

DISTRIBUTION AND ABUNDANCE OF BIRDS AT POTTER PENINSULA, 25 DE MAYO (KING GEORGE) ISLAND, SOUTH SHETLAND ISLANDS, ANTARCTICA

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SUMMARY

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I surveyed the bird community at Potter Peninsula, 25 de Mayo (King George) Island, South Shetland Islands, Antarctica during the 1987/88 and 1988/89 austral summers. Ten species were found to breed: Adélie Penguin *Pygoscelis adeliae* (14 554 pairs), Gentoo Penguin *P. papua* (2325), Chinstrap Penguin *P. antarctica* (265), Southern Giant Petrel *Macronectes giganteus* (75), Wilson's Storm Petrel *Oceanites oceanicus* (100-200), Kelp Gull *Larus dominicanus* (44), South Polar Skua *Catharacta maccormicki* (2), Subantarctic Skua *C. antarctica* (20), Antarctic Tern *Sterna vittata* (100-200) and Greater Sheathbill *Chionis alba* (15). Four species were frequently sighted as nonbreeding visitors: Macaroni Penguin *Eudyptes chrysolophus*, Pintado Petrel *Daption capense*, Snow Petrel *Pagodroma nivea*, and Imperial Cormorant *Phalacrocorax atriceps*. Six species were occasionally recorded: Antarctic Fulmar *Fulmarus glacialis*, Blackbellied Storm Petrel *Fregata tropica* (possibly breeding in small numbers), Whiterumped Sandpiper *Calidris fuscicollis*, Blacknecked Swan *Cygnus melancoryphus*, Yellowbilled Pintail *Anas georgica* and Cattle Egret *Bubulcus ibis*. Nest distribution was associated with environmental features. The value of the surveyed area for scientific research and environmental conservation purposes is considered, in light of increased human activities recorded in this area during the last decade.

INTRODUCTION

The region between Elephant and Stranger Points, on the southern coast of 25 de Mayo (King George) Island, South Shetland Islands, Antarctica, was designated as a Site of Special Scientific Interest (SSSI No.13, Fig.1) to protect the diverse community of birds and mammals breeding there. In the present study, I evaluate the status of this bird community, because previous studies (Jablonski 1984, Shuford & Spear 1988, Peter *et al.* 1991) provide only partial information. Such an assessment was considered timely due to the increase in human activities in the region during the last decade (Harris 1991). Furthermore, a more

comprehensive and current assessment was needed in order to facilitate the protection and conservation of this diverse Antarctic seabird community.

MATERIALS AND METHODS

The study area comprised the exposed land between Potter Cove and the northeast coast of Stranger Point, known as Potter Peninsula (Fig.1). This area, which includes SSSI No. 13, was surveyed during the 1987/88 and 1988/89 austral summers. The abundance of all avian species, as well as their reproductive status and nest positions, were recorded. From October 1988 to March 1989 26 censuses were carried out

along the coast. For the penguin species, breeding population size was determined according to CCAMLR Ecosystem Monitoring Program methods (CCAMLR 1992). For all the nonpenguin species, the location of nests containing eggs or chicks were plotted on a map. The breeding population sizes for most species could be estimated with 5-10% accuracy. However, the Antarctic Tern *Sterna vittata* breeding population was only roughly estimated ($\pm 50\%$) because a more intensive investigation would have resulted in nest desertions. The breeding population of the Wilson's Storm Petrel *Oceanites oceanicus* was also assessed roughly, with a $\pm 50\%$ error, due to the difficulty in counting cavity-nesting species. The nonbreeding populations of South Polar *Catharacta maccormicki* and Subantarctic *C. antarctica* Skuas were not differentiated because of field identification difficulties.

RESULTS AND DISCUSSION

The distribution of penguin breeding groups is detailed in Fig. 2. The population sizes of the nonpenguin species are detailed in Table 1 and the position of nests and colonies are shown in Fig. 3. The dates of main breeding events for all species are detailed in Table 2.

