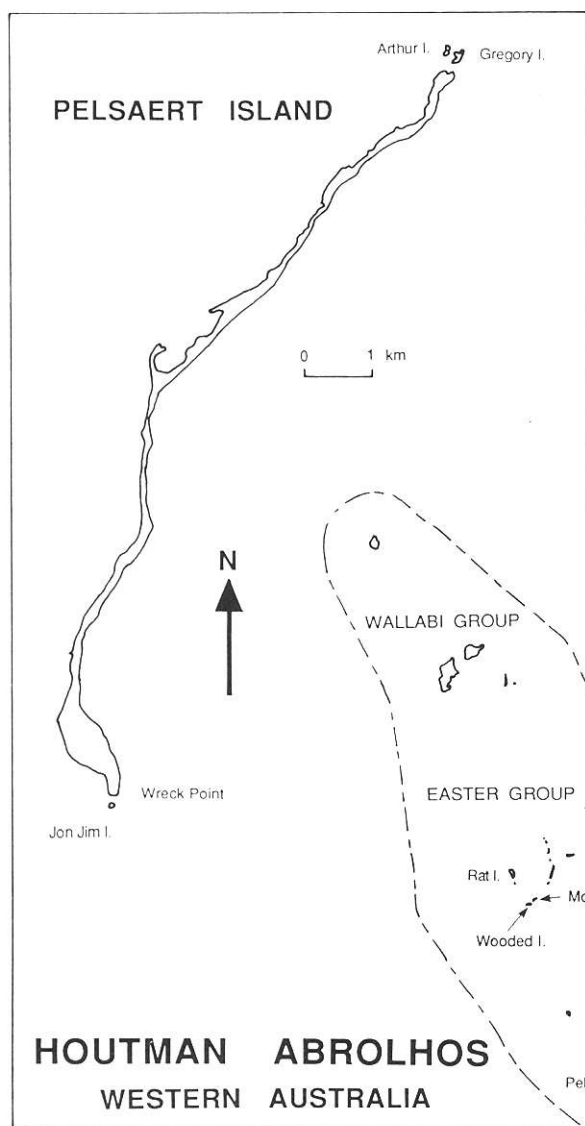


SEABIRD ISLANDS

No. 215

Pelsaert Island, Houtman Abrolhos, Western Australia



Location: 28°56'S, 113°58'30"E; 50 km west of Geraldton, WA.

Status: Part Class A Reserve No. 20253, 'Conservation of Flora and Fauna, Tourism and Purposes Associated with the Fishing Industry', vested in the Western Australian Minister for Fisheries. Under the Abrolhos Islands Planning Strategy² Pelsaert will become part of the Abrolhos National Park.

Other Names: Pelsart Island (spelling changed in May 1976), Long Island, South Island.

Description: About 120 ha, c. 12 km long; width varies between 500 m and less than 50 m. The long axis is at 30°–210°. The Houtman Abrolhos is located near the edge of the continental shelf and consists of the single North Island and three groups — Wallabi Group, Easter Group and Pelsaert (or Southern) Group. Pelsaert Island is the southernmost island in the Abrolhos, apart from the nearby, small, Jon Jim Islet. Data on Jon Jim and on the immediately adjacent Arthur and Gregory Islets to the north of Pelsaert have been included in this paper.



- *Pelsaert Island at its narrowest point. The sheltered north-western shore has fringing mangroves.*



- *Dense mangroves fringing a lagoon with large colonies of the Lesser Noddy (Site 2, Fig. 2).*



- *Coral shingle typical of much of Pelsaert Island. A mixed Roseate and Fairy Tern colony is in middle distance.*

Pelsaert is mostly a low cay, rising less than three to four metres above high water mark, with a small area near Wreck Point being slightly higher. Most of the island consists of coral boulders and shingle thrown up by the ocean waves. In some areas, notably at the southern end, there are accumulations of white sand, with a few, low dunes. Low, undercut limestone cliffs are found near the southern tip and along parts of the western and eastern shores¹⁹.

Twenty-seven indigenous and 17 alien species of plants have been recorded on the island (Appendix 1). Most of the coral rock is bare, some has very low perennial and annual herbs and grasses and prostrate shrubs such as *Atriplex cinerea* var. *brachythea*, *Threlkeldia diffusa*, *Frankenia pauciflora*, *Enchylaena tomentosa*, *Scaevola crassifolia* and *Carpobrotus virescens*. *Spinifex longifolius* occurs behind beaches and on low dunes, often in association with *Threlkeldia* and *Enchylaena*. Near the southern end, where soils are deeper, there is a dense low heath of shrubs, especially *Nitraria billardierei* and *Atriplex cinerea* var. *brachythea*. Samphire (*Sarcocornia* and *Halosarcia*) is found in salt marsh areas, while the White Mangrove (*Avicennia marina*) forms dense low forests along sheltered parts of the north-western shore, around salt lakes and in some moist low-lying inland areas. In southern parts, ice plant (*Mesembryanthemum crystallinum*) has invaded and small areas of African Boxthorn (*Lycium ferocissimum*) occurred on shallow soils on limestone where guano mining has taken place and on some areas of shell grit. The African Boxthorn plants were removed in November 1990.

Landing: Pelsaert Island is at the southern end of an extensive area of coral reef (Half Moon Reef) and sandbanks, and there are many shoals, reefs and bommies off the north-western shore. A limestone reef platform extends about 30 to 100 m off-shore along the full length of the south-eastern coast.

