

THE SEABIRDS OF INACCESSIBLE ISLAND, SOUTH ATLANTIC OCEAN

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SUMMARY

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Thirty-three seabird species have been recorded at Inaccessible Island, Tristan da Cunha group, South Atlantic Ocean, of which thirteen are known to breed and seven are likely to do so. The Wandering Albatross *Diomedea exulans* population has remained at a maximum of four pairs for at least 50 years. No birds or nests were found in 1987, but this need not imply extinction. There are an estimated 1 000 pairs of the endemic form of the Whitechinned Petrel *Procellaria aequinoctialis conspicillata*, and the island is one of only three main breeding localities of the Great Shearwater *Puffinus gravis*. The status of a number of species is unknown and warrants further investigation. The current absence of a resident human population or any alien predators makes Inaccessible Island exceptional among oceanic islands. A major threat to the island's avifauna is from the possible introduction of rats *Rattus* sp. It is recommended that Inaccessible Island be proclaimed a wildlife reserve in terms of the Tristan da Cunha Conservation Ordinance, 1976.

INTRODUCTION

This paper details observations made on the seabirds of Inaccessible Island, Tristan da Cunha group, South Atlantic Ocean, between October 1982 and February 1983 (MWF) and during September and October 1987 (PGR and BPW). Previous published information is collated. Inaccessible Island is uninhabited and is one of the least studied oceanic islands. Previous scientific visits have been few and brief, limited largely by the difficulty in landing. The absence of alien mammals, few alien plants and little interference by man makes Inaccessible Island one of the oceanic islands least modified by human activities in the world.

DESCRIPTION OF INACCESSIBLE ISLAND

Location

Inaccessible Island (Fig. 1) is the middle island, in terms of size and geological age, of the Tristan da Cunha group, central South Atlantic Ocean (37 15S, 12 30W). Tristan, 40 km northwest, and Nightingale, 22 km southeast, are the other main islands in the group. Gough Island lies 350 km southeast of Tristan and is not considered part of the group *sensu stricto*.

Geology and topography

Inaccessible Island is approximately three million years old (Preece *et al.* 1986, *contra* Miller 1964), and is a volcanic remnant dominated by interbedded basalt flows and pyroclastics that gently dip towards the northeast (McDougall & Ollier 1982, Mateer 1985). The island is roughly rhomboidal in shape with a planar area of 12 km² (Siddall 1985). Cliffs rise sheer from sea level round most of the island's coastline, rising to 300 m at

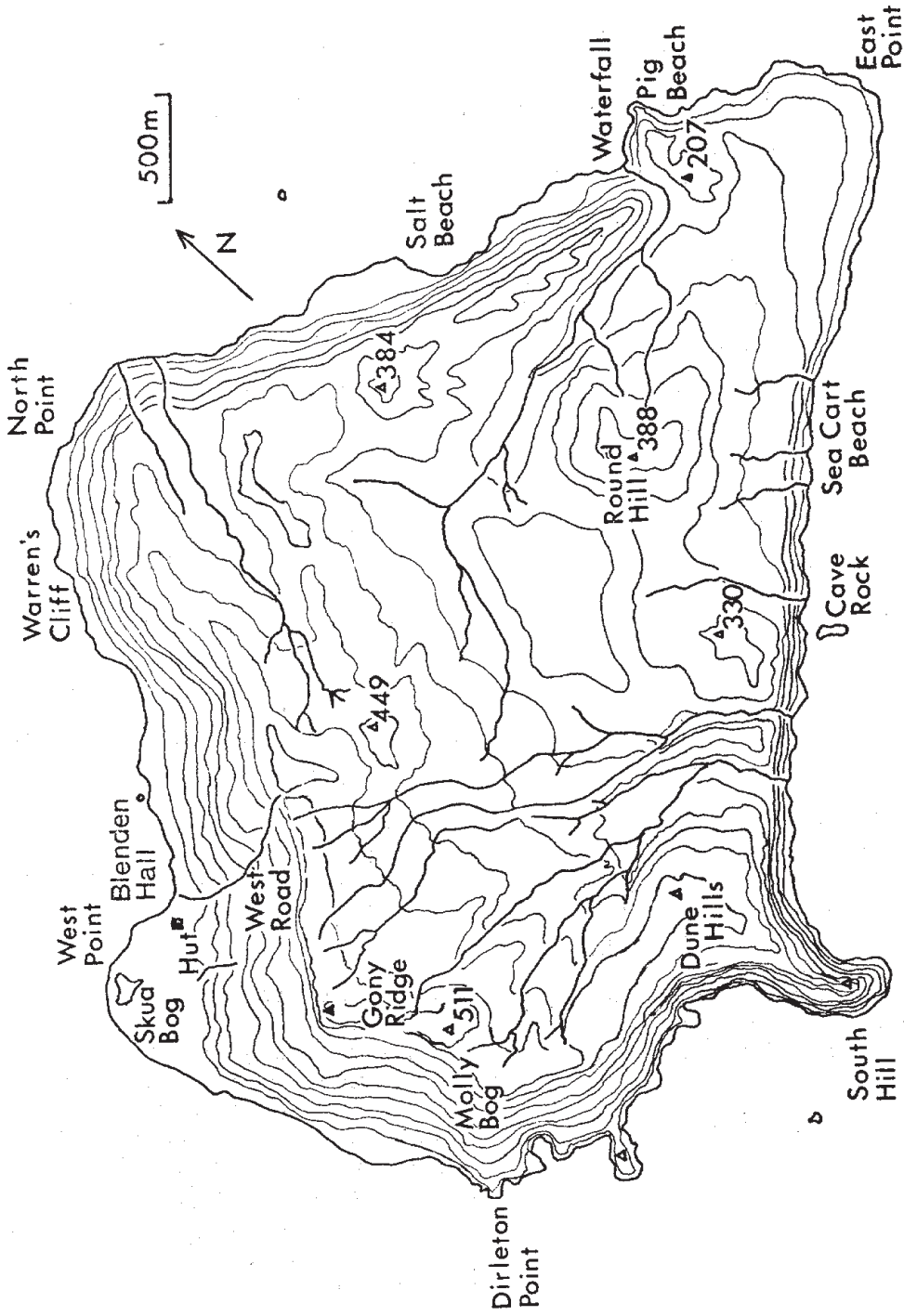


Figure 1

Inaccessible Island, after Siddall (1985).
(Contour lines at 50 m intervals)

South Hill (Fig. 1). The island plateau comprises three principal drainage systems, with numerous additional ravines and gulches, a shallow central basin and a few small, conical hills. Narrow boulder beaches are present at the base of most cliffs, with wider beaches at Salt Beach and Waterfall Beach. Landslide material at West Point forms the only extensive relatively flat land area at sea level. A recent bog (c. 400 years old, Preece *et al.* 1986) incorporates the only area of standing freshwater on the island.

Climate

The Tristan climate is cool temperate oceanic. Rain is recorded on 250 days a year at the settlement on the main island Tristan, averaging 1 676 mm per annum. The annual mean temperature is 14.5°C, with very minor diel and seasonal fluctuations (Wace & Holdgate 1976). Orographic cloud on the Inaccessible Island plateau is a common feature. The prevailing winds are westerly, with deep depressions bringing severe storms from this direction.

Inaccessible typically lies to the north of the Subtropical Convergence (Miller & Tromp 1982). Mean sea-surface temperatures at Tristan are 18°C and 13°C in summer and winter respectively (Wace & Holdgate 1976). Meteorological data collected on Inaccessible in 1982-83 have still to be analyzed (C. P. Siddall *in litt.* to MWF), but are unlikely to differ greatly from those recorded at Tristan.