Breeding species

Adélie Penguin *Pygoscelis adeliae*

A total of 14 554 pairs was found breeding at Stranger Point. The population comprised 53 breeding colonies, ranging between three and 8000 nests (Fig. 2). At Stranger Point, Adélie Penguins were the most abundant species in the area, breeding mainly on low to medium sloped rock-gravel terraces and on old sand dunes on the northeast coast.

M.G. White recorded 6440 breeding pairs at Stranger Point in the 1965/66 breeding season (in Croxall & Kirkwood 1979) and

Müller-Schwarze (1975) recorded roughly 18 000 pairs in 1971/72. Jablonski (1984) counted the Stranger Point breeding population three times after population stabilization during the 1980/81 breeding season, recording 18 412 pairs. The record of 14 554 breeding pairs in the 1988/89 season may be interpreted as a population decrease in view of the 1980/81 value. Moreover, the 1987/88 breeding population was 15 491 pairs, and during the 1989/90 and 1990/91 breeding seasons the population continued decreasing.

Adélie Penguin populations have fluctuated substantially in the region of the Antarctic Peninsula over last 15 years (Trivelpiece *et al.* 1987b, 1990). Some local populations have declined and it has been suggested that this may be due to human disturbance (Culik 1992); however, many cases could not be explained in this manner (Anon. 1993). At Stranger Point, the decrease could have resulted from a combination of factors, such as food availability, human disturbance and environmental conditions (Trivelpiece *et al.* 1987b, Croxall *et al.* 1988, Trivelpiece *et al.* 1990, Fraser *et al.* 1992). Nevertheless, the decrease is coincidental with an increasing level of human activities in the area of Maxwell Bay. More research is needed to deduce causes of the observed population trends.

Gentoo Penguin *Pygoscelis papua*

I recorded 2325 pairs in 57 breeding groups, ranging between five and 352 nests (Fig. 2). The breeding groups occurred mainly on the beach and on storm ridges with low slopes, as recorded by Jablonski (1984) at Admiralty Bay. White recorded 2920 breeding pairs in the 1965/66 breeding season (in Croxall & Kirkwood 1979), Müller-Schwarze (1975) roughly assessed the population in 1971/72 as 1000 pairs, Jablonski (1984) recorded 2584 pairs in 1980/81 and Shuford & Spear (1988) reported 1500-2000 breeding pairs in 1986/87. Although these censuses were conducted in different moments

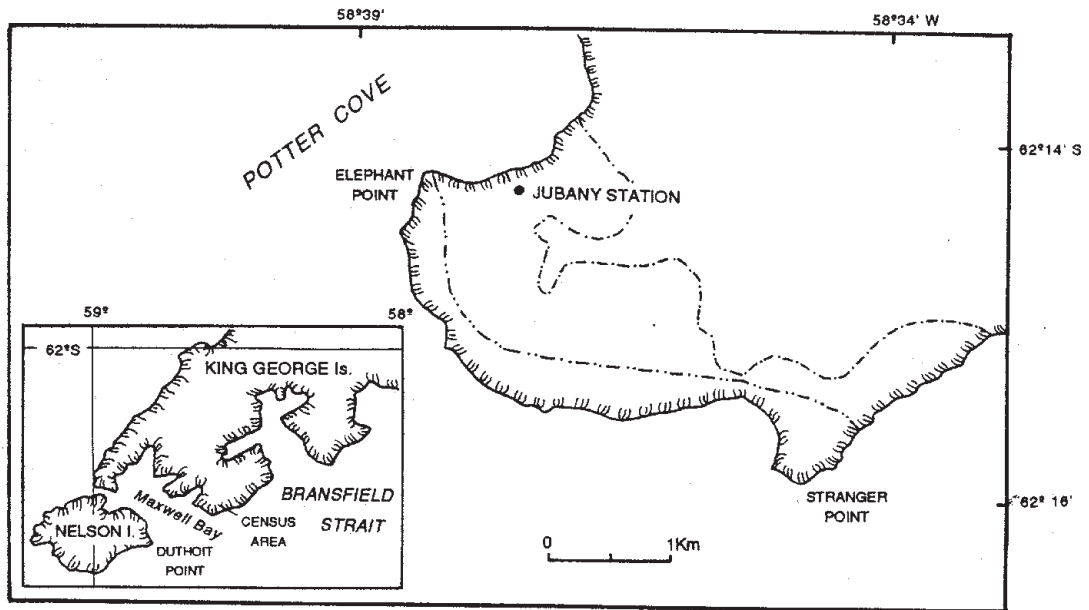


Figure 1

Potter Peninsula, 25 de Mayo (King George) Island: surveyed area (-.-) and SSSI Nr.13 (-.-) limits.