There is a good, sheltered anchorage off the north-western shore adjacent to the old guano jetty about 2.2 km north of Wreck Point. Access is along a channel from the north, suitable for vessels up to several metres draft. However, there are many shoals in the channel and to navigate it, local knowledge or extreme care is needed. Landing almost anywhere on the north-western

shore is possible by shallow-draft dinghy. The south-eastern shore is exposed to the prevailing southerly winds and landing is only possible when the sea is calm.

Ornithological History: The Abrolhos were first sighted by the Dutch navigator Frederik Houtman in 1619, and the name Houtman Abrolhos is derived from a combination of the name of the discoverer and a group of shoals off Brazil. The Portuguese word 'abrolhos' is applied to 'spiked obstructions'³³. Pelsaert Island was named by Stokes⁴¹ after Francois Pelsaert, commander of the *Batavia*, which was wrecked in the Abrolhos in June 1629. For many years the *Batavia* was thought to have been wrecked in the southern part of the Abrolhos and the Pelsaert Group was named in error. Stokes⁴⁵, when he visited the Abrolhos in April 1840 in HMS *Beagle*, noted the beams of a large vessel on the south-west point of Pelsaert Island. These were also reported by the crew of the *Zeewijk*, wrecked on Half Moon Reef in 1727, and Stokes presumed the beams to be the remains of the *Batavia*. Now the *Batavia* is known to have been wrecked on Morning Reef in the Wallabi Group. The identity of the wreck seen by Stokes is not known, nor has it been rediscovered.

Other maritime explorers who sighted the islands included the French Baudin Expedition⁶ in 1801 and P.P. King in 1822²⁹. There are references to the abundant seabird fauna in some of the early reports, and Stokes⁴⁵ reported the presence of guano. However, the first substantial account of Pelsaert Island birds dates from the visit by John Gilbert sometime between 8 January and mid-March 1843⁵¹.

The next visitor was A. J. Campbell^{12,13} in December 1889, followed by visits from C. P. Conigrave¹⁵ in 1897 and either 1913 and/or 1916, R. Hall²⁶ in 1899 and C. G. Gibson²² in November 1907. The first detailed account of the Abrolhos and their fauna was produced by the Percy Sladen Trust Expeditions of 1913 and 1915 under the leadership of Professor W. J. Dakin¹⁶. W. B. Alexander⁴, who was a member of the 1913 expedition, published a separate account of the vertebrate fauna.

Numerous ornithologists have visited Pelsaert since 1930. These include P. T. Sandland⁴⁰ in 1936, V. N. Serventy⁴³ in 1942, D. L. Serventy in

1943, 1944 and 1945⁴⁷, H. E. Tarr⁴⁸ in 1948, E. H. M. Ealey¹⁸ in 1953, J. Warham³⁰ in 1954, P. J. Fuller in August 1961, August 1962, September 1963, August 1964, November 1964 and August 1965, the Prince Philip, Duke of Edinburgh in 1963⁴⁷, the Aquinas College expeditions of 1966, 1968 and 1970^{25,37}, T. C. Allen in 1961 and 1964⁴⁷, G. A. Lodge in 1963⁴⁷, N. Kolichis in 1973 and 1975⁴⁷, A. A. Burbidge in March 1973 and K. Coate in 1987, 1988 and 1989 (pers. comm.).

Since 1977, either or both Fuller and Burbidge have visited Pelsaert in October 1977, February 1978, February 1979, November 1980, February 1981, October 1981, November 1982, February 1984, December 1986, December 1989, July 1990, October–November 1990 and November 1991. Data from these 13 visits have been published elsewhere^{10,11,20} or are included herein. R. Garstone accompanied Fuller in 1977 and has published his and some of Fuller's data²¹. S. G. Lane³⁰ accompanied Fuller in 1982. G. M. Storr, R. E. Johnstone and P. Griffin have published their own and many other peoples' data in a comprehensive summary of all birds of the Houtman Abrolhos⁴⁷.

Breeding Seabirds and Status

Puffinus pacificus Wedge-tailed Shearwater — About 49 400 nest burrows were estimated in December 1986¹⁰, with 44 550 in the main colony at the southern end of the island (Fig. 1) and 4 860 in smaller colonies further north. Since then the accuracy of the air photographs used to calculate the area occupied by nests has been checked against a detailed survey of the southern end of the island. This showed the photographs to have an actual scale of 1:5 200 rather than the 1:5 000 indicated. A recalculation showed that there were about 51 400 burrows. Birds arrive in the second half of August to prepare their burrows at night until early in November when they return to the sea. In mid-November they begin to return to the island and egg-laying takes place the night after a bird returns⁴⁷. The eggs hatch in January and by early February the chicks are unattended during the day. By early May most chicks are wholly or partly fledged, but the date that the young take to the wing and leave the island for the sea is unknown.

