

# THE VEGETATION, FLORA AND FAUNA OF SADDLE ISLAND, NEAR WALPOLE, WESTERN AUSTRALIA

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## ABSTRACT

Saddle Island, near Walpole, Western Australia, was visited briefly in November 2005. Our observations were collated with previous records from 1841 and 1990. Three structural vegetation types, herbfield, shrubland and tussock grassland, are present. The known biodiversity of the island comprises 14 lichen species, 2 moss species, 3 non-marine alga species, 30 vascular flora species (including 6 exotic species), at least 14 invertebrate species, 2 lizard species, 14 bird species (with several new breeding records), and 2 mammal (seal) species. Seals have not yet re-established a breeding population.

## INTRODUCTION

Saddle Island is a small (27 ha) island situated 1 km offshore from mainland Western Australia (WA), forming with Goose Island (38 m elevation, 1.5 km farther south) the Casuarina Isles. The island (Fig. 1) was named by W.N. Clark from its resemblance to a saddle with the flaps extended. Freshwater was found in February 1841 flowing down from the high rocks (Clark 1841). It is the wettest island in WA, experiencing an average of c. 1400 mm of rain per annum (based on an isohyet map of WA produced by the Bureau of Meteorology). The close proxim-

ity to the mainland and the shallow depth of the intervening sea (perhaps 10 m) suggest that Saddle Island has been isolated for c. 7 000 years. Furthermore, the island would have experienced few fires in this period, as Aborigines in southwest WA had no watercraft to access islands.

The limited information known about the island is based on visits by W.N. Clark on 22 February and 5 March 1841 (Clark 1841), and by D. Coughran, G. Pobar and P. Lambert of the Department of Conservation and Land Management on 13 February 1990 from 0945 to 1430 h (Lambert

