OBSERVATIONS ON THE BIRDS OF THE VESTFJELLA AND HEIMEFRONTFJELLA, DRONNING MAUD LAND, ANTARCTICA, 1991/92 AND 2001/02

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SUMMARY

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During the austral summers of 1991/92 and 2001/02, we visited the Swedish Research Stations of Wasa and Svea, situated 120 km and 300 km inland in the Vestfjella and Heimefrontfjella, respectively, Dronning Maud Land, Antarctica. There is no previous comprehensive documentation of the occurrence and the breeding numbers of birds from these areas. To obtain such estimates we combined our field records and extrapolations from nest counts. Four species were encountered, Antarctic Petrel *Thalassoica antarctica,* Snow Petrel *Pagodroma nivea,* Wilson's Storm Petrel *Oceanites oceanicus* and South Polar Skua *Catharacta maccormicki.* We report the first nest site of Wilson's Storm Petrel in the Vestfjella and the first records of Antarctic Petrels in the Heimefrontfjella. The Snow Petrel was by far the most numerous species, with an estimate of 2300–4050 breeding pairs at Scharffenbergbotnen in the Heimefrontfjella. Previous population estimates for the Snow Petrel in these areas are of the same magnitude.

Key words: Bird fauna, Vestfjella, Heimefrontfjella, Dronning Maud Land, Antarctica

INTRODUCTION

Accurate data on the numbers of breeding birds in Antarctica are relatively scarce due to the remote and inaccessible nature of the continent. For example, in a review of the distribution and numbers of the Snow Petrel *Pagodroma nivea* (Croxall *et al.* 1995), population estimates were available for only 108 of 298 reported breeding sites, and many of these estimates were old. Further, there are large discrepancies between the high numbers counted at sea and the estimated population sizes at known colonies for both the Snow Petrel (Croxall *et al.* 1995) and Antarctic Petrel *Thalassoica antarctica* (van Franeker *et al.* 1999). Hence, there is a need for updated information on the breeding bird colonies of Antarctica.

During the austral summers of 1991/92 (GT) and 2001/02 (PJ), we visited the Swedish Antarctic Research Stations of Wasa and Svea, situated far inland in Dronning Maud Land. The main purpose of our visits was to monitor the terrestrial vegetation (see Thor 1997), but we also made notes on the bird fauna. In these areas, four bird species have been encountered: Snow Petrel, Antarctic Petrel, Wilson's Storm Petrel *Oceanites oceanicus* and South Polar Skua *Catharacta maccormicki.* However, there has been no previous comprehensive documentation of the occurrence and breeding numbers of these species from the region. The most extensive data so far are provided by Sømme (1977), who visited the Vestfjella in 1976/77, and by Bowra *et al.* (1966), who visited the Heimefrontfjella in 1963/64. Bowra *et al.* (1966) recorded "many thousands" of Snow Petrels with as many as six nests per square meter at one of the localities. Bowra's record is still the only confirmed breeding information describing colonies with more than 1000 pairs of Snow Petrels as far as 300 km inland (Croxall *et al.* 1995). The most inland breeding site known for this species is situated 440 km from the coast, but only 13% of the 298 known breeding sites are found farther inland than 100 km (Croxall *et al.* 1995, Goldsworthy & Thomson 2000).

This paper gives an updated account of the present birds and breeding numbers from the areas around the Swedish Research Stations Wasa and Svea. We also provide a brief summary of earlier observations on the birds in the Vestfjella and Heimefrontfjella.

