NEW INFORMATION ON SEABIRDS AT INACCESSIBLE ISLAND AND OTHER ISLANDS IN THE TRISTAN DA CUNHA GROUP

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SUMMARY

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New data on the distribution, abundance and breeding phenology of seabirds breeding at islands in the Tristan da Cunha group are presented, with particular emphasis on Inaccessible Island. At least two previously unknown breeding colonies of Rockhopper Penguin *Eudyptes chrysocome* are reported at Inaccessible Island, and revised population estimates are made for the island group. Three species were proved to breed at Inaccessible Island for the first time: Softplumaged Petrel *Pterodroma mollis*, Little Shearwater *Puffinus assimilis* and Whitefaced Storm Petrel *Pelagodroma marina*. This is the first proven breeding record for Whitefaced Storm Petrel in the Tristan group. Observations are also made on the relict population of Wandering Albatrosses *Diomedea exulans* at Inaccessible Island and the small population of Sooty Shearwaters *Puffinus griseus* at the main island of Tristan. New records of non-breeding visitors to Tristan waters included Cory's Shearwater *Calonectris diomedea* and Arctic Skua *Stercorarius parasiticus*.

INTRODUCTION

The Tristan da Cunha group of islands (37 15S, 12 30W, excluding Gough Island, 400 km SSW), central South Atlantic Ocean, supports several globally important breeding populations of seabirds (Williams 1984). The avifauna has been described in some detail, with major works by Hagen (1952), Elliott (1957) and Richardson (1984). More recently, Fraser *et al.* (1988) reviewed the status of seabirds at Inaccessible Island, the least known island in the group. Despite this extensive literature, much still remains to be discovered about the distribution, abundance and breeding phenology of seabirds at the Tristan islands. This note summarizes novel observations made primarily at Inaccessible Island during spring 1988 and summer 1989-90.

METHODS

Wace & Holdgate (1976) describe the Tristan group of islands and summarize the history of human discovery and exploitation. Specific information about Inaccessible Island is presented by Fraser *et al.* (1988). We visited Inaccessible Island from 9 October to 2 November 1988 (PGR, CLM & BPW), 5 to 25 October 1989 (PGR, WRJD, CLM & SJM), and 3 December to 17 March 1989-90 (PGR & CLM). PGR and CLM spent three weeks ashore at the main island of Tristan from 25 October to 18 November 1989, and two weeks at sea aboard a crayfish vessel off Nightingale Island from 18 November to 3

December 1989. Observations on seabirds were incidental to other studies; where necessary, methodology and interpretation are presented in the species accounts.

SPECIES ACCOUNTS

Species accounts are presented only for species for which new information was collected. For a complete account of the seabirds of the islands, refer to Richardson (1984) and Fraser *et al.* (1988).

Rockhopper Penguin *Eudyptes chrysocome*

Inaccessible Island

Rockhopper Penguins of the northern race *E. c. moseleyi* breed at all the larger islands in the Tristan group except Stoltenhoff, a precipitous stack off Nightingale (Richardson 1984, Fig. 1). Little has been reported of the distribution of Rockhopper Penguins at Inaccessible Island. Hagen (1952) identified two colonies (Blenden Hall and Salt Beach) which Elliott (1957) estimated to contain at least 25 000 pairs. Fraser *et al.* (1988) reported three colonies, with a considerably smaller total population (5 000-10 000 pairs): Blenden Hall (up to 1 000 pairs), Warren's Cliff (up to 500 pairs) and Salt Beach (many thousands). Another colony on the "south side" of Inaccessible Island was almost exterminated by feral pigs (Moseley 1892), and is thought to have disappeared (Hagen 1952).

Colonies at Inaccessible Island are located under dense stands of tussock grass *Spartina arundinacea*, which makes accurate surveys difficult. We estimated the extent of the Blenden Hall colony to cover 3 500 m^2 (70x50 m) at an average density of 0.5 pairs.m^{-2} (each nest occupied *c.* 1 m^2, but only half the total area was occupied by nests, the rest being tussock bases and penguin pathways). This gives a breeding population estimate of *c.* 1 700 pairs in October 1989. The Warren's Cliff colony was estimated to be at least 2 to 2.5 times larger than that at Blenden Hall, giving a population of 3 500-4 250 pairs. The beach party at Warren's Cliff also was at least two to three times larger than that at Blenden Hall. This contradicts Fraser *et al.* (1988), who considered the Blenden Hall colony to be larger than that at Warren's Cliff in 1982-83.

