

## Herpetofauna of the Lake MacLeod Region, Western Australia

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### Abstract

The herpetofauna consists of 14 families, 46 genera and 104 species of frogs, turtles, lizards and snakes. Brief notes are given on their local distribution, relative abundance and habitat preferences. *Triodia*-dominated habitats are important in the north, where many reptiles are shared with the neighbouring Exmouth region. In the south *Acacia*-dominated habitats prevail; several elements of the Shark Bay region have their northern limits here. South-west Australian species are largely restricted to the coastal strip, which is notable for its winter showers and relatively cool summers.

### Introduction

In their comparison of the herpetofauna of the Exmouth region with that of Shark Bay, Storr and Hanlon (1980) found considerable differences between the two areas, even though they were separated by a block of land only two degrees of latitude wide. That block of land is the subject of the present paper. It is located on the arid west coast of Western Australia between latitudes 23° and 25°S and extends inland to longitude 114°45'E (see Figure 1).

A generous grant from Mr and Mrs W.H. Butler to the Western Australian Museum enabled G. Harold and C.D. Winton to spend four weeks in October 1980 collecting in the Lake MacLeod region. Their specimens and observations and those of other visitors allow us to paint a broad picture of the herpetofauna. We are grateful to Mr A.J. Coventry for records and loans of specimens in the Museum of Victoria; the registered numbers of these specimens are prefixed with NMV. Specimens in the R series of the Western Australian Museum are cited without prefix.

This paper is one of several on the herpetofauna of the west coast of Western Australia. Others include Dell and Chapman (1977), Ford (1963), Smith (1976), Storr and Hanlon (1980), Storr, Hanlon and Dunlop (1983), Storr and Harold (1978, 1980a, 1980b) and Storr, Harold and Barron (1978).

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Herpetofauna of the Lake MacLeod Region

