

LOW NUMBERS AND APPARENT LONG-TERM STABILITY OF SOUTH POLAR SKUAS *STERCORARIUS MACCORMICKI* AT COMMONWEALTH BAY, ANTARCTICA

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SUMMARY

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We censused breeding South Polar Skuas *Stercorarius maccormicki* at Cape Denison, Commonwealth Bay, Antarctica, in 2013, and collated all available South Polar Skua counts in the wider Commonwealth Bay area, including previously unpublished records from the Australasian Antarctic Expedition 1911–1914. Counts made in 1912, 1913, 1982, 2002 and 2013 indicate that the population has remained stable over the last century. These counts also indicate that the density of the resident skua population in this region is lower than the densities recorded in other parts of Antarctica.

Key words: Commonwealth Bay, East Antarctica, population stability, South Polar Skua

INTRODUCTION

With recent changes in climate and marine parameters in Antarctica and the Southern Ocean, population trends of the region's top predators are valuable bioindicators of environmental change. While trends in penguin populations, especially Adélie Penguins *Pygoscelis adeliae*, are relatively well documented, other species of Antarctic birds have been less well studied. Most of the relevant publications date from the BIOMASS programme of the 1980s (e.g. Croxall *et al.* 1984, Woehler & Johnstone 1991, Woehler & Croxall 1997). Population trends for the South Polar Skua *Stercorarius maccormicki* are largely unknown, and Pointe Géologie, Terre Adélie, is one of few locations in East Antarctica where regular skua counts have been made (Woehler *et al.* 2001, Micol & Jouventin 2001).

Elsewhere in Antarctica, most skua counts have been irregular or one-off, the best trend data coming from locations close to research bases where human activities have influenced skua numbers (Ainley *et al.* 1986, Woehler & Johnstone 1991). Cape Denison and other locations in Commonwealth Bay, East Antarctica, are of interest, as skua observations and population counts were first made 100 years ago and the region is seldom visited by people, providing a record of natural change essentially free from human influence.

We visited Cape Denison on 20 December 2013 in order to census the Adélie Penguin population and document the impact of the giant iceberg B09B and the subsequent formation of extensive fast ice in Commonwealth Bay on Adélie Penguin numbers (Wilson *et al.*, unpubl. data). We took the opportunity to repeat the census of South Polar Skuas conducted in 1982 (Ensor & Bassett 1987) and 2002 (D. Patterson, unpubl. data; E. Woehler, pers. comm.).

The diary kept by John Hunter, a biologist on the Australasian Antarctic Expedition (AAE) 1911–1914, while he was at Cape

Denison from 8 January 1912 to 8 February 1913, has recently been published (Hunter & Hunter 2011) and includes information on South Polar Skuas not available to earlier researchers. In addition, we accessed Hunter's unpublished journal from his return to Cape Denison to evacuate the overwintering party in December 1913, as well as unpublished reports by H. Hamilton and C.F. Laseron, also members of the AAE 1911–1914, in which they record observations made on skuas at other Commonwealth Bay sites. These unpublished documents are all held by the Mawson Centre, South Australian Museum, Adelaide, Australia. Hunter's December 1913 diary includes a summary of bird observations made during the 1911–1914 expedition; these were never published, although much of the information was incorporated into the later BANZARE birds report (Falla 1937). Some of Hunter's information on skuas was not included in Falla (1937), and Falla did not include the observations made by Hamilton or Laseron, which have remained unpublished. In this note, we compare the numbers present in 1911–1914, 1982 and 2002 with our count in 2013 and tabulate all information available on skua distribution and abundance in the Commonwealth Bay area for the period 1912–2013.

METHODS

Study area

Cape Denison, 67°00'30"S, 142°40'20"E, is an area of ice-free moraines and rocky ridges in Commonwealth Bay, East Antarctica. The ice-free area measures approximately 1.5 km east-west and 500–750 m north-south and supports about 5500 pairs of Adélie Penguins (Wilson *et al.*, unpubl. data). Snow Petrels *Pagodroma nivea* and Wilson's Storm Petrels *Oceanites oceanicus* also breed at Cape Denison. The AAE 1911–1914 had its main base at Cape Denison, but since then little ornithological research has been

undertaken there. To the east and west of Cape Denison are a string of small islands and widely spaced ice-free cliffs. Adélie Penguins breed on most of the islands with Snow Petrels, Wilson's Storm Petrels, Antarctic Fulmars *Fulmarus glacialisoides*, Antarctic Petrels *Thalassoica antarctica* and Cape Petrels *Daption capense* on some of these ice-free areas.

On 20 December 2013, we noted the location of each South Polar Skua nest encountered while undertaking a census of Adélie Penguins. We searched all parts of Cape Denison occupied by penguins and all other ice-free parts of Cape Denison where skuas were likely to nest, except for a small area, approximately 350 m × 250 m, east of Petrel Hill. That area was scanned using binoculars from the summit of Petrel Hill; no skuas, nesting or otherwise, were seen.