Vegetation

The vegetation of Inaccessible Island is typical southern oceanic wet-heathland (Moore 1971) and comprises three main plant-species assemblages. The lower slopes are blanketed with dense, uniform tussock *Spartina arundinacea* up to 2.5 m high. The western plateau comprises largely tree ferns *Blechnum palmiforme* interspersed with stunted thickets (c. 1 m) of Island Tree *Phyllica arborea*. Dense stands of taller (3 m or more) *Phyllica* occur

in the lower, eastern part of the island plateau and at sea level at Skua Bog (Fig. 1). Scattered *Phyllica* occurs elsewhere over much of the island, particularly in sheltered gulches. Twenty-two species of alien flowering plants have been recorded from the island (Groves 1981). These are confined largely to the landing sites at Blenden Hall and Salt Beach, but seven alien species were discovered on the plateau in 1982-83 (Preece *et al.* 1986). Two major tussock fires have been recorded, one in 1872 and one in 1909 (Hagen 1952, Wace & Holdgate 1976). The 1909 fire, which was deliberately started by sealers, burnt for over a month. Full accounts of the botany of the Tristan group can be found in Wace & Dickson (1965), Wace & Holdgate (1976) and Groves (1981). The Quaternary palaeobotany of Inaccessible Island is detailed by Preece *et al.* (1986).

Mammals

Subantarctic Fur Seals *Arctocephalus tropicalis* and Southern Elephant Seals *Mirounga leonina* formerly were hunted on the island (Wace and Holdgate 1976) and now are rare. Solitary female elephant seals hauled out at Blenden Hall and Salt Beach in 1982-83 (M. K. Swales *in litt.*), were the only records made during the period of observations. Small numbers of adult and pup fur seals were recorded. Presently there are no alien mammals on Inaccessible Island (but see below). However, there is a risk of introducing Black Rats *Rattus rattus* and House Mice *Mus domesticus*, both of which occur on Tristan da Cunha (Richardson 1984).

Birds

Thirty-three seabird taxa are known from Inaccessible Island (see below). Four species of breeding landbirds occur, of which one (the Tristan Thrush *Nesocichla eremita*) is found at all islands in the Tristan group, two (Tristan and Wilkins' Buntings *Nesospiza acunhae* and *N. wilkinsi*) are found only on Nightingale and Inaccessible, and

one (Inaccessible Rail *Atlantisia rogersi*), is endemic to Inaccessible Island. Three species of nonmarine vagrants (American Purple Gallinule *Porphyrio martinica*, Whiterumped Sandpiper *Calidris fuscicollis* and European (= American Barn) Swallow *Hirundo rustica*) have been recorded at Inaccessible Island (Richardson 1984, Fraser 1984a).

Human activities at Inaccessible Island

The main island of Tristan da Cunha was settled permanently in 1816 (Wace 1969) and the population currently stands at just over 300 (C. Mackenzie pers. comm.). In common with many other oceanic islands, considerable damage has been inflicted on the flora and fauna by man and his commensals. Exploitation of seabirds on Tristan and particularly Nightingale Island was, and still is, extensive (Cott 1953, Richardson 1984) but the difficulty in landing and the (relatively) small number of harvestable seabirds has resulted in few visits to Inaccessible Island by the Tristan islanders. Three shipwrecks have been recorded (Fraser *et al.* 1983): in 1821 (the *Blenden Hall* at West Point; the survivors spent five months marooned on Inaccessible Island, Lockhart 1930), 1883 (the *Shakespeare* off Pig Beach), and 1897 (the *Helen S. Lea* off North Point).

Domestic Goats *Capra hircus* and Pigs *Sus scrofa* were put ashore sometime after 1816. An attempt to establish a farming enterprise at Salt Beach in 1937-38 failed and all animals there or on the plateau apparently were removed (Wace & Holdgate 1976). Although Boeuy (1957) suggested that pigs had died out or were killed before the 1930s, rumours of pigs still living on the Inaccessible Island plateau persisted among the Tristan islanders up to the time of the Denstone Expedition in 1982. However, no evidence of pigs or any other alien mammal was found on the island in 1982-83 or 1987.

In 1872 two Germans, the Stoltenhoff brothers, lived on Inaccessible Island in an attempt to

establish a sealing enterprise (Richards 1873, Rosenthal 1952). The endeavour was unsuccessful and the brothers were evacuated by H.M.S. *Challenger* in 1873. They provided the first account in any detail of the island's birds (Richards 1873, Stoltenhoff 1952). Subsequent scientific or collecting trips to Inaccessible Island are detailed in Table 1. Of these, the longest were made by the Denstone Expedition (three months), the Norwegian Expedition (three weeks), the South African Expedition (16 days) and H.F.I. Elliott (two weeks). The duration of other visits, where known, have been for a day or less.

Major publications on the ornithology of the Tristan group are Hagen (1952), Elliott (1957) and Richardson (1984). The seabirds of Gough Island are described by Swales (1965). Wace & Holdgate (1976) give a comprehensive description of the islands, their people, wildlife and conservation. A bibliography of scientific work carried out in the Tristan group up to 1984 has been compiled by Watkins *et al.* (1984).

METHODS

The Denstone Expedition visited Inaccessible Island between 14 October and 22 December 1982 and between 22 January and 10 February 1983 (Fraser 1983, 1984b, Fraser *et al.* 1983, Swales *et al.* 1985), and the South African Expedition visited the island between 28 September and 14 October 1987 (Watkins & Ryan 1987). Both expeditions were based at Blenden Hall (Fig. 1), whence access to the plateau was made along West Road. Ornithological observations were made over most of the island plateau and those areas at sea level accessible on foot (i.e. the shore between Warren's Cliff and Dirleton Point, Fig. 1). A single visit was made by boat to Salt Beach and Waterfall Beach at the eastern side of the island in January 1983 (D. J. Briggs & M. K. Swales pers. comm. to MWF). Methods of assessing the seabird population are given under individual species accounts where

TABLE 1

VISITS TO INACCESSIBLE ISLAND ON WHICH SCIENTIFIC RECORDS HAVE BEEN MADE

Expedition/personnel	Date	References
F. & G. Stoltenhoff	1871/1873	Richards 1873, Stoltenhoff 1952, Rosenthal 1952
H.M.S. <i>Challenger</i>	1873	van Willemoes-Suhn 1876, Sclater 1878, Saunders 1881, Moseley 1892, Beintema 1972, 1973
P.C. Keytel*	1908	Mathews 1932, Hagen 1952, Winterbottom 1972
R.Y.S. <i>Quest</i>	1922	Wilkins 1923, Marr 1923, Lowe 1923,
H.M. Rogers	1923	Lowe 1927, 1928, Rogers 1927
P. Lindsay	1928	Rothschild 1928, Rand 1955
A.G. Partridge	1929/1933	Rowan <i>et al.</i> 1951
R.R.S. <i>Discovery</i>	1933	Holdgate 1965
Norwegian Scientific Exped.	1938	Christophersen 1947, Hagen 1952, 1982
J. Kirby	1946	Roberts & Kirby 1948
M. Handley**	1948	Broekhuysen & Macnae 1949
Lambert's Bay Canning Co.	1948/1949	Broekhuysen & Macnae 1949, Rowan <i>et al.</i> 1951, Rowan 1952, 1965
R. Upton	1950/1951	Ripley 1954, Rand 1955
H.F.I. Elliott	1950/1952	Elliott 1953, 1954a,b, 1957
H.G. Stableford	1953/1955	Wace & Holdgate 1976
Royal Society Expedition	1962	Baird <i>et al.</i> 1965
H.M.S. <i>Protector</i>	1966	Wace & Dickson 1965, Manton & Vida 1968
J.H. Flint	1966	Flint 1967
Conservation survey	1968	Wace 1969
M.E. Richardson	1974	Richardson 1984
FitzPatrick Institute	1981	Fugler 1981
Denstone Expedition	1982/1983	Fraser 1983, 1984a,b,c, Fraser <i>et al.</i> 1983, Collar & Stuart 1985, Cooper & Fraser 1986, Mateer 1985, Siddall 1985, Swales <i>et al.</i> 1986, Preece <i>et al.</i> 1986, Ryan & Fraser 1988
FitzPatrick Institute	1984	Cooper 1984, Ryan 1987b
C. Mackenzie	1986	pers. comm. to MWF
First South African Expedition	1987	Watkins & Ryan 1987, Ryan & Watkins in press

* listed as having visited Inaccessible by Hagen (1952) but not by Holdgate (1965)

** listed as having visited Inaccessible by Holdgate (1965) but not by Wace & Holdgate (1976)

appropriate. Approximate estimates of population sizes are given for several breeding species for which no methods of assessment are given below. These estimates were based on casual observations of the frequency with which species were encountered during fieldwork.