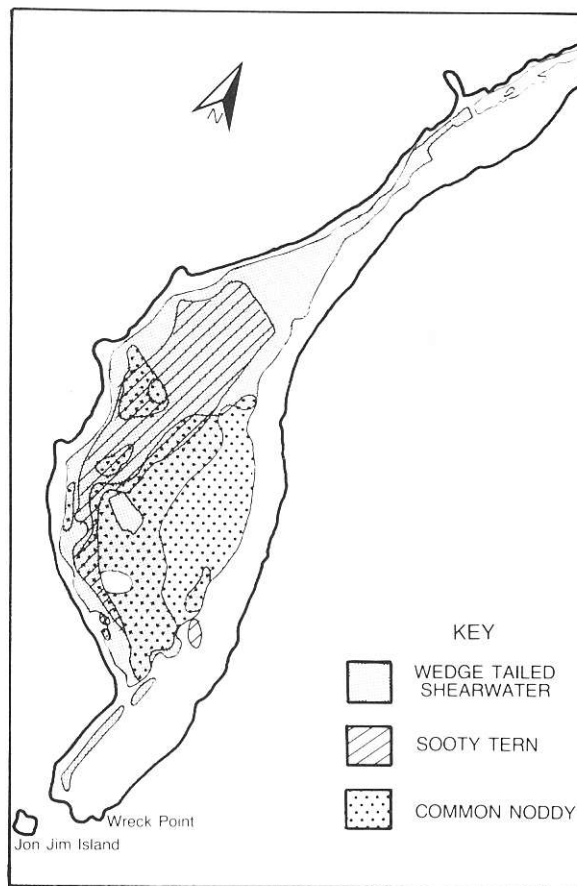


Figure 1. Southern end of Pelsaert Island, showing extent of colonies of seabirds, December 1989.

Puffinus assimilis Little Shearwater — 35 burrows were recorded 400 m south of the northern tip of the island on 11 July 1990. One burrow examined contained a bird sitting on a fresh egg; another burrow had a sitting bird but no egg. Another colony of about 12 burrows was located near the northern tip in October 1990. Little Shearwater burrows possibly occur elsewhere on the island, but continuous heavy rain during our only winter visit made searching for fresh burrows difficult. The single egg is laid between early July and late August and the young fledge in November or December⁴⁷.

Pelagodroma marina White-faced Storm-Petrel — Three nesting colonies known; one in sand behind a beach at the northern end, one in sand 1.5 km from the northern tip and one on a sandspit between Lesser Noddy colonies 1 and 2. Numbers are not known, but there are probably only a few hundred. Birds start returning to the Abrolhos in mid-August and eggs are laid in the second and third weeks of October. Hatching occurs in late-November to early-December and the birds leave the island about February.

Phalacrocorax varius Pied Cormorant — Sand-land⁴⁰ recorded a breeding colony of about 40 pairs on either Arthur or Gregory Islets, just off the northern tip of Pelsaert, in 1936. Although Pied Cormorants are a common bird on Pelsaert no other breeding records exist. They do, however, breed on other nearby islands. Abrolhos Pied Cormorants breed from mid-August to November⁴⁷.

Phaethon rubricauda Red-tailed Tropicbird — Breeding recorded in the 1940s and 1950s^{47,48} (five nests were found in 1949), but no nests were observed between 1954, when J. Warham⁵⁰ found eight nests, and December 1988 when R. Goodale and K. Coate found one bird incubating (pers. comm. 1989). No tropicbirds were sighted in the Abrolhos between 1955 and 1975⁴⁷. No nests were found in December 1989 or October–November 1990, although birds were present and displaying. Egg-laying occurs in late spring or early summer.

Egretta sacra Eastern Reef Egret — Occasional nests have been found scattered along the full length of the island. Nests are constructed low in mangroves or on ledges in cliffs. Egg-laying occurs in spring⁴⁷. Only grey-phase birds have been recorded.

Haematopus longirostris Pied Oystercatcher — Tarr⁴⁸ reported breeding in September–October 1948. On 7 October 1981, Fuller found a nest with one egg. In October 1977 and October 1990, several pairs were holding territory and probably had chicks.

Larus novaehollandiae Silver Gull — Colonies of up to 20 pairs scattered throughout the island²⁰; they also occasionally nest in small numbers on

Arthur and Jon Jim Islets. Nests are among vegetation on coral rock and sand. Breeding commences in autumn and continues until early summer with peaks in autumn and spring. Unlike many colonies close to centres of human population, the Pelsaert and other Houtman Abrolhos colonies have not undergone recent rapid expansion^{10,47}. The distance from Geraldton (50 km) may be too great for birds to make feeding forays from these colonies. Lobster fishers live on islands in Southern Group (and other groups) from early March to July each year, but this usage has apparently not led to an increase in Silver Gull numbers.

Larus pacificus Pacific Gull — Several pairs breed with nests scattered throughout the island. Nests on ground among grass and herbs on low ridges. A flock of 26 birds noted in October 1977²⁰. On 31 October and 1 November 1990, a total of 52 adults and 13 chicks were counted during a survey of the whole island. Eggs are laid in September and October and runners are present until November or December.

Hydroprogne caspia Caspian Tern — About 10 to 20 pairs nest throughout the island each year. The nest is a scrape in the bare sand. Egg-laying usually takes place from August to October (sometimes early November) and runners are present until December or January²⁰.

Sterna dougallii Roseate Tern — Nests in colonies scattered throughout island. Nesting sites vary from year to year. Nests are scrapes or natural depressions among coral rock or limestone. Clutch size is one or two eggs. Colonies are usually from less than 50 pairs to several hundred pairs; however, Serventy and White⁴⁴ reported a colony of 2 656 pairs in December 1946 and a colony with about 900 nests was recorded by Fuller and Burbidge in November 1982. On 1 November 1990 no eggs were found although many birds present in breeding plumage. Egg-laying commences in November or December and chicks are present until February or March. On 26 November 1991, 785 nests with eggs were found in one large and four small colonies and egg-laying was still underway. Autumn–winter breeding has been recorded in the Wallabi Group⁴⁷. Colonies are sometimes mixed with those of Fairy Terns. Breeding has also been recorded on Jon Jim Islet and on either Gregory or Arthur Islet⁴⁷.