In 1912 and 1913, skuas first appeared at Cape Denison in late October, and started to defend territories about 22 November; eggs were usually laid between 12 and 27 December (Falla 1937). The incubation period for this bird is 26–34 d, and the chicks remain in their parents' territories for about 50 d (Higgins & Davies 1996), so at Cape Denison any count in December or January should include most, if not all, breeding pairs.

RESULTS AND DISCUSSION

On 20 December 2013, we found four South Polar Skua nests, two near Memorial Hill and two near Penguin Knob, and during the course of the day saw only 10 or 12 skuas. The only other skua censuses conducted at Cape Denison were in January 1982, when four pairs of skuas were present (Ensor & Bassett 1987), and October to December 2002, when eight pairs were located (D. Patterson, unpubl. report; E. Woehler pers. comm.; Table 1).

The biologist on the AAE 1911–1914, John Hunter, was at Cape Denison from 8 January 1912 until 8 February 1913 (Hunter &

Hunter 2011). He returned on 13 December 1913, leaving on 18 December (Hunter, unpubl. report). Hunter located three South Polar Skua nests during the 1912/13 summer, and his diaries include a number of other references to skuas that give some indication of their abundance.

After arriving in January 1912, the party was so preoccupied with building huts and settling in for the winter that Hunter made only three references that give any indication of South Polar Skua abundance. On 15 February 1912, he killed the first skua, on 15 March, he and a colleague shot nine more; two additional skuas were seen on 3 April (Hunter & Hunter 2011). The following summer, skuas were first mentioned on 2 November 1912, when one or two were seen. Skuas were "slightly more numerous" on 28 November when he returned from a 20-d sledging excursion, and on 1 December 1912 he reported "about a dozen skuas" (Hunter & Hunter 2011). Hunter shot six skuas on 14 January 1913 and five more the following day (Hunter & Hunter 2011). During 1913, the last skua was seen at Cape Denison on 10 April; the following summer, skuas were first seen on 20 October 1913; two were shot on 31 October, several on 4 November 1913 and one on 28 November 1913 (McLean, unpubl. report).

Hunter's ornithological priority was to obtain a large collection of specimens, both eggs and adults. Skuas are relatively easy to shoot, thus the number shot presumably represented a large proportion of the skuas seen. In February–March 1912 he shot a total of 10 skuas in addition to the 11 shot in January 1913 and about five in October–November 1913.

On 15 December 1912, Hunter found two skua nests and collected an egg from one of them, leaving the other pair to incubate their two eggs. On 30 December he "searched everywhere" for skua nests but found only the nest where two eggs were present on 15 December. A third nest was discovered on 11 January 1913. Hunter returned to Cape Denison on 13 December 1913 accompanied by H. Hamilton,

TABLE 1
Counts of South Polar Skua nests in the Commonwealth Bay region, George V Land, East Antarctica

	December 1912 ^a	December 1913 ^b	January 1982 ^c	October— December 2002 ^d	December 2013 ^e
Cape Denison	3 ^f	6	4	8	4
Mackellar Islets	—	6	6	—	—
Cape Hunter	—	3	—	—	—
Cape Gray	—	2	—	—	—
Stillwell Island	—	3	3	—	—
Mainland near Stillwell Island	—	Nesting	—	—	—
Cape Pigeon Rocks	—	Several	—	—	—
Way Archipelago	—	—	3	—	—
Larger of the Hodgeman Islands	—	—	—	—	0

^a Hunter & Hunter 2011.

^b Unpubl. reports by Hunter, Hamilton and Laseron.

^c Ensor & Bassett 1987.

^d D. Patterson, unpubl. data, E. Woehler, pers. comm.

^e This study.

^f Nest count may have been low as a result of shooting of adult skuas earlier in the season. A dash (—) indicates that no skua observations were made at that site that season.

a second expedition biologist. During their visit, Hamilton collected a total of 10 skua eggs from six nests (Hunter, unpubl. report; Falla 1937).

South Polar Skua populations include a significant proportion of non-breeding birds; the size of the non-breeding contingent varies year to year and place to place — e.g. up to 115 non-breeding birds at Pointe Géologie, where the highest number of breeding pairs in any year was 58 (Micol & Jouventin 2001), and 85 pairs plus 83 non-breeders at Cape Hallett (Pascoe 1984). Skuas may visit areas tens of kilometres from their own breeding site, these visits being more likely pre- or post-breeding (Ainley *et al.* 1986), i.e. before December or after January at Cape Denison. Skuas are avid scavengers and would have been attracted to Cape Denison during the AAE 1911–1914 by human refuse and the seals killed for dog food or specimens. Thus, not all of the approximately 27 skuas shot at Cape Denison between February 1912 and December 1913, nor the “over a score” (20) seen bathing in a melt pool on 13 November 1913 (Hunter, unpubl. report; McLean, unpubl. report) would have been locally breeding birds, and perhaps not all were Cape Denison residents. Indeed, a few skuas banded at Pointe Géologie, apparently as transients, have returned each year to breed at Ross Island colonies during the past decade (D. Ainley, pers. comm.).