Bird masses were taken to the nearest g using Pesola spring balances. Linear data (maximum wing length [Svensson 1975], tail, tarsus, middle toe and culmen lengths, and bill widths and depths, Fig. 2) were taken to the nearest mm using calipers, a stopped metal rule and dividers. Measurements were taken mostly from birds caught when attracted to hand-held lights at Blenden Hall. Prey remains and pellets of Subantarctic Skuas (scientific names are given under individual species accounts, below) were collected from a stretch of shore at Blenden Hall (Fraser 1984c). In 1982-83 Yellow-nosed and Sooty Albatrosses and Great Shearwaters were banded systematically; other species were banded on an opportunistic basis. No seabirds were banded in 1987. Observations of birds offshore were made from Blenden Hall with telescopes and from ships during arrival at and departure from the island.

SYSTEMATIC LIST

We recorded 30 seabird taxa from Inaccessible Island; three additional species have been recorded previously. Fairly accurate population estimates were made for five species: Wandering, Sooty and Yellow-nosed Albatrosses, White-chinned Petrels and Subantarctic Skuas. Details of the almost 3 000 seabirds banded over the period are given in Fraser (1983) and Cooper & Fraser (1986).

Species accounts

Rockhopper Penguin *Eudyptes chrysocome*

The northern subspecies of Rockhopper Penguin *E. c. moseleyi* is an abundant breeding species at

Inaccessible Island. Colonies were found in tussock at Blenden Hall, Warren's Cliff and Salt Beach (Fig. 1). Owing to the lack of suitable habitat there are unlikely to be other colonies on the island. The Salt Beach colony appeared to stretch the length of the shore and contained many thousands of birds (D. J. Briggs pers. comm. to MWF). At Warren's Cliff the population was estimated to be not more than 500 pairs with a further maximum of 1 000 pairs at Blenden Hall. The total island population is considered to be in the region of 5 000-10 000 pairs, considerably less than the 25 000 pairs estimated by Elliott (1957). A colony on the "south side of the island" was reportedly "nearly exterminated" by pigs in the nineteenth century (Moseley 1892).

Macaroni Penguin *Eudyptes chrysolophus*

This species is a rare non-breeding vagrant to Inaccessible Island. Hagen (1952) collected an adult male at Blenden Hall on 3 March 1938, the only confirmed record for the Tristan group.

Wandering Albatross *Diomedea exulans*

The Wandering Albatross is a rare breeding species at Inaccessible Island. A single chick fledged from a nest site on Gony (= Wandering Albatross) Ridge (Fig. 1), in December 1982. In late January 1983 a female was found incubating, with two additional pairs displaying nearby. No birds or nests were found in 1987, but this need not imply extinction; breeding attempts of birds breeding that year may have failed prior to the survey. Small numbers of birds (up to six) were seen offshore, often coinciding with the arrival of ships. However, many of these birds probably are visitors from other breeding islands (e.g. Gough Island).

Table 2 presents the known population of Wandering Albatrosses on Inaccessible Island since records were first kept in the late 19th century. The population has remained at an extremely low, but apparently stable, level for at least 50 years. The

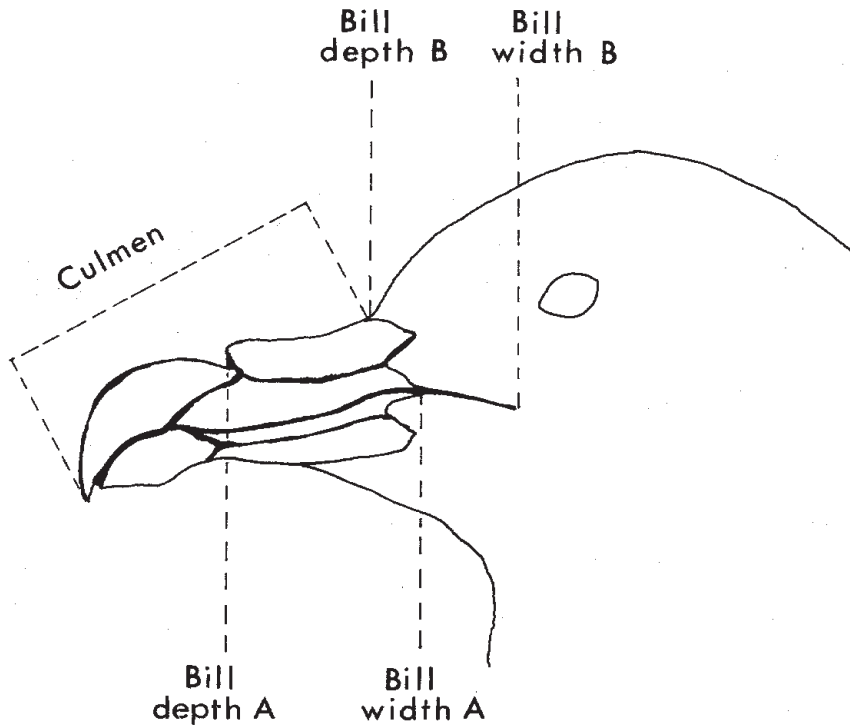


Figure 2

Positions of measurements made on bills of seabirds

TABLE 2

BREEDING POPULATION OF WANDERING ALBATROSSES *DIOMEDEA EXULANS* AT
INACCESSIBLE ISLAND, 1871-1986

Year	Population	Reference
1871/1872	"not more than 200 pairs"	Stoltenhoff 1952
1938	2 pairs	Hagen 1952
1950/1952	"not more than six pairs"	Elliott 1953
1950/1952	2-3 pairs	Elliott 1957
1982	1 chick	this paper
1983	3 pairs	this paper
1986	3 chicks	C. Mackenzie, pers. comm.
1987	0 chicks	this paper

population decrease probably was caused by pigs; Stoltenhoff (1952) comments that wild pigs consumed a large number of eggs and "birds" (= chicks?). The pigs were already present on the island when the Stoltenhoffs arrived, possibly the descendants of two which swam ashore from the wreck of the *Blenden Hall* in 1821 (Wace & Holdgate 1976). No pigs have been unequivocally recorded since the 1930s. It is perhaps surprising that any Wandering Albatrosses survived, if the pigs were responsible for eliminating almost the entire population. Moors & Atkinson (1984) note that pigs "probably eat the eggs and young of surface-nesting seabirds such as albatrosses" but "evidence for pigs causing declines in particular seabird populations is largely circumstantial." The collection of single birds and/or eggs from Inaccessible Island by visiting expeditions (Mathews 1934, Roberts & Kirby 1948, Hagen 1952) may be partly responsible for the consistently small breeding population during the last 50 years. In view of the sustained low breeding population at Inaccessible Island, an investigation of the bird's taxonomic status is warranted.

The Wandering Albatross population that bred at the main island of Tristan was extirpated there at the start of the twentieth century (Barrow 1910, Bourne & David 1981). A Tristan islander, Mrs. M. Rogers, gives 1907 as the year in which the last birds bred on the main island (pers. comm. to C. Mackenzie). This extinction was almost certainly caused by human exploitation (Hagen 1952). Elliott (1957) noted an increasing frequency of birds alighting on Tristan in the early 1950s, and collected two specimens "on Tristan", but it is not clear whether these were taken on- or offshore. Richardson (1984) recorded no landings on Tristan in 1972-74. The potential reasons for failure of the birds to re-establish on Tristan, rats, feral Domestic Cats *Felis domesticus* (which have been known to take Royal Albatross *D. epomophora* chicks, Westerskov 1963) and human exploitation, do not apply at Inaccessible Island.

Blackbrowed Albatross *Diomedea melanophris*

This species is an occasional non-breeding visitor (<10 sightings during the present surveys) to the waters off Inaccessible Island. Breeding at the main island of Tristan has been reported once (Hagen 1952) and a chick on Nightingale Island in the early 1980s was reputed to be of this species (L. Lavarello, Tristan islander, pers. comm. to MWF). Although Blackbrowed Albatrosses breed later than Yellow-nosed Albatrosses (Weimerskirch *et al.* 1985), hybridization with Yellow-nosed Albatrosses in such cases cannot be ruled out.

