).
Yeo Lake Area—1♀.
Gibson Desert Nature Reserve—1♀.
Sandplains with spinifex (1.4); sand dunes with shrubs (1.6, 2.5, 2.10, 4.2).
Trapped. Caught by hand while spotlighting.

Pseudomys hermannsburgensis (Waite) **Sandy Mouse**

Carnarvon Range Area—4 (3♂, 1♀).
Lake Disappointment Area—1 (damaged).
Yeo Lake Area—3 (2♂, 1♀).
Gibson Desert Nature Reserve—5 (1♂, 4♀).
Samphire flats (3.6); plains and slopes with mulga and spinifex (1.5); sandplains with spinifex (1.4, 3.8); sandplains with gravel and spinifex (4.1); sand dunes with shrubs (1.6, 2.5, 4.2).
Trapped.

Mus musculus Linnaeus **House Mouse**

Carnarvon Range Area—1♂.
Yeo Lake Area—3♂.
Gibson Desert Nature Reserve—Cranial fragments in owl pellets.
Saltbush and bluebush plains (3.4); mulga woodlands (3.1); sandplains with spinifex (3.9); ranges with mulga (1.1).
Trapped.

FAMILY LEPORIDAE

Oryctolagus cuniculus (Linnaeus) **European Rabbit**

Yeo Lake Area—Characteristic warrens and mounds of rabbit scat.
Samphire flats (3.3); sandplains with spinifex (3.8).
Rabbit fur was identified from a dingo scat collected at the Todd Range.

FAMILY CANIDAE

Canis familiaris dingo Meyer **Dingo**

Carnarvon Range Area—Tracks.
Yeo Lake Area—Scats.
Gibson Desert Nature Reserve—One seen, scats and tracks recorded.
Mulga woodlands (3.1); sandplains with spinifex (1.4); sandplains with gravel and spinifex (4.1); sand dunes with shrubs (4.2); breakaways with mulga (4.5).
Scats from Yeo Lakes contained *Megaleia rufa* bone and hair material; scats from the Gibson Desert Nature Reserve (Young Range) contained *Macropus robustus* hair material and those from the Todd Range (25°45'S, 126°12'E) contained Rabbit and *Macropus robustus* hair material.

Vulpes vulpes (Linnaeus) **European Fox**

Lake Disappointment Area—Tracks thought to be those of the European Fox.
Yeo Lake Area—Tracks thought to be those of the European Fox.
Gibson Desert Nature Reserve—one seen.
Sandplains with spinifex (3.9); sandplains with gravel and spinifex (4.1); sand-dunes with shrubs (2.5).

FAMILY CAMELIDAE

Camelus dromedarius Linnaeus **Camel**

Carnarvon Range Area—Tracks.
Lake Disappointment Area—Tracks.
Yeo Lake Area—Nine seen.
Samphire flats (3.3); sandplains with spinifex (1.4, 2.6).
Seen in groups of 4 and 5 individuals.

FAMILY TACHYGLOSSIDAE

Tachyglossus aculeatus (Shaw) **Echidna**

Carnarvon Range—Characteristic scats.
Yeo Lake Area—Characteristic scats and an Echidna quill.
Gibson Desert Nature Reserve—Characteristic scats.
Ranges with mulga (1.1); stony hills and breakaways with mulga (3.5, 4.4, 4.5).
Butler (1971) records "fresh Echidna trails" from the Durba Hills (Lake Disappointment Area, 2.1) in August 1971.

FAMILY EMBALLONURIDAE

Taphozous georgianus Thomas **Common Sheath-tailed Bat**

Lake Disappointment Area—12 (4♂, 8♀).
Gibson Desert Nature Reserve—2♀.
(Todd Range; 25°45'S, 126°12'E—1♀).
Ranges and breakaways with mulga (2.2, 4.4, 4.5); watercourses with river gums (2.4).
Collected by hand in caves, shot at night in floodlights (1930–2100 hrs).
A single female was taken in a mist net set across a cave entrance on the mesaform face of the Todd Range in a similar situation to habitat 4.5.



Figure 1—*Taphozous flaviventris* from the Durba Hills.

Taphozous flaviventris Peters **Yellow-bellied Sheath-tailed Bat** (Figure 1)

Carnarvon Range Area—1♀.
Lake Disappointment Area—4 (3♂, 1♀).
(Karri Karri Pool; 25°29'S, 120°37'E—1♂.)
Watercourses with river gums (1.2, 2.4).
Shot at night in floodlights (1915 hrs–2205 hrs).
The Karri Karri Pool specimen was collected after dark on 19 November 1975. It was flying along a watercourse fringed with *Eucalyptus microtheca*.

FAMILY MOLOSSIDAE

Tadarida australis (Gray) **White-striped Bat**

Carnarvon Range Area—1♀.
Watercourses with river gums (1.2).
Shot at night in floodlights (2150 hrs).

Tadarida sp.

Carnarvon Range Area—14 (4♂, 10♀).
Lake Disappointment Area—1♀.
Watercourses with river gums (1.2, 2.4).
Shot in floodlights between 1945 hrs and 2100 hrs.

FAMILY VESPERTILIONIDAE

Nyctophilus geoffroyi Leach **Lesser Long-eared Bat**

Carnarvon Range Area—1♂.
Watercourses with river gums (1.2).
Shot in floodlights at 1930 hrs.

Eptesicus pumilis (Gray) **Little Brown Bat**

Carnarvon Range Area—4 (1♂, 3♀).
Lake Disappointment Area—3♀.
Yeo Lake Area—1♂.
Gibson Desert Nature Reserve—4 (3♂, 1♀).
(Todd Range; 25°45'S, 126°12'E—6 (5♂, 1♀).)
Ranges, breakaways and stony hills with mulga (1.1, 2.2, 3.5, 4.5); watercourses with river gums (1.2, 2.4).
Caught by hand and mist netted in caves; shot at dusk and in floodlights at night (1940–2020 hrs).
The Todd Range specimens were mist netted after dark in the mouth of a cave. The habitat of the Todd Range specimens was similar to 4.5.
Three were seen huddled together in a small fissure on the wall of a scree cave in the Durba Hills. They were ca. 4 m from the entrance.

Chalinolobus gouldii (Gray) **Gould's Wattled Bat**

Carnarvon Range Area—10 (9♂, 1♀).
Watercourses with river gums (1.2).
Shot in floodlights (1825–2200 hrs).

Nycticeius greyi (Gould) **Little Broad-nosed Bat**

Lake Disappointment Area—2 (1♂, 1 damaged).
Watercourses with river gums (2.4).
Shot in floodlights (1935–2000 hrs).

DISCUSSION

The distributions of mammals in the deserts of Western Australia (as defined by Beard 1969) are poorly documented. Early specimens (1931 and before) were mostly collected along the only two access routes available—the Canning Stock Route and the road between Laverton and Warburton—or from aboriginal missions and pastoral stations situated around the fringes of the deserts. These specimens often have imprecise collection localities and no habitat data.

By the time the Gunbarrel Highway (1958) and Gary Highway (1963) had penetrated the Gibson Desert and the Rawlinna–Warburton Road (1961) had crossed the Great Victoria Desert, thereby improving access, many mammals indigenous to these deserts had apparently disappeared.

Modern mammal records from these areas are still restricted to the main access routes and, with the exception of a few rodent and bat species, are still relatively few. Information published here and in a previous publication in this series (Burbidge *et al.* 1976) has improved knowledge of the habitats and distributions of many desert mammals and, in addition, increased the number of mammal species known to live in these deserts.

A total of sixteen extant species of native mammal were recorded during the November 1975 and March 1976 surveys (see Table 2). Field observations and trapping success indicate that the “plague” of rodent species recorded in the Great Victoria Desert and the southern Gibson Desert in March 1975 (Burbidge *et al.* 1976) did not exist at the areas reported on here during November 1975 and March 1976.

Megaleia rufa, *Ningauai ridei* and *Antechinus macdonnellensis* (as distinct from *A. bilarni*) are largely restricted to the arid zone. *Pseudomys hermannsburgensis* and *Notomys alexis* are also desert species although their distributions extend into peripheral areas of the South West Land Division of Western Australia (W.A.M. M4397, Kalbarri National Park, 1972; W.A.M. M10597, 50 km north of Beacon, 1973). The other species have wider distributions in W.A.: *Taphozous georgianus* and *Taphozous flaviventris* are known from both the arid zone and northern W.A., and *Nycticeius greyi* (W.A.M. M15184; 30°51'S, 116°22'E; 1977) and *Macropus robustus* are also known from the South-West Land Division. *Tadarida australis* and *Nyctophilus geoffroyi* are known from both the arid zone and southern W.A. *Canis familiaris*, *Tachyglossus aculeatus*, *Eptesicus pumilis* and *Chalinolobus gouldii* have been recorded throughout the State.

Ningauai ridei is apparently widespread in these deserts although it has been recorded only in spinifex formations on sandplains and sand dunes. The four previous specimens were all collected in the Great Victoria Desert (Archer 1975; Burbidge *et al.* 1976) although Burbidge *et al.* found skeletal fragments in owl pellet material from the Gibson Desert. Our records show that *N. ridei* is extant in the Gibson Desert and also occurs in the Little Sandy Desert. A partial skeleton of a *Ningauai* (W.A.M. M13857) was found in the Great



Plate 1.—
Tall open-shrubland of *Acacia aneura* on Carnarvon Range (1.1); low open-woodland of *Eucalyptus setosa* (1.3) in foreground.

Plate 2.—
Low open-woodland of *Eucalyptus* sp. over *Acacia* sp. and *Thryptomene maisonneuvii* on sand dunes (1.6). Carnarvon Range in background.