Only approximate estimates of breeding populations on the northeastern shore of Inaccessible Island could be made, because the area was visited on foot on 16 February after all chicks had fledged. Breeding was confirmed to have taken place at three localities: Where-The-Pig-Fell-Off (2 000-5 000 pairs), the low-lying land north of Salt Beach (5 000-10 000 pairs), and the low-lying land south of Salt Beach (1 000-5 000 pairs). The latter colonies are separated by 50 m of sheer cliff backing the shingle beach. The extent of the colony at Where-The-Pig-Fell-Off (7 500 m^2) was estimated from the cliff-top, giving a breeding population of *c.* 3 750 pairs. This colony is separated from those at Salt Beach by *c.* 300 m of sheer cliffs that can not be walked around, and its presence has not been reported previously.

The size of Rockhopper Penguin breeding populations can be crudely estimated from the size of beach parties (Table 1; $r=0.927$, $n=5$). Penguins in beach parties were counted on the eastern and northern beaches between South Hill and Blenden Hall on 28 November 1989 from a fishing vessel close inshore, and the number of penguins in beach parties was related to the estimate of colony size (Table 1). In addition to the five colonies identified above, three other beach parties were seen between Waterfall Beach and East Point (Table 1). Breeding was not proven at these sites, but is likely given that late November is in the middle of the chick-rearing period when few if any penguins are seen on beaches away from breeding colonies.

One additional colony of Rockhopper Penguins was discovered at Inaccessible Island, in the southwest-facing bay west of South Hill (Fig. 1). This site was not visited, but from the cliffs above birds were seen in the sparse tussock over an area of approximately 4 000 m^2, suggesting a population of *c.* 2 000 pairs. It is possible that this colony is the