METHODS

Study area and survey periods

Vestfjella is a 135-km long mountain range, up to *c.* 1100 m high, situated parallel to the coastline and 120 km from the coast in western Dronning Maud Land (Fig. 1). In Vestfjella we visited the northernmost nunataks Basen, altitude 584 m (site of the Swedish Station Wasa, 73°02′S, 13°25′W); Fossilryggen, 731 m, with adjacent small nunataks; and Plogen, 898 m (Fig. 1). The bird colonies at Basen were visited on several occasions between 30 November 1991 and 20 February 1992 (GT) and between 10 December 2001 and 27 January 2002 (PJ). Fossilryggen was visited on 13 and 24 December 1991, 5–6 February 1992, 29–30 December 2001 and 18 January 2002. Plogen was visited on 22 January 2002.

The Heimefrontfjella is a 135-km long mountain range situated 300 km from the coast and parallel to the Vestfjella (Fig. 1). In the Heimefrontfjella we visited the area around Scharffenbergbotnen in northern Sivorgfjella, where the Swedish Station Svea is situated, at the northernmost tip of Haldorsentoppen, 1245 m (74°34′S,

11°13′W). The localities around Scharffenbergbotnen were visited during 1–6 and 26–31 January 1992 and 3–15 January 2002. In 1992, GT also visited three high peaks in the Heimefrontfjella by helicopter: Engenhovet (1742 m), Wrighthamaren (2154 m) and Paalnibba (2711 m), of which the last is the highest peak in the Heimefrontfjella.

Bird counts

No standardized method was used to count the number of breeding birds. Instead we combined field observations and extrapolations from nest counts to obtain estimates. Observations were made mainly between early morning and midnight. At Basen, Snow Petrels breed in precipices up to 400 m high, impossible to reach.

TABLE 1
Observations and estimated numbers of breeding pairs of birds around the Wasa and Svea Antarctic research stations based on observations in 1991/92 and 2001/02. The — symbol indicates no observations. The ? symbol indicates that the species was recorded but that no nest sites were found.

Localities	Snow Petrel[1]	Antarctic Petrel[2]	Wilson's Storm Petrel[3]	South Polar Skua[4]
Vestfjella				
1. Basen	200–500	?	≤1	1
2. Plogen	—	—	—	?
3. Fossilryggen	?	—	?	?
Heimefrontfjella				
4. Steinnabben	200–400	—	—	2
5. Boyesennuten	600–1000	?	—	?
6. Svea–Haldorsentoppen	50–200	—	—	?
7. Haldorsentoppen–Torsvikstoppen	200–400	—	—	?
8. Torsvikstoppen–Wrighthamaren	1200–2000	—	—	?
9. Wrighthamaren–Engenhovet	50	—	—	?

[1]Snow Petrel

1. Basen: Similar estimates both in 1991/92 and 2001/02. Nest sites were found along the whole northern precipices, on vertical cliffs and on scree slopes, particularly above the blue-ice area at the western part of the nunatak. At most, 57 birds were seen together on 27 December 2002.
2. Plogen: No records, probably in part due to the late date and the short time of visit.
3. Fossilryggen: At most, 10 flying birds were seen on 30 December 2001.
   Heimefrontfjella: In 1991/92 the peak of Wrighthamaren hosted fewer than five breeding pairs. No nest sites were found on the peaks of Paalnibba or Engenhovet. In 1992, observations of single birds were made on the Amundsenisen (one bird as far as 75°13′16″S, 09°33′41″E on 18 January) during a traverse by glaciologists (P. Holmlund pers. comm.). Amundsenisen is an almost flat, 2500-m-high ice plateau south-east of Heimefrontfjella, continuing towards the South Pole without any nunataks.

[2]Antarctic Petrel

1. Basen: One bird was seen on 21 December 1991. In 2001, seen regularly between the 17–26 December, with at most seven birds together on 25 December. No birds were seen after 26 December.
   Heimefrontfjella: In 2002, single birds were seen on 5 and 13 January, flying between the nunataks Steinnabben and Boyesennuten.