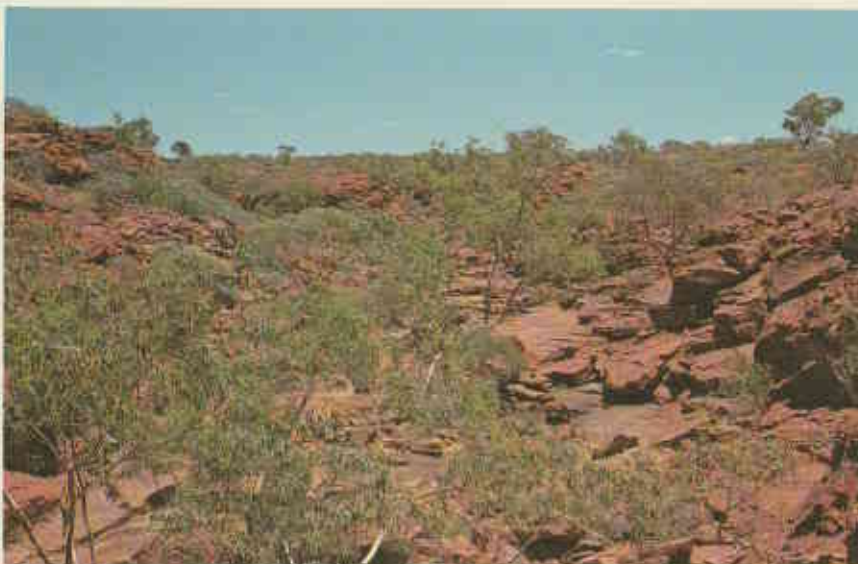


Plate 3.—
Low open-woodland; many areas of bare sandstone on top of the Durba Hills (2.1).



Plate 4.—
Low open-woodland of mulga
and *Eucalyptus oleosa* over a
tussock grassland of *Eragrostis*
eriopoda (3.1). Yeo Lake Area.

Plate 5.—
Durba Springs. *Eucalyptus*
camaldulensis; sandstone cliff
(2.4).



Plate 6.—
Ride's Ningai (*Ningai ridei*).
Photo by A.G. Wells.

Sandy Desert in 1975 (21°42'S, 122°12'E; Paterson Ranges) but it is not known whether the specimen belongs to *N. ridei* or to the Pilbara species *N. timealeyi*.

Tadarida sp. has only recently been recognised from collections made in Western Australia. Our records from the Lake Disappointment and the Carnarvon Range Areas (Little Sandy Desert) are the first from the inland deserts of W.A. Other Western Australian collections have come from the Pilbara (W.A. Museum collection).

The *Tadarida* sp. from the Carnarvon Range and Lake Disappointment Area were compared with descriptions of Indo-Australian taxa of the sub-genus *Mormopterus* included in Hill (1961) and Felten (1964). In external and cranial appearance the specimens differ from any of the described species. Further work on the taxonomic status of these and other collections of Western Australian *Mormopterus* is being undertaken.

Taphozous flaviventris was first recorded in the deserts of Western Australia by W. H. Butler who collected a specimen in the Durba Hills (Lake Disappointment Area) in August 1971 (Butler 1971). Our collections from the Lake Disappointment (Durba Hills) and Carnarvon Range Areas and from Karri Karri Pool indicate that the species is widespread in the Little Sandy Desert and also occurs in the Carnegie Salient as defined by Beard (1969); specimens from the Pilbara (W.A.M. M6622; 24°00'S, 117°50'E; 1965) and the Northern Territory (Parker 1973) suggest an even wider arid zone distribution.

Scats of a Rock-Wallaby were collected in the Durba Hills (Lake Disappointment Area) during our visit and W. H. Butler reported sighting a Rock-Wallaby in the same place in 1971. The taxonomy of *Petrogale* is still uncertain. Ride (1970) recognises two species from the arid zone of Western Australia. Relevant specimens are *Petrogale penicillata* (W.A.M. M3532, 1959; W.A.M. M4988, 1961) from the Warburton Region and a specimen labelled "*Petrogale rothschildi*" (W.A.M. M3884; 23°22'S, 120°47'E) which was recorded from the western edge of the Little Sandy Desert in 1959. A return visit is required to determine which of these species, if either, is present in the Durba Hills.

Other mammal species are known from these deserts. Many of these species are likely to occur (or to have occurred) within areas proposed as reserves because these areas were delineated so that the resulting system of desert reserves would include the range of geological formations, soil surfaces and vegetational formations typical of each desert.

Several species have been recorded recently in these deserts. Burbidge and Fuller (in press) discuss evidence that *Onychogalea lunata* occurred recently in the Gibson Desert. *Sminthopsis crassicaudata* was recorded in the proposed Baker Lake Nature Reserve in the Gibson Desert as recently as 1967 (W.A.M. M10043; 26°47'S, 125°57'E). Recent specimens of *Sminthopsis froggatti* are known from the Little Sandy Desert (W.A.M. M8405; 22°56'S, 121°11'E; 1971) and Great Victoria Desert (W.A.M. M8862; 27°58'S, 123°45'E; 1967), the latter record being only 20 km west of the Yeo Lake Area. A recent specimen of *Sminthopsis hirtipes* from Djindirana Claypan (W.A.M. M8083; 24°22'S, 125°08'E; 1968) in the Gibson Desert along with records of this species from reserves in the Great Victoria Desert (Burbidge *et al.* 1976) and an older

record from the Great Sandy Desert (W.A.M. M1547-50; 22°33'S, 123°52'E; 1930) suggest that this species may also be found in sand dune country within the Gibson Desert Nature Reserve, Yeo Lake Area and the proposed reserves of the Little Sandy Desert.

Sminthopsis longicaudata was recorded in the proposed Baker Lake Nature Reserve in 1975 (Burbidge and McKenzie 1976). The species may occur elsewhere in the Gibson Desert because habitats similar to those recorded at the collection site are widespread in the region. Burbidge *et al.* (1976) report collections of *Sminthopsis murina ooldea* from sand dune and sandplain country in the southern and central Great Victoria Desert and on a watercourse in the southern edge of the Gibson Desert. These records, with a further specimen from the western end of the Great Victoria Desert (W.A.M. M5782; 28°03'S, 121°57'E; 1963) suggest the presence of this species in country represented in the Yeo Lake Area and the Gibson Desert Nature Reserve.

Pesudomys desertor is known in W.A. from the Great Sandy Desert (W.A.M. M1448; 20°00'S, 126°30'E; *ca* 1930) and from the south edge of the Gibson Desert in the Baker Lake Area (Burbidge *et al.* 1976). Habitats listed in Burbidge *et al.* (*ibid.*), Parker (1973) and Watts (1972) suggest that this species occurs in the Gibson Desert Nature Reserve and the other proposals which incorporate sandplain and sand dune/spinifex country.

A number of species, known to have inhabited these deserts in the past (*ca* 1930) have not been subsequently recorded there. For example *Lagorchestes hirsutus* was recorded in the Little Sandy Desert near Lake Disappointment in 1931 (W.A.M. M1471, M1472; 23°30'S, 122°45'E). It is probable that the species occurred in similar sorts of country found within the Lake Disappointment Area. Finlayson (1961) states that this species had its "headquarters . . . in the great spinifex deserts to the west of the area here considered . . ." *viz* the Gibson, Great Victoria, Great Sandy and Little Sandy Deserts. He states that the "mode of occurrence of this hare wallaby is fluctuating and discontinuous and with isolated colonies widely sundered . . . but there seems no doubt that a major collapse in its numbers . . . has occurred in the last 25 years". A further specimen was recorded near Warburton in 1931 (W.A.M. M1572; 26°09'S, 126°35'E). The species still occurs in the Tanami Desert of the Northern Territory (Parker 1973).

Isoodon auratus was recorded in the Gibson Desert (W.A.M. M1574; 26°15'S, 126°30'E; 1931) in country very similar to that found in the Gibson Desert Nature Reserve. *Perameles eremiana* was collected at Gahnda Rockhole in the Gibson Desert in 1931 (W.A.M. M1575; 26°36'S, 125°52'E) and in the Great Sandy Desert in 1944 (W.A.M. M2629; 22°13'S, 125°03'E) in similar country to that found in the Gibson Desert Nature Reserve and the Lake Disappointment Area respectively. Extant populations of *Leporillus* have not been recorded in Western Australia. However, the wide occurrence and relatively good condition of remnant "stick-nests" in the deserts of Western Australia suggest a similar pattern of disappearance to that described by Frith (1973, p.306) for other parts of Central Australia.

Four species, known from these deserts in the past, have been recorded in peripheral areas more recently and are more likely to be extant in the deserts than the species just mentioned. There are recent records of *Macrotis*

lagotis from the Warburton region (W.A.M. M7036; 26°08'S, 126°35'E; 1965). The authors recently received a live specimen collected in March 1977 from near Warburton Mission; it is at present on display in the Perth Zoological Gardens. Specimens are also known from the Great Sandy Desert (W.A.M. M1491; 22°31'S, 124°24'E; 1930) and from the western edge of the Great Victoria Desert (W.A.M. M1010; 26°21'S, 119°49'E; 1928). A specimen of *Lagorchestes conspicillatus* was presented to the W.A. Museum in 1959 from the western edge of the Little Sandy Desert (W.A.M. M3497; 23°55'S, 120°07'E) but there is no recent evidence to suggest its continued presence further east in W.A. Finlayson (1961) states that this species had "... essentially ... an east-west range to approx. 24°S. lat. and probably formerly occupied all the area north of that parallel." *Dasyercus cristicauda* was last recorded in the Gibson (W.A.M. M1576; 26°35'S, 126°56'E) and Great Sandy (W.A.M. M1521; 22°54'S, 123°30'E) Deserts in 1930-31. Although a specimen came from the Warburton Region in 1967/68 (W.A.M. M7743; 26°06'S, 126°40'E) its status in the deserts of Western Australia to-day is unknown.

Smith (1966, p.128-129) refers to a specimen of *Notoryctes typhlops* collected in 1906 by H. S. Trotman on the Canning Stock Route, between Killagurra Rock-hole (23°44'S, 122°29'E) and Onegunyah Rock Hole (23°33'S, 122°34'E). She states that it was the first record of *Notoryctes typhlops* from Western Australia and that it was lodged in the W.A. Museum as specimen number 8815. This specimen has now been re-catalogued as M16061. Its locality data places it within the boundaries of the proposed Lake Disappointment Nature Reserve. Unfortunately, the locality listed for this specimen in the 1907 taxidermist's log of the W.A. Museum is "Joanna Springs", ca 200 km NNE of Onegunyah R.H. and this is the locality included in Corbett (1975). Certainly habitat preferences discussed in Corbett (1975) indicate that both localities are equally possible. However, as Smith is quoting Trotman's actual description of the events associated with the collection, the "Joanna Springs" locality is probably an error. In 1968 a specimen of *N. typhlops* (W.A.M. M7711; 26°08'S, 126°35'E) was recorded from Warburton Mission.