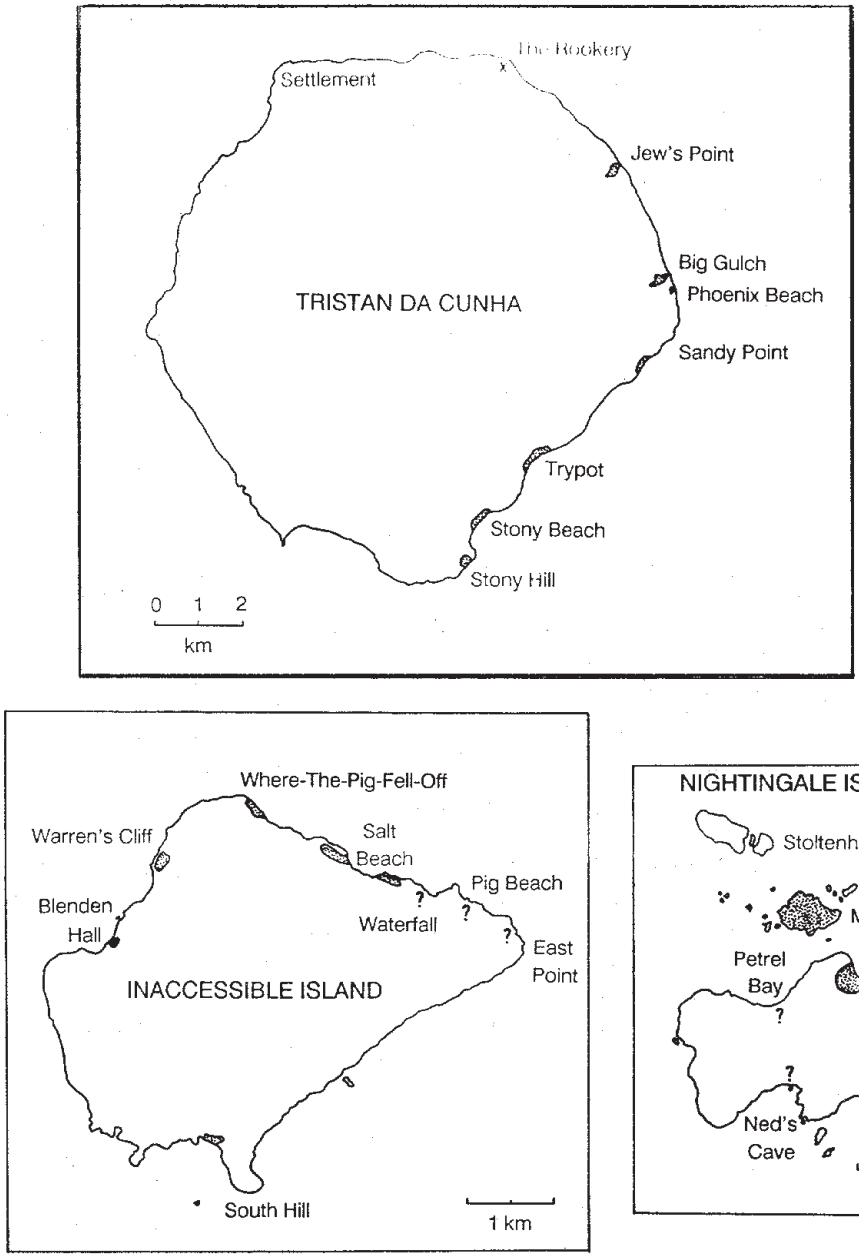

Figure 1

The distribution of Rockhopper Penguin colonies at islands in the Tristan group. Stippled areas denote existing colonies, ? are possible colony sites, and X is the extinct colony on Tristan. The colony at "Goats Road Gulch" mentioned by Richardson (1984) is not marked because the exact location is not known. There is no colony in Goats Road Gulch (between Jew's Point and Big Gulch), and according to islanders the colony lies between Sandy Point and Stony Beach.

TABLE 1

ESTIMATES OF COLONY SIZES OF ROCKHOPPER PENGUIN AND COUNTS OF BIRDS IN BEACH PARTIES AT INACCESSIBLE ISLAND

Locality	Beach party[a]	No. breeding pairs
Blenden Hall	100	1 700
Warren's Cliff	500	3 500 - 4 250
Where-The-Pig-Fell-Off	500	3 750
Salt Beach (north)	800	5 000 - 10 000
Salt Beach (south)	150	1 000 - 5 000
Waterfall Beach	150	?
Pig Beach	100	?
East Point	80	?
South Hill bay	No count	2 000
Total	2 380	17 000 - 27 000

[a] all counts on afternoon of 28 November 1989

TABLE 2

THE DENSITY OF GREAT SHEARWATER BURROWS IN TWO 50 M-TRANSECTS AT NIGHTINGALE ISLAND

Number burrows m^{-2}	Habitat of transect	
	Phylica woodland	*Phylica/Spartina*
0	21	14
1	19	21
2	7	13
3	2	2
4	1	0
Mean density	0.86	1.06

same as that on the "south coast" described to Moseley (1892) by the Stoltenhoff brothers, but the extreme difficulty of access to the exposed site west of South Hill suggests that the Stoltenhoffs' colony was on the more sheltered coast between South Hill and East Point.

Little is recorded about breeding phenology at Inaccessible Island. The first chicks hatched on 13 October 1989, and by 22 October ten nests examined all contained at least one chick. This is almost identical to the hatching period reported from the main island of Tristan da Cunha (Williams & Stone 1981, *contra* Elliott 1957). All nests contained two-egg clutches (n=107), confirming that previous reports that three-egg clutches were the norm were in error (see Williams & Stone 1981).

Nightingale Island

Only two large Rockhopper Penguin colonies are reported from Nightingale Island: one on the northeastern side of the main island, and one on Middle (Alex) Island, a low-lying islet to the north of Nightingale (Hagen 1952, Elliott 1957, Richardson 1984). While aboard a fishing vessel operating around Nightingale island in November-December 1989, two beach parties of Rockhopper Penguins were observed in adjacent small bays near Ned's Cave on the south side of Nightingale Island. Although breeding was not confirmed, it is likely to occur there as birds were seen disappearing into the tussock. The beach party in the eastern baylet comprised *c.* 300 birds and that in the western baylet *c.* 50 birds.

These observations confirm Wace's records of birds seen ashore at Ned's Cave, and Wace also reported another possible colony in Petrel Bay, in the centre of the north shore of Nightingale Island (Wace & Holdgate 1976). These colonies are not mentioned by Richardson (1984) in his estimate of 125 000 breeding pairs for the Nightingale archipelago. However, given the low accuracy of population estimates at Nightingale, numbers breeding at other colonies probably are too small to warrant altering the total population estimate.

Tristan da Cunha

More complete census data exist for Rockhopper Penguin colonies at Tristan da Cunha than at the uninhabited islands in the Tristan group (Williams & Stone 1981, Richardson 1984). This is partly because of easier access to colonies, and partly because, with the virtual disappearance of tussock grass from Tristan, the colonies are in the open. Richardson (1984) recognized eight colonies, each comprising more than two breeding pairs. On 7 November 1989 we counted occupied sites at three colonies between Sandy Point and the settlement. Most nests contained chicks (96%, n=651), although a few had eggs (4%), some of which were pipping. Most chicks were small to medium-sized, but some were larger and already were forming small creches, agreeing with the observations of Williams & Stone (1981).