Yellow-nosed Albatross *Diomedea chlororhynchus*

The Yellow-nosed Albatross is a regular breeding species at Inaccessible Island. Apart from one nest at 150 m above sea level on West Road (Fig. 1), nests were situated on the island plateau. Here nests generally are scattered and often are concealed in dense vegetation. Concentrations of nests (maximum 33) were located in boggy areas near Long Ridge, at Cairn Peak, Molly Bog and Dick's Bog (Fig. 1). Depressions and sheltered areas were favoured sites. Those nests close to the cliff edge, which were regularly subjected to severe updraught, were sited in dense *Phyllica* scrub. A search of the plateau resulted in 816 occupied nests being found in 1982-83. A small number in the densest *Phyllica* may have been overlooked. Approximately one quarter of the island was not searched thoroughly, but nesting density seemed comparable to that in similar habitat elsewhere. The total island population is estimated at 1 100 breeding pairs. This is similar to the estimate of 1 400 pairs made for the island in the early 1950s (Elliott 1957). Hagen (1952) considered that the Inaccessible Island population in 1939 "hardly constituted more than a few hundred pairs", suggesting an increase in Yellow-nosed Albatross numbers between 1939 and 1950 which has not, apparently, been paralleled at the other islands in the Tristan group. It may be that Hagen's (1952) estimate was coloured by his experiences on

Nightingale Island where large numbers of nests are concentrated around "The Ponds" (Rowan 1951, Richardson 1984). Inaccessible Island, where the nests are more scattered, may have appeared depauperate by comparison.

In late September most birds were incubating, although some courtship and nest building were evident. Birds without eggs at this stage were likely to be immatures or failed breeders, because laying takes place in early September on Nightingale (Watson 1975), and copulation was observed on less than 10 occasions in late September. In 1982 the first egg pipped on 23 November, and by mid-February 1983 the first flight feathers were beginning to appear on only the most well developed chicks. All clutches comprised a single egg, but one nest contained two chicks, one of which had died in the process of hatching and one c. two weeks old. Elliott (1957) records two instances of two-egg clutches on Nightingale Island which he suggests were each the product of one female. However, other records of albatrosses with two-egg clutches have been attributed to two females laying in the same nest (Rice & Kenyon 1962, Tickell & Pinder 1966).

Totals of 1 120 adult and 573 nestling Yellow-nosed Albatrosses were banded on Inaccessible Island in 1982-83 (Fraser 1983). To date, there have been two recoveries, both of birds banded as adults and found on the southern Brazilian coast (one on 15 June 1984 near Sao Paulo [28 56S, 49 03W] and one on 7 September 1985 near Ararangua [24 18S, 47 31W]). Previous recoveries of Yellow-nosed Albatrosses banded at the Tristan islands (mainly on Nightingale Island, Hagen 1952, 1982) were recovered off the southwestern African coast between Walvis Bay and Angola (Morant 1977, Morant *et al.* 1983). The absence of recoveries of Inaccessible Island birds from this region may be due to one of two factors. Firstly, birds in their first year apparently move farther up the southwestern African coast than do adults (Morant *et al.* 1983). Since the majority (79%) of chicks ringed at Inaccessible during 1983 were marked with South

African (SAFRING) bands, these may not be reported from Angola for political reasons (T. B. Oatley pers. comm.). Secondly, there has been a decrease in the commercial fishery off Angola since 1938 (O'Toole 1978, Brooke 1981). With less trawler offal available, fewer albatrosses may gather there. The correspondingly lower frequency of banding recoveries would be exacerbated by the fact that most of the reports are of birds caught at fishing boats (Morant 1977).

Sooty Albatross *Phoebastria fusca*

The Sooty Albatross is a regular breeding species at Inaccessible Island. Only 60 nests were found during 1982-83, but observations in 1987 suggested a considerably larger breeding population. A group of six nests near Gony Ridge was the largest concentration of nests found in 1982-83. Stoltenhoff (1952) estimated the number of Sooty Albatrosses on Inaccessible Island in 1872-73 as "small". Hagen (1952) did not attempt to judge the size of the population. Elliott (1957), noting that there seemed to have been an increase in numbers since 1938, estimated 2 000 breeding pairs, including "groups of up to 25" in 1950-52. A survey of the breeding population of the Sooty Albatross at the Tristan island group and at Gough Island is warranted since the islands may support more than 30% of the world population of this species (Richardson 1984).

Light-mantled Sooty Albatross *Phoebastria palpebrata*

This species is a rare visitor to the waters of the Tristan island group. None was seen during the present surveys, but one was observed "midway between Tristan and Inaccessible" in January 1974 (Richardson 1984).

Northern Giant Petrel *Macronectes halli*

This species probably is a regular non-breeding visitor to Inaccessible Island. Individuals were

recorded from the *M. V. S. A. Agulhas* off Salt Beach and from the shore at Blenden Hall in September-October 1987.

Southern Giant Petrel *Macronectes giganteus*

This species probably is a regular non-breeding visitor to Inaccessible Island. Individuals were recorded from the *M. V. S. A. Agulhas* off Sea Cart Beach in September 1987. A giant petrel, species not determined, was seen feeding on a Rockhopper Penguin carcass on the beach at Blenden Hall on 4 November, 1982 (H.N. Hall pers. comm. to MWF). Richardson (1984) describes the Southern Giant Petrel as a nonbreeding visitor to the Tristan group throughout the year. This species breeds at Gough Island (Williams & Imber 1982) and it or the Northern Giant Petrel *M. halli* formerly did so at Tristan (Wace & Holdgate 1976, Bourne & David 1981).

Antarctic Fulmar *Fulmarus glacialisoides*

This species is an irregular non-breeding visitor to the waters off Inaccessible Island (Richardson 1984). A single bird was photographed by J. J. Woolley from the *M.V. Tristania II* off Blenden Hall in December 1982, and a washed-up carcass was found at Blenden Hall in September 1987. A record from "probably near Inaccessible" is given by Roberts & Kirby (1948).

Pintado Petrel *Daption capense*

This species is a regular non-breeding visitor to the waters off Inaccessible Island, chiefly during winter (Elliott 1957, Richardson 1984). Four were seen from North Point (Fig. 1) on 5 December 1982. Birds were observed from vessels offshore Inaccessible Island in December 1986 (M. de L. Brooke *in litt.*) and September-October 1987. According to Moseley (1892) the Pintado

Petrel once nested in the Tristan group, but this has been rejected by Hagen (1952).

Broadbilled Prion *Pachyptila vittata*

This species is an abundant breeding species at Inaccessible Island. It is abundant offshore at Blenden Hall and, after the Great Shearwater, is the most abundant species seen around Blenden Hall at night. Calling birds were located under boulders above the beach at West Point and were fairly abundant in burrows on the western edge of the island plateau. Well-feathered chicks were extracted from burrows amongst tussock at Warren's Cliff on 10 December 1982, which agrees with the December fledging date recorded for this species at the main island of Tristan (Richardson 1984).

Measurements taken from light-attracted birds are given in Table 3. These conform to those given by Hagen (1952) from Tristan and Swales (1965) from Gough. Trematode anklets (Imber 1984) were recorded from seven of 39 (18%) of Broadbilled Prions examined during September-October 1987. All anklets were small, withered and attached to one leg only.

Antarctic Prion *Pachyptila desolata*

This species probably is a frequent non-breeding visitor to the waters off Inaccessible Island. Remains were found in freshly regurgitated pellets of Subantarctic Skuas in October (one) and November (one) 1982 (Fraser 1984c) and September 1987 (two), the first definite records for the Tristan group (Fraser 1984a).