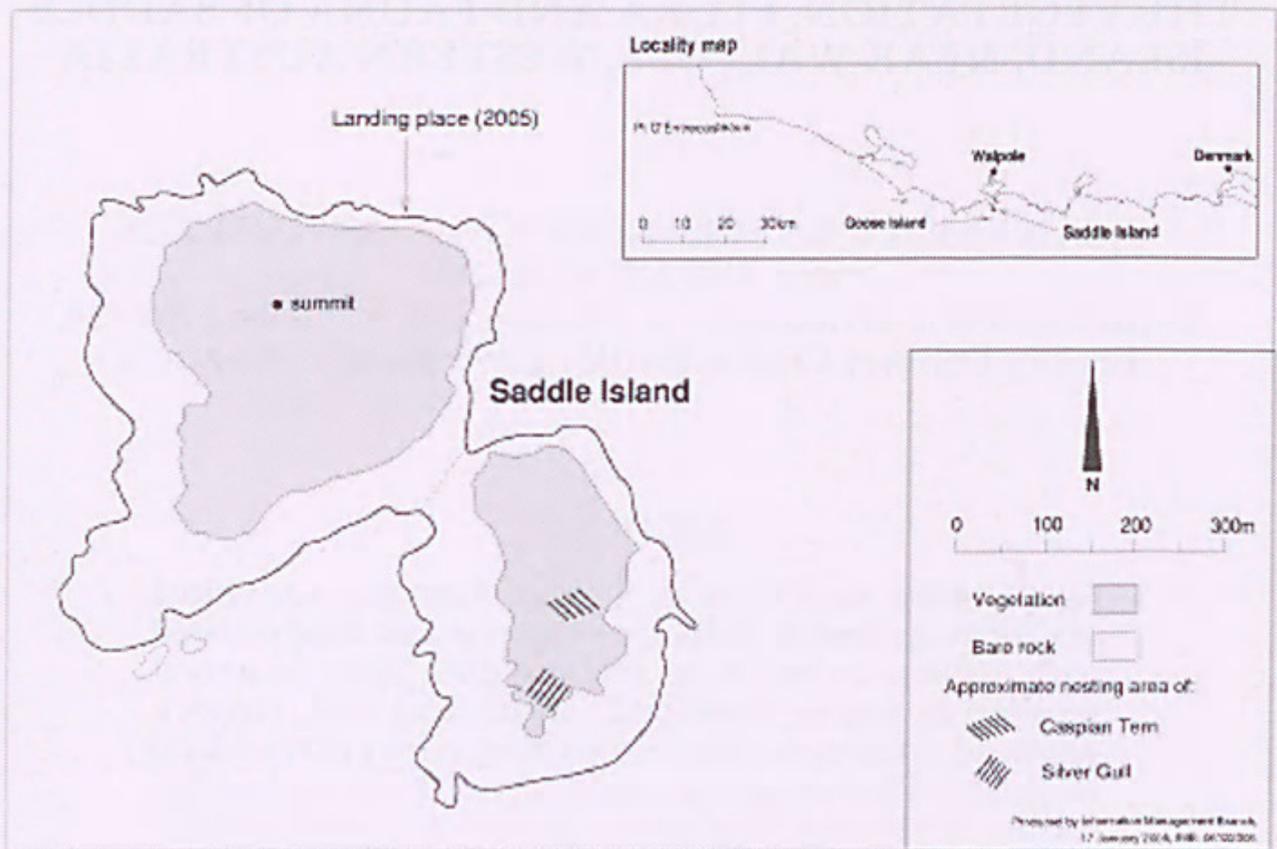


Figure 1. Map of Saddle Island, showing extent of vegetation and bare rock and location of Caspian Tern and Silver Gull nesting areas.

1990). A party of six CALM staff (comprising the four authors, and Jason Fletcher and Michael Sawyer) visited the island between 0730 and 1030 h on 29 November 2005. Tidal and local weather conditions allowed a limited visit of only three hours. At 1100 h the air temperature was 16° C, with occasional light showers and wind WSW at 20 km/h.

#### COLLECTION SITES AND METHODS

The entire island was traversed for flora, and specimens were collected at no particular site. Observations of birds were made

over the entire island, but seabird burrows were not searched. Collections of invertebrates were made at three sites: Landing Rocks (on the north coast 300 m east of the north-western tip); Landing Cave (limestone breakaway with shallow caves some 3 m deep, 50 m upslope from Landing Rocks in a southerly direction; and Landing Hill (potholed limestone capping on hilltop, 40 m above Landing Cave).

Three topographically different sites were each searched for invertebrates for a standard time of 30 minutes, in order to allow species density comparisons. The remainder of the visit was

occupied by movement between sites, through a thick 1 m high shrub layer. Specimens were hand collected by searching the predominant microhabitats at each site.

### SPECIMEN IDENTIFICATION

Specimens of all flora species were collected and have been lodged in the WA Herbarium. Plant specimens were compared with specimens housed at the regional herbarium, Science Division, Manjimup. Plant names are those officially recognized at the WA Herbarium (WA Herbarium 2006).

Terrestrial arthropod specimens were identified to the level of family, sub-family or morphospecies (Muir *et al.* 2005) where possible. The identification keys used were Davies (1986) for spiders (Araneae), Matthews (1984) for scarab beetles (Coleoptera, Scarabaeidae) and CSIRO (1991) for other insect specimens. Once identified to a taxon, all specimens were incorporated into the Walpole Wilderness Invertebrate Project collection (Muir *et al.* 2005, WWIP 2006), then assigned a distinct specimen number and compared to previously collected morphospecies from this local collection. For specimens not previously collected in the WWIP, the specimen number was used as the new morphospecies number.

Names of vertebrate fauna

follow the WA Museum list (WA Museum 2001).

### RESULTS

To avoid repetition we have integrated all information from the four visits, clearly acknowledging the source.