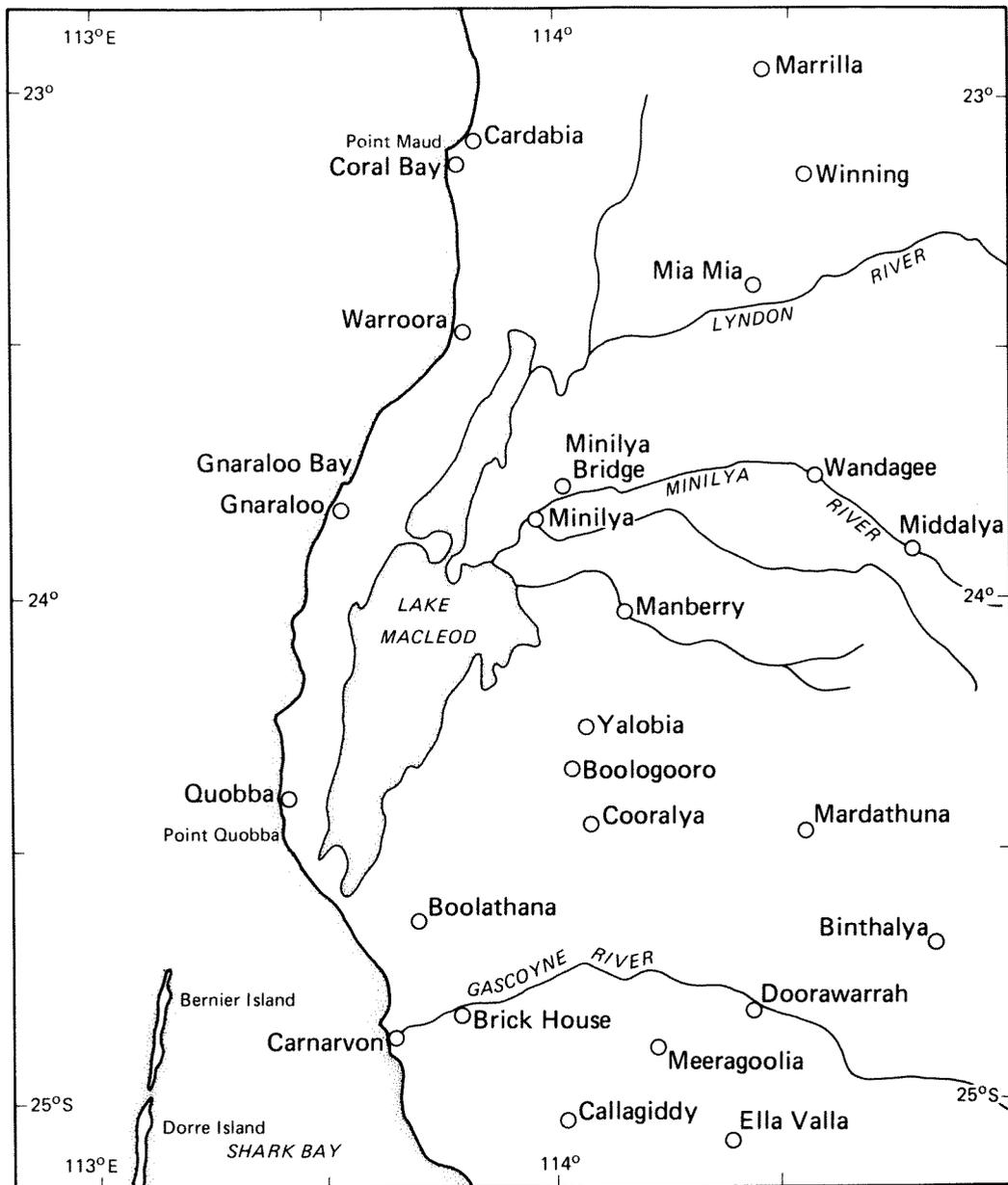


Figure 1 Map of Lake MacLeod region.

## The Environment

Mean annual rainfall (21-25 cm) is fairly uniform throughout the region but its seasonality varies with distance from the sea: more in summer in the interior, more in winter on the coast (Table 1). Summers are much hotter in the interior than on the coast, e.g. mean daily maximum temperature in January is 40.2°C at Winning and 30.8°C at Carnarvon.

Table 1 Mean monthly and yearly rainfall (in mm) at Winning in the interior and Carnarvon on the coast.

	J	F	M	A	M	J	J	A	S	O	N	D	Year
Winning	30	45	40	13	33	30	13	8	1	4	3	6	226
Carnarvon	20	23	15	9	42	50	46	17	4	4	1	1	232

Lying wholly within the Carnarvon Basin the region is one of gentle relief, and it is only in the far east, towards the low Gooch and Kennedy Ranges, that the altitude exceeds 150 m. The region is divisible into two zones: (1) the coastal strip; and (2) the remainder, herein termed the interior.

### The Coast

The narrow strip of country 1-10 km wide along the coast consists largely of white sand dunes or white to pink sandplains overlying aeolian limestone, which is exposed here and there as sea cliffs or as small outcrops inland. On the white and less stable sands near the sea the low open vegetation is dominated by such typically south-western littoral plants as *Spinifex longifolius*, *Nitraria schoberi*, *Scaevola crassifolia* and *Acanthocarpus preissii*. Inland they soon give way to denser and more varied assemblages of plants, including scrubs of *Acacia coriacea* and other wattles, and hummock grasslands of *Triodia*.

Reptiles characteristic of the coastal strip include *Diplodactylus alboguttatus*, *D. ornatus*, *Tympanocryptis parviceps*, *Ctenotus fallens*, *Lerista lineopunctulata*, *Morethia lineocellata* and *Vermicella littoralis*. Most of these are south-western species at or near the northern limit of their distribution. No frogs have yet been reported from this waterless tract, and none can be expected, except perhaps for *Arenophryne rotunda*.

### The Interior

Here all soils are red regardless of texture (sands, loams or clays) or situation (floodplains, stony rises or desert sandridges). In the west, that is about Lake MacLeod (a large saltmarsh), the lower Gascoyne and the coastal plain south of Carnarvon, much of the land is low-lying and subject to inundation. Eastwards the country gradually rises towards the Precambrian Shield.

The various soil types, and consequently the plant associations, are so intermingled as to make it impossible to subdivide the interior into a few broad zones. Generally the vegetation is dominated by open *Acacia* scrubs in the south, and by open or sparsely wooded hummock grasslands (*Triodia*) in the north. The numerous intermittent watercourses are lined with river gums (*Eucalyptus camaldulensis*).

Reptiles characteristic of *Triodia*-dominated habitats include *Diplodactylus conspicillatus*, *Gehyra pilbara*, *Ctenophorus clayi*, *C. femoralis*, *Diporiphora winneckeii*, *Ctenotus colleti rufescens*, *C. hanloni* and *C. iapetus*. All of them occur in the eastern deserts of Western Australia or are closely related to such taxa, and none of them extends south to the Shark Bay region.