Atlantic Petrel *Pterodroma incerta*

This species is a frequent visitor to the offshore waters of Inaccessible Island, where it may breed in winter (Richardson 1984). A dead bird was found at

TABLE 3
MEASUREMENTS OF BROADBILLED PRIONS *PACHYPTILA VITTATA*
FROM INACCESSIBLE ISLAND

	Mean	SD	Range	n
Wing	203,8	5,3	194 - 213	16
Culmen	33,9	1,2	31,5 - 35,5	16
Tarsus	34,1	1,9	30,0 - 36,5	16
Tail	102,1	5,2	91 - 111	16
Bill depth A	13,6	0,9	12,0 - 15,0	12
Bill depth B	17,1	0,8	15,5 - 18,5	16
Bill width A	21,6	0,8	20,0 - 23,5	12
Bill width B	20,8	0,5	20,0 - 21,5	12
Middle toe	44,9	1,6	42,0 - 48,0	14
Mass	190,8	25,2	153 - 233	16

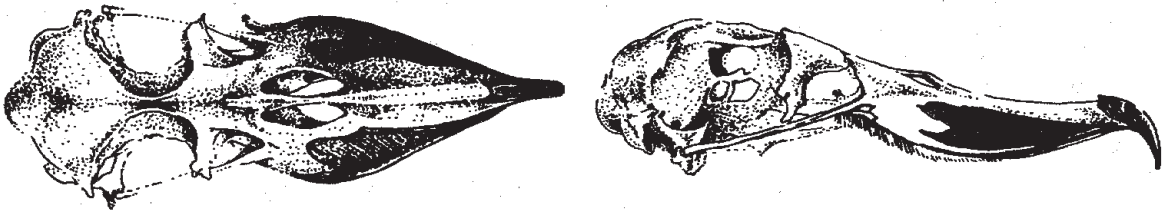


TABLE 4
MEASUREMENTS OF SOFTPLUMAGED PETRELS *PTERODROMA MOLLIS*
FROM INACCESSIBLE ISLAND

	Mean	SD	Range	n
Wing	250,4	3,7	244 - 258	21
Culmen	27,9	1,3	26,0 - 31,5	17
Tarsus	37,6	2,1	34,0 - 42,0	17
Tail	103,3	25,3	102 - 127	16
Bill depth A	9,9	0,4	9,5 - 10,5	5
Bill depth B	13,9	0,7	13,0 - 14,5	6
Bill width A	12,1	1,1	10,0 - 13,0	6
Bill width B	15,1	1,1	14,0 - 16,5	5
Middle toe	48,9	3,3	46,0 - 52,0	14
Mass	283,8	18,6	275 - 314	19

Blenden Hall on 7 October 1987 and the species was common at sea at this time, but no birds were seen ashore. The species breeds at the main island of Tristan (Richardson 1984).

Greatwinged Petrel *Pterodroma macroptera*

This species is a frequent visitor to the offshore waters of Inaccessible Island, where it may breed in winter (Richardson 1984). It was fairly common at sea off Inaccessible Island in September-October 1987, but none was recorded on the island. It breeds at the main island of Tristan (Richardson 1984).

Kerguelen Petrel *Pterodroma brevirostris*

The Kerguelen Petrel is an uncommon breeding species at Inaccessible Island. It occurred in small numbers at light-attractions in November 1982 and several skua-killed carcasses were found on the western plateau during 1987. One was heard calling at Blenden Hall in January (M. K. Swales pers. comm.). The only proof of breeding is a newly fledged juvenile collected from Inaccessible in 1946 (Roberts & Kirby 1948, Elliott 1957).

Softplumaged Petrel *Pterodroma mollis*

This is a common species at Inaccessible Island, where it almost certainly breeds. It was one of the most abundant species attracted to lights at Blenden Hall. It was absent from 28 September until 4 October 1987, when calling birds were heard at Blenden Hall. One individual called nightly from a boulder amongst tussock from 9 November until at least 20 December 1982. None of the burrows from which birds were extracted (in uniform tussock at Blenden Hall and short *Blechnum pennamarina* on the plateau) contained eggs or chicks.

The nominate race occurs at Inaccessible Island (cf. Clancey *et al.* 1981). Measurements from light-attracted birds are given in Table 4. These conform generally to measurements of birds from the main island of Tristan and from Gough Island (Clancey *et al.* 1981), but appear to be longer in the tarsus and shorter in the tail when compared with Gough birds examined by Swales (1965). This may be attributable to differences in measuring techniques. No dark-morph individuals (described by Elliott (1954a) who recorded it nesting at the main island of Tristan) were encountered. This morph occurs in a ratio of less than 1:100 with the light form on Gough (Swales 1965) and Marion Islands (Schramm 1982).

Whitechinned Petrel *Procellaria aequinoctialis*

The Whitechinned Petrel is a regular breeding species at Inaccessible Island. The local breeding population is distinguished by a conspicuous white "spectacle" (hence the local Tristan name of Ringeye), and Inaccessible is the only locality where this form breeds. It has been given subspecific status (*P. a. conspicillata*, Rowan *et al.* 1951, Southern 1951), making it the only seabird taxon endemic to Inaccessible Island. Its pelagic range extends across the South Atlantic (Enticott & O'Connell 1985), but some remain around Inaccessible Island throughout the year (Rowan 1951). Both races of Whitechinned Petrel are numerous at sea around Inaccessible Island, but the nominate form is very rare over the island; only two were seen over the plateau in 1982-83, and none was seen in 1987.

Nesting burrows of the Whitechinned Petrel are confined to the banks of river valleys on the higher, western part of the plateau. In 1982 an area of approximately 1 km² (about half that considered suitable for nesting Whitechinned Petrels) was searched for occupied burrows. Burrows in which birds were either heard or seen entering were considered occupied on the basis of fresh excavations, footprints or droppings at the entrance.

A total of 569 occupied burrows was found, singly or in groups of up to 73 (mean 11,6). Superficial examination of the remainder of the area indicated a similar density. The total island population was, therefore, approximately 1 000 pairs. Two factors affecting this figure are 1) communal burrow-entrances with more than one pair of birds using a single entrance (as reported for Great Shearwaters, Hagen 1952) and, 2) eroded or collapsed burrows being counted as more than one nest.

Grey Petrel *Procellaria cinerea*

This species almost certainly breeds at Inaccessible Island, but its status is little known since it breeds during winter. A pair was found displaying near South Hill (Fig. 1) on 5 February 1983. The birds occupied a natural burrow underneath a boulder which also contained a freshly dead Great Shearwater chick. It is not known whether the petrels forced out the shearwaters. The arrival time conforms to that reported for the main island of Tristan (Elliott 1957, Richardson 1984).

Great Shearwater *Puffinus gravis*

This is the most abundant breeding seabird at Inaccessible Island. Occupied burrows were found in all vegetation types over the entire island. Major concentrations were located under *Phyllica* trees at North Point and in all uniform tussock examined. At North Point burrows were dug in deep, humic soil, and non-woody vegetation was absent from the ground surface through the activities of the birds. Burrow density was estimated at 1 m^{-2} in an area of approximately $0,25 \text{ km}^2$, suggesting 250 000 occupied burrows in this area. In the tall tussock at Warren's Cliff well-worn, vegetation-free paths indicated prolonged use of the area. Systematic searching of twenty random $10 \times 10 \text{ m}$ quadrats gave an occupied burrow density of $0,21 \text{ m}^{-2}$ (range $0,03\text{-}0,52 \text{ m}^{-2}$), which, extrapolated to the c. 4 km^2 of this habitat type, gives 840 000 occupied burrows. Burrow density was estimated to be as high as

$1,0 \text{ m}^{-2}$ on the western edge of the plateau. Burrow density was not estimated in other vegetation types, but was lower than in the habitats described above. The Great Shearwater population on Inaccessible is estimated to be at least 1 500 000-2 000 000 pairs and may be considerably greater.

The species breeds on Nightingale Island in similarly large numbers. On the basis of one occupied burrow m^{-2} , Rowan (1952) estimated 2 000 000 pairs there. Recent observations, however, indicate a burrow density slightly lower than this (M. de L. Brooke pers. comm.). It does not currently breed on Tristan, but probably did so in small numbers during the 1940s (Richardson 1984). Elliott (1970) estimated the numbers on Gough Island to be 600 000-3 000 000 pairs. The size of a small population of Great Shearwaters discovered at the Falkland Islands in 1961 (Woods 1975) is unknown (Cramp & Simmons 1977), but it is likely that at least a third of the world population of this species breeds at Inaccessible Island.

