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Report on

Fulmarus glacialis Expedition II

Jan Mayen June-August 1983

by

J.A. van Franeker
&
C.J. Camphuijsen

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Preface and Acknowledgments

During the summer of 1983 an ornithological expedition went to Jan Mayen to study seabirds, especially the Fulmar Fulmarus glacialis. After failure of earlier attempts in 1981 and 1982 it finally became possible to travel to Jan Mayen from June to August 1983. This ultimate success was only possible thanks to the patience and continued support of many institutes and persons. At presenting this report we want to thank all contributors to the fulfilment of Fulmarus glacialis Expedition II, Jan Mayen, 1983.

Arctic Centre, University of Groningen
Carl Denig BV, Amsterdam
Dehyfood Company BV, Rotterdam
DOMO Melkprodukten Bedrijven, Beilen
Institute of Taxonomic Zoology, University of Amsterdam
Intendance der Rijkspolitie, Apeldoorn
Koninklijke Verkade Fabrieken BV, Zaandam
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Stavanger Museum, Bird Ringing Centre, Stavanger
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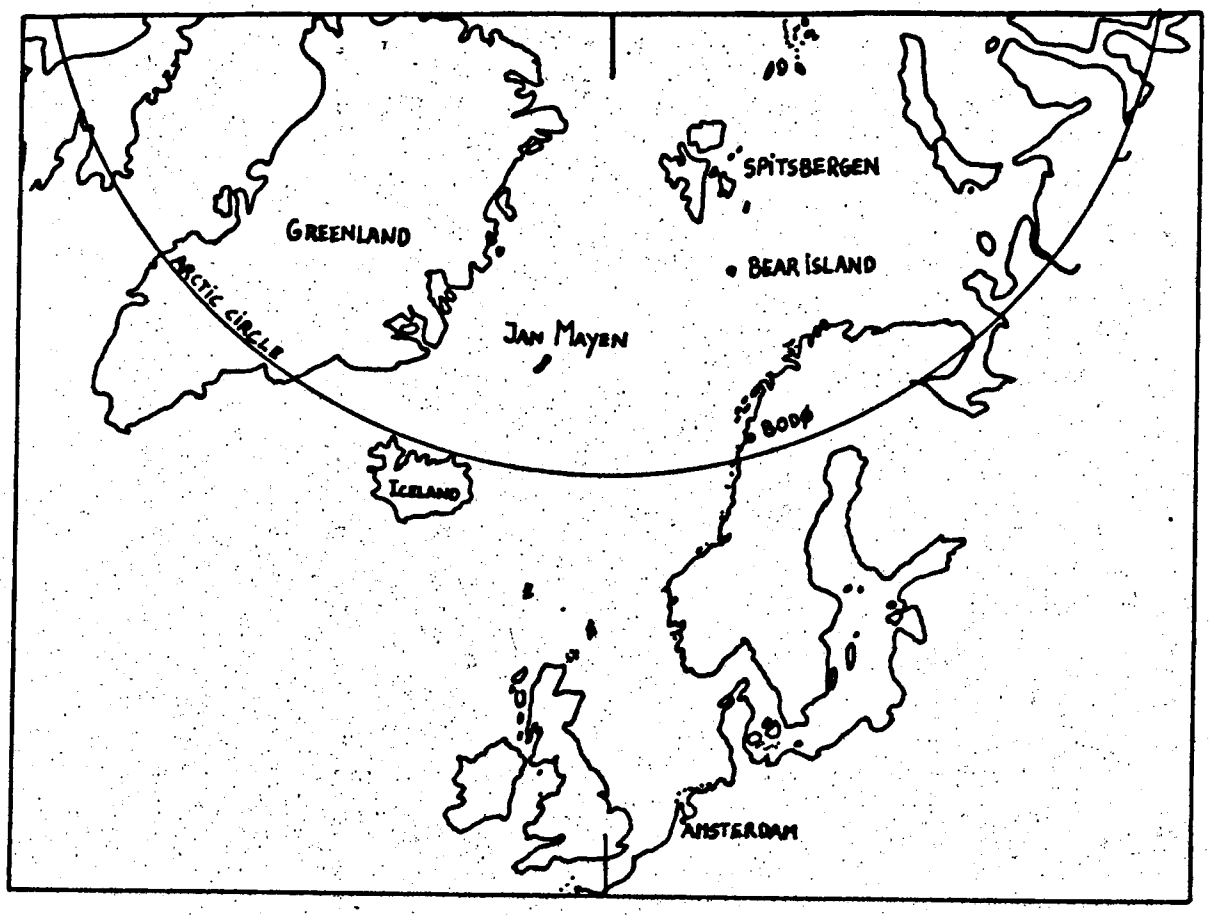
1. INTRODUCTION

Apart from being mysteriously attracted to the arctic environment we had several good reasons for ornithological research on Jan Mayen. The bird-life of this isolated arctic island was poorly known. Reports of ornithologists visiting Jan Mayen almost 50 years ago give some information on the species living there but are rather incomplete. Almost no data are available on the number of birds or on their distribution, and details on e.g. morphology of several species are unknown. Such data are of basic interest for all biological studies. Information on number and distribution of birds is, apart from its scientific interest, indispensable in decisions concerning management of the area.
A special reason to go to Jan Mayen was the Fulmar Fulmarus glacialis (Norwegian:Havhest ; Dutch:Noordse Stormvogel). In a long-term study it is tried to reveal patterns in the Fulmar's distribution and morphology. Such patterns may be the basis for a reconstruction of the evolutionary history of this species. In morphology the Atlantic Fulmar shows a wide variation in colour of the plumage and in size. General trends are that Atlantic Fulmars become darker and smaller towards colder breeding-areas. Data on colour and size of Jan Mayen Fulmars were very incomplete and confusing, and formed one of the last important gaps in the knowledge on Atlantic Fulmars. Field studies on Jan Mayen could solve this problem.
Apart from our ornithological research we explored the island for remains of old whaling-settlements and for general features; we took samples of the bottom, and made some notes on vegetation.
This report is a general one about Jan Mayen and its birds. Detailed information on special topics will be given in other reports and papers.



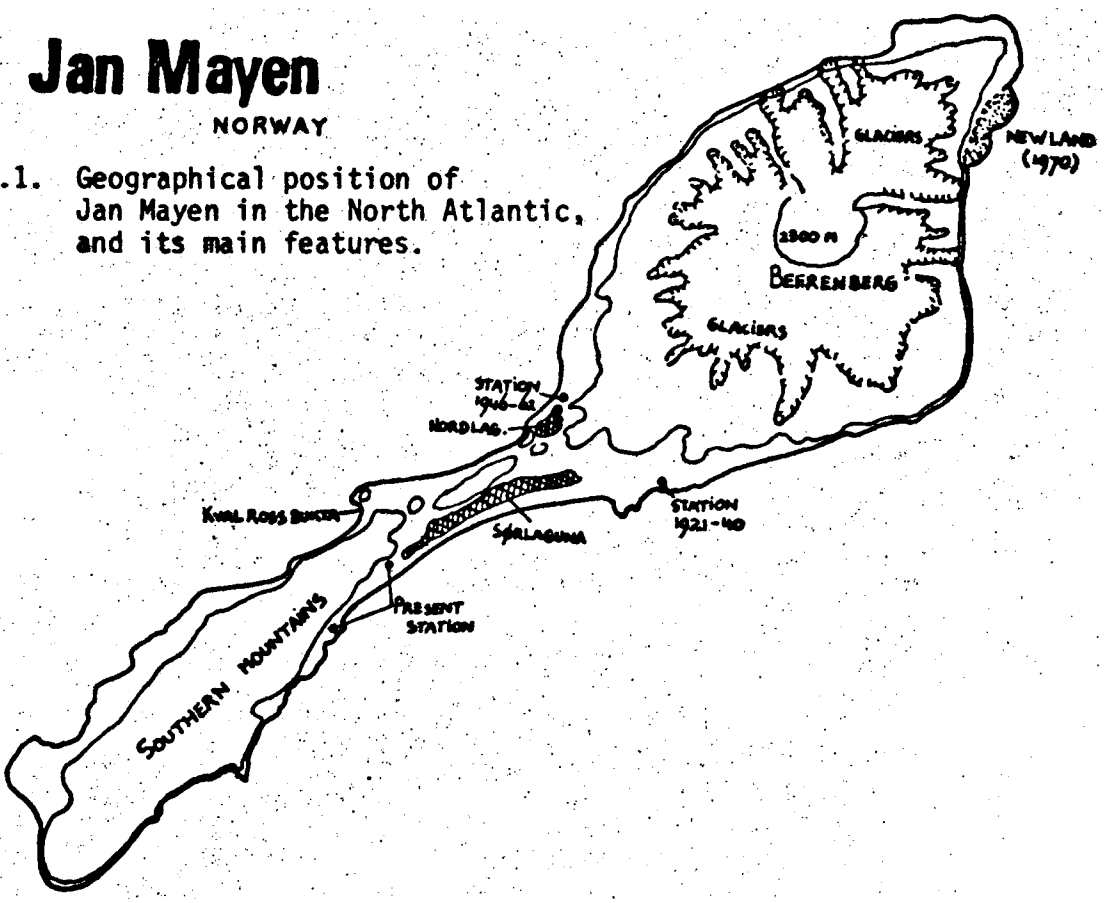


Fig.1. Geographical position of Jan Mayen in the North Atlantic, and its main features.

2. JAN MAYEN.

Jan Mayen is an island in the middle of the North Atlantic Ocean. It is situated at 71 degrees northern latitude in the arctic climatic zone. The island has a very isolated position: the most nearby land is Greenland, about 500 km to the west(Fig.1.).
Jan Mayen was shaped by volcanic eruptions. Like Iceland, 600 km to the south, it is no more than a small visible part of a large and mostly submerged mountain-chain which crosses the Atlantic from north to south. This so-called "Mid-Atlantic-Ridge" is a fracture-zone in the crust of the earth between the continental plates of the New and Old World that drift apart. It is characterized by strong volcanic activity, and therefore it is not surprising that the landscape of Jan Mayen is dominated by a huge volcano: the Beerenberg ("Bear-Mountain"). This volcano on the northern half of the island is about 2300 m high, and its slopes are covered by glaciers. It is still active: eruptions on its northeastern slope formed an area of new land in 1970.
Jan Mayen owes its name to the Dutchman Jan Jacobsz May, who came to the island in 1614 during a whaling expedition. It would be exaggerated to say that he discovered the island, but it was his visit that started a period of vivid whaling-activities by mainly the Dutch and the English. Several settlements were build. In the winter of 1633/34 seven Dutch men tried to stay on the island on order to protect the possessions of their company. Their attempt failed and all of them died of scurvy and cold.
It took to the end of the 19th century for other activities to take place on this isolated island. In 1882/83 an Austrian Expedition stayed on the island to do many kinds of polar research. In the beginning of the 20th century they were followed by a number of Norwegian trappers that quickly caused an almost complete extermination of the Polar Fox on the island.
Jan Mayen, until then no-mans land, was proclaimed to be Norwegian territory in 1929. Some years before a Norwegian meteorological station was established. Since 1929 Norwegian men have permanently been stationed on the island for meteorological observations, radio-services, and operation of navigation systems. Three different stations have been used. The present station at Trollsletta has a crew of 20 to 30 men. Strongest human activities took place during World War II, when Jan Mayen was the only Norwegian territory not occupied by the Germans.
Apart from the station there is no human inhabitation. There are some cabins around the island which are sometimes used by the station-crew at trips during days off. We used such cabins during our work; our main "biological station" was a cabin called Puppebu in Kvalrossbukta.
Jan Mayen is long in shape (Fig.1.): from the Nordkapp to Sørvestkapp it measures about 55 km. The width varies from 15 km in the north (Beerenberg) to about 6 km in the south. The narrowest part, about 3 km, is situated at the center of the island, which is also the lowest part. In this area two lakes are found: the Sørlaguna and the Nordlaguna. Sørlaguna is very shallow dries up during summer. Nordlaguna is deeper and contains brackish water.
Most of the snow-cover of the middle and southern part of the island disappears during summer; only on the Beerenberg eternal snow an glaciers remain. When the snow has melted the landscape looks very dark because of the mostly blackish lava bottom and

scarce vegetation. Only minor patches of mosses and small flowering plants and grasses are able to grow in this hars climate and in the mostly dry bottom.
The coast of Jan Mayen consists of a regular alternation of bays or beaches with steep lava cliffs directly rising from sea. Longer stretches of uninterrupted cliffs are present around the Beerenberg and in the southeast. The cliffs offer a breeding place to large numbers of seabirds. Compared to the barren interior parts of Jan Mayen the coast is very rich in life.
The climate of Jan Mayen is rather unpleasant. In spite of the fact that afternoon-temperatures rise above 6 o Celsius in July and August, the strong winds, rain, and especially heavy fog often hamper outdoor work even during summer. Most of the year the island is covered by snow; generally the island gets surrounded by sea-ice during late winter, though this did not happen during the winter '82/83. Polar Bears are only occasionally seen at Jan Mayen during summer; the latest report is from August 1974. Because of the lack of sea-ice in the winter preceding our expedition the risk of Polar Bear was very low during our stay.