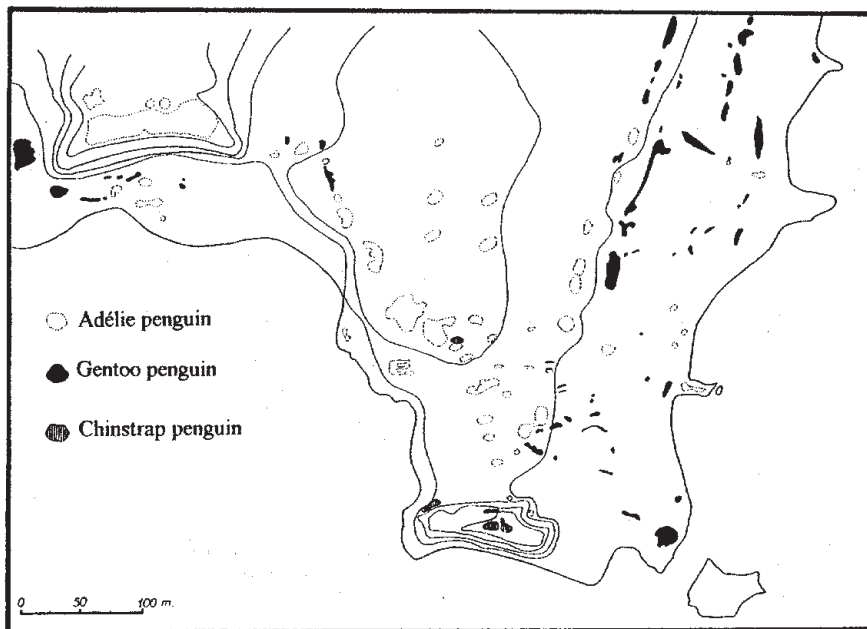


Figure 2

Penguin breeding colonies at Stranger Point.

TABLE 1

BREEDING POPULATION SIZE AND MEAN NUMBER AND RANGE OF NONPENGUIN SPECIES
WITHIN THE CENSUS AREA

| Species | Population | | Nests |
|-----------------------|------------|----------|---------|
| Southern Giant Petrel | 80 | (21-209) | 75 |
| Wilson's Storm Petrel | 25 | (1-222) | 100-200 |
| Pintado Petrel | 56 | (2-189) | 0 |
| Snow Petrel | 4 | (2-8) | 0 |
| Imperial Cormorant | 15 | (1-90) | 0 |
| Kelp Gull | 170 | (21-411) | 44 |
| South Polar Skua | 86 | (8-207) | 20 |
| Subantarctic Skua | | | 2 |
| Antarctic Tern | 111 | (3-372) | 100-200 |
| Greater Sheathbill | 1 | (6-308) | 15 |