Rafts of Great Shearwaters were present at sea beyond the kelp beds during the day in late September 1987. Birds in these rafts either roosted or involved in social behaviours (calling, agonistic displays, etc.). No foraging activity was observed. Birds came ashore at dusk to occupy burrows and display. Towards mid-October off- and onshore numbers decreased markedly. On 9 November 1983 the first "post-honeymoon" bird was recorded ashore occupying a burrow, and by 13 November six of approximately 100 burrows examined at Blenden Hall contained eggs, one of which was beginning to develop. Seventeen fresh eggs were collected by Tristan islanders for human consumption from c. 200 occupied (cleaned-out) burrows on 14 November. After 20 November no further eggs were collected since all were starting to develop. However, a soft-shelled egg was found in the oviduct of a female collected on the latter date. Therefore the laying season may be slightly more prolonged and later than the "well-synchronized and brief laying season early in November" reported for Nightingale Island (Rowan 1952). The

first chick, judged to be less than one week old, was found on 25 January 1983.

Measurements from birds and eggs collected by Tristan islanders at Inaccessible Island will be analyzed elsewhere. No albino birds were recorded amongst thousands of birds seen, although a low incidence of albinism is known to occur in the species (Elliott 1954, Richardson 1984, Lee & Grant 1986). By February the plumage of most of the birds was becoming heavily worn, but no active moult was recorded at this time. Primary moult commences soon after birds reach their winter quarters in the North Atlantic (Stresemann & Stresemann 1970).

Two of 980 adult Great Shearwaters banded in 1982-83 on Inaccessible Island have been recovered. These were banded on 10 December 1982 and 27 January 1983 (not February, as given in Cooper & Fraser 1986) and recovered in the North Atlantic off Newfoundland on 27 July 1983 (48° 32'N, 53° 06'W) and 31 July 1984 (45° 30'N, 48° 30'W), respectively. These conform to the known movements of the species; birds arrive in Newfoundland waters at the end of May and return to the breeding grounds at the end of August (Hagen 1952, Rowan 1952, Voous & Wattel 1963, Cramp & Simmons 1977, Brown *et al.* 1981).

Sooty Shearwater *Puffinus griseus*

This species is regular offshore at Inaccessible Island. Birds moving inshore at dusk with Great Shearwaters in October 1987 may indicate breeding, as has recently been reported to occur at the main island of Tristan (C. Mackenzie pers. comm.), but no birds have been found ashore.

Little Shearwater *Puffinus assimilis*

This species is fairly abundant at Inaccessible Island, where it almost certainly breeds. It occurred frequently at light-attractions, and in 1987 was

judged from calls to be second only to Great Shearwaters in abundance at Blenden Hall. It was also heard calling from amongst tussock on the plateau at North Point. One was extracted from a burrow at Blenden Hall in November 1982. Although unproven, breeding at Inaccessible Island is highly likely. The species is regular in the diet of Subantarctic Skuas there (Fraser 1984c).

All the birds handled were of the race *P. a. elegans*. Measurements of 13 individuals (Table 5) fall within the range given for a series from Gough (Swales 1965).

Wilson's Stormpetrel *Oceanites oceanicus*

This species is a regular non-breeding visitor to the waters off Inaccessible Island, chiefly in winter (Richardson 1984). Two were seen at sea off Skua Bog (Fig. 1) in November 1982 and one was seen from the *M. V. S. A. Agulhas* c. 3 km off South Hill during October 1987.

Whitebellied Stormpetrel *Fregetta grallaria*

This is a fairly abundant breeding species at Inaccessible Island. It was more abundant than the Whitefaced Stormpetrel at light-attractions at Blenden Hall, and on two misty nights in December 1982 many thousands of Whitebellied Stormpetrels were seen there. It also was the most abundant stormpetrel in the diet of Subantarctic Skuas (Fraser 1984c). This contrasts with the position elsewhere in the Tristan islands; Richardson (1984) considered the Whitefaced Stormpetrel much more abundant, and in late November/early December 1986 Whitefaced Stormpetrels were estimated to be approximately five times commoner than Whitebellied Stormpetrels offshore (M. de L. Brooke *in litt.*). It is likely that in other habitats at Inaccessible Island the Whitebellied Stormpetrel is much less numerous than the Whitefaced Stormpetrel; the ratio of birds coming aboard ship at night while anchored off the eastern side of

TABLE 5
MEASUREMENTS OF LITTLE SHEARWATERS *PUFFINUS ASSIMILIS*
FROM INACCESSIBLE ISLAND

	Mean	SD	Range	n
Wing	186,2	5,0	180 - 195	13
Culmen	26,9	1,8	25,5 - 32,0	11
Tarsus	39,3	1,6	37,5 - 40,5	11
Tail	69,2	3,4	63 - 73	10
Bill depth A	7,3	0,6	6,0 - 8,0	11
Bill depth B	9,9	0,4	9,5 - 10,5	11
Bill width A	9,8	0,5	9,0 - 10,5	11
Bill width B	13,1	1,0	11,0 - 14,0	11
Middle toe	46,7	2,8	41 - 50	11
Mass	260,7	21,6	237,5 - 295,0	11

TABLE 6
MEASUREMENTS OF WHITEBELLIED STORMPETRELS *FREGETTA GRALLARIA*
FROM INACCESSIBLE ISLAND

	Mean	SD	Range	n
Wing	167,8	3,8	158 - 174	29
Culmen	15,8	0,6	14,5 - 17,0	25
Tarsus	40,7	2,7	37 - 43	25
Tail	78,3	3,8	71,0 - 86,5	25
Bill depth A	5,6	0,4	5,0 - 6,5	24
Bill depth B	7,3	0,3	7,0 - 8,0	25
Bill width A	7,3	0,6	5,5 - 8,5	25
Bill width B	8,8	0,7	7,5 - 9,5	24
Middle toe	26,1	2,7	22 - 30	24
Mass	52,6	4,7	45,5 - 62,5	30

Inaccessible Island on 14 October 1987 was approximately eight Whitefaced to one Whitebellied Stormpetrel.

Whitebellied Stormpetrels were recorded on land and calling from rock crevices amongst tussock from the beginning of October. An bird with a vascularized brood-patch was caught on 8 December and a bird incubating a single egg was extracted from a burrow in the tussock at Warren's Cliff on 26 January 1983. Elliott (1957) considered the bird a late summer breeder.

Measurements from a series of Whitebellied Stormpetrels are given in Table 6. These fall within the range given by Hagen (1952) who found that, of birds sexed by dissection, males have significantly shorter wings than do females. This sexual dimorphism may account for the broad range (147-178 mm) in wing lengths recorded by Swales (1965) at Gough Island. There was considerable individual variation in the extent of pale edging to the mantle feathers. There is considerable confusion as regards the taxonomy of *Fregatta* stormpetrels at the Tristan and Gough islands (Mathews 1932, Murphy 1936, Palmer 1962, Clancey 1981). Although conforming more to the measurements of Blackbellied Stormpetrels given in Harrison (1985), none of the Inaccessible Island birds displayed any black division on the belly. A number of individuals did, however, display noticeably more pronounced and elevated nostrils than did others. According to Tuck & Heinzl (1979) this is a characteristic of the Blackbellied Stormpetrel *F. tropica*.

Whitefaced Stormpetrel *Pelagodroma marina*

This species is fairly abundant at Inaccessible Island, where it almost certainly breeds. Individuals with vascularized brood patches and with soil on the bill and plumage were captured on 7 and 16 November 1982 at Blenden Hall, suggesting that breeding is likely. Only small numbers were attracted to lights at Blenden Hall, but many birds came aboard the *M. V. S. A. Agulhas* at night while

anchored off the eastern side of Inaccessible Island on 15 October 1982 and 14 October 1987, when they greatly outnumbered Whitebellied Stormpetrels. These observations suggest that large numbers breed on the eastern side of the island, possibly amongst *Phylica* trees.