Sterna fuscata Sooty Tern — A large colony exists at the southern end of Pelsaert (Fig. 1), overlapping those of Wedge-tailed Shearwaters and Common Noddies. The single egg is laid in a scrape in bare sand under shrubs. Egg-laying commences in October and may continue until late November; runners are present until February or March. On 2 November 1990, using the triangular tessellation method of Ward⁴⁹, about 233 000 nests were estimated in the colony which covered an area of 16.18 ha, while on 26 November 1991 the colony covered 17.08 ha and, assuming the same nest density as in 1989, it contained about 246 000 nests. Colony size varies from year to year; in November 1982 the colony extended north almost to the old guano jetty and there was another colony further south, to the west of the lighthouse. In December 1986 the colony covered 12.89 ha and in December 1989 it was 12.43 ha. Breeding has been reported on Jon Jim Islet⁴⁷.

Sterna anaethetus Bridled Tern — Colonies of up to 60 pairs scattered throughout northern two-thirds of island²⁰. The single egg is laid in November or early December and young may be present until April. Nests are a scrape in the sand, under rock slabs or vegetation. Also nests in small numbers on Arthur and Gregory Islets.

Sterna nereis Fairy Tern — Colonies of from three to 60 pairs have been recorded scattered throughout northern three-quarters of island²⁰. About 200 nests were present during 1989–90¹¹. On 26 November 1991, 71 nests with eggs were found in three colonies and egg-laying was still underway. The nests are often intermingled with those of Roseate Terns. One or two eggs are laid in a scrape or a depression in coral rock or limestone. Laying usually commences in late October and continues until February⁴⁷; however, no eggs had been laid on 1 November 1990. Chicks may be present until late February. Nesting occurred on Arthur Islet in December 1989.

Sterna bergii Crested Tern — Nests in large colonies in open sandy areas or on sand among rocks; sometimes with sparse vegetation. Nesting sites vary from year to year. Nest is a scrape in the sand; sometimes lined with grass or twigs. Egg-laying commences in early October (newly-hatched chicks recorded on 30 October 1990) and



• *Crested Tern colony near southern end of Pelsaert Island.*

may continue until December. Breeding has also been reported in the Abrolhos in autumn⁴⁷. Runners may be present until late January or February. Colonies are usually of about 100 to 200 pairs, but may be larger. In 1977, a colony of about 700 pairs nested near the northern tip of the island²⁰; in 1989, a colony of about 400 nested on the south-east side of the island near the Common Noddy colony; in 1990 and 1991, colonies of about 350 and 1 159 nests were present in the same area. Breeding has also been reported on either Arthur or Gregory Islets⁴⁷.

Anous stolidus Common Noddy — In December 1986 the colony covered 13.355 ha and about 76 000 nests were estimated to be in use or recently used¹⁰. A recalculation of the area (see earlier) showed that there were about 79 200 nests and that the colony actually occupied 13.89 ha. In December 1989 the colony covered 17.93 ha and, using Ward's⁴⁹ triangular tessellation method, it was estimated to contain 116 500 nests. In November 1991, the colony occupied 14.44 ha and the same method gave an estimate of 130 000 nests. Nests are built from twigs and seaweed with some being decorated with small shells and pieces of coral. Some are placed on soil with little or no added material; most are on vegetation, including *Sarcocornia quinqueflora*, *Atriplex cinerea* and *Nitraria billardierei*. Nest density is highest in *Sarcocornia* around salt-pans where densities as high as 254/100 m² were noted in 1986. Breeding is not synchronized; in December

1986 and 1989 some birds were constructing nests, some had the usual single egg, and young were at all stages to flying¹⁰. In late October 1990 nests were either being constructed or contained an egg.

After the breeding season Common Noddies completely desert the Abrolhos and their vicinity; the earliest date of a returning bird is 11 August⁴⁷. Egg-laying usually commences in late September or October and continues until December or January, although there is some evidence of eggs as early as August in the past⁴⁷. Most young are flying by late February or March, with birds leaving the island by April. The colony is the largest in Western Australia¹⁰. Elsewhere in the eastern Indian Ocean only three other colonies have been reported: a small colony on Wooded Island⁴⁷ and colonies on Bedout Island off the Pilbara and on the Lacepede Islands north of Broome. The former, very large colony on Rat Island in the Easter Group was estimated by Campbell¹² at more than a million in 1889. This colony had disappeared by the late 1930s⁴⁰ and was probably destroyed by a combination of guano mining, cats and rats.