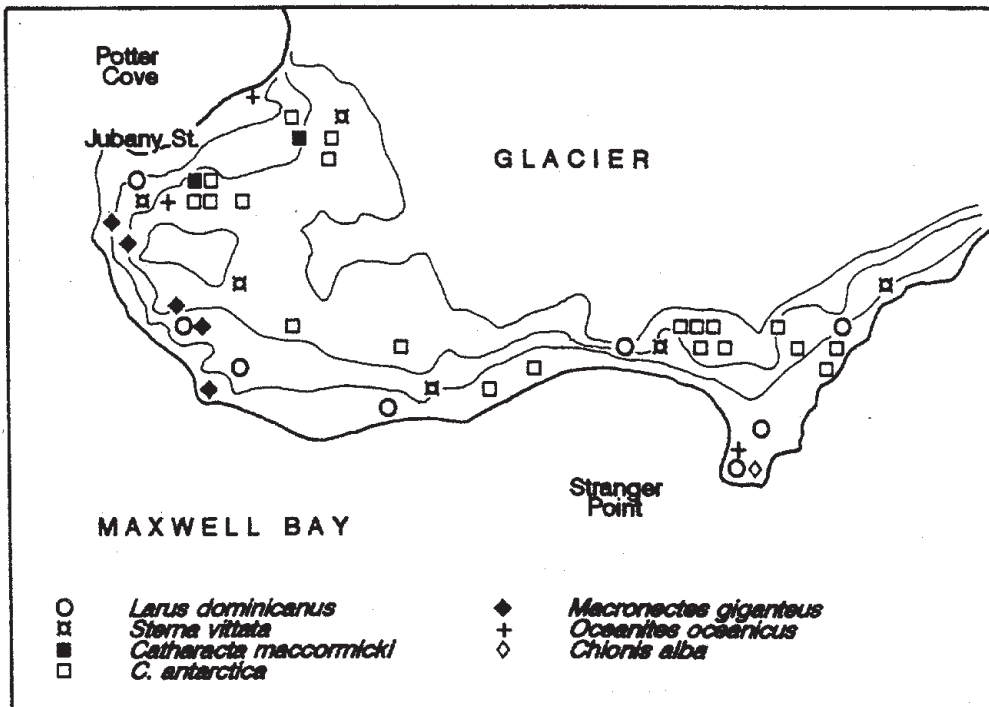


Figure 3

Nests and breeding localities of nonpenguin species at Potter Peninsula.

TABLE 2

DATES OF MAIN REPRODUCTIVE EVENTS FOR BREEDING SPECIES AT POTTER PENINSULA

| Species | Arrival | Laying | Hatching | Departure |
|------------------------|---------|--------|----------|-----------|
| Adélie Penguin | 1 Oct | 23 Oct | 29 Nov | Feb/March |
| Gentoo Penguin | 4 Oct | 30 Oct | 10 Dec | March |
| Chinstrap Penguin | 28 Oct | 17 Nov | 23 Dec | March |
| Southern Giant Petrel* | - | 15 Nov | 6 Jan | - |
| Wilson's Storm Petrel | 5 Nov | ? | ? | 5 Mar |
| Kelp Gull* | - | 5 Nov | 6 Dec | - |
| South Polar Skua | ? | ? | ? | ? |
| Subantarctic Skua | 12 Oct | 22 Nov | 25 Dec | 27 Apr |
| Antarctic Tern | 5 Nov | ? | ? | 12 Mar |
| Greater Sheathbill* | - | 12 Dec | 5 Jan | - |

* year-round residents

?: not recorded

of the breeding season, the Gentoo Penguin population appears to be stable at Stranger Point.

Chinstrap Penguin *Pygoscelis antarctica*

Three breeding groups were recorded with 27, 97 and 141 nests (Fig. 2). Two were on coastal stacks, and the third was mixed with an Adélie Penguin breeding group in a rock-gravel terrace. White reported 950 breeding pairs during the 1965/66 breeding season (in Croxall & Kirkwood 1979), Müller-Schwarze (1975) recorded roughly 200 pairs in 1971/72, Jablonski (1984) recorded 495 pairs in 1980/81 and Shuford & Spear (1988) 150-200 breeding pairs during 1986/87. The general trend is defined as fluctuating since the 1970s or a very reduced increase but decreasing populations have been recorded at many sites, perhaps due to human disturbance (Anon. 1993). As with the Adélie Penguin, more research is needed to explain the local trend.