[3]Wilson's Storm Petrel

1. Basen: Single birds were seen on 23 December 1991 and 9 February 1992 at the western precipice above the blue-ice area. In 2001/02 the species was recorded regularly all over the nunatak from mid-December to 26 January, with at most four birds together above the scree slopes of the western precipice. A nest site was located in that area, 1250 m northwest of Wasa. The entrance was a narrow crevice with fresh regurgitations, feathers and a mummified adult bird. On 23 January, a bird was seen entering another crevice in the same area. This indicates at least one breeding pair in the scree slopes above the blue-ice in 2002.
3. Fossilryggen: One bird was seen during 29–30 December 2001.

[4]South Polar Skua

1. Basen: In 1991/92, one or two pairs were seen regularly. In 2001/02, at most three birds were seen together. A nest with one newly hatched chick and one egg was found on the lower parts of the northern precipices on 17 January 2002 (1900 m northwest of Wasa).
2. Plogen: One bird was seen at the peak on 22 January 2002.
3. Fossilryggen: Two birds were seen near an unnamed nunatak 500 m west of the north end of Fossilryggen on 6 February 1992. One bird was seen on 18 January 2002.
   Heimefrontfjella: In 1991/92 and 2002, single birds were seen at most of the nunataks visited.
4. Steinnabben: Two breeding pairs found close to each other near the northwest end in 1991/92. On 13 January 2002, one nest with two eggs was found in the same area and another pair was present, suggesting two breeding pairs.

There the number of breeding Snow Petrels was estimated in both 1991/92 and 2001/02 by counting nest sites and the number of birds flying along the precipices. Nest sites at Basen were identified by visual signs of nest presence: present birds or petrified regurgitations on the rocks around nest entrances (*cf.* Ryan & Watkins 1989). Hence, we did not separate active and non-occupied nest sites at Basen. To obtain estimates of Snow Petrels in the Heimefrontfjella, occupied nest sites were counted in a small area, *c.* 20 _xby 50 m, on the scree slope between Wrighthamaren and Torsvikstoppen during January 2002 (Fig. 1, area 8). This number was used to extrapolate the number of breeding pairs from visual assessments of the area and nest density of Snow Petrel colonies at the other visited localities around Scharffenbergbotnen in 2002. Hence, for the Snow Petrel, the estimates of breeding pairs refer to the assumed number of breeding pairs. For the South Polar Skua, we counted only nest sites with eggs or chicks.

The geographical names for Vestfjella are in accordance with Norsk Polarinstitutt 1972 maps (sheets C7 and B7) and for Heimefrontfjella, with Norsk Polarinstitutt 1988 maps (sheets D8 and D9).

Previous publications on the bird life of the Vestfjella

Sømme (1977) reported the first records of Snow Petrel, Antarctic Petrel, Wilson's Storm Petrel and South Polar Skua from Vestfjella. He visited the south and central Vestfjella in 1976/77 and found many scattered Snow Petrel colonies. Most of these colonies were small, but two (Skuafjellet and Audunfjellet) consisted of 500–1000 breeding pairs. He also reported observations of Snow Petrels at Basen and Plogen, made during the Norwegian Expedition of 1968/69. Later, Larsson (1990) reported the number of Snow Petrels at Basen to be "some 100 pairs" (see also Croxall *et al.* 1995). Sømme (1977) reported the only known breeding site of Antarctic Petrels in Vestfjella, with four pairs at Pagodromen in 1968/69 and one pair at the same locality in 1977.

