

The herpetofauna of Faure Island, Shark Bay, Western Australia

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Abstract – The currently recorded Faure Island herpetofauna comprises 24 species of reptile. This is a strict subset of the more diverse herpetofauna recorded from adjacent Peron Peninsula. We describe the broader geographic distributions and habitat associations of each species, and discuss the biogeography of the island herpetofauna in the context of the Carnarvon Basin biogeographic region. The reduced island diversity is presumably due to a combination of lesser sampling effort and ‘drop out’ extinctions following drowning of the continental shelf and severance of the island around 6500 years ago.

Key words: Shark Bay World Heritage Property, herpetofauna, reptiles, ‘drop out’ extinction, continental shelf

INTRODUCTION

The Shark Bay World Heritage Area (SBWHA) is a landscape of outstanding biotic diversity. Located at latitude 26°S along the Western Australian coastline, it falls within the Carnarvon Basin biogeographic region (Thackway and Cresswell 1995) and comprises a complex of peninsulae and associated major islands of which Faure Island, with an area of 5,816 hectares, is the second largest (exceeded only by Dirk Hartog Island). The high biodiversity in the area reflects its location at the contact zone between two major Australian biogeographic provinces – those of the temperate southwest and the arid inland – as well as a complex geomorphic history related to its position near the inland margin of a broad continental shelf (Kendrick *et al.* 1991; Wyrwoll *et al.* 2000).

Faure Island was a pastoral lease from 1873 and was purchased by the Australian Wildlife Conservancy (AWC) in 2000. Biological surveys were conducted in May–June 2000 ahead of its development for conservation. The purpose of this paper is to summarize current knowledge of the herpetofauna of Faure Island, including new information gathered during a field survey in May–June 2000. We also explore the biogeographic significance of the Faure herpetofauna in the context of the wider Carnarvon Basin biogeographic region (Thackway and Cresswell 1995; Burbidge *et al.* 2000).

ENVIRONMENT

Faure Island is located in Disappointment Reach, on the eastern side of Peron Peninsula, and is centred on 25°50'S and 113°53'E (Figure 1). The island rises to a maximum of 26 m above sea level and comprises two north-south trending dune ridges, with lower dunes and swales down the central axis. Surface sediments are predominantly mobile to weakly consolidated red sands derived from the Peron Sandstone but habitat diversity is created by cliffs along the western margin of the island, by local outcrops of shelly limestone and calcrete, and by a prograded Holocene dune complex of white sands along the northern, eastern and southern margins. Numerous small birridas (deflational salt pans) and saline marshes further extend the habitat complexity of the island.

Faure Island experiences an arid climate. Rainfall records from Hamelin Pool (26°25'S; 114°11'E), immediately to the south, average 210 mm per year, with rainfall divided between winter fronts and summer cyclonic rains. Average daily maximum temperatures for the winter months are 21°–25°C and for the summer months are 30°–35°C.

Beard (1976) identified two vegetation systems on the island and included it in his Eremaean (Desert) Phytogeographical Region (Beard 1980). The southern third of the island was mapped as *Acacia ligulata* X *rostellifera* thicket (included in the Denham Vegetation System), while the northern

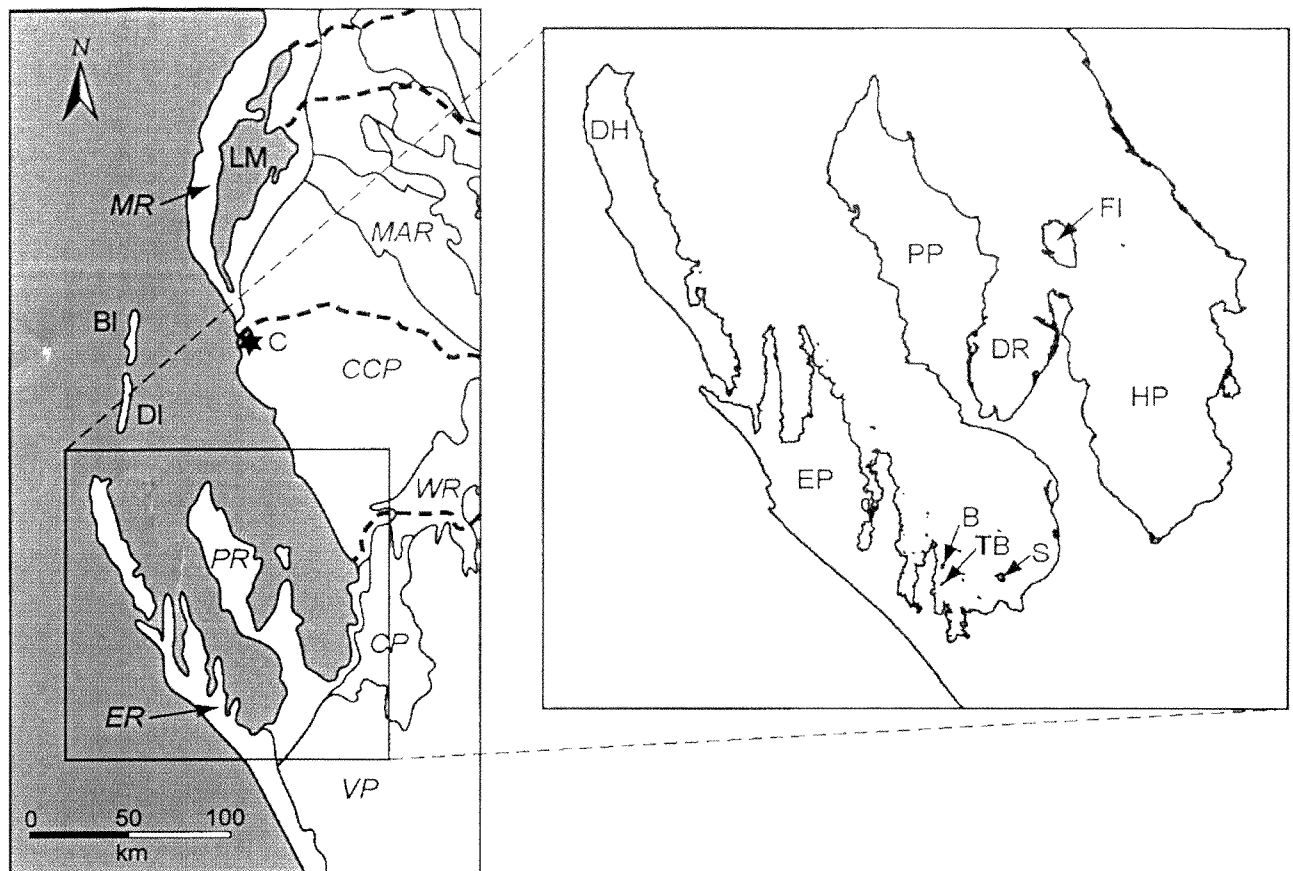


Figure 1 Location map showing geographic features and geomorphic regions (after Hocking *et al.* 1987) mentioned in the text. Geographic features: B-Baudin Island; BI-Bernier Island; C-Carnarvon Townsite; DH-Dirk Hartog Island; DI-Dorre Island; DR-Disappointment Reach; EP-Edel Land Peninsula; FI-Faure Island; HP-Hamelin Pool; LM-Lake Macleod; PP-Peron Peninsula; S-Salutation Island; TB-Three Bays Island. Geomorphic Regions: CCP-Carnarvon Coastal Plain; CP-Carbla Plateau; ER-Edel Region; MAR-Mardathunna Region; MR-Macleod Region; PR-Peron Region; VP-Victoria Plateau; WR-Wooramel region.

portion mapped as *Acacia ramulosa* scrub with scattered samphire shrublands in the birridas and saline marshes (included in the Peron Vegetation System). Keighery and Muir (2008) identified five plant communities on the island of which *Acacia* shrublands occupy by far the largest area, followed by roughly equal areas of samphire, spinifex grasslands (on coastal dunes), *Atriplex* shrublands (around birridas) and mangrove communities. The north of the island supports small stands of mallee shrubland over a dense grassland of *Triodia plurinervata*. The vascular flora is a subset of that recorded from Peron Peninsula (Keighery *et al.* 2000).

Hocking *et al.* (1987) included Faure Island in their Peron Region, otherwise represented by the adjacent Peron Peninsula and the southern and eastern margins of Disappointment Reach. This region is characterised by an undulating topography (to 30 m) of stabilized, unconsolidated red sand dunes of late Pleistocene age, overlying an older, consolidated dune complex (the Peron Sandstone) laid down during earlier Quaternary times. Peron Region is encircled by Edel Region (including Edel Peninsula) to the west, Victoria

Plateau to the south, and Carbla Plateau and Carnarvon Coastal Plain to the east (Figure 1).

HISTORY OF HERPETOFAUNAL COLLECTING

There was no information on the herpetofauna of Faure Island until May 1959 when W. H. Butler visited the island and collected five species (see Table 1). A sixth species was collected by K. D. Morris in September 1989. Greg Harold and Angela Sanders visited Faure Island in November 1989 during a search for threatened native mammals in the Shark Bay region and added an additional nine reptile species. All specimens collected during these prior visits to Faure Island, representing a total of 15 species, are lodged in the collections of the Western Australian Museum (identified by R prefix).

During the May–June 2000 and February 2002 surveys of Faure Island (Schmitz and Richards 2008), reptiles were taken in traps, especially in pit traps, set by team members for mammals and invertebrates. Brief descriptions of trap sites are given in Schmitz and Richards (2008). Specimens were also collected by hand especially during

Table 1 Summary of collections of reptiles from Faure Island with associated voucher specimens (W.A. Museum collection).

Collector: W. H. Butler, 12–13/5/1959	
<i>Ctenophorus reticulatus</i>	R13127
<i>Gehyra variegata</i>	R13141, R13262, R98204-10
<i>Heteronotia binoei</i>	R13130/3, R78922-3
<i>Menetia greyii</i>	R13193
<i>Simoselaps littoralis</i>	R23636
Collector: K. D. Morris, 20/9/1989	
<i>Morethia lineocellata</i>	R103255-6
Collector: G. Harold, 23–26/11/1989	
<i>Diplodactylus pulcher</i>	R103937
<i>Heteronotia binoei</i>	R103938/83
<i>Lucasium squarrosum</i>	R103940
<i>Nephrurus levis occidentalis</i>	R103936
<i>Ctenotus fallens</i>	R103935
<i>Lerista connivens</i>	R103941
<i>Lerista elegans</i>	R103975, R103987-8
<i>Lerista lineopunctulata</i>	R103939
<i>Lerista varia</i>	R104251-3
Collector: AWC Biological Survey, 25/05/2000– 1/06/2000	
<i>Ctenophorus reticulatus</i>	R141452/6
<i>Pogona m. minor</i>	No voucher; sight record
<i>Gehyra variegata</i>	R141460-1, 67/9, 89-90
<i>Heteronotia binoei</i>	R141453-4/9, 71
<i>Lucasium squarrosum</i>	R141462
<i>Nephrurus levis occidentalis</i>	R141450, 88
<i>Strophurus strophurus</i>	R141457, 72, 95
<i>Cryptoblepharus sp. plagiocephalus?</i>	No voucher; sight record
<i>Ctenotus fallens</i>	R141451/5-6, 64-5, 70, 141698
<i>Lerista connivens</i>	R141487
<i>Lerista elegans</i>	R141474-5, 83/6, 95-6
<i>Lerista lineopunctulata</i>	R141493
<i>Lerista macropisthopus</i>	R141492
<i>Lerista micra</i>	R141692
<i>Lerista planiventralis</i>	R141463
<i>Lerista praepedita</i>	R141482/5, 73, 91
<i>Lerista varia</i>	R41494
<i>Menetia greyii</i>	R141484, 93
<i>Morethia lineocellata</i>	R141458, 68, 94/7
<i>Simoselaps littoralis</i>	R141476-7, 96
<i>Antaresia stimsoni</i>	No voucher; captured and released
AWC Opportunistic surveys 2000–2005	
<i>Eremiascincus sp.</i>	Recorded in cat gut
<i>Ctenotus schomburgkii</i>	Trapped and released, photo
<i>Varanus gouldii</i>	Frequently recorded, photos

nocturnal head torching. Most of these specimens were identified on site, recorded and released. Some voucher specimens were retained and lodged in the collections of the Western Australian or South Australian Museums, along with frozen tissues suitable for molecular analyses. In addition, three species were identified by sightings and not collected. During this survey, all but one of the reptiles recorded on the island previously were recorded again. The exception is *Diplodactylus pulcher*. However, the survey recorded eight species for the first time,

bringing the total then recorded from Faure Island to 22 species.

A feral cat trapping programme in September 2000 (Algar and Angus 2008) revealed five reptile species as cat prey, including one additional species for Faure Island (*Eremiascincus sp.*). An additional species (*Ctenotus schomburgkii*) was trapped in July 2005, making a final tally of 24 species for Faure Island.

Several of the species recorded on Faure Island belong to groups requiring further taxonomic study. These are indicated here by the designation 'c.f.'

The herpetofauna of the wider Carnarvon Basin biogeographic region was inventoried by Storr and Harold (1978, 1980, 1984) and more recently subjected to systematic, quadrat-based sampling as part of a regional biological survey (McKenzie *et al.* 2000). A comprehensive review of the regional herpetofauna was undertaken in conjunction with this survey by Aplin, M.A Cowan and M. Adams (unpublished report), including genetic analyses of selected taxa. We draw heavily on this report for information on regional distributions and for some taxonomic considerations.

HERPETOFAUNA OF FAURE ISLAND AND SURROUNDING AREAS

The currently documented herpetofauna of Faure Island, as listed in Tables 1–2, includes 21 confirmed reptile species and three others recorded as sightings only (indicated by 's'). No frogs are known to occur on the island. Scincidae (skinks) is the most speciose family (13 spp.), followed by Diplodactylidae (clawed geckos; 3 spp.) and Gekkonidae and Agamidae (padded geckoes and dragons, respectively; 2 spp. each). Caphodactylidae (knob and leaf-tailed geckos), Varanidae (goannas), Boidae (pythons) and Elapidae (front-fanged snakes) are each represented by a single species.

Peron Region has a recorded herpetofauna of 65 reptile species (Table 2). No frogs are recorded from this extremely arid landform. Scincids (25 spp.) and gekkotans (includes the three gecko families above; 10 spp.) are similarly well-represented in this region, but elapids (8 spp.) are proportionally more diverse. Two additional families are also represented, Typhlopidae (blind snakes) and Pygopodidae (legless lizards), the latter of which is well-represented with nine species.

All of the reptile species found on Faure Island probably also occur on Peron Region. A possible exception is *Cryptoblepharus plagiocephalus*, recorded as a possible sighting only on Faure Island. Regionally, this species is present on Edel Region and adjacent western margin of the Victoria Plateau, extending onto Dirk Hartog and Dorre Islands. In Peron Region it is replaced ecologically by a form of *C. carnabyi*. The two species are morphologically very alike and without a voucher specimen, we cannot be certain as to the identity of the Faure Island *Cryptoblepharus*.

Lucasium squarrosum was recorded on Faure Island in 1989 and 2000. A recently collected sample (R141462) was included in a genetic study by Pepper *et al.* (2006), thereby confirming its genetic identity to other local populations of *L. squarrosum*. This taxon is not recorded from Peron Peninsula but is widespread in the Carnarvon Basin region. Most records come from open *Acacia* scrub or chenopod shrubland on heavy red soils.

Edel Region has a recorded herpetofauna of 52 reptiles and three frogs including the Northern Sandhill Frog, *Arenophryne rotunda* (Table 2). Six of the species found on Faure Island are absent from Edel Region. This includes a python (*Antaresia stimsoni*), three diplodactylid geckos (*Diplodactylus pulcher*, *L. squarrosum*, *Strophurus strophurus*) and a small litter-dwelling skink (*Lerista micra*). In addition, the fossorial skink *Lerista planiventralis* is represented by a different subspecies (n nominate on Edel Region; *decora* on Faure Island).

Carnarvon Coastal Plain, on the eastern margin of Disappointment Reach, supports a recorded herpetofauna of 57 reptile and 7 frog species (Table 2). Four of the species found on Faure Island are absent from the Carnarvon Coastal Plain. This includes three skinks (*Cryptoblepharus* sp., *Lerista varia*, *Menetia greyii*) and one elapid (*Simoselaps littoralis*). In addition, the fossorial skink *L. planiventralis* is represented by a different subspecies (n nominate on Carnarvon Coastal Plain; *decora* on Faure Island).

Dirk Hartog Island supports a herpetofauna of 24 reptiles and one frog (Table 2). The species list is similar to that of Edel Region but with a number of significant differences. Notable absences from Dirk Hartog include *Furina ornata*, *Christinus marmoratus* and *Lucasium alboguttatum*. Several taxa found on Dirk Hartog are absent from Edel Region. The most notable are *Antaresia stimsoni*, which is present on Bernier and Dorre Islands and Peron Peninsula, and occurs throughout the inland part of the Carnarvon Basin biogeographic region; and *Delma butleri*, which also occurs at Cape Cuvier and in the northern part of the Carnarvon Basin biogeographic region.

Bernier and Dorre Islands have a combined herpetofauna of 31 reptile species (Table 2). All but one of these are recorded from Bernier Island, with a reduced suite of 17 species known from Dorre Island, presumably reflecting a lesser sampling effort. These islands share a variety of typically southern species with Dirk Hartog and/or the Edel Region, including *Strophurus s. spinigerus*, *Nephrurus milii* and *Ramphotyphlops australis*; these taxa do not occur on Peron Peninsula or on the mainland to the north. In contrast, several species are shared exclusively with the Cape Cuvier region (*Strophurus rankini* and *Rankinia parviceps*) or with the inland Carnarvon Basin including Peron Peninsula (*Strophurus strophurus*, *Diplodactylus klugei*). The presence of *Menetia surda cresswelli* on Bernier Island provides a unique link with Peron Peninsula and inland sand plain habitat on the Victoria Plateau south to the Yuna district; while the population of *Egernia multiscutata* on Bernier Island is spectacularly disjunct, the nearest population being on coastal sands between

Table 2 Comparison of the Faure Island herpetofauna with that recorded from various other islands in the Shark Bay World Heritage Area and on adjacent land units of the Carnarvon basin biogeographic region (Burbidge *et al.* 2000, based on Hocking *et al.* 1987).

	FAURE ISLAND	SALUTATION ISLAND	BAUDIN ISLAND	THREE BAYS ISLAND	EDEL REGION	DIRK HARTOG ISLAND	DORRE/BERNIER ISLAND	PERON REGION	VICTORIA PLATEAU	CARBLA PLATEAU	CARNARVON COASTAL PLAIN
Hylidae											
<i>Cyclorana maini</i>											+
<i>Cyclorana platycephala</i>											+
<i>Litoria rubella</i>										+	
Myobatrachidae											
<i>Arenophryne rotunda</i>					+	+			+		
<i>Opisthodon spenceri</i>											+
<i>Neobatrachus fulvus</i>											+
<i>Neobatrachus pelobatoides</i>					+						
<i>Neobatrachus sutor</i>											+
<i>Neobatrachus wilsmorei</i>					+					+	+
<i>Pseudophryne guentheri</i>									+		+
<i>Pseudophryne occidentalis</i>									+		
Chelidae											
<i>Chelodina steindachneri</i>										+	+
Typhlopidae											
<i>Ramphotyphlops australis</i>					+		+				
<i>Ramphotyphlops grypus</i>								+			+
<i>Ramphotyphlops hamatus</i>								+	+		
<i>Ramphotyphlops leptosoma</i>									+		+
<i>Ramphotyphlops waitii</i>					+						
Boidae											
<i>Antaresia stimsoni</i>	+					+	+	+	+		+
<i>Aspidites ramsayi</i>								+			
Elapidae											
<i>Brachyuropis approximans</i>									+		
<i>Brachyuropis f. fasciolata</i>					+	+		+			
<i>Brachyuropis semifasciata</i>									+		
<i>Demansia calodera</i>					+	+	+	+	+		+
<i>Demansia psammophis cupreiceps</i>										+	+
<i>Demansia psammophis reticulata</i>					+	+		+			
<i>Furina ornata</i>					+				+		+
<i>Neelaps bimaculata</i>					+					+	+
<i>Parasuta monachus</i>								+	+	+	+
<i>Pseudechis australis</i>					+	+	+	+	+	+	+
<i>Pseudonaja modesta</i>									+	+	+
<i>Pseudonaja nuchalis</i>					+	+		+	+	+	+
<i>Simoselaps bertholdi</i>								+	+	+	+
<i>Simoselaps littoralis</i>	+				+	+	+	+	+	+	+
<i>Suta fasciata</i>									+	+	+
Agamidae											
<i>Amphibolurus longirostris</i>								+			+
<i>Caimanops amphiboluroides</i>									+		
<i>Ctenophorus maculatus badius</i>									+		+
<i>Ctenophorus maculatus maculatus</i>					+	+	+	+	+	+	+
<i>Ctenophorus nuchalis</i>									+	+	+
<i>Ctenophorus reticulatus</i>	+		+	+	+	+	+	+	+	+	+
<i>Ctenophorus rubens</i>									+		

Table 2 (cont.)

	FAURE ISLAND	SALUTATION ISLAND	BAUDIN ISLAND	THREE BAYS ISLAND	EDEL REGION	DIRK HARTOG ISLAND	DORRE/BERNIER ISLAND	PERON REGION	VICTORIA PLATEAU	CARBLA PLATEAU	CARNARVON COASTAL PLAIN
<i>Ctenophorus scutulatus</i>								+	+	+	+
<i>Moloch horridus</i>								+	+	+	+
<i>Pogona minor minor</i>	S	+			+	+		+		+	+
<i>Rankinia adelaidensis adelaidensis</i>					+				+		
<i>Rankinia butleri</i>					+	+					
<i>Rankinia parviceps</i>							+				
Gekkonidae											
<i>Christinus marmoratus</i> s.l.					+						
<i>Gehyra punctata</i>									+		+
<i>Gehyra variegata</i>	+	+	+	+	+	+	+	+	+	+	+
<i>Heteronotia binoei</i>	+	+	+	+	+	+	+	+	+	+	+
Diplodactylidae											
<i>Crenadactylus ocellatus</i>					+	+	+	+	+		
<i>Diplodactylus conspicillatus</i>											+
<i>Diplodactylus klugei</i>								+	+	+	+
<i>Diplodactylus ornatus</i>			+		+	+	+	+	+		
<i>Diplodactylus pulcher</i>	+						+	+	+	+	+
<i>Lucasium alboguttatum</i>					+			+	+	+	
<i>Lucasium squarrosus</i> s.l.	+							+	+	+	+
<i>Nephurus levis occidentalis</i>	+				+	+	+	+	+		+
<i>Nephurus milii</i>					+	+	+				
<i>Rhynchoedura ornata</i>									+	+	
<i>Strophurus michaelsoni</i>								+		+	
<i>Strophurus rankini</i>							+				
<i>Strophurus s. spinigerus</i>					+	+	+		+		
<i>Strophurus strophurus</i>	+						+	+	+	+	+
Pygopodidae											
<i>Aclys concinna major</i>					+			+			
<i>Aprasia haroldi</i>					+						
<i>Aprasia smithi</i>					+			+	+		
<i>Delma australis</i>					+			+	+	+	+
<i>Delma butleri</i>						+		+			
<i>Delma fraseri</i>					+						
<i>Delma nasuta</i>					+			+			
<i>Delma tinca</i>									+	+	+
<i>Lialis burtonis</i>		+			+	+	+	+	+		+
<i>Pletholax gracilis edelensis</i>					+			+			
<i>Pygopus lepidopodus</i>					+	+		+	+		
<i>Pygopus nigriceps</i>					+			+	+		+
Scincidae											
<i>Cryptoblepharus carnabyi</i> A		+	+	+	+	+	+	+		+	+
<i>Cryptoblepharus carnabyi</i> B					+	+	+				
<i>Cryptoblepharus plagiocephalus</i> s.l.	S				+	+	+		+		
<i>Ctenotus alleni</i>								+	+		
<i>Ctenotus australis</i>		+				+	+		+		
<i>Ctenotus fallens</i>	+			+	+	+	+	+	+		+
<i>Ctenotus leonhardii</i>									+		
<i>Ctenotus mimetes</i>								+	+	+	+
<i>Ctenotus pantherinus ocellifer</i>											+
<i>Ctenotus pantherinus pantherinus</i>								+	+		
<i>Ctenotus schomburgkii</i>	+				+			+	+	+	+
<i>Ctenotus severus</i>									+	+	+

Table 2 (cont.)

	FAURE ISLAND	SALUTATION ISLAND	BAUDIN ISLAND	THREE BAYS ISLAND	EDEL REGION	DIRK HARTOG ISLAND	DORRE/BERNIER ISLAND	PERON REGION	VICTORIA PLATEAU	CARBLA PLATEAU	CARNARVON COASTAL PLAIN
<i>Ctenotus uber uber</i>									+		
<i>Ctenotus youngsoni</i>		+		+	+	+					
<i>Ctenotus zasticus</i>									+		
<i>Cyclodomorphus celatus</i>			+		+	+	+		+		
<i>Egernia depressa</i>									+	+	+
<i>Egernia inornata</i>								+			
<i>Egernia kingii</i>				+							
<i>Egernia multiscutata</i>							+				
<i>Egernia stokesii badia</i>			+			+		+		+	+
<i>Egernia stokesii stokesii</i>					+						
<i>Eremiascincus richardsonii</i>	?							+			+
<i>Lerista connivens</i>	+			+	+			+	+	+	+
<i>Lerista elegans</i>	+				+	+	+	+	+		+
<i>Lerista gascoynensis</i>									+		
<i>Lerista humphriesi</i>									+		
<i>Lerista kendricki</i>								+	+		
<i>Lerista lineopunctulata</i>	+				+	+		+	+	+	+
<i>Lerista macropisthopus fusciceps</i>								+	+	+	+
<i>Lerista micra</i>	+							+		+	+
<i>Lerista planiventralis decora</i>	+							+			
<i>Lerista p. planiventralis</i>					+	+	+				+
<i>Lerista praepedita</i>	+	+			+	+	+	+	+	+	+
<i>Lerista uniduo</i>								+	+	+	+
<i>Lerista varia</i>	+				+	+		+	+		+
<i>Menetia greyii</i>	+		+	+				+	+		
<i>Menetia surda creswelli</i>							+	+	+		
<i>Morethia butleri</i>									+		
<i>Morethia lineocellata</i>	+				+	+	+	+	+	+	+
<i>Morethia obscura</i>					+			+	+	+	
<i>Tiliqua multifasciata</i>											+
<i>Tiliqua occipitalis</i>								+			+
<i>Tiliqua rugosa</i> subsp.					+	+	+	+	+		+
Varanidae											
<i>Varanus brevicauda</i>								+			
<i>Varanus caudolineatus</i>									+	+	+
<i>Varanus eremius</i>					+			+	+	+	+
<i>Varanus gouldii</i>	+				+	+	+	+	+	+	+
<i>Varanus tristis</i>									+		

Stockyard Gully and Lancelin, far to the south. No frogs are recorded on Bernier and Dorre Islands.

The numerous small islands located in Useless Loop, between Edel Land and Peron Peninsula, support a total of 16 reptile species (Table 2). Three of the better sampled islands are included in Table 2. Salutation Island, with an area of 162 ha, has a recorded herpetofauna of eight reptiles, all but one of which are recorded from Edel Region. The sole exception, *Ctenotus australis*, is recorded from Victoria Plateau to the south and Dirk Hartog Island to the north, and might yet be expected to turn up on Edel Land. Baudin Island, with an area

of 19 ha, also has eight reptile species. Notably, this includes a member of the *Menetia greyii* group, absent from Edel Region but shared with Peron Region, and a distinctive population of *Egernia stokesii* (described by Storr (1978) as *E. s. aethiops* but mtDNA identity with *E. s. badia*; Hamilton 2003). Three Bays Island, with an area of 5.5 ha, has a total of nine recorded species, including a member of the *Menetia greyii* group and a highly disjunct population of *Egernia kingii*. The nearest populations of *E. kingii* are in the Houtman Abrolhos (Storr 1978). Its wider distribution extends around the southwest corner of Western Australia,

east to the Recherche Archipelago, and includes numerous small islands throughout its range. Even smaller islands, with areas of < 5 ha, support only two or three reptile species. Typically, these include one or more of the gekkonids *Gehyra variegata* and *Heteronotia binoei*, and the skink *Cryptoblepharus carnabyi*. Not surprisingly, these taxa are also common to each of Salutation, Baudin and Three Bays Islands.

DISCUSSION

Although the May–June 2000 and subsequent surveys significantly extended the species list for Faure Island, a number of apparent absences may yet be due to inadequate sampling. In particular, snakes, goannas and legless lizards are notoriously difficult to sample (Rolfe and McKenzie 2000), the first two groups because they occur in naturally low numbers, and the last-mentioned because many members of the group are highly cryptic and/or exhibit low mobility. In contrast, knowledge of mobile, surface dwelling lizards, such as the larger agamids (*Pogona*, *Ctenophorus* spp.) and larger skinks (e.g. *Ctenotus* spp.) is probably more complete, and absences more likely to be real. In particular, some confidence can be placed in the absence from Faure Island of the dragons *Ctenophorus maculatus* and *C. scutulatus*, and the skinks *Ctenotus pantherinus*, *Egernia* spp. and *Tiliqua* spp. Skinks of the genus *Lerista* are also relatively well-sampled, with a tally of seven species for Faure Island, only three less than on Peron Region. Good coverage in this genus reflects the combined use of pit-trapping and foraging during the survey.

Faure Island was formed shortly before 6500 years ago, during the final stage of the Holocene marine transgression (Semeniuk and Searle 1986). At that time, the recently formed island probably supported something close to the full complement of herpetofauna found on the adjacent landforms of the Peron Region. Divergence of the insular and mainland herpetofaunas since that time potentially occurred through several processes, namely i) local extinction on the island or the mainland habitats; ii) dispersal of taxa onto Peron Region from surrounding habitats, perhaps facilitated by local climatic and environmental adjustments to high sea levels; and iii) dispersal of taxa to Faure Island from a source outside of the Peron Region. In the case of reptiles and frogs, across-water dispersal has probably been relatively insignificant, although several lizard species found in this region are semi-commensal and thus prone to anthropogenic translocation (see Appendix).

According to the theory of island biogeography, the biota of continental islands (i.e. those created by sea level rise) undergo a step-wise 'drop out' of taxa

towards an 'equilibrium' state where diversity is in accord with island size and habitat complexity (MacArthur and Wilson 1967; Diamond 1975). Kitchener *et al.* (1980) analysed patterns of reptile diversity on continental islands along the Western Australian coast and concluded that the insular herpetofaunas are approaching or have achieved equilibrium. They also documented a latitudinal effect on diversity, with species richness decreasing to the south. The herpetofaunas of the various Shark Bay islands fit comfortably within this general relationship, suggesting that local extinction has indeed played a significant role in shaping the herpetofauna of these islands.

As reported here, the Faure Island herpetofauna is a subset of that found on the adjacent Peron Region, and such differences that are not due to sampling effort presumably reflect 'drop out' extinctions on the island. As argued earlier, this process appears to have eliminated two of three species of *Ctenophorus*, several of the larger skinks (*Egernia* and *Tiliqua* spp.), and one or more species of *Ctenotus*. This limited analysis suggests that extinction on Faure Island has resulted in loss of some of the larger reptile taxa, and possibly a reduction in congeneric diversity, especially among medium-sized, surface-dwelling taxa. The present day absence of frogs on both Faure Island and Peron Region might be due to a shared history of extinction. Alternatively, it might reflect an absence of frogs on the adjacent land surface during the terminal Pleistocene and early Holocene.

A more comprehensive analysis of the 'drop out' phenomenon is possible through comparison of other insular herpetofaunas in the SBWHA. To do so, we must assume that the disjunct occurrence of a taxon on each of Edel Land and the Cape Cuvier coastal margin (west of Lake Macleod) is evidence of former continuity of range across the now submerged Shark Bay plains. If so, then it may be reasonably inferred that the absence of such a taxon from any of Dirk Hartog, Dorre or Bernier Islands is likely to be due to the 'drop out' effect. Using this criterion, two reptile species (*Lerista connivens* and *Lucasium alboguttatum*) appear to have become extinct on all major islands. Five reptiles (*Lerista varia*, *Pogona m. minor*, *Ctenophorus reticulatus*, *Delma butleri* and *Pseudonaja nuchalis*) were lost from Bernier and Dorre Islands but survive on Dirk Hartog Island. Two species (*Lerista elegans* and *Cyclodomorphus celatus*) were lost from Dirk Hartog but survive on Bernier and Dorre Islands. One species (*Cryptoblepharus plagioccephalus*) was lost from Bernier Island only; and two (*Nephrurus levis occidentalis* and *Lerista praeepedita*) only from Dorre Island. Other reptile species which might once have occurred on other islands include *Menetia surda cresswelli* and *Egernia multiscutata*, both currently restricted to Bernier Island; and

Brachyurophis f. fasciolata, now restricted to Dirk Hartog Island. With the exception of the population of *Arenophryne rotunda* on Dirk Hartog Island, any original frog fauna has been lost from the other islands of Shark Bay.

While these lists of presumed local extinction events are informative, they are also inherently conservative, since they require the survival of any taxon on both the Cuvier coastal margin and one or both of the Shark Bay peninsulae, all of which are relatively small and narrowly connected areas where local extinction might not be immediately countered by dispersal from surrounding areas. This is especially true in the case of the Cuvier coastal strip, which is in many ways a continental refugium of south-coastal herpetofauna (Aplin *et al.* unpublished report), bordered to the east by an arid-zone fauna.

An interesting feature of the presumed local extinctions is the lack of obvious bias toward any particular taxonomic or ecological group. All families except varanids, boids, typhlopids and hylid frogs are represented, and there is no clear bias towards larger-bodied taxa or for terrestrial over fossorial species. This observation is in keeping with the conclusions of Kitchener *et al.* (1980), although their data, based on a larger series of Western Australian islands and mainland conservation reserves, show a slightly enhanced survival of smaller members of any family of lizards, and of gekkotans compared with other groups of lizards. Persistence of relatively large lizards on even very small islands in Shark Bay, for example of *Egernia kingii* on Three Bays Island (5.5 ha), has already been noted. Indeed, in this particular genus, which shows many such examples of populations persisting on very small Western Australian islands (Ford 1963; Storr 1965), a case might be made for *enhanced* survival prospects on very small islands, perhaps on account of the absence of many competitors or major predators such as pythons and varanids.

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APPENDIX

TAXONOMIC AND DISTRIBUTIONAL NOTES ON FAURE ISLAND REPTILES

NOMENCLATURE

The taxonomic arrangement follows usage in Aplin and Smith (2001), except where more recent work supports an alternative arrangement. At the higher level, the major change is recognition of three families within 'Gekkonidae' – true Gekkonidae, Carphodactylidae and Diplodactylidae (following Han *et al.* 2004).

FAMILY ELAPIDAE

Simoselaps littoralis (Storr, 1968)

This species was collected by W.H. Butler in 1959 and again by the survey team in 2000 when two were trapped in site 4 and a dead specimen located on a birrida. It was also recorded in feral cat stomachs in September 2000 (Algar and Angus 2008).

The wider distribution of *S. littoralis* extends from Cervantes in the south, north to North West Cape. In the Carnarvon Basin biogeographic region it is distributed along the coastal strip, including the Edel and Peron Regions and adjacent parts of the Victoria Plateau, Dirk Hartog, Dorre and Bernier Islands, and the vicinity of Cape Cuvier and Gnaraloo in the north.

Storr (1967) noted geographic variation within *S. littoralis*. Specimens from northern areas (Point Cloates to Shark Bay) differed from those from south of Jurien Bay in having a lower number of encircling rings on the body and tail; a longer nuchal blotch; fewer ventral and subcaudal scales; and a relatively longer tail. Aplin *et al.* (unpublished report) examined geographic variation in these and other features of *S. littoralis*, based on a far larger sample than was available to Storr. Their preliminary results indicate that *S. littoralis* appears to consist of two closely related but, in all likelihood, distinct taxa that can be distinguished on a variety of scalation and pattern characteristics. These are distributed roughly north and south of Shark Bay, as indicated by Storr (1979). However, in the vicinity of Shark Bay itself, the distinction between the two 'morphs' becomes blurred, with many intermediates and atypical admixtures of characters. Whether this represents a zone of hybridisation or alternatively, an area where the diversity of contrasting habitats results in strong patterns of differential selection on traits, cannot be decided without some analysis of molecular genetic markers.

FAMILY BOIDAE

Antaresia stimsoni stimsoni (Smith, 1981)

This species was encountered on Faure Island by

the survey team in 2000. Individuals were located in old buildings including the shearing shed and buildings around the homestead.

Stimson's python is widespread throughout the Carnarvon Basin biogeographic region. Collection records suggest that it is more abundant in the northern half of the region and on each of Dirk Hartog, Bernier and Dorre Islands, with comparatively few records from Peron and the Victoria Plateau. A specimen from Denham was examined at the Western Australian Museum in 1992, but was returned for release on Peron Peninsula.

FAMILY AGAMIDAE

Ctenophorus reticulatus (Gray, 1845)

This species is virtually ubiquitous throughout the Carnarvon Basin biogeographic region and was commonly observed on Faure Island. Storr (1966) suggested a preference for heavy, loamy soils. However, its pattern of distribution on major landforms suggests a preference for more sandy substrates than those frequented by its close relative *C. nuchalis*.

A specimen collected by W.H. Butler was located "near burrow under dead mangroves" (R13127; notes on label). Specimens in 2000 were recorded on birridas.

Pogona minor (Sternfeld, 1919)

This species is tentatively included on the basis of a sight record at the northern end of Faure Island by S. Donnellan. The specimen was viewed only briefly before escaping under a large *Acacia* shrub, but it appeared to be larger than the common *Ctenophorus reticulatus* and its colour and pattern were consistent with that of *Pogona minor*, the only other large scansorial dragon species recorded from the region.

The taxonomy of Western Australian *Pogona* remains unresolved. Badham (1976) identified the southwestern and near-coastal populations north to North West Cape as *P. minimus*, those of the Murchison, Gascoyne and southern Pilbara regions as *P. minor*, and those of the northern Pilbara as *P. mitchelli*. Possible hybrids or intergrades were noted along the boundaries between each of *minimus* and *minor*, and *minor* and *mitchelli*. Storr (1982) treated all of these populations as subspecies of *P. minor*, and restricted *minimus* to the Abrolhos Islands. He postulated the presence of a narrow hybrid zone to explain the apparent intergradation between *minor* and *mitchelli*. He also noted consistent geographic variation in the colour of the oral mucosa in *P. m. minor* (yellow in the south;

changing to white, north of Kalbarri). Witten's (1994a,b) morphometric analysis supported Storr's impressions.

Carnarvon Basin region specimens appear relatively uniform in both body proportions and details of spination. This observation is consistent with Storr's (1982) interpretation and his nomenclature is followed here. A detailed genetic and morphometric investigation of the group is currently underway by Jane Melville (Museum Victoria).

FAMILY GEKKONIDAE

Gehyra variegata (Duméril and Bibron, 1836)

This species is virtually ubiquitous in the Carnarvon Basin region and is recorded from all major and several of the smaller islands in Shark Bay, including Faure Island. Substantial morphological and chromosomal variation within Carnarvon Basin populations of *G. variegata* suggests that several distinct species occur in this area. No attempt has been made to divide this sample, pending some genetic insight into the broader problem.

W.H. Butler collected a series of this species on Faure Island "in dead mangroves" (R98204-98210; notes on label). In 2000 it was recorded in dead stumps at site 3 and in February was caught at sites 1, 2, 3, 4, 5, and 6.

Heteronotia binoei (Gray, 1845)

Bynoe's gecko is ubiquitous through the study area. It is present on all major and many minor islands in Shark Bay. W.H. Butler collected two specimens on Faure Island "mangroves" (R78922-78923; notes on label). G. Harold obtained specimens from two habitats: "mid-dense *S. longifolius* on white sandy beach (R103983; notes on label) and "mid-dense *S. longifolius*, sparse low shrubs, very sparse samphire on pink sand" (R103938; notes on label). Specimens in 2000 were trapped at sites 1, 2 and 5 and located under iron at the bore and under limestone rocks on cliff near site 4.

Work by Moritz and others (Moritz 1983; Moritz *et al.* 1989, 1990) revealed a complex of chromosomally and genetically distinct, diploid sexually reproducing populations within *H. binoei*, among which are interspersed various triploid parthenogenetic populations of hybrid origin. The various parental taxa are weakly differentiated genetically and have largely non-overlapping distributions (Moritz *et al.* 1990); they probably represent a complex of six or more weakly differentiated species.

Two main groups of sexually reproducing populations are represented in Western Australia. In the Carnarvon Basin area, one group has been recorded from the Victoria and Carbla Plateaus,

north to Wooramel. The second group is mainly found in the arid centre of Western Australia and the Northern Territory, extending west to Nanutarra, but with an outlying population at Carrarang. Parthenogenetic populations are known from several localities within the Carnarvon Basin region, most notably Wooramel and near Lake Macleod (Moritz *et al.* 1989). Precise identification of Faure Island specimens will require genetic analyses.

FAMILY CARPHODACTYLIDAE

Nephrurus levis occidentalis De Vis, 1886

This species is widely distributed in the Carnarvon Basin region but is probably most abundant in the near coastal areas.

G. Harold obtained a specimen on Faure Island in "mid-dense *S. longifolius*, sparse low shrubs, very sparse samphire on pink sand" (R103936; notes on label). Specimens in 2000 were trapped at sites 4, 10.

FAMILY DIPLODACTYLIDAE

Diplodactylus pulcher (Steindachner, 1870)

This taxon is widespread in the Carnarvon Basin biogeographic region but is seemingly absent from Edel Region and from much of the Carnarvon Coastal Plain. It has been collected once only on Faure Island, by G. Harold in "low, open *Acacia* shrubland on red sand" (R103937; notes on label). An additional individual was captured and photographed in October 2005 by AWC staff.

Lucasium squarrosus (Kluge, 1962)

This species is also widespread in the Carnarvon Basin biogeographic region but with no records from Edel Region or Peron Peninsula. It was collected on Faure Island by G. Harold in 1989 and again by the survey team in 2000. Harold's specimen was obtained in "eaten out *Acacia* shrubland on red sand (R103940; notes on label). This species was trapped at site 10 in 2000.

The Carnarvon Basin population is probably disjunct from other populations centred on the semiarid southern interior and the headwaters of the Ashburton River in the Pilbara. Storr *et al.* (1990) noted morphological differences between the various populations. Pepper *et al.* (2006) reported molecular differentiation between the Carnarvon Basin and southern interior populations. Their study included the recently collected specimen (R141462) from Faure Island.

Strophurus strophurus (Duméril and Bibron, 1836)

This species is widespread in the Carnarvon Basin region. Its wider distribution includes the central and southern arid zone of Western Australia, north to North West Cape and the Pilbara Region, and

inland to the Warburton Range. It was recorded in *Acacia* shrubland during head torching in May 2000.

Storr *et al.* (1990) noted geographic variation in the colour of the dermis around the eye and between the tail segments, which is usually orange or yellow, but may be pure white in the southwestern part of the species' range. The pigment is rapidly lost in preservative. The majority of specimens collected in the Carnarvon Basin region survey had distinctly yellow eye rings and tail skin but with occasional white examples at a number of sites.

FAMILY SCINCIDAE (Skinks)

Cryptoblepharus sp.

Cryptoblepharus plagioccephalus was tentatively recorded from Faure Island on the basis of a sight record by J. Dell on the homestead building in May–June 2000. However, this species is morphologically very similar to *C. carnabyi* and, without a voucher specimen, we cannot be certain as to the identity of the Faure Island *Cryptoblepharus*. In the wider Carnarvon Basin region, *C. plagioccephalus* is recorded from sites in Edel Region and the adjacent western margin of the Victoria Plateau, and also on Dirk Hartog and Dorre Islands. One of two distinct forms of *C. carnabyi* found in the Carnarvon Basin biogeographic region is recorded from Peron Region.

Ctenotus fallens Storr, 1976

This species was recorded by G. Harold in 1989 and again by the 2000 survey team. Harold's specimen was collected from "mid-dense *S. longifolius*, sparse low shrubs, very sparse samphire on pink sand" (R103935; notes on label). It was widespread and abundant on Faure Island in 2000 and 2003 and trapped at sites 1, 2, 3, 4, 5, 6, 7, and 9.

The species is widely distributed across the Edel and Peron Regions and the adjacent southwest part of Victoria Plateau, extending onto Peron Peninsula.

Ctenotus schomburgkii (Peters, 1863)

This species was not recorded until July 2005 when three were pit-trapped at site 10 and an additional freshly dead individual was photographed on a track in red sand.

Ctenotus schomburgkii is widespread across the inland part of the Carnarvon Basin biogeographic region and it also occurs on both Peron Peninsula and Edel Land. These populations are highly variable in appearance and it is possible that more than one taxon is represented (Aplin *et al.*, unpublished report). Rather surprisingly, no member of this group is recorded on any of the other large islands in Shark Bay.

Eremiascincus sp.

An *Eremiascincus* sp. was recorded in a cat stomach by Algar and Angus (2008). This represents the only evidence for a member of this genus on Faure Island.

Genetic studies underway by S. Donnellan and P. Doughty indicates great complexity within the genus *Eremiascincus* and there is little value at present in attempting a species identification. Previous samples from localities on Peron Peninsula and on the Carnarvon Coastal Plain have been identified as *E. richardsonii*. Interestingly enough, this genus is not represented on any of the other islands in Shark Bay.

Lerista connivens (Storr, 1972)

This species was recorded by G. Harold in 1989 and again by the 2000 survey team. Harold's specimen was collected from "mid-dense *Spinifex longifolius* on white sandy beach" (R103941; notes on label). Specimen in 2000 was trapped at site 9.

The wider range of this species encompasses most of the Carnarvon Basin region, including both coastal landforms and inland depositional and erosional surfaces.

Lerista elegans (Gray, 1845)

This species is widely distributed and abundant in the Carnarvon Basin region with numerous records from the adjacent Edel and Peron Regions. On Faure Island G. Harold collected two specimens in "mid-dense *Spinifex longifolius* on white sandy beach" (R103987-103988; notes on label). Specimens in 2000 were trapped at sites 1 and 5.

Lerista elegans shows considerable variation in patterning within the Carnarvon Basin area, especially in the degree of 'brightness', but there appears to be little geographic structure to the observed variation. A pilot genetic study of representative specimens showed low levels of genetic differentiation between regions within the Carnarvon Basin, compatible with the presence of a single species (Aplin *et al.*, unpublished report).

Lerista lineopunctulata (Duméril and Bibron, 1839)

Faure Island specimens obtained by G. Harold came from "mid-dense *Spinifex longifolius* on white sandy beach" (R103939; notes on label). Habitat of the 2000 specimen was not recorded.

Lerista lineopunctulata is best regarded as a 'complex' of closely related forms with abutting or narrowly overlapping distributions. Members of this complex are widely distributed along the west coast, from the Swan River to North West Cape.

Storr (1972) reported differences between southern and northern populations in forelimb development (style vs groove), pedal digit number (2 vs 1), body patterning (dashed vs plain), head colouration (pale vs dark) and number of nuchal scales. However, specimens from "the intervening

region" were stated to be "variously intermediate" with "no concord between limb development and colour type". Storr examined a total of 62 specimens; since his time the holdings of the Western Australian Museum for this species has grown to more than 560 specimens, over 100 of which were obtained during the Carnarvon Basin Biological Survey.

Preliminary study of this greatly expanded series by Aplin *et al.* (unpublished report) revealed very strong geographic patterning in both the degree of limb reduction and body elongation. However, a pilot study of Carnarvon Basin populations failed to identify any genetic differences between one-toed and two-toed populations. A geographically broader genetic study of *L. lineopunctulata* undertaken by Hammond (1998) also found low levels of genetic divergence between populations.

Lerista macropisthopus fusciceps Storr, 1991

This species is widespread through the Carnarvon Basin region; represented on all surfaces except Edel Land and the adjacent western margin of Victoria Plateau and Peron Region. It is present on Peron Peninsula but absent from all major and minor islands in Shark Bay except Faure Island where it remained undetected until the survey in 2000. Habitat of the 2000 specimen was not recorded.

Storr (1991) noted considerable variation in supraciliary formula in *L. m. fusciceps*, with varying degrees of fusion of anterior supraciliaries to the adjacent supraocular scales. This showed some geographic basis, most notably in the high frequency of the '0 + 3' variant at Yardie Creek, North West Cape. Aplin *et al.* (unpublished report) found no evidence for differing frequencies of supraciliary variants across the Carnarvon Basin region.

The '*Lerista muelleri* group'

The *Lerista muelleri* group is a complex of 10 or more weakly differentiated species, four of which are represented in the Carnarvon Basin biogeographic region (Aplin *et al.*, unpublished report; Smith and Adams 2007). No member of the group is present on Edel Land, on the western side of Lake Macleod, or on any of Dirk Hartog, Bernier or Dorre Islands. Peron Peninsula supports a population of *L. micra* Smith and Adams (2007; '*Lerista muelleri* B' of Aplin *et al.*, unpublished report), which is the most widely distributed member of the group in this region. Kendrick's (1991) ecological observations for this group pertain to *L. micra*. He noted a preference for the surface and outer margins of litter beds, and a diet consisting primarily of termites.

Lerista micra was collected on Faure Island for the first time during the 2000 survey but detail of habitat was not recorded.

Lerista planiventralis decora (Storr, 1978)

This taxon was collected on Faure Island for the first time during the 2000 survey when specimens were trapped at site 10 and again in 2002 when trapped at sites 1, 2, 3, 4 and 7.

The subspecies *L. p. decora* is found on Peron Peninsula. It extends south through Hamelin and the Zuytdorp area to Badgingarra on the lower west coast and inland to the sand plains of Yuna and Watheroo. The subspecies *L. p. planiventralis* is found on Edel Land and Dirk Hartog, Dorre and Bernier Islands, along a coastal strip of the northern Carnarvon Basin south to Cape Cuvier, and inland to Kennedy Range. The typical form is replaced in the far north at Barradale Roadhouse and near Onslow by *L. p. maryani*. The various subspecies are well-differentiated morphologically. However, Kendrick (1991) found no genetic differences between samples of the typical form and populations of *L. planiventralis decora* from the Hamelin area. He also found no evidence of genetic differentiation between samples of *L. p. planiventralis* from the northern and southern parts of its range.

Lerista praepedita (Boulenger, 1887)

This taxon was collected on Faure Island for the first time during the 2000 survey when specimens were trapped at site 7.

It is widely distributed through the Edel and Peron Regions and the adjacent parts of the Victoria Plateau and Carbla Plateau, north to the Carnarvon Coastal Plain and the vicinity of Lake Macleod. Its broader distribution extends from Mandurah in the south to the tip of North West Cape.

Examination of specimens from the Carnarvon Basin region by Aplin *et al.* (unpublished report) revealed a significant difference in paravertebral numbers between the populations with contrasting supraocular patterns (higher in all populations with two supraoculars) and a correlated difference in nuchal scale counts (lower in these populations). Although these correlated morphological differences suggest the presence of a sibling species pair within *L. praepedita*, genetic analysis revealed low levels of differentiation.

Lerista varia Storr, 1986

This taxon was collected on Faure Island by G. Harold and again during the 2000 survey. Harold's specimens were obtained from "mid-dense *Spinifex longifolius* with sparse low shrubs and samphire on pink sand" (R104251-104252; notes on label); and from "mid-dense *Spinifex longifolius* on white sandy beach" (R104253; notes on label). Habitat of the 2000 specimen was not recorded.

This species has a disjunct distribution in the Carnarvon Basin biogeographic region, with populations in Edel Region and adjacent parts of the Victoria Plateau, on Peron Peninsula north of

Lharidon Bight, on Dirk Hartog Island, and at Cape Cuvier in Macleod Region. It appears to be strictly confined to sandy soils.

The 'Menetia greyii group'

Members of this group are more or less ubiquitous throughout the Carnarvon Basin biogeographic region. However, morphological and genetic analyses of *Menetia* from this region and elsewhere in Australia revealed a number of distinct sexually reproducing taxa, together with various regional parthenogenetic populations of hybrid origin (Aplin *et al.*, unpublished report; Adams *et al.* 2003). Three sexually reproducing taxa are represented in the Carnarvon Basin biogeographic region. Genetic identification of Faure Island specimens is required to establish their identity.

The taxon was undetected on Faure Island prior to the survey in 2000 when a specimen was trapped at site 2.

Morethia lineoocellata (Duméril and Bibron, 1839)

This species is widely distributed through the Carnarvon Basin region, although most specimens come from near coastal localities. It appears to be particularly abundant on Edel Land, on Dirk Hartog, Dorre and Bernier Islands, and at Cape Cuvier. It was collected on Faure Island by K. Morris in 1989 and recorded as abundant and widespread by the survey team in 2000 when specimens were trapped at sites 1, 3, 6, 7, 9, 10.

The wider distribution of *M. lineoocellata* extends from the tip of North West Cape south to Cape Leeuwin. Across its range, *M. lineoocellata* is highly variable in both the style and intensity of patterning. Classic 'ocellated' individuals are often found together with less intensely spotted individuals that resemble sympatric *M. obscura*,

while others are darkly pigmented, almost melanistic, both dorsally and ventrally. Within the Carnarvon Basin region, pale, brightly patterned and dark individuals occur in approximately equal numbers and both forms are generally present within any given area. At localities on Peron Peninsula and on Mardathuna Station, inland of Lake Macleod, dark individuals predominate, while at Cape Cuvier the reverse is true. In general, the 'dark' morph appears to be more abundant on the red sand and inland surfaces, the 'patterned' morph more so on pale coastal sands. A pilot genetic analysis failed to identify any significant difference between the two forms of *M. lineoocellata* in the Carnarvon Basin biogeographic region (Aplin *et al.*, unpublished report).

FAMILY VARANIDAE (Monitors)

Varanus gouldii (Gray, 1838)

This species was listed as occurring on Faure Island by Douglas and Ride (1962) and Storr and Harold (1990), presumably based on information from W.H. Butler, but there are no associated voucher specimens. It was not observed by the survey team in 2000. In September 2000 Algar and Angus (2008) recorded it as the principal dietary item of trapped feral cats, indicating it was then reasonably common on Faure Island. Since 2000 this species has frequently been sighted, trapped and photographed on Faure Island by AWC staff and recorded feeding on reintroduced and radio-collared Shark Bay Mouse (Trish Gardner, pers. comm.).

Varanus gouldii is widely distributed within the Carnarvon Basin biogeographic region and is present on Dirk Hartog, Dorre and Bernier Islands.