South Polar Skuas were seen at other ice-free localities visited by the AAE 1911–1914, but were rare at mainland sites (Hunter, unpubl. report). Five sets of eggs were collected and several other pairs were seen on the Mackellar Islets, where “skuas were not very numerous,” on 18–19 December 1913; three pairs were found nesting at Cape Hunter on 22 December 1913; three pairs were found at Stillwell Island later that month (Hunter, unpubl. report); and low numbers were recorded at three other locations (Laserson, unpubl. report; Hamilton, unpubl. report Table 1). During the AAE 1911–1914, skuas were found to be breeding wherever Adélie Penguins nested (Mawson 1940). Five adult skuas and two chicks were collected at Cape Denison on 5 January 1931 (Falla 1937).

The only other survey of South Polar Skua numbers in the Commonwealth Bay region was made by Ensor & Bassett (1987; Table 1). We visited the larger of the Hodgeman Islands on 23 December 2013; one or two skuas were seen, but no nest was found despite a thorough search of this small island.

The population trends of South Polar Skuas are poorly documented. On the basis of these counts, we suggest that skua populations in the Commonwealth Bay area have remained relatively stable over a century, or at least rebounded from the slaughter of the early 20th century (Table 1). There are few other places in East Antarctica where South Polar Skuas have been censused on more than one occasion. The only series of annual skua counts comes from Pointe Géologie, about 150 km from Cape Denison, where numbers increased from 29 pairs in 1966 to 58 in 1998, decreasing to 46 in 1999; to some degree fluctuations reflected trends in local Adélie Penguin populations (Micol & Jouventin 2001). At Haswell Island (93°E), 23 pairs were counted in 1963 and 20 in 1967 (Woehler & Johnstone 1991).

In the Ross Sea region, there is more information on population trends, but it dates from the 1980s (Ainley *et al.* 1986), and the best survey data come from localities where the presence of people has influenced local South Polar Skua numbers. At Cape Hallett, the number of South Polar Skua pairs decreased from 181 in

1960/61, soon after the USA-NZ base was established, to 98 in 1971/72 (Pascoe 1984). In January 1983, 10 years after the base was abandoned, 85 pairs and 83 non-breeding skuas were present (Pascoe 1984). At Northern Rookery, Cape Bird, Ross Island, numbers decreased between 1967 and 1981/82 (Ainley *et al.* 1986), despite an increase in Adélie Penguin numbers over the same time period (Wilson 1990). At Cape Crozier (also on Ross Island), skua populations remained stable at least through the 1980s (Ainley *et al.* 1986), but since have decreased dramatically (D. Ainley, pers. comm.). Trends at other Ross Sea locations have varied (Ainley *et al.* 1986). However, numbers at Cape Royds, Cape Barne and Cape Evans, have declined since 2002 (D. Ainley, pers. comm.).

Between the 1970s and 1990s, numbers increased at three locations in the Antarctic Peninsula area: Anvers Island in Potter Peninsula, King George Island and Cuverville Island (Woehler & Croxall 1997). The reasons for these increases are unclear. In recent years, numbers of both South Polar Skuas and Brown Skuas *Stercorarius antarcticus lonnbergi* have decreased in locations around the South Shetland Islands (Grilli 2014).

South Polar Skua density in East Antarctica, in particular George V Land, appears to be much lower than that recorded elsewhere in Antarctica. The only estimate available indicates a minimum of 357–400 pairs in the entire Australian Antarctic Territory, with only 17 pairs in George V Land (Woehler 1990, 1993). The unpublished records from AAE 1911–1914 (Table 1), not available to Woehler (1990, 1993), would raise the George V Land population to about 27–30 pairs. There were about 50 pairs at nearby Pointe Géologie alone (Micol & Jouventin 2001). Even with these additional numbers, the density is lower than other areas of Antarctica.

South Polar Skuas are much more common along the Victoria Land Coast, including McMurdo Sound and Ross Island, with a minimum of 4798 pairs, including about 1000 pairs at Cape Crozier and 399 at Cape Bird (Ainley *et al.* 1986). South Polar Skuas are moderately common on the Antarctic Peninsula (650 pairs) but rare on adjacent Continental coastlines and the Scotia Arc (Croxall *et al.* 1984). The relationship between numbers of South Polar Skuas and Adélie Penguins appears to vary throughout their ranges, and further data would contribute to a better understanding of regional populations.

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