Southern Giant Petrel *Macronectes giganteus*

Recorded nesting on coastal stacks (50,6%) and rocky terraces (49,4%). The 1988/89 breeding population was estimated at the end of November as 75 breeding pairs (nests with eggs) (Table 1). At least 65 more nest sites were inactive. Peter *et al.* (1991) estimated the breeding population in the surveyed area as 35-74 pairs, but no details about assessment methods nor the exact year of estimation (1983-1985) were given. The available information indicates that the Southern Giant Petrel breeding population may have decreased during the 1988/1991 period (N.R. Coria & S. Vivequin pers.comm.). This species is highly sensitive to human disturbance (Prevost 1958, Roby *et al.* 1986, Croxall 1987, Peter *et al.* 1991) and its decrease in the surveyed area reflects a trend reported for this species in other regions of Antarctica (Anon. 1993). Increased human activities at bases near breeding colonies and mortality associated with the longline fishery are cited as possible causes of the population decreases.

Wilson's Storm Petrel *Oceanites oceanicus*

This species breeds mainly on medium-sloped rocky cliffs (Fig. 3). At least three breeding groups were identified and a single pair was found in a pebble beach near Jubany station. Roby *et al.* (1986) referred to Araya & Arrieta (1967) who recorded a breeding population located in the vicinity of Three Brothers Hill with a size similar to those recorded at Ardley Island (300-1000 pairs, probably 600). This is the only previous record found, but due to the uncertainty of the methods employed no comparisons can be made.

Kelp Gull *Larus dominicanus*

A total of 44 pairs breeds in seven groups in the area, ranging from two to 15 nests (Fig. 3). Eight (18%) were on pebble beaches and 36 (82%) on coastal stacks. The nonbreeding population was larger (Table 1) with peaks of more than 400 gulls in middle October. No previous records of this species have been published for this area.

South Polar Skua *Catharacta maccormicki*

Two nests were found in the study area, both on gravel terraces (Fig.3).

Subantarctic Skua *C. antarctica*

This species nested mainly on gravel terraces with abundant lichen growth (Fig. 3). Part of the breeding population (45%) nested close to the penguin colony at Stranger Point. The remainder was found near colonies of Southern Giant Petrels (20%) or other bird species (35%). The nonbreeding population remained stable at 60-70 birds from October-December and was associated mainly with Southern Elephant Seals *Mirounga leonina* and breeding penguins. Numbers increased in January, probably in response to the increased amount of refuse associated with the

enlarged human population of the station during summer. This period is also coincident with the beginning of creches in Adélie Penguins, a stage when the mortality of chicks due to predation is low (Davis & MacCaffrey 1986), further reducing food availability for skuas.

Antarctic Tern *Sterna vittata*

This species was found nesting in several places, with sites changing between seasons. I estimated the breeding population to be about 200 pairs in 1987/88, but in 1988/89 only 100 pairs nested in the area (Table 1). Antarctic Terns were found nesting principally on alluvial terraces and pebble beaches in groups of four to 110 nests (Fig. 3). No previous census exists.

Greater Sheathbill *Chionis alba*

Greater Sheathbills nest at Stranger Point in close association with penguin breeding groups (Fig. 3). All nests found were in cavities on coastal stacks. Although there is only a small breeding population (15 pairs), more than 300 birds were observed in a single census in October. Most were recorded scavenging among elephant seals, feeding on dead pups, afterbirths or faeces. On some occasions up to 90% of the recorded birds were seen associated with elephant seal breeding groups, especially during October. No previous published records are known.

Nonbreeding resident species

Macaroni Penguin *Eudyptes chrysolophus*

One individual was observed during the 1986/87, 1987/88 and 1988/89 breeding seasons, building and guarding a nest inside the main Chinstrap Penguin breeding colony. It remained at the nest the whole season, leaving it only for short foraging trips. On some occasions it was observed making reproductive displays to Chinstrap Penguins.

Pintado Petrel *Daption capense*

Pintado Petrels were observed flying along the coast during the spring, in flocks of up to 150 individuals. The nearest breeding localities are Ardley Island (Roby *et al.* 1986), Admiralty Bay (Jablonski 1986), Harmony Point (Favero *et al.* 1992) and on rock stacks offshore from the study area.

Snow Petrel *Pagodroma nivea*

Snow Petrels were observed flying along the coast during September and October. By November they had left the area.

