

MIGRATION ROUTES AND WINTERING AREAS OF LITTLE AUKS *ALLE ALLE* RINGED IN SVALBARD

TREKROUTES EN OVERWINTERINGSGEBIEDEN · VAN KLEINE ALKEN GERINGD OP SPITSBERGEN

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ABSTRACT

Ringed of Little Auks in Svalbard took place during 1962-96, mainly in Hornsund, Bellsund and in NW Spitsbergen. Ringing effort varied considerably, and most birds were ringed 1962-65 (11 012), 1976-78 (800), 1983-88 (1950), and 1990-94 (1300). A total of 19 Little Auks have been recovered outside Svalbard, 17 of which were found or shot in Greenland and two in Iceland (Table 1). It is concluded that at least part of the Svalbard population is wintering off SW Greenland. However, most recoveries were from areas in which extensive hunting has increased the chances for recovery, whereas in much of its (presumed) wintering range the chance of recovery is only remote. Despite the fact that some work has been done on Little Auks in Russian colonies, none of these projects included ringing activities. Further studies are needed to more fully clarify migration patterns of Little Auks and particularly the origin of birds wintering off Norway and in the North Sea remains rather obscure.

The Little Auk *Alle alle* is the smallest in size of the auks in the Atlantic, and it is also the most numerous (Nettleship & Evans 1985). It breeds in rock crevices and screes in the arctic areas from eastern Baffin Island, Canada in the west to Severnaja Zemlja, Russia in the east. There are only rough estimates of population size available; a reasonable very rough mean estimate of the world population is about 15 million pairs (Nettleship & Evans 1985, Isaksen & Gavrilov 1996). The Thule region in northwest Greenland seems to be the most important breeding area with estimates of the population size ranging 7-15 million pairs for this area alone (Nettleship & Evans 1985). Also the Scoresby Sound area in central east Greenland is an important area with at least a few million breeding pairs (Kampp *et al.* 1987). Svalbard and Franz Josef Land are the main breeding areas in the Barents Sea, with probably about one million and 250 000 pairs respectively (Isaksen & Gavrilov 1996). Despite the high number of individuals, there has been relatively little research on Little Auks. The knowledge on migration and wintering areas is,

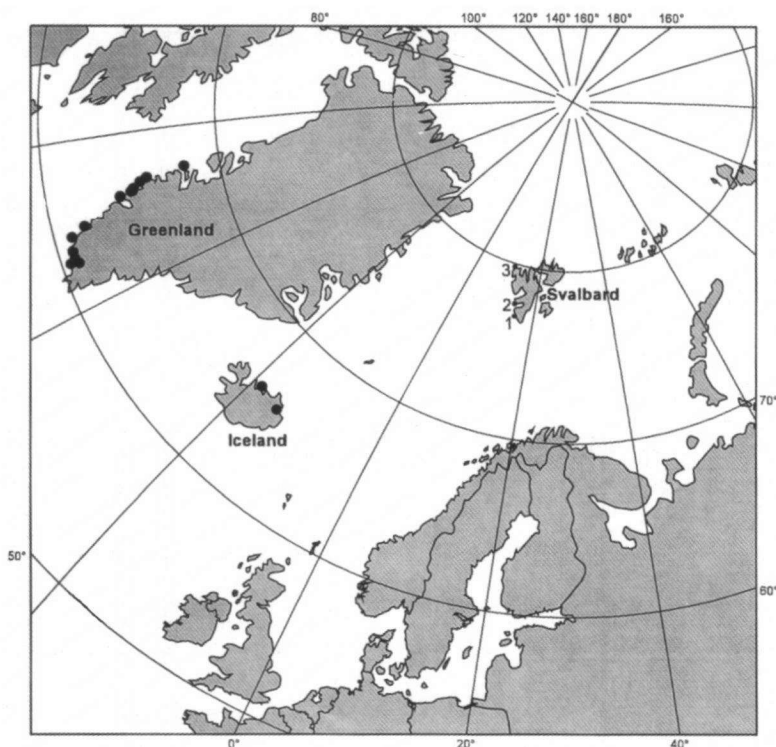


Figure 1. Recoveries of Little Auks ringed in Svalbard (black dots). Ringing localities in western Svalbard are (1) Hornsund, (2) Bellsund and (3) NW Spitsbergen.
*Figuur 1. Terugmeldingen van op Spitsbergen geringde Kleine Alken (stippen). Ring-
 plaatsen op Spitsbergen zijn (1) Hornsund, (2) Bellsund en (3) NW Spitsbergen.*

for instance, generally low. Some information is, however, available for the populations breeding in western Svalbard and northwestern Greenland, mainly due to the pioneering work of Magnar Norderhaug (Svalbard) and Finn Salomonsen (Greenland). These authors reported results from their work two decades ago (Norderhaug 1967, Salomonsen 1967). There has been some ringing of Little Auks later on, resulting in recoveries giving more information about the migration of these birds.