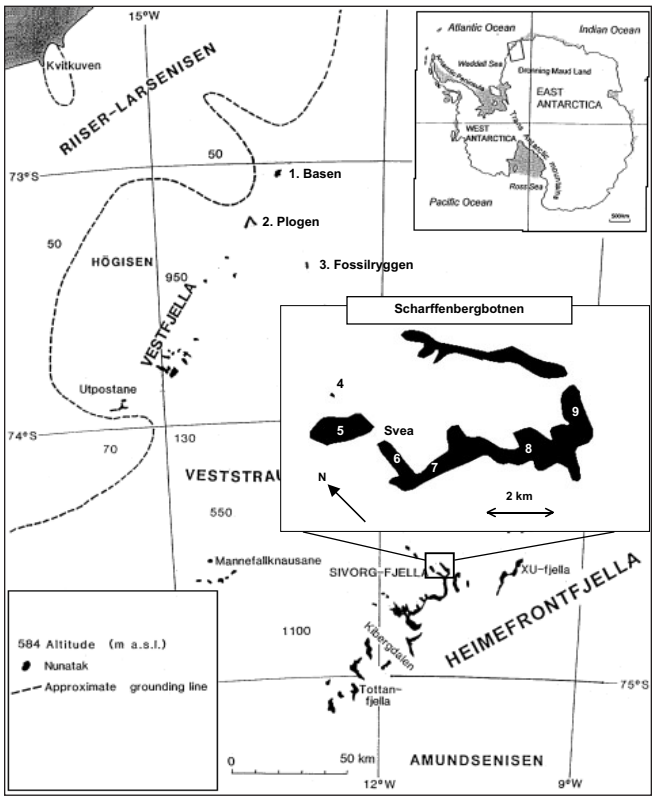

Fig. 1. The general location of the visited localities in the Vestfjella and the Heimefrontfjella. Numbers refer to the surveyed localities. At Scharffenbergbotnen they were: 4 – Steinnabben; 5 – Boyesennuten; 6 – Svea-Haldorsentoppen; 7 – Haldorsentoppen-Torsvikstoppen; 8 – Torsvikstoppen-Wrighthamaren; 9 – Wrighthamaren-Engenhovet.

There are scattered observations of Wilson's Storm Petrels from Vestfjella, but no nests have hitherto been found (Sømme 1977). During the Norwegian Expedition of 1968/69, the species was seen in the "central mountains" and at "three more northern localities" (Sømme 1977). During the 1976/77 Norwegian Expedition, one specimen was observed at Utpostane and one at Pagodromen (Sømme 1977). South Polar Skuas have been observed at several localities in Vestfjella (Sømme 1977) and from Basen "some 10 individuals" have been observed (Larsson 1990). The only breeding record was reported from Utpostane, where Sømme (1977) reported two breeding pairs, each with one chick.

Previous publications on the bird life of the Heimefrontfjella

Thurston (1961) first reported the Snow Petrel from Heimefrontfjella, with *c.* 250 breeding pairs in the "Tottan Hills" (see Croxall *et al.* 1995). Ardus (1964) specified one breeding site in the Tottanfjella as "a scree facing northeast at the easternmost arête of the mountain 15 miles northeast of the westernmost extremity of the range." This most likely refers to the north end of Johnsonhogna, where Bowra *et al.* (1966) reported "thousands of petrels" in 1963/64 (as locality Z.92). Bowra *et al.* (1966) also reported "many thousands of birds" breeding at Torsvikstoppen south of Scharffenbergbotnen (as localities Z.66–68). Further, Bowra *et al.* (1966) reported Snow Petrels from two additional nunataks in Tottanfjella: Cottontoppen (as Z.81) and an unnamed nunatak 100 m northwest of Cottontoppen (as Z.73), marked with the altitude 1667 m on the present map. These localities are designated with the symbol "(×)" (Bowra *et al.* 1966, Table 1); otherwise, the symbol "×" was used. No definition of the parentheses is given and these localities are not mentioned in the text. They also reported a small colony, a dozen unoccupied nests, from "Z.63, Peak R" in the text (p. 67, not included in Table 1). It is somewhat unclear where this locality is situated, because the south end of Bieringmulen (Z.63) and Poulssonhamaren (Peak R) are located about 10 km apart. A dozen pairs near the base of the nunatak were also reported from the north end of Bieringmulen (as Z.103, Bowra *et al.* 1966, Table 1). The latest report on the Snow Petrel in Heimefrontfjella was given in Croxall *et al.* (1995), who referred to unpublished information on the breeding numbers at Scharffenbergbotnen as "many" in 1992/93.