#### Physical

Saddle Island consists of two hills, each forming two parts (17.3 ha, 9.5 ha) joined by a boulder isthmus devoid of vegetation, over which the sea occasionally washes. Much of the island west of this isthmus has an elevation greater than 20 m, reaching a maximum of 45 m. The eastern sector is much lower, with only a small portion of its southern end exceeding 20 m. Although the most exposed parts of the island are bare rock (Fig. 1), the entire island would be subject to frequent deposition of salt carried by strong winds from breaking waves. The island is composed of granite/gneiss rock, with aeolianite present on the highest parts of the western hill. No aeolianite was noticed on the eastern hill. Freshwater seepage points were noted at the base of the aeolianite. No sandy beaches are present.

#### Vegetation

The total area vegetated is 13 ha, comprised of 9.4 ha and 3.6 ha on the western and eastern sectors respectively. Three types of vegetation were distinguished on

our visit. Herbfield (c. 10–15 cm tall) is the most extensive, and is dominated by *Carpobrotus*, *Lobelia*, *Samolus*, *Sporobolus* and *Leucophyta*. Large areas of *Carpobrotus* were present particularly on the southern slopes of the western hill. This vegetation type dominated the eastern sector of the island. The next most extensive vegetation type is shrubland (50 cm–1 m tall), which is dominated by *Rhagodia* and is mainly restricted to aeolianite. Tussock grassland (up to 80 cm tall) occurs on the lower eastern and north-eastern slopes of the western hill, and is also represented on the eastern sector in small areas.

Much *Carpobrotus* and *Rhagodia* on the southern side of the eastern hill was dead at the time of our visit. The tallest plant species seen on the island was *Malva australiana*, with several individuals 1.3 m tall near the summit of the western hill. We found no evidence of recent fire, such as charcoal, anywhere on the island.

#### Cryptogamic Flora

The cryptogam flora of Saddle Island at first glance appears to be rich (Table 1), but in fact is restricted to a few dominant species, with the bright showy lichens being the most obvious. From the collections made on this brief visit, 14 lichen, 2 moss, 3 algae and 1 fungal species were recorded.

The lichen flora is principally of the crustose type, with one

dominating foliose species *Xanthoria parietina* occurring on all stable substrates present on the island (except for sandy areas). Although *Xanthoria* was observed on the rocky edge of the island it is above the tidal zone but still subjected to some of the sea water splashing and wind-driven salt spray. The tidal zone and heavy splash areas were colonized by two orange coloured *Caloplaca* species, *C. ?holocarpa* and *Caloplaca marina*, with the latter the more dominant species in the tidal zone. *Caloplaca citrina* occurred on granite and limestone outcropping, is widespread on the exposed granite outcrops above the splash zone, and is associated with the black *Pyrenopsis* sp. The lack of large perennial shrubs and trees on the island restricted the number of usable substrates available to the lichen flora. The more damage-resistant crustose species dominated the open exposed areas while other less robust taxa were located in sheltered crevices, overhangs or areas protected by association with the vascular flora. *Aspicilia calcarea* and *Buellia pruinosa*, both commonly found on the mainland coast, were scarce on Saddle Island. Several other crustose and one squamulose lichen species were located in small numbers in sheltered positions. These require further study as they appear to be undescribed species.

The moss flora appears to be restricted to two species, both of

Table 1. Cryptogam species recorded on Saddle Island during the 2005 visit.