Reptiles characteristic of *Acacia*-dominated habitats include *Diplodactylus squarrosus*, *D. strophurus*, *Caimanops amphiboluroides*, *Ctenophorus reticulatus*, *C. scutulatus*, *Ctenotus leonhardii*, *Egernia depressa*, *Lerista macropisthopus* and *L. muelleri*. All of these taxa are widespread in the mulga country of Western Australia, and most of them extend south to Shark Bay.

For further details of the physiography, soils and vegetation of the region see Beard (1975).

### Annotated List

#### Leptodactylidae

##### *Limnodynastes spenceri* Parker, 1940

One record from the interior: two specimens of *Limnodynastes* (10359-60) collected at Minilya probably belong to this species rather than to *L. ornatus* (Gray).

##### *Neobatrachus sutor* Main, 1957

Common at claypans and river pools, north at least to the lower Lyndon (a specimen from Winning could have belonged to this species or to *N. centralis* [Parker, 1940]).

##### *Neobatrachus wilsmorei* (Parker, 1940)

Common about claypans and watercourses, north to Warroora and 25 km NE of Minilya Bridge.

Several specimens of *Neobatrachus* collected in February, August and October at Winning, Barrabiddy Creek, Boolathana and Carnarvon could not be identified beyond their not being *N. wilsmorei*.

##### *Neobatrachus* sp.

M. Mahony of Macquarie University believes that a specimen (76583) from 18 km E of Gnaraloo belongs to an undescribed species of *Neobatrachus*.

*Uperoleia russelli* (Loveridge, 1933)

Recorded from two localities in the interior: the Minilya River near Minilya Bridge (including a specimen feeding in a patch of damp grass on an evening in August) and the Gascoyne River at Rocky Pool (two heard calling in October).

**Hylidae**

*Cyclorana maini* Tyler and Martin, 1977

Moderately common about claypans and watercourses in the interior. Collected in summer and autumn (December-May) at Winning, Minilya, Barrabiddy Creek, 17 km N of Boologooro, Manberry, and 40 km NE and 10 km N of Carnarvon.

*Cyclorana platycephala* (Günther, 1873)

Two records from the interior: single specimens (33208-9) from south-west of Winning and at 16 km S of Minilya.

*Litoria rubella* (Gray, 1842)

Common about the Gascoyne and in the interior north to Mia Mia. As elsewhere, this frog has become a commensal of man, living in wells, water-taps, etc.

**Cheloniidae**

*Chelonia mydas* (Linnaeus, 1758)

There are three specimens (12927, 67328-9) from Carnarvon.

**Dermochelyidae**

*Dermochelys coriacea* (Linnaeus, 1766)

One record: a specimen (1942) from Carnarvon.

**Cheluidae**

*Chelodina steindachneri* Siebenrock, 1914

One record: a specimen (57317) from Carnarvon. It has also been collected just outside our northern boundary in 22°58'S, 114°13'E.

**Gekkonidae**

*Crenadactylus ocellatus horni* (Lucas and Frost, 1895)

One record from far south-west: a specimen (NMV D1669) from Carnarvon.

*Diplodactylus alboguttatus* Werner, 1910

One record from west coast: eight specimens (71547-54) collected in low wattle and heath on whitish sand at Beagle Hill (Point Quobba). This represents a northward extension of known range of 150 km (from the Peron Peninsula).

*Diplodactylus conspicillatus* Lucas and Frost, 1897

The interior, south to 40 km NE of Carnarvon. Uncommon. Mainly red sands and sandy loams with *Triodia* and scattered *Acacia*.

*Diplodactylus ornatus* Gray, 1845

Coastal dunes from Point Maud south to Quobba. Uncommon.

*Diplodactylus pulcher* (Steindachner, 1870)

Throughout the interior. Moderately common. A wide variety of lightly vegetated red soils from stony clays to dune sands.

*Diplodactylus rankini* Storr, 1979

West coast, south nearly to Carnarvon (Miaboolia Beach). Common. Mainly in low vegetation of white dunes but also on samphire flats immediately inland from the dunes and on near-coastal pink sands.

*Diplodactylus squarrosus* Kluge, 1962

The interior, west nearly to Boolathana. Moderately common. Red soils (clays, loams and sands) with open *Acacia*.

*Diplodactylus stenodactylus* Boulenger, 1896

The interior, south to Cooralya and Mardathuna, and west nearly to Gnaraloo. Common. Red soils (sands to stony clays) with open *Acacia* and often with *Triodia*.

*Diplodactylus strophurus* (Duméril and Bibron, 1836)

Throughout the region. Moderately common. Open *Acacia* and other shrubs on a wide variety of soil types from the pinkish sands at Gnaraloo Bay to the red clays and sands of the interior.