● *Common Noddy colony near southern end of Pelsaert Island.*



● *Common Noddy.*

Anous tenuirostris Lesser Noddy — About 30 250 occupied or recently used nests were estimated in seven colonies (Fig. 2) from 9 to 15 December 1986¹⁰. A recalculation of the area of mangroves (see earlier) showed that the estimate should have been about 31 450 nests. In December 1989 a recount using the same method revealed about 56 300 nests in four colonies and in November 1991 there were 41 750 nests in five colonies. The nests, which are large for a seabird, are placed on White Mangrove *Avicennia marina* branches and are built from seaweed (various green and brown algae, especially *Ulva* and *Cystophora* spp⁴⁷), copiously cemented with white excreta. In 1986, nest density was as high as 43/20 m² (noting that the nests were at different heights)¹⁰, and 75 nests were counted in one 20 m² quadrat in 1989. Numbers have varied over the years. Two large colonies (probably 1 plus 2, and 3, 4 and 5; Fig. 2) were noted by Stokes⁴⁵ in 1840 and by other visitors up to 1899. In 1907 Gibson²² found these to be abandoned, with thriving colonies in place on Wooded and Morley Islands in the Easter Group. The colonies on Pelsaert were still abandoned in 1913¹². However, by 1936 colonies 1 and 2 had re-established and were flourishing⁴⁰, and a similar situation was reported by later visitors up to 1954⁵⁰. Since then additional areas have been colonized, not only colonies 3, 4 and 5, but also colonies 6 to 10 further to the north. Colony 10 was first noted in 1980 and all 10 colonies were used in 1982 and 1984¹⁰. However, in 1986 colonies 8, 9, and 10 had been abandoned and colonies 3, 4 and 7 were considerably smaller with many old nests being visible, suggesting use in recent years¹⁰, and in 1989 colonies 3, 4 and 7 had also been abandoned.

Breeding is not synchronized; in December 1986¹⁰ and 1989 the stage of breeding varied from nest construction to flying young. Commencement of egg-laying varies from year to year. Laying had not begun during our visit of 26–30 October 1977, had commenced on 1 November 1990, and was well underway on 27 November 1980 and 9–15 December 1986. Tarr⁴⁸ found half-grown chicks in late September 1948, so egg-laying in that year must have commenced in late August. The majority of eggs are apparently laid in October and November in most years. Young would have been present until March in the years of Fuller's and Burbidge's visits. Few birds remain

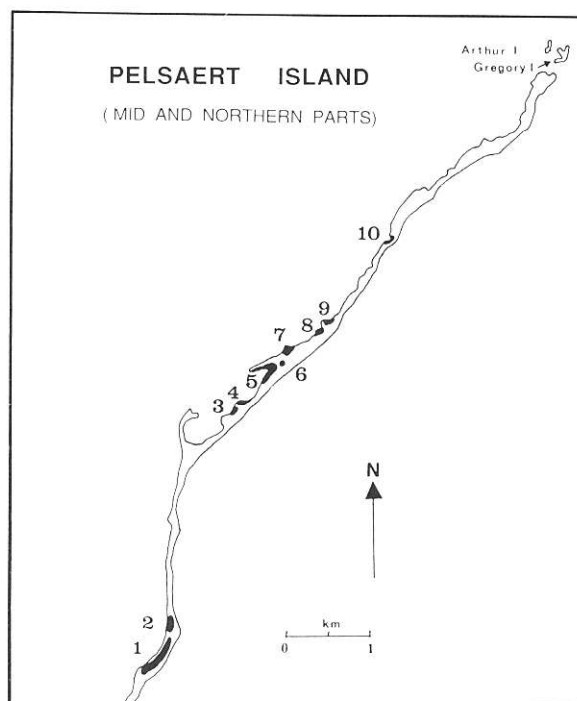


Figure 2. Pelsaert Island. Numbers show location of Lesser Noddy nesting colonies.

near the mangroves during the daytime by late April or early May⁴⁷. Unlike the Common Noddy, the Lesser remains in the vicinity of the breeding colonies all year round and continues to roost in the mangroves at night. In July 1990, no birds were present in the mangroves during the day.

Only two other colonies exist in Australia — on the adjacent Wooded and Morley Islands in the Easter Group. Numbers there are much lower than on Pelsaert; in August 1977 R. E. Johnstone estimated about 8 700 nests on Wooded and 2 585 on Morley¹⁰. In December 1989 Fuller and Burbidge estimated 6 875 on Wooded and 16 375 on Morley, and in December 1991 Fuller and Burbidge estimated 5 325 on Wooded and 11 745 on Morley. Another sub-species breeds in the western Indian Ocean on Latham Island,



• *Lesser Noddy on nest in mangroves.*

Gloriosa Island, the Aldabras, Providence Island, Amirantes Island, Agalegas Island, the Seychelle Islands, the Mascarenes, St Brandon Island, the Maldives and Chagos Island¹⁹.

With a fluctuating population that may be under 100 000 adult birds in some years and with only two breeding stations 35 km apart¹⁰, the Australian sub-species of the Lesser Noddy is vulnerable to a catastrophe such as a major oil spill and could be greatly affected by rising sea levels; it has been declared 'vulnerable' in the 1991 List of Australian Endangered Vertebrates⁵.

Factors Affecting Status

The presence of the warm, off-shore, southerly-flowing Leeuwin Current leads to sea temperatures being markedly higher around the Abrolhos than inshore³⁸. This explains how an archipelago with a Mediterranean climate supports a predominantly tropical avifauna^{17,47}.

The guano accumulations on the Abrolhos were discovered during the survey by HMS *Beagle* in 1840 and exploitation began in 1844 when the cutter *Waterwitch* brought a load of Pelsaert guano to Fremantle. Fishing schooners continued to bring small supplies for the local market, but it was not until after John Forrest made a survey of guano resources of the Abrolhos in 1879 that steps were taken for regular production. This was begun in 1885 by the firm of Broadhurst and McNeil, and continued by a number of companies until 1915. During this period 56 900 tonnes of guano were known to have been removed from the Abrolhos. Many islands were mined and the proportion that came from Pelsaert is not known. In 1943 the industry was revived on Pelsaert by the British Phosphate Commissioners because of urgent war needs and 10 900 tonnes were taken up to 1945^{27,41}; this large amount, which presumably accumulated since the previous mining around the turn of the century, clearly indicates the vast number of seabirds that must have been present during that time.