While the information collected during these surveys, and an earlier survey reported by Burbidge *et al.* (1976), has improved knowledge of the mammal fauna of these areas, the foregoing discussion suggests that modern mammal collections are incomplete, especially with respect to species of bandicoots and small wallabies (see also Calaby 1971; Marlow 1958). A further series of mammal surveys is essential if the conservation status of modern populations of such species in these deserts, and especially in the areas defined for reservation, is to be established.

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TABLE 1
FEMALE BREEDING INFORMATION—RODENTS AND BATS
(X : enlargement; — : no enlargement)

Species	Number of Adult Females	Location*	Date	Enlarged uterus/i	Enlarged mammae	Notes
<i>Notomys alexis</i>	4	CR, LD	21–30 Nov. 1975	X	X	All with one foetus Two lactating
	3	CR, YL, GD	19–29 Mar. 1976	X (2)	X (3)	
<i>Pseudomys hermannsburgensis</i>	1	CR	22 Nov. 1975	X	X	
	4	YL, GD	19–22 Mar. 1976	—	—	
<i>Taphozous georgianus</i>	6	LD	25–27 Nov. 1975	X	X	Three of the November specimens with one foetus, a fourth was suckling a juvenile.
	{ 1	GD	26 Mar. 1976	X	X	
	{ 2	TR, GD	24–26 Mar. 1976	—	—	
<i>Taphozous flaviventris</i>	1	LD	25 Nov. 1975	X	X	One foetus.
	1	CR	28 Mar. 1976	X	X	
<i>Tadarida australis</i>	1	CR	28 Mar. 1976	—	—	
<i>Tadarida</i> sp.	2†	CR, LD	21–25 Nov. 1975	X	—	One foetus each.
	{ 4	CR	28 Mar. 1976	X	X	
	{ 4	CR	28 Mar. 1976	—	—	
<i>Eptesicus pumilis</i>	5	CR, LD	20–26 Nov. 1975	X	X	Two with two foetuses.
	3	CR, TR, GD	22–30 Mar. 1976	—	—	
<i>Chalinolobus gouldii</i>	1	CR	28 Mar. 1976	?	?	Damaged during collection.

* GD—Gibson Desert Nature Reserve.
CR—Carnarvon Range Area.
YL—Yeo Lake Area.
LD—Lake Disappointment Area.
TR—Todd Range.

† A third female specimen was damaged during collection.

TABLE 2
SPECIES KNOWN FROM THE PROPOSED NATURE RESERVES (1975–1976)

Species	Carnarvon Range Area	Lake Disappointment Area	Yeo Lake Area	Gibson Desert Nature Reserve
<i>Macropus robustus</i>	X	....	X	X
<i>Megaleia rufa</i>	X	....	X	....
<i>Antechinus macdonnellensis</i> ....	....	....	....	X
<i>Ningauai ridei</i>	X	....	....	X
<i>Notomys alexis</i>	X	X	X	X
<i>Pseudomys hermannsburgensis</i>	X	X	X	X
<i>Nyctophilus geoffroyi</i>	X	....	....	....
<i>Eptesicus pumilis</i>	X	X	X	X
<i>Chalinolobus gouldii</i>	X	....	....	....
<i>Nycticeius greyi</i> ....	....	X	....	....
<i>Tadarida australis</i> ....	....	X	....	....
<i>Tadarida</i> sp.	X	X	....	....
<i>Taphozous georgianus</i> ....	....	X	....	X
<i>Taphozous flaviventris</i>	X	X	....	....
<i>Tachyglossus aculeatus</i>	X	....	X	X
<i>Canis familiaris</i>	X	....	X	X

PART IV

BIRDS

by R. E. JOHNSTONE¹, C. P. S. de REBEIRA² and L. A. SMITH¹.

INTRODUCTION

This paper is based mainly on data gathered during biological survey work on four proposed or existing desert nature reserves in Western Australia. The work was carried out by Department of Fisheries and Wildlife, Western Australian Museum and C.S.I.R.O. Wildlife Research personnel.

The Lake Disappointment Area was visited from 26 November—1 December 1975, the Gibson Desert Nature Reserve from 23–27 March 1976, the Carnarvon Range Area from 20–24 November 1975 and from 28–31 March 1976, and Yeo Lake Area from 18–21 March 1976. Descriptions of areas and itineraries are given in McKenzie, and Burbidge and McKenzie (this publication).

We are grateful to the following people for allowing us to use their relevant and unpublished data: W. H. Butler (Lake Disappointment Area 11–17 August 1971), G. M. Storr (Gibson Desert 6–7 September 1966 and 25–26 July 1963) and J. R. Ford (Carnarvon Range Area 15–16 July 1975 and Yeo Lake Area 17–19 May 1966). Data collected in the Gibson Desert on 25 and 26 August 1973 by J. R. Ford and R. E. Johnstone is also included.

Abundance at the time of our surveys is indicated as scarce, uncommon, moderately common and common. Habitat notes are given whenever available. Durba Gorge and Killagurra Gorge refer to the steep sided rocky valleys in which Durba Springs and Killagurra Spring are situated.

LIST OF SPECIES

FAMILY CASUARIIDAE

Dromaius novaehollandiae (Latham) **Emu**

Lake Disappointment Area—Scarce in November 1975.

A skeleton and a carcass at Durba Springs; droppings and tracks at Killagurra Gorge.

Gibson Desert Nature Reserve—Scarce in March 1976.

One on a lush grassy flat 9 km south-east of Mt Everard; tracks at Young Range.

Carnarvon Range Area—Moderately common in March 1976 (largest group 10). Mostly on sandplain at south end of the range.

Yeo Lake Area—Common in March 1976 (nineteen counted on a 17 km transect from Stony Point to Yeo Homestead). Mostly on samphire flats. Male, with seven chicks about 75 cm high, on Yeo Lake in March 1976.

FAMILY ARDEIDAE

Ardea novaehollandiae Latham **White-faced Heron**

Yeo Lake Area—Five seen, all at small pools in lake.

Two single birds in May and three in March 1976.

FAMILY ANATIDAE

Anas gibberifrons Müller **Grey Teal**

Yeo Lake Area—one on small pool near Yeo Homestead in March 1976.

Chenonetta jubata (Latham) **Wood Duck**

Yeo Lake Area—Flock of about sixty in a claypan full of water near Yeo Hills (28°06'S, 125°29'E) in May 1966. Also one flying over Yeo Hills at night in May 1966.

FAMILY ACCIPITRIDAE

Hamirostra melanosternon (Gould) **Black-breasted Kite**

Carnarvon Range Area—One over sandplain at south end of range in March 1976.

Accipiter cirrocephalus (Vieillot) **Collared Sparrowhawk**

Carnarvon Range Area—Three seen in March 1976, all along a gully in the range.

Aquila morphnoides Gould **Little Eagle**

Lake Disappointment Area—One at Durba Gorge in November 1975.

Carnarvon Range Area—One at south end of range in November 1975.

Aquila audax (Latham) **Wedge-tailed Eagle**

Lake Disappointment Area—One at Durba Hills in November 1975.

Gibson Desert Nature Reserve—One over spinifex flat near Mt Everard in March 1976.

Carnarvon Range Area—One over sandplain, south end of range in March 1976. Another seen in July 1975.

Yeo Lake Area—Three in March 1976. Seen over samphire flats and breakaways.

FAMILY FALCONIDAE

Falco peregrinus Tunstall **Peregrine Falcon**

Carnarvon Range Area—Four circling bluff in November 1975, one pair of which were displaying. One in March 1976 and a pair in July 1975. (All at south end of range.)

Yeo Lake Area—One at Swamper Point (Yeo Hills) in May 1966.

Falco longipennis Swainson **Little Falcon**

Lake Disappointment Area—Two at Durba Gorge in November 1975.

Yeo Lake Area—One in a mallee near Point Sunday in March 1976.

Falco berigora Vigors and Horsfield **Brown Falcon**

Gibson Desert Nature Reserve—Several seen at Young Range in March 1976 and August 1973 and two in a wash area with lush herbage and bloodwoods 32 km

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west of Everard Junction in August 1973. Nest with three eggs on top of an old White-browed Babbler's nest 6 m up in a Gidgee (*Acacia pruinocarpa*) near the Young Range in August 1973. The sitting bird was very pale.

Carnarvon Range Area—Single bird over Mulga (*Acacia aneura*) flat near the south-west corner of proposed reserve in March 1976 and another in November 1975.

Yeo Lake Area—Moderately common around break-aways and over samphire flats in March 1976.

Falco cenchroides Vigors and Horsfield **Nankeen Kestrel**
Moderately common on all four Areas. Associated with bluffs and cliffs.

FAMILY MEGAPODIIDAE

Leipoa ocellata Gould **Mallee Fowl**

Yeo Lake Area—Old nest found in Mulga woodland.

FAMILY TURNICIDAE

Turnix velox (Gould) **Little Quail**

Lake Disappointment Area—Three single birds in open spinifex at Durba Gorge in November 1975.

Carnarvon Range Area—One on the track to Mt Methwin, west end of range, in November 1975.

FAMILY RALLIDAE

Gallinula ventralis Gould **Black-tailed Native Hen**

Yeo Lake Area—Six at pool near Yeo Homestead in May 1966.

FAMILY OTIDAE

Otis australis Gray **Australian Bustard**

Lake Disappointment Area—One in spinifex near the west side of Durba Hills in November 1975.

Gibson Desert Nature Reserve—One on spinifex flat with mulga and scattered eucalypts at Young Range in March 1976.

Carnarvon Range Area—Tracks at north end of range in November 1975.

Yeo Lake Area—A single bird, a pair and a group of three on open samphire flats in March 1976. Tracks at Yeo Hills in May 1966.

FAMILY CHARADRIIDAE

Vanellus tricolor (Vieillot) **Banded Plover**

Yeo Lake Area—Flock of forty and a single bird at claypans near Yeo Homestead in May 1966.

Charadrius melanops Vieillot **Black-fronted Dotterel**

Yeo Lake Area—One at a pool near Yeo Homestead in May 1966.

Charadrius cinctus (Gould) **Red-kneed Dotterel**

Yeo Lake Area—Six at pool near Yeo Homestead in May 1966.

FAMILY COLUMBIDAE

Geopelia cuneata (Latham) **Diamond Dove**

Lake Disappointment Area—Common in November 1975. Flocks of up to forty drinking at pools at Durba and Killagurra Gorges.