Taxon	Substrate	Stratum	Frequency	Voucher No.
LICHENS				
<i>Aspicilia calcarea</i>	Stone limestone	Ground	Isolated	22133
<i>Buellia pruinosa</i>	Stone granite, limestone	Ground	Occasional	22126, 22153
<i>Caloplaca citrina</i>	Stone granite	Ground	Frequent	22128
<i>Caloplaca ?holocarpa</i>	Stone limestone	Ground	Frequent	22137
<i>Caloplaca marina</i>	Stone granite	Ground	Frequent	22136
<i>Diploschistes gypsaceus</i>	Stone granite	Ground	Occasional	22124
<i>Pyrenopsis</i> sp.	Stone granite	Ground	Frequent	22123a
<i>Verrucaria</i> sp.	Stone granite	Ground	Frequent	22141
<i>Xanthoria parietina</i>	Stone granite, wood decaying	Ground	Frequent- abundant	22123, 22134
Genus sp.	Stone granite	Ground	Occasional	22125
Genus sp.	Stone limestone	Ground	Isolated	22129
Genus sp.	Stone granite	Ground	Isolated	22138
Genus sp.	Stone granite	Ground	Frequent	22146
Genus sp.	Stone ironstone	Ground	Occasional	22154
MOSESSES				
<i>Didymodon torquatus</i>	Stone limestone, soil	Ground	Frequent	22140, 22147
<i>Tortula antarctica</i>	Stone limestone	Ground	Frequent	22139
ALGAE				
Genus sp.	Stone ironstone	Ground	Frequent	22130
Genus sp.	Stone limestone	Ground	Abundant	22131
Genus sp.	Soil, organic material	Ground	Occasional	22155
FUNGI				
Genus sp.	Soil	Ground	Isolated	22142

which are commonly found in coastal areas and occur on protected soils and limestone outcropping usually located in overhangs or hollows. Three non-marine algal species were collected but not identified and it is a likely that several other taxa are still to be located. Most algae were confined to seepage areas or associated with other

cryptogams and the protected vegetative bases and bark of the vascular flora.

#### Vascular Flora

Only 30 species were found on Saddle Island during our visit, which coincided with flowering of most species. Six of these are exotic (Table 2). The only species recorded (though not collected)

Table 2. Vascular flora recorded on Saddle Island during the 2005 visit.

Family	Taxon	Frequency	Life Form (Mode of regeneration)	Voucher No.
Aizoaceae	# <i>Carpobrotus pulcher</i>	Abundant	Prostrate shrub (S)	RC22100
Apiaceae	# <i>Apium prostratum</i> var. <i>prostratum</i>	Abundant	Annual herb (S)	RC22106
Asteraceae	<i>Angianthus preissianus</i>	Locally abundant	Annual herb (S)	RC22101
	# <i>Cotula coronopifolia</i>	Locally frequent	Annual herb (S)	RC22111
	# <i>Leucophyta brownii</i>	Frequent	Dwarf shrub (S)	RC22095
	<i>Olearia axillaris</i>	Occasional	Shrub (R)	RC22094
	# <i>Senecio pinnatifolius</i> * <i>Sonchus oleraceus</i>	Frequent Locally abundant	Annual/dwarf shrub (S) Annual herb (S)	RC22098 RC22117
Brassicaceae	<i>Lepidium foliosum</i>	Abundant	Shrub (S)	RC22107
Caryophyllaceae	* <i>Cerastium glomeratum</i>	Locally abundant	Annual herb (S)	RC22112
	* <i>Spergularia diandra</i>	Occasional	Annual herb (S)	RC22114
Chenopodiaceae	# <i>Atriplex hypoleuca</i>	Abundant	Shrub (R)	RC22121
	# <i>Rhagodia baccata</i> ssp. <i>baccata</i>	Frequent	Dwarf shrub (R)	RC22119
	# <i>Sarcocornia blackiana</i>	Occasional	Dwarf shrub (R)	RC22096
Crassulaceae	<i>Crassula colorata</i> var. <i>colorata</i>	Frequent	Annual herb (S)	RC22115
	<i>Crassula tetramera</i>	Occasional	Annual herb (S)	RC22115a