The South Polar Skua was reported by Bowra *et al.* (1966) both from the north end of Johnsonhogna in Tottanfjella (as Z.92, Table 1) and the north end of Bieringmulen in Sivorgfjella (as Z.103, Table 1). In the text (not included in Table 1), Bowra *et al.* (1966, p. 68) also reported South Polar Skuas "in small numbers (up to 12 birds) whenever the main colonies were visited, but there was no proof of their breeding." The localities at the north end of Johnsonhogna and at Bieringmulen are included only in Table 1 and are not mentioned in the text (Bowra *et al.* 1966). It is uncertain whether Bowra *et al.* (1966) intended to suggest that there was no conclusive evidence of breeding outside the two localities mentioned in Table 1, or whether they meant there was no proof of breeding at all in the Sivorgfjella and Tottanfjella.

RESULTS

The Snow Petrel was by far the most numerous species observed. In the Heimefrontfjella the total number of assumed breeding pairs at the surveyed localities was estimated to be 2300–4050 (Table 1). The highest nest-site densities were found in the north-facing slopes of Torsvikstoppen and at Steinnabben. South Polar Skuas were seen at most of the visited localities in the Heimefrontfjella, but the only nest sites were found at Steinnabben (Table 1). We report the first record of a nest site of Wilson's Storm Petrel in the Vestfjella, where our observations indicated at least one breeding pair at Basen (Table 1). We also report the first observations of Antarctic Petrels in the Heimefrontfjella. For this species, we found no indications of breeding birds (Table 1).

DISCUSSION

This paper provides baseline information on the birds recorded and breeding in the areas around the Swedish Antarctic Research Stations of Wasa and Svea. For the Snow Petrel, the most numerous species, the number of breeding pairs must still be considered as a rough estimate. Besides the uncertainty in our extrapolations, the estimated number of occupied nests in the Heimefrontfjella was made in the first half of January when many nests probably have been abandoned. Ryan & Watkins (1989) calculated the mean proportion of abandoned nests to be 40% in late December.

Despite the uncertainty in the actual population size of the Snow Petrel, previous population estimates are of the same magnitude. Larsson (1990) estimated "some hundred pairs" at Basen compared with our estimates of 200–400 in 1991/92 and 300–500 in 2001/02. At Scharffenbergbotnen, Bowra *et al.* (1966) reported thousands of birds in 1963/64 as compared with "many" in 1992/93 (Croxall *et al.* 1995) and up to 4000 pairs in 2002. Further, in both 1992 and 2002, we counted the number of occupied nests on the scree slope at the second hill south of Svea (part of area 6 in Table 1). The results were similar, with up to 30 nests in 1992 and 28 in 2002. The congruence between all these estimates suggests that no major changes in the breeding numbers of Snow Petrels in the region have occurred during the past decades. In a long-term study of a Snow Petrel colony in Adélie Land, Chastel *et al.* (1993) recorded a fairly high dispersal rate among fledglings, which, compensated by 5.7% immigration per year, resulted in an overall stable population size over a 27-year period.

Inland Snow Petrel colonies are often located on north-facing slopes and on hills raised high above their surroundings (Ryan & Watkins 1989). Most of the colonies we visited were facing north, but in Heimefrontfjella the variation in nest site location was high. Nest sites were found in north- and south-facing slopes, as well as on vertical cliffs and scree slopes, with high nest densities even in low parts of the slopes, close to the ice.

There are no other known Snow Petrel colonies as large as thousands of breeding pairs located as far inland as are those in the Heimefrontfjella (Croxall *et al.* 1995). Most of the colonies we visited around Scharffenbergbotnen are relatively easy to access. These circumstances make them suitable for future reference on inland breeding Snow Petrel populations in Antarctica.

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