Gibson Desert Nature Reserve—Only seen in August 1973. Two at Everard Junction and three 25 km west of Everard Junction. All among *Acacia* and *Grevillea* on open gravelly ground.

Carnarvon Range Area—Several pairs at northern end of range in November 1975.

Yeo Lake Area—a single bird at Stony Point in March 1976.

Phaps chalcoptera (Latham) **Common Bronzewing**

Carnarvon Range Area—Three drinking from pools at dusk at south end of range in March 1976 and one in July 1975.

Yeo Lake Area—About fifteen drinking from small pools at dusk.

Ocyphaps lophotes (Temminck) **Crested Pigeon**

Lake Disappointment Area—Ones and twos at Durba Gorge in November 1975.

Carnarvon Range Area—Moderately common. A flock of twelve in July 1975. Flocks of up to five and one of fifty in November 1975 and flocks up to twelve and one of twenty-five in March 1976.

Geophaps plumifera Gould **Plumed Pigeon**

Carnarvon Range Area—Two parties (total twelve) at Katjera Spring about 5 km east of Mt Methwin on 15 May 1975 (Reid, 1976).

FAMILY PSITTACIDAE

Platycercus zonarius (Shaw) **Ringneck Parrot**

Lake Disappointment Area—Uncommon. Ones, twos and threes in gullies with eucalyptus at Durba and Killagurra Gorges.

Carnarvon Range Area—Uncommon. Mostly pairs, in mulga and spinifex and gullies in the range with *Eucalyptus microtheca* and *Callitris*.

Platycercus varius (Clark) **Mulga Parrot**

Gibson Desert Nature Reserve—Uncommon to moderately common. Several pairs and a flock of six in open mulga at Young Range in March 1976.

Carnarvon Range Area—Uncommon. Two in River Gums in July 1975 and several sightings of twos and threes in thickets in gullies at north end of range in November 1975.

Yeo Lake Area—Moderately common. Mostly in mallee and Mulga woodlands, usually in twos and threes (one flock of eight).

Neophema bourkii (Gould) **Bourke Parrot**

Gibson Desert Nature Reserve—Two on stony ground with scattered mulga near Charlies Knob in March 1976.

Yeo Lake Area—Pair at Miller Soak in March 1976.

Melopsittacus undulatus (Shaw) **Budgerygah**

Lake Disappointment Area—Common to very common at Durba Hills. Large flocks roosting in mulgas on dunes and in eucalypts along the creek in Killagurra Gorge.

Gibson Desert Nature Reserve—Scarce in March 1976, moderately common in August 1973 and September 1966. Young found in hollows of bloodwoods and white gums in a wash area about 25 km west of Everard Junction in August 1973.

Carnarvon Range Area—Moderately common. Flocks of six to fifteen in July and November 1975.

Yeo Lake Area—Scarce. Twos and threes at Miller Soak and in good stands of mulga in March 1976.

Nymphicus hollandicus (Kerr) **Cockatiel**

Lake Disappointment Area—Two at Durba Gorge in November 1975.

Cacatua roseicapilla (Vieillot) **Galah**

Lake Disappointment Area—One on a dune near Durba Gorge in November 1975.

Carnarvon Range Area—Flocks of ten and thirteen at south end of range in March 1976 and two pairs at north end of range in November 1975.

Yeo Lake Area—Moderately common in March 1976 and May 1966. Pairs and flocks of three, mostly at water at Point Sunday, Miller Soak and Yeo Hills.

FAMILY CUCULIDAE

Cuculus pallidus (Latham) **Pallid Cuckoo**

Lake Disappointment Area—One at Durba Gorge in November 1975.

Gibson Desert Nature Reserve—Several sightings on stony flats with mulga, gidgee and bloodwoods at Browne and Young Ranges.

Carnarvon Range Area—Five in November 1975 (one calling at night) and one in July 1975.

Yeo Lake Area—Total of five in March 1976 and May 1966, all in well-wooded habitats. Pair of yellow-fronted Honeyeaters feeding a juvenile in a mallee near Point Sunday in March 1976.

Chrysococcyx osculans (Gould) **Black-eared Cuckoo**

Gibson Desert Nature Reserve—One near Charlies Knob in September 1966.

Carnarvon Range Area—Two in November 1975, both at south end of range.

Yeo Lake Area—Two single birds in March 1976 and several pairs at Yeo Hills in May 1966.

Chrysococcyx basalis (Horsfield) **Horsfield Bronze Cuckoo**

Gibson Desert Nature Reserve—One in July 1963, three in August 1973. In good stands of mulga at Young Range and mulga and *Eremophila* on stony flats near Everard Junction. Chestnut-tailed Thornbills feeding a fledgling near Everard Junction in August 1973.

Carnarvon Range Area—One in mulga at foot of range in March 1976.

Yeo Lake Area—One in March 1976.

FAMILY STRIGIDAE

Tyto alba (Scopoli) **Barn Owl**

Gibson Desert Nature Reserve—A large number of pellets found in a cave at the Young Range were probably deposited by a bird of this species.

Carnarvon Range Area—One chasing bats around pools at night at south end of range in March 1976.

Yeo Lake Area—Four, all in March 1976. Mostly around samphire flats at night, one at edge of break-away at Point Sunday.

Ninox novaeseelandiae (Gmelin) **Boobook Owl**

Lake Disappointment Area—Calling at Durba Gorge in November 1975.

Carnarvon Range Area—Calling on two occasions in March 1976.

Yeo Lake Area—One at edge of samphire flat and one roosting in eucalypt on dune, both in March 1976.

FAMILY PODARGIDAE

Podargus strigoides (Latham) **Tawny Frogmouth**

Yeo Lake Area—Five, all in March 1976. Mostly around breakaways and samphire flats at night.

FAMILY AEGOTHELIDAE

Aegotheles cristatus (White) **Crested Owlet-Nightjar**

Lake Disappointment Area—One calling at Durba Gorge in November 1975.

Gibson Desert Nature Reserve—One calling at night at Young Range in March 1976.

Carnarvon Range Area—One flushed from spout of dead eucalypt on a creek bank in November 1975, one from hollow of *Eucalyptus microtheca* in the range in March 1976 and two on sandplain at night in low open-shrubland of *Hakea lorea* at south end of range.

Yeo Lake Area—Two in open Mulga at Stony Point and one at Miller Soak, all in March 1976.

FAMILY CAPRIMULGIDAE

Eurostopodus guttatus (Vigors and Horsfield) **Spotted Nightjar**

Gibson Desert Nature Reserve—Two at Young Range in March 1976.

Carnarvon Range Area—Two near pool at south end of range in November 1975, and one calling from mulga in March 1976.

Yeo Lake Area—Two in March 1976, one near a small pool on samphire flat and another at Miller Soak.

FAMILY ALCEDINIDAE

Halcyon pyrrhopygia Gould **Red-rumped Kingfisher**

Gibson Desert Nature Reserve—One in a wash area with white gums, bloodwoods and lush herbage 32 km west of Everard Junction in August 1973 and another at Charlies Knob, Young Range in September 1966.

Carnarvon Range Area—Two in November 1975 (one feeding on grasshoppers), and one in low open-shrubland on sandplain south of range in March 1976.

Yeo Lake Area—Four seen in wooded areas.

FAMILY HIRUNDINIDAE

Cheramoeca leucosterna (Gould) **White-backed Swallow**

Lake Disappointment Area—Flock of six over pools at head of Durba Gorge and two over the Gorge in November 1975. Also recorded at Durba Spring in August 1971.

Carnarvon Range Area—Two at west end of range in November 1975.

Yeo Lake Area—Several pairs at east end of proposed reserve in March 1976.

Hirundo ariel (Gould) **Fairy Martin**

Lake Disappointment Area—Three hawking over pool and some old nests under a rock ledge at Durba Gorge in November 1975.

Gibson Desert Nature Reserve—Several old nests under a rock overhang in the Young Range.

Carnarvon Range Area—Old nests below a rock ledge over a pool at south end of range.

Yeo Lake Area—Old nests below a rock ledge at Miller Soak and twenty old nests under a ledge at a breakaway south-east of Stony Point.

FAMILY MOTACILLIDAE

Anthus novaeseelandiae (Gmelin) **Richard's Pipit**

Lake Disappointment Area—Recorded for Killagurra Gorge in August 1971 and two on the west side of Durba Hills in November 1975.

Gibson Desert Nature Reserve—Recorded in August 1973 and September 1966. On flats with scattered mulga, in wash areas and at the Young Range. Nest with three eggs under a small *Eremophila* at Charlies Knob in August 1973.

Carnarvon Range Area—Scarce. One on a burnt area south end of range in March 1976, two on sandplain south of range in July 1975 and two at north end of range in November 1975.

Yeo Lake Area—Common on samphire flats and in open mulga savannah in March 1976 and May 1966.

FAMILY CAMPEPHAGIDAE

Coracina maxima (Ruppell) **Ground Cuckoo-shrike**

Yeo Lake Area—Flock of seven near Yeo Homestead in March 1976.

Coracina novaehollandiae (Gmelin) **Black-faced Cuckoo-shrike**

Lake Disappointment Area—Several at Durba Gorge in November 1975.

Gibson Desert Nature Reserve—One near Everard Junction in March 1976.

Carnarvon Range Area—Moderately common in March 1976 in gullies with River Gums. One at the south end of the range in November 1975. Nest with brooding adult on horizontal fork of eucalypt in gully, in 1975.

Yeo Lake Area—Moderately common in well wooded habitats. Recorded at Point Sunday, Stony Point, Miller Soak and Yeo Hills.

Lalage sueurii (Vieillot) **White-winged Triller**

Lake Disappointment Area—Recorded at Killagurra Gorge in August 1971 and one along dunes at Durba Hills in November 1975.

Gibson Desert Nature Reserve—Uncommon. Ones and twos in March 1976, July 1963 and August 1973. Mostly on open flats with mulga.

Carnarvon Range Area—Uncommon. In flowering trees and shrubs in November 1975.

FAMILY PACHYCEPHALIDAE

Microeca leucophaea (Latham) **Brown Flycatcher**

Gibson Desert Nature Reserve—One in mulga at Young Range in March 1976.

Yeo Lake Area—One in mulga-mallee woodland in March 1976.