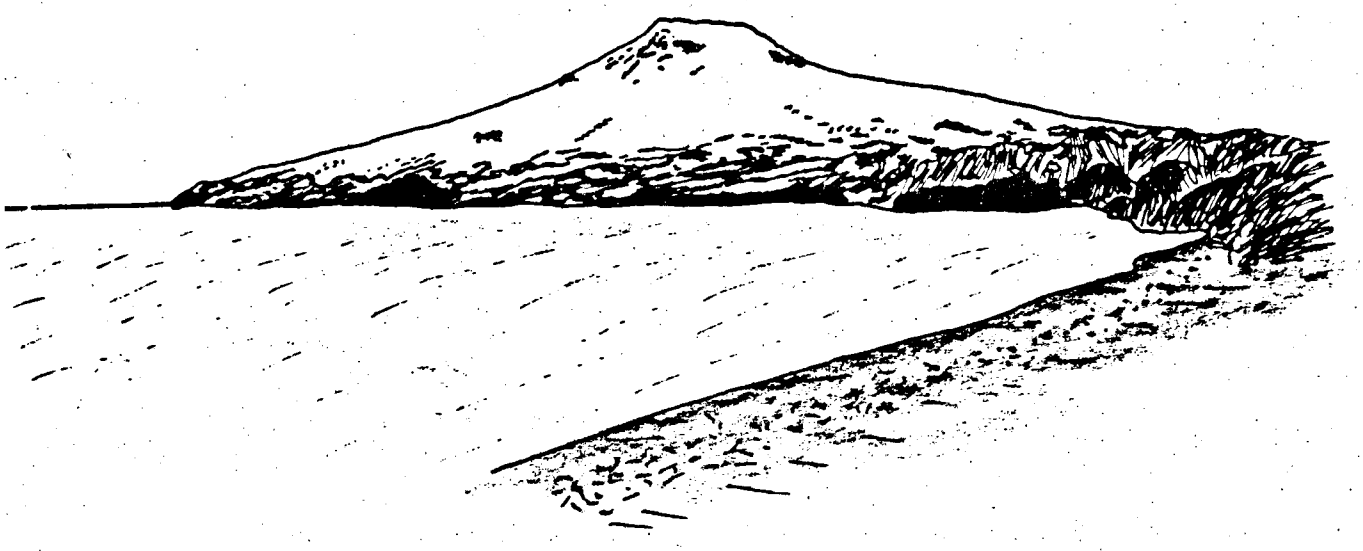
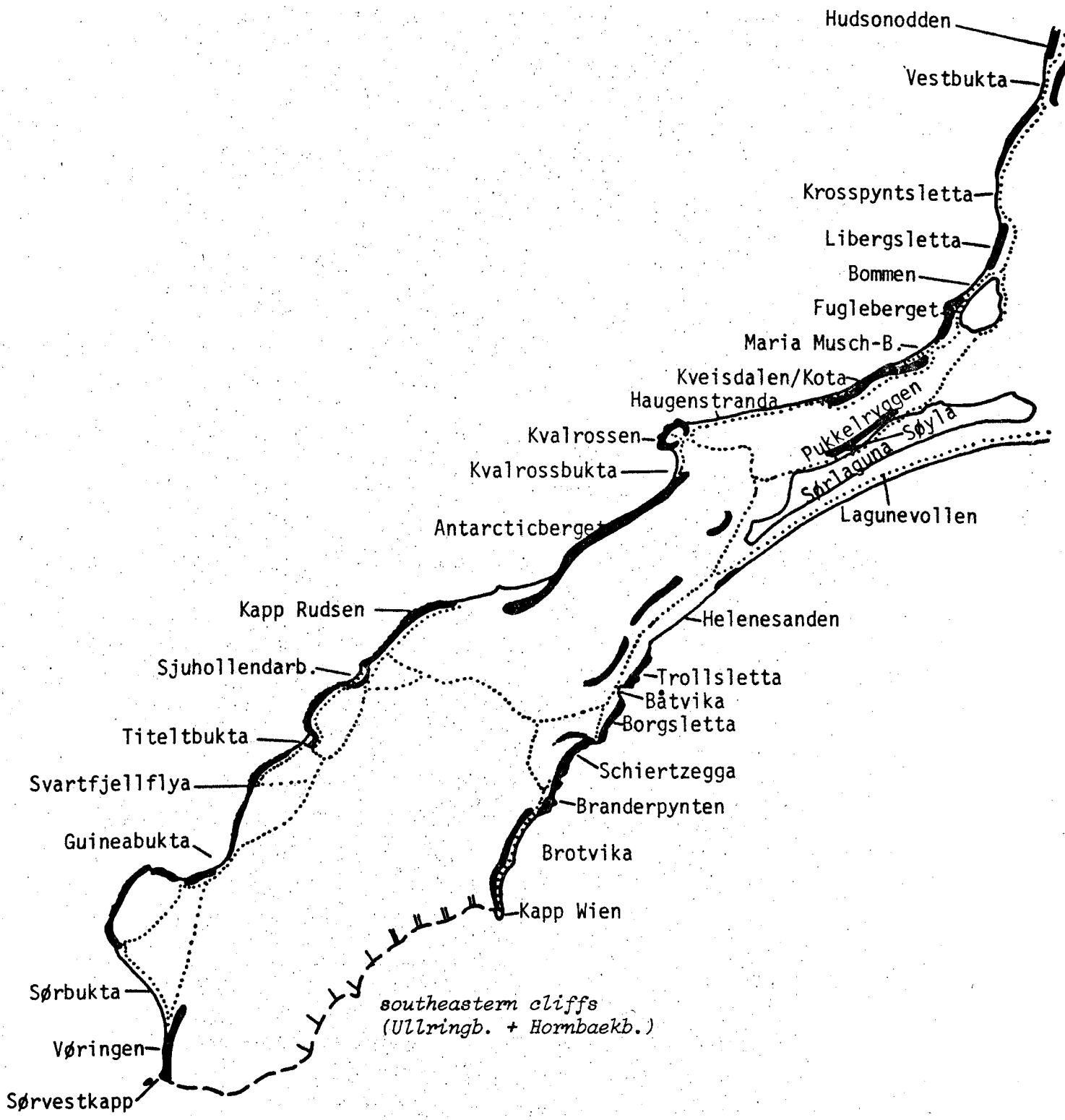


Fig.2. Beerenberg, Jan Mayen
(seen from top of Kvalrossen, Haugenstranda in front)

3. SHORT DIARY

Departure from Amsterdam is on 27 May, on board a ship bound for Kristiansand, Norway. In a few days we drive our heavily loaded car from Kristiansand to Bodø. Forsvarets Fellessamband has arranged that we can travel from Bodø to Jan Mayen by military airplane. On 8 June we fly to Jan Mayen but low clouds and snow showers make a landing impossible, which forces the plane to fly back the 900 km to Bodø. On 9 June we fly again and this time successfully: at the fourth attempt of landing the pilot manages to ground the plane on the airstrip in the middle of the island. In a snowy landscape we are welcomed by captain and crew of the station. We get rooms in the station and we enjoy a superb welcome meal.
During the first ten days of our stay we make trips on the eastern coast of the island (between Kapp Wien and Kapp Fishburn) to count bird colonies. We also explore Kvalrossbukta on the other coast. We decide to make Kvalrossbukta to the basis for our Fulmar studies because of the presence of a cabin and large seabird colonies in its neighbourhood. Part of our luggage is therefore brought to Kvalrossbukta from the station. More supplies are delivered to us by the Dutch ship Plancius, which is on its way to Spitsbergen. The Plancius stays for a few days (20-22 June) and enables us to observe some coastal areas that cannot be reached by foot, e.g. the northern side of the island (Storfjellet, Krossbukta).
When the Plancius has left we start our work on Fulmars in Kvalrossbukta. The birds are caught with long-handled nets (fleygs) and are measured, described, and ringed. We wait to 5 July with making further counting-trips along the coast because until then the snow makes walking too difficult. In order to reach the southwestern coast of the island we have to cross the mountains along the backside of the station and Borgdalen. The remaining snow is not much of a problem there, bu fog makes it very difficult to find our way. However, once over the top of the mountains the sun shines and it stays like that for the following three days. We explore the southwestern coast from Kapp Rudsen down to Sørbukta. Low cloud cover makes it useless to climb the cliffs in the south: therefore we cannot visit the southeastern cliffs between Sørvestkapp and Kapp Wien.
After a day rest at the station we go to the cliffs of Splittodden and Skrinnodden to work on the auks breeding there. From July 10 to 14 we are busy catching and ringing guillemots.
From then on we spend most of our time in the cabin in Kvalrossbukta to proceed with our work on Fulmars. Apart from measuring and ringing living birds we collect some specimens for the Zoölogical Museum in Amsterdam. During the (many) days that bad weather hampers outdoor work we clean and dry the skins of these birds. We also make some trips north along the western coast up to Hudsonodden.
During the last few days we enjoy the last of our regular stays at the station. On 10 August we have to say goodbye to all our friends there because the plane has arrived to take us back to Bodø. On 14 August we return in Amsterdam.


Hudsonodden
Vestbukta
Krosspyntsletta
Libergsletta
Bommen
Fugleberget
Maria Musch-B.
Kveisdalen/Kota
Haugenstranda
Kvalrossen
Kvalrossbukta
Pukkelryggen
Søyla
Sørlaguna
Lagunevollen
Antarcticberget
Kapp Rudsen
Helenesanden
Sjuhollendarb.
Trollsletta
Båtvika
Borgsletta
Titeltbukta
Schiertzegga
Svartfjellflya
Branderpynten
Guineabukta
Brotvika
Kapp Wien
Sørbukta
southeastern cliffs
(Ullringb. + Hornbaekb.)
Vøringen
Sørvestkapp

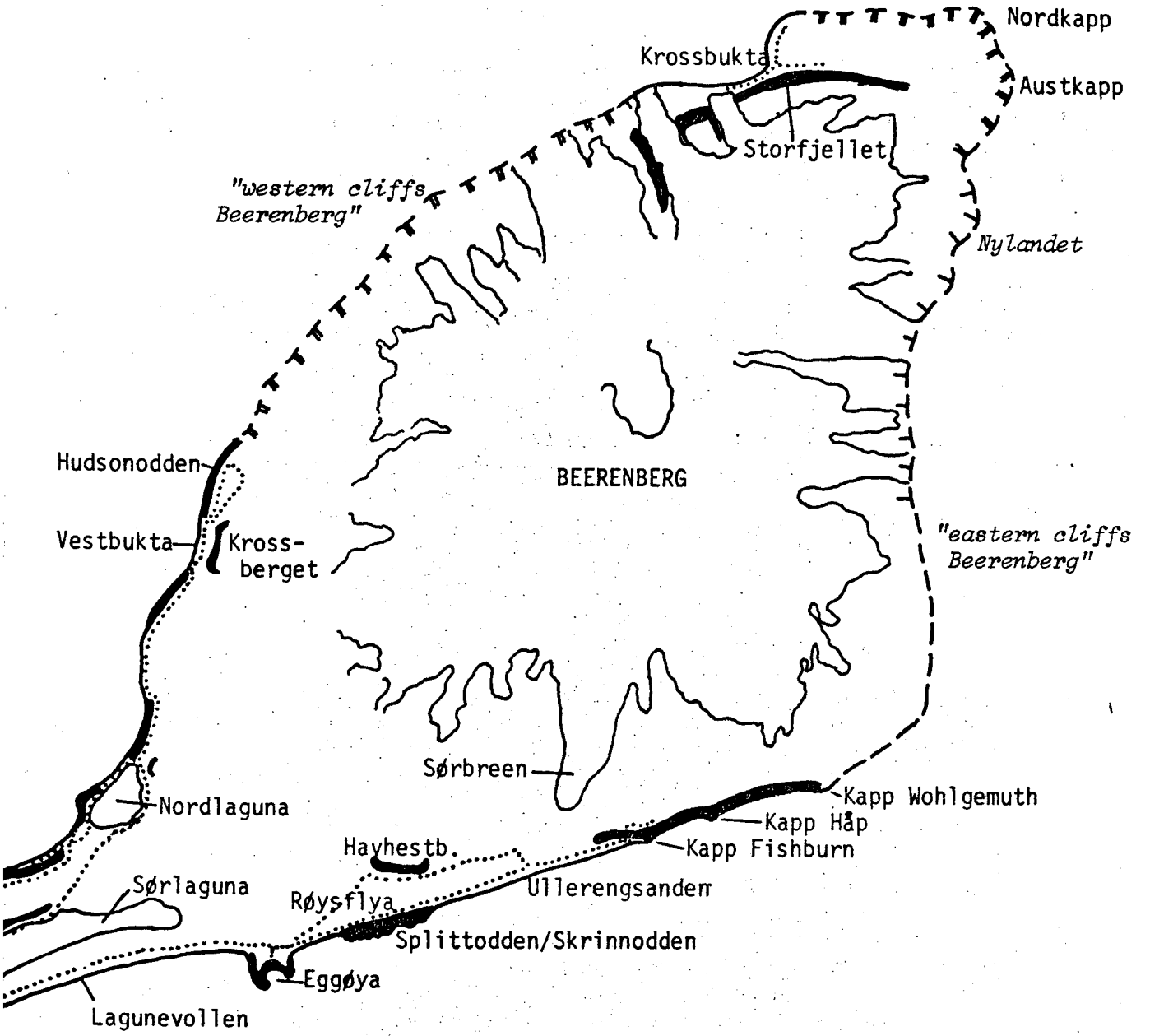


Fig.3. Jan Mayen. Names, routes of walking, and cliffs. Accuracy in censusing bird numbers is given by solid or broken coast-lines.

..... routes of walking (accurate observations possible)
——— beach of sand and/or stones
▬▬ cliff-areas (including low cliffs)
⊥⊥ cliff-areas only observed from ship:
⊥⊥ proper observations possible
⊥ superficial observations (large distance, foggy)
— no observations possible (fog)

4. THE BIRDS.

In this chapter all birds are listed that were observed by us during our stay at Jan Mayen. It is not a complete list of the avifauna of the island (we will prepare a paper in which our observations are compared with the available data in literature). Species are listed in their usual sequence; first in a table with general information on their occurrence on Jan Mayen and then in separate accounts. In all species English, scientific, Dutch, and Norwegian names are given.
As far as possible we will supply data on distribution and numbers. Details on the methods used in censusing are given with each species, but some general aspects of seabird-counts need discussion in advance.
When counting in seabird colonies it is impossible to spot all the birds in the area. First problem is that always some parts of the coast are hidden from view. Secondly, several species breed in crevices or holes. Therefore each count has to be followed by an estimate of the total number of birds, which takes into account the peculiarities of the terrain, the habits of the species involved, weather conditions during observation, etc. Since the accuracy of the estimate will vary strongly depending on such factors, a range (minimum-maximum) is always added to the estimate.
Whenever possible accurate figures are used in counts, estimates and ranges. However, sometimes circumstances, or species involved, forced us to restrict estimates and ranges to "orders of magnitude":

order 1	=	1 -	10
order 2	=	10 -	100
order 3	=	100 -	1.000
order 4	=	1.000 -	10.000
order 5	=	10.000 -	100.000
order 6	=	100.000 -	1.000.000

etc.

(N.B. codes used in this report differ from codes used in the report on Fulmarus glacialis Expedition (1), Bear Island 1980 (v.Franeker & Luttik 1981).
A thorough investigation of all coastal areas proved to be impossible. Long stretches of coast were walked, enabling us to make rather accurate counts. Other parts of the coast, mainly around the Beerenberg and in the southeast, were too difficult or dangerous to walk, or weather conditions prevented observations. Thanks to the Dutch expedition vessel "PLANCIUS" we were able to make general observations from sea, covering several of these coastal sections. Heavy fog and bad weather however, prevented even such observations from the ship along the southeastern side of the Beerenberg and along the cliffs between Kjeglene and Sørvestkapp. On such areas only very limited information is available from observations on the surrounding sea or from knowledge of some members of the station crew. The ways in which different coastal areas were observed, are expressed in Fig.3.
From the above, it is evident that we cannot give accurate figures for the size of the seabird populations of Jan Mayen. Nevertheless, next to our figures on well observed areas, we will attempt to give estimates on the total Jan Mayen populations, based on all the information available to us. We prefer "best possible estimates" for the whole of Jan Mayen above the limited information value of giving only accurate estimates for some restricted parts of the island.

4.1.	Gavia immer	- visitor in small numbers
4.2.	Fulmarus glacialis	- breeding in large numbers
4.3.	Sula bassana	- rare visitor
4.4.	Anser anser	- rare visitor
4.5.	Anser brachyrhynchus	- visitor in small numbers
4.6.	Cygnus cygnus	- rare visitor
4.7.	Somateria mollissima	- probably non breeding common visitor
4.8.	Somateria spectabilis	- visitor in small numbers
4.9.	Melanitta nigra	- rare visitor
4.10.	Clangula hyemalis	- visitor in small numbers
4.11.	Mergus serrator	- rare visitor
4.12.	Charadrius hiaticula	- probably non breeding common visitor
4.13.	Pluvialis apricaria	- visitor in small numbers
4.14.	Arenaria interpres	- visitor in small numbers
4.15.	Calidris maritima	- breeding in small numbers
4.16.	Calidris alpina	- visitor in small numbers
4.17.	Calidris canutus	- rare (?) visitor
4.18.	Calidris alba	- common visitor
4.19.	Tringa totanus	- rare visitor
4.20.	Numenius phaeopus	- visitor in small numbers
4.21.	Stercorarius skua	- possibly breeding in small numbers
4.22.	Stercorarius pomarinus	- visitor in small numbers
4.23.	Stercorarius parasiticus	- common breeding bird
4.24.	Stercorarius longicaudus	- rare, non breeding(?)
4.25.	Larus ridibundus	- visitor in small numbers
4.26.	Larus fuscus	- common visitor, breeding possible
4.27.	Larus argentatus	- visitor in small numbers
4.28.	Larus hyperboreus	- common breeding bird
4.29.	Larus glaucoides	- rare visitor (?)
4.30.	Larus marinus	- breeding, and common visitor
4.31.	Larus canus	- rare visitor
4.32.	Rissa tridactyla	- common breeding bird
4.33.	Sterna paradisea	- common breeding bird
4.34.	Alle alle	- breeding in large numbers
4.35.	Alca torda	- breeding in small numbers
4.36.	Uria aalge	- breeding in small numbers
4.37.	Uria lomvia	- breeding in large numbers
4.38.	Cepphus grylle	- common breeding bird
4.39.	Fratercula arctica	- common breeding bird
4.40.	Asio flammeus	- rare visitor
4.41.	Anthus pratensis	- probably breeding in small numbers
4.42.	Motacilla alba	- probably non breeding rare visitor
4.43.	Oenanthe oenanthe	- probably breeding in small numbers
4.44.	Turdus pilaris	- visitor in small numbers
4.45.	Turdus merula	- visitor in small numbers / rare?
4.46.	Turdus iliacus	- visitor in small numbers
4.47.	Plectrophenax nivalis	- breeding in small numbers
4.48.	Carduelis flammea	- rare visitor
4.49.	Carduelis hornemanni	- rare visitor

Table 1. Species observed at Jan Mayen, June to August 1983. (including finds of dead birds; personal observations only. Information on some other species reported by the station crew is given in section 4.50.). Indications on frequency of occurrence and/or breeding should be interpreted carefully: they are based on two summer months of observations, and some may change considerably when observations are made during other months or other years.

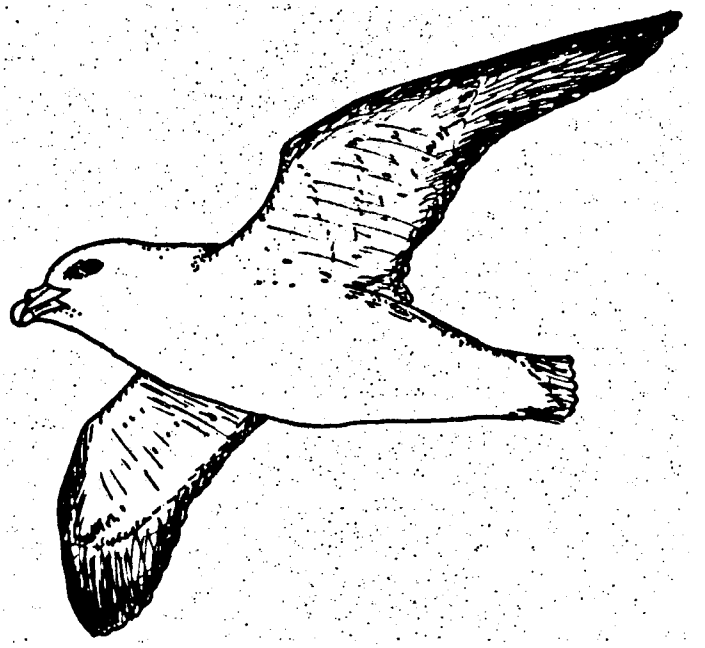
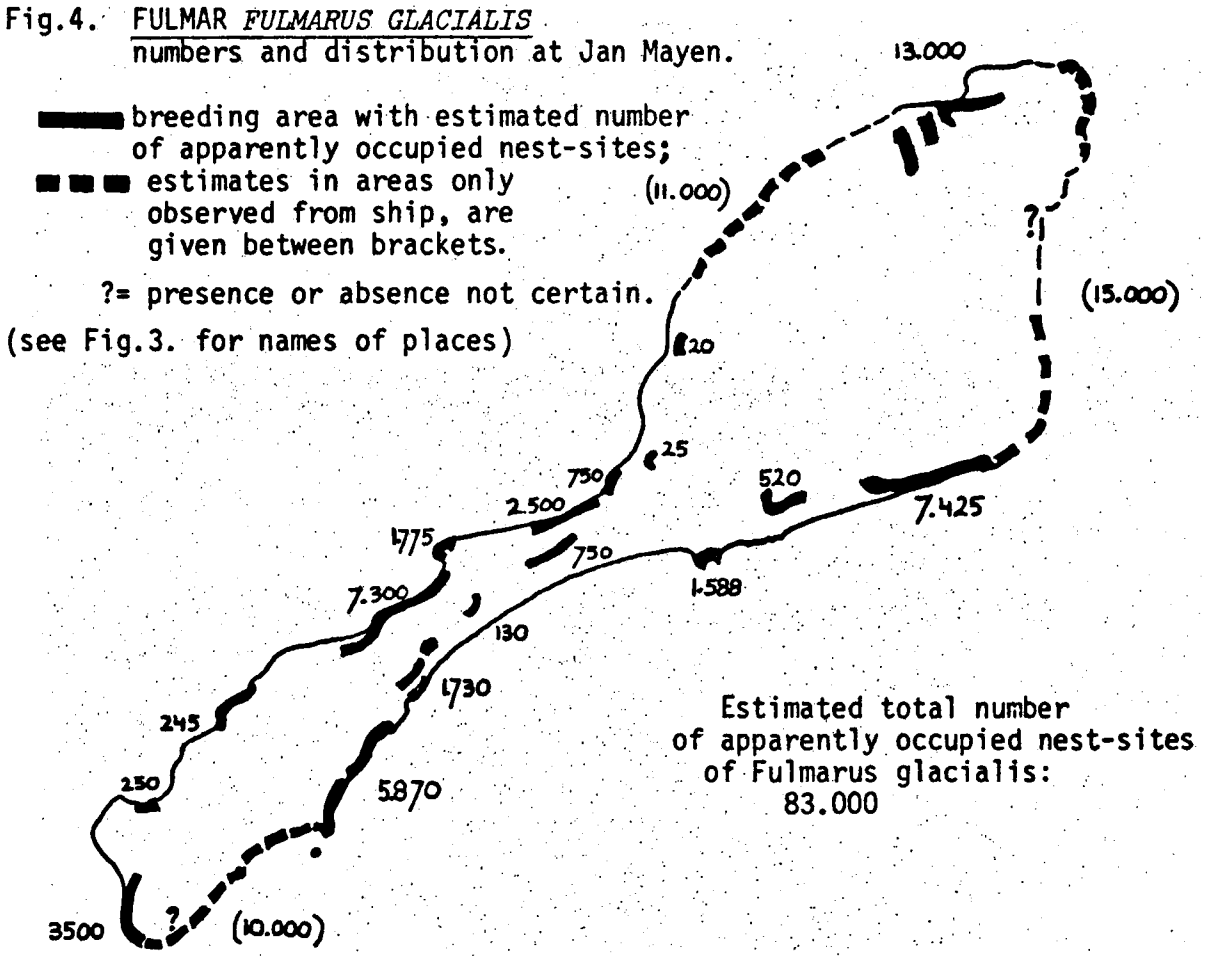


Fig.4. FULMAR *FULMARUS GLACIALIS* numbers and distribution at Jan Mayen.

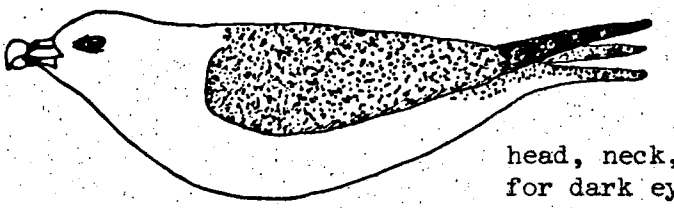


4.1. Great Northern Diver GAVIA IMMER, IJsduiker, Islom.

Great Northern Divers were observed on several occasions throughout our stay on Jan Mayen. In total 15 birds were seen during eight observations in widely separated localities. Six of these birds were in adult breeding plumage; nine in juvenile/non-breeding plumage. Apart from an adult bird at Nordlaguna, all Great Northern Divers were staying at sea. We have no indications of breeding, and the species is probably best considered as a regular (non-breeding) visitor of Jan Mayen.

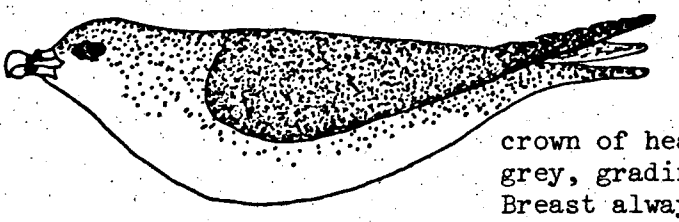
4.2. Fulmar FULMARUS GLACIALIS, Noordse Stormvogel, Havhest.

Numbers and distribution. Fulmar colonies are censused by the number of "apparently occupied nest-sites". Since the Fulmar builds no nest it sometimes is difficult to separate the birds with an egg or young from non-breeding birds sitting on the cliffs. Position and/or behaviour of a bird may be indicative for its breeding status, but a number of non-breeding birds/pairs will inevitably be included in counts. Nevertheless, the number of apparently occupied nest-sites provides a reliable index of population size.
Our counts of Fulmars in well investigated areas (see Fig.3.) amount to 31.968 apparently occupied nest-sites. When accounting for hidden cliff-sections and the occasional breeding in crevices and holes the accompanying estimate results in 47.378 sites (range 37.697 - 65.528). Detailed information on numbers in different areas is given in Fig.4.
Large numbers of Fulmars however also breed in the other areas around the Beerenberg and in the southeast. Comparison of the densities of breeding there (as observed from the ship) with densities in well known colonies leads to an estimated number of 36.000 sites in these areas (range 20.500 - 62.500).
Combined for the whole of Jan Mayen this means that we estimate the Fulmar population at over 83.000 apparently occupied nest-sites (range 60.000 - 120.000).
When trying to translate this number of nest-sites into the number of actual breeding pairs one has to take into account that considerable losses of eggs may occur at the onset of laying. Therefore it seems reasonable to suggest that the Jan Mayen Fulmar population will have about a 100.000 adult breeding pairs (or, more carefully expressed in orders of magnitude, the number of breeding pairs will be high in order 5 to low in order 6).
Details on numbers and distribution are given in Fig.4., showing that the Fulmar is well spread on Jan Mayen. It breeds on almost all steep and high cliffs facing sea but generally avoids low cliffs like in the southwest and at Splittodden/Skrinnodden. Some of the colonies are situated at some distance from the sea, like on Havhestberget, Pukkelryggen, and Trollslottet. Breeding is generally restricted to ledges or crevices in almost vertical cliffs; only in some inaccessible places like peninsulas, small islands or stacks, nests are to be found on flat surfaces as well.
Colour-phases. The Fulmar shows a wide variation in the colour of its plumage. The lightest birds have a gull-like coloration with white head, neck, and underparts. The darkest individuals have an uniformly grey colour. Between these extremes innumerable intermediate types exist. For practical purposes this



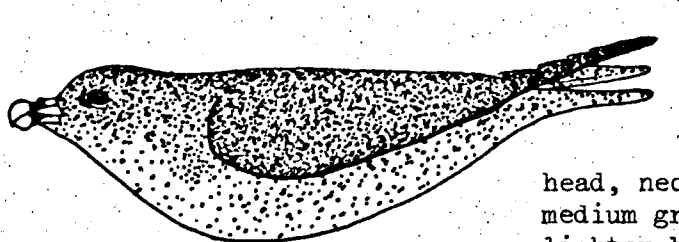
LL

Double light
head, neck, and underparts white (exept for dark eyemark) or white tinged with yellow. Underwing-coverts white.



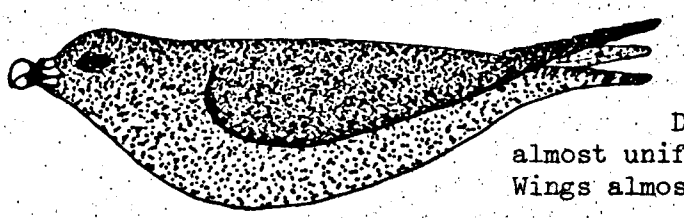
L

Light
crown of head, nape, and hind of neck grey, grading into grey of mantle. Breast always white, but rest of underparts may vary from white to grey. Underwing-coverts always grey.



D

Dark
head, neck, and underparts light or medium grey. Breast in most cases lighter but never white.



DD

Double dark
almost uniformly dark or very dark grey. Wings almost as dark as their tips.

Fig.5. Colour-phases of Fulmarus glacialis

colour variation has been described in a system using four colour-phases, described in Fig.5.
In southern colonies, like e.g. in Britain, the LL-type ("white") constitutes virtually 100% of the population. In many arctic colonies the "coloured" types (L, D, DD) constitute the vast majority of the population. (This description only fits the Atlantic Fulmars; in the north Pacific the situation is exactly reversed).
An example of a coloured Atlantic population is present at Bear Island (Bjørnøya). In 1980 the first Fulmarus glacialis Expedition found that at Bear Island most Fulmars were coloured (28.1% L; 54.0%D; and 10.2%DD) whereas only 7.7% was white (LL). The situation at Jan Mayen appeared to be completely different: 99.6% of the birds is white (LL), and only 0.4% coloured (L, D, and DD). This is rather surprising considering the relatively short distance between Jan Mayen and Bear Island and the similarity in climatic conditions in these places. The difference in colour indicates that dark colour of the plumage is not an functional adaptation to a cold environment as is sometimes suggested. It also indicates that these two colonies are strongly isolated: only few individuals, if any, settle themselves in an other colony than they were born in.
Measurements. A number of 191 Fulmars was captured for taking measurements. Fulmars were captured with long-handled nets (fleygs) when flying close along the edge of the cliffs. Most of these birds were released with Norwegian rings (Stavanger Museum) after notes had been taken of plumage-colour, moult, measurements and weight. Partly these birds were given a coloured plastic ring on the second leg (females-red; males-white). For the Zoological Museum in Amsterdam 29 of these Fulmars were collected.
Measurements of Jan Mayen Fulmars appeared to be only slightly smaller than measurements of Fulmars from Britain. For example the mean bill-length of males was 39.95mm, and of females 37.11mm; tarsus-length in males 56.7mm and in females 52.6mm.
Both colour and measurements of Jan Mayen Fulmars show that this population is very similar to the southern subspecies Fulmarus glacialis auduboni.
Further notes on Fulmars.
- Considerable numbers of empty egg-shells were found below the Fulmar colony at Kvalrossen between 16 and 18 July, indicating the hatching of many young Fulmars at the time. Assuming a normal period of incubation this means that most birds had laid their eggs around the 25th of May.
- The Fulmar produces only one egg, and observations of 2 eggs in one nest-site are generally attributed to two females using the same nest. At Jan Mayen we observed one Fulmar with two eggs at the western side of Kvalrossen. This bird attempted to incubate both eggs at the same time, but did so clearly without success. The incubation patch of a Fulmar can cover no more than one egg.
- Studies of interbreeding of different colour-morphs were not possible on Jan Mayen because of the rarity of coloured (L, D, DD) Fulmars. However, the few observations of coloured Fulmars with their partner at a nest-site showed in all cases that the partner was LL.
- Collecting of Fulmars was needed to ascertain the relation between sex and measurements (males are generally larger). Birds collected are studied in as many aspects as possible. Investigation of stomach-contents showed for example that pollution of the oceans with plastic materials may become a

danger to birds like the Fulmar. Earlier studies on Fulmars found dead in the Netherlands showed that plastic eating is a common phenomenon in this species. Apparently the birds consider almost all floating materials as edible. It was alarming to learn that even 76% of the Fulmars collected at Jan Mayen had ingested several kinds of plastics. Each of these birds had a mean of 4 plastic objects in its stomach! Plastic ingestion probably causes a decrease in uptake of nutrients, and an increased level of toxic chemicals in the birds body.
- One "iron-eating" Fulmar was collected. At dissection we found that the bird contained an iron nail of about 7 cm length in the distal part of its gut! The nail was embedded in a thick layer of fat-like material (diameter 2.5cm; length 9cm). In spite of this voluminous object in its body, the birds showed no strong physical impairment. We cannot explain the origin of the nail otherwise than by assuming that the bird had been eating driftwood which contained the nail.
- A remarkable pattern of feeding of Fulmars could be observed regularly at Jan Mayen. When strong winds were blowing off the land, large quantities of small crustaceans came up close along the shore, apparently from deeper water-layers. Huge numbers of Fulmars would show up to take advantage of this source of food, forming white bands close along the shore. Swimming close together the birds continuously dipped their heads into the water to pick up the small crustaceans. Occasionally the number of Fulmars in such flocks could grow to tens of thousands (e.g. on June 9 along the beaches of Helenesanden and Lagunevollen).
- These and other objects of study of the Fulmar (e.g. development of sexual organs; moult; ....) will or have been dealt with in other publications.

4.3. Gannet SULA BASSANA, Jan van Gent, Havsule

Two Gannets flew along Vestbukta on 8 August. Both birds were immature (second and fourth year plumage respectively). Probably Gannets are only occasional visitors of the waters around Jan Mayen.

4.4. Greylag Goose ANSER ANSER, Grauwe Gans, Grågås

On 21 June a Greylag Goose was walking on the mud-flat at the southwestern tip of Sørlaguna. Later on in July we found the decayed corpse of a Greylag Goose at Helenesanden (unlikely to be the same bird as seen alive). We consider this species to be an accidental visitor to Jan Mayen in summer.

4.5. Pink-footed Goose ANSER BRACHYRHYNCHUS Kleine Rietgans, ----------Kortnebbgås.

One Pink-footed Goose was seen and heard flying above Kvalrossbukta on 26 June. Five geese flying over the same area almost certainly belonged to this species as well. Since we did not observe any Pink-footed Geese in July or August, we assume that the species is not breeding at Jan Mayen and is only a visitor in small numbers, at least during summer. Considering the many geese droppings that we found at vegetations below bird-cliffs it is possible that larger groups of geese visit Jan Mayen during migration. Groups of Pink-footed Geese are the most likely migrants.
(Anser fabalis ? : A goose seen near Båtvika on 20 June was in our opinion a Bean Goose. Unfortunately, positive identification was prevented by fog.)

4.6. Whooper Swan CYGNUS CYGNUS, Wilde Zwaan, Sangsvane.

One Whooper Swan was observed swimming in Nordlaguna on 9 July. The same bird was seen earlier by the station crew. From mid-June on the bird was recorded around the station-area and Sørlaguna.

4.7. Eider SOMATERIA MOLLISSIMA, Eidereend, AErfugl.

Eiders were observed 13 times with a total number of 92 individuals. At least 54 of these birds were males. Largest numbers were seen in late July to August. We found no indications of breeding at Jan Mayen. Probably some non-breeders spend the summer around the island. Numbers may grow during summer by breeders from elsewhere coming to Jan Mayen to moult. Sexes tended to gather in separate groups rather than forming pairs. In our opinion Eiders do not breed at Jan Mayen.

4.8. King-Eider SOMATERIA SPECTABILIS, Koningseider, Praktaerfugl

On 5 July two male King-Eiders were swimming in a group of Eiders near Kapp Rudsen. One of these males was in adult breeding plumage; the other one was a young male (2nd.calendar-year). Possibly the same young male was seen in Sjuhollendarbukta a few days later. On 5 August two males in moulting plumage were flying near Trollsletta in a large group of male Eiders.

4.9. Common Scoter MELANITTA NIGRA, Zwarte Zeeeend, Svartand

A pair of adult Common Scoters (subspecies M.n.nigra) was present in Kvalrossbukta on 20 June. Since this is the first observation of this species at Jan Mayen, Common Scoters probably are rare visitors to the island.

4.10. Long-tailed Duck CLANGULA HYEMALIS, IJseend, Havelle

Long-tailed Ducks were observed at different localities along Jan Mayen's coast. On eight occasions a total number of 13 individuals was seen (6 males, 6 females, 1?). Several of these birds were in adult plumage, but we found no indications of breeding. A dead adult male was found on the beach of Kvalrossbukta. The species probably is a non breeding visitor in small numbers.

4.11. Red-breasted Merganser MERGUS SERRATOR, Middelste Zaagbek,

A pair of adult Red-breasted Mergansers shortly visited Kvalrossbukta on 29 June. Probably the female was still present in the area during the next day. The species is a rare visitor at Jan Mayen.

4.12. Ringed Plover CHARADRIUS HIATICULA, Bontbekplevier, Sandlo.

During the first few days of our stay at Jan Mayen (June 9-10) groups of Ringed Plovers were present at the beaches. In total we observed some tens of individuals. Apparently these birds were just passing migrants, because numbers quickly declined. Until the last week of June nearly daily Ringed Plovers were recorded, but only single birds or small groups. From 27 June to 10 August only six Ringed Plovers were recorded, without any indication of breeding at the island. We consider Ringed Plovers as rather common visitors at Jan Mayen, but not as breeding birds.

4.13. Golden Plover PLUVIALIS APRICARIA, Goudplevier, Heilo.

Small numbers of Golden Plovers were present throughout our stay at Jan Mayen. Observations were most frequent in June: on 13 June at least 9 different Golden Plovers in summer plumage were present on the beaches of Helenesanden and Lagunevollen In July we only made 5 records of one to three Golden Plovers. No indications of breeding were noted.

4.14. Turnstone ARENARIA INTERPRES, Steenloper, Steinvender.

Turnstones were only seen in small numbers just after our arrival (e.g. on 13 June 7 birds at Lagunevollen) and near the end of our stay (e.g. 10 birds in Kvalrossbukta on the last days of July). Turnstones apparently only visit Jan Mayen on their spring and autumn migrations, and do not breed on the island.

4.15. Purple Sandpiper CALIDRIS MARITIMA, Paarse Strandloper, ----------Fjaereplytt.

During June our only observation of Purple Sandpipers was two individuals in Båtvika. It was therefore rather surprising to find proof of breeding of this species near Kapp Rudsen. One chick was seen, and about 5 pairs in this area showed strong distraction behaviour and made loud alarm calls, indicating breeding (5 July). Further south, in Titeltbukta and around Guinea-bukta an additional number of 9 Purple Sandpipers was seen (but without distraction behaviour). The occurrence of Purple Sandpipers seems to be restricted to this southwestern part of Jan Mayen, because afterwards only one more individual was seen in Kvalrossbukta at the end of July. The Purple Sandpiper is a scarce breeding bird at Jan Mayen; it seems unlikely that the number of breeding pairs will exceed order 2 .

4.16. Dunlin CALIDRIS ALPINA, Bonte Strandloper, Myrsnipe.

Small groups of Dunlins (order 2) were present at the beaches of Helenesanden and Lagunevollen in the second week of June. In the remaining weeks of June only occasionally singles or pairs were seen. Later on, the Dunlins completely disappeared, except for one individual in a group of Sanderlings at the end of July. Dunlins are only migratory visitors to Jan Mayen.

4.17. Knot CALIDRIS CANUTUS, Kanoetstrandloper, Polarsnipe.

Only one Knot was observed at Jan Mayen. It was seen in association with a large group of Sanderlings in Kvalrossbukta at 27 July.

4.18. Sanderling CALIDRIS ALBA, Drieteenstrandloper, Sandløper.

Six Sanderlings at least were present at Helenesanden during the second week of June. No other Sanderlings were observed until 19 July, when we spotted two birds on Haugenstranda. On 27 July a clearly migratory group of over 50 Sanderlings came to Kvalrossbukta; part of these birds stayed until the next day. It is worth noting that at least two individuals of this group carried metal rings. In August three additional Sanderlings were recorded at Krosspyntsletta. Clearly, the Sanderling is no more than a migratory visitor at Jan Mayen.

4.19. Redshank TRINGA TOTANUS, Tureluur, Rødstilk.

On 12 June a Redshank landed on the beach of Helenesanden. Since this is the first record of this species at Jan Mayen, the bird probably is a rare visitor.

4.20. Whimbrel NUMENIUS PHAEOPUS, Regenwulp, Småspove

During June and the first week of July we made eight observations of Whimbrels, all of single birds. All birds were seen at beaches, except for one specimen that walked between the stones and moss-vegetation on top of Kapp Rudsen. No evidence of breeding was recorded. During the remaining part of the summer no Whimbrels were seen. The species is probably best considered as an accidental visitor.
(On 4 July two Numenius spec. were shortly seen flying above Trollsletta. First impression was of Curlew, Numenius arquata, but positive identification was not possible.)

4.21. Great Skua STERCORARIUS SKUA, Grote Jager, Storjo.

Great Skuas were observed on different localities all over the island. Breeding was not proved but is likely to occur, as several pairs showed more or less evident territorial behaviour (attack in defence). Presumed breeding pairs were noted at Branderpynten, Sørbreen-morena, and Kota (see Fig.6.). The pair at Kota showed very evident territorial behaviour. Pairs without territorial behaviour were seen near Sjuhollendarbukta and Kapp Fishburn. No previous records are known of (attempted) breeding of Great Skuas at Jan Mayen. We feel that this is a present breeding species (order 1) or at least a common summer-resident. Great Skuas were seen regularly in or near Sørlaguna, obviously using the lake as a bathing place. A ringed individual was observed near Nordlaguna on 19 July. Kvalrossen was regularly visited by a pair of Great Skuas, especially at night, probably originating from Kota.
Most of the Great Skuas observed were in adult plumage (intensively speckled white on neck and throat), only once two immatures were observed (20 June, red-bellied, possibly second calendar year).
Great Skuas were seen chasing Kittiwakes and Arctic Terns. Fights with Arctic Skuas occurred regularly when either Great Skuas entered an Arctic Skuas territory or the other way round.

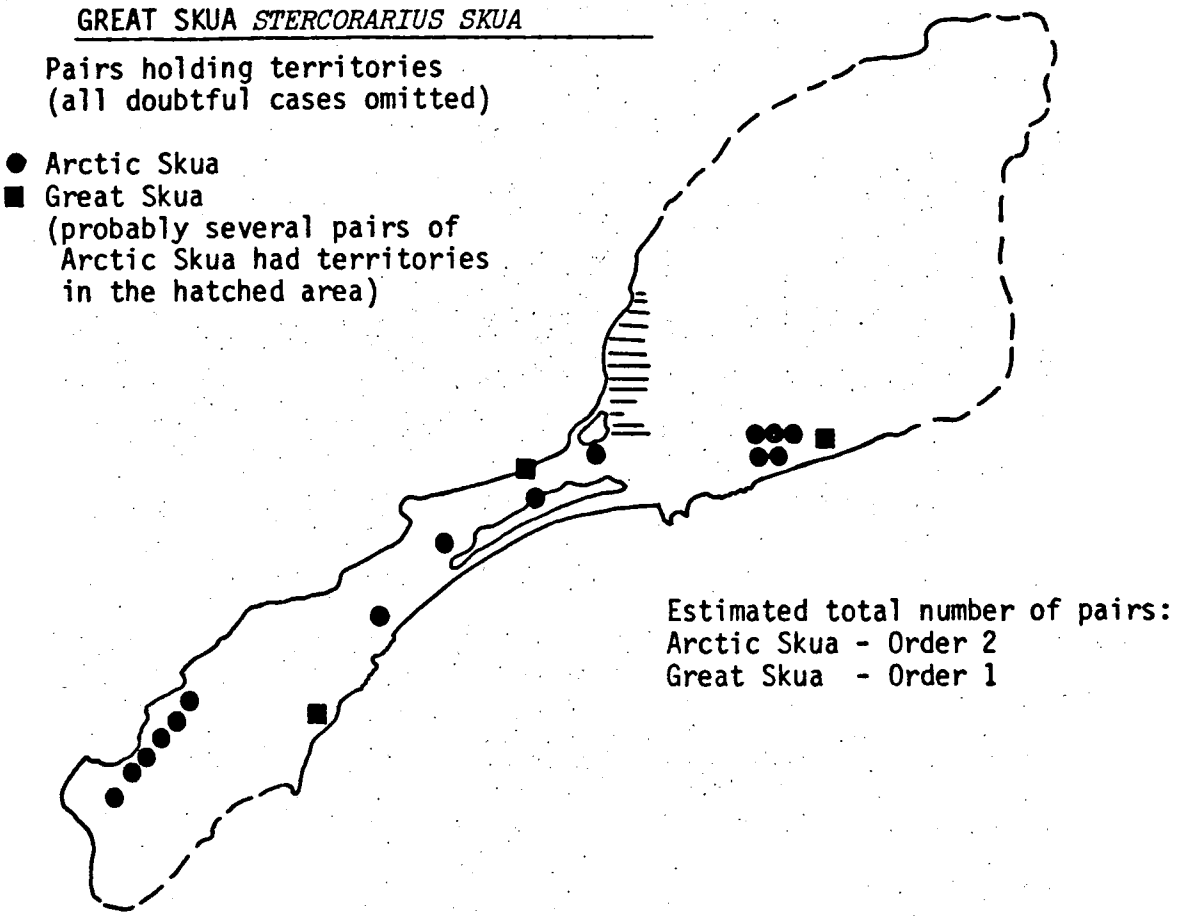
4.22. Pomarine Skua STERCORARIUS POMARINUS, Middelste Jager, Polarjo.

An adult light morph Pomarine Skua passed the ship Plancius when sailing along the southeastern cliffs on 20 June. Four light morph individuals flew along Sjuhollendarbukta on 6 July (2 immatures, 1 adult, 1 ?). Our last observation of a Pomarine Skua was a light morph bird seen at Krosspyntsletta on 8 August. The Pomarine Skua is probably best considered as a visitor in small numbers during summer.

4.23. Arctic Skua STERCORARIUS PARASITICUS, Kleine Jager, Tyvjo.

A small population of Arctic Skuas lives at Jan Mayen. Breeding of this species was proved by observations of territorial behaviour, chicks, and eggs. Arctic Skuas could be seen all over

Fig.6. ARCTIC SKUA *STERCORARIUS PARASITICUS*
GREAT SKUA *STERCORARIUS SKUA*



the island, but were common in certain areas only. Concentrations of territories were found near Ullerengsanden (around Kreklinghaugen: at least 5 pairs) and west of Sjuhollendarbukta (at least 6 pairs). Arctic Skuas were also observed frequently in the centre of the island around Jøssingdalen, Søyla, Sørlaguna, and Helenesanden(see Fig.6.). Northeast of Nordlaguna Arctic Skuas appeared to be common as well but since this area was not sufficiently surveyed until 8 August, the number of terrritories is unknown. The total figure of breeding pairs at Jan Mayen can be estimated well within order 2 (10 -100 pairs).
Many pairs showed intensive distraction behaviour ("broken-wing-act") at approach of their territory. A pair of birds in Jøssingdalen still showed this behaviour on 8 August, when their chick was already able to fly short distances. Some days before a juvenile, fully capable of flying, was observed at sea near Trollsletta.
Colour-phases were studied throughout the period. Pale phase birds were, without doubt, predominant (>90%). Intermediates were not seen, but at least 4 different dark phase birds were observed (including two immatures). One of these probably kept a territory together with a pale bird.
Arctic Skuas were observed chasing Kittiwakes regularly, and once a Black Guillemot carrying fish. Apart from those observations we noted an Arctic Skua pecking up small crustaceans that had washed upon the beach.

4.24. Long-tailed Skua STERCORARIUS LONGICAUDUS, Kleinste Jager, Fjelljo.

Three adult Long-tailed Skua's (light morph) were present near Guinea-Bukta at the southern side of Svartfjellflya. We observed these birds on 7 July, but a member of the station crew reported having seen the birds at the same spot about a week before. The birds showed strong territorial defence, hovering above us and making dives. Several severe territorial disputes went on with two pairs of Arctic Skua's in the neighbourhood. Almost all of the time the three birds stayed close together. Apart from their strong territorial behaviour we observed no proof of actual breeding of these Long-tailed Skuas.

4.25. Black-headed Gull LARUS RIDIBUNDUS, Kokmeeuw, Hettemåke.

From 14 to 19 June Black-headed Gulls were observed several times along the eastern coast between the station and Kapp Fishburn. At least 7 (and possibly 12) different individuals were recorded, five of which were adults in summer plumage, and two 1-year old immatures. An one year old Black-headed Gull stayed in Kvalrossbukta on 1 and 2 August; on 9 August a bird of similar age was seen at the other side of the island near Trollsletta. Since several people at the station reported observations of Black-headed Gulls, the species must be considered as a rather regular summer visitor to Jan Mayen.

4.26. Lesser Black-backed Gull LARUS FUSCUS, Kleine Mantelmeeuw, Sildemåke.

Lesser Black-backed Gulls have not been reported before at Jan Mayen. We observed this species regularly throughout our stay, but almost exclusively along the eastern coast. Only one bird was observed along the western coast (Kvalrossbukta). At least 35 different individuals were present in small groups, always seen in the same areas (e.g. 5 near Kreklinghaugen, 4 at Røysflya, 5 near Søyla, and at Branderpynten 10 birds were present). Almost all birds were adults; only two Lesser Black-backed Gulls in immature plumage were noted. From the colour of the mantle and the wings in the adult birds we judge that Lesser Black-backed Gulls at Jan Mayen belong to subspecies L.f.intermedius. We observed no proof of breeding, but if reproduction has not yet occured, it seems likely that it will take place in future.

4.27. Herring Gull LARUS ARGENTATUS, Zilvermeeuw, Gråmåke.

Throughout our stay at Jan Mayen we occasionally observed Herring Gulls, mostly single birds, but sometimes small parties. Probably our observations refer to at least 15 different individuals, three of which were immatures. Like in the Lesser Black-backed Gull, observations of Herring Gulls were more frequent on the eastern side of the island. Pairs giving alarm calls were recorded near Havhestberget and at Branderpynten, but actual indications of breeding were absent. At the moment the Herring Gull is best considered as a non-breeding visitor with a number of individuals in order 2.
On 9 August a hybrid Herring Gull-Glaucous Gull was seen near Trollsletta.

4.28. Glaucous Gull LARUS HYPERBOREUS, Grote Burgemeester, ----------Polarmåke.

Glaucous Gulls were found breeding in most coastal areas, but in low numbers. Only about 35 nests with eggs or young were actually seen by us. However, frequently the behaviour of birds indicated the presence of nests on parts of the cliffs that were hidden from view. Highest density of breeding was observed at the Storfjellet colony, where at least 15 nests were visible. The number of breeding pairs at Jan Mayen should be estimated low in order 3 (no more than a few hundred).

Rather large flocks of non breeding birds were gathered on the beaches of Helenesanden and Lagunevollen. At Lagunevollen numbers amounted to order 3 (viz. over a 100 individuals) in which often adult birds were outnumbered by birds in immature plumages. Probably the total number of non breeding Glaucous Gulls at Jan Mayen will not exceed order 3.

Almost all nests of Glaucous Gulls were situated near colonies of seabirds. Such colonies supply a rich source of food. At Kvalrossen Glaucous Gulls could be seen hunting for eggs and young of Brünnichs Guillemots and Fulmars. We were able to watch a clever behaviour of Glaucous Gulls at Storfjellet. Lots of stones were falling from the cliffs there and endangered the birds breeding on lower ledges. A Brünnichs Guillemot was struck by a falling stone and dropped down in convulsions: Glaucous Gulls sitting below the cliffs just waited until the worst twitching had stopped and then started immediately on this fresh and easy meal. The large number of devoured corpses of Brünnichs Guillemots near this spot suggested that this event was common practice.

- One dead Glaucous Gull was found at Helenesanden; because the corpse was rather decayed, the sex of the bird could not be determined. Measurements in mm's: bill-length 59.8; head-length 135; tarsus-length 72.; wing-length 474.

4.29. Iceland Gull LARUS GLAUCOIDES, Kleine Burgemeester, ----------Grønlandsmåke.

During our first visit to Kvalrossbukta on 17 June we discovered a dead Gull on the beach. Its "Iceland Gull appearance" was confirmed by measurements. Bill-length was 43.8mm; head.l. 119mm; tarsus.l. 61mm; and wing.l. 432mm. The bird was in adult plumage. Internally the bird was too decayed to determine its sex. This dead specimen is our only record of this species at Jan Mayen. There is a previous record of Iceland Gulls breeding at Jan Mayen. It is extremely difficult to discriminate all Glaucous Gulls from Iceland Gulls because the species look very much alike and even show some overlap in size. Nevertheless, almost all individuals accurately observed by us were obvious Glaucous Gulls. Very few birds caused a bit of doubt, but were judged to belong to L.hyperboreus as well. So, in spite of the fact that we found corpses of both a Glaucous Gull and of an Iceland Gull, we think that only the Glaucous Gull is a breeding bird at Jan Mayen. Maybe some Iceland Gulls from Greenland straggle to Jan Mayen outside the breeding season.

4.30. Greater Black-backed Gull LARUS MARINUS, Grote Mantelmeeuw, ----------Svartbak.

Greater Black-backed Gulls were rather common at Jan Mayen. The number of different individuals was certainly in order 3 (100-1000). Largest numbers were always present at the beaches of Helenesanden, Lagunevollen, and Ullerengsanden, where tens of non-breeding birds of all age-classes wandered around. In most other parts of the coast Greater Black-backed Gulls were observed as well, often adult couples flying around us and giving alarm calls. We met at least 10 of such pairs. In two cases proof of breeding was found: nests with eggs were present at Branderpynten and in Kveisdalen. Successful hatching of the eggs certainly occurred in Kveisdalen. Breeding is likely to have occurred in other pairs as well. The number of breeding pairs of Greater Black-backed Gulls at Jan Mayen should be estimated in order 2.

4.31. Common Gull LARUS CANUS, Stormmeeuw, Fiskemåke.

An adult Common Gull flew along Trollsletta on 8 August. Common Gulls should be considered as accidental visitors, because this is the first record of this species at Jan Mayen.

4.32. Kittiwake RISSA TRIDACTYLA, Drieteenmeeuw, Krykkje.

Numbers and distribution. An index of population size of Kittiwakes is easily provided by the number of (occupied) nests. On small ledges of rather steep cliffs Kittiwakes build conspicuous nests from seaweed. In the areas that were well investigated by us we were rather surprised by the low numbers of nests of Kittiwakes. Apart from a larger colony at Storfjellet in the north (estimated at about 2500 sites) we never found considerable numbers of nests, not even on seemingly suitable cliffs. In the coastal areas walked by us, we only counted 2372 nests; the accompanying estimate is 2996 nests (range 1908-5725). The large range in the estimate is caused by hidden sections of the cliffs at Vøringen and Storfjellet. Fig.7. illustrates the estimated number of nests in different areas. The cliffs observed from the ship showed no major Kittiwake colonies. Some small ones were spotted between Nordkapp and Austkapp, and on the southeastern cliffs. Probably some number of Kittiwakes will breed on most of these cliffs; even major colonies may have escaped our attention in areas where fog prevented observations. Nevertheless, we do not expect huge colonies of Kittiwakes in these areas; during observations of birds at sea Kittiwakes never were very numerous. Probably there are some colonies at the eastern side of the Beerenberg and at the southeastern cliffs (see Fig.7.) but we consider it unlikely that such colonies would outnumber the Storfjellet colony. For the whole of Jan Mayen we estimate the number of nests at probably between 5.000 and 10.000 (order 4). In our opinion it is unlikely (but not impossible) that the number of nests would reach order 5 (over 10.000).

Notes. - In most places we found that nests of Kittiwakes were rather scattered over the cliffs, mostly in the lower parts. Even in the Storfjellet colony counting proved to be difficult because of the scattered occurrence of many single nests. Generally Kittiwakes prefer to breed in dense colonies.

- The breeding-success in the scattered nests in the small colonies probably was very low. Only few of the nests in such places actually contained eggs or young. Often adult birds were

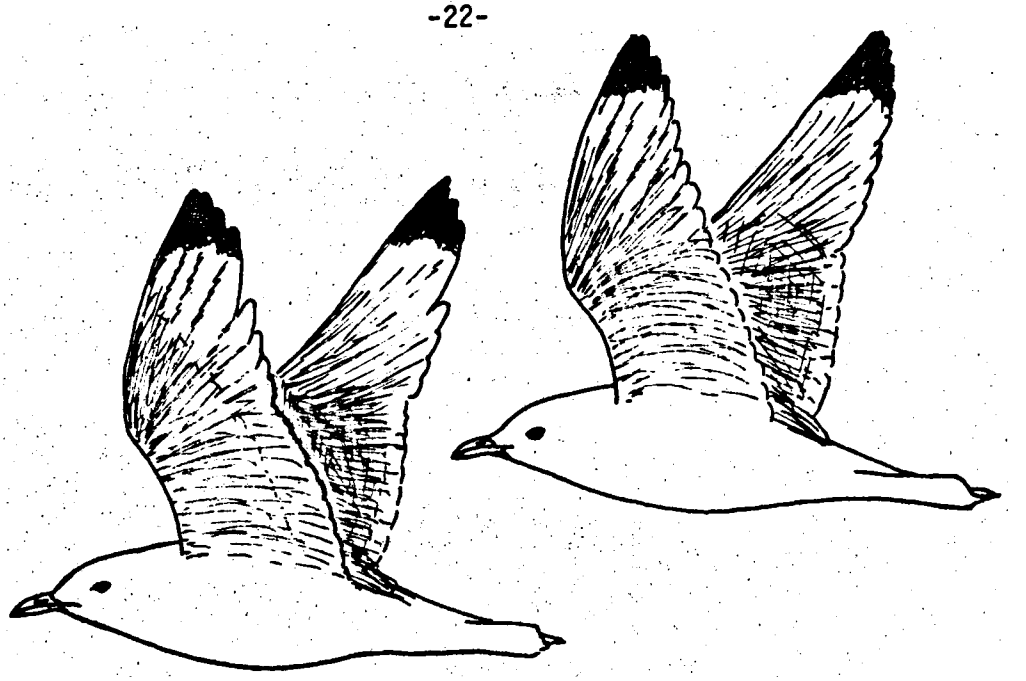
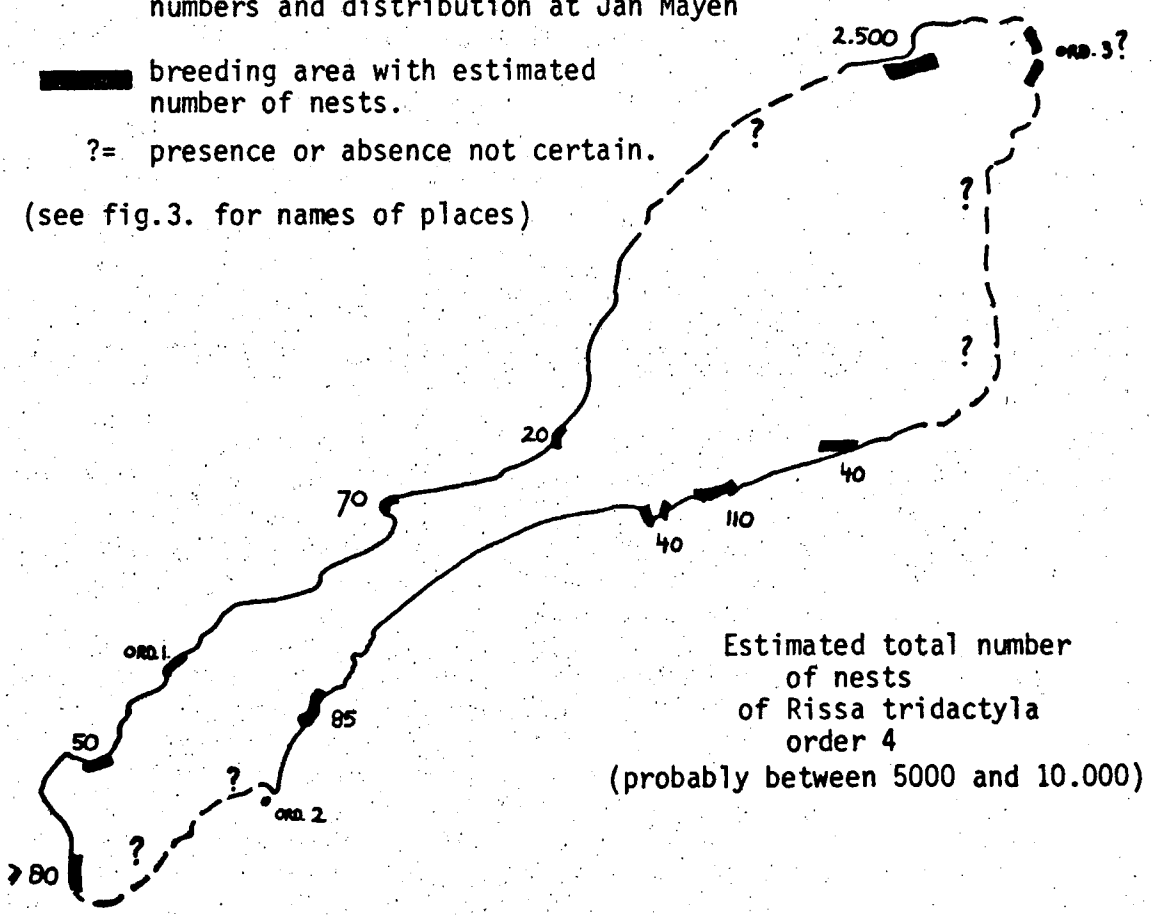


Fig.7. KITTIWAKE *RISSA TRIDACTYLA*
numbers and distribution at Jan Mayen

breeding area with estimated number of nests.

?= presence or absence not certain.

(see fig.3. for names of places)



Estimated total number
of nests
of Rissa tridactyla
order 4
(probably between 5000 and 10.000)

standing on empty nests. Breeding was probably more successful in larger colonies: from the beginning of August increasing numbers of newly fledged Kittiwakes were observed at sea.
- From a distance, several places along the coast looked like Kittiwake colonies, but turned out to be roosting sites of non-breeders at close range. In flocks of non-breeders one year old birds were very common, and could constitute up to 30% of the flock.
- We did not capture Kittiwakes for measurements or ringing. Some corpses of dead Kittiwakes found on beaches showed usual measurements for this species.
- Access to fresh water seems to be an important factor to Kittiwakes. Also at Jan Mayen flocks of hundreds of Kittiwakes could be observed at lakes with fresh or brackish water. Flocks were present at Nordlaguna, Steingardtjørna, and at Sørlaguna in the beginning of the summer (Sørlaguna dried up during summer). Observations in Vestbukta indicated that flocks of Kittiwakes, probably originating from the Storfjellet colony, went all the way to Nordlaguna for bathing. Possibly the scarcity of fresh water at Jan Mayen has some influence on the rather low number of Kittiwakes at the island.

4.33. Arctic Tern STERNA PARADISEA, Noordse Stern, Rødnebbterne.

Arctic Terns were found breeding on many of the larger beaches. Nests were situated between the huge numbers of dead trees that wash up the shore. We made no attempt to count nests, but estimates are possible on the basis of the number of birds showing territorial behaviour. Largest number of Arctic Terns were present in several colonies at Lagunevollen. Some hundreds of pairs (low in order 3) must nest here. Small numbers breed at Helenesanden as well. At Haugenstranda the number of nests was in order 2 at least. Both in Maria Musch Bukta and at Bommen several tens of pairs were nesting. Further north at Krosspyntsletta they breed at least in order 2. Anywhere else along the coast Arctic Terns could be observed as well, but not breeding or in small numbers. Remarkably few terns were seen in Sørbukta and Krossbukta. Since we have investigated most areas that are basically suitable for Arctic Terns to breed, it is unlikely that many more birds would breed at Jan Mayen than the ones mentioned above. Therefore we estimate the number of breeding pairs at Jan Mayen in order 3, probably over 500 but unlikely to raise far above 1000.

4.34. Little Auk ALLE ALLE, Kleine Alk, Alkekonge.

The number of Little Auks in a colony is very difficult to estimate because the birds breed in crevices and holes. In the time available to us, it was impossible to make accurate counts of such hole-nesting species. Most of the colonies could not be visited more than once. Generally we only estimated an order of magnitude of a colony of Little Auks.
Little Auks were breeding well spread over the island. We found them in most of the cliff areas surveyed by us (see Fig.3.). The majority of the colonies was rather small; frequently our estimates of the number of breeding pairs were in order 2 or 3 (less than 1000 pairs). In some places larger concentrations of Little Auks were found, e.g. south of Kapp Wien, and on top of the low cliffs along Svartfjellflya and Splittodden/Skrinnodden.

However, even in these cases the colonies obviously did not exceed order 4. Because of the difficulties in counting this species it is difficult to give an estimate for the complete Jan Mayen population. In our opinion the number of breeding pairs of Little Auks at Jan Mayen is somewhere in order 5 (10.000 to 100.000 pairs) and probably not close to the upper limit of this order.

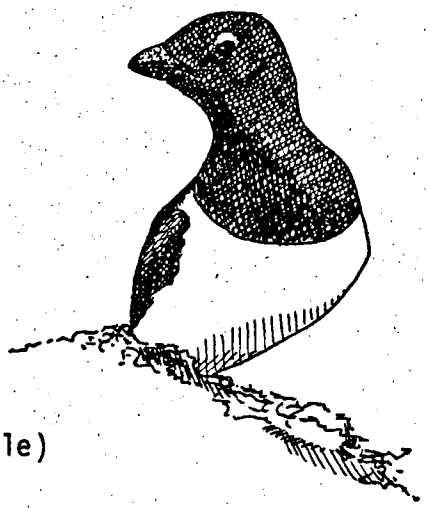


Fig.8.a.
Little Auk (Alle alle)

We ringed 9 Little Auks and collected 9 others. One of the birds collected was an injured individual; judging from the wound in its breast muscles it had been shot at. In spite of its bad condition it was still diving for food shortly before we captured it. Additional to these birds we collected the corpses of two Little Auks that were killed by collisions with the wires of the Loran mast at Borgsletta. Measurements and weight of the 20 Little Auks captured at Jan Mayen are usual for subspecies A.a.alle (mean bill-length 14.1mm; wing-length 118.6mm; weight 147g).
Little Auks showed an obvious diurnal rythm in their presence at the colony. During day-time only few individuals were seen at the colony at Kvalrossen, but at night groups of some hundreds of individuals gathered at the colony. In dense flocks they were flying around Kvalrossen. Several times we were able to observe that the last individual of a flock that was approaching the cliffs at high speed, forgot to make its turn in time: as a consequence such birds smashed against the rocks, but generally recovered after a dizzy moment.
Several times we noted birds with entirely worn wings: apart from the tertials all flight feathers and coverts were worn and brownish. Maybe such birds are immatures (1 year old).
When gathering at the colonies at night, many Little Auks were observed with their crops filled with small crustaceans for feeding their young. Even when captured for ringing such birds were very reluctant to let go of their food.

4.35. Razorbill ALCA TORDA, Alk, Alke.

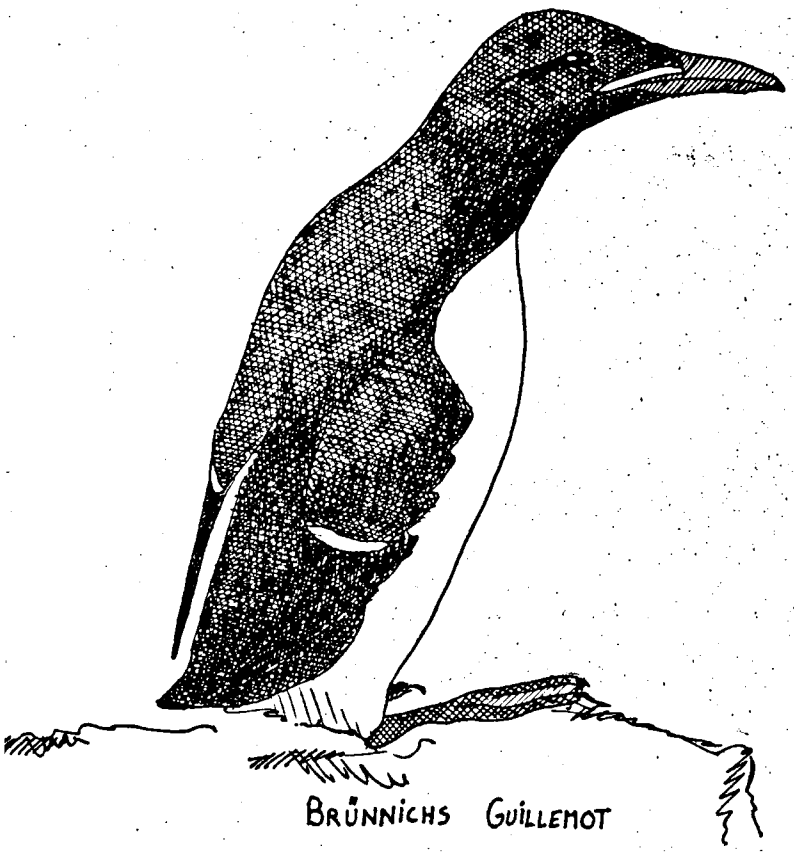
Apart from a presumed Razorbill seen in 1882/83, no Razorbills were recorded before at Jan Mayen. We found this species as a breeding bird in small numbers. At the low cliffs between Splittodden and Skrinnodden we observed 7 adult Razorbills during our first visit on 13 June. More Razorbills were discovered here

Fig 8.b. ALCA TORDA

on further occasions. A maximum number of 17 individuals at one time was seen on 13 July. Nests were hidden in crevices and holes and therefore hard to find. Breeding was proved on 11 July in finding an adult bird with an egg. Razorbills were observed twice near Kvalrossen, with a maximum of four adults feeding at sea on 18 June. Breeding was not proved in this area, but is is likely that some pairs are breeding at Kvalrossen. We estimate the total breeding population of Jan Mayen to be within order 2 (10-100 pairs): order 2 at the Splittodden-Skrinnodden colony and probably order 1 at Kvalrossen.
We did not catch any Razorbills at Jan Mayen, so little can be said about their subspecific identity. Observations and studies of colour-slides lead to the opinion that Razorbills at Jan Mayen are rather large and especially large-billed.

4.36. Guillemot URIA AALGE, Zeekoet, Lomvi.

Guillemots were never recorded at Jan Mayen before. We have found this species in two colonies, mixed up with Brünnich's Guillemots. At the colonies between Splittodden and Skrinnoden 185 individuals were counted. We estimate the breeding stock in this area at about 250 (200 to 300) individuals. Apart from this colony only 3 "aalges" were observed in a colony of Brünnichs Guillemots at Branderpynten. Little can be said about the presence of this species at the southeastern cliffs between Kapp Wien and Sørvestkapp; it seems unlikely that large numbers would occur there. None were seen at sea in this region during passage with MV Plancius, nor when seawatching at Båtvika.
Proof of breeding of Guillemots was apparent at Splittodden-Skrinnodden, where many adults were observed taking care of eggs or young. We estimate the total breeding population of this species at Jan Mayen to be at least in order 3 (100-1000 individuals). The species was not seen in the large "lomvia"-colonies of Storfjellet and Kvalrossen. Further research at mainly the southeastern cliffs between Kapp Wien and Sørvestkapp would reveal the actual number at Jan Mayen.
Compared to other arctic breeding places the percentage of bridled birds in Jan Mayen's Guillemots is rather low. Counts in the Splittodden-Skrinnodden area gave 28.7% (13 June, n=185) and 29.1% (11 July, n=55) bridled birds as results.
Seven Guillemots were caught, ringed, and released after measuring. According to W.J.R. de Wijs their measurements and colour indicate that Guillemots at Jan Mayen are similar to subspecies U.a.hyperborea. Mean measurements of the birds are: bill-length 45.4mm; bill-depth 14.4mm, wing-length 212mm, and weight 1002g. Two of the birds captured were of the bridled morph.



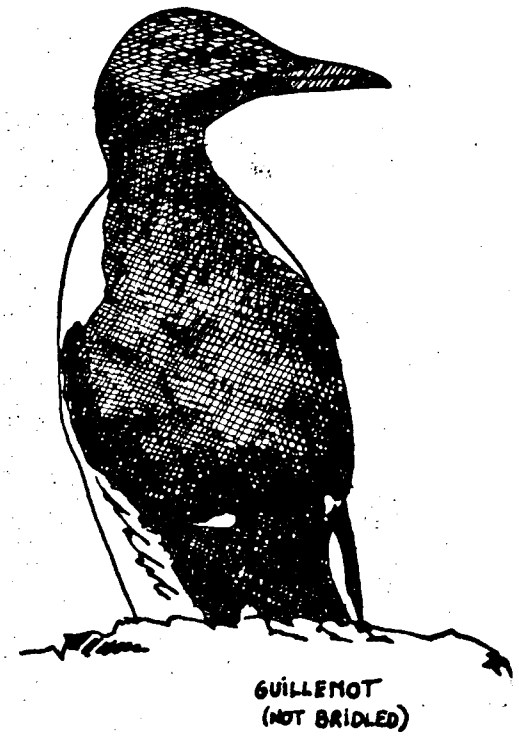
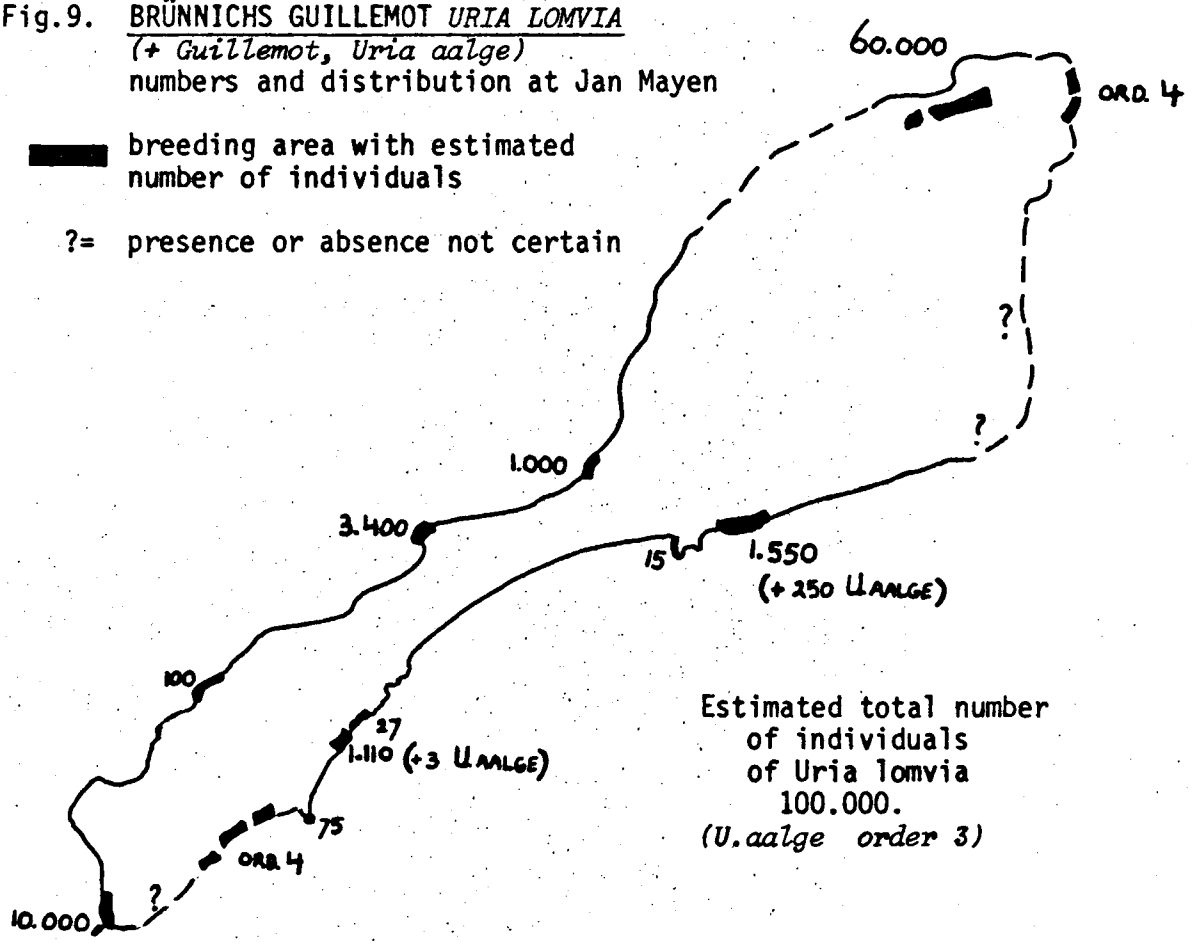


Fig.9. BRÜNNICHS GUILLEMOT *URIA LOMVIA*
(+ Guillemot, Uria aalge)
numbers and distribution at Jan Mayen

breeding area with estimated number of individuals

?= presence or absence not certain



Estimated total number of individuals of Uria lomvia 100.000.
(U.aalge order 3)

4.37. Brünnichs Guillemot URIA LOMVIA, Dikbekzeekoet, Polarlomvi.

Numbers and distribution. Colonies of Uria are censused by their number of individuals. In the colony it is almost impossible to separate the birds with an egg or young from the non-breeding birds sitting on the ledges. Counting the individuals however supplies a reliable index of population size. Generally about 75% of the number of observed birds is considered to represent pairs.
Eight large colonies of over 1000 individuals were noted at Jan Mayen, as well as several smaller ones (Fig.9.). By far the largest colony was observed at Storfjellet: we estimated that about 60.000 birds were present on the steep cliffs. We can not give accurate estimates on the colonies that were observed from the ship (north of Nylandet and on the southeastern cliffs): both were judged to have between 1000 and 10.000 individuals (order 4). In our opionion there are no colonies of the size of Storfjellet in the areas that were badly observed by us. Concluding we estimate the total population of Brünnichs Guillemot on Jan Mayen at about 100.000 individuals (range 65.000 - 130.000).
Notes. In the colonies at Splittodden/Skrinnodden we captured 27 Brünnichs Guillemots. Birds were captured with nooses that were attached to long rods. We measured and ringed 25 individuals and collected two. Almost all of these birds were certainly breeding. Their mean bill-length was 35.67mm; wing-length 224.5mm, and weight 1007.5g.
Birds that were measured and ringed, returned to their ledges with a remarkable speed. When capturing birds from the same ledge for some time, one had to be careful not to recapture birds that had been released only few minutes before.
The crew of Jan Mayen station had collected several hundreds of eggs of Uria at the Splittodden/Skrinnodden colony around 1 June. At our arrival at Jan Mayen, about 185 eggs were left and we took the opportunity to take the measurements of these eggs. Unfortunately the egg-sample will be a mixture of eggs of both Uria lomvia (about 90%?) and Uria aalge (about 10%?). We were unable to separate the eggs of the two species. Mean values of measurements of all eggs were: length 80.29mm; width 50.47mm and weight 108.35g. Probably many of the birds whose egg was taken produced a replacement: on 13 July we observed a lot of birds with eggs on easily accessible ledges at Splittodden, while almost all birds on inaccessible parts of the cliffs already took care of their chicks.
All Uria colonies were situated at steep cliffs close to the sea. It is sometimes hard to understand why some cliffs are chosen as a breeding site. The cliffs at Splittodden/Skrinnodden are very low, generally no more than about 15 metres. During bad weather the birds in this area will suffer a lot from spray or even the waves that reach the ledges. In other colonies birds do not suffer so much from water, but from falling rocks. At Storfjellet we observed that birds got killed by falling stones (see 4.28).

4.38. Black Guillemot CEPPHUS GRYLLE, Zwarte Zeekoet, Teiste.

Counting the number of breeding Black Guillemots in an area is very difficult: the birds breed hidden in crevices and show little tendency to concentrate in large colonies. Especially when visiting areas only once, the accuracy of counts of Black

Guillemots is very limited. We counted birds both at the cliffs and at sea, and made estimates of breeding numbers in orders of magnitude only.
Black Guillemots were breeding well spread along Jan Mayen's coast, but always in small numbers. Breeding may be assumed from observations of birds entering (carrying fish) or leaving crevices; we did not try to find eggs or chicks to obtain solid proof of breeding. Black Guillemots were seen in the majority of the coastal areas surveyed, but partly our observations only refer to birds at sea. Our estimates of the number of pairs in "colonies" rarely exceeded order 1 (1-10 pairs); larger numbers were noted in Brotvika (order 2), near Kveisdalen/Kota (order 2), and at sea near Vestbukta. The breeding population of Black Guillemots at Jan Mayen may be estimated in order 3 (100-1000 pairs), almost certainly not exceeding the upper limit of this order. We do not expect large concentrations of this species in the areas that were surveyed superficially or not at all.

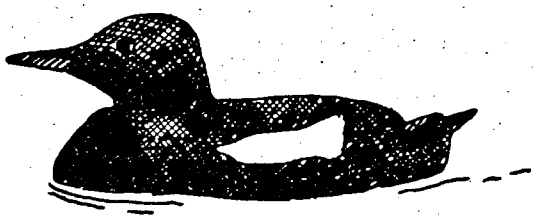


FIG. 10.
BLACK GUILLEMOT

Generally small parties of Black Guillemots were seen foraging at sea, but we observed birds feeding in the brackish water of Nordlaguna as well. Regularly we noted birds in immature plumage (2nd calendar year) among parties of adults.
Since we did not capture Black Guillemots we have no information on measurements or subspecific identity.

4.39. Puffin FRATERCULA ARCTICA, Papegaaiduiker, Lunde.

Like in other hole-nesting Alcidae, the number of Puffins in an area is rather difficult to census, especially when many cliffs are observed only once. Therefore we only estimated orders of magnitude of colonies, based on the number of individuals that was present in the area.
Puffins were well spread at Jan Mayen, and frequently occupied the same areas as Little Auks. Breeding was confirmed by observations of incubating birds, eggs, parents carrying fish into crevices, and calls of chicks. Most colonies were rather small, not exceeding order 2 (10-100 pairs) in size. Major Puffin concentrations were recorded at Splittodden/Skrinnodden and along the southwestern coast (Kapp Rudsen to Sørbukta). Largest numbers were seen at Kapp Rudsen (order 3). The total population of Puffins at Jan Mayen is best estimated in order 4 (1000-10.000 pairs). The species is without doubt more common than the Black Guillemot, but much less numerous than the Little Auk.
The lack of huge Puffin colonies (like e.g. in Iceland and further south) at Jan Mayen, may be explained by the scarcity of suitable locations for nests. Unlike the situation in more southern areas, there are almost no places at Jan Mayen where Puffins could excavate their own burrows. Almost completely they have to depend on the limited availablity of natural holes and

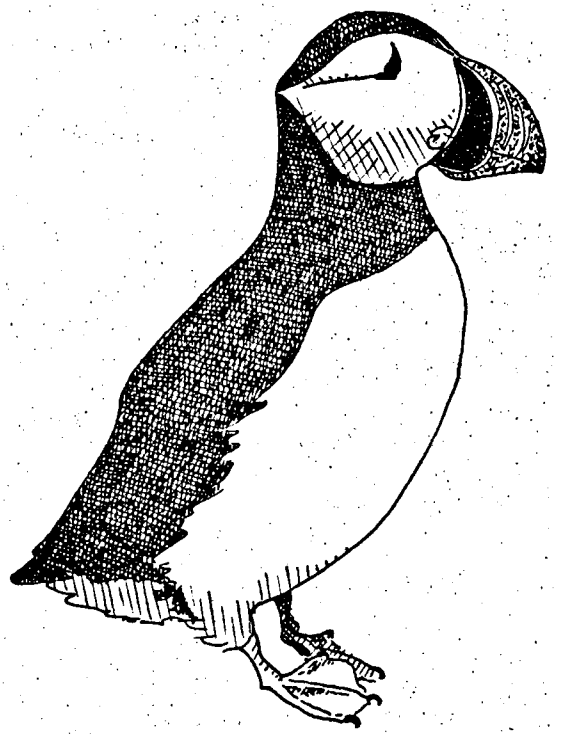


Fig.11.

Puffin
(Fratercula arctica)

crevices. A relatively rich supply of such natural sites was available at the low cliffs of Splittodden/Skrinnodden and of the southwestern coast (e.g. Kapp Rudsen). The low number of available nest-sites may cause rather uncommon locations of nests: at Splittodden we found Puffins breeding on the flat top of the cliffs, between heaps of loose volcanic stones.
One of the objectives of our expedition was to determine the subspecific identity of Puffins at Jan Mayen. Capturing Puffins however, for taking their measurements, proved to be more difficult than we had expected. Since we did not want to disturb Puffins at, or close to, their nest, we only captured birds with long-handled nets when they were flying along the cliffs. Our problems with capturing this species that way, are illustrated by the fact that only six individuals were caught. We ringed and released four, and collected the two others. Mean measurements of five adults in this sample showed a large size of Jan Mayen Puffins: bill-length 54.8mm; wing-length 184.2mm, weight 602g. These measurements certainly indicate Fratercula arctica naumanni rather than F.a.arctica, but the sample is too small to consider the evidence to be conclusive for the complete population of Puffins at Jan Mayen.
Puffins showed an evident diurnal pattern in their attendance at the colony. Like in the Little Auk, numbers at Kvalrossen usually were low during day-time, but strongly increased at night. From the end of July, immature Puffins paid visits to the Kvalrossen colony as well. Immatures may be identified by their little developed bill with a small number of bill-grooves. Even quite young Puffins, born in the previous summer, were sometimes seen at Kvalrossen.

4.40. Short-eared Owl ASIO FLAMMEUS, Velduil, Jordugle.

The strongly decayed corpse of a Short-eared Owl was found in the end of June on the beach of Haugenstranda. We collected skull, legs, and tail of this bird. Kees Roselaar informed us that the tail-feathers indicate that the bird was a young female.

4.41. Meadow Pipit ANTHUS PRATENSIS, Graspieper, Heipiplerke

On 27 June we were surprised by the song and the display of a Meadow Pipit at the top of mount Kvalrossen. At the end of July the bird was seen again twice. During our trip to the southwestern part of the island (5 to 9 July) we observed at least eight different Meadow Pipits between Kapp Rudsen and Guinea-Bukta. The calling and the behaviour of these birds indicated to us that breeding, or at least attempts thereto, is likely to occur in this area. We observed no pipits along the eastern coast or north of Kvalrossen. At Jan Mayen the Meadow Pipit should be listed as a possible breeding bird in small numbers (maximum in order 2).

4.42. White Wagtail MOTACILLA ALBA, Witte Kwikstaart, Linerle.

A pair of White Wagtails (M.a.alba) was present in the station area at Trollsletta from the beginning of June to the beginning of August. Frequently the birds were eating from the food that was put outside for the station dogs. We observed no evidence of breeding. On 17 June a dead immature White Wagtail was found in the melting snow around the station. Probably this bird had already died in the preceding autumn, and does not necessarily indicate that breeding occurs at the island. In autumn stragglers of several species arrive at Jan Mayen by accident. Outside the station area no White Wagtails were observed. In our opinion White Wagtails are accidental visitors to Jan Mayen: if (attempts of) breeding occurs, it probably has to be attributed to the favourable environment (food, warmth) created by the station.

4.43. Wheatear OENANTHE OENANTHE, Tapuit, Steinskvett.

During June, small numbers of Wheatears were seen on many different localities. The number of observations declined in July, indicating that a part of these birds was not resident on the island. Occasionally however, Wheatears were observed throughout the summer e.g. near the station and in Kvalrossbukta. In spite of the fact that no proof of breeding was obtained, Wheatears are probably best considered as breeding at Jan Mayen in small numbers (order 2).
At Kvalrossen Wheatears were often looking for food around the seabird colonies or even on the ledges with Brünnichs Guillemots. Near the station, in Båtvika, birds were regularly looking for food in the materials that had washed ashore. A male Wheatear discovered a polychaete worm (over 10 cm long) between seaweeds and ate it by pecking of small pieces.

4.44. Fieldfare TURDUS PILARIS, Kramsvogel, Gråtrost.

In June we found three dead Fieldfares at Jan Mayen: two specimens near the station and one at the southeastern side of Sørlaguna below Hannberget. One of these birds may have arrived following its spring migration, but the other two clearly originated from the previous year. We observed no living specimens of this accidental visitor.

4.45. Blackbird TURDUS MERULA, Merel, Svarttrost

Members of the station crew reported to us that in the autumn of 1982 a flock of about 30 Blackbirds had arrived at the station. During