The guano mining left areas of the southern part of Pelsaert bare of soil and some of this is now unusable for breeding by seabirds such as Wedge-tailed Shearwater or Sooty Tern. Fortunately there are still extensive sand deposits that support vegetation and the damage to Pelsaert by guano mining has been much less than on many other islands where almost all the soil was removed (e.g. Rat Island in the Easter Group, which once supported very large seabird colonies²⁰). As stated earlier, the Lesser Noddy abandoned Pelsaert as a breeding station some time between 1899 and 1907 with the colonies not being re-established until sometime between 1913 and 1936. The disappearance of the Lesser Noddy from Pelsaert coincided with the peak in guano mining there. Although the mining would not have affected many mangrove areas directly, it is likely that there were indirect effects. John Gilbert, during his 1843 visit⁵¹ stated 'As an article of food it was the favourite, several hundred being killed almost daily during our stay on the island' (p. 291). Whittell⁵¹ believed that the Lesser Noddy shifted its breeding ground from Pelsaert to Wooded Island in the Easter Group as a result of the activities of the guano miners. However, there is no information as to whether the Lesser Noddy bred on Wooded Island prior to the commencement of the major guano mining period, although Campbell¹² implies that Pelsaert contained the only colony at the time of his 1889 visit.

The buildings left on Pelsaert by the guano miners were utilized as a tourist resort from 1946 to 1953; when this enterprise collapsed the buildings were removed to other islands by lobster fishers. The buildings were located among burrows of the Wedge-tailed Shearwater and on the edge of the breeding areas of the Sooty Tern. Tourists, and probably guano miners before them, walking near the camp could not avoid collapsing the shearwater burrows (N. E. McLaughlan, pers. comm.).

In 1980, local rock lobster fishers proposed to the Department of Fisheries and Wildlife that an airstrip be built on the northern end of Pelsaert to facilitate access and increase safety during the lobster season. After a report was compiled detailing the values of the island to the seabirds²⁰ the application was refused.

The Osprey *Pandion haliaetus* and White-bellied Sea-Eagle *Haliaeetus leucogaster* regularly breed on Pelsaert Island. In October 1981 a systematic search located 17 Osprey and/or Sea-Eagle nests, some of which had not been used for some time. Five of these were being used by Ospreys, and two were being used by the White-bellied Sea-Eagles²⁰. About seven pairs of Osprey nest on Pelsaert and its satellite islets in most years and two or three (sometimes four) pairs of Sea-Eagles are resident and breeding in most years²⁰. The Sea-Eagles prey on breeding seabirds but, while seabird wings are sometimes found built into Osprey nests, we have never seen Ospreys eat anything but fish. King's Skinks *Egernia kingii* are common and prey on seabird eggs and chicks. The Spotless Crake *Porzana tabuensis*, also common, probably predated eggs and small chicks.

Camping on Pelsaert is prohibited except by permit and these days disturbance caused by humans is minimal.

OTHER VERTEBRATES

Neophoca cinerea Australian Sealion.
Oryctolagus cuniculus European Rabbit — reported to have been liberated from a wrecked schooner about 1880²⁷, but have not been reported since. In addition to King's Skinks, three other reptiles occur — *Phyllodactylus marmoratus* Marbled Gecko, *Cryptoblepharus plagioccephalus* and *Morethia obscura*⁴⁶.

Other Seabirds Recorded

Unless a reference is given, all records marked derelict are supported by specimens in the Western Australian Museum or in the Australian National Wildlife Collection.

<i>Eudyptula minor</i>	Little Penguin ⁴⁷
<i>Diomedea melanophrys</i>	Black-browed Albatross (derelict)
<i>Diomedea chrysostoma</i>	Grey-headed Albatross (derelict)
<i>Diomedea c. chlororhynchus</i>	Yellow-nosed Albatross (derelict)
<i>Diomedea c. bassi</i>	Yellow-nosed Albatross (derelict)
<i>Macronectes giganteus</i>	Southern Giant Petrel (derelict)

<i>Fulmarus glacialisoides</i>	Southern Fulmar (derelict)
<i>Daption capense</i>	Cape Petrel (derelict)
<i>Pterodroma m. macroptera</i>	Great-winged Petrel (derelict)
<i>Pterodroma m. mollis</i>	Soft-plumaged Petrel (derelict)
<i>Pachyptila desolata</i>	Antarctic Prion (derelict)
<i>Pachyptila belcheri</i>	Slender-billed Prion (derelict) ¹⁷
<i>Puffinus carneipes</i>	Flesh-footed Shearwater (derelict)
<i>Pelecanus conspicillatus</i>	Australian Pelican
<i>Morus serrator</i>	Australasian Gannet
<i>Phaethon lepturus</i>	White-tailed Tropicbird ¹²
<i>Phalacrocorax melanoleucos</i>	Little Pied Cormorant
<i>Haematopus fuliginosus</i>	Sooty Oystercatcher

Banding

Period between December 1963 and November 1982.

Puffinus pacificus — 272 adults.
Pelagodroma marina — 1 adult.
Larus novaehollandiae — 2 chicks.
Larus pacificus — 1 runner.
Hydroprogne caspia — 3 chicks.
Sterna dougallii — 28 adults.
Sterna fuscata — 184 runners; 334 adults.
Sterna bergii — 273 chicks and runners.
Anous stolidus — 9 chicks; 1 321 adults.
Anous tenuirostris — 427 chicks; 300 adults.

No recoveries have been reported.

Acknowledgments

We thank the Director of Fisheries, Bernard Bowen, for permission to camp on Pelsaert Island and for providing transport to the Abrolhos on many occasions; Neil McLaughlan and the crew of P.V. *Baudin* have been particularly helpful. We are most grateful to John and Beth Fitzhardinge of Port Denison, who transported us to and from Pelsaert in October/November 1990. Judith Harvey and Jeni Alford provided data on the plants. Frances Burbidge, Mike Choo, Ken Johnson, Randall Owens and Susan Worley all assisted with counts. We thank all those who have provided data on Pelsaert birds, particularly Kevin Coate who provided unpublished data. We are grateful to the Australian Bird and Bat Banding Schemes, Australian National Parks and Wildlife Service, for providing data on birds banded at Pelsaert Island.

Our costs, except for boat transport, have been met by the Department of Conservation and Land Management.

Bibliography

- Abbott, I. (1980). The floras of 37 South-western Australian Islands. *West. Aust. Herbar. Res. Notes* 3: 19–36.
- Abrolhos Islands Task Force (1988). 'Abrolhos Islands Planning Strategy.' A report prepared by the Abrolhos Islands Task Force for the Abrolhos Islands Consultative Committee.
- Alexander, D. J., Mackenzie, J. S. and Russell, P. H. (1986). Two types of Newcastle disease viruses isolated from feral birds in Western Australia detected by monoclonal antibodies. *Aust. Vet. J.* 63: 365–367.
- Alexander, W. B. (1922). The vertebrate fauna of Houtman's Abrolhos (Abrolhos Islands), Western Australia. *J. Linn. Soc. (Zool.)* 34: 457–486.
- Australian National Parks and Wildlife Service (1991). 'List of endangered vertebrate fauna April 1991.' (ANPWS: Canberra.)
- Baudin, N. (1974). 'The journal of Post Captain Nicholas Baudin,' translated by C. Cornell. (Libraries Board of South Australia: Adelaide.)
- Blakers, M., Davies, S. J. J. F. and Reilly, P. N. (1984). 'The atlas of Australian birds'. (RAOU and Melbourne University Press: Carlton.)
- Burbidge, A. (1989). Endangered! Lesser Noddy *Anous tenuirostris*. *Landscape* 4: 53.
- Burbidge, A. and Fuller, P. (1987). 'Seabird islands.' Resource Notes No. 8. (Depart. of Conserv. and Land Management: Como.)
- Burbidge, A. A. and Fuller, P. J. (1989). Numbers of breeding seabirds on Pelsaert Island, Houtman Abrolhos, Western Australia. *Corella* 13: 57–61.
- Burbidge, A. and Fuller, P. (1991). A million seabirds. *Landscape* 6: 17–23.
- Campbell, A. J. (1890). Notes on the zoology of Houtman's Abrolhos. *Rep. Australas. Assoc. Advanc. Sci.* 2: 492–496.
- Campbell, A. J. (1900). 'Nests and eggs of Australian birds.' (Pawson and Brailsford: Sheffield.)
- Condon, H. T. (1975). 'Checklist of the birds of Australia.' (RAOU: Melbourne.)
- Conigrave, C. P. (1916). On the bird-life of Houtman's Abrolhos Islands, Western Australia. *Ibis* (10)4: 492–497.
- Dakin, W. J. (1918). The Percy Sladen expeditions to the Abrolhos Islands.... Report 1. *J. Linn. Soc. (Zool.)* 34: 127–180.
- Dunlop, J. N. and Wooller, R. D. (1990). The breeding seabirds of southwestern Australia: trends in species, populations and colonies. *Corella* 14: 107–112.
- Ealey, E. H. M. (1954). Some observations made at the Abrolhos Islands. *West. Aust. Nat.* 4: 73–74.
- Feare, C. J. (1984). Seabird status and conservation in the tropical Indian Ocean. In: 'Status and conservation of the world's seabirds' (Eds J. Croxall, P. G. H. Evans and R. W. Schreiber). ICBP Technical Publication No. 2.
- Fuller, P. J. and Burbidge, A. A. (1981). 'The birds of Pelsaert Island, Western Australia.' Report No. 44. (Depart. Fish. Wildl.: Perth.)
- Garstone, R. (1978). Notes on the birds of Pelsaert Island, Abrolhos. *West. Aust. Nat.* 14: 62–64.

22. Gibson, C. G. (1908). Notes on some birds of the Abrolhos Islands (WA). *Emu* 8: 64–66.
23. Gould, J. (1848). 'Birds of Australia.' (Author: London.)
24. Gould, J. (1865). 'Handbook to the Birds of Australia.' (Author: London.)
25. Green, G. A. (1972). 'Fifth Abrolhos Expedition, 1970.' (Aquinas College: Manning.)
26. Hall, R. (1902). On a collection of birds from Western Australia. *Ibis* (8)2: 121–143, 180–206.
27. Helms, R. (1902). Houtman's Abrolhos. *J. Dept Agric. West. Aust.* 5: 33–55.
28. Jackson, S. W. (1907). 'Egg collecting and bird life of Australia. Catalogue and data of the "Jacksonian oological collection".' (F. W. White: Sydney.)
29. King, P. P. (1827). 'Narrative of a survey of the inter-tropical and western coasts of Australia, performed between the years 1818 and 1822.' 2 Vols. (John Murray: London.)
30. Lane, S. G. (1986). Nesting behaviour of Sooty Terns *Sterna fuscata* on Pelsart Island, Western Australia. *Corella* 10: 28–29.
31. Mackenzie, J., Britten, D., Hinshaw, V. and Wood, J. (1985). Isolation of avian influenza and paramyxoviruses from wild birds in Western Australia. In: 'Veterinary viral diseases: their significance in south-east Asia and in the western Pacific' (Ed. A. J. Della-Porta) pp. 330–335. (Academic Press: Sydney.)
32. Mackenzie, J. S., Edwards, E. C., Holmes, R. M. and Hinshaw V. S. (1984). Isolation of ortho- and paramyxoviruses from wild birds in Western Australia, and the characterization of novel influenza A viruses. *Aust. J. Exp. Biol. Med. Sci.* 62: 89–99.
33. Mann, P. (1990). The Houtman Abrolhos. *Aust. Geog. No.* 18: pp. 74–97.
34. Mathews, G. M. (1913). 'The birds of Australia.' (H. F. and G. Witherby: London.)
35. Mathews, G. M. and Iredale, T. (1921). 'A manual of the birds of Australia.' (H. F. and G. Witherby: London.)
36. North, A. J. (1913–14). 'Nests and eggs of birds found breeding in Australia and New Zealand.' Australian Museum, Sydney, Special Catalogue, No. 1. (F. W. White: Sydney.)
37. O'Loughlin, P. M. (1969). 'Aquinas College third and fourth expeditions to the Pelsart Group of Houtman's Abrolhos. (Aquinas College: Manning.)
38. Pearce, A. F. and Walker, D. I. (Eds) (1991). The Leeuwin Current: an influence on coastal climate and marine life in Western Australia. *J. Roy. Soc. W. Aust.* 74: 1–140.
39. Saliva, J. E. and Burger, J. (1989). Effect of experimental manipulation of vegetation density on nest-site selection in Sooty Terns. *Condor* 91: 689–698.
40. Sandland, P. T. (1937). Notes on birds of Pelsart Island. *Emu* 37: 144–149.
41. Serventy, D. L. and Whittell, H. M. (1976). 'Birds of Western Australia.' 5th edition. (University of Western Australia Press: Perth.)
42. Serventy, D. L., Serventy V. and Warham, J. (1971). 'The handbook of Australian seabirds.' (A. H. and A. W. Reed: Sydney.)
43. Serventy, V. N. (1943). Notes on the nesting birds of the Abrolhos Islands. *Emu* 42: 235–241.
44. Serventy, V. N. and White, S. R. (1951). The Roseate Tern: notes on nesting behaviour. *Emu* 50: 145–151.
45. Stokes, J. L. (1846). 'Discoveries in Australia, etc.' (T. and W. Boone: London.)
46. Storr, G. M., Hanlon T. M. S. and Dunlop, J. N. (1983). Herpetofauna of the Geraldton region, Western Australia. *Rec. West. Aust. Mus.* 10: 215–234.
47. Storr, G. M., Johnstone R. E. and Griffin, P. (1986). Birds of the Houtman Abrolhos, Western Australia. *Rec. West. Aust. Mus. Suppl. No.* 24.
48. Tarr, H. E. (1949). Notes on the birds of Long Island, Abrolhos Group, Western Australia. *Emu* 48: 276–282.
49. Ward, D. (1991). Triangular tessellation: a new approach to forest inventory. *Forest Ecology and Management* 44: 285–290.
50. Warham, J. (1956). Observations of the birds of Pelsart Island. *Emu* 56: 83–93.
51. Whittell, H. M. (1942). A review of the work of John Gilbert in Western Australia. *Emu* 41: 216–242, 289–305.

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APPENDIX 1

Vascular flora of Pelsaert Island.

Data from visits by Abbott¹ (9–21 October 1975), O'Loughlin³³ (24 August–1 September 1966 and January 2–12, 1968), J. Harvey (pers. comm.) (February 1984) and J. Alford (pers. comm.) (July 1990). * denotes alien taxon.

Triglochin mucronata; *T. trichophora*; **Avena barbata*; **Bromus hordeaceus*; *Eragrostis dielsii*; **Ehrharta brevifolia*; **E. longiflora*; **Lolium rigidum*; *Setaria dielsii*; *Spinifex longifolius*; *Bulbine semibarbata*; *Parietaria debilis*; *Atriplex* sp.; *A. cinerea* var. *brachythea*; **Chenopodium murale*; *Enchylaena tomentosa*; *Halosarcia halocnemoides*; *Salsola kali*; *Sarcocornia quinqueflora*; *Sueda australis*; *Threlkeldia diffusa*; *Carpobrotus virescens*; **Mesembryanthemum crystallinum*; **Spergularia rubra*; **Cakile maritima*; **Hymenobolus procumbens*; **Raphanus raphanistrum*; *Crassula colorata*; **Medicago polymorpha*; **Melilotus indica*; **Erodium cicutarium*; *Nitraria billardierei*; *Lavatera plebeia*; *Frankenia pauciflora*; **Anagallis arvensis*; **Centaurium spicatum*; *Avicennia marina*; **Lycium ferocissimum*; *Nicotiana rotundifolia*; *Myoporum insulare*; *Scaevola crassifolia*; *Actites megalocarpa*; *Senecio lautus*; **Sonchus oleraceus*.