Petroica goodenovii (Vigors and Horsfield) **Red-capped Robin**

Moderately common at Gibson Desert Nature Reserve, Carnarvon Range Area and Yeo Lake Area. Mainly in well wooded areas of mulga and mallee, and in thickets along creeks.

Breeding at Carnarvon Range Area in November 1975. Nest 1.5 m up in a Kurara (*Acacia tetragonophylla*) bush with two feathered nestlings.

Petroica cucullata (Latham) **Hooded Robin**

Lake Disappointment Area—Recorded at Killagurra Gorge in August 1971.

Gibson Desert Nature Reserve—Moderately common. Mainly open mulga. Pair with two fledglings (just flying) 11 km west of Everard Junction in August 1973.

Carnarvon Range Area—One in sandplain area south of the range in July 1975 and another in November 1975.

Yeo Lake Area—Moderately common. Mainly in mulga thickets around base of hills and breakaways.

Pachycephala rufiventris (Latham) **Rufous Whistler**

Lake Disappointment Area—Calling at Killagurra Gorge and Durba Hills in November 1975.

Gibson Desert Nature Reserve—Common. Mostly in mulga thickets around ranges and along small creeks with eucalypts.

Carnarvon Range Area—Common. Mainly along gullies and creeks with eucalypts.

Yeo Lake Area—Common in all wooded habitats.

Colluricincla harmonica (Latham) **Grey Shrike-thrush**

Lake Disappointment Area—Seen and heard daily along the creeks at Durba and Killagurra Gorges in November 1975. Also recorded in August 1971.

Gibson Desert Nature Reserve—Moderately common. Two around the Young Range in March 1976 and five pairs at Charlies Knob in August 1973. Nest with three eggs in a mulga at Charlies Knob in August 1973.

Carnarvon Range Area—Moderately common along gullies and creeks with thickets of *Eucalyptus*, *Acacia* and *Callitris*.

Yeo Lake Area—Moderately common. Ones and twos in mallee near Stony Point and mulga at Yeo Hills.

FAMILY FALCUNCULIDAE

Oreoica gutturalis (Vigors and Horsfield) **Crested Bell bird**

Gibson Desert Nature Reserve—Moderately common. Ones and twos mainly around the Browne and Young Ranges in mulga and eucalypts.

Carnarvon Range Area—Uncommon. Two at south end of range in July 1975 and one calling along creek at same place in November 1975.

Yeo Lake Area—Moderately common. Mainly areas of good mulga woodland and mallee woodland around Point Sunday, Stony Point and Yeo Hills.

Psophodes cristatus (Gould) **Western Wedgebill**

Gibson Desert Nature Reserve—Scarce in August 1973. Two in open mulga-spinifex 13 km north of Young Range and one heard singing 12 km west of Everard Junction.

FAMILY MONARCHIDAE

Rhipidura leucophrys (Latham) **Willie Wagtail**

Lake Disappointment Area—Pair in Durba Gorge in November 1975.

Gibson Desert Nature Reserve—Moderately common. Mainly around the Browne and Young Ranges and along creeks with thickets of mulga.

Carnarvon Range Area—Moderately common. Ones and twos along creeks and gullies at the south end of the range.

Yeo Lake Area—Moderately common. Mainly in mulga and mallee woodland.

FAMILY GRALLINIDAE

Grallina cyanoleuca (Latham) **Magpie-lark**

Carnarvon Range Area—Single birds on the sandplain south of the range in March 1976 and July 1975.

Yeo Lake Area—Recorded for Yeo Lake by Pianka and Pianka (1970, p.22).

FAMILY ORTHONYCHIDAE

Cinlosoma cinnamomeum Gould **Cinnamon Quail-thrush**

Lake Disappointment Area—Calling along creek below Durba Gorge in November 1975.

Gibson Desert Nature Reserve—Common. Mainly on the slopes of the breakaways vegetated with open mulga and low *Eremophila*. Pairs and groups of up to eight (including several juveniles) at the Young Range in August 1973.

Carnarvon Range Area—One at edge of creek with mulga and spinifex in November 1975.

Yeo Lake Area—Moderately common to common on the rock strewn slopes of breakaways with open mulga and low *Eremophila*, *Cassia* and *Scaevola*.

Pomatostomus temporalis (Vigors and Horsfield) **Grey-crowned Babbler**

Carnarvon Range Area—Several old nests found in mulga trees in July 1975.

Pomatostomus superciliosus (Vigors and Horsfield) **White-browed Babbler**

Lake Disappointment Area—Several at Durba Gorge in November 1975.

Gibson Desert Nature Reserve—moderately common. Mainly in good stands of mulga and eucalypts along creeks and around the ranges. Many old nests in mulga and gidgee trees. Fresh nest in mulga in August 1973.

Carnarvon Range Area—Moderately common in ranges, both in well-vegetated gullies and sparse vegetation on ridges.

Yeo Lake Area—Moderately common. Mainly in good stands of eucalypts and mulga around Yeo Lake, Point Sunday and Yeo Hills.

FAMILY ACANTHIZIDAE

Aphelocephala leucopsis (Gould) **Southern Whiteface**

Gibson Desert Nature Reserve—Uncommon. Two pairs in gidgee and *Eremophila* at the Young Range in March 1976 and one on an open stony flat with mulga 24 km west of Everard Junction in July 1963.

Yeo Lake Area—Common in well-wooded areas around breakaways.

Aphelocephala nigricincta (North) **Banded Whiteface**

Gibson Desert Nature Reserve—Moderately common. Mainly in open stony areas with scattered mulga, *Hakea*, *Grevillea*, *Eremophila* and spinifex. A nest with young near the Young Range in March 1976.

Gerygone fusca (Gould) **Western Flyeater**

Carnarvon Range Area—Two in eucalypts along creek at south end of the range in November 1975.

Smicrornis brevirostris (Gould) **Weebill**

Carnarvon Range Area—Moderately common in eucalypts along creeks and gullies at the range.

Yeo Lake Area—Moderately common in mallee woodlands.

Acanthiza pusilla (Shaw) **Brown Thornbill**

Carnarvon Range Area—Several at the south end of the range in March 1976.

Yeo Lake Area—Uncommon to moderately common. Mainly mallee and mulga woodland.

Acanthiza robustirostris Milligan **Slate-backed Thornbill**

Lake Disappointment Area—Recorded at Killagurra Gorge in August 1971.

Gibson Desert Nature Reserve—Moderately common. Mainly in low bushy mulgas around the Young Range. Nest with two eggs in a mulga on top of the Young Range in August 1973.

Carnarvon Range Area—Several in March 1976. All in *Acacia* sp. on the range.

Yeo Lake Area—Common around Yeo Hills in tall mulga on stony plateau, but scarce in other areas.

Acanthiza uropygialis Gould **Chestnut-rumped Thornbill**
Lake Disappointment Area—Recorded at Killagurra Gorge in August 1971.

Gibson Desert Nature Reserve—Common. Pairs and small flocks of up to fifteen on flats with low open mulga around the Young Range in March 1976 and August 1973. Pair with fledglings in mulga on plateau in August 1973.

Carnarvon Range Area—Moderately common. Mainly mulga thickets around the base of the range.

Yeo Lake Area—Moderately common to common. Mainly in mulga-mallee woodland at breakaways and on dunes. Breeding in May 1966.

Pyrholaemus brunneus Gould **Redthroat**

Gibson Desert Nature Reserve—Moderately common in thickets of *Acacia* sp. and bloodwoods around the Young Range.

Yeo Lake Area—Uncommon. Three in May 1966, two at Stony Point in low bushes and one at Yeo Hills.

Calamanthus fuliginosus (Vigors and Horsfield) **Field Wren**

Yeo Lake Area—One calling on extensive samphire-saltbush flat near Turkey Hill in May 1966.

FAMILY MALURIDAE

Amytornis striatus (Gould) **Striated Grass-wren**

Gibson Desert Nature Reserve—Uncommon in March 1976. One on flats near the Browne Range, and two pairs flushed from dense spinifex on open sandy flat 4 km north of the Young Range. One of the latter birds was sitting in a nest constructed of soft grass and lined with spinifex seeds, spider web and spider egg cases. The nest measured 130 mm long and 90 mm wide with an opening near the top.

Malurus lamberti Vigors and Horsfield **Variiegated Wren**
Lake Disappointment Area—Recorded at Killagurra Gorge in August 1971.

Gibson Desert Nature Reserve—Moderately common. Mainly mulga thickets along creeks and wash areas with dense shrubbery.

Yeo Lake Area—One party of six, including a male in nuptial plumage, in open *Acacia* near Point Sunday in May 1966.

Malurus leucopterus Dumont **White-winged Wren**

Lake Disappointment Area—Recorded at Durba Springs in August 1971.

Gibson Desert Nature Reserve—Uncommon. Mostly in spinifex on gravelly or sandy flats. A female-plumaged bird was flushed from a recently-used nest in a low shrub near Everard Junction in August 1973.

Yeo Lake Area—Moderately common on samphire flats with saltbush and *Atriplex*.

Stipiturus ruficeps Campbell **Rufous-crowned Emu-wren**

Gibson Desert Nature Reserve—Pair with two fledglings on sandplain near Everard Junction in August 1973.

FAMILY SYLVIIDAE

Cincloramphus mathewsi Iredale **Rufous Songlark**

Gibson Desert Nature Reserve—One in a wash area with *Eucalypts* and *Acacia* 24 km west of Everard Junction in August 1973.

Cincloramphus cruralis (Vigors and Horsfield) **Brown Songlark**

Gibson Desert Nature Reserve—three single birds in open mulga and spinifex near Everard Junction in March 1976.

Carnarvon Range Area—One giving display flight and calling at north-west end of the range in November 1975.

Yeo Lake Area—One on an open flat with scattered mulga in March 1976 and another near Yeo Homestead in May 1966.

FAMILY NEOSITTIDAE

Neositta chrysoptera (Latham) **Australian Sittella**

Gibson Desert Nature Reserve—Moderately common in flocks of two to fifteen in mulga and eucalypts at Young Range.

Carnarvon Range Area—Flock of eight in mulga at south end of range in July 1975.

FAMILY CLIMACTERIDAE

Climacteris affinis Blyth **White-browed Tree-creeper**

Gibson Desert Nature Reserve—Six, including two juveniles in open mulga 56 km north of the Young Range in August 1973.