*Gehyra pilbara* Mitchell, 1965

Northern interior south to Warroora and Mia Mia. Moderately common. On and in termitaria on red sands and sandy loams vegetated with *Triodia*.

*Gehyra variegata* (Duméril and Bibron, 1836)

Throughout the region. Very common. In trees and shrubs, especially of *Acacia*, on a wide variety of soil types.

*Heteronotia binoei* (Gray, 1845)

Throughout most of the region, but not yet recorded from far north-east around Winning. Common. Many habitat types, including white coastal sands.

*Nephrurus levis occidentalis* Storr, 1963

Throughout much of the region, but not recorded from north-east (north of the Lyndon). Common. Mostly red sands and sandy loams with low open *Acacia* and/or *Triodia*; also near-coastal white and pinkish sands.

*Rhynchoedura ornata* Günther, 1867

The interior, west to Minilya and Cooralya. Common. Red soils (sands, sandy loams and clay loams) with open *Acacia* and/or *Triodia*.

**Pygopodidae**

*Aprasia rostrata fusca* Storr, 1979

One record from north coast: a specimen (76888) collected in pink sand under leaf litter in *Acacia coriacea* shrubland near Gnaraloo.

*Delma nasuta* Kluge, 1974

One record: three specimens collected in *Triodia* on pale red sand 5 km SE of Gnaraloo.

*Delma tinctoria* DeVis, 1888

Throughout the region. Scarce.

*Lialis burtonis* Gray, 1835

Uncommon in white coastal dunes and near-coastal pink or red sands. Only one record from the interior: a specimen collected on red sandy loam with *Triodia* at an interdune 26 km NE of Minilya Roadhouse.

*Pygopus nigriceps nigriceps* (Fischer, 1882)

The interior, west nearly to Carnarvon (Brown Range). Uncommon. Red sands and sandy loams with open *Acacia*.

**Agamidae**

*Caimanops amphiboluroides* (Lucas and Frost, 1902)

Regionally known from only one small area in north-western interior: *Acacia* scrub at 6 km SE, 13 km SE and 34 km S of Warroora.

*Ctenophorus clayi* (Storr, 1966)

Much of the interior, but not far south (south of 24°40'S). Moderately common. Red sandridges with *Triodia* and red sandplains with open *Acacia*, low shrubs and *Triodia*.

*Ctenophorus femoralis* (Storr, 1965)

The interior, south to Warroora, Yalobia and Mardathuna. Common. Red sandridges with low open vegetation, especially *Triodia*, *Acacia* and other shrubs.

*Ctenophorus inermis* (DeVis, 1888)

Throughout the region. Very common. Most habitats, but not white coastal dunes.

*Ctenophorus isolepis isolepis* (Fischer, 1881)

One record from far north-western interior: eight specimens from 10 km N of Warroora.

*Ctenophorus maculatus badius* (Storr, 1965)

Far west, south to Carnarvon and east to the Minilya-Exmouth road (36 km N of Warroora). Common. Coastal and near-coastal red, pink or white sandridges and sandplains with low open shrubs, tussock grasses, sedges or *Triodia*.

Also a slightly different population on red sandridges with open *Acacia* around Doorawarrah in the southern interior. These lizards are larger and have a brighter red back than those from the coast.

*Ctenophorus reticulatus* (Gray, 1845)

Much of the region, but not the north-east (north of Minilya). Common. Mainly open *Acacia* on a wide variety of red soils.

*Ctenophorus rubens* (Storr, 1965)

Eastern interior, south to Yalobia and Mardathuna; also small area in western interior between Gnaraloo and Lake MacLeod. Common. *Triodia* (and occasionally tussock grasses) on red sands, sandy loams and interdunal clays.

*Ctenophorus scutulatus* (Stirling and Zietz, 1893)

Throughout the interior, west to Warroora, Boolathana and Brick House. Moderately common. Mainly open *Acacia* on red sands and loams.

*Diporiphora winneckei* Lucas and Frost, 1896

North-eastern interior, south to Wandagee (and west to Marrilla). Scarce. Red sands and loams with *Triodia*.

*Gemmatophora gilberti gilberti* (Gray, 1842)

Far north-west coast, south to Coral Bay. Moderately common. Beaches, cliffs and dunes; sheltering in tidal debris, *Spinifex longifolius* and shrubs.

*Gemmatophora longirostris* (Boulenger, 1883)

Patchily distributed throughout the region, but not reported from coastal country between Quobba and Carnarvon. Common in river gums and other vegetation along watercourses and around claypans; moderately common in *Acacia* scrubs and *Ficus platypoda* thickets of north-western interior south to Gnaraloo; uncommon elsewhere.