The numbers of occupied sites at the three colonies were 215 at Jew's Point, 436 at Big Gulch and *c.* 120 at Phoenix Beach. We estimated that there were up to 25% more nest scrapes than occupied sites, giving total breeding populations of *c.* 270, 550 and 150 pairs respectively. These counts are, with the exception of Jew's Point (which Richardson only estimated from the sea), approximately one-third lower than counts made in 1973 (Richardson 1984). This may reflect a decrease in the Tristan population, but could also be due to sampling differences.

Rockhopper Penguins have been formally protected from human exploitation at the Jew's Point colony since 1979 (Williams & Stone 1981) and at the rest of the main island colonies since 1984 (Tristan da Cunha Conservation Ordinance 1976, amended 1984 and 1986). There is no evidence that this protection has resulted in an increase in the size of the breeding population; there were slightly fewer pairs in the Jew's Point colony on 7 November in 1989 (215 pairs) than on 4 November 1980 (247

pairs, Williams & Stone 1981). However, there has been a marked increase in the size of the Jew's Point colony since 1937, when only 15 pairs were estimated to occur there (Hagen 1952). Jew's Point currently is the colony closest to the settlement on Tristan and presumably was most severely exploited. Another colony closer to the settlement, The Rookery, was exterminated prior to 1937 and has not been re-established.

The revised population estimate for Rockhopper Penguins at the Tristan group is thus between 147 000 and 159 000 breeding pairs. However, more accurate surveys are needed of colonies at Nightingale Island and the east side of Inaccessible Island.

Wandering Albatross *Diomedea exulans*

Breeding Wandering Albatrosses are confined to Inaccessible Island in the Tristan group, although the species occurred formerly at the main island of Tristan (Carmichael 1818, Hagen 1952). The breeding population at Inaccessible has remained at 2-3 pairs for at least the last 50 years, having decreased from several hundred pairs in 1871-72, apparently as a result of predation, primarily by feral Domestic Pigs *Sus scrofa* (Fraser *et al.* 1988). Despite this severe bottleneck from a population genetics viewpoint, the appearance of the birds breeding at Inaccessible Island still resembles that of typical *D. e. dabbenena* from Gough Island (Fig. 2).

Annual breeding information is now available for the summers 1986-1989, with the number of large chicks present each summer varying as follows: two in 1986, none in 1987 (Fraser *et al.* 1988), two in 1988, and none in 1989. This suggests that only two pairs breed regularly. At the start of the 1990 season, two pairs again built nests in November-December, but only one pair was found incubating an egg on 21 February. The two nests were at the western edge of Gony Ridge, within 200 m of each other and in virtually the same localities as the nests that contained large chicks in October 1988. A third pair was seen displaying 500 m inland on Gony Ridge in February 1990, after egg-laying had taken place.

One possible reason for the apparent lack of recruitment to the breeding population is mortality of young birds returning to the island for the first time. Much of the plateau of Inaccessible Island is thickly vegetated, and naive immature birds landing in dense vegetation have great difficulty taking off again, and may well die. On 16 January 1990 we found a Wandering Albatross in immature plumage in *Phylica* woodland on a tributary of the main river inland of Denstone Hill, near the northeastern edge of the plateau 2.5 km from Gony Ridge. As it was still present two days later, having moved *c.* 20 m, we carried it 400 m to the edge of the plateau where it was released and flew off. It is unlikely that it could have taken off from where it was originally found.

Wandering Albatrosses bred on The Long Ridge at Inaccessible Island in 1937-38 (Hagen 1952); it is not known when breeding shifted to Gony Ridge. The vegetation on The Long Ridge is dominated by procumbent treeferns *Blechnum palmiforme*, whereas that at the current breeding site on Gony Ridge has a greater proportion of grasses and sedges, which may allow easier run-ups for taking off. Inaccessible Island is the most northerly breeding locality of the Wandering Albatross (Watson 1975), and the species is confined to the highest part of the island. At Gough Island Wandering Albatrosses only breed above *c.* 350 m (Swales 1965) in moorland, peat bog and wet heath, all short vegetation types (Wace 1961).