Climacteris rufa Gould **Rufous Tree-creeper**

Yeo Lake Area—A male collected in mixed mallee and marble gums (*E. gongylocarpa*) near Yeo Hills in May 1966.

FAMILY DICAETIDAE

Dicaeum hirundinaceum (Shaw) **Mistletoe-bird**

Lake Disappointment Area—Recorded at Durba Springs in August 1971 and ones and twos in eucalypts along Durba Gorge in November 1975.

Gibson Desert Nature Reserve—One in mixed *Acacia* and eucalypts along a creek in March 1976.

Carnarvon Range Area—Ones, twos and threes, mainly in eucalypts at south end of the range.

Yeo Lake Area—One near Point Sunday and another at Yeo Hills both in May 1966.

FAMILY PARDALOTIDAE

Pardalotus rubricatus Gould **Red-browed Pardalote**

Gibson Desert Nature Reserve—Single birds in July 1963 and September 1966 in a wash area with bloodwoods 24 km west of Everard Junction.

Pardalotus striatus substriatus Mathews **Red-tipped Pardalote**

Lake Disappointment Area—Recorded at Durba Springs in August 1971.

Carnarvon Range Area—Pair in eucalypts at south end of range in March 1976.

Yeo Lake Area—Moderately common to common. At stony Point and Yeo Hills in May 1966, mostly in mallee but also in mulga-mallee woodland.

FAMILY MELIPHAGIDAE

Lichmera indistincta (Vigors and Horsfield) **Brown Honeyeater**

Carnarvon Range Area—One in March 1976 and one in July 1975, both in a gully with eucalypts, *Grevillea* and *Acacia*.

Certhionyx niger (Gould) **Black Honeyeater**

Lake Disappointment Area—Recorded at Durba Gorge in August 1971 and several sightings at Durba Gorge and inter-dune adjacent to Durba Hills in November 1975.

Certhionyx variegatus Lesson **Pied Honeyeater**

Lake Disappointment Area—Recorded at Durba and Killagurra Gorges in August 1971 and one in mulga and one in interdune thicket near Durba Gorge in November 1975.

Gibson Desert Nature Reserve—Single birds in July 1963, August 1973 and September 1966.

Carnarvon Range Area—Three males at the south end of the range in November 1975 one in vegetation along a creek and two in *Hakea lorea*.

Yeo Lake Area—Two pairs in mulga woodland in May 1966, the males calling frequently.

Meliphaga virescens (Vieillot) **Singing Honeyeater**

Lake Disappointment Area—Uncommon. At Durba Hills and at Durba and Killagurra Gorges.

Gibson Desert Nature Reserve—Moderately common, in March 1976, August 1973 and September 1966. Mostly in mulga and eucalypts along creeks. Also on well-vegetated dunes. Breeding in September 1966.

Carnarvon Range Area—Moderately common in March 1976, July 1975 and November 1975. Mostly in areas of *Eucalyptus microtheca* and *Grevillea wickhami* at south end of range.

Yeo Lake Area—Uncommon. One in mulga-mallee in March 1976 and several at Yeo Hills in May 1966.

Meliphaga keartlandi (North) **Grey-headed Honeyeater**

Lake Disappointment Area—Recorded at Durba and Killagurra Gorges in August 1971 and two at Durba Gorge in November 1975.

Gibson Desert Nature Reserve—Three noted in March 1976. Two in stunted eucalypts near Everard Junction and one in open mulga near the Young Range. Two on spinifex sandplain with low shrubs in August 1973.

Carnarvon Range Area—Moderately common in March 1976, July 1975 and November 1975. Mainly in river gums and Minnerichie (*Acacia* spp.) flats and in mallee and *Grevillea wickhami* on the range.

Meliphaga plumula (Gould) **Yellow-fronted Honeyeater**

Yeo Lake Area—Moderately common to common. Ones, twos and flocks of up to fifteen. Mostly in sandplain areas with *Eucalyptus youngiana*, mallee and marble gums but occasionally in mulga. Pair feeding a juvenile Pallid Cuckoo in a mallee near Point Sunday in March 1976.

Meliphaga penicillata Gould **White-plumed Honeyeater**

Lake Disappointment Area—Moderately common. Pairs and small groups in eucalypts at Durba and Killagurra Gorges.

Phylidonyris albifrons (Gould) **White-fronted Honeyeater**

Lake Disappointment Area—Recorded at Killagurra Gorge in August 1971.

Gibson Desert Nature Reserve—One in mulga near Everard Junction in August 1973.

Carnarvon Range Area—several in eucalypts at the south end of the range in March 1976.

Yeo Lake Area—Uncommon in March 1976, common in May 1966. Small groups in stunted mallee on dunes and at Miller Soak in March 1976. In May 1966 many birds were attracted to flowering *Eremophila* at Point Sunday, Stony Point and Yeo Hills. Nest with two eggs in low bush in May 1966.

Manorina flavigula (Gould) **Yellow-throated Miner**

Lake Disappointment Area—Moderately common at Durba and Killagurra Gorges.

Gibson Desert Nature Reserve—Several calling at the Young Range in March 1976.

Carnarvon Range Area—Moderately common. Small groups of up to eight in eucalypts at base of range.

Yeo Lake Area—Common. Mainly small flocks of up to ten. Mostly in mallee woodland on sandplains, mallee-mulga woodland and in marble gums.

Acanthagenys rufogularis (Gould) **Spiny-cheeked Honeyeater**

Lake Disappointment Area—Recorded at Killagurra Gorge in August 1971.

Gibson Desert Nature Reserve—Uncommon in March 1976, August 1973 and September 1966. Ones and twos in open mulga on stony flats and in mulga woodland around ranges.

Carnarvon Range Area—Uncommon in March 1976, July 1975 and November 1975. Ones, twos and threes in open vegetation on the range.

Yeo Lake Area—Uncommon to moderately common in March 1976 and May 1966. Mainly in mulga-mallee woodland.

FAMILY EPTHIANURIDAE

Epthianura albifrons (Jardine and Selby) **White-fronted Chat**

Yeo Lake Area—Several pairs near Yeo Homestead in May 1966.

Epthianura aurifrons (Gould) **Orange Chat**

Yeo Lake Area—Common in May 1966. Flock of twelve on extensive samphire flat near Turkey Hill, two near Yeo Homestead and a flock of twelve on saltbush-samphire flat around claypan full of water at Yeo Hills.

Epthianura tricolor (Gould) **Crimson Chat**

Lake Disappointment Area—Uncommon in August 1971 and November 1975. Several pairs at Durba and Killagurra Gorges. One pair carrying food in November 1975.

Gibson Desert Nature Reserve—Common. Pairs and small flocks of up to seven. Mainly on flats and dunes with *Acacia*, *Grevillea* and *Hakea*. Nest with two young being fed by a male in a wash area 24 km west of Everard Junction in August 1973.

Carnarvon Range Area—Uncommon in November 1975. Pairs on open spinifex flats and on sandplain at south end of range.

Yeo Lake Area—Moderately common in May 1966. Pairs and small flocks on samphire-saltbush flats.

FAMILY PLOCEIDAE

Poephila guttata (Vieillot) **Zebra Finch**

Moderately common at Lake Disappointment Area; common at Gibson Desert Nature Reserve, Carnarvon Range Area and Yeo Lake area.

Breeding at Gibson Desert Nature Reserve in March 1976 and August 1973.

FAMILY ARTAMIDAE

Artamus personatus (Gould) **Masked Wood-swallow**

Gibson Desert Nature Reserve—Common in August 1973; less common in March 1976 and July 1963. Mostly areas with flowering trees and shrubs. Several nests with eggs in August 1973.

Carnarvon Range Area—Pairs and small flocks at south end of range in November 1975.

Yeo Lake Area—Common, in twos and threes in well-wooded areas. One flock of a hundred over a samphire flat.

Artamus cinereus (Vieillot) **Black-faced Wood-swallow**

Common at Gibson Desert Nature Reserve, Carnarvon Range Area and Yeo Lake area. Ones, twos, threes and small flocks of up to eight in all wooded habitats.

Artamus minor (Vieillot) **Little Wood-swallow**

Lake Disappointment Area—Several nesting in cliffs at Durba and Killagurra Gorges in November 1975.

Gibson Desert Nature Reserve—Scarce in March 1976. One at Mt Everard and three around the Young Range.

Carnarvon Range Area—Two birds building nests at south end of range in November 1975.

Yeo Lake Area—Flock of eight along breakaways at Yeo Hills in May 1966.

FAMILY CRACTICIDAE

Cracticus torquatus (Latham) **Grey Butcherbird**

Carnarvon Range Area—Uncommon in March 1976, July 1975 and November 1975. Mainly in thickets around base of range.

Yeo Lake Area—Moderately common. In woodlands.

Cracticus nigrogularis (Gould) **Pied Butcherbird**

Lake Disappointment Area—Pair with young at Durba Gorge in November 1975. Adult was feeding an *Amphibohurus* to a nestling. The lizard was wedged into the splintered end of a broken branch.

Gibson Desert Nature Reserve—One at Young Range in March 1976.

Carnarvon Range Area—Moderately common on the range and in eucalypts along creeks.

Yeo Lake Area—Moderately common in well-wooded areas, particularly mulga-mallee at hills and break-aways.

Cracticus tibicen (Latham) **Magpie**

Carnarvon Range Area—One at west side of range in November 1975.

Yeo Lake Area—One near Turkey Hill in March 1976.

Strepera versicolor (Latham) **Grey Currawong**

Yeo Lake Area—Two in mulga-mallee woodland near Stony Point in March 1976.

FAMILY PARADISAEIDAE

Ptilonorhynchus maculatus (Gould) **Spotted Bowerbird**

Carnarvon Range Area—One pair along a creek with *Ficus*, *Eucalyptus*, *Acacia* and *Callitris* at south end of range in March 1976 and a pair at same place in November 1975.

FAMILY CORVIDAE

Corvus orru Bonaparte **Australian Crow**

Lake Disappointment Area—A crow, probably of this species, seen at Durba and Killagurra Gorges in November 1975.

Corvus bennetti North **Little Crow**

Gibson Desert Nature Reserve—Several flying northwards over camp in March 1976.

Yeo Lake Area—Eleven near Stony Point in March 1976 and two in May 1966.

DISCUSSION

Forty-six species were recorded at Lake Disappointment Area, fifty-eight at Gibson Desert Nature Reserve, sixty-six at Carnarvon Range Area and seventy-five at Yeo Lake Area.