*Moloch horridus* Gray, 1841

The interior. Uncommon. Red sands and sandy loams with low open vegetation.

*Pogona minor minor* (Sternfeld, 1919)

Throughout the region. Common. Most habitats, including white coastal sands.

*Tympanocryptis cephal* Günther, 1867

One record from far eastern interior: a specimen (14060) collected at Wandagee.

*Tympanocryptis parviceps* Storr, 1964

Coastal dunes south to Point Quobba. Moderately common. White sands with low open vegetation.

**Scincidae**

*Cryptoblepharus carnabyi* Storr, 1976

Regionally known only from mallee scrub 5 and 9 km SE of Gnarlloo and from a park in Carnarvon.

*Cryptoblepharus plagiocephalus* (Cocteau, 1836)

One record from extreme north-west: a specimen (16967) collected on a limestone outcrop 13 km N of Cardabia.

*Ctenotus colletti rufescens* Storr, 1979

Two records from eastern interior: solitary individuals observed by G. Harold on red sands vegetated with low shrubs and *Triodia*, one at 6 km N of Mia Mia, the other at 3 km NW of Mardathuna.

*Ctenotus fallens* Storr, 1974

One record from west coast: a specimen (32588) collected in dense scrub at Point Quobba. (Three specimens from Ningaloo, a little north of the present region, were included by Storr and Hanlon [1980] in *C. saxatilis* but are better treated as *C. fallens*.)

*Ctenotus hanloni* Storr, 1980

The interior, west nearly to Gnarlloo and south to Mardathuna. Uncommon. Red sandy loams and pink sands with *Triodia*.

*Ctenotus helenae* Storr, 1969

Two records from far northern interior: one specimen (36080) collected in *Triodia-Acacia* on clay near Winning, the other (63682) among grass tussocks on

red clay with low open *Acacia* 32 km E of Cardabia. (The specimen [5340] cited by Storr [1975] as coming from 'near Carnarvon' was actually collected at Marrilla.)

*Ctenotus iapetus* Storr, 1975

Northern interior, south to Quobba Station and Mia Mia. Uncommon. Red sandridges and sandplains with *Triodia*.

*Ctenotus leonhardii* (Sternfeld, 1919)

The flatlands east of Lake MacLeod, from 26 km E of Minilya Bridge south to 40 km NE of Carnarvon. Uncommon. Clayey floodplains and adjacent sandplains.

*Ctenotus pantherinus ocellifer* (Boulenger, 1896)

Northern interior, south and west nearly to Gnaraloo. Uncommon. Red sands and brownish loams with low open vegetation.

*Ctenotus schomburgkii* (Peters, 1863)

One record from far northern interior: a specimen (63683) collected among grass tussocks and low open *Acacia* on red clay 32 km E of Cardabia.

*Ctenotus severus* Storr, 1969

One record: a specimen (8214) from Warroora.

*Ctenotus uber uber* Storr, 1969

North-eastern interior, west to Winning and south to Wandagee. Uncommon. Red loamy flats.

*Egernia depressa* (Günther, 1875)

Western interior, north to Warroora and east to Boologooro. Moderately common. Mainly *Acacia* scrubs, where it commonly shelters in hollow logs.

*Eremiascincus fasciolatus* (Günther, 1867)

One record from far eastern interior: a specimen (71739) collected on a red sandridge 16 km SE of Mardathuna.

*Eremiascincus richardsonii* (Gray, 1845)

One record: three specimens (8212-3, 8232) from Warroora.

*Lerista bipes* (Fischer, 1882)

North-eastern interior, south and west to Mia Mia. Uncommon. Sparsely vegetated, red sands and sandy loams.

*Lerista connivens* Storr, 1972

Western, east to 12 km NW of Mia Mia and 27 km E of Cooralya. Uncommon. In litter beneath *Acacia* on red or brown sands and sandy loams.

*Lerista elegans* (Gray, 1845)

Southern interior, north to Gnaraloo and Mardathuna. Scarce. In or under leaf litter on red or pink sands.

*Lerista haroldi* Storr, 1983

The unique specimen (81199) of this skink came from 0.5 km S of Gnaraloo HS.

*Lerista lineopunctulata* (Duméril and Bibron, 1839)

West coast, south to Point Quobba and inland to 14 km SE of Gnaraloo. Moderately common. Mainly in white beach dunes, but also further inland on pinkish sands and pale brown sandy loams with low shrubs and *Triodia* or *Atriplex*. (The specimens [4775-6] cited by Storr [1972] as coming from Carnarvon were actually collected in the Exmouth region.)