Yellownosed Albatross *Diomedea chlororhynchos*

Yellownosed Albatrosses breed at all islands in the Tristan group (Richardson 1984). We marked 50 nests containing eggs on the plateau of Inaccessible Island on 11 October 1989 to assess breeding success. On 10 December most eggs had hatched (39), with seven birds still incubating and four nests deserted. Two of the seven eggs still being

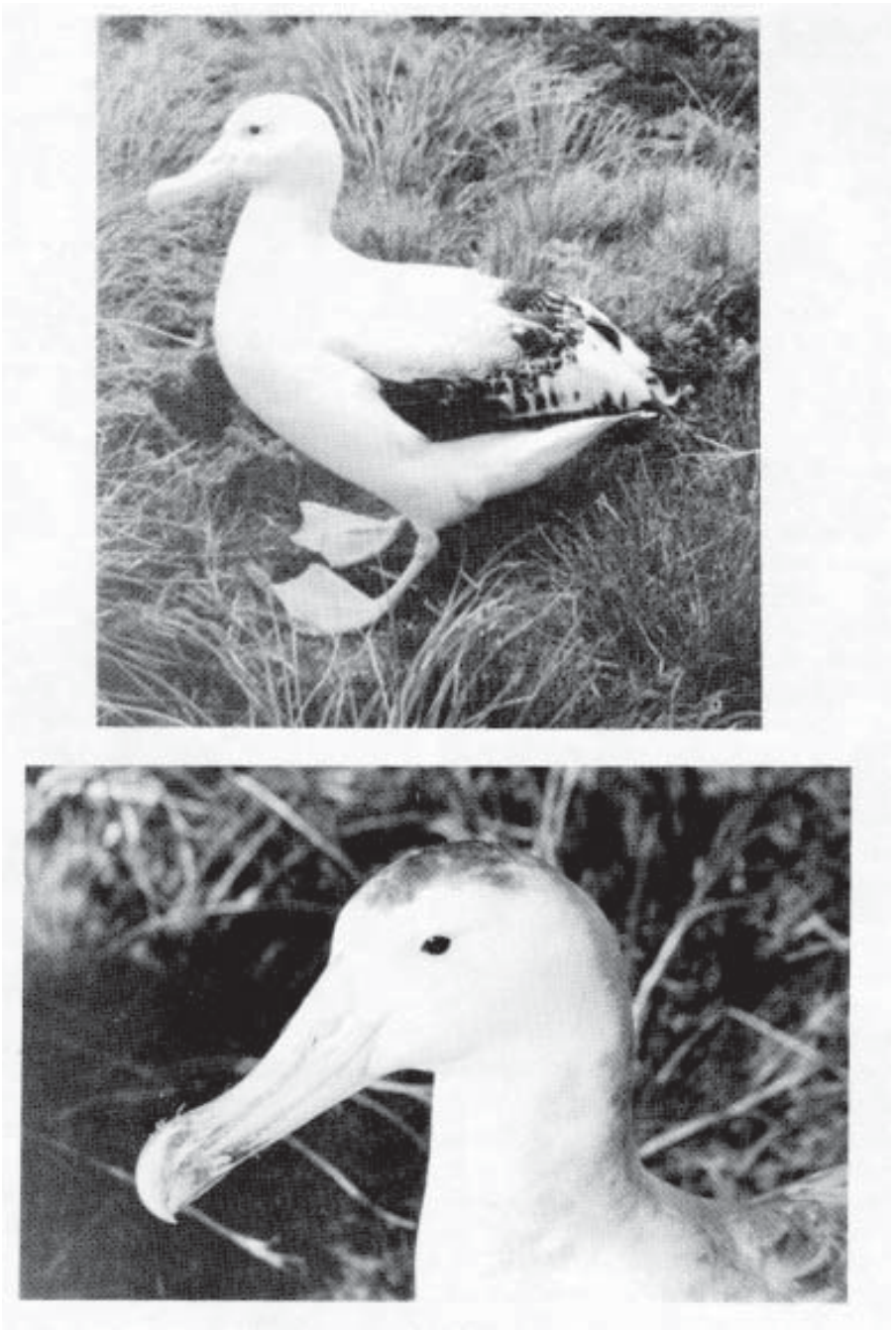

Figure 2

Wandering Albatrosses breeding at Inaccessible Island: A = male at nest site, B = head of incubating female.

incubated subsequently hatched, whereas the other five were abandoned (at least three of them were infertile). On 11 March 1990, the large chicks were almost down-free, and were starting to leave their nests. Overall breeding success was 78%, with 82% of eggs hatching, and 95% of chicks surviving to the stage where they left the nest. The estimate of hatching success (and thus also overall breeding success) presumably is inflated, however, because observations commenced some time after egg-laying took place.

Southern and Northern Giant Petrels

Macronectes giganteus and *M. halli*

Giant petrels (presumably Southern) formerly bred on the main island of Tristan (Hagen 1952), but are now only non-breeding visitors to the islands (Richardson 1984, Fraser *et al.* 1988). There are no data on the relative abundances of the two taxa in Tristan waters. Up to 50 giant petrels gathered at a fishing vessel anchored off Inaccessible and Nightingale islands in November-December to scavenge scraps (Ryan subm.). Southern Giant Petrels predominated, with a maximum ratio of 2:27 Northern:Southern. Two white-phase Southern Giant Petrels attended a fishing vessel, one being present for at least five days.

Softplumaged Petrel *Pterodroma mollis*

Softplumaged Petrels previously have not been proven to breed at Inaccessible Island, despite being one of the more abundant burrow-nesting petrels at night at Blenden Hall (Fraser *et al.* 1988). A fresh egg (54.8 x 39.6 mm, 46.3 g) found on 5 January 1990 constitutes the first proof of breeding. The burrow was *c.* 1 m long in short *Blechnum penna-marina* scrub inland from Blenden Hall, and the nest chamber was lined with mosses and *Spartina* leaves. Other burrows examined contained birds but no other eggs or chicks were found. Pairs occupied burrows on the plateau as well as near sea level at Blenden Hall. Some pairs in thick tussock grass lacked a burrow, occupying a cleared area under the dense tussock bases in the manner of Great Shearwaters (see below).

Cory's Shearwater *Calonectris diomedea*

Cory's Shearwaters previously have not been reported from the Tristan group, although there is a single record from Gough Island (Richardson 1984). We saw single Cory's Shearwaters flying past the settlement on Tristan on 16 and 17 November 1989. Subsequently up to five birds were seen together from a fishing vessel off Nightingale and Inaccessible islands on 28 November 1989. Two of six birds seen on this date were moulting their inner primaries. These records are considerably farther west than the usual range of Cory's Shearwaters in the southeast Atlantic Ocean (Griffiths & Sinclair 1982).

Great Shearwater *Puffinus gravis*

Great Shearwaters are the most abundant seabird breeding at the Tristan islands (Richardson 1984, Fraser *et al.* 1988). They breed in all habitats at Inaccessible Island, and, in addition to those mentioned by Fraser *et al.* (1988), are particularly abundant under tall *Phylica* woodland with poor understorey development on the lower, eastern parts of the plateau. Burrow densities of up to 0.8 m^{-2} were recorded in these areas, which resemble the woodlands on Nightingale Island.

Not all Great Shearwaters breed in burrows. Near sea-level at West Point only two-thirds of pairs occupied earth burrows; the rest were in clearings under dense tussock grass (n=21). This apparently was not a consequence of the lack of suitable burrows; in the area searched at West Point only 71% of burrows were occupied (n=18). Mid-way through the incubation period, the proportion of nests with eggs was greater for burrows (73%, n=15) than for surface nests (29%, n=7). This may result from a larger proportion of young pairs that fail to lay occupying surface nests, or from greater egg loss in surface nests. Either way, it appears that surface-nesting is sub-optimal

compared with burrow-nesting. However, at least some of the surface-nesting Great Shearwaters bred successfully, having large chicks when we left the island in mid-March 1990. This is apparently the first record of shearwater surface-laid eggs being incubated successfully (Warham *et al.* 1982).

Rowan (1952, 1965) reported Great Shearwaters laying on the surface at Nightingale Island, and termed this "abortive" egg-laying, inferring that it occurred due to the lack of suitable burrows. However, it appears that surface nesting need not always fail, as implied by Rowan (1965). Thick tussock provides good shelter from the elements and predatory Subantarctic Skuas *Catharacta antarctica*, but presumably is less secure than a burrow against egg predation by Tristan Thrushes *Nesocichla eremita*.

Egg-laying at Inaccessible Island presumably occurred during mid-November while we were absent from the island. Chicks hatched between 5 and 11 January (n=14 nests), earlier than reported in 1983, and with a greater degree of synchrony (cf. Fraser *et al.* 1988). After hatching, the behaviour of the adult birds changed markedly. Pre-laying and incubating birds primarily came ashore at dusk and departed before dawn, whereas birds feeding chicks came ashore throughout the day. The duration of the brood period was 5-10 days.

Rowan (1952) calculated the average density of Great Shearwater burrows at Nightingale Island to be approximately 1.2 m^{-2}, but this figure has been suggested to be somewhat high (M. de L. Brooke in Fraser *et al.* 1988). Rowan calculated the greatest burrow density in open meadows of *Scirpus bicolor* (1.85 m^{-2}), an intermediate burrow density on tussock *Spartina* slopes (1.25 m^{-2}), and the smallest density in *Phylica arborea* woodland (0.76 m^{-2}). On 20 October 1989, we counted the numbers of Great Shearwater burrows along two 50 m-long transects, each 1 m-wide. Both transects were under *Phylica* woodland adjacent to Third Pond. One transect was under a dense *Phylica* grove (5 600 trees greater than 30 mm basal diameter ha^{-1}), whereas the other was at the *Phylica/Spartina* interface (1 200 trees ha^{-1}).

As reported by Rowan (1952), the mean density of burrows was slightly smaller under dense *Phylica* (0.86 m^{-2}) than at the *Phylica/Spartina* interface (1.06 m^{-2}, Table 2). Our data agree fairly closely with those of Rowan (1952), and do not suggest that her density estimates are too large. We doubt whether every burrow is occupied (see above for Inaccessible), and given a revised area estimate for Nightingale of 3.2 km^2 (calculated from the map in Wace & Holdgate 1976), we estimate the breeding population at Nightingale to be approximately 3 million pairs, intermediate between the estimates of Rowan (1952) and Richardson (1984) (2 million and 4 million pairs respectively).

Sooty Shearwater *Puffinus griseus*

Several pairs of Sooty Shearwaters were found on eggs in late November 1985 at Big Green Hill, on the main island of Tristan, together with a few pairs of Great Shearwaters (C. Mackenzie *in litt.*, Fraser *et al.* 1988). During the summer of 1987-88, an incubating Sooty Shearwater was removed from its burrow and photographed with its egg (J. Kerr *in litt.*). We visited this site on 11 November 1989 and found seven shearwater burrows along the edge of The Base (the coastal scarp) at the east side of Big Green Hill. Five of the burrows showed signs of recent excavation, but all were empty during the day (laying apparently not having occurred). Ian Lavarello examined the burrows again in early January 1990 and found five burrows occupied, but to avoid undue disturbance he did not remove birds from their burrows to identify them.

Little Shearwater *Puffinus assimilis*

Little Shearwaters previously have not been proven to breed at Inaccessible Island, despite being abundant in dense *Spartina* tussock at Blenden Hall (Fraser *et al.* 1988). An egg (55.9 X 37.0 mm) found in a 0.6 m-long burrow on 13 October 1989 constitutes the first proof of breeding. This nest

was subsequently deserted, but a large chick with feathering already fairly well advanced was found in a 1 m-long burrow on 22 December. This chick was fully feathered on 11 January and appeared ready to fledge; very little calling by adults at night was heard in January. Both nests were located in a small area of bare earth under dense tussock on a slope above Blenden Hall. Elliott (1957) noted this species' apparent preference for densely vegetated slopes in the Tristan group. Together with Broadbilled Prions *Pachyptila vittata*, Little Shearwaters were the most abundant prey of a pair of Subantarctic Skuas breeding in the valley a third of the way up the West Road, above Blenden Hall (Ryan & Moloney in press).

Whitebellied Storm Petrel *Fregetta grallaria*

The Whitebellied Storm Petrel is a widespread and abundant breeding bird at Inaccessible Island. Birds start calling from burrows in early October (*contra* Elliott 1957), but egg-laying occurs only in January. A fresh egg (36.6 x 26.7 mm, 13.2 g) was found on 9 January 1990 in a 0.6 m-long burrow under *Phylica* trees at Wilkins' Copse, Blenden Hall. The female was incubating the egg, which was placed on a mat of vegetation (*c.* 150 mm diameter, similar to that described by Hagen 1952). A second fresh egg (35.0 x 26.8 mm, 14.2 g) was found on the surface at Denstone Hill on 20 January. Both eggs were translucent pale cream, tinged pink, with a very faint ring of small pink spots at the blunt end.

A large chick was found in a burrow at Denstone Hill on 1 March. It was still covered in down, but the primary quills had erupted (stage 2-3) and it had feathering on the belly. These observations confirm the late summer breeding period of Whitebellied Storm Petrels at the Tristan group (Elliott 1957, Richardson 1984). However, breeding was several weeks earlier at Inaccessible in 1990 than in previous years at Nightingale Island (Hagen 1952, Elliott 1957, Richardson 1984).

Both occupied burrows were under *Phylica* woodland, with little understorey vegetation. Nest entrances were easily located in this habitat, but breeding also occurs in *Spartina* tussock (Fraser *et al.* 1988) and in other vegetation types including fern heath (Hagen 1952). The burrows were shallow and convoluted, winding between *Phylica* roots.

Whitefaced Storm Petrel *Pelagodroma marina*

Whitefaced Storm Petrels previously have not been proven to breed at the Tristan group, despite being abundant offshore and in the diet of Subantarctic Skuas (Elliott 1957, Fraser 1984, Richardson 1984, Fraser *et al.* 1988, Ryan & Moloney in press). A fresh egg (35.1 x 26.1 mm, 14.1 g) was found in a 0.4 m-long burrow on 13 October 1989, and a second egg (38.2 x 26.6 mm-long) was found on 19 October. A third nest was found to contain an egg on 19 October, and a small downy chick on 23 October 1989. A downy chick (mass 33.8 g, culmen 12.4 mm, tarsus 25 mm) was found in a fourth burrow on 12 December, with the quills just starting to erupt. These records are the first proof of breeding in the Tristan group and confirm Elliott's (1957) contention that the bird is an early summer breeder.

Occupied burrows were all near sea-level in the region of Blenden Hall. One nest was in open ground under *Phylica* woodland at Wilkins' Copse, in the same area used by the Whitebellied Storm Petrel. The other three nests were in *Blechnum penna-marina* heath, one in a raised area among *Spartina* tussock at Blenden Hall, and two among open *Phylica* woodland at Wilkins' Copse. Nest structure was similar to that of the Whitebellied Storm Petrel, with a mat of vegetation in the nest chamber. Some of the nests in *B. penna-marina* had burrows running through the ferns rather than underground, before entering the excavated chamber.

There has been some confusion about the relative abundance of Whitebellied and Whitefaced Storm Petrel at the Tristan islands (e.g. Fraser *et al.* 1988).

This can to a large part be ascribed to the difference in breeding season between these species. Observations in spring suggest a greater abundance of the early breeding Whitefaced Storm Petrel, whereas observations later in summer suggest a preponderance of the later breeding Whitebellied Storm Petrel. The large proportion of Whitebellied Storm Petrels in the diet of Subantarctic Skuas at Inaccessible Island (Fraser 1984, Ryan & Moloney in press) suggests that this species is more abundant than the Whitefaced Storm Petrel, but this difference may be influenced by differences in the behaviour of the two species (e.g. the frequent diurnal visits to the island by Whitebellied Storm Petrels may contribute to greater predation by skuas). We do not support Richardson's (1984) contention that Whitebellied Storm Petrels are much less common than Whitefaced Storm Petrels, at least at Inaccessible Island.

Common Diving Petrel *Pelecanoides urinatrix*

Little is known about the breeding of Common Diving Petrels at Inaccessible Island (Fraser *et al.* 1988). One egg (38.0 x 30.7 mm) was being incubated on 16 October 1989 in a burrow *c.* 0.5 m long in a stony bank above the beach at West Point. Fledging apparently is protracted, occurring throughout December and January. A chick with only a few wisps of down was found in a burrow on 9 December, and a fledgling with eyelids that had failed to open was found struggling through the vegetation during the day at Blenden Hall on 19 December. Another fledgling still retaining some down on the neck and belly was found out of its burrow on the plateau on 20 January. The two occupied burrows were in loose peaty soil amongst *Spartina* tussock at West Point, and were similar to the burrow described by Fraser *et al.* (1988) found at Inaccessible Island. This contrasts with the burrows described as characteristic for the species at Nightingale Island (Elliott 1957).

Arctic and Longtailed Skuas

Stercorarius parasiticus and *S. longicaudus*

An Arctic Skua was seen off Nightingale Island on 21 November 1989, and a Longtailed Skua was seen off the settlement at Tristan on 17 November. Two unidentified *Stercorarius* skuas also were seen from the settlement at Tristan on 16 and 17 November 1989. Arctic Skuas have not been reported previously from the Tristan group (Griffiths & Sinclair 1982, Richardson 1984), and Longtailed Skuas have only been reported from well offshore (Ryan 1989).

Kelp Gull *Larus dominicanus*

An immature Kelp Gull was seen at Blenden Hall, Inaccessible Island, on 28 February and 2 March 1989. On one occasion it was resting at sea 100 m offshore when it was harried by Subantarctic Skuas; on neither occasion was it seen to come ashore. This species is a fairly common vagrant to the Tristan group (Richardson 1984), but this is the first definite record for Inaccessible Island (Fraser *et al.* 1988).

Arctic Tern *Sterna paradisaea*

An Arctic Tern was seen off Nightingale Island on 23 November 1989. Arctic Terns are uncommon visitors to the Tristan group (Richardson 1984, Fraser *et al.* 1988), and this is the first record for Nightingale Island.

CONCLUSIONS

The observations presented in this paper provide additional information on the status and breeding phenology of seabirds at the Tristan da Cunha Islands. However, with the exception of Rockhopper Penguins at Inaccessible Island, the current observations provide no substantive improvement in the estimates of breeding populations presented by Richardson (1984) and Fraser *et al.* (1988). There is still a need for accurate surveys of breeding populations at the islands, particularly as regards numbers of burrow-

nesting petrels.

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