Most of the resident species, such as the Bourke Parrot, Rufous Whistler, Banded Whiteface, Slate-backed Thornbill, Chestnut-rumped Thornbill, Redthroat and Singing Honeyeater, were recorded from all the proposed and existing reserves. The majority of birds in the Little Sandy, Gibson and Great Victoria Deserts are highly nomadic and several visits during different seasons are required to establish their status. This group would include the Red-tipped Pardalote, Black Honeyeater, Pied Honeyeater, White-fronted Honeyeater, Orange Chat, Crimson Chat and Masked Wood-swallow.

The high number of species from Yeo Lake Area is partly because Ford's May 1966 visit was immediately after rains, which added vagrants such as the Wood

Duck, Black-tailed Native Hen, Banded Plover and Red-kneed Dotterel, and partly because of the greater habitat diversity of this area, with dunes, mulga-mallee, Marble Gums, samphire-*Atriplex* flats and breakaways. The mallee-Marble Gum woodland is not found on the other three reserves. Ford (1970) indicates that this belt north of the Nullarbor Plain is an important avenue between Eyre Peninsula and the South-West for several species such as the Red-tipped Pardalote and the Grey Currawong.

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PART V

AMPHIBIANS AND REPTILES

by L. A. SMITH¹ and R. E. JOHNSTONE¹

INTRODUCTION

The following list is based on specimens collected on proposed and existing reserves at Lake Disappointment (hereinafter designated LD) in the Gibson Desert (GD), at Carnarvon Range (CR) and at Yeo Lake (YL) by Department of Fisheries and Wildlife, Western Australian Museum, and CSIRO Wildlife Research personnel. McKenzie, and Burbidge and McKenzie (this publication) include details of personnel, itineraries and boundaries of the proposed and existing reserves visited. Relevant data from Western Australian Museum catalogues are included as well as data from Pianka (1969). His study areas Y and E were respectively 5 to 7 km East of Stony Point (28°05'S, 124°15'E), which is well within Yeo Lake proposed reserve, and 8 km NE of Dungs Table (28°08'S, 123°55'E) which is just outside the western boundary of Yeo Lake proposed reserve. Records from the latter locality are entered in square brackets.

Specimens collected by us are lodged in the Western Australian Museum under numbers R40325-40363, R51863-51945, R53510-53616 and R53620-53682.

Habitat notes are given where possible.

LIST OF SPECIES

ANURA

FAMILY LEPTODACTYLIDAE Ground Frogs

Cyclorana maini Tyler

Collected at LD, CR and YL.

Masses of tadpoles in drying pools in Yeo Lake on 9 March. Adults in pools at Durba Spring 26 November and Carnarvon Range 20 November.

FAMILY HYLIDAE Tree Frogs

Litoria rubella (Gray)

Collected at CR.

Adults and juveniles in same pool as *Cyclorana maini* but on 28 and 30 March.

REPTILIA

FAMILY GEKKONIDAE Geckos

Diplodactylus ciliaris Boulenger

Collected at LD, CR, YL and [E].

Up to 2 m above the ground in dead or sparse, open shrubs.

Diplodactylus conspicillatus Lucas and Frost

Collected at CR, YL and [E].

On sand among spinifex at night.

Diplodactylus elderi Stirling and Zeitz

Collected at LD, GD, YL and [E].

Burnt from *Plectrachne* and *Triodia* on various substrates. Never seen active at night, presumably because of its scansorial habits (it confines itself to stalking within spinifex clumps).

Diplodactylus stenodactylus Boulenger

Collected at [E].

Diplodactylus strophurus (Dumeril and Bibron)

Collected at GD and YL.

Found in dead or sparse shrubs.

Gehyra variegata (Dumeril and Bibron)

Collected at LD, CR and YL.

Mostly in trees (usually mulga). Also in leaf litter and under debris.

Gehyra sp.

Collected from LD and CR.

Lake Disappointment specimen from sandstone cliff above pool.

Heteronotia binoei (Gray)

Collected at LD and YL.

Yeo Lake specimens among jumbled laterite at Point Sunday breakaway.

Nephrurus laevis Mertens

Collected at CR and YL.

On dune crests at night.

Nephrurus levis pilbarensis Storr

Collected at CR.

Three on sand among spinifex at night.

Nephrurus vertebralis Storr

Collected at YL.

One on *Atriplex* flat and another on a sandy interdune.

Oedura marmorata Gray

Collected at CR.

All specimens active in trees or on sandstone at night.

Rhynchoedura ornata Günther

Collected at LD, CR, YL and [E].

On clayey soil at night.

FAMILY PYGOPODIDAE Legless Lizards

Delma nasuta Kluge

Collected at GD.

Burnt from *Plectrachne* on loamy alluvial soil.

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Lialis burtonis Gray
Collected at LD and [E].

Pygopus nigriceps (Fischer)
Collected at LD.

FAMILY AGAMIDAE **Dragon Lizards**

Amphibolurus caudicinctus caudicinctus × *mensarum*
Collected at LD and CR.
On bare expanses of sandstone.

Amphibolurus caudicinctus ? subsp.
Collected at GD.
One juvenile collected on laterite at Young Range.

Amphibolurus clayi Storr
Collected at YL and [E].
Burnt from spinifex on sandy interdune.

Amphibolurus fordi Storr
Collected at YL and [E].
One on dune crest.

Amphibolurus inermis (de Vis)
Collected at LD and [E].

Amphibolurus isolepis gularis Sternfeld
Collected at LD, CR, GD, YL and [E].
Common on sandy soil.

Amphibolurus minor Sternfeld
Collected at LD, YL and [E].
The specimen from Miller Soak (YL) was perched on a dead tree.

Amphibolurus reticulatus (Gray)
Collected at LD, GD and YL.
One in burrow in hard clayey floor of Yeo Lake. Also on bare stony ground with mulga.

Amphibolurus scutulatus Stirling and Zietz
Collected at YL.
Confined to heavier soils with mulga.

Diporiphora winneckeii Lucas and Frost
Collected at LD and [E].

Moloch horridus Gray
Collected at LD, YL and [E].
Yeo Lake specimen on a sandy track in interdune.

Lophognathus longirostris Boulenger
Collected at LD, CR and [E].
Along watercourses at Carnarvon Range and Durba Springs (LD).

FAMILY SCINCIDAE **Skinks**

Cryptoblepharus plagiocephalus (Cocteau)
Collected at LD and CR.
On tree trunks.

Ctenotus brooksi brooksi (Loveridge)
Collected at [E].

Ctenotus calurus Storr
Collected at GD, CR and [E].
Gibson Desert specimen running among spinifex mid-morning.

Ctenotus colletti nasutus Storr
Collected at [E].

Ctenotus dux Storr
Collected at CR, YL and [E].
Carnarvon Range specimen in "spinifex on dune".

Ctenotus grandis Storr
Collected at LD, GD, CR and [E].
6 specimens collected by our party; all from sandy soil.

Ctenotus helenae Storr
Collected at LD, GD, YL and [E].
Two specimens were burnt from *Plectrachne* on alluvial soil in watercourse running out of Young Range (GD).

Ctenotus leae (Boulenger)
Collected at [E].

Ctenotus leonhardii (Sternfeld)
Collected at LD, GD, and YL.

Ctenotus pantherinus ocellifer (Boulenger)
Collected at LD, GD, CR, YL and [E].
From spinifex on various substrates (sand, loam and sandstone).

Ctenotus piankai piankai Storr
Collected at [E].

Ctenotus quattuordecimlineatus Sternfeld
Collected at GD, YL and [E].
Specimen from Yeo Lake in interdune vegetated with marble gums and mallee. Gibson Desert specimen from side of poorly vegetated dune.

Ctenotus affin. *saxatilis* Storr.
Collected at LD and CR.
Specimens from tangles of *Plectrachne* and low shrubs from gullies in Carnarvon Range and deep couch grass at edge of pool, Durba Spring.

Ctenotus schomburgkii Peters
Collected at YL and [E].
Two specimens from loamy soil with mulga.

Ctenotus uber uber Storr
Collected at CR.
One under mulga log.

Egernia depressa (Günther)
Collected at CR.

Egernia formosa Fry

Collected at CR.

Under bark of mulga 1.5 m above ground.

Egernia inornata Rosèn

Collected at YL and [E].

Egernia striata Sternfeld

Collected at GD, CR, YL and [E].

All three collected by our party were from break-back traps; two from one burrow complex on clayey soil with mulga (YL) and one from side of low dune (GD).

Lerista bipes (Fischer)

Collected at GD, YL and [E].

Burnt from spinifex or scooped from top few centimetres of sand on dunes.

Lerista desertorum (Sternfeld)

Collected at CR and [E].

Menetia greyii Gray

Collected at GD and [E].

From spinifex on gravelly flat.

Morethia butleri Storr

Collected at [E].

Omolepida branchialis (Günther)

Collected at CR.

Stony ground at foot of range.

Sphenomorphus richardsonii (Gray)

Collected at LD, GD and YL.

Two specimens from Yeo Lake dug from burrow in moist loamy soil under rubbish.

Tiliqua multifasciata Sternfeld

Collected at CR.

In pit trap in red sandplain with spinifex.

FAMILY VARANIDAE **Goannas**

Varanus acanthurus Boulenger

Collected at CR.

At bottom of scree slope with spinifex and *Acacia*.

Varanus eremius Lucas and Frost

Collected at [E].

Varanus giganteus (Gray)

Collected at LD, GD and CR. Observed at YL.

Varanus gouldii (Gray)

Collected at CR, YL and [E].

Varanus tristis (Schlegel)

Collected at LD, GD, YL and [E].

Specimens from Red Bluff (YL) and Young Range (GD) from unused Fairy Martin nests. Specimen from Durba Spring (LD) from dead tree.

FAMILY TYPHLOPIDAE **Blind Snakes**

Typhlina nigroterminata (Parker)

Collected at LD.

FAMILY BOIDAE **Pythons**

Liasis childreni (Gray)

Collected at LD and YL.

Among laterite boulders at Point Sunday (YL).

FAMILY ELAPIDAE **Front-fanged Snakes**

Furina christieana (Fry)

Collected at LD.

Pseudechis australis (Gray)

Collected at CR and YL.

One in well at Yeo Lake, another in Elliott trap in gully in Carnarvon Range.