Imperial Cormorant *Phalacrocorax atriceps*

A common species in the study area but no breeding colonies exist. The nearest breeding localities are on offshore rock stacks in front of Stranger Point and Duthoit Point (pers. obs.).

Occasional species

Antarctic Fulmar *Fulmarus glacialisoides*

Observed once in October 1988, flying along the Stranger Point coast.

Blackbellied Storm Petrel *Fregetta tropica*

Several recorded near Three Brothers Hill and, although no nests were found, they may breed there in small numbers in association with a Wilson's Storm Petrel colony.

Blacknecked Swan *Cygnus melancoryphus*

Five individuals were recorded flying high on several occasions during January 1989. These observations match previous records elsewhere in the South Shetland Islands (Trivelpiece *et al.* 1987a, Lazo & Yañez 1989, Orgeira & Fogliatto 1991, Favero *et al.* 1992).

Yellowbilled Pintail *Anas georgica*

On October 1989 a freshly dead individual was found on the beach. The presence of the Yellowbilled Pintail was first recorded at 25 de Mayo (King George) Island at Admiralty Bay (Trivelpiece *et al.* 1987a), where 20 birds were observed on 25 October 1985.

Cattle Egret *Bubulcus ibis*

Two long-dead individuals were found in October 1988, on a gravel terrace. A discussion on the presence of the Cattle Egret at 25 de Mayo (King George) Island is given by Trivelpiece *et al.* (1987a), who first recorded its presence at Admiralty Bay and Barton Point in the 1984/85 and 1985/86 summers.

Whiterumped Sandpiper *Calidris fuscicollis*

A flock of seven birds was recorded at Stranger Point in the 1987/88 summer on five occasions and a flock of three was recorded in the 1988/1989 summer on two occasions. In both seasons they frequented the Adélie Penguin colony close to flowing meltwater. Bannasch *et al.* (1984) recorded three individuals of this species at Ardley Island in October 1981. Trivelpiece *et al.* (1987a) recorded it at Admiralty Bay in 1985/86 and 1986/87 summers, observing similar behaviour as described here.

In summary, 10 of the 20 species recorded in the study area were found breeding. Another four species, known to breed at the South Shetland Islands (Croxall *et al.* 1984), were recorded as nonbreeders and one, the Blackbellied Storm Petrel needs to be confirmed as a breeder. The bird community found at the study area is considered representative of the region, and represents nearly 30% of the South Shetland Islands Adélie Penguin population and 12% of Gentoo Penguin population (Croxall & Kirkwood 1979, Jablonski 1984, Shuford & Spear 1988),

making the area an important site for future research.

In addition, the surveyed area contains an important (600 cows) elephant seal pupping locality. During the elephant seal breeding season in October, nearly 600-1000 kg of dead seal pups and 2500 kg of afterbirths are available to scavenging seabirds (pers. obs.). This food source makes the area an important foraging site for avian scavengers, particularly because no penguin eggs or chicks are then available. This in turn accounts for the abundance of nonbreeding populations of Southern Giant Petrels, Kelp Gulls, skuas and Greater Sheathbills.

Maxwell Bay is an area under disturbance because of increasing human activities (Harris 1991). Prior to 1980 only one refuge (Argentina) and two permanent stations (Chile and USSR) existed in the Maxwell Bay area (Harris 1991). Since then, three new permanent stations have been built (China, 1985; Uruguay, 1985; and Korea, 1987). In 1982 the Argentine refuge became a permanent station. Between 1980 and 1986 the Chilean station grew significantly, incorporating hotel and airport facilities. Currently, the area of Maxwell Bay has six permanent stations and nine refuges, with a winter population of 150 persons and 300-400 in summer (Harris 1991).

The value of the surveyed area for scientific research and environmental conservation purposes is substantial, given the abundance and diversity of breeding birds and mammals and the value of the area as a foraging site for scavengers. However, the risk of increasing human activities on the island, especially at Maxwell Bay, makes the area an important site for future environmental monitoring research.

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