Cyperaceae	# <i>Ficinia nodosa</i> <i>Isolepis cernua</i> # <i>Lepidosperma gladiatum</i>	Locally abundant Locally abundant Locally frequent	Sedge (R) Sedge (S) Sedge (R)	RC22118 RC22099 RC22102
Geraniaceae	*# <i>Pelargonium capitatum</i>	Frequent	Shrub (S)	RC22093
Lobeliaceae	# <i>Lobelia alata</i>	Frequent	?Annual herb (S)	RC22109
Malvaceae	# <i>Malva australiana</i>	Frequent	Annual shrub (S)	RC22097
Poaceae	* <i>Bromus diandrus</i> # <i>Poa porphyroclados</i> <i>Sporobolus virginicus</i>	Frequent Abundant Locally abundant	Annual grass (S) Perennial grass (R) Perennial grass (R)	RC22104 RC22103 RC22108
Portulacaceae	<i>Calandrinia brevipedata</i> <i>Calandrinia granulifera</i>	Abundant Locally abundant	Annual herb (S) Annual herb (S)	RC22105 RC22122
Primulaceae	<i>Samolus repens</i> var. <i>repens</i>	Locally abundant	Dwarf shrub (R)	RC22116
Solanaceae	* <i>Solanum nigrum</i>	Locally abundant	Dwarf shrub (S)	RC22092
Urticaceae	<i>Parietaria debilis</i>	Occasional	Annual herb (S)	RC22113

\*denotes exotic species.

#denotes species recorded by Lambert (1990).

Mode of regeneration: R = resprouter; S = seeder.

Table 3. Terrestrial arthropods collected on Saddle Island during the 2005 visit.

Taxon	Common Name	Life Stage	Abundance	WWIP Msp. No.	Site	Micro-habitat
Araneae						
Miturgidae	Sac spiders	juvenile	1	8875	1	litter
Spassidae	Huntsman spiders	male	1	8859	1	litter
Thomisidae	Flower spiders	female	2	8869	3	foliage
Thomisidae	Flower spiders	female	1	8870	3	foliage
		egg case?	1	8873	3	litter
Gastropoda	Snails	shell	1	8863	3	litter
Isopoda	Slaters	juvenile	1	8866	3	lime-stone
Orthoptera						
Acrididae	Short-horned grasshoppers	nymphs	3	8872	3	lime-stone
Hemiptera						
Flatidae	Leafhoppers	nymphs	1	8874	2	cave floor
Coleoptera						
Chrysomelidae	Leaf beetles	elytra	1	8881	1	litter
Scarabaeidae						
<i>Colpochila</i>	Cockchafer beetles	elytra	1	8860	2	cave floor
Scarabaeidae						
<i>Colpochila</i>		elytra	7	8861	2	cave floor
Scarabaeidae		elytra	1	8865	3	litter
Scarabaeidae		adult	1	8876	1	litter
Scarabaeidae		elytra	1	8878	1	litter
Scarabaeidae		elytra	1	8879	1	litter
Diptera						
Carnidae		adult	1	8871	3	litter
Lepidoptera						
Arctiidae						
<i>Spilosoma</i>	Woolly bears	larvae	1	8864	3	litter
Geometridae	Loopers	larvae	1	8877	1	litter
Saturniidae	Emperor Moths	larvae	1	8880	3	foliage
	Moths & butterflies	pupae	1	8862	3	litter
Hymenoptera						
Dolichoderinae	Ants	workers	50	8868	3	litter

Abundance: The number of individuals collected during 30 minutes.

Msp. = morphospecies.

Site: 1 = Landing Rocks; 2 = Landing Cave; 3 = Landing Hill (see text).

by Lambert (1990) but not found by us is *Arctotheca populifolia*.

#### Invertebrates

During a 90 minute search a total of 22 specimens, representing 14 morphospecies, were collected. Only specimen #8866, an isopod, had been previously collected on the nearby Nuyts Peninsula (WWIP Msp 8184), from recently burnt Jarrah (*Eucalyptus marginata*) woodland. This is an unexpected observation, as isopods have limited dispersal capability. The remaining 13 morphospecies belong to widespread and common coastal and forest taxa.

One other interesting observation was the large proportion of beetle elytra found in the litter at site 1 and on the cave floor at site 2. Most of the beetle remains were of a large scarab beetle *Colpochila* sp. This species attains a length of 25 mm and is common flying in nearby coastal forest on summer nights.