DISCUSSION

We collected 52 species of herptile on the four proposed and existing reserves: 22 from the Lake Disappointment Area, 18 from Gibson Desert Nature Reserve, 30 from Carnarvon Range Area and 27 from Yeo Lake Area. With the addition of data derived from previous collecting, 47 species are known from Yeo Lake.

It is difficult to compare the faunas of the individual areas because we do not know how complete the species lists are, although Pianka's (1969) thorough collecting gives some indication (44 species of lizards, compared to our 27 herptiles, for the Yeo Lake area).

When we combine Pianka's Yeo Lake and Dunges Table lists with our combined list for the four areas, most species which could be expected in the Little Sandy, Gibson and Great Victoria Deserts are present. The few absentees are mostly fossorial herptiles such as *Neobatrachus*, *Lerista*, *Typhlina* and *Vermicella* spp.

One of the two *Vermicella anomala* collected in the Eastern Division of Western Australia is from Well 24 (Canning Stock Route), about 50 km NE of the Lake Disappointment area. Other important specimens from Well 24 are the only Eastern Division specimen of *Sphenomorphus fasciolatus* and a series of 13 *Amphibolurus isolepis isolepis* x *Amphibolurus isolepis gularis* hybrids.

One of only 6 known specimens of *Ctenotus ariadnae* is from 96 km east of Dunges Table, only 16 km outside the eastern boundary of the Yeo Lake proposed reserve (Storr 1968). This species is only known from four localities.

The Western Australian Museum has two *Neobatrachus centralis* from 32 km south of Durba Hills, just outside the Lake Disappointment Area.

Pianka's study area E is the type locality of *Ctenotus colletti nasutus* and *Ctenotus dux*.

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PART VI

CONCLUSIONS

by A. A. BURBIDGE¹ and N. L. MCKENZIE¹

The papers in this Bulletin, when added to the data presented by Burbidge *et al.* (1976), provide a summation of our knowledge of eight existing and proposed nature reserves in the Little Sandy, Gibson and Great Victoria Deserts of Western Australia.

Two areas in the system of desert conservation reserves proposed by the Conservation Through Reserves Committee (1974) still have to be examined in detail—the Rudall River National Park which includes portions of the Great Sandy and Little Sandy Deserts, and the Great Victoria Desert Nature Reserve which includes parts of the Great Victoria Desert and Nullarbor Plain (see Fig. 1 in McKenzie, this publication). Furthermore, as recommended by the Environmental Protection Authority (1975), further investigations need to be made in the Great Sandy Desert from which reserves representing this desert can be delineated. Thus, only in the Gibson Desert have we surveyed all the existing or proposed conservation reserves.

Table 1 lists the plant formations delineated by Beard (1974) in the Gibson Desert. It includes an estimate of their relative extent and the area of each included in the proposed Baker Lake Nature Reserve and the Gibson Desert Nature Reserve. It can be seen that the two areas are quite different although, overall, all the mapped formations except one—*Acacia pachycarpa* shrub steppe—are represented. This formation is developed in the northern Gibson Desert and in the Great Sandy Desert and should be included in reserve proposals for the latter.

When reviewing the adequacy of the reserves with respect to vertebrate animals, we have chosen groups which are reasonably abundant in good seasons, relatively easy to collect, well known taxonomically and rich in species.

Table 2 shows the distribution of small dasyurid marsupials and native rodents in seven of the eight areas so far examined—the Plumridge Lakes Nature Reserve is omitted because Burbidge *et al.* (1976) worked mainly in the Nullarbor Plain plant formations of that reserve. It can be seen that eleven species have been recorded, numbers from individual areas ranging from two to nine. Two species known to be extant in the region have not been collected—*Antechinomys laniger* and *Sminthopsis froggatti*. Available habitat data for desert populations of these species suggest that they have been

overlooked rather than that they are absent from the reserve system; apparently suitable mulga habitat is present.

Table 3 lists the occurrence of two genera of diurnal lizards—*Amphibolurus* (Agamidae) and *Ctenotus* (Scincidae). Distribution data given in Storr (1968) and Pianka (1969) show that only one of the species known from the Great Victoria, Gibson or Little Sandy Deserts has not been recorded from the proposed conservation reserve system, i.e. *Ctenotus ariadnae*.

The above data suggest that the system of conservation reserves proposed by the Conservation Through Reserves Committee (1974) does include habitats for most vertebrate animals. However, it does not provide information on the value of the system in conserving species which have declined in abundance, are cryptic, or occur only in isolated colonies. Thus the conservation status of all species of medium sized mammals, e.g. *Lagorchestes hirsutus*, *Isodon auratus*, *Perameles eremiana*, *Macrotis lagotis* and *Notoryctes typhlops* is uncertain (McKenzie *et al.*, this publication). Burbidge and Fuller (in press) have recently suggested that some of these species are extinct in the Warburton Region but others still remain at low densities. Further work is needed to clarify this situation.

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TABLE 1.
GIBSON DESERT PLANT FORMATIONS IN EXISTING AND PROPOSED NATURE RESERVES
From Beard (1974a, 1974b), Burbidge *et al.* (1976), Burbidge and McKenzie (this publication)

Vegetation Type	Beard/Webb Formula	Description	Extent	Area in Reserves (km ²)		
				Baker Lake Area	Gibson Desert Nature Reserve	Total
Low Woodland	a ₁ Li	mulga low woodland	moderate	1 561	....	1 561
Shrubland	a ₁ Li	mulga low woodland between sandhills	moderate	852	....	852
Savannah	a ₁ Si	mulga scrub on stony hills	moderate	....	3 840	3 840
Tree Steppe	e ₁₇ Mi.xGc	Coolabah, mixed grasses and spinifex	moderate	....	740	740
Shrub Steppe	c ₁ Mp.t ₂ Hi	groves of Desert Oak between sandhills	moderate	....	1 260	1 260
	a ₁ Sr.t ₂ Hi	mixed <i>Acacia</i> shrub steppe on sandplain	small	....	230	230
	a ₁ Sr.t ₂ Hi	mixed <i>Acacia</i> shrub steppe on sandplain between sandhills	moderate	1 613	920	2 533
	a ₁ Sr/eSi.t ₂ Hi	mulga and mallee between sandhills	small	1 710	....	1 710
Steppe Parkland	a ₅ Sr.t ₂ Hi	<i>Acacia pachycarpa</i> and spinifex on laterite	moderate	....	....	....
Succulent Steppe	a ₁ Sp.t ₂ Hi	mulga parkland on lateritic plains	large	3 871	11 300	15 171
Salt Lake	xCl	saltbush on samphire	small	....	120	120
			small	148	180	328
Totals				9 755	18 590	28 345

TABLE 2.
RODENT AND SMALL DASYURID SPECIES RECORDED IN EXISTING AND PROPOSED RESERVES
Data from Burbidge *et al.* (1976), McKenzie *et al.* (this publication)

SPECIES	GREAT VICTORIA DESERT			GIBSON DESERT		LITTLE SANDY DESERT	
	QVSNR	NJNR	YLA	BLA	GDNr	CRA	LDA
<i>Dasyercus cristicauda</i>	....	....	....	X	....	....	....
<i>Antechinus macdonnellensis</i>	....	....	....	X	X	....	....
<i>Ningauai ridei</i>	X	X	....	X	X	X	....
<i>Sminthopsis longicaudata</i>	....	....	....	X	....	....	....
<i>Sminthopsis crassicaudata</i>	....	....	....	X	....	....	....
<i>Sminthopsis hirtipes</i>	X	X	....	....	....	....	....
<i>Sminthopsis ooldea</i>	X	X	....	X	....	....	....
<i>Notomys mitchellii</i>	X	....	....	....	....	....	....
<i>Notomys alexis</i>	X	X	X	X	X	X	X
<i>Pseudomys hermannsburgensis</i>	X	X	X	X	X	X	X
<i>Pseudomys desertor</i>	....	....	....	X	....	....	....
Totals	6	5	2	9	4	3	2

Key—QVSNR: Queen Victoria Spring Nature Reserve. NJNR: Neale Junction Nature Reserve. YLA: Yeo Lake Area. BLA: Baker Lake Area. GDNr: Gibson Desert Nature Reserve. CRA: Carnarvon Range Area. LDA: Lake Disappointment Area.

TABLE 3.
 AMPHIBOLURUS AND CTENOTUS SPECIES RECORDED IN EXISTING AND PROPOSED RESERVES
 Data from Storr (1968), Pianka (1969), Burbidge *et al.* (1976) and Smith and Johnstone (this publication)

SPECIES	GREAT VICTORIA DESERT			GIBSON DESERT		LITTLE SANDY DESERT	
	QVSNR*	NJNR	YLA	BLA	GDNR	CRA	LDA
<i>Amphibolurus—</i>							
<i>caudicinctus</i>	....	....	....	....	X	X	X
<i>clayl</i>	X	....	X	....	....	....	....
<i>cristatus</i>	X	....	....	....	....	....	....
<i>fordi</i>	X	X	X	....	....	....	....
<i>inermis</i>	....	....	X	....	....	....	X
<i>isolepis</i>	X	X	X	X	X	X	X
<i>minor</i>	X	X	....	....	....	....	....
<i>reticulatus</i>	....	....	....	X	X	....	X
<i>scutulatus</i>	....	....	X	....	....	....	....
<i>Ctenotus—</i>							
<i>atlas</i>	X	....	....	....	....	....	....
<i>brooksi</i>	X	....	X	....	....	....	....
<i>calurus</i>	X	X	....	....	X	X	....
<i>colletti</i>	....	....	X	....	....	....	....
<i>dux</i>	....	X	X	X	....	X	....
<i>grandis</i>	....	X	X	....	X	X	X
<i>helenae</i>	....	X	X	X	X	....	X
<i>leae</i>	X	X	X	....	....	....	....
<i>leonhardii</i>	....	....	X	X	X	....	X
<i>pantherinus</i>	X	X	X	....	X	X	X
<i>piankai</i>	....	X	X	....	....	....	....
<i>quattuordecimlineatus</i>	X	X	X	....	X	....	....
<i>affin. saxatilis</i>	....	....	....	....	....	X	X
<i>schomburgkii</i>	X	....	X	....	....	....	....
<i>uber</i>	....	....	....	....	....	X	....
Totals	12	11	16	5	9	8	9

* Abbreviations as in Table 2.