In this report we give an updated presentation of the recoveries of Little Auks ringed in Svalbard, with a discussion on what the recoveries tell us about the migration of these birds. We also shortly summarise the knowledge on wintering areas of Little Auks breeding in other areas, and discuss this with emphasis on the North Sea.

MATERIAL AND METHODS

Ringling of Little Auks in breeding colonies in Svalbard has taken place in the period 1962–96. The number of birds ringed per year has varied considerably, and the ringling activity can be separated in four main activity periods. Extensive ringling in breeding colonies was performed in Svalbard in the period 1962–65 (Norderhaug 1967). The majority of the 11 012 ringed birds were adult or subadult birds; only small numbers of nestlings were ringed. The large colonies in Hornsund, southwest Spitsbergen (figure 1), were the main areas for the ringling (10 012 individuals), and the remaining birds were ringed in northwestern Spitsbergen (Norderhaug 1967). The other main periods of activity are 1976–78 (about 800 ringed), 1983–88 (about 1950), and 1990–94 (1300). Also in the periods after 1965, Hornsund has been the main area of ringling, but birds have also been ringed in several other areas along the west coast of Spitsbergen as well as on Bjørnøya (74°30'N 19°00'E; 248 individuals). Almost all birds ringed are adults, except in the period 1983–88 when 700 nestlings were ringed. The total number of Little Auks ringed in Svalbard adds up to at least 15 139 (including 1996). This figure is not absolutely correct as the total number of ringed birds in the Norwegian ringling schemes have not been summed up, but the true number is probably only marginally larger.

Several authors have presented recoveries of ringed Little Auks from Svalbard (see references in Table 1). Some changes have been made in the records presented here as compared to those in these earlier works. This applies to the age at ringling and the recovery conditions of #3 in Table 1 (changed according to Salomonsen 1971 and Anker-Nilssen & Jensen 1981), and the recovery coordinates of #12 (corrected according to Salomonsen 1971 and Berthelsen *et al.* 1989). Recoveries made in Svalbard are not dealt with here. All these recoveries are of birds ringed and recovered in the breeding period in the same breeding colony, and consequently give little information about migration.

RESULTS

A total of 19 recoveries of Little Auks ringed in Svalbard has been reported up to 1995. Of these, 17 were recovered in Greenland and two in Iceland (Table 1). The positions of both ringling and recovery are shown in Fig. 1. The Greenland recoveries are distributed along the southwest coast from Julianehåb (60°N) in the south to Egedesminde (68°N) in the north. All birds

Table 1. Recoveries of Little Auks ringed in Svalbard. Recovery localities are in southwest Greenland (G) and in north or east Iceland (I).

Tabel 1. Terugmeldingen van op Spitsbergen geringde Kleine Alken. Terugmeldingen zijn afkomstig van zuidwest Groenland (G) en van noord of oost IJsland (I).

#	Ringed				Recovered			
1	26/07/62	Hyttevika, ad	77°03'N 15°10'E	11/01/66	Eqalugårssuit, Julianehåb (G)	60°50'N 46°10'W	a	
2	26/07/62	Hornsund	77°03'N 15°10'E	25/01/63	Ikerasak, Egedesminde (G)	68°00'N 53°40'W	a	
3	30/07/62	Hyttevika, ad	77°03'N 15°10'E	27/12/63	Kangâmiut, Sukkertoppen (G)	65°50'N 53°20'W	e	
4	30/07/62	Hornsund	77°03'N 15°10'E	18/12/62	Napassok, Sukkertoppen (G)	65°00'N 52°20'W	a	
5	05/08/63	Fuglesangen, ad	79°50'N 11°20'E	30/11/66	Atangmik, Sukkertoppen (G)	64°55'N 52°00'W	a	
6	16/07/63	Ariekammen, ad	77°00'N 15°33'E	30/11/63	Napassok, Sukkertoppen (G)	65°00'N 52°20'W	a	
7	27/07/63	Ariekammen, ad	77°00'N 15°33'E	12/07/66	Arsuk, Frederikshåb (G)	61°00'N 48°40'W	a	
8	27/07/63	Ariekammen, ad	77°00'N 15°33'E	20/11/63	Sydpræven, Julianehåb (G)	60°30'N 45°45'W	a	
9	05/08/63	Hyttevika, ad	77°03'N 15°10'E	30/11/66	Atangmik, Sukkertoppen (G)	64°55'N 52°00'W	a	
10	23/07/64	Ariekammen, ad	77°00'N 15°33'E	28/02/65	Ilulilårssuk, Frederikshåb (G)	61°50'N 49°26'W	a	
11	07/08/64	Ariekammen, ad	77°00'N 15°33'E	05/01/66	Igaliko, Julianehåb (G)	60°58'N 45°30'W	b	
12	10/08/64	Ariekammen, pull	77°00'N 15°33'E	04/12/64	Kangâmiut, Sukkertoppen (G)	65°50'N 53°20'W	b	
13	22/07/63	Skoddefjellet, ad	77°02'N 15°29'E	13/12/70	Atangmik, Sukkertoppen (G)	64°55'N 52°00'W	e	
14	06/08/63	Fuglesangen, ad	79°51'N 11°20'E	04/12/69	Godthåb, Godthåb (G)	64°10'N 51°40'W	b	
15	29/07/65	Gulliksenfj., ad	77°03'N 15°10'E	06/03/68	Egilsstadir, Thingeyjars.(I)	65°40'N 14°53'W	c	
16	21/06/78	Ingeborgfj., ad	77°45'N 14°25'E	17/01/80	Manitsoq, Sukkertoppen (G)	65°25'N 53°00'W	b	
17	18/07/78	Ingeborgfj., ad	77°45'N 14°25'E	< Nov '78	Qagssimiut, Julianehåb (G)	60°50'N 47°00'W	b	
18	21/07/84	Ariekammen, pull	77°00'N 15°33'E	15/01/86	Godthåb, Godthåb (G)	64°11'N 51°45'W	b	
19	31/07/84	Ariekammen, ad	77°00'N 15°33'E	03/01/91	Olafsfjordur (I)	66°04'N 18°39'W	d	

Sources: Norderhaug 1967 (rec. no. 1-12); Anker-Nilssen & Jensen 1982 (13-14); Holgersen 1969 (15); Runde 1984 (16); Holgersen 1980 (17); Stavanger Museum (18-19).

(a) Shot or captured by man. No confirmation whether the date given is the date of death.

(b) Shot or captured by man at the date given.

(c) Found dead at the date given. No indication of time of death given.

(d) Found dead at the date given. Reported to be recently dead.

(e) No information about cause of death or whether the date given is the date of death.

from Greenland were shot or captured, except two, for which no information about cause of death was available. The two recoveries from Iceland are from the northern and eastern part of the island; both were found dead.

With one exception, all recoveries were reported from late November to early March (four recoveries in November, six in December, five in January, one in February, one in March and one in July) (Table 1). Most birds were recovered at a relatively early stage after ringing (seven during the first winter after ringing, three in the second, two in the third, one in the third winter or earlier, three in the fourth, two in the seventh, and one in the eighth winter). The oldest recovered individuals were at least 8–9 years old. Of the 11 012 birds ringed in the period 1962–65, 15 were recovered (14 from Greenland and one from Iceland). This gives 0.14% recoveries of the number of ringed birds (0.13% from Greenland). Of the 3151 birds known to have been ringed in the period 1976–92, four were recovered (three from Greenland and one from Iceland), resulting in 0.13% recoveries (0.10% from Greenland). For the whole period 1962–92, 0.13% of the ringed birds have so far been recovered.

DISCUSSION

The recoveries of Little Auks ringed in Svalbard show that at least some birds from this area move southwest in autumn to wintering areas around Iceland and along the coast of southwest Greenland. Probably all recoveries from Greenland are of birds shot or captured. Both present and previous hunting seasons of Little Auks in Greenland extend from late August to early June (Evans 1984, Anon. 1995a). The earliest autumn recoveries are from late November. This indicates that Little Auks need several months to migrate to southwest Greenland after leaving the breeding colonies in Svalbard in August. They may gain some help from the east Greenland Current during this migration (Petersen 1995). The recovery in January from Iceland (no. 19 in Table 1) shows that at least some birds may stop before reaching southwest Greenland. Probably, quite a few birds winter in the outer pack-ice belt along the migration route between Svalbard and southwest Greenland, as suggested by Salomonsen (1967). Brown (1984) found, however, very low densities of Little Auks in the northwest Greenland Sea between Iceland and Svalbard in late February and March. Southeast Greenland is very sparsely populated, even compared with southwest Greenland (Anon. 1995b), so the lack of recoveries from this region does not exclude it as an important wintering area. Both birds recovered in Iceland were found

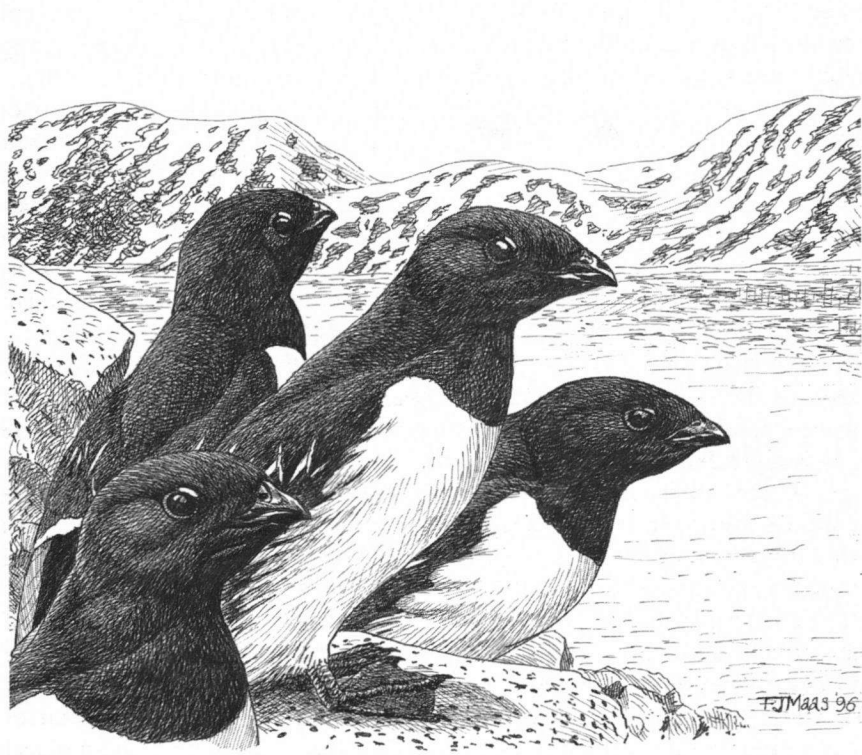
dead, and probably few Little Auks are shot in Iceland. The areas off Iceland and southeast Greenland may consequently be more important as wintering areas than suggested by the proportion of recoveries from these areas.

The drop in number of recoveries from January (five) to February (one) and March (one from Iceland) may indicate that most Little Auks start their migration from southwest Greenland to Svalbard in February. They return in large numbers to the breeding colonies in Svalbard in April, sometimes already in March (Løvenskiold 1964). However, as already noted, Brown (1984) found very low densities between Iceland and Svalbard in late February and March, and he concluded that the majority of the migrants had not reached this area by then.

For many of the recoveries the date of death is not clear (Table 1), but most of the dates given for the Greenlandic recoveries 'do probably not deviate much from the true dates of death (K. Kampp *pers. comm.*). The recovery in July from Greenland (no. 7 in Table 1) might either involve a false date or an individual summering in the area (Norderhaug 1967). There are no or only very few Little Auks breeding in the region where this bird was found (Salomonsen 1981, Evans 1984), so the probability that the bird bred here seems low.

The migration pattern outlined above is undoubtedly correct for part of the population of Little Auks breeding in Svalbard. The proportion of the Svalbard population wintering in Greenlandic waters, and the wintering areas of the rest of the population, are, however, unknown. The aggregation of recoveries along the west coast of Greenland reflects the geographical distribution of hunting of Little Auks. According to recent hunting statistics, less than 5,000 Little Auks were shot in the southern and eastern parts of Greenland in 1993 (Anon. 1995a). How correct this figure is and whether the hunting activity has changed during the last decades is not known, but probably fewer wintering Little Auks are killed now than earlier on in Greenland (K. Kampp *pers. comm.*).

Little Auks are known to winter in the areas around Svalbard (Løvenskiold 1964), in the Barents Sea (Anker-Nilssen *et al.* 1988a, Isaksen 1995), along the Norwegian coast (Follestad *et al.* 1986, Strann *et al.* 1993) and in the North Sea and Skagerrak (Skov *et al.* 1995). The hunt for Little Auks in these areas is very limited and the probability of recoveries of ringed birds from these areas is low. However, in the southern areas a relatively high number of dead Little Auks is occasionally found on beaches, especially in connection with oil spills (*e.g.* Anker-Nilssen *et al.* 1988b, Heubeck *et al.* 1992), but no recoveries of ringed birds have been reported.

Little Auks *Kleine Alken* (F.J. Maas)

Little Auks from the huge breeding colonies in northwest Greenland are known to winter in the areas off Newfoundland, where three recoveries of ringed birds have been reported (Salomonsen 1967, 1979, Stenhouse & Montevocchi 1996; K. Kampp *pers. comm.*). There are no winter recoveries in Greenland of the at least 9000 birds ringed in west Greenland (Salomonsen 1979). Thus, Little Auks from west Greenland and Svalbard seem to winter in separate areas. It is not known where Little Auks from east Greenland winter, as there are no recoveries of the only 100 birds ringed in this region (Kampp *et al.* 1986, K. Kampp *pers. comm.*). It has been speculated that they use the same areas as birds from Svalbard (Salomonsen 1967).

In Russia, there has been some work on Little Auks in colonies both in Franz Josef Land and on Novaja Zemlja (Isaksen & Gavrilov 1996). Unfortu-

nately, none of these studies included ringing activities. According both to the published literature and the inquiries we made, no Little Auks were ringed in any of the Russian colonies (Moscow Ringing Scheme; L. Stempniewicz *pers. comm.*). Little Auks from these areas seem, at least to some extent, to winter in areas relatively near the breeding colonies (see Brown 1985 and Isaksen & Gavrilo 1996). It has, however, also been suggested that Little Auks from these areas may migrate south along the Norwegian coast and winter in more southern areas (*e.g.* Norderhaug *et al.* 1977).

The Little Auks breeding in Franz Josef Land belong to the larger subspecies *Alle a. polaris*. Despite a considerable overlap in biometrical measures, a large part of these birds may be distinguished from the nominate subspecies inhabiting the rest of the species' distribution range (the taxonomic status of the Little Auks breeding on Severnaja Zemlja is unknown) (Stempniewicz *et al.* 1996). Little Auks of the nominate subspecies from Svalbard may attain maximum wing length of at least 134 mm (Bédard 1985, Isaksen unpubl. data). Very few birds larger than this have been found in Skagerrak or in the North Sea (*cf.* Vaurie 1965, Jones *et al.* 1985, Camphuysen 1986, Anker-Nilssen *et al.* 1988b, Heubeck & Suddaby 1991). The population of the nominate subspecies in Russia (Novaja Zemlja and, possibly, Severnaja Zemlja) is relatively small, probably less than 150 000 pairs (Golovkin 1984, Isaksen & Gavrilo 1996). This indicates that at least part of the large number of Little Auks that have been estimated to winter in the North Sea and Skagerrak (see Skov *et al.* 1995) stems from breeding areas outside Russia.

Further studies are obviously needed to clarify migration patterns and wintering areas of Little Auks from the different breeding populations. The chance of recoveries of ringed birds is very small for most areas, especially offshore. Ringing will therefore probably never give a representative picture of the migration routes and winter distribution of populations of this species. To gain a significantly better understanding of these issues, further work on biometry and genetics of birds from different breeding and wintering areas is required; in the future also in combination with the use of satellite telemetry or other automated positioning devices.

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SAMENVATTING

In de jaren 1962-96, werden op Spitsbergen, vooral in Hornsund, Bellsund en op NW Spitsbergen, Kleine Alken geringd. Het aantal geringde exemplaren verschilde sterk van jaar tot jaar. In de jaren 1962-65 werden 11 012 exemplaren geringd, in 1976-78 800 stuks, in 1983-88 1950 stuks, en in 1990-94 nog eens 1300 dieren. In totaal werden buiten de Svalbard archipel 19 Kleine Alken teruggemeld (geschoten of gevonden), waarvan 17 uit ZW Groenland en twee op IJsland (Tabel 1). Geconcludeerd wordt, dat op zijn minst een deel van de vogels van Spitsbergen overwinteren langs de kust van ZW Groenland, maar dat de terugmeldingen een afspiegeling zijn van de intensieve jacht op zeevogels in dat gebied. Zo is de terugmeldingskans in het veel dunner bevolkte ZO Groenland aanmerkelijk geringer. In grote delen van het potentiële overwinteringsgebied van Kleine Alken, zoals rond IJsland, voor de Noorse kust en in de Noordzee, lijkt de terugmeldingskans een stuk kleiner te zijn. Ondanks dat er de laatste tijd wel onderzoek aan Kleine Alken wordt gedaan op Russische kolonies zijn hierbij geen vogels geringd. Verder onderzoek is gewenst om de grotendeels onbekende trekwegen van de Kleine Alk in kaart te brengen en de herkomst van vooral de vogels rond Noorwegen en in de Noordzee te leren kennen.

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