*Lerista macropisthopus* (Werner, 1903)

The interior, north to Gnaraloo and Mia Mia; also coast at 2 km SSW of Carnarvon. Common. Mainly in leaf litter under *Acacia* and *Eucalyptus* (mallee) on red loams and sands; also in litter beneath shrubs on coastal white sands near Carnarvon.

*Lerista muelleri* (Fischer, 1881)

The interior, west to 21 km NE of Warroora, Boologooro and Brick House. Common. Under leaf litter beneath *Acacia* and *Eucalyptus* (mallee) on red sands, loams and clays.

*Lerista nichollsi petersoni* Storr, 1976

Two records from eastern interior: two specimens (81828-9) from 10 km N of Wining, and one (76842) collected in soil under litter in open *Acacia-Triodia* on red sandy loam 10 km W of Manberry.

*Lerista planiventralis* (Lucas and Frost, 1902)

Uncommon in west, on pinkish sands inland to Warroora and Gnaraloo. Also one record from south-eastern interior: a specimen (71597) collected on a red sandridge with open *Acacia* and other shrubs 9 km SE of Doorawarrah.

*Lerista praepedita* (Boulenger, 1877)

Regionally recorded only at or near Gnaraloo. Common. In soil under litter on pink or red sands vegetated with *Acacia*, *Eucalyptus* and other shrubs.

*Lerista uniduo* Storr, 1984

The interior, west nearly to Gnaraloo (10 km SSE of homestead) and Carnarvon (16 km E of town). Common. Red or pale brown sands and sandy loams with open *Acacia* or other low trees over *Triodia*, *Plectrachne* or soft grasses.

*Menetia greyii* Gray, 1845

Widely but sparsely distributed throughout region, including islet off Point Quobba. Locally common (Gnaraloo) but generally scarce. Leaf litter, especially beneath *Acacia* scrubs on sandy soils.

*Morethia lineoocellata* (Duméril and Bibron, 1839)

West coast, inland to 5 km SE of Gnaraloo. Uncommon. White coastal dunes and near-coastal white or pinkish sands with low open vegetation.

*Morethia obscura* Storr, 1973

One record: two specimens (76717-8) collected in leaf litter beneath mallee over low open *Acacia* and *Triodia* on a red sandridge 9 km SE of Gnaraloo.

*Morethia ruficauda exquisita* Storr, 1973

One record from far northern interior: a specimen (63690) from 13 km S of Marrilla.

*Omolepida branchialis* (Günther, 1867)

Northern interior, south to Gnaraloo, Manberry and Mardathuna. Uncommon. In *Triodia* or leaf litter on red or pinkish sands.

*Tiliqua multifasciata* (Sternfeld, 1919)

One record from interior: a specimen (22946) from 20 km N of Boologooro.

*Tiliqua occipitalis* (Peters, 1863)

Far south-west, north to 23 km NNW of Carnarvon and east to Brick House. Scarce.

*Tiliqua rugosa rugosa* (Gray, 1827)

Far south-west, north to Boolathana and east to Brick House. Common in the Carnarvon plantations; uncommon elsewhere.

**Varanidae**

*Varanus acanthurus* Boulenger, 1885

One record from far north: a specimen (76584) collected in a termitarium 11 km NE of Warroora.

*Varanus caudolineatus* Boulenger, 1885

The interior, west to Warroora (and Callagiddy). Scarce.

*Varanus eremius* Lucas and Frost, 1895

The interior, west to Booloogooro (and Callagiddy). Scarce. Red sands. One observed pursuing an adult *Ctenophorus rubens*.

*Varanus giganteus* (Gray, 1845)

One record from far north-west: one observed at a limestone gully 26 km N of Warroora.

*Varanus gouldii* (Gray, 1838)

The interior, west nearly to Carnarvon (11 km E of town). Uncommon. Red sands, loams and clays, usually with open *Acacia*.

### Typhlopidae

*Ramphotyphlops grypus* (Waite, 1918)

One record from the interior: a specimen (NMV D4812) from Middalya. (It has also been collected at Callagiddy, just south of our region.)

*Ramphotyphlops hamatus* Storr, 1981

One record from the interior: a specimen (34570) from Rocky Pool, Gascoyne River (50 km E of Carnarvon).