Measurements from 15 birds are presented in Table 7. Hagen (1952) and Swales (1965) measured only a single bird each, at Tristan and Gough respectively, and Furness (1984) 35 from Gough. Of the latter, 24 (69%) were found to carry trematode anklets. Ryan (1986) recorded anklets on five out of six Whitefaced Stormpetrels examined at Gough. No such anklets were recorded on this, or any other species, inspected in the hand on Inaccessible Island in 1982-83. However, during September-October 1987 single, withered anklets were found on five of 95 (5.3%) birds at Blenden Hall. By comparison, 39 of 41 (95.1%) birds handled aboard ship off Sea Cart Beach on 14 October 1987 had anklets, 36 of which were fresh (wet and slightly sticky). Thirty-three of these 36 birds had anklets on both legs. This sudden increase in the incidence of anklets suggests that there had been a recent emission of trematode filaments (cf. Imber 1984). Interestingly, none of 59 Whitebellied Stormpetrels examined at Blenden Hall or off Sea Cart Beach had anklets.

Greybacked Stormpetrel *Garrodia nereis*

The status of this species at Inaccessible Island is unresolved (Fraser 1984a). Two birds came on board the *M. V. S. A. Agulhas* on the night of 15 October 1982 while the ship was anchored off Salt Beach. The species is frequent at Gough Island (Swales 1965, Williams & Imber 1982, Richardson 1984), but it previously had not been recorded from the Tristan group.

TABLE 7

MEASUREMENTS OF WHITEFACED STORMPETRELS *PELAGADROMA MARINA*
FROM INACCESSIBLE ISLAND

	Mean	SD	Range	n
Wing	157,6	6,3	149 - 173	15
Culmen	16,1	1,1	14 - 18	9
Tarsus	42,4	2,2	39,5 - 45,0	9
Tail	70,5	5,7	62 - 75	9
Bill depth A	4,8	0,3	4,5 - 5,0	3
Bill depth B	6,6	0,5	6 - 7	4
Bill width B	8,5	1,3	7,5 - 10,0	3
Middle toe	36,8	1,6	35 - 39	6
Mass	52,0	5,1	45 - 60	15

TABLE 8

MEASUREMENTS OF COMMON DIVING PETRELS *PELECANOIDES URINATRIX*
FROM INACCESSIBLE ISLAND

	Mean	SD	Range	n
Wing	117,0	4,0	112 - 124	6
Culmen	16,5	0,9	16 - 18	5
Tarsus	23,9	1,7	21,5 - 26,0	5
Tail	44,0	3,8	42,0 - 46,5	5
Bill depth A	7,2	0,4	6,5 - 7,5	5
Bill depth B	9,6	1,0	8,5 - 11,0	5
Bill width A	8,3	0,8	7,5 - 9,5	5
Bill width B	9,3	0,4	9 - 10	5
Middle toe	31,9	2,1	29,5 - 34,0	5
Mass	109,1	23,5	82,5 - 134,0	5

Common Divingpetrel *Pelecanoides urinatrix*

This is a fairly abundant breeding species at Inaccessible Island. It was occasional in small numbers (< 50) at light-attractions in 1982-83, and was very numerous (rafts of 1 000) at sea off the island in October 1987. A burrow, 5 cm below the ground-surface and c. 75 cm long, contained a downy chick on 28 November 1982, and an adult with a vascularized brood patch was caught on 29 November 1982.

Table 8 presents biometrical data for six light-attracted birds. These do not differ greatly from measurements given by Hagen (1952) or Swales (1965).

Frigate bird sp. *Fregata* sp.

An unidentified frigate bird was seen over Blenden Hall in March 1951 (Elliott 1957).

Subantarctic Skua *Catharacta antarctica*

This is a resident breeding species at Inaccessible Island. A search of the island in 1982-83 revealed 17 nests (Fig. 3). In addition, a single pair at Blenden Hall formed a nest scrape but did not lay. The conspicuousness of the adults and nature of the nest sites make it unlikely that other nests were overlooked. Nests on the plateau were solitary and tended to be among short vegetation on open ground. A nest at Molly Bog was closely encircled by over thirty Yellow-nosed Albatross nests. A loose group at Skua Bog comprised five nests on the Bog itself, plus two in short tussock on the edge and one on the boulder beach. All clutches/broods comprised 1-2 eggs/chicks. A club of nonbreeding birds at Skua Bog peaked at 64 in January 1983.

The diet of Subantarctic Skuas at Inaccessible Island has been investigated, based on pellet and prey remains collected at Blenden Hall in 1982-83 (Fraser 1984c). Additional prey items recorded in

1987 were an Antarctic Tern and two Tristan Thrushes. The occurrence of plastic items in skua pellets has been described (Ryan 1987a, Ryan & Fraser 1988).

Kelp Gull *Larus dominicanus*

This species is an irregular visitor to Inaccessible Island. A subadult bird, thought to be of this species, was seen from the M.V. *Tristania II* off Blenden Hall on 8 December 1982 (J. J. Woolley *in litt.* to MWF). All previous records (of up to seven birds together) in the Tristan group have been of subadults (Richardson 1984).

Antarctic Tern *Sterna vittata*

This is a regular breeding species at Inaccessible Island. The island breeding population in 1982-83 was at least 86 pairs, dispersed around the coast (Fig. 4). This is a minimum breeding population estimate, since much potential breeding habitat (e.g. on cliffs at Dirleton Point) could not be surveyed. The estimated population falls within the lower half of the range given by Richardson (1984). All nests found were high (up to 20 m) on cliff ledges, with the exception of two on the ground at Warren's Cliff, which were amongst boulders and sparse tussock. Two newly-fledged young were found there on 23 January 1983.

Arctic Tern *Sterna paradisaea*

This species is an uncommon non-breeding visitor to Inaccessible Island. Up to 10 first-winter birds were seen at Blenden Hall between November 1982 and February 1983.

Common Noddy *Anous stolidus*

This is a regular breeding species at Inaccessible Island. Approximately 30 pairs were estimated to

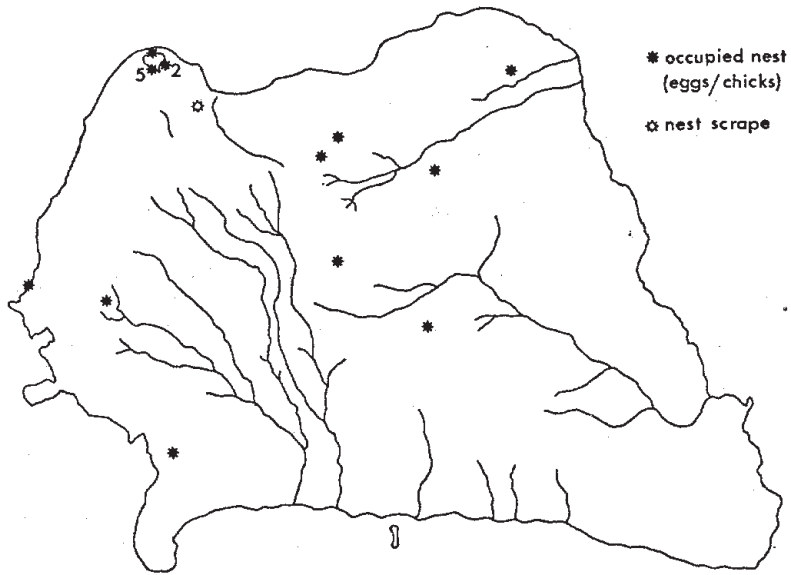


Figure 3

Distribution of breeding Subantarctic Skuas *Catharacta antarctica* at Inaccessible Island

