

# Birds and (marine) mammals in Svalbard, 1985-91

## *Vogels en (zee-)zoogdieren op Spitsbergen, 1985-91*

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### Introduction

In 1964, Løvenskiold published his now classic work *Avifauna Svalbardensis* and an excellent overview was provided of the avifauna of this high arctic archipelago. This review made very clear what was known of the avifauna, but also what was unknown and how incomplete certain areas were surveyed. The information on status, numbers and distribution of seabirds appeared to be insufficient to fully appreciate the importance of Svalbard. Publications of De Korte (1972abc), Norderhaug *et al.* (1977), Mehlum & Fjeld (1987), Norderhaug (1989) and Mehlum (1989) have shown that more information is now available, but also that large gaps in our knowledge still occur. Moreover, it appeared that information on seabirds is mainly collected at few, relatively often visited sites, whereas other sites were seldom studied, while even the most basic information (presence as a breeding species, number of pairs) was missing. Recent reviews of the status of seabirds in the North Atlantic (Evans 1984, Mehlum & Fjeld 1987, Grimmett & Jones 1989) have clearly demonstrated how poor and incomplete the information on seabirds at high latitudes was and still is.

As a tourist guide onboard the expedition vessel MV *Plancius*, between 1985 and 1990, the opportunity arose to obtain a good impression of the flora, fauna and avifauna of Svalbard, particularly of West Spitsbergen, the largest island of the archipelago. On 57 different locations on West Spitsbergen, Prins Karls Forland, Nordaustlandet, Barentsøya and Edgeøya, parties were landed and data were collected (figure 1). During field expeditions in Kongs-

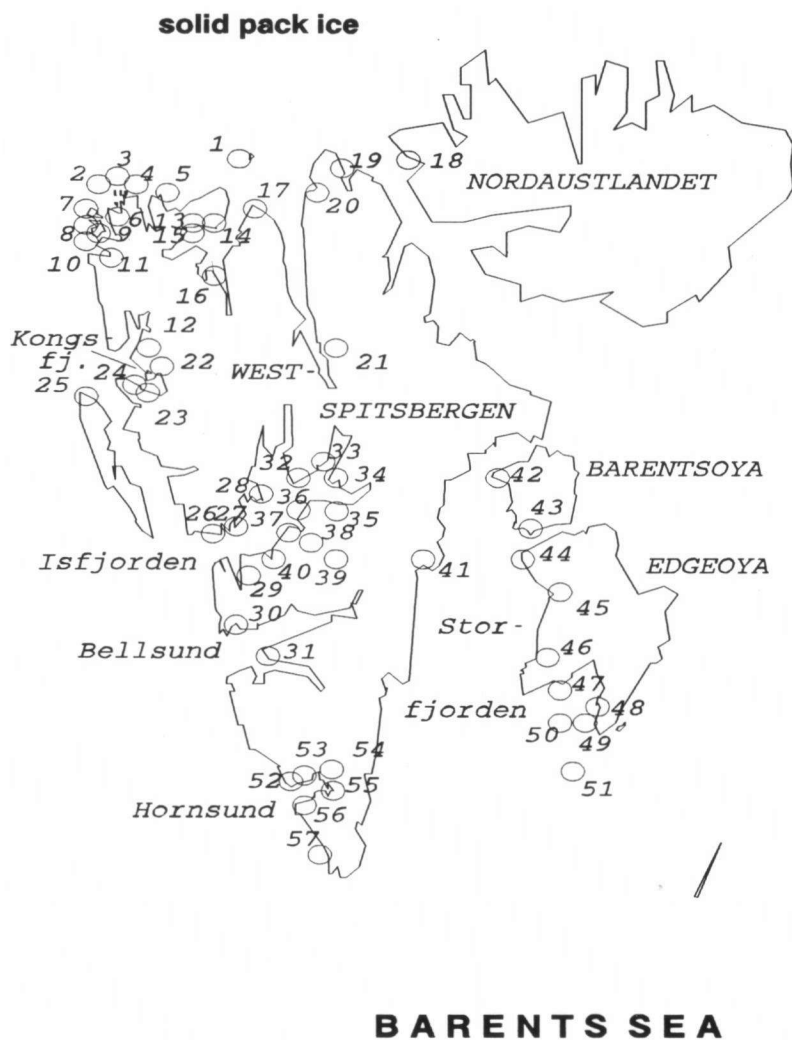


Figure 1. Landing places in Svalbard, 1985-90 (see table 1).

Figuur 1. Landingsplaatsen op Spitsbergen (zie tabel 1.)

Table 1. Landing places in Svalbard (see figure 1).

Tabel 1. Landingsplaatsen op Spitsbergen (zie figuur 1).

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1	Moffen	30	Van Muydenbukta (Bellsund)
2	Fuglesangen (Fair Haven)	31	Midterhuken
3	Klovningen	32	Kapp Thordsen (Isfjorden)
4	Ytre Norskøya	33	Skansbukta
5	Biskajerhuken	34	Gipsvika
6	Fyglepynten	35	De Geerdalen, Diabasodden
7	Smeerenburg, Amsterdamøya	36	Carolinedalen
8	Danskøya (Danskegattet)	37	Vestpynten, Bjørndalen
9	Danskøya (Sørgattet)	38	Longyearbyen
10	Moseøya (Sørgattet)	39	Adventdalen
11	Magdalenafjorden	40	Colesbukta
12	Fjortende Julibreen (Krossfjorden)	41	Agardhbukta (Storfjorden)
13	Reinsdyrflya (Liefdefjorden)	42	Mistakodden (Barentsøya)
14	Worsleyneset	43	Sundneset
15	Andøya	44	Kapp Lee (Edgeøya)
16	Bockfjorden (Woodfjorden)	45	Diskobukta
17	Gråhuken	46	Habenichtbukta
18	Kinnvika (Nordaustlandet)	47	Risetreppen
19	Sorgfjorden	48	Andreetangen
20	Mosselbukta (Wijdefjorden)	49	Delitschøya
21	Austfjordneset	50	Zieglerøya
22	Blomstrandhalvøya (Kongsfjorden)	51	Bolscheøya)
23	Ny Ålesund	52	Isbjørnhamna (Hornsund)
24	Brandalpynten	53	Sofiekammen
25	Fuglehuken (Prins Karls Forland)	54	Adriabukta
26	Alkhornet/Trygghamna (Isfjorden)	55	Treskelen/Brepollen
27	Erdmanflya	56	Gåshamna
28	Bohemanflya	57	Stormbukta
29	Barentsburg		

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fjorden (1988) and in Isfjorden (1987-90), the opportunity was taken to study seabirds for longer periods.

Although nature tourism is gaining importance rapidly in Svalbard, it can still not be considered a very busy place. Since very few visitors make systematic notes on what they encounter during their stay and because few persons have the possibility to visit Svalbard again and again and, hence, experience the striking differences between years, it was considered valuable to publish the results obtained during five years of summer visits. A list of species of birds and (marine) mammals observed during the summers of 1985-91 is given, focussing on seabird distribution. Differences in breeding success and (local) abundance of species between years are described. During summer 1985-90 observations were collected by the author. Jurren Koerts

(JK) collected additional information in Sassendalen (Isfjorden, to the east of no. 35 in figure 1) between 9 July and 3 August 1989. Bram Couperus (BC), as a crew member of MV Plancius, collected some data in summer 1990 (25 June-8 September) and made more extensive notes during landings on Spitsbergen, in Tusenøyane and on Nordaustlandet in 1991. Gepke Jonker (1987-89) and Jan den Ouden (1990) assisted during expeditions at Brandalpynten, Carolinedalen, Vestpynten en Alkhornet (table 1). Additional data were collected by David Boertman (DB), Michel Broersen (MB), Rinie van Meurs, Jaap Taapken (JT) and Jan Andries van Franeker (cetaceans, 1984, JAF).

## Methods

The author made constant notes of all birds and mammals, including species, time of day, location (or geographical position), number, and details on behaviour, breeding status, chicks or clutch, food and plumage. Only of the very common landbirds and terrestrial mammals (Snow Bunting *Plectrophenax nivalis*, Purple Sandpiper *Calidris maritima*, and Reindeer *Rangifer tarandus*) notes were not always complete. Of divers, waterfowl, the other waders, skuas, scarcer species of gulls, seals, cetaceans, Arctic Fox *Alopex lagopus* and Polar Bears *Ursus maritimus* it was tried to record each individual sighting. Besides notes on the presence or absence of birds and mammals, descriptions were made of weather conditions and sea ice each few hours. The observer effort is expressed as 'number of field hours' and summarised in a 1°lat. x 2.5°long. grid (figure 2). As a result of the expeditions at Brandalpynten, Carolinedalen, Vestpynten and Alkhornet, meant to study the diet of Fulmars *Fulmarus glacialis*, the number of field hours is relatively large in Kongsfjorden and Isfjorden. Information collected at sea while steaming towards Spitsbergen or around the archipelago is included and again expressed with respect to the number of hours 'on watch'. To correct for observer effort, the distribution is sometimes summarised in the grid as 'number of individuals per 100 hours of observation'. Unfortunately, observer effort is not known for the 'additional' sightings provided by Jurren Koerts (1989) and Bram Couperus (1990-91) and their data are therefore not included on maps which were corrected for effort. It is important to know that the east coast of Spitsbergen, Edgeøya, Barentsøya and Tusenøyane were not visited before the end of July, whereas the west coast and northern half of West Spitsbergen were usually visited between late June and mid-July. Obviously, with Longyearbyen as 'home port', Isfjorden was visited very often and throughout the season.

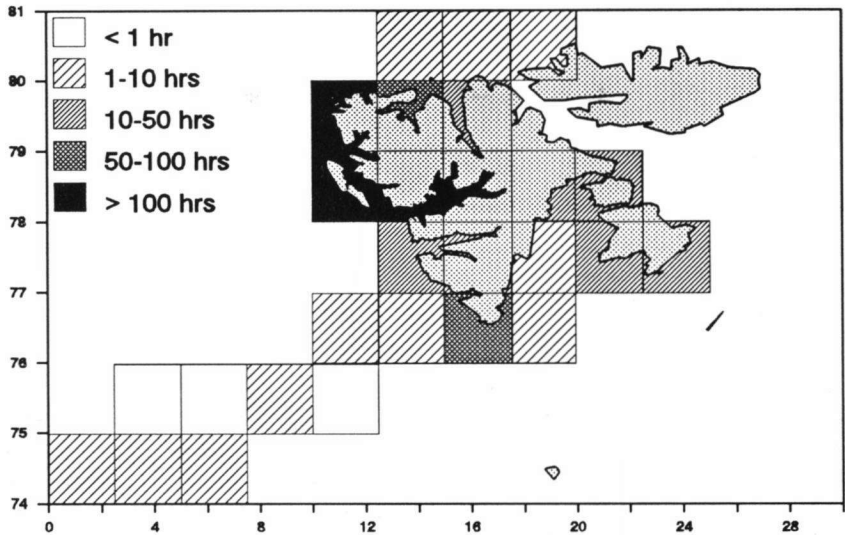


Figure 2. Observer effort in Svalbard (number of field hours), 1985-90.

Figur 2. Waarnemingsinspanning op Spitsbergen (aantal velduren), 1985-90.

### Species list (1) Birds

As background information, the status of birds in Svalbard is indicated based on Mehlum (1989) and Norderhaug (1989), using the following symbols:

- common breeding species (> 1000 pairs)
- regular breeding species (< 1000 pairs)
- irregular breeding species
- common visitor
- irregular visitor
- ◇ scarce visitor (5-10 sightings)
- △ vagrant (1-4 sightings)
- ? status unknown, probably rare

● **Red-throated Diver** *Gavia stellata* A common breeding species of small ponds in the tundra near the coast (figure 3). Displaying birds were frequently seen, either engaged in aerial courtship or while in the breeding pond or at sea. Most sightings were feeding flights of adult breeding birds from the

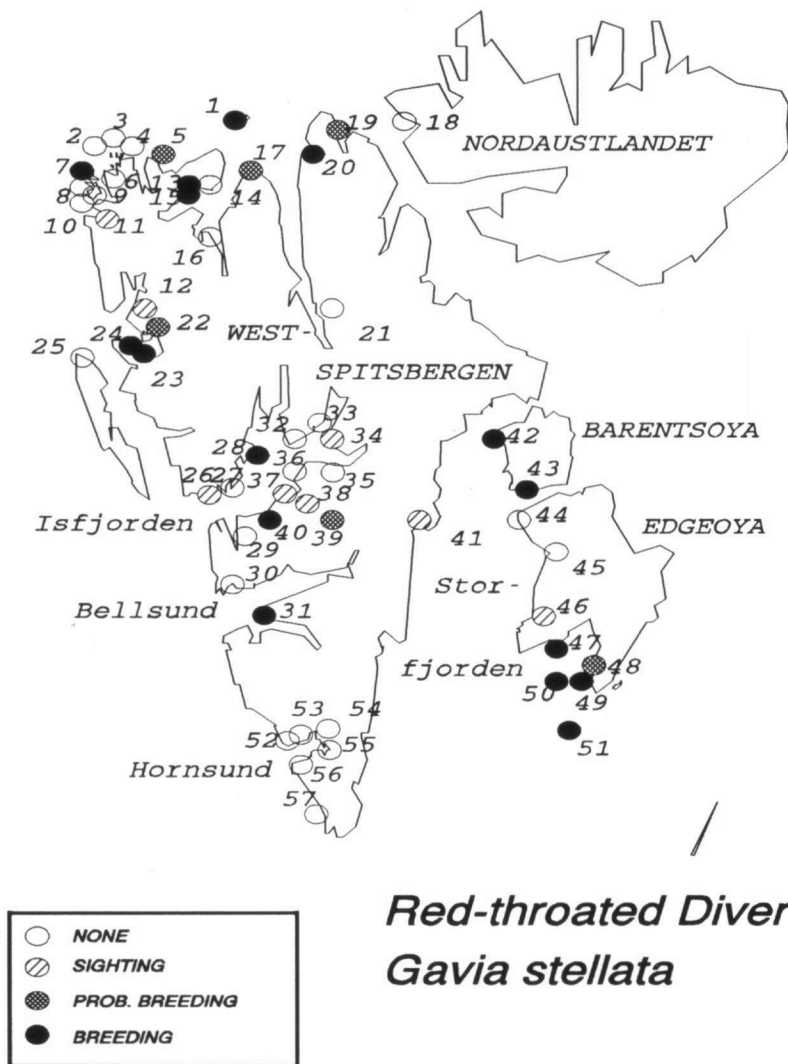


Figure 3. Breeding distribution of Red-throated Divers in Svalbard, 1985-90.

Figuur 3. Verspreiding van broedende Roodkeelduikers op Spitsbergen, 1985-90.

breeding pond to sea or *vice versa*. Most ponds were too small to possibly hold more than one breeding pair. Red-throated Divers were remarkably numerous near Andreetangen (Edgeøya), particularly at the tiny nearby islands Delitschøya, Zieglerøya and Bolscheøya (nos. 48-51, figure 1). On each of the islands Red-throated Divers were found breeding, with some 8-10 and 4-6 pairs respectively at Zieglerøya and Bolscheøya. During 1985-89 only a single chick was observed (5 August 1989, Mistakodden, 1 pair with small downy young). In 1990, however, several pairs with 1-2 chicks were observed. The impression was, that 1990 was a very successful year for most tundra breeding waterfowl and divers. A list of the pairs with young birds in 1990:

Amsterdamøya, 24 July 1990 1 adult, 1 pullus  
 Reinsdyrflya, 25 July 1990 1 pair, 1 pullus  
 Mosselbukta, 27 July 1990 1 pair, 2 pulli; 1 adult, 1 pullus  
 Ny Ålesund, 23 July 1990 1 adult, 1 pullus  
 Sundneset, 11 August 1990 2 pairs, 2 pulli (each 1?)  
 Risetreppen, 7 August 1990 1 pair, 2 pulli  
 Delitschøya, 8 August 1990 1 adult, 2 pulli  
 Zieglerøya, 9 August 1990 3 pairs, 3 pulli (each 1); 2 pairs, 4 pulli  
 Bolscheøya, 9 August 1990 1 pair, 2 pulli; 1 pair, 1 pullus

In 1991 an adult with pullus was seen at Russeøya, near Murchisonbukta (Nordaustlandet; BC).

● **Fulmar *Fulmarus glacialis*** Locally a common breeding species of high, inaccessible cliff sections (often 400-500 m above sea level) near the coast or further inland. Several tens of pairs were nesting near Austfjordneset (Wijdefjorden, 7 July 1988, 21 July 1989) and in Mosselbukta (8 July 1988). The colonies at Alkhornet were carefully counted early July 1990 and were found to hold 415 AON (Apparently Occupied Nests) in scattered pairs along the south face and 33 AON at the north face. Hundreds of pairs were nesting at Fuglehuken, and substantial colonies, not counted during our visits, were present at Skansen and in Gipsvika (thousands of pairs, 30 June 1985, 22 June 1986). Prospecting Fulmars were observed at several coastal seabird colonies (e.g. Fuglesangen, Klovningen, Ytre Norskøya, Redingerpynten), but breeding could not be confirmed. At least 99% of the population is 'coloured' (phase L, D or DD, according to Van Franeker & Wattel 1982).

The largest colonies are deep in fjords (figure 4), so that breeding birds have to perform feeding trips of a length of 100-200 km to reach open sea (figure 5). Feeding flights of Fulmars are a common feature in Svalbard. With head-winds, Fulmars stream along the low cliffs of most fjords, with

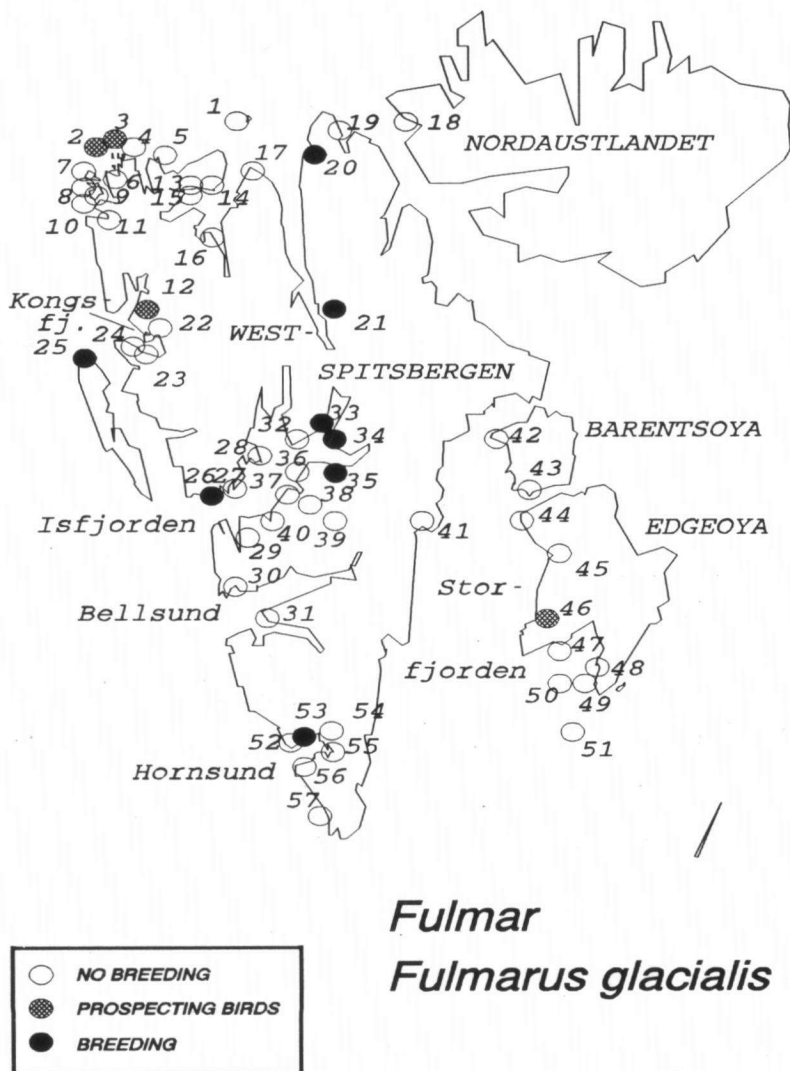


Figure 4. Colonies of Fulmars in Svalbard, 1985-90.

Figuur 4. Kolonies van Noordse Stormvogels op Spitsbergen 1985-90.



tail-winds they cruise at greater height over the centre of fjords. Feeding flights occurred over land in valleys and over glaciers, enabling Fulmars to feed in other fjord systems. Feeding Fulmars were observed at a variety of places: near pebble beaches with strong winds from land (upwelling zooplankton), near glacier fronts, around large boulders in the sea at rising tide, in the middle of fjords, near ice edges, at trawlers, at cruise vessels (sewage and kitchen leftovers), scattered at open sea and concentrated near the shelf edge in the Greenland Sea and western Barents Sea.

The diet of Fulmars in Svalbard consisted mainly of zooplankton (adult birds and non-breeders) and fish (most often in loads brought to the chick). Important prey species in 1988-90 were crustaceans (*Parathemisto libellula*, *P. abyssorum*, *Gammarus* spp., *Thyssanoessa*, Euphausiacea, Decapoda), pteropods (*Limacina* spp.), annelida (*Nereis* spp.), chaetognatha (*Sagitta elegans*), squid and fish (*Mallotus villosus*, *Sebastes* spp., *Benthosema glaciale*). Plastic particles were frequently recorded, both in stomachs and in regurgitated food of some 300 birds that were forced to release the contents of the proventriculus. Offal and discards are probably unimportant as prey in Svalbard, although commercial trawlers are quite common in these waters. Fulmars caught near shellfish trawlers off northwest Spitsbergen had been feeding on zooplankton and Fulmars carrying fish loads in the proventriculus

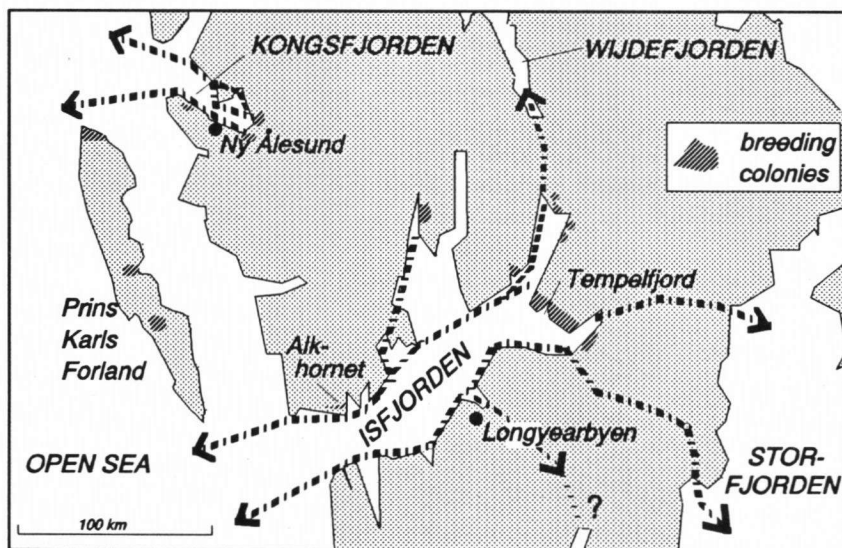


Figure 5. Feeding flights of Fulmars in Isfjorden and Kongsfjorden.

Figuur 5. Voedselvuchten van Noordse Stormvogels in Isfjorden en Kongsfjorden.

(heading for the colony), had been fishing themselves at small shoaling fish. A leucistic Fulmar was spotted on three occasions during the stay at Alkhornet in 1990.

△ **Gannet** *Sula bassana* Three sightings, all immatures: 15 June 1986 (75° 07'N, 04°16'E), 26 June 1989 (off Amsterdamøya, 79°48'N, 10°20'E; JK) and 7 August 1990 (near Risetreppen (Edgeøya), 77°23'N, 20°58'E; DB).

□ **Whooper Swan** *Cygnus cygnus* 26 July 1991, 1 adult, Habenichtbukta, (BC).

● **Pink-footed Goose** *Anser brachyrhynchus* Commonly breeding at Redingerpynten (Krossfjorden), Fuglehuken (Prins Karls Forland), Alkhornet (Isfjorden). Large groups were seen at Reinsdyrflya and on islets in Woodfjorden: on 4 July 1988, 97 individuals at Andøya, a total of 204 adults in wing moult (no chicks seen) on 18 July 1989 at Reinsdyrflya, 600 moulting geese on small islands off Reinsdyrflya on 19 July, on 25 July 1990 at the same locality some 180 moulting geese and another 310 individuals on nearby Ringholmen. In Mosselbukta, large numbers of shed primaries were found on the beach, while 98 geese in compact groups were seen running away over the tundra. Some 70 Pink-footed Geese were seen running over the tundra in Sorgfjorden (29 July 1990).

● **Barnacle Goose** *Branta leucopsis* A common breeding species and an extremely shy one, except in Ny Ålesund village, where Barnacle Geese breed commonly but are found feeding with chicks at the roadside. At Moffen, 22 July 1989, a group of 150 individuals (including many downy young) were observed. Other counts of substantial numbers of adults with pulli:

10 July 1988, 20 adult, 19 pulli, Smeerenburg, Amsterdamøya  
 14 July 1989, 119 adult, 37 pulli, in and near Ny Ålesund  
 24 July 1989, 38 adult, 38 pulli, Smeerenburg, Amsterdamøya  
 23 July 1990, 56 adult, 41 pulli, Ny Ålesund  
 24 July 1990, 58 adult, 71 pulli, Smeerenburg, Amsterdamøya  
 24 July 1990, 6 adult, 11 pulli, Danskøya

● **Brent Goose** *Branta bernicla hrota* Locally a common breeding species, but much less frequently seen than the other two species of geese. At Moffen on 24 July 1990 71 adult and 50 pulli were observed (one year earlier only Barnacle Geese were seen here). Ten adults were feeding at Ytre Norskøya,

02 July 1988. A large group (69 individuals, including 4 pulli) at Ludwigsøyane, just south of Edgeøya, 8 August 1991 (BC). Sixteen adults at Bolscheøya, that same day. Five more adults on a small islet near Andreetangen, 14 August 1991 (BC).

□ Teal *Anas crecca* Two pairs in Ny Ålesund village, 25 June 1989. Records of this small duck are not unusual at Spitsbergen and in 1938 a female was flushed from a nest in Ny Ålesund (Løvenskiold 1964, Norderhaug 1989).

Δ Shoveler *Anas clypeata* A female in Ny Ålesund, 23-24 June 1989, on a little pond with some phalaropes *Phalaropus* spp. and Long-tailed Ducks *Clangula hyemalis*. Previously, Shovelers had only been reported three times at Spitsbergen (Norderhaug 1989).

● Eider *Somateria mollissima* Very common and widespread breeding species. At Ytre Norskøya, large numbers of nests on wet tundra appeared to be predated by Arctic Fox (28 June 1989). Large creches at Smeerenburg (Amsterdamøya) on 24 July 1990 (71 ♀♀, 206 pulli). Locally, high numbers of moulting non-breeding birds were seen:

27 June 1989, 158 ♂♂, 8 ♀♀, Danskøya

27 June 1989, 82 ♂♂, 55 ♀♀, 90 unsexed, Amsterdamøya

01 July 1989, 74 adult ♂♂, 43 ♀♀, Danskøya, >150 Magdalenafjord

22 July 1989, 111 adult ♂♂, 60 ♀♀, Gråhuken (Woodfjorden)

25 June ) 18 July 1990, maximum 357 ♂♂ in one group, Alkhornet (Isfjorden),  
feeding socially, surfacing individuals were often attacked by Glaucous  
Gulls *Larus hyperboreus*

24 July 1991, some 300 individuals, mixed with Long-tailed Ducks and King  
Eiders *Somateria spectabilis*, Stormbukta (BC).

● King Eider *Somateria spectabilis* Scarce breeding species. At Alkhornet (Isfjorden) in 1990, small groups were seen daily. Other records:

19 June 1986, 43 individuals Ymerbukta (Isfjorden)

22 June 1989, 2 adult ♂♂, 3 ♀♀, Alkhornet (Isfjorden)

03 July 1988, 49 adult ♂♂, 14 ♀♀, Reinsdyrflya

16 July 1988, 5 adult ♂♂, Brandalpynten (Kongsfjorden)

19 July 1988, 11 adult ♂♂, 1 imm. ♂, 2 ♀♀, Brandalpynten (Kongsfjorden)

22 July 1988, 6 adult ♂♂, Brandalpynten (Kongsfjorden)

20 July 1988, 4 adult ♂♂, Brandalpynten (Kongsfjorden)

26 June 1989, 5 adult ♂♂, 3 imm. ♂♂, 3 ♀♀, Fjortende Julibreen

◇ **Steller's Eider** *Polysticta stelleri* An adult ♂ Trygghamna (Alkhornet), 25 June 1990.

● **Long-tailed Duck** *Clangula hyemalis* Common breeding species. Socially feeding flocks of 29 and 49 individuals in bays at Reinsdyrflya, 18 July 1989, 31 individuals in a bay in Mosselbukta, 08 July 1988. A moulting group in Stormbukta, approximately 600 individuals, mixed with Eider and King Eiders, 24 July 1991 (BC).

● **Ptarmigan** *Lagopus mutus hyperboreus* Common breeding species. Not very often seen, but droppings on dry tundra and hills indicate that these birds are numerous (Magdalenafjord, Fjortende Julibreen, Ny Ålesund, Wijdefjord, Tempelberg, Diabasodden, Skansbukta).

△ **Coot** *Fulica atra* An old corpse near the den of an Arctic Fox at Andreetangen (Edgeøya), 8 August 1990. This species was once recorded before; in 1969, also a corpse, near Ny Ålesund (Norderhaug 1989).

● **Ringed Plover** *Charadrius hiaticula* Locally common breeding species. Two pairs with pulli on 21 July 1989, Austfjordneset (Wijdefjorden). Records of larger groups:

25 June 1989, 4 adult, Ny Ålesund

20 July 1989, 5 adult, Bockfjorden

24 July 1990, 14 adult feeding, Smeerenburg, Amsterdamøya

○ **Golden Plover** *Pluvialis apricaria* An adult summer plumage individual, Alkhornet (Isfjorden), 16 July 1990.

○ **Knot** *Calidris canutus* Few records. Six feeding on mudflat, Sassendalen, 15 July 1989 (JK), one moulting individual, Amsterdamøya, 24 July 1990.

● **Sanderling** *Calidris alba* Scarce breeding species. Three records of summer plumage adults at Amsterdamøya (27 June 1989, 24 July 1990 (3)) and Andreetangen (Edgeøya; 31 July 1989). In Sassendalen, on 15 July 1989, feeding individuals (JK) and three more on 16 July 1989, same spot. An adult individual showed territorial behaviour at Kapp Belvedere (Isfjorden; 29 July 1989, JK). On Reinsdyrflya, 25 July 1990, an alarming couple with 3 pulli was found. Two more sightings in 1991: two feeding individuals in Habenichtbukta (Edgeøya) 26 July 1991, two feeding in Augustabukta (BC).

● **Purple Sandpiper** *Calidris maritima* Very common and widespread breeding species. Many colour ringed adults were seen at Brandalpynten in 1989 and 1990, but these were ringed in nearby Ny Ålesund. At Smeerenburg, Amsterdamøya, 24 July 1990, 60 summer plumage individuals were seen feeding, 20 moulting birds were seen on the same spot one year earlier. A flock of 40 was seen feeding on pebble beaches, Stormbukta, 24 July 1991 (BC).

● **Dunlin** *Calidris alpina* Locally common breeding species, (Adventdalen, Ny Ålesund) scarce elsewhere.

□ **Whimbrel** *Numenius phaeopus* On 21 June 1989 one feeding in Long-yearbyen. 2 July 1989 two at Fuglehuken, Prins Karls Forland. Three feeding on mudflats, Sassendalen, 15-16 July 1989 (JK).

● **Turnstone** *Arenaria interpres* Scarce breeding species. Territorial behaviour of adults seen at Andøya, 4 July 1988. One pair with at least one chick in Mosselbukta, 08 July 1988; two pairs (1 of which with 4 pulli) in Mosselbukta on 27 July 1990. At least two pairs breeding near Ny Ålesund (11 July 1988, 23 June 1989).

○ **Red-Necked Phalarope** *Phalaropus lobatus* An adult ♀, 24 June 1989, Ny Ålesund in a small pond with several Grey Phalaropes.

● **Grey Phalarope** *Phalaropus fulicarius* Common breeding species at Bohemanflya (Istjorden) and Ny Ålesund. At Bohemanflya, at least 40 adults were found on a single visit (20 June 1986, 21 June 1987). During these visits, when the wet tundra was still partly snow covered and completely soaked and while adult ♀♀ were very active with courtship displays, incubating males were found with clutches of 3 and 4 eggs. Other records:

19 June 1987, 1 adult flying, Diabasodden

08 July 1988, 1 adult ♀ flying, Mosselbukta

28 June 1989, 2 adult ♀, feeding in surf, Ytre Norskøya

02 August 1989, 1 adult ♀, attacked by Arctic Skua *Stercorarius parasiticus*, Habenichtbukta

25 July 1990, 1 adult ♂, feeding in pond, Reinsdyrflya

14 August 1991, 1 adult with pulli, Zieglerøya (BC).

□ **Pomarine Skua** *Stercorarius pomarinus* Pomarine Skuas were rather scarce in most seasons, and most frequently seen at sea:

16 June 1986, 1 imm. light phase, 76°24' 11°05'  
16 June 1987, 2 adult light phase, 74°00'N, 01°0' 7'  
17 June 1987, 1 adult light phase, 76°42'N, 13°37'  
16 July 1989, 1 adult light phase, Sassendalen (JK)  
17 July 1989, 1 imm. light phase, 79°55'N, 14°00'E  
22 July 1989, 1 adult light phase, 79°55'N, 14° 25'  
23 July 1989, 2 adult light phase → W, Sassendalen (JK)

However, an influx, mainly of immature birds, occurred in 1990. Single skuas were seen at Fuglehukken (imm., 22 July), in Danskegattet near Amsterdamøya (24 July), off Ytre Norskøya (adult dark phase, 30 July) and at sea off Prins Karls Forland (78°22'N, 10°52'E, 78°24'N, 10°48'E, immatures, 18 August, BC). Small groups were seen around Moffen (4 imm. 24 July, 3 individuals 19 August, BC), in Sorgfjorden (3 imm., 29 July), off Prins Karls Forland (78°32'N, 10°25'E, 2 imm., 18 August, BC), between Verlegenhukken and Nordaustlandet (2 adult light phase, 2 imm., 28 July), at the pack ice edge north of Spitsbergen (80°23'N, 16°10'E, 4 imm., 29 July), at Andreetangen (3 imm., 8 August), and Bolscheøya (2 imm., 9 August). Small groups of immatures, totalling 16 individuals, were seen along the pack ice edge, off northern Spitsbergen (80°38'N, 14°50'E, 29 July). Between Risetreppen and Andreetangen, 7 August 1990, 5 immatures (1 dark phase, 4 light phase) and 1 adult light phase Pomarine Skuas were seen. Larger groups, in fact roosts on the tundra, were seen in Hornsund at Isbjørnhamna (7 imm., 5 August), at Zieglerøya (26 imm., 9 August), and at Helvetesflya (19 imm., 21 August, BC). At most roosts, large numbers of feathers (moulting birds) and pellets were found.

• *Arctic Skua Stercorarius parasiticus* Arctic Skuas were common and widespread as breeding birds on coastal tundras (figure 6). Of all individuals recorded during landings, 97.4% were light phase adults ( $n = 455$ ). The remaining 12 birds were adult dark phase individuals (2.6% of which three sightings were probably referring to the same individuals). Five of them were paired to light phase adults at firmly established territories (Reinsdyrflya, Fjortende Julibreen, Brandalpynten, Adventfjorden, and Hornsund). In Kongsfjorden (around Ny Ålesund, at Brandalpynten and at Blomstrandhalvøya), several nests were on ancient skua mounts in wet tundra, as described by Van der Knaap (1989), and easy to locate. However, several of these mounts were only in use as 'look-out' post. Arctic Skuas were widespread, but numbers were small and they occurred mainly in inshore waters (figure 7). Few Arctic Skuas were seen far out at sea and numbers were low at the

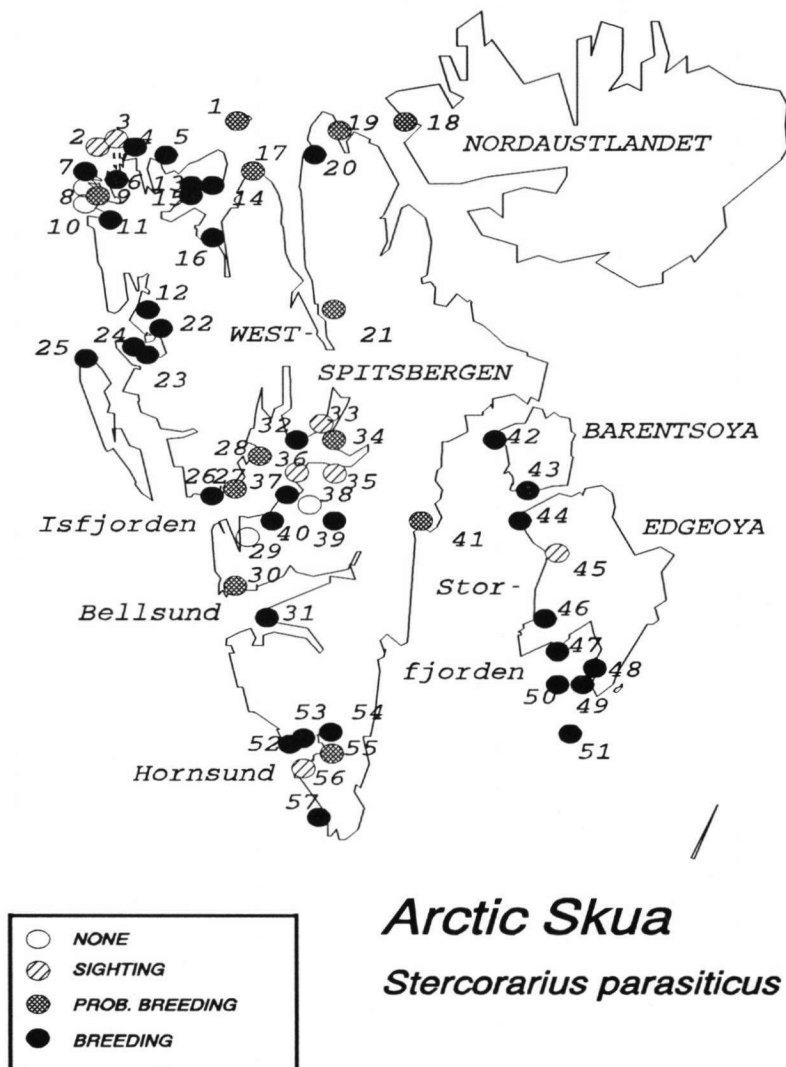


Figure 6. Breeding distribution of Arctic Skuas in Svalbard, 1985-90.

Figuur 6. Verspreiding van broedende Kleine Jagers op Spitsbergen, 1985-90.

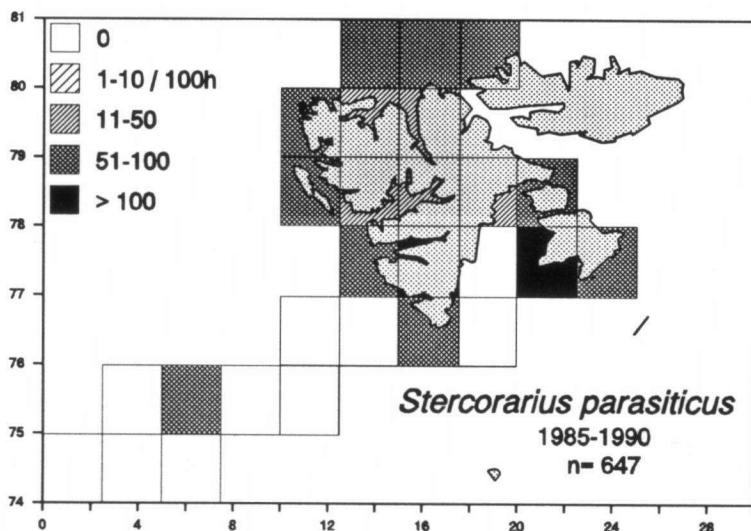


Figure 7. Relative abundance of Arctic Skuas in Svalbard (n/100 hours), 1985-90.  
 Figuur 7. Waarnemingen van Kleine Jagers rond Spisbergen (n/100u), 1985-90.

ice edge north of Spitsbergen. Territorial Arctic Skuas were seen to attack any other seabird species, including Great Skua *Catharacta skua*, Glaucous Gull, Great Black-backed Gull *Larus marinus* and Pink-footed Geese), or mammals (Arctic Fox, Reindeer, Polar Bear), intruding the territory. Kleptoparasitism was recorded very frequently, with Purple Sandpiper, Grey Phalarope, Pomarine Skua, Ivory Gull *Pagophila eburnea*, Kittiwake *Rissa tridactyla*, Arctic Tern *Sterna paradisaea*, Black Guillemot *Cephus grylle*, and Snow Bunting as victims. Arctic Skuas chasing Black Guillemots were most frequently seen at Edgeøya and Barentsøya, particularly near colonies of Black Guillemots in canyons at Risetreppen and near low cliffs in Habenichtbukta and Sundneset. The skuas would simply await the auks on the foreland tundra, and vigorously chase the birds coming in with fish for the chick.

○ **Long-tailed Skua** *Stercorarius longicaudus* Probably breeding Austfjordneset (Wijdefjorden, 7 July 1988, 2 adult light phase territorial behaviour; 21 July 1989, 3 adult light phase) and Blomstrandhalvøya (Kongsfjorden, 25 June and 15 July 1989, 2 adult light phase at a very old skua mount; cf. Van der Knaap 1989). Breeding was confirmed when a chick was found at Blomstrandhalvøya on 23 July 1990. Large numbers of migrating Long-tailed



Skuas were recorded on 28 July 1990, between Verlegenhukken and Murchisonfjord (Nordaustlandet), where 42 individuals (4 adult light phase, 38 immatures) moved →N. Other sightings:

- 12 July 1988, 1 adult light phase W, Ny Ålesund
- 10 July 1989, 1 ex., Sassendalen (JK)
- 13 July 1989, 3 ex. →E, Sassendalen (JK)
- 16 July 1989, 2 feeding on tidal mud flat, Sassendalen (JK)
- 20 July 1989, 1 ex., Sassendalen (JK)
- 23 July 1989, 1 adult light phase near ice edge (80°42'N, 13°59'E)
- 21 July 1989, 2 ex., Sassendalen (JK)
- 30 July 1989, 2 adult, Sassendalen (JK)
- 01 August 1989, 2 adult feeding on insects at tundra Sassendalen (JK)
- 29 June 1990, 1 adult light phase, Alkhornet (Isfjorden)
- 07 August 1990, 1 adult light phase, off Risetreppen (Edgeøya)
- 18 August 1990, 1, 78°32'N, 10°25'E (BC)
- 25 June 1991, Bohemanflya, 1 flying along (BC)

○ **Great Skua** *Catharacta skua* Great Skuas recently colonised Svalbard and sightings are now quite common (Vader 1980, Vader *et al.* 1992). Single individuals or small groups can be seen in most places, but most frequently off NW Spitsbergen (figure 8). During expeditions at Brandalpynten (Kongsfjor-

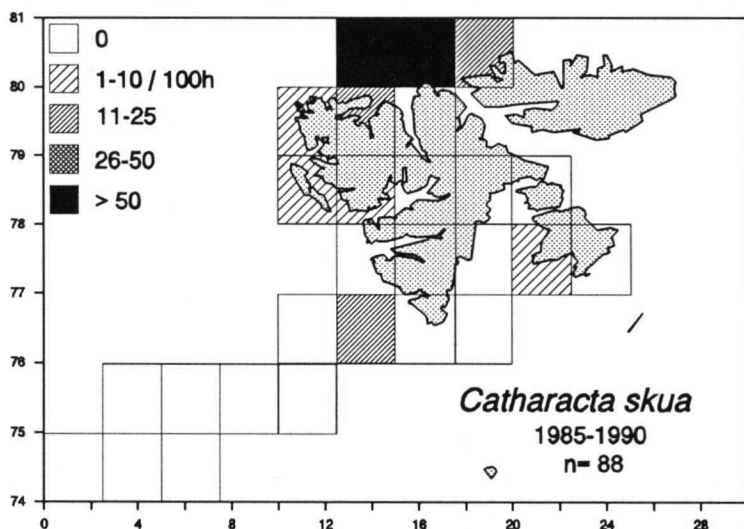


Figure 8. Relative abundance of Great Skuas in Svalbard (n/100h), 1985-90.

Figuur 8. Verspreiding van Grote Jagers rond Spitsbergen (n/100u), 1985-90.

den) in 1988 and at Alkhorner in 1990, single Great Skuas were seen almost daily. At Moffen, solitary individuals were seen in July 1989 and 1990, one of which was wearing a yellow colour ring. On 28 July 1990, nine individuals were observed when sailing between Mosselbukta and Murchisonfjord. An adult Great Skua in Trygghamna (Isfjorden) was seen to attack feeding Brännich's Guillemots *Uria lomvia*. In dominance hierarchies at recently killed Polar Bear prey, Great Skuas were positioned at a similar level as Glaucous Gulls, being inferior only to Ivory Gulls. An adult bird showed territorial behaviour on Bolscheøya on 9 August 1990, and a rather large downy young found hiding behind some rocks confirmed its breeding status. On 8 August 1991, a pair was found on the island, and territorial behaviour was again recorded (BC), but these are the only indications of breeding Great Skuas observed by us.

○ **Sabine's Gull** *Larus sabini* At Moffen, Sabine's Gulls were probably breeding annually, but since landings are not allowed on this island, this could not be confirmed. All visits (anchoring over 300m from the shore) resulted in records of adult summer plumage Sabine's Gulls: 22 July 1989 (1 adult), 23 July 1989 (2 adult), 24 July 1990 (2 adult), 15 July 1991 (1 adult, BC).

02 July 1988, 1 adult feeding near 19 Kittiwakes, Ytre Norskøya  
16 July 1988, 1 adult feeding Brandalpynten (Kongsfjorden)  
23 July 1989, 1 adult →W, Sassendalen (JK)  
28 July 1990, 1 adult off Murchisonfjord (Nordaustlandet)

□ **Black-headed Gull** *Larus ridibundus* 19 June 1986, 1 adult, jetty Barentsburg (Grønfjorden)

Δ **Common Gull** *Larus canus* 20 June 1988, 1 adult, Skansbukta (Isfjorden).

□ **Lesser Black-backed Gull** *Larus fuscus* 16 July 1988, 1 adult, Brandalpynten (Kongsfjorden), 22 June 1989, 1 adult Isfjorden (78°06'N, 12°16'E).

Δ **Iceland Gull** *Larus glaucoides* 27 June 1985, 3rd calendar year individual, Hansbreen (Hornsund).

? **Herring Gull** *Larus argentatus omissus* (?) One sighting of a yellow-legged gull with a rather dark mantle, paired with a Glaucous Gull ('long-call'). Both were present in a roost of large gulls (08 July 1988, Mosselbukta).

? hybrid Herring Gull X Glaucous Gull *Larus argentatus* X *hyperboreus*. A probable hybrid of Glaucous and Herring Gull was seen on 21 July 1990 in Longyearbyen (Adventfjorden). The adult bird was very similar to a Glaucous Gull, but the other three primaries had some grey pattern.

● **Glaucous Gull *Larus hyperboreus*** Numerous at Moffen, where the presence of large downy young (23 July 1989) confirmed its status as a breeding bird. Large groups were sometimes seen on pack ice or drift ice near Polar Bear kills (e.g. 18 July 1989, 29 adult, 3 2nd cy, Worsleyneset). Large numbers were found roosting at Smeerenburg, Amsterdamøya and in Magdalenafjord (47 individuals, 24 July 1989). Breeding pairs were found at Moffen, Klovningen, Ytre Norskøya, Gråhøken, Moseøya, Redingerpynten and Fuglehøken (NW Spitsbergen), Alkhornet and Diabasodden (Isfjorden), Sofiekammen (Hornsund), and Stormbukta (S Spitsbergen). Breeding was suspected on a number of other localities (figure 9). On all these sites, scattered isolated nests were found. At Alkhornet, a nest was found 1 m above the nest of a Barnacle Goose. All goslings hatched and fledged, although the gulls were feeding on goslings taken from other nests in the area.

● **Great Black-backed Gull *Larus marinus*** Great Black-backed Gulls were seen occasionally, but exclusively in W and NW Spitsbergen. Most sightings referred to single adults. There was no evidence for breeding found at any of the sites visited.

● **Kittiwake *Rissa tridactyla*** Colonies of Kittiwakes were found on cliffs along the west coast, deep in fjords (Kongsfjorden, Isfjorden, Hornsund), and in canyons at Risetreppen and Diskobukta on Edgeøya (figure 10). At Klovningen, an estimated 125-175 AON were found (9 July 1988). The cliffs at Redingerpynten (Fjortende Julibreen) were estimated to hold 1160 AON on 1 July 1988 and 1600 AON on 26 June 1989. On small cliff faces east of Ny Ålesund, 616 pairs were found breeding on 11 July 1988. The colonies at Alkhornet were carefully counted early July 1990 and were found to hold 9-622 AON in scattered colonies along the south face and 1670 AON at the north face. Substantial colonies, not counted during our visits, were present at Fuglehøken, Van Muydenbukta, Sofiekammen, Stormbukta and Diskobukta. Kittiwakes were often seen in very large feeding flocks at glacier fronts (e.g. Magdalenafjord, Hansbreen, Monacobreen). In the extremely turbid water of an outlet of meltwater in Bockfjorden, 1500 feeding Kittiwakes were observed on 20 July 1989.

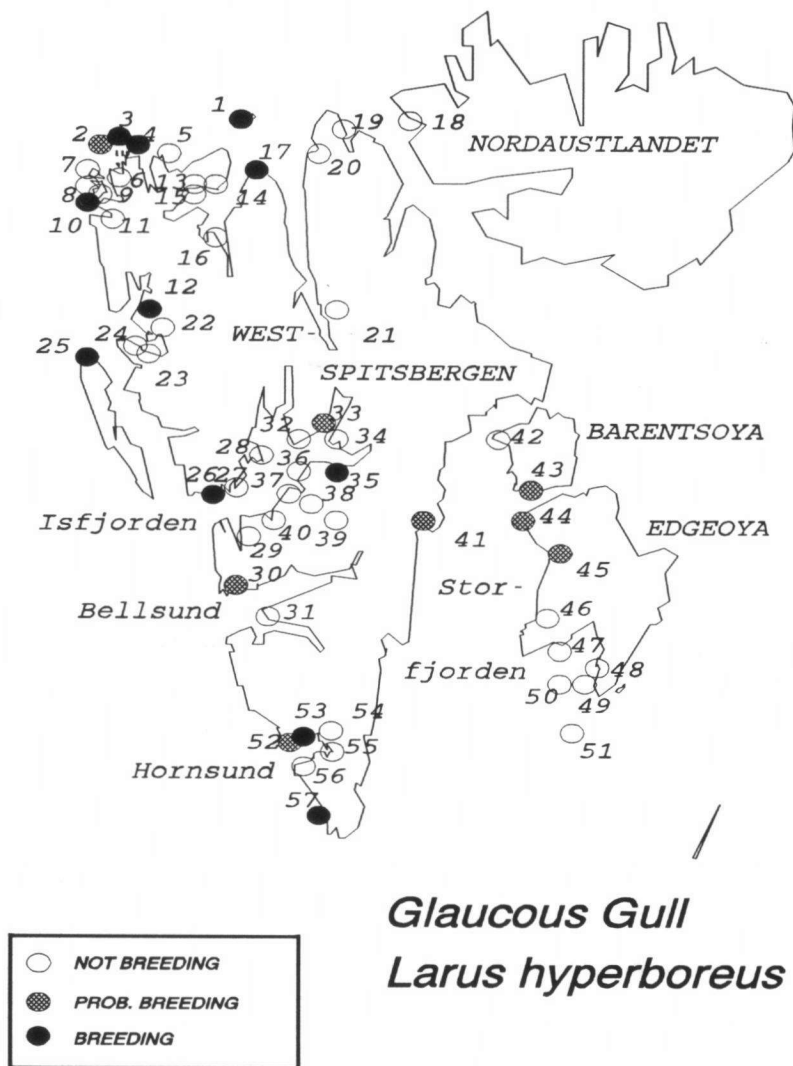


Figure 9. Breeding distribution of Glaucous Gulls in Svalbard, 1985-90.

Figuur 9. Verspreiding van broedende Grote Burgemeesters op Spitsbergen, 1985-90.

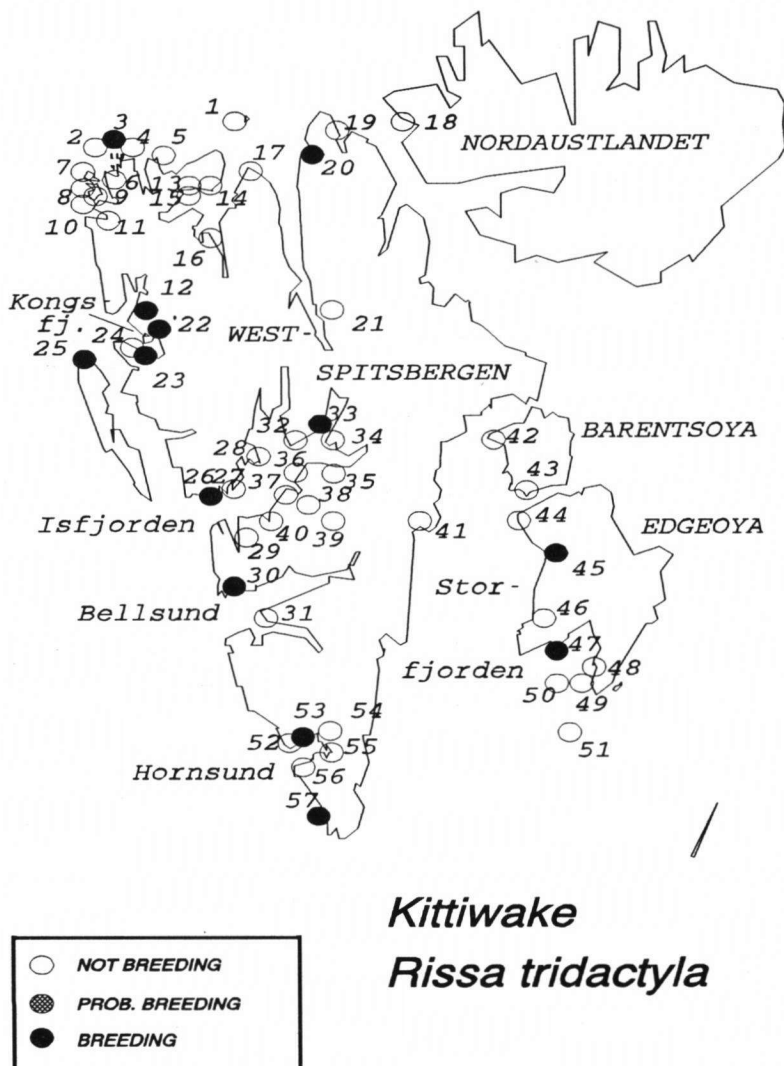


Figure 10. Colonies of Kittiwakes in Svalbard, 1985-90.

Figuur 10. Kolonies Drieteenmeeuwen op Spitsbergen, 1985-90.

● **Ivory Gull** *Pagophila eburnea* The information on Ivory Gulls seen during these voyages has been published earlier (Camphuysen 1991). The relative abundance of Ivory Gulls around Spitsbergen is shown in figure 11. Further sightings include: Sassendalen, 1 adult →W, 22 July 1989, 25 July 1989 en 1 August 1989 (JK). One adult in Adriabukta (Hornsund) on 21 June 1991 (BC), 7 adults in Stormbukta on 7 August 1991, three of which were feeding on beached *Chaetognatha* (arrow worms) and *Gammarus* spp. (BC). Some 17 adults at a glacier front in Augustabukta, 24 August 1991 (BC).

● **Arctic Tern** *Sterna paradisaea* Breeding colonies at Møffen, Ytre Norskøya, in Ny Alesund and around Longyearbyen numbered at least several tens of pairs (figure 12). Arctic Terns nested in most human settlements in considerable numbers, while most other colonies were small. A breeding colony was found in shingle on top of a recently calved iceberg off Negribreen on 5 August 1989 (Camphuysen 1989). The colony was again found on shingle on top of the glacierfront on 12 August 1990 and it was concluded that this colony was well protected against ground predators. On 27 June 1985 in Hornsund and on 24 July 1989 at Smeerenburg (Amsterdamøya), 2nd calendar year individuals were observed. A group of 100 non-breeding adult terns was found at Brandalpynten (Kongsfjorden) in 1988.

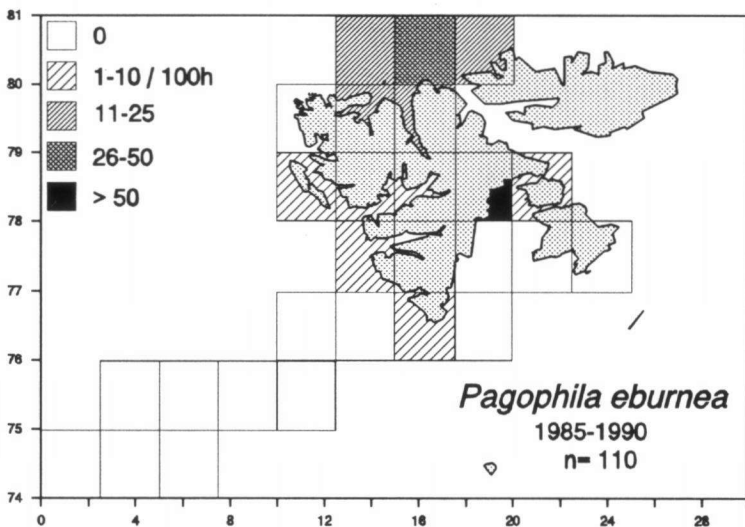


Figure 11. Relative abundance of Ivory Gulls in Svalbard (n/100h), 1985-90.

Figuur 11. Verspreiding van Ivoormeeuwen rond Spitsbergen (n/100u), 1985-90.

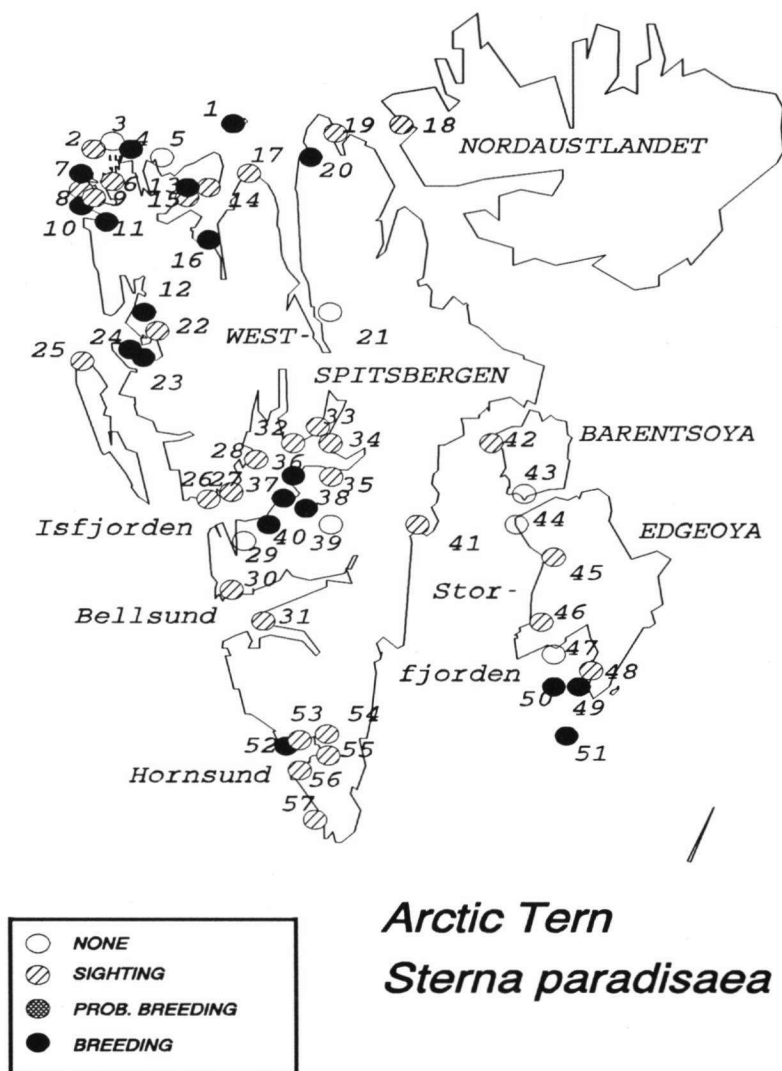


Figure 12. Colonies of Arctic Terns in Svalbard, 1985-90.

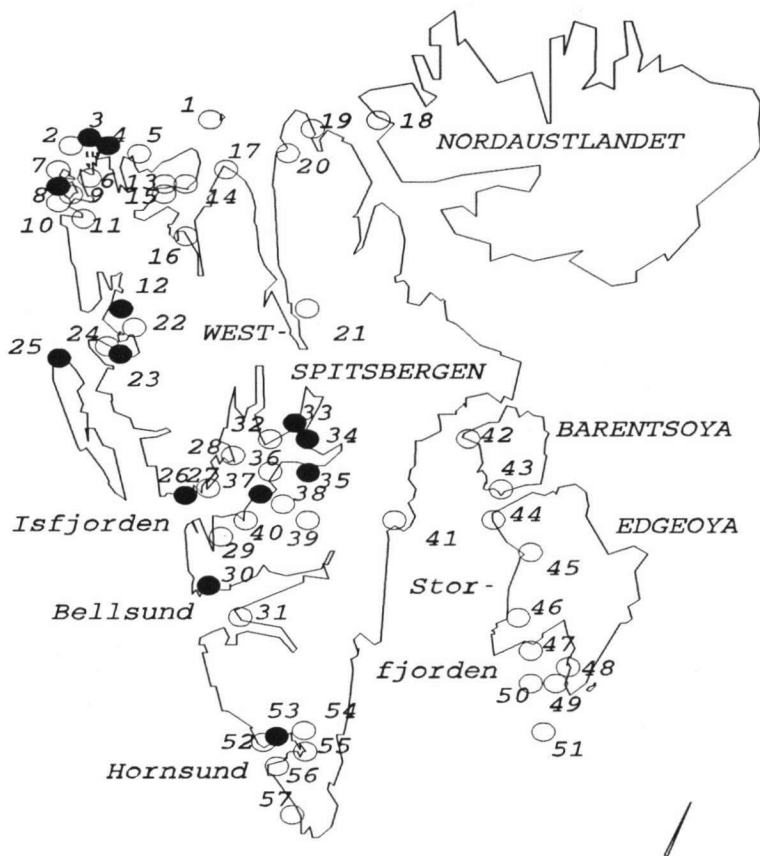
Figuur 12. Kolonies van Noordse Sterns op Spitsbergen, 1985-90.

● **Brünnich's Guillemot** *Uria lomvia* Colonies of Brünnich's Guillemots were exclusively found on cliffs along the coast. At Klovningen, an estimated 2750-3500 individuals were breeding (counted 2594 individuals; 09 July 1988). At the cliffs at Redingerpynten (Fjortende Julibreen) 2575 individuals were seen on 01 July 1988 and 3406 (an estimated 90% of the breeding ledges well visible) on 26 June 1989. On small cliff face s east of Ny Ålesund, 50 individuals were found breeding on 11 July 1988. The colonies at Alkhornet were carefully counted early July 1990 and were found to hold 20,000 individuals on ledges scattered along the south face and at least 740 individuals at the north face. Substantial colonies, not counted during our visits, were present at Ytre Norskøya, Fuglehuken, Skansen, Gipsvika, Diabasodden, Van Muydenbukta, and Sofiekammen (figure 13). Very large feeding concentrations, mixed with Little Auks *Alle alle*, were found in the ice, north of Spitsbergen on 29 June 1989. Impressive feeding flights were seen near colonies as Fuglehuken, Alkhornet, Kapp Martin (Bellsund) and in Hornsund. On 5 and 7 July 1990, thousands of feeding Brünnich's Guillemots were seen in the centre of Isfjorden, feeding like shearwaters on shoaling fish near the surface (probably Capelin *Mallotus villosus*, considering the fish brought to the colony at Alkhornet these same days). Very large numbers were seen in Isfjorden (e.g. between Adventfjorden and Trygghamna, 22 June 1989). Adults and small chicks were seen at sea off Sørkapp on 30 July 1989, between Agardhbukta and Sørkapp (Storfjorden) on 6 August 1989, and off Kapp Linné on 8 August 1989. Not a single chick was seen between Agardhbukta and Sørkapp on 6 August 1990, although fully grown Brünnich's Guillemots were quite numerous.

Δ **Razorbill** *Alca torda* In a small colony of Brünnich's Guillemots on a low cliff section at Redingerpynten, Fjortende Julibreen, on 31 July 1990, 3 adult Razorbills were seen on ledges. Two Razorbills were engaged in a greeting ceremony. There were two earlier records of Razorbills in this colony (one individual, no year of observation known, Mehlum *pers. comm.*; 3 individuals in 1986, De Korte *pers. comm.*), but the sighting in 1990 was the first indication of a breeding status.

● **Black Guillemot** *Cephus grylle mandti* A widespread and common species, of which small parties were seen in all fjords and bays (figure 14). Breeding colonies were mainly on low cliff sections, sometimes several hundreds of metres inland at the forland tundra, or in canyons (Edgeøya). Favourite feeding sites were at glacier faces and in drift ice fields.





## Brännich's Guillemot *Uria lomvia*

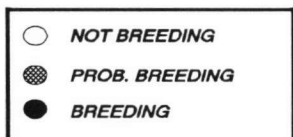
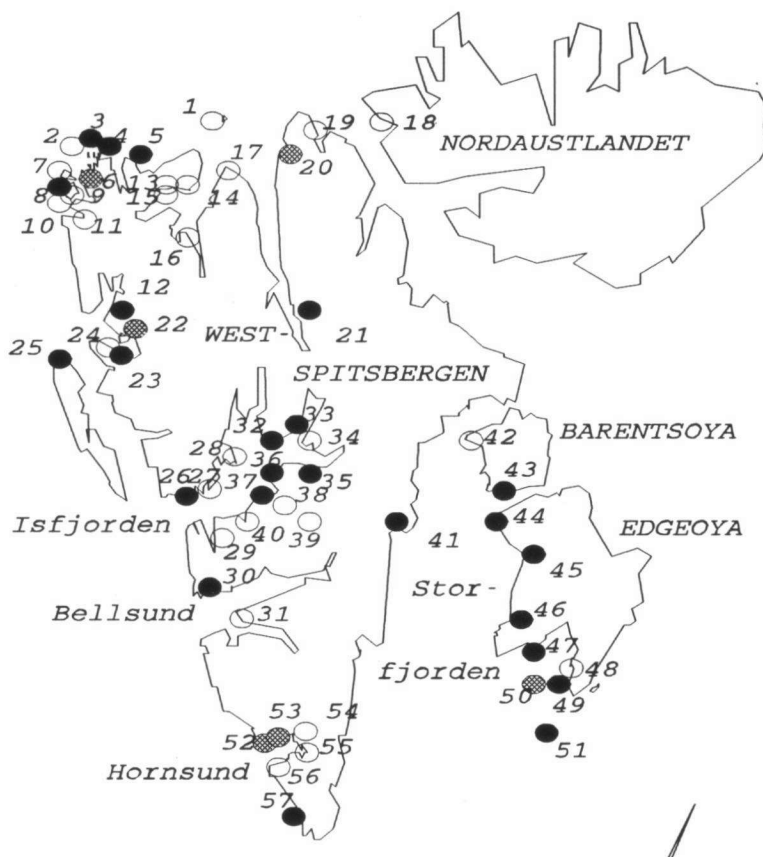


Figure 13. Colonies of Brännich's Guillemots in Svalbard, 1985-90.  
 Figuur 13. Kolonies van Dikbekzeekoeten op Spitsbergen, 1985-90.



**Black Guillemot**  
***Cephus grylle mandti***

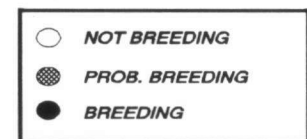
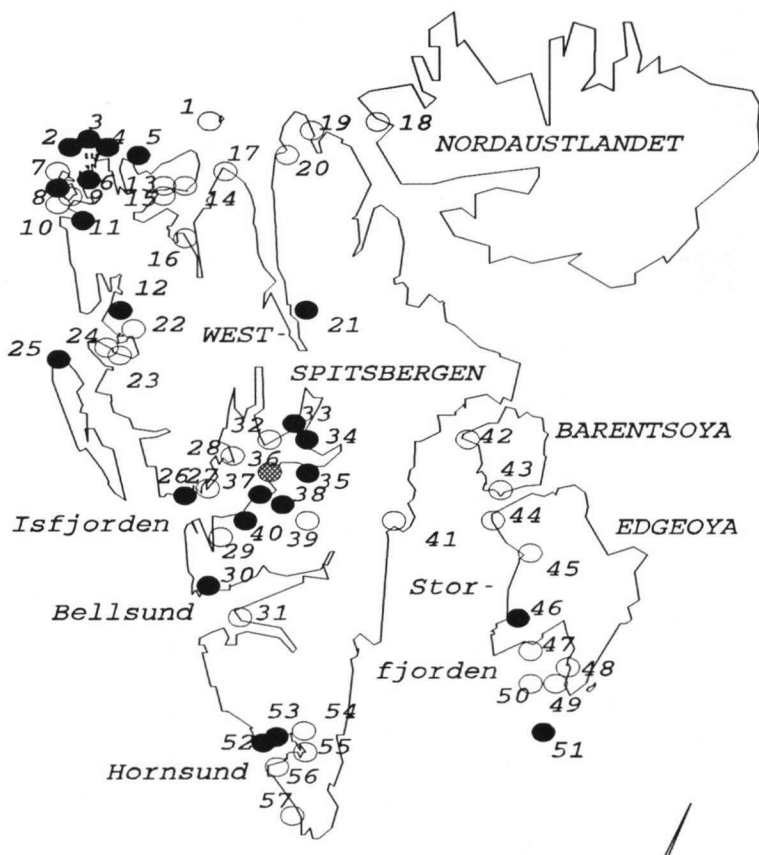


Figure 14. Colonies of Black Guillemots in Svalbard, 1985-90.

Figuur 14. Kolonies van Zwarte Zeekoeten op Spitsbergen, 1985-90.



## Little Auk Alle alle

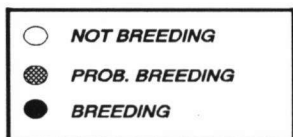


Figure 15. Colonies of Little Auks in Svalbard, 1985-90.

Figuur 15. Kolonies van Kleine Alken op Spitsbergen, 1985-90.

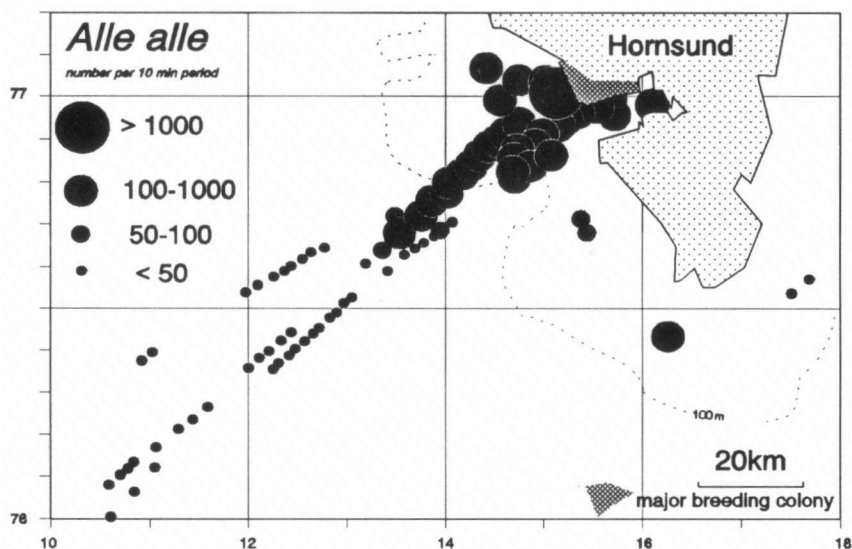


Figure 16. Numbers of Little Auks at sea off Hornsund, 1985-90.

Figuur 16. Aantallen Kleine Alken op zee bij Hornsund, 1985-90.

● **Little Auk *Alle alle alle*** A very common species in Svalbard, of which very large colonies were found in boulder screes in NW Spitsbergen (particularly at Fuglesangen), in Magdalenafjorden and in Hornsund (figure 15). Most of the large colonies were within territories of one or more Arctic Foxes and several foxes were obviously specialised in feeding on Little Auks. The relatively flat and low islands off Andreetangen were found to hold surprisingly large numbers of breeding Little Auks between boulders above the pebble beaches. Very large numbers occurred off NW Spitsbergen near the ice edge, with large feeding concentrations were found off Fuglesangen, Amsterdamøya, Magdalenfjorden and Fuglehuken. Massive feeding flights occurred to and from these colonies. Very large numbers were usually seen at Sjubreflaket (off Magdalenafjord) and between Krossfjorden and open sea and many thousands were seen at sea in Wijdefjorden, off Mosselbukta (7 July 1988). By far the highest densities, however, were recorded off Hornsund (figure 16), where considerable numbers were seen feeding as far out to the Greenland Sea as the continental shelf edge in 1985-88.

● **Puffin *Fratercula arctica naumanni*** A widespread but rather scarce breeding species (figure 17). Large colonies were not located, but several sites

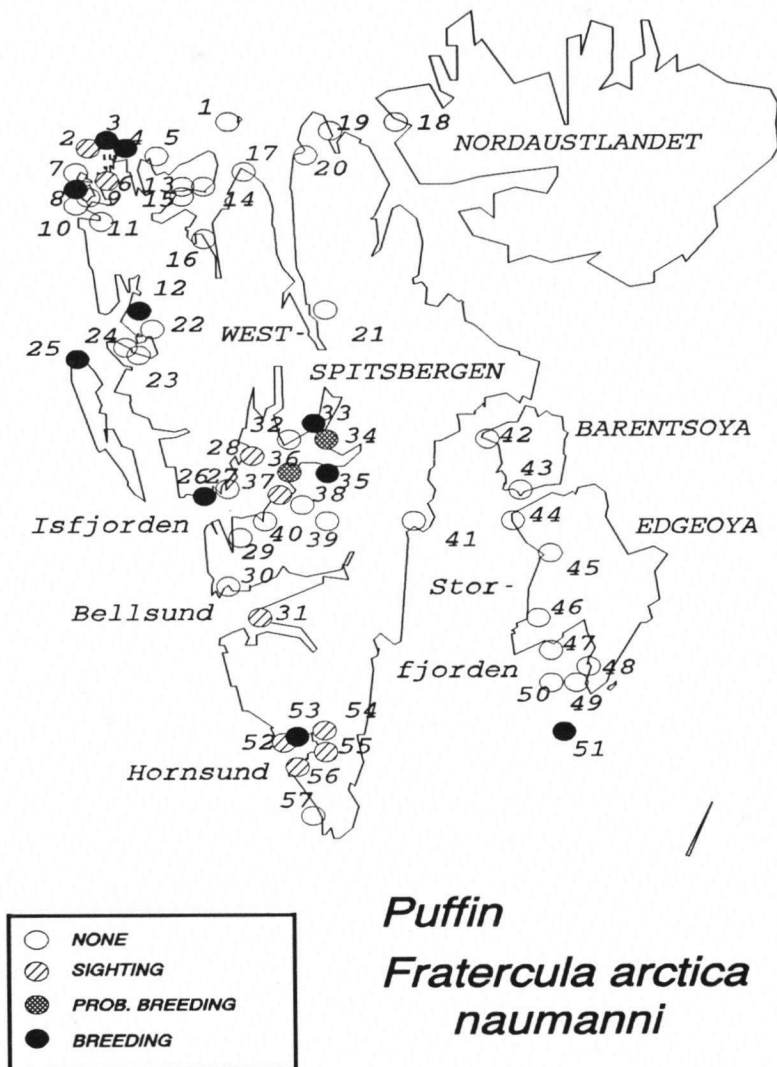


Figure 17. Colonies of Puffins in Svalbard, 1985-90.

Figuur 17. Kolonies van Papegaaiduikers op Spitsbergen, 1985-90.

were found to hold a few or some tens of pairs. Puffins were usually breeding in crevices on cliffs or on deep ledges, but never in boulder screes. At Alkhornt, adult ledge-breeding Puffins were predated upon by an Arctic Fox denning at the same ledge. Large concentrations of Puffins at sea were not seen and most individuals were seen near the (probable) breeding places in fjords and bays.

□ **Snowy Owl** *Nyctea scandiaca* An adult ♂ at Delitschøya, heavily attacked by some Arctic Terns, 1 August 1989 and an adult ♀ in Isbjørnhamna, Hornsund, on 7 August of the same year. Earlier that season, a Snowy Owl was observed by the crew of MV Plancius in Bellsund (A. Korving pers. comm.). Pellets of Snowy Owls were found in Habenichtbukta (2 August 1989) and Stormbukta (6 August 1990).

● **Wheatear** *Oenanthe oenanthe* One juvenile, Adventdalen, 9 August 1989. One adult ♂ feeding, 24 July 1990, Smeerenburg (Amsterdamøya).

● **Snow Bunting** *Plectrophenax nivalis* Common and widespread.

## Species list (2) Terrestrial mammals

**Polar Bear** *Ursus maritimus* Late June and early July, Polar Bears were scarce in the northern half of Spitsbergen. Most sightings were of immatures or young adults. Good opportunities to observe Polar Bears occurred on small islands just to the south of Reinsdyrflya or on drift ice in Liefdefjorden and Woodfjorden. At Worsleyneset, a hide of a Polar Bear was found on a small peninsula, covered with bones of Ringed Seals *Phoca hispida* (killed by Polar Bears). Tracks were often found on the pack ice and in the snow, but most were old and it was obvious that most bears had moved further to the east. At Andøya, on 19 July 1989, a dead immature bear was found, while a second individual wandered around on the island. Several bears were seen with freshly killed Ringed Seals. Late July 1990, in Kinnvika (Nordaustlandet), Polar Bears were very common. According to the crew of the Swedish polar station in this bay, Polar Bears were seen daily, and most sightings were of different individuals migrating to the northeast. The chance of spotting Polar Bears on the east side of Spitsbergen (particularly in Agardhbukta) and on Barentsøya and Edgeøya was considerably larger (figure 18). Most bears were solitary adult males, but females and (small) cubs were spotted and many fresh tracks were found in snow and mud. At Andreetan-

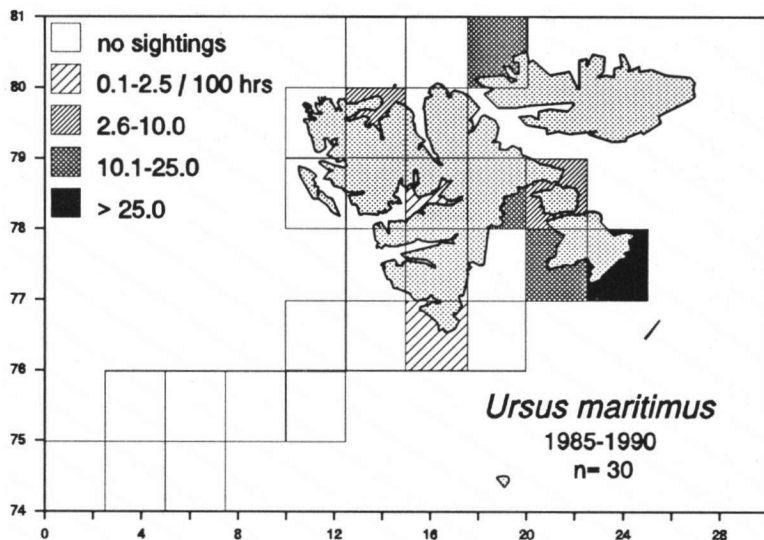


Figure 18. Relative abundance of Polar Bears in Svalbard (n/100h), 1985-90.

Figuur 18. Verspreiding van IJsberen op Spitsbergen (n/100u), 1985-90.

gen, on 31 July 1989, a cub was 'adopted' by the inhabitants of a small cabin. Unusual records were: 15 individuals in Gâshamna (W Hornsund) on 19 June 1988 (crew Polish station Isbjørnhamna pers. comm.), two fleeing adult bears on fjord-ice in Isfjorden, just east of Longyearbyen (19 June 1987), a recently used hide on Bohemanflya (25 June 1991; BC), a swimming bear off Sørkapp (77°12'N, 20°00'E) on 30 July 1989. On 18 June 1987 at Treskelen (Hornsund), an immature Polar Bear was seen at a freshly killed prey which was found to be a young White Whale *Delphinapterus leucas*.

**Arctic Fox *Alopex lagopus*** Widespread and common. Tracks or droppings were found on virtually all landing sites and foxes were commonly observed in most areas. Dens were found in Bockfjorden (under a hot spring), at Fuglehuken, Ny Ålesund, Alkhornet, Bjørndalen and Andreetangen. The Bockfjorden den was covered by remains of Little Auks, although no nearby colonies are known. Foxes on Fuglesangen and in Bjørndalen were probably mainly feeding on Little Auks. At Alkhornet and Fuglehuken, Arctic Fox were seen to kill adult Brünnich's Guillemots after having climbed the steep cliffs in the colonies. A fox denning at a cliff-ledge at Alkhornet was found to feed on adult Puffins, while individuals at Reinsdyrflya were seen to

attack, exhaust and kill adult moulting Pink-footed Geese. At the den at Andreetangen, the remains of a Coot were found.

**Reindeer** *Rangifer tarandus platyrhynchus* Widespread and common mammal, usually in small herds. Absent at Fuglehuken, although (old) antlers were found, present on the small islands off NW Spitsbergen (Ytre Norskøya, Klovningen, Fuglesangen, Danskøya, Amsterdamøya. Large herds:

29 June 1985, 77 individuals, Diabasodden-De Geerdalen (Isfjorden)

25 June 1988, 52 individuals, Adventdalen (Adventfjorden)

15 August 1990, 74 individuals, Van Muydenbukta (Bellsund)

### Species list (3) Pinnipeds

**Bearded Seal** *Erignathus barbatus* Solitary Bearded Seals were frequently seen in fjords and on ice fields around Spitsbergen (sometimes resting on small icefloes). In all, 138 individuals were seen, 54 of which while sailing near the pack ice or in icefields, 84 near the various landing places. Bearded Seals were most abundant in West Spitsbergen (figure 19). During the stay at Alkhornet between 28 June and 17 July 1990, Bearded Seals were seen daily (mean  $1.6 \pm 1.3$  per day, all heading west). Singing Bearded Seals were recorded under water with hydrophones in Hornsund and Isfjorden, without any seals being visible at the surface.

**Ringed Seal** *Phoca hispida* In fjords of Spitsbergen this is by far the commonest seal. In all, 1123 Ringed Seals were spotted, 1011 of which during landings and 112 while sailing around in fjords (figure 20). Larger groups were mainly seen early in the season on icefields in fjords, very near leads in the ice or near escape holes. Later in the season, most sightings referred to solitary, swimming individuals in fjords, particularly near glacier fronts. At Bohemanflya three young pups (white coat) were seen on fjord ice near 11 adults (20 June 1986). Large concentrations:

26 June 1985, 55 on ice, Storbreen (Hornsund)

17 June 1986, 246 on ice, Ny Ålesund (Kongsfjorden)

19 June 1986, 35 on ice, Ymerbukta (Isfjorden)

20 June 1986, 215 on ice, Nordfjorden

18 June 1987, 98 on ice, Treskelen/Brepollen (Hornsund)

19 June 1987, 41 on ice, Tempelfjorden

20 June 1988, 111 on ice, Diabasodden-De Geerdalen (Isfjorden)



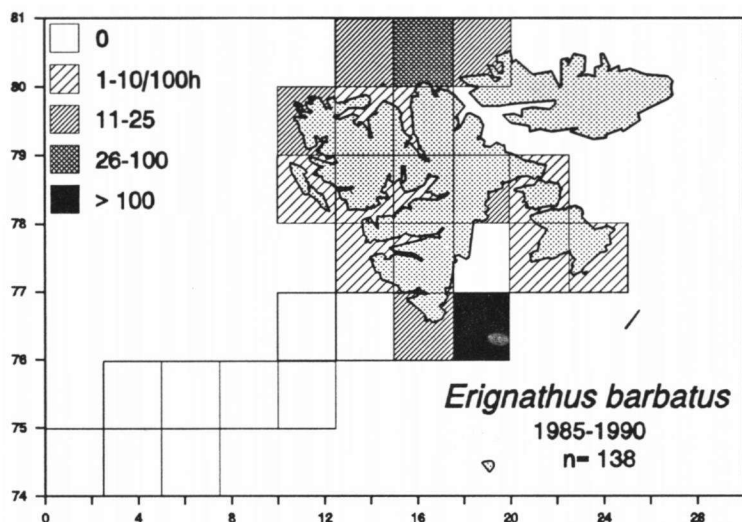


Figure 19. Relative abundance of Bearded Seals in Svalbard (n/100h), 1985-90.

Figuur 19. Verspreiding van Baardrobber op Spitsbergen (n/100u), 1985-90.

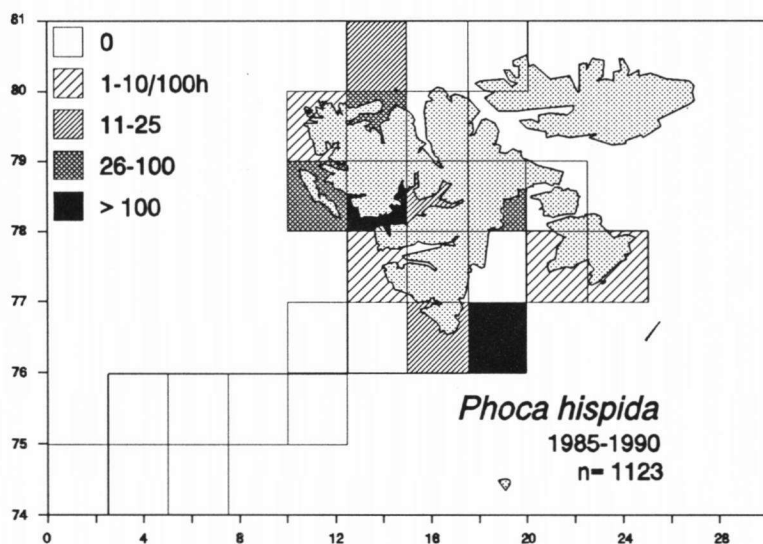


Figure 20. Relative abundance of Ringed Seals in Svalbard (n/100h), 1985-90.

Figuur 20. Verspreiding van Ringelrobber op Spitsbergen (n/100u), 1985-90.

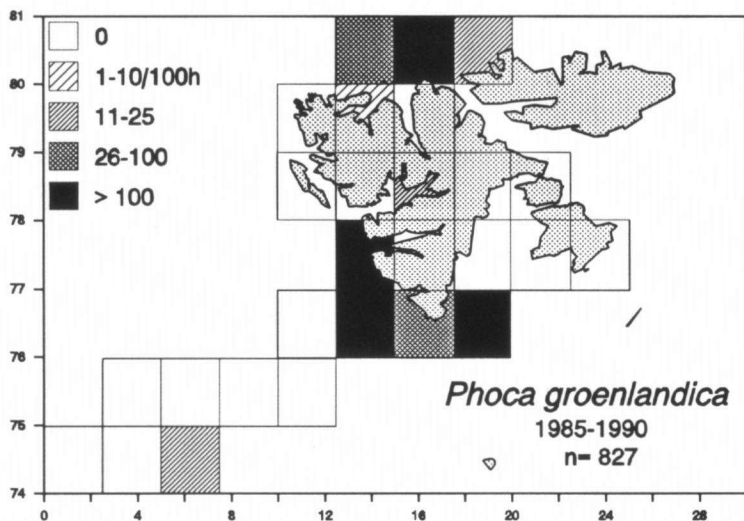


Figure 21. Relative abundance of Harp Seals in Svalbard (n/100h), 1985-90.

Figuur 21. Verspreiding van Zadelrobben op Spitsbergen (n/100u), 1985-90.

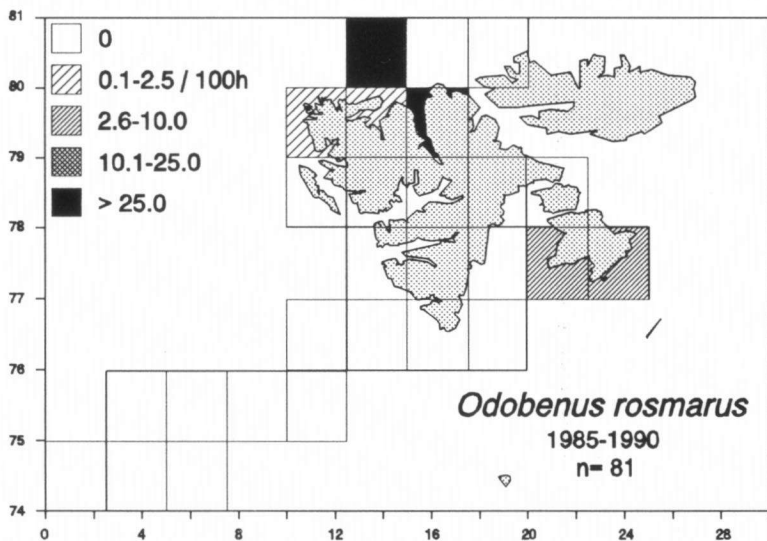


Figure 22. Relative abundance of Walrus in Svalbard (n/100h), 1985-90.

Figuur 22. Verspreiding van Walrussen op Spitsbergen (n/100u), 1985-90.

**Harbour Seal *Phoca vitulina*** Harbour Seals are rare on Spitsbergen, and are only found at Prins Karls Forland. Two records, both at the same site:

02 July 1989, 14 adults on rocks, 1 pup, Fuglehuken

22 July 1990, 19 adults on rocks, Fuglehuken

**Harp Seal *Phoca groenlandica*** Harp Seals were typical offshore seals, often in association with large ice-fields. Few Harp Seals were spotted in fjords in Spitsbergen or anywhere very near the coast (figure 21). Most were seen while sailing (total number 827 individuals). Large concentrations were found off SW Spitsbergen (Hornsund latitude) on pack ice remains on 16 June 1986 (at least 657). Several tens were seen on loose drift ice in Storfjorden on 30 July 1989 (79 individuals). The pack ice to the north of Svalbard was not very rich in Harp Seals, but single individuals were observed. Very unusual was the sighting of a compact herd of 50 Harp Seals in ice-free water in Isfjorden, close to Longyearbyen (78° 15'N, 14° 10'E) on 15 August 1990. Harp Seals seen from the boat off Spitsbergen were sometimes porpoising at the bow. Most individuals were swimming on the back on these occasions.

**Walrus *Odobenus rosmarus*** Most frequently found off N Spitsbergen and around Edgeøya (figure 22). At Moffen, a nature reserve for Walrus, numerous bleached skulls demonstrate the historic importance of the island as a hauling site. Only in 1990, 20 individuals were seen at the beach on Moffen, while the crew of the ship confirmed that Walrus were usually absent during 1984-89. In 1985, however, at least 40 Walrus were seen on Moffen (MB) and in 1987 at least 10 occurred on the ice near the island (JT). Near Moffen, solitary young males were seen in 1989. One young animal (small tusks) attacked the zodiac and small boats (28 June 1989). In Sorgfjorden on 29 July 1990 a herd of 45 Walruses was found on the beach and this group could be observed in peace for over 6 hours. As far as seen, all animals were males and very young animals (tusks less than 10 cm) were scarce. Smaller groups were seen around Edgeøya in 1990: Andreetangen, 8 August 1990, and Bolscheøya 9 August 1990. On Bolscheøya, some very old animals were seen (many scars, pinkish orange skin, often with broken tusks), one of which had no tusks anymore. Walruses were rare along the west coast of West Spitsbergen. Single individuals were seen in Hornsund (crew of Polish station Isbjørnhamna *pers. comm.*) and a Walrus was seen in Isfjorden on 20 June 1988 (Sysselmannen på Svalbard (governor) *pers. comm.*). On Delitschøya a fresh corpse was found on 1 August 1989.

### Species list (4): Cetaceans

To the list of cetaceans observed in the Svalbard area, some sightings from 1984, provided by Jan Andries van Franeker, are added. That year, similar to later seasons, MV Plancius approached Spitsbergen from the SW and Isfjorden, Kongsfjorden and Krossfjorden were visited.

**Fin Whale *Balaenoptera physalus*** Off West Spitsbergen several records of large fin whales on 9 July 1991 (BC) and 1 September 1991 (6 individuals, BC) which were probably Fin Whales. An adult (female) and calf was seen at 74°29'N, 4°11'E on 25 June 1985 and a solitary individual was seen off S Spitsbergen on 1 September 1991 (BC).

**Sei Whale *Balaenoptera borealis*** One record of a solitary individual in ice-free water north of Ytre Norskøya, 30 July 1990. The size, grey lower jaw and strongly curved dorsal were the most important characters used for identification. Another probable Sei Whale, identified by an experienced member of the crew, was seen in the Greenland Sea at 75°35'N, 5°10'E on 24 June 1984.

**Minke Whale *Baleanoptera acutorostrata*** In all 26 sightings of Minke Whales around Svalbard (36 individuals), most off NW and W Spitsbergen near the ice edge (figure 23). Feeding individuals were observed at the shelf edge, off Kapp Linné, and off Alkhornet in Isfjorden (15 July 1990, probably feeding on Capelin *Mallotus villosus*). Feeding whales were usually accompanied by massive numbers of feeding Fulmars and auks.

**White Whale *Delphinapterus leucas*** Several herds were seen in 1984, 1989 and 1990, but White Whales were very scarce in summers 1985-88. Records:

- 28 June 1984, 17 individuals, off Diabasodden (Isfjorden; JAF)
- 01 July 1984, 16 individuals, Krossfjorden (JAF)
- 02 July 1984, 20 adults plus unknown number of calves, Adventfjorden (JAF)
- 22 June 1986, 30 individuals, off Diabasodden (Isfjorden)
- 07 July 1988, 5 adult and 2 calves, Austfjordneset (Wijdefjorden)
- 08 July 1989, 35 adult →W, Carolinedalen (Isfjorden)
- 11 July 1989, 93 →W (5 herds, mainly adults but at least 1 imm. and 11 calves), Carolinedalen (Isfjorden)
- 01 August 1989, 6 adult, 2 calves, Zieglerøya (Edgeøya)
- 03 August 1989, 7 adult, 1 imm., 3 calves, Kapp Lee (Edgeøya, Storfjorden)
- 25 June 1990, 56 →E, Alkhornet (Isfjorden)

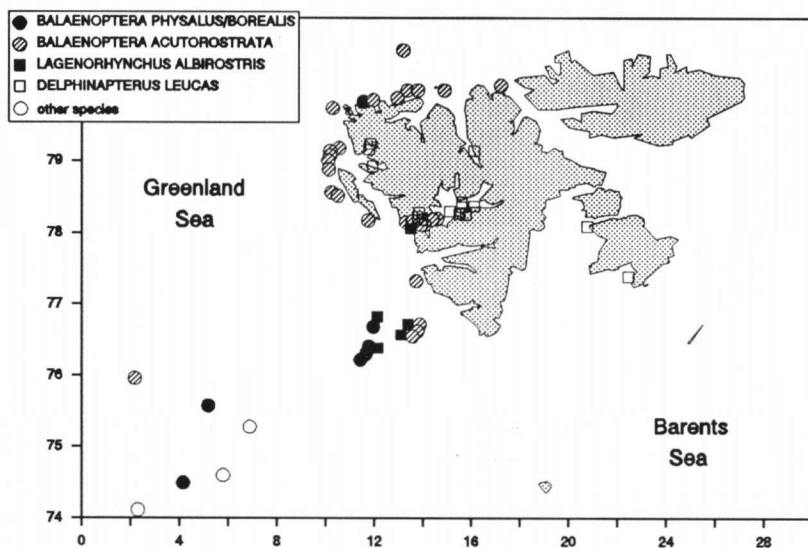


Figure 23. Sightings of cetaceans around Svalbard, 1985-90.

Figuur 23. Waarnemingen van walvisachtigen rond Spitsbergen, 1985-90.

26 June 1990, 29 adult, 3 imm., 5 calves →E, Alkhornet (Isfjorden)

18 July 1990, 140 adult, 15 calves →E, Longyearbyen (Adventfjorden)

21 July 1990, 200 adult, 10 calves, Longyearbyen (Adventfjorden)

**White-beaked Dolphin *Lagenorhynchus albirostris*** Six sightings of patterned dolphins off SW Spitsbergen, five of which were clearly groups of White-beaked Dolphins. On 17 June 1987, three groups of 5, 6 and 7 individuals were seen feeding in an area very rich in seabirds and near some Minke Whales ( $76^{\circ}36'N$ ,  $13^{\circ}10'E$ ). A group of 10 individuals was seen off Kapp Linné on 03 September 1987 (A. Korving *pers. comm.*) and a group of 4 dolphins was seen on 01 September 1991 at  $76^{\circ}48'N$ ,  $12^{\circ}07'E$  (D. Hoogerheide *pers. comm.*). Four patterned dolphins off Hornsund on 14 June 1990 were probably the same species (BC).

## Discussion

The Svalbard archipelago is very important as a breeding station for seabirds in the high arctic. The west coast, influenced by the Gulf Stream, is usually free of ice but the ice edge, very important as a feeding area for seabirds, is normally within reach. The most numerous seabirds in Svalbard are Fulmar,

Kittiwake, Brünnich's Guillemot and Little Auk. Only Little Auks occur in very large colonies (hundreds of thousands of individuals), while most colonies of the other species are rather small compared to colonies elsewhere in arctic and sub-arctic regions (Croxall *et al.* 1984). Population estimates for seabirds in Svalbard are still very crude (Norderhaug *et al.* 1977, Evans 1984, Mehlum & Fjeld 1987, Grimmett & Jones 1989, Norderhaug 1989). This is particularly unfortunate, because many colonies are rather small (a few thousands of pairs), well accessible or visible from either land or sea, and therefore easy to count. Estimates given by Evans (1984) for Fulmar (10,000-1,000,000 pairs) are meaningless and suggest a much too large population. Very few colonies are in excess of 1000 breeding pairs and Fulmars are not found breeding in most seabird colonies along the west coast. For most other species only a range (order of magnitude) is known. During his visits in 1985-90, the author was unaware of the lack of information for most colonies, even for those at regularly visited sites. The one-day visits onboard MV Plancius would otherwise have offered excellent opportunities to count many of these colonies. Future visitors should consult the catalogue published by Mehlum & Fjeld (1987) and try and count seabirds in any colony for which information is inadequate.

The distribution and numbers of Red-throated Divers in Svalbard are insufficiently known and this species deserves particular attention. Known as an extremely shy breeding species, nesting in small ponds in flat terrain, this species is likely to suffer from the increased tourism in the archipelago. Many important areas for breeding geese, also being birds which are extremely vulnerable for disturbance, are well protected, but divers are dispersed species for which these reserves are rather meaningless.

Fulmars are among the most prominent seabirds in Svalbard, being overabundant anywhere around the islands. Breeding colonies are rather difficult to locate, however, and are often found on steep cliffs at inaccessible ledges high above sea level and deep in fjords. It is remarkable that these birds breed so deep in fjords, particularly because Fulmars arrive in the colonies in January and February (Frantzen *et al.* 1986, H. van der Laan *pers. comm.*) when the nearest ice-free water is hundreds of kilometres away from the ledges. Fulmars in Svalbard have not shown the increase in numbers as found in the more southerly populations (Fisher 1952). Population trends are not very well documented, but there is anecdotal evidence that numbers declined since whaling ceased in these waters (Scoresby 1820, Løvenskiold 1964). The feeding flights of Fulmars in Svalbard are impressive. The use of upward air-pressure around low cliffs enables the birds to fly

large distances at energetically low costs. While sailing along the cliffs, large potential feeding areas in fjords can be overlooked and exploited and the location of breeding stations deep in fjords has clearly changed into an advantage: feeding concentrations of Fulmars were observed anywhere in fjords. Fulmars were found to profit from rapidly changing conditions like upwelling caused by tidal currents, strong wind from the shore, ice edges and at glacier fronts in fjords. When working on the diet of Fulmars in Spitsbergen, it could be observed how local patches of available prey developed and disappeared and how immediately and adequately Fulmars reacted on the constantly changing situation (*pers. obs.*). Most Fulmars were found to have been feeding on zooplankton or small fish and, contrary to many more southerly populations, discards and offal obtained at commercial trawlers were probably of little significance for these birds (Mehlum & Giertz 1984, Camp-huysen in prep.). It would be interesting to compare the ecology of the Fulmar population in Svalbard, which is clearly relying on more 'natural' food sources, with that of its southern counterparts in the future.

Of four species of skuas in Svalbard, only Arctic Skuas are common breeding birds. The absence of small mammalian prey like lemmings *Lemmus lemmus* is probably responsible for the very small numbers of Long-tailed Skuas and the absence of Pomarine Skuas as breeding species. Pomarine Skuas, which are much more numerous in some years than in others, were probably all immatures or non-breeding adults wandering around (*cf.* De Korte 1972b). Despite reports of the recent colonisation of Svalbard by Great Skuas (Vader 1980, Norderhaug 1983, Vader *et al.* 1992), only one breeding territory was located (Bolscheøya) at 57 landing sites scattered over the archipelago. A single expedition at Jan Mayen (Van Franeker *et al.* 1986) and brief visits since in summers 1984-88, resulted in a considerably larger number of possible territories (6). Great Skuas were regularly observed in Svalbard, but there is by no means a firmly established breeding population.

Most colonies of Kittiwakes in Svalbard are well known, although remarkably few accurate censuses have been published. The abundance and distribution of Glaucous and Great Black-backed Gulls, however, remains rather obscure. At none of the 57 visited sites, Great Black-backed Gulls were found breeding, despite the recent increase in numbers in Svalbard (Norderhaug 1983). Breeding Glaucous Gulls and small roosts (a few tens at most) occurred widely scattered along the coast. The Glaucous Gull is a common species in Svalbard, but is by no means numerous.

The distribution of colonies of auks was basically as described in the literature (Løvenskiold 1964, Norderhaug *et al.* 1977, Mehlum & Fjeld

1987). The large numbers of adult Brünnich's Guillemots and chicks seen in Storfjorden originated probably from colonies at Stellingfjellet, Kovalskifjella and Kapp Wojeikow (see Norderhaug *et al.* 1977), colonies that were not visited during the Plancius trips. Fuglesangen was described as a small colony of Little Auks and Brünnich's Guillemots (Norderhaug *et al.* 1977), while Little Auks were simply recorded as 'present' in Mehlum & Fjeld (1987), but this appeared to be an important breeding station for Little Auks with many thousands of breeding pairs. Three species of auks were found breeding at several locations in Tusenøyane; breeding sites which were not listed Løvenskiold (1964) or Norderhaug *et al.* 1977, but most of which were stated in Mehlum & Fjeld (1987). Despite the rather small seabird populations on the islands which are quite accessible, few were adequately censused.

The distribution of seals, as shown in figures 19-20, is greatly influenced by a field of ice just SE of Sørkapp where all species were comparatively numerous. Ugland & Ree (1983) found hardly any seals in this area, probably because there was no ice during their cruises in 1981 and 1982. Bearded Seals were intermediate to Ringed and Harp Seals in being widespread and numerous both offshore (only on ice) and in fjords. Ringed Seals were virtually restricted to fjord ice and inshore waters, whereas Harp Seals were seldom seen in fjords. Walrus are rather common in the northern and eastern half of the archipelago, being virtually absent in SW and S Svalbard (*cf.* Ugland & Ree 1983). Bleached skulls on beaches, with the tusks being cut off, illustrate that the Walrus occurred in a much wider area in previous centuries, prior to the excessive slaughter which has taken place. The Walrus is another species which may prove to be very vulnerable to disturbance as a result of increased tourism in the archipelago.

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### Samenvatting

*In de zomers van 1985-90 werd Spitsbergen (of Svalbard, zoals de Noren deze archipel plegen aan te duiden), met name het eiland West-Spitsbergen bezocht aan boord van het M.S. Plancius. Van alle vogels en (zee-) zoogdieren werden uitgebreide aantekeningen gemaakt en dit artikel is een weergave van de belangrijkste waarne-*



mingen. De gegevens werden aangevuld met waarnemingen van derden, waarvan die van Jan Andries van Franeker (zeezoogdieren, 1984), Jurren Koerts (1989), Bram Couperus (1990-91) de voornaamste zijn. De in de jaren 1985-90 bezochte locaties zijn weergegeven in figuur 1 en tabel 1, terwijl de waarnemingsinspanning in deze jaren is uitgedrukt in het aantal 'velduren' (figuur 2). Van de algemene zeevogels en zeezoogdieren werden verspreidingskaarten gemaakt, waarbij het broedvoorkomen op de landingsplaatsen (paginavullende kaarten) of de verspreiding, gecorrigeerd voor waarnemingsinspanning, middels arceringen in kaartgrids zijn weergegeven. De belangrijkste in de Svalbard archipel broedende zeevogels zijn Roodkeelduiker, Noordse Stormvogel, Kleine Jager, Grote Burgemeester, Drieteenmeeuw, Ivoormeeuw, Noordse Stern, Dikbekzeekoet, Zwarte Zeekoet, Kleine Alk en Papegaaiduiker. Schaarse soorten, al dan niet incidentele broedvogels, zijn Middelste Jager, Kleinste Jager, Grote Jager, Grote Mantelmeeuw en Vorkstaartmeeuw. De in totaal drie soorten landzoogdieren op Svalbard, IJsbeer, Poolvos en Rendier, zijn algemene soorten op de eilandengroep. De meest voorkomende zeezoogdieren waren Baardrob, Ringelrob, Zadelrob, Walrus, Dwergvinvis, Beluga en Witsnuidolfijn. In de discussie wordt kort ingegaan op de mogelijke gevolgen van het toenemende toerisme voor schuwe soorten als de Roodkeelduiker, verschillen de soorten ganzen en Walrussen. Verschillen tussen de tijdens deze reizen gevonden verspreiding en aantallen zeevogels en opgaven in de literatuur worden kort besproken.

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