#### Reptiles

Only two species have been recorded.

*Christinus marmoratus* Marbled Gecko. We saw several geckoes under one rock on the eastern sector.

*Egernia kingii* King Skink. Clark (1841) noted a very large species of lizard, presumably this species. Twenty were seen during the 1990 visit.

#### Birds

Fourteen bird species have so far been recorded from Saddle Island. All but three breed or probably breed on the island. We noted holes wherever soil was deep, at a density of c. 1/m<sup>2</sup>. Burrows were not so widely distributed on the eastern sector as on the western sector. We saw signs of freshly ejected soil. Time did not permit examination and we are uncertain of the relative contribution made by the following three species.

*Eudyptula minor* Little Penguin. Clark (1841) noted that penguins abounded. Three were seen in 1990. We saw signs of their excreta along walkways around the northern side of the island.

*Puffinus carneipes* Fleshy-footed Shearwater. Clark (1841) found considerable numbers of petrels, referred to as mutton birds or sooty petrels. These were knocked down at night with sticks and salted. In 1842 he wrote that this species left all islands in May and returned in October. Some 2 000 burrows were estimated to occur during the 1990 visit. Material collected by us and submitted to the WA Museum consisted of a skull, two wings, a foot and part of a sternum of this species (R. Johnstone pers. comm.).

*Puffinus assimilis* Little Shearwater. Clark (1842) noted the occurrence of a 'variegated petrel', with white under the belly and the wings and black on the back. It occurred in 'vast

numbers', never migrated, and thus provided a constant supply of food. This record was either overlooked or not accepted by Johnstone and Storr (1998, p. 82). We collected shearwater corpses during our visit and submitted these to the WA Museum. Two whole carcasses and five wings, some of which are from juveniles, of this species were identified by R. Johnstone (pers. comm.). A footprint found on the floor of the cave above the landing place was copied, and this best matched with this species (R. Johnstone pers. comm.).

*Oceanites marinus* White-faced Storm Petrel. Three were seen during the 1990 visit. Several clusters of burrows, with an entry diameter of c. 8 cm, were found in 2005 in herbfield on both sectors, though more were seen on the eastern sector. None of the entrances were blocked by soil.

*Ardea novaehollandiae* White-faced Heron. Six were seen during the 1990 visit. Probably vagrant.

*Pandion haliaetus* Osprey. Two were seen during the 1990 visit. Probably vagrant.

*Haematopus fuliginosus* Sooty Oystercatcher. Six were seen during the 1990 visit. We saw two on the western side and two on the eastern side in 2005, but could not ascertain whether these were the same birds.

*Larus pacificus* Pacific Gull. Four were recorded during the 1990

visit. We saw two on the western side and found signs of shells presumably dropped by this species, and saw two birds on the eastern sector.

*Larus novaehollandiae* Silver Gull. Twenty were counted during the 1990 visit. We saw 34, all on the eastern part of the island. Nesting was in progress, with several fresh nests and one with an egg and one with a small chick.

*Sterna caspia* Caspian Tern. Six were seen during the 1990 visit. We saw 25, all on the eastern sector, where nesting was in progress: empty nests (several); C1 (3 nests); C2 (4); and C2 with one egg chipping.

*Sterna anaethetus* Bridled Tern. Ten were recorded during the 1990 visit. These were massing over the island in a way indicating imminent departure (D. Coughran pers. comm.). Johnstone and Storr (1998, p. 247) provisionally accepted this as a breeding record.

*Neophema petrophila* Rock Parrot. Fifty were noted on the 1990 visit. We saw three on the western sector and nine on the eastern sector.

*Hirundo neoxena* Welcome Swallow. Ten were recorded during the 1990 visit. We saw three birds on the western side and found an empty nest in a cave above the landing place.

*Anthus australis* Australian Pipit. Eight were seen during the 1990 visit. We saw one on the western side of the island.