### Boidae

*Liasis childreni* (Gray, 1842)

Evidently widespread and moderately common; the seven regional specimens in the Western Australian Museum come from Warroora, Wandagee, Booloogooro and Carnarvon, and it has been collected at Callagiddy just south of our region.

*Liasis perthensis* Stull, 1932

One record from the interior: a specimen (NMV D4568) from Middalya.

### Elapidae

*Acanthophis pyrrhus* Boulenger, 1898

Three records from north-eastern interior: a specimen (49985) collected between Manberry and Williambury Stations, and two (71228, 71601) from red sandy soils with *Acacia* and *Triodia* at 16 km NNW of Mia Mia and 5 km SW of the Lyndon River bridge respectively.

*Demansia calodera* Storr, 1978

Moderately common near west coast, but only one record from more than 20 km inland, namely a specimen (14055) from Wandagee Station.

*Demansia reticulata cupreiceps* Storr, 1978

Eastern interior, generally west to Booloogooro (and Callagiddy); also the lower Gascoyne downstream nearly to Carnarvon. Common. As in the Exmouth region, the ranges of the two *Demansia* tend to be mutually exclusive.

*Denisonia fasciata* Rosén, 1905

Eastern interior, west to Minilya (and Ella Valla). Uncommon.

*Furina ornata* (Gray, 1842)

One record from northern interior: a specimen (80702) collected on red loam vegetated with *Acacia* 27 km SW of Mia Mia.

*Pseudechis australis* (Gray, 1842)

Western, east to the Minilya-Exmouth road (50 km N of Warrora) and Meera-goolia. Apparently uncommon.

*Pseudonaja modesta* (Günther, 1872)

The interior, west to Warroora and Boolathana. Common; apparently outnumbering its congener (*P. nuchalis*) in the north-east and far east. In a wide variety of open or lightly wooded habitats and on all soil types from red sands to reddish clays.

*Pseudonaja nuchalis* Günther, 1858

Throughout the region. Common. Even wider in its habitat preferences than *P. modesta* and outnumbering that species in the western half of the region.

*Rhinoplocephalus punctatus* (Boulenger, 1896)

Two records from north-eastern interior: a specimen (80725) from Winning and one (NMV D5381) from Minilya.

*Vermicella approximans* (Glauert, 1954)

One record: a specimen (81710) caught after dark when it surfaced on red sand in interdune 10 km SSE of Gnaraloo.

*Vermicella bertholdi* (Jan, 1859)

The interior, west nearly to Carnarvon, e.g. 8 km SSE of Boolathana. Moderately common.

*Vermicella littoralis* Storr, 1968

West coast, south to Gnaraloo. Moderately common. White coastal dunes and the pinkish sands a little further inland.

## Hydrophiidae

*Ephalophis greyii* M.A. Smith, 1931

One record: a specimen (32023) from Carnarvon.

*Hydrophis elegans* (Gray, 1842)

Several records: a specimen from the ocean beach near Warroora, one from the beach at Point Quobba, and nine from Carnarvon (offshore as well as on beaches).

*Hydrophis major* (Shaw, 1802)

There are 13 specimens in the Western Australian Museum from Carnarvon and vicinity, including the seas 70 km NW and 40 km SW of the town and Miaboolia Beach.

*Pelamis platura* (Linnaeus, 1766)

Two records: a specimen (9409) from Quobba, and one observed by P. Griffin on the surface of the sea off Point Quobba in November 1977.

## Discussion

The herpetofauna of the region comprises 46 genera and 104 species distributed among 14 families as follows:

Leptodactylidae	3 genera	5 species
Hylidae	2 genera	3 species
Cheloniidae	1 genus	1 species
Dermochelyidae	1 genus	1 species
Cheluidae	1 genus	1 species
Gekkonidae	6 genera	14 species
Pygopodidae	4 genera	5 species
Agamidae	6 genera	16 species
Scincidae	9 genera	33 species
Varanidae	1 genus	5 species
Typhlopidae	1 genus	2 species
Boidae	1 genus	2 species
Elapidae	7 genera	12 species
Hydrophiidae	3 genera	4 species

Although the region covers a much greater area (c. 26 000 sq. km) than the neighbouring Exmouth and Shark Bay regions, it has received far less attention from herpetologists. This and the high number of species known from only one or two records indicate that several more remain to be collected. Among these species is *Menetia surda*, which has been recorded in both the Exmouth and Shark Bay regions. Some of the species known from only a few kilometres outside our

region can also be expected to occur here, e.g. *Ctenotus calurus*, *C. piankai* and *Varanus brevicauda* which have been collected at Marrilla to our immediate north; *Egernia inornata* which has been collected at Merlinleigh just east of our region; and *Ctenotus mimetes*, *Egernia stokesii badia* and *Rhinoplocephalus monachus* which have been collected to our immediate south.

