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HERPETOFAUNA OF THE SHARK BAY REGION, WESTERN AUSTRALIA

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and

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ABSTRACT

The 13 families, 43 genera and 97 forms (92 species, 5 of which are represented by two subspecies) of amphibians and reptiles inhabiting the Shark Bay region are listed with notes on their local distribution, relative abundance and habitat preferences. The region is located on the west coast of Australia between latitudes 24°40′ and 26°45′S and is divisible into three longitudinal zones: (1) the western, with waterless white sandy soils, relatively cool summers and wet winters, and a predominantly southwestern fauna and several endemic forms; (2) the central, with waterless red sandy soils, intermediate climate and somewhat depauperate southwestern fauna; and (3) the eastern, with red loamy and clayey soils, hot summers, less winter and more summer rain than other zones, some surface water, and a fauna rich in arid-zone elements. Only 14 species are shared by all three zones, indicating that regional diversity is largely due to the juxtaposition (without blending) of distinct faunas. The region is especially rich in fossorial reptiles (e.g. *Lerista* and *Vermicella* spp.).

INTRODUCTION

Knowledge of the herpetofauna of Shark Bay began in a small way early last century with the visits of the French navigators Baudin and Freycinet and the naturalists who accompanied them, notably Péron, Quoy and Gaimard. Generally their collections were too small and too poorly localised to give even a hint of the richness of the region.

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Next to visit Shark Bay were the German zoologists Michaelsen and Hartmeyer in 1905. Although their specimens were accurately localised, well annotated, and carefully studied by F. Werner, the leading German herpetologist of the day, such was the backward state of reptile taxonomy that one can only wonder what species Werner (1909) was referring to when he listed *Aprasia pulchella* and *Delma fraseri*, only to mention the pygopodids in his report.

In the last two decades, the tempo of collecting in the region has increased enormously, yielding for the first time material adequate for research into the taxonomy of Shark Bay reptiles. Until recently more work had been done on the islands than the mainland. Led by W.D.L. Ride, an expedition to Bernier and Dorre Islands collected reptiles in July 1959 (Douglas & Ride, 1962); in the previous May W.H. Butler visited Faure Island. G.M. Storr collected on Bernier Island in May 1963 and on several small islands in Freycinet Estuary in August 1965. A.A. Burbidge and associates visited Dirk Hartog Island on several occasions between September 1972 and April 1977, Bernier Island in April 1969 and Dorre Island in December 1973.

During the same period many reptiles were collected on the Shark Bay mainland. However, collections tended to be opportunistic rather than systematic and were usually made by naturalists travelling to and from areas further north. Exceptional were J.R. Ford's work in the country between Hamelin and Tamala in December 1964 (when he rediscovered the gecko *Diplodactylus michaelseni*) and the visits of A. Baynes to Edel Land in December 1968 and August 1970 (on the second of which he discovered a new genus of frogs, *Arenophryne*).

Imbalance between islands and mainland was more than corrected in August and September 1976 when G. Harold and M. Peterson, financed by a grant from Mr and Mrs W.H. Butler, collected amphibians and reptiles on Edel Land, Peron Peninsula and the coastal plains south and east of the Hamelin Pool gulf. This collection (itemised in Storr, 1977) and others lodged in the Western Australian Museum form the basis of the following accounts.

Finally we would like to acknowledge all the people (in addition to those mentioned above) whose specimens have contributed to this report; they are J.L. Bannister, G. Barron, D.G. Bathgate, M.G. Brooker, J. Bywater, E.J. Car, B.T. Clay, P. Cowley, J. Estbergs, P.J. Fuller, T.M.S. Hanlon, B. Harty, G. Kendrick, N. Kolichis, O. Lipfert, A.R. Main, K. Malcolm, G.F. Mees, H. Merrifield, R.L. Pink, W. and W. Poole, R.D. Royce, S. St John, T.C. Scott, R. Slack-Smith, P. Slater, T.A. Smith, A.G. Wells, B.R. Wilson

and J. Wombey. We exclude E.L. Grant Watson from this list, for we believe that his specimens of several species, e.g. the agamid lizards *Amphibolurus cristatus*, *Tympanocryptis cephala* and *Moloch horridus*, could not have come from Bernier Island.

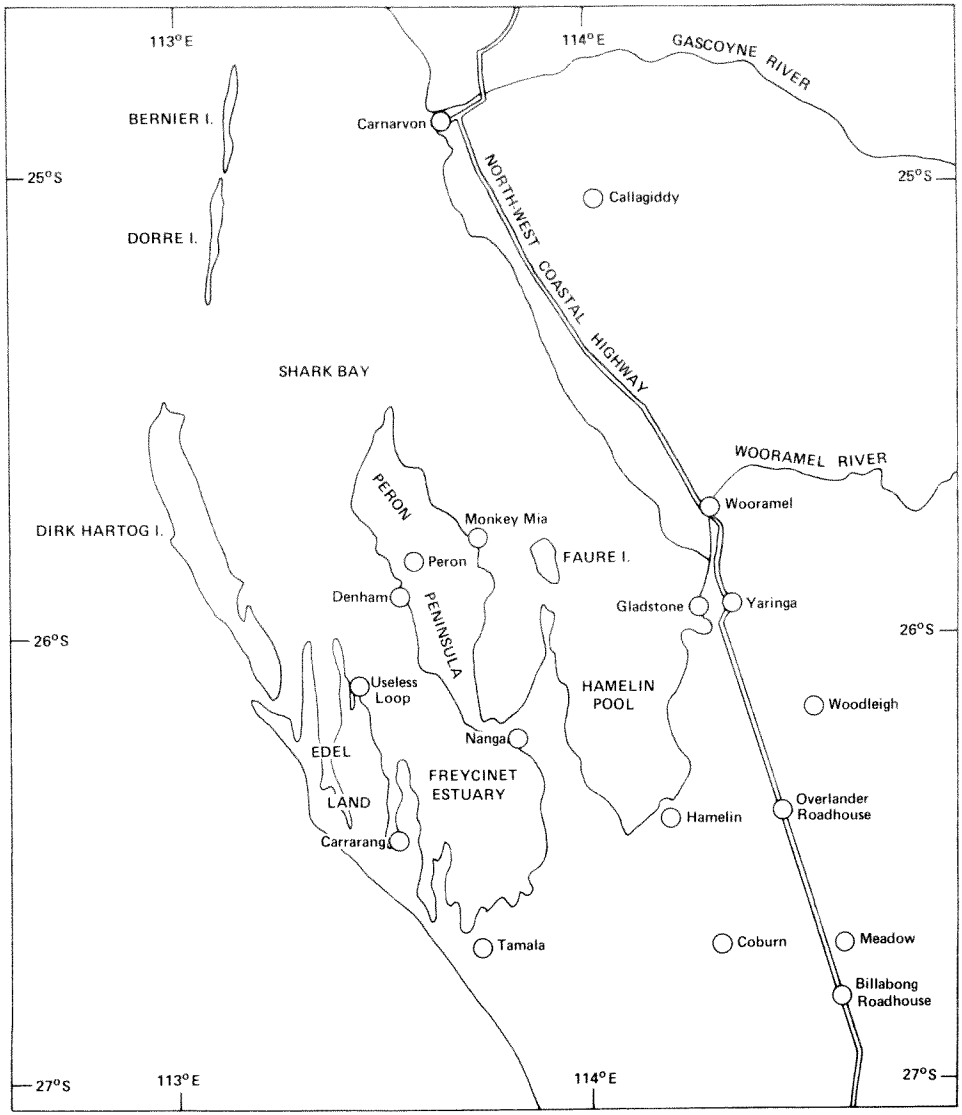

Fig. 1: Map of Shark Bay region, Western Australia.

THE ENVIRONMENT

The Shark Bay region can be divided longitudinally into three zones:

(1) the western, comprising the large islands Dirk Hartog, Dorre and Bernier, the Edel Land peninsula and the small islands in Freycinet Estuary,

(2) the central, comprising Peron Peninsula, Faure Island and the southern hinterland of Freycinet Estuary,

(3) the eastern, comprising the coastal plains south and east of the Hamelin Pool gulf, north to the Gascoyne River and east to about the North-west Coastal Highway.

Though it is the most humid of the three, the western zone (like the central) is almost completely devoid of surface fresh water. Annual rainfall averages about 30 cm, most of it falling in winter. The soils are predominantly white sands. Coastal dunes are vegetated with the coarse grass *Spinifex longifolius* and shrubs such as *Olearia axillaris* and *Myoporum insulare.* Where the limestone is outcropping or shallowly covered with sand the vegetation is more varied and includes *Triodia* and several species of tall and low shrubs.

The central zone consists mainly of Peron Peninsula and similar country around the bottom of Freycinet Estuary southwestwards nearly to Tamala. Annual rainfall varies from 23 cm in the north to 20 cm in the far southeast and 28 cm in the far southwest. The soils are reddish and range in texture from sands to sandy loams. In the south the dunes and interdunes are densely wooded with small trees and shrubs of *Acacia, Eucalyptus, Melaleuca, Banksia, Hakea, Grevillea, Conospermum, Gyrostemon, Codonocarpus* and *Brachychiton,* interspersed with open belts of soft spinifex *(Plectrachne).* The central sector consists mainly of rolling plains of *Triodia* and *Atriplex,* which give way to samphires in low-lying areas. In the north, open scrubs of *Acacia* are common.

Apart from a few mesas between Overlander and Yaringa, the eastern zone is level and low-lying. Annual rainfall ranges from 19 to 23 cm, more of it falling in summer than further west (see **Table 1**). Less affected by oceanic influences, this zone is markedly hotter and more arid than the others; nevertheless, it alone is endowed with seasonal surface waters. In the south the shallow red loams over limestone support open scrubs dominated by *Acacia* (several species), *Eremophila* and *Cassia.* North of the Wooramel the soils are heavier and deeper and support little shrubbery except where they are crossed by low ridges of lighter soil. Towards the coast the plains of *Atriplex, Kochia, Carpobrotus* and grasses are successively replaced by

samphire and mangrove swamps. Two intermittent streams, the Gascoyne and Wooramel Rivers, traverse the zone; they are fringed with *Eucalyptus camaldulensis*. Claypans, especially in the northern half, fill with fresh water after good rains.

In the following list of species and subspecies we briefly describe the local distribution, relative abundance and habitat preferences of each form.

Table 1: Mean monthly and yearly rainfall (mm) at Dirk Hartog HS (western zone), Denham (central zone) and Brick House (eastern zone).

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Year
Dirk Hartog	6	10	14	16	56	90	63	36	14	6	2	2	315
Denham	11	13	17	17	37	61	39	19	9	4	2	2	231
Brick House	25	22	15	15	36	46	43	15	8	6	0	2	230

ANNOTATED LIST

Leptodactylidae

Arenophryne rotunda Tyler

Endemic to Edel Land. Only known from white coastal dunes in the vicinity of False Entrance Well, 22 km NW of Carrarang HS. Harold and Peterson's specimen was collected on 27 August (almost the same date as the type series).

Neobatrachus centralis (Parker)

Restricted to claypans in eastern zone. Collected at 64 km SSE of Carnarvon (and on nearby Callagiddy Station).

Neobatrachus wilsmorei (Parker)

Presumably occurring in eastern zone. (M.G. Brooker found one on 13 June 1972 on Callagiddy Station after rain in sandy country without permanent water.)

Hylidae

Litoria rubella (Gray)

Eastern zone, on and near the Gascoyne and Wooramel Rivers.

Cheloniidae

Caretta caretta (Linnaeus)

Loggerheads have been collected at Denham and Bernier Island.

Chelonia mydas (Linnaeus)

A Green Turtle has been collected at Carnarvon. Turtles, presumably of this species, nest in summer on the beaches of Bernier and Dorre Islands (Douglas & Ride, 1962: 119).

Cheluidae

Chelodina steindachneri Siebenrock

Eastern zone. Harold and Peterson collected two specimens in a bore drain 8 km N of Wooramel HS on 11 September 1976.

Gekkonidae

Crenadactylus ocellatus horni (Lucas & Frost)

Large islands (Bernier, Dorre and Dirk Hartog), Edel Land and Peron Peninsula. Common. Mainly spinifex *(Triodia* and *Plectrachne)* and limestone.

Diplodactylus alboguttatus Werner

Common in far north of Peron Peninsula on red sand with *Triodia* and open *Acacia;* also found in similar habitats near Nanga HS. Much less plentiful on Edel Land, where it is confined to far north of peninsula (collected at 4 km S of Useless Loop on brown soil with low open *Acacia* and dense *Triodia* and in coastal dunes 8 km SE of Steep Point).

Diplodactylus michaelseni Werner

Far south of Peron Peninsula. Common. Red sands with soft spinifex *(Plectrachne)* and open *Acacia* and other shrubs and low trees.

Diplodactylus ornatus Gray

Large islands (Bernier, Dorre and Dirk Hartog), Edel Land (including Baudin Island) and Peron Peninsula. Moderately common. On Peron Peninsula mainly on red sands with open to moderately dense *Acacia* scrub; elsewhere mainly in sparsely vegetated white coastal dunes and limestone.

Diplodactylus pulcher (Steindachner)

Mainly on the red loams and clays of eastern zone; also in sand-dune country with wattle scrub at base of Peron Peninsula. Uncommon.

Diplodactylus spinigerus Gray

Large islands (Bernier, Dorre and Dirk Hartog) and Edel Land. Common. In *Spinifex longifolius* and bushes on white coastal dunes and on pale brown soils with *Triodia* and open *Acacia.*

Diplodactylus squarrosus Kluge

Eastern zone. Moderately common. Red soils with open *Acacia.*

Diplodactylus strophurus (Duméril & Bibron)

Moderately common on Peron Peninsula in low open *Acacia* and other bushes and low trees growing on red sands; occurring in narrow belts of similar habitat in eastern zone near Carnarvon. Found on Bernier Island in *Olearia* and other bushes (dead or alive) growing in white coastal dunes.

Gehyra variegata (Duméril & Bibron)

Very common throughout region, including several islands (Bernier, Dorre, Dirk Hartog, Three Bays, Salutation and Faure). Mainly in small *Acacia* trees but also among rocks, especially coastal limestone.

Heteronotia binoei (Gray)

Very common throughout region, including several islands (Bernier, Dorre, Dirk Hartog, Freycinet, Double, Mary Anne, Baudin, Three Bays and Salutation).

Nephrurus levis occidentalis Storr

Large islands (Bernier, Dorre and Dirk Hartog), Edel Land and north of Peron Peninsula. Common. On Peron Peninsula and in northeast of Edel Land (4 km S of Useless Loop) on red and brown sands with *Triodia* and open *Acacia;* elsewhere in white coastal dunes. Possibly also occurring on the narrow belts of red sandy soil traversing northern half of eastern zone, in view of its presence further inland (e.g. at Ellavalla and Mooka).

Phyllurus milii Bory

Large islands (Bernier, Dorre and Dirk Hartog) and Edel Land. Common. Mainly in coastal limestone.

Rhynchoedura ornata Günther

Confined to heavy soils of eastern zone. Rare. Collected at Overlander (and a little further inland at Ellavalla, Towrana and Woodleigh).

Pygopodidae

Aprasia haroldi Storr

Endemic to Edel Land. Moderately common. White coastal sands.

Aprasia smithi Storr

Far south of Edel Land. One record: three specimens collected by Harold and Peterson at 1 km S of Tamala on 29 August 1976.

Delma fraseri Gray

Far south of Edel Land. One record: specimen collected by G. Barron and T.M.S. Hanlon at 1 km S of Tamala on 7 February 1977.

Delma nasuta Kluge

Three specimens collected by Harold and Peterson in *Triodia* on reddish sandy loam 25 km S of Denham and four collected by Fisheries and Wildlife Department on Dirk Hartog Island.

Delma tincta DeVis

Eastern zone (collected at Carnarvon, Wooramel and Hamelin). Scarce. Red clay loams with open *Acacia.*

Lialis burtonis Gray

Islands (Bernier, Dorre, Dirk Hartog and Salutation), Edel Land and eastern zone (from Carnarvon south to Coburn), but not yet recorded from Peron Peninsula. Moderately common in *Spinifex longifolius* and low shrubbery of white coastal sands and in *Triodia* and/or low open *Acacia* on pale brown loams near east coast of Edel Land; scarce elsewhere.

Pletholax gracilis edelensis Storr

Endemic to Edel Land, in vicinity of Useless Loop. Moderately common. Mainly in dense *Triodia* growing on pale brown loam; also in *Spinifex longifolius* on white coastal dunes.

Pygopus lepidopodus (Lacépède)

Dirk Hartog Island, Edel Land and Peron Peninsula. Uncommon. Sandy country, especially with *Triodia.*

Pygopus nigriceps (Fischer)

Moderately common in eastern zone, but only two specimens from elsewhere (Tamala and 8 km S of Nanga). Mainly red loams with open *Acacia.*

Agamidae

Amphibolurus inermis (DeVis)

Confined to eastern zone (unless provenance of a specimen from Tamala can be confirmed). Common. Sparsely wooded red sandy loams and clay loams and salt flats.

Amphibolurus maculatus badius Storr

Northern half of eastern zone (south to 16 km N of Wooramel). Moderately common. Scattered low ridges of red sandy loam with low open *Acacia* and other bushes.

Amphibolurus maculatus maculatus (Gray)

Large islands (Bernier, Dorre and Dirk Hartog), Edel Land and Peron Peninsula. Red or white sands with spinifex *(Plectrachne* or *Triodia)* and low open *Acacia* and other shrubs.

Amphibolurus minor Sternfeld

Dirk Hartog Island, Edel Land, Salutation Island, Peron Peninsula and eastern zone. Moderately common. All habitats from coastal heath on whitish sand to open *Acacia* scrub on red clay loam.

Amphibolurus parviceps butleri Storr

Edel Land. Common. White coastal dunes and pinkish sandplains with low open vegetation.

Amphibolurus parviceps parviceps (Storr)

Large islands (Bernier and Dirk Hartog). Common. White coastal dunes with *Spinifex longifolius, Olearia axillaris* and other low open vegetation.

Amphibolurus reticulatus (Gray)

Islands close to mainland (Dirk Hartog, Baudin and Faure), Edel Land, Peron Peninsula and eastern zone. Common. Coastal limestone and all well-vegetated habitats.

Amphibolurus scutulatus Stirling & Zietz

Eastern zone. Common in southern quarter of zone, around Hamelin, Overlander and Wannoo, but scarce on heavier soils and more sparsely wooded country further north (they seem to be more plentiful inland, where the soil is generally lighter, e.g. at Brick House, Callagiddy and Woodleigh).

Moloch horridus Gray

Peron Peninsula (southwest to 8 km NE of Tamala) and eastern zone. Uncommon. Reddish loams and sands vegetated with open *Acacia* and other shrubs, with or without a lower storey of *Plectrachne* or *Atriplex*.

Physignathus longirostris Boulenger

Eastern zone, south to Gladstone. Common. River gums and other trees along and near the Gascoyne and Wooramel Rivers and in coastal thickets along east shore of Hamelin Pool.

Scincidae

Cryptoblepharus carnabyi Storr

Islands (Bernier, Dorre, Dirk Hartog, Wilds and Three Bays), northern Edel Land and southern shore of Hamelin Pool. Moderately common. Mainly in coastal limestone; also in trees and shrubs of coastal dunes and shell beds.

Cryptoblepharus plagiocephalus (Cocteau)

Far south of Edel Land. One record: a specimen collected by J.R. Ford at 8 km S of Tamala (the vegetation here is moderately tall *Melaleuca* and *Acacia* on sand over limestone — G.M.S.).

Ctenotus fallens Storr

Large islands (Bernier, Dorre and Dirk Hartog), Edel Land and southern Peron Peninsula (north to Eagle Bluff). Scarce on Peron Peninsula; moderately common elsewhere. In coastal limestone, *Spinifex longifolius* on coastal dunes, and *Triodia* and open *Acacia* on brown sandy loams.

Ctenotus lesueurii (Duméril & Bibron)

Large islands (Bernier, Dorre and Dirk Hartog) and northern Edel Land. (Record from Carnarvon requires confirmation.) Moderately common on islands but scarce on Edel Land. Mainly white coastal dunes with *Spinifex longifolius;* also pinkish sands with low open *Acacia* and heath.

Ctenotus mimetes Storr

Southern quarter of eastern zone (around Hamelin and Wannoo). Uncommon. Open *Acacia* and other shrubs on red loam over limestone. (Inland from the heavy, sparsely wooded coastal soils it occurs much further north, e.g. at Callagiddy.)

Ctenotus pantherinus pantherinus (Peters)

Southern quarter of eastern zone (two specimens from 7 km W of Hamelin). Scarce. Open *Acacia* on red loam. (Inland it occurs much further north, e.g. at Callagiddy.)

Ctenotus schomburgkii (Peters)

Edel Land (one specimen from 2 km S of Useless Loop) and southern quarter of eastern zone (one specimen from Overlander). Scarce.

Ctenotus severus Storr

Southern half of eastern zone (five specimens from Wooramel). Scarce. Red loam with open *Acacia.*

Ctenotus youngsoni Storr

Endemic to Dirk Hartog Island and Edel Land (False Entrance Well). Scarce (known from five specimens). White coastal dunes.

Egernia depressa (Günther)

Eastern zone. Uncommon. Lightly wooded country, sheltering in hollow logs, beneath loose bark of trees and under boulders of laterite on scree slopes of mesas.

Egernia multiscutata bos Storr

Bernier Island. Common. Burrowing in sparsely vegetated sandplains.

Egernia stokesii aethiops Storr

Endemic to Baudin Island in Freycinet Estuary. Common. Sheltering under slabs of coastal limestone.

Egernia stokesii badia Storr

Dirk Hartog Island and possibly the eastern zone (one specimen from nearby Callagiddy).

Lerista connivens Storr

Islands in Freycinet Estuary (Freycinet, Mary Anne, Salutation and Three Bays) and far south of Edel Land (1 km S of Tamala). Common. Under limestone on islands and in reddish brown sand beneath *Acacia rostellifera* on mainland.

Lerista elegans (Gray)

Bernier Island, northern Edel Land (near Useless Loop), northern Peron Peninsula (Monkey Mia) and far north of eastern zone (56 km SSE of Carnarvon). Moderately common on Bernier Island and Edel Land; scarce elsewhere. White coastal dunes with *Olearia* and reddish sands with open *Acacia.*

Lerista lineopunctulata (Duméril & Bibron)

Large islands (Bernier and Dirk Hartog), Edel Land and Peron Peninsula. Common. Red dunes with open *Acacia* and white coastal dunes.

Lerista macropisthopus (Werner)

Eastern zone. Common. Red loams and sands, usually with open *Acacia.*

Lerista muelleri (Fischer)

Far south of Edel Land (Tamala), southern quarter of Peron Peninsula, and southern quarter of eastern zone about Hamelin (inland it occurs much further north, e.g. at Callagiddy). Moderately common. Reddish sands and loams with open to moderately dense *Acacia.*

Lerista nichollsi (Loveridge)

Eastern zone. Moderately common. Red sands and loams with open *Acacia.*

Lerista planiventralis decora Storr

Peron Peninsula (two specimens from Denham). White coastal dunes.

Lerista planiventralis planiventralis (Lucas & Frost)

Bernier Island and Edel Land. Moderately common. White coastal dunes.

Lerista praepedita (Boulenger)

Larger islands (Bernier, Dirk Hartog and Salutation), Edel Land, Peron Peninsula and far north of eastern zone (56 km SSE of Carnarvon). Very common. White coastal dunes and red sands.

Menetia amaura Storr

Edel Land. Only known from holotype, which was collected by Harold and Peterson under a slab of limestone at False Entrance Well at inland edge of white coastal dunes.

Menetia greyii Gray

Far south of Edel Land (Tamala), northern half of Peron Peninsula (including Faure Island) and southern quarter of eastern zone about Hamelin and Yaringa (inland much further north, e.g. at Callagiddy). Moderately common in eastern zone but scarce further west. Loamy and sandy soils.

Menetia surda Storr

Bernier Island and Peron Peninsula. Moderately common. Spinifex *(Triodia* and *Plectrachne)* on white, brown or red sands.

Morethia butleri (Storr)

Eastern zone. One record: a specimen collected by Harold and Peterson on 6 September 1976 on red stony loam with open *Acacia* 7 km NW of Hamelin.

Morethia lineoocellata (Duméril & Bibron)

Large islands (Bernier, Dorre and Dirk Hartog), Edel Land, Peron Peninsula (at Denham and 25 km S) and eastern zone (at Gladstone and 40 km N of Carnarvon). Common in coastal dunes and coastal limestone; also in open *Triodia* on red sand on Peron Peninsula.

Morethia obscura Storr

Edel Land (at 19 km N of Carrarang) and southern Peron Peninsula (at 15 and 17 km SE of Nanga). Uncommon. Coastal limestone (Edel Land) and *Acacia* scrub (Peron Peninsula).

Omolepida branchialis (Günther)

Large islands (Bernier and Dirk Hartog), Edel Land (including Baudin Island) and Peron Peninsula. Common. In spinifex *(Triodia* and *Plectrachne)* on red, brown and white sands, in coastal limestone and on coastal dunes (especially with *Spinifex longifolius*).

Sphenomorphus richardsonii (Gray)

Eastern zone. Rare. Three specimens collected by Harold and Peterson at and near Wooramel.

Tiliqua occipitalis (Peters)

Northern Peron Peninsula (Peron HS) and extreme north of eastern zone (Carnarvon and 16 km E). Reddish sandy loams with low open *Acacia.*

Tiliqua rugosa (Gray)

Large islands (Bernier, Dorre and Dirk Hartog), Edel Land, northern half of Peron Peninsula and extreme north of eastern zone (about the lower Gascoyne). Moderately common. Mainly low open *Acacia* scrub on sandy soils.

Varanidae

Varanus caudolineatus Boulenger

Eastern zone, west to 15 km E of Hamelin. Uncommon. Open *Acacia* scrub on red loam.

Varanus eremius Lucas & Frost

Northern Peron Peninsula (Peron HS) and eastern zone. Scarce. Red sands and sandy loams with open *Acacia.*

Varanus giganteus (Gray)

Eastern zone. One record: observation by G.M. Storr on the lower Wooramel on 2 August 1961.

Varanus gouldii (Gray)

Large islands (Bernier, Dorre, and Dirk Hartog) and far north of eastern zone. Uncommon.

Typhlopidae

Typhlina leptosoma (Robb)

Eastern zone. Two specimens collected by Harold and Peterson under cement slabs at Wooramel HS.

Typhlina nigroterminata (Parker)

Eastern zone. One found (but later lost) by Harold and Peterson in red loam with open *Acacia* at 7 km W of Hamelin on 6 September 1976.

Boidae

Liasis childreni Gray

Northern islands (Bernier and Dorre) and eastern zone. Moderately common.

Elapidae

Demansia olivacea calodera Storr

Large islands (Bernier and Dirk Hartog), far south of Edel Land (Tamala), northern half of Peron Peninsula and extreme north of eastern zone. Moderately common.

Demansia reticulata cupreiceps Storr

Eastern zone, south to Wooramel. Uncommon. Red loams with open *Acacia.*

Demansia reticulata reticulata (Gray)

Dirk Hartog Island and Edel Land. Uncommon. White coastal sands.

Denisonia fasciata Rosén

Eastern zone. One record: a specimen collected by P.J. Fuller at 8 km N of Overlander (apparently more plentiful further inland — specimens from Ellavalla and Woodleigh).

Denisonia monachus Storr

Southern half of Peron Peninsula (specimen from 15 km SE of Nanga) and eastern zone. Uncommon. Mainly red loams with open *Acacia.*

Pseudechis australis (Gray)

Large islands (Bernier, Dorre and Dirk Hartog), Edel Land and eastern zone. Moderately common.

Pseudonaja modesta (Günther)

Eastern zone. Moderately common. Red loams with open *Acacia.*

Pseudonaja nuchalis Günther

Northern Peron Peninsula (Denham and vicinity) and eastern zone. Common.

Vermicella bertholdi (Jan)

Eastern zone. Uncommon. Red loams with open *Acacia.*

Vermicella bimaculata (Duméril, Bibron & Duméril)

Far south of Edel Land. One record: two specimens collected by Harold and Peterson in reddish brown sandy loam with open *Acacia* at 1 km S of Tamala.

Vermicella fasciolata fasciolata (Günther)

Peron Peninsula. One record: specimen collected at 7 km E of Denham.

Vermicella littoralis Storr

Large islands (Bernier, Dorre and Dirk Hartog), Edel Land and Peron Peninsula (including Faure Island). Moderately common on islands; uncommon on mainland. White coastal sands.

Vermicella semifasciata semifasciata (Günther)

Eastern zone. One record: specimen collected by W.H. Butler at 16 km S of Overlander in December 1966.

Hydrophiidae

Aipysurus laevis pooleorum L.A. Smith

Endemic to Shark Bay. Common.

Emydocephalus annulatus Krefft

One record: a mounted specimen from Cape Peron brought into the W.A. Museum for identification (L.A. Smith, pers. comm.).

Ephalophis greyii M.A. Smith

One record: a specimen collected by K. Malcolm at Carnarvon in May 1968.

Hydrophis elegans (Gray)

Common in seas of Shark Bay region. Two specimens of *H. elegans* and eight of *H. major* were taken by fishermen east of Koks Island in June 1970 when trawling for prawns at 18-22 fathoms.

Hydrophis major (Shaw)

Very common. Judging from number of specimens in W.A. Museum this is the commonest sea-snake in the Shark Bay region.

Pelamis platurus (Linnaeus)

One record: a specimen collected at Shark Bay in April 1972.

DISCUSSION

The 43 genera and 97 species and subspecies of amphibians and reptiles listed for the region are distributed among 13 families as follows:

Leptodactylidae (2 genera, 3 species)
Hylidae (1 genus, 1 species)
Cheloniidae (2 genera, 2 species)
Cheluidae (1 genus, 1 species)
Gekkonidae (7 genera, 13 species)
Pygopodidae (5 genera, 9 species)
Agamidae (3 genera, 10 species and subspecies)
Scincidae (9 genera, 32 species and subspecies)
Varanidae (1 genus, 4 species)
Typhlopidae (1 genus, 2 species)
Boidae (1 genus, 1 species)
Elapidae (5 genera, 13 species and subspecies)
Hydrophiidae (5 genera, 6 species)

It is not surprising that frogs only account for 4% of the fauna. One of them, *Arenophryne rotunda*, seems to have no need for surface water, but the others depend on claypans and river-pools that fill after summer rains, habitats that are found in only a small part of the region, namely the northern half of the eastern zone.

Most reptile families are well represented, some extremely well. To a large extent this diversity is due to the location of Shark Bay at the meeting point of Western Australia's three main natural regions, (1) the south-western with its relatively cool summers and rainy winters, (2) the northern with its hot rainy summers and warm winters, and (3) the eremaean with its hot summers, cold winters and low irregular rainfall.

Many southern reptiles have their northern limit in the Shark Bay region, e.g. the geckos *Diplodactylus alboguttatus*, *D. michaelseni*, *D. spinigerus* and *Phyllurus milii*, the pygopodid lizards *Delma fraseri* and *Pygopus lepidopodus*, the skinks *Ctenotus lesueurii*, *C. p. pantherinus*, *Egernia multiscutata bos*, *Lerista planiventralis decora*, *L. praepedita*, *Morethia obscura*, *Tiliqua occipitalis* and *T. rugosa*, and the elapid snake *Demansia r. reticulata*. Southern taxa are almost confined to the western and central zones.

The northern component in the herpetofauna includes the hylid frog *Litoria rubella*, the pygopodid lizard *Delma tincta*, the agamid lizard *Physignathus longirostris*, the blind-snake *Typhlina nigroterminata*, the elapid snake *Demansia reticulata cupreiceps*, and all the marine turtles and sea-snakes.

Several taxa characteristic of the arid interior reach the coast in the Shark Bay region, e.g. the geckos *Diplodactylus squarrosus*, *D. strophurus* and *Rhynchoedura ornata*, the pygopodid *Pygopus nigriceps*, the agamids *Amphibolurus scutulatus* and *Moloch horridus*, the skinks *Ctenotus mimetes*, *C. severus*, *Egernia depressa*, *E. stokesii badia*, *Lerista macropisthopus*, *Menetia surda* and *Morethia butleri*, the monitors *Varanus caudolineatus* and *V. eremius*, and the elapid *Denisonia monachus*. The eremaean component is almost confined to the eastern zone.

Another source of diversity are the large islands, peninsulas and gulfs of the region. They provide a refuge for eight relict or endemic taxa, namely the leptodactylid *Arenophryne rotunda*, the pygopodids *Aprasia haroldi* and *Pletholax gracilis edelensis*, the agamid *Amphibolurus parviceps butleri*, the skinks *Ctenotus youngsoni*, *Egernia stokesii aethiops* and *Menetia amaura*, and the sea-snake *Aipysurus laevis pooleorum*. Almost restricted to Shark Bay are another three species that extend south only to the mouth of the Murchison: the pygopodid *Aprasia smithi*, the skink *Lerista connivens* and the blind-snake *Typhlina leptosoma*.

Of the 89 terrestrial and freshwater amphibians and reptiles listed for the Shark Bay region, 52 have been recorded in the western zone, 35 in the central and 55 in the eastern (the eastern zone total probably exceeds 60, for some of the additional species known from the country immediately north and east of Carnarvon, viz. *Cyclorana maini*, *C. platycephala*, *Amphibolurus clayi*, *Caimanops amphiboluroides*, *Ctenotus helenae*, *C. leonhardii*, *Varanus brevicauda* and *Typhlina australis*, could well extend to the eastern zone). Nineteen taxa are locally restricted to the western zone, 3 to the central and 27 to the eastern. Only 14 species are found in all three zones.

The region is rich in old Australian elements, e.g. 11 species of diplodactyline geckos, 9 species of pygopodid lizards and 12 species of elapid snakes. It is especially rich in fossorial species, viz. the endemic frog *Arenophryne rotunda*, two species of the pygopodid genus *Aprasia* (one endemic, the other almost so), six species of the scincid genus *Lerista*, two blind-snakes *(Typhlina)* and five species of the elapid genus *Vermicella*.

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