## Mammals

*Arctocephalus forsteri* New Zealand Fur Seal. Clark (1841) noted this species as 'frequent' at Saddle Island, and recorded that the island was 'much frequented' by this species, particularly a small valley on the western side (Clark 1842). Three were reported by fishermen to have been observed on the island several months before the 1990 visit. Lambert (1990) recorded one haul out site, just north-west of the isthmus, evidenced by faeces and roughage pellets amongst rocks. We saw one animal in the water at the landing place.

*Neophoca cinerea* Australian Sea Lion. One was observed on the island by fishermen several months before the 1990 visit. Lambert (1990) recorded one haul out site, just north-east of the isthmus, evidenced by faeces and flattened areas of tussock grass.

## DISCUSSION

There are 13 vegetated islands, up to the planar area of Saddle Island and situated offshore and thus fully exposed to the ocean swell, present between Cape Leeuwin and Two Peoples Bay. Nearly all have been visited by naturalists. Lists of plant species have been published for St Allouarn and Seal, near Cape Leeuwin (Gillham 1963), Sandy (Abbott 1980a), and Coffin Islands (Abbott 1981a, Smith and Kolichis 1980). Observations of vegetation and dominant plant species have been published for

St Allouarn (Lane 1978), Flat (Lane 1985b), and Stanley Islands (Lane 1985a). Birds present have also been reported on eight islands: St Allouarn (Gillham 1963, J.A.K. Lane 1978, S.G. Lane 1978); Seal (Gillham 1963); Flat (Lane 1985b); Sandy (Lane 1982); Stanley (Lane 1985a); Seagull and Green in Torbay (Johnstone and Storr 1998, 2004); and Coffin (Abbott 1980b, Smith and Kolichis 1980, 1981). These investigations help contextualize the vegetation and biota of Saddle Island.

Herbfield dominates on these islands where soils are shallow or exposure to seaspray is high. Deeper soils, particularly those on the leeward side of islands, support shrubland and grassland. Detailed studies of two small islands near Cape Leeuwin that are continually exposed to wind and spray have demonstrated that the flora is halophytic and lacks sclerophyllous species. *Malva australiana*, *Apium prostratum*, *Carpobrotus virescens* and *Threlkeldia diffusa* dominate the vegetation under which seabirds dig their nesting burrows (Gillham 1963). The absence of forest is understandable, as the 13 islands are small, and there is insufficient shelter from salt spray and strong winds.

These islands collectively support breeding populations of eight species of seabird, though no single island has all species present. The small extent of vegetation and its reduced height

has resulted in no more than four highly vagile landbird species (Rock Parrot, Welcome Swallow, Silvereye, Australian Pipit) occurring, and usually only two of these would be expected to breed (Welcome Swallow and Rock Parrot). This is consistent with a more comprehensive and quantitative investigation of islands between Shark Bay and Esperance (Abbott 1978) and near Albany (Abbott 1980b). Granite islands with a planar area less than 30 ha are too small to support viable populations of marsupials or native rodents, though there is little doubt that the non-native House Mouse *Mus musculus* would persist (Abbott and Burbidge 1995).

One of the most interesting characteristics of continental islands is the absence of species that occur commonly on the coastline of the adjacent mainland. For example, the plant families Myrtaceae, Epacridaceae, Fabaceae and Mimosaceae are not represented on Saddle Island. Snakes appear to be absent. The land bird *Zosterops lateralis* (Silvereye) was not recorded by Lambert (1990) or by us, though it is listed by Johnstone and Storr (2004). The analysis presented by Abbott (1981b), based on the proportion of vegetation cover 1.5 m above ground and the extent of suitable habitat, suggests that the Silvereye should be unable to persist on Saddle Island.

The small size of the island is doubtless a major factor in

explaining the absence of many plant, bird and mammal species. Some plant species may be absent because of the high levels of chloride ions in the soil and the high concentrations of soil nitrogen and phosphorus supplied by the nesting seabirds (Gillham 1963). The small area and low topography of the island appears to provide few of the sheltered habitats favoured by restricted or relict invertebrate species.

Notable absences of plant species include the rare fern *Asplenium obtusatum* var. *northlandicum*, present on nearby Chatham Island (Abbott and Watson 1978, Smith 1979), *Nitraria billardierei*, present on St Allouarn and Sandy Islands (Gillham 1963, Abbott 1980), *Threlkeldia diffusa*, present on St Allouarn, Sandy, and Chatham Islands, *Leucopogon parviflorus*, present on Sandy and Chatham Islands, and *L. revolutus*, present on Coffin Island.

Consistent with the long fire interval on Saddle Island is the low proportion (38%) of native plant species that regenerate by resprouting from corm, tuber or bulb, and not directly from seed. This proportion is similar to that (33%) recorded for vegetation on granite outcrops on mainland WA (Yates *et al.* 2003, p401).

Several corpses of shearwaters were found, apparently the result of predation by a raptor. Although nine raptor species have been recorded on islands along the south coast between Cape Leeuwin and Bald Island

(references cited above; Fullagar and Van Tets 1976; Smith 1977; Storr 1965; Warham 1955), the Peregrine Falcon *Falco peregrinus* appears to be the most likely suspect to have depredated shearwaters on Saddle Island. As we saw no raptors on the island, it appears that raptors only occasionally visit Saddle Island from the adjacent mainland.

Two fibrous pellets containing bird feathers and bones (30, 35 mm in length and 21, 23 mm wide), apparently of owl egesta, were retrieved by J. Fletcher from a cave. We saw no owl on the island. Only one owl species, the Barn Owl *Tyto alba*, has been recorded on islands between Cape Leeuwin and Bald Island (Abbott 1980b). It seems that owls occasionally visit Saddle Island from the adjacent mainland.

Clark (1842) thought that Saddle Island had 'fine feed' for several hundred pigs, which could also eat the variegated petrel. Salt, which was plentiful, could also be used to cure fish. Clark applied before August 1841 for a lease but the Colonial Secretary replied on 25 October that this was not possible until the island was surveyed, and in any case a lease would only be available on an annual basis.

Clark (1842) also mentioned nearby Hummock Island, named for its resemblance to a hummock of hay. Presumably the reference is to Goose Island, as he stated that the island is very small, with little or no vegetation, and is only the resort

of fur seals and petrels. Clark was told by sealers that at certain times 'wild geese' were seen there and had been shot. If the species alluded to is *Cereopsis novaehollandiae*, Cape Barren Goose, it represents a considerable western extension of range, as this species has not otherwise been recorded by early visitors west of Oyster Harbour (P.P. King, December 1821, in King 1827, p144; M. Quoy, October 1826, in Rosenman 1987: 32, 36, 48; February 1827, Lockyer 1827: 493). The original western limit of breeding populations remains uncertain - records of this species near Mammoth Cave in 1921 and Busselton in 1942 (Serventy and Whittell 1976, p142) are apparently of vagrants.

Although not specifically alluding to Saddle Island, Clark (1842) noted that during October and November 'great quantities' of mutton birds were brought into the southern settlements of Western Australia, presumably Albany, where they retailed at 4 pence each. Aborigines collected eggs before the process of incubation had taken place, and these eggs retailed at 6-12 pence per dozen.

An overnight stay during April would be an appropriate time to conduct a simultaneous census of Little Penguins, Fleshy-footed Shearwaters, and Little Shearwaters. More extensive surveys (of both island and nearby mainland) are needed to establish if any invertebrate species are restricted to Saddle Island. The

possibility of translocating the Cape Barren Goose to Saddle and Goose Islands from the Archipelago of the Recherche merits consideration. Finally, being the wettest island in WA, Saddle Island would be an ideal long-term monitoring station for measuring the impact of a warming and drying climate on vegetation and biota, without the confounding influence of fire.

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