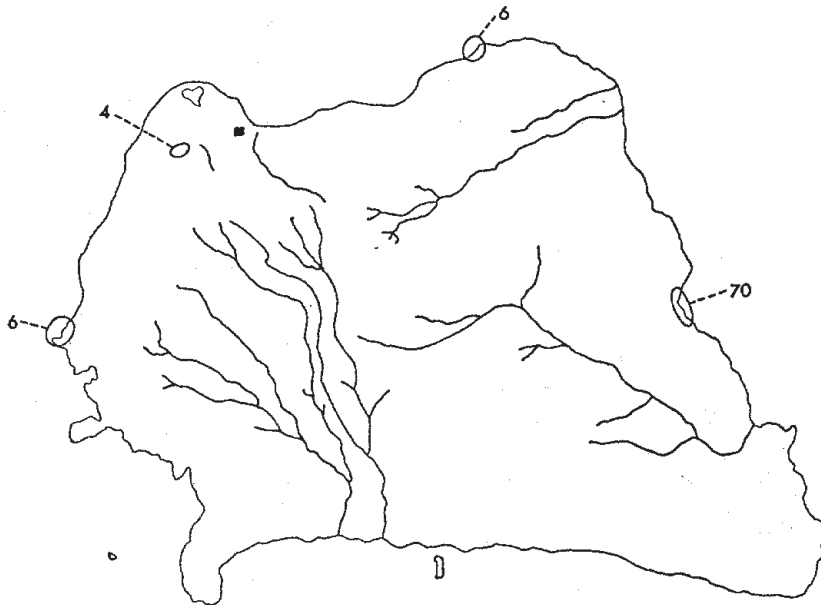


Figure 4

Distribution of breeding Antarctic Terns *Sterna vittata* at Inaccessible Island

be breeding at Salt Beach in late January 1983 (D. J. Briggs pers. comm. to MWF), two nests were found at West Road and one was found at Skua Bog. Even though birds were seen at a number of other localities around the island, suggesting a population somewhat larger than these figures indicate, the population is probably considerably smaller than the 500 pairs estimated by Richardson (1984) in 1974.

All the nests at Salt Beach were located on the cliff face in sites similar to those occupied by Antarctic Terns (D. J. Briggs pers. comm. to MWF). The nests at West Road and Skua Bog were in *Phyllica* trees, and an old nest at West Road was in the fork of an apple *Malus* tree. The egg in a nest at West Road hatched on 9 December 1982, the chick weighing 21.5 g. The chick fledged sometime before 22 January 1983, the exact date unknown.

Lesser Noddy *Anous tenuirostris/minutus*

A single bird purported to have been taken from a nest at Blenden Hall by the *Challenger* Expedition was mislabelled and was actually collected on St. Paul's Rocks (Watson 1969, Beintema 1972, 1973).]

STATUS, POPULATION SIZES AND CONSERVATION OF THE SEABIRDS OF INACCESSIBLE ISLAND

Inaccessible Island supports large breeding populations of at least thirteen seabird species (Table 9). There are no seabird species endemic to Inaccessible Island, but the island is of considerable conservation importance as one of the three main breeding localities of the Great Shearwater, as well as for its relict population of Wandering Albatrosses and the endemic race of the Whitechinned Petrel. Perhaps the island's greatest value lies in its virtually unspoiled (by man) state, maintenance of which is of the utmost importance in conservation and scientific terms. The value of preventing further environmental deterioration

within the Tristan da Cunha group is discussed by Wace (1965).

"Complete sanctuary" status has been recommended for Inaccessible Island, largely to protect the endemic Inaccessible Rail (Broekhuysen 1957, Flint 1967, Collar & Stuart 1985). Such protection would also benefit the other birds on the island, including seabirds. However, as recently as 1981 farming on Inaccessible has been advocated as a means of supplementing the Tristan islanders' diet (Helyer 1981). Any such development inevitably would degrade the island's vegetation and result in the introduction of more alien plants. Increased traffic from Tristan also would increase the risk of the introducing rats or mice. It is strongly recommended that no such development be permitted at any time on Inaccessible Island.

Protection of the birds of the Tristan group is provided by the Tristan da Cunha Conservation Ordinance, 1976 (Wace & Holdgate 1976, Grundy 1984, Clark & Dingwall 1985). Under this ordinance, only Rockhopper Penguins and Great Shearwaters and their eggs may be killed or collected, and only by Tristan islanders for human consumption, on Inaccessible Island. The Sooty Albatross on Inaccessible Island, which previously could be killed by Tristan islanders in terms of the ordinance, was fully protected by an amendment order to the ordinance on 1 July 1986. Visits to the island by the Tristan people are, however, sporadic, since the collection of seabirds is carried out largely on Nightingale Island which is more accessible. Killing of Rockhopper Penguins for bait by the crews of fishing vessels has taken place on Nightingale Island (Richardson 1984). Such activities are illegal, but are unlikely to be detected on Inaccessible Island.

Oil pollution rarely has occurred in the Tristan group (Richardson 1984). In 1986 a crayfishing vessel was reported to have leaked lubrication oil for many days, leading to large numbers of birds being contaminated (C. Mackenzie pers. comm.).

TABLE 9

STATUS AND POPULATION ESTIMATES OF SEABIRDS AT INACCESSIBLE ISLAND

Species	Status	Population (pairs)
Rockhopper Penguin	b	5 000-10 000
Macaroni Penguin	v	
Wandering Albatross	b	0-4
Blackbrowed Albatross	r	
Yellownosed Albatross	b	1 100
Sooty Albatross	b	200
Lightmantled Sooty Albatross	v	
Northern Giant Petrel	r	
Southern Giant Petrel	r	
Antarctic Fulmar	v	
Pintado Petrel	r	
Broadbilled Prion	b	50 000-500 000
Antarctic Prion	v/r	
Atlantic Petrel	(b)	
Greatwinged Petrel	b?	
Kerguelen Petrel	b	50-500
Softplumaged Petrel	(b)	5 000-50 000
Whitechinned Petrel	b/B	1 000
Grey Petrel	(b)	?
Great Shearwater	b	1 500 000-2 000 000
Sooty Shearwater	b?	
Little Shearwater	(b)	5 000-50 000
Wilson's Stormpetrel	r	
Whitebellied Stormpetrel	b	5 000-50 000
Whitefaced Stormpetrel	(b)	5 000-50 000
Greybacked Stormpetrel	v?	
Common Divingpetrel	b	1 000-10 000
Frigatebird sp.	v	
Subantarctic Skua	B	17
Kelp Gull	v	
Antarctic Tern	b	>86
Arctic Tern	r	
Common Noddy	b	>33

KEY v = vagrant (< five records or sightings), b = non-resident breeder, B = resident breeder, (b) = probable breeder, r = nonbreeding visitor

The Denstone Expedition hut at Blenden Hall, now the property of the Island Council of Tristan da Cunha and maintained by periodic visits by Tristan islanders, is the only permanent artificial structure on the island. An attempt to erect an automatic weather-station on the island plateau in October 1986 by South African personnel from the M. V. S. *A. Agulhas* (Anon. 1986) failed when the station blew down (Watkins 1986). Despite attempts to remove it, the structure is still present.

The greatest and most immediate threat to the island's avifauna is the introduction of alien predators, most notably rats. Live rats have been found aboard Tristan longboats bound for Nightingale Island and a dead rat was found amongst cargo being unshipped at Gough Island (Richardson 1984). A live rat was seen ashore at Gough in 1983 (Wace 1986a,b, Watkins & Furness 1986). A crayfish boat working round the islands in 1973 was found to be rat-infested (Richardson 1984). Forays ashore by the crews of such vessels and the dumping overboard of rubbish in the vicinity of the islands should be prohibited to avoid the possible introduction of rats. Floating refuse has been implicated in the spread of rats to offshore islands around New Zealand (Moors 1984); beached refuse is abundant at Inaccessible Island, much of which is derived from the local crayfish fishery (Ryan 1987b, Ryan & Watkins in press).

To maintain its unspoiled state, it is recommended that there should be no further construction on Inaccessible Island. Construction of buildings without a permit on Inaccessible Island is prohibited by the conservation ordinance. Scientific visits and the use of the Denstone hut should be strictly controlled by the Administrator and Island Council of Tristan da Cunha. The collection of Rockhopper Penguins and Great Shearwaters for human consumption by Tristan islanders at Inaccessible Island should be prohibited and the island should be proclaimed a wildlife reserve in terms of the Tristan da Cunha Conservation Ordinance, 1976. Inaccessible Island is an excellent

candidate for registration as a site within the World Heritage Convention of 1972.

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