The region has only 4 genera and 5 species of pygopodid lizards, compared with 4 genera and 6 species in the Exmouth region and 6 genera and 11 species at Shark Bay. This impoverishment is almost certainly due to the relative homogeneity of the Lake MacLeod region. The Exmouth region includes extensive areas of rocky country, a habitat type almost completely lacking in the present region; and climatic diversity in the Shark Bay region (which permits the juxtaposition of distinct faunas) contrasts with the climatic uniformity of the Lake MacLeod region.

With regard to agamid lizards, however, the present region is the richest on the west coast. It has 6 genera and 16 species, compared with 4 and 14 at Exmouth and 3 and 8 at Shark Bay. It so happens that the Australian Agamidae are most diversified in arid and seasonally arid climates. Now the present region is not only the most arid on the west coast, it also lies partly within both of the major divisions of the Australian arid zone, namely the northern with its *Triodia*-dominated habitats, and the southern with its *Acacia*-dominated habitats. Nine of the 16 species of Agamidae recorded from the Lake MacLeod region are confined or almost confined to one or other of these divisions of the arid zone: *Ctenophorus clayi*, *C. femoralis*, *C. i. isolepis*, *C. rubens*, *Diporiphora winneckeii* and *Moloch horridus* favouring the *Triodia*-dominated habitats; and *Caimanops amphiboluroides*, *Ctenophorus reticulatus* and *C. scutulatus* favouring the *Acacia*-dominated habitats.

In their comparison of the Exmouth and Shark Bay regions, Storr and Hanlon (1980: 438) pointed out that in most families only half of the species extended from one region to the other. This implied that many of the amphibians and reptiles in the intervening Lake MacLeod region were at either the northern or southern limit of their distribution.

On the west coast and coastal plains of Western Australia eight taxa attain their northern limit in the Lake MacLeod region. Three of these, *Diplodactylus alboguttatus*, *Morethia obscura* and *Tiliqua r. rugosa*, are western or southern species that extend northwards in an ever-narrowing strip along the coast. The others, *Neobatrachus sutor*, *N. wilsmorei*, *Ctenotus severus*, *Lerista connivens* and *Tiliqua occipitalis*, are more or less widely distributed in the western half of the arid and semi-arid zones of southern Western Australia.

A much larger number of taxa (23) reach their southern limit in the Lake MacLeod region. One of these, *Gemmatophora g. gilberti*, is a northern lizard that extends down the west coast to the far north of the present region. Another two, *Diplodactylus rankini* and *Aprasia rostrata fusca*, are endemic to the upper west coast of Western Australia. Another six, *Ctenotus helenae*, *C. u. uber*, *Lerista*

*bipes*, *Varanus acanthurus*, *Acanthophis pyrrhus* and *Furina ornata*, are widespread in the arid zone of Western Australia. A fourth category consists of species whose distribution is centred on the Pilbara, namely *Cyclorana maini*, *Gehyra pilbara* and *Liasis perthensis*. The largest category is that of taxa which are widespread in the arid zone of northern Australia: *Diplodactylus conspicillatus*, *Ctenophorus clayi*, *C. i. isolepis*, *Diporiphora winneckeii*, *Ctenotus hanloni*, *C. pantherinus ocellifer*, *Eremiascincus fasciolatus* and *Rhinoplocephalus punctatus* or are derivatives of such taxa, viz. *Ctenotus colletti rufescens* (from *C. c. nasutus*) and *C. iapetus* (from *C. quattuordecimlineatus*). Many of these taxa and *Ctenophorus femoralis* (a species confined to the Onslow, Exmouth and Lake MacLeod regions) are inhabitants of red sandridges and sandplains dominated by *Triodia*.

Finally there are the eight species known from the Lake MacLeod region but not the Exmouth or Shark Bay regions, namely the frogs *Cyclorana platycephala*, *Limnodynastes spenceri* and *Uperoleia russelli*, the agamid lizards *Caimanops amphiboluroides* and *Tympanocryptis cephalo*, the skinks *Ctenotus leonhardii* and *Lerista haroldi*, and the blind snake *Ramphotyphlops hamatus*. Apart from the endemic *Lerista haroldi*, all these species are characteristic of heavy soils, a habitat type that is well developed in this region about the floodplains of the Lyndon, Minilya and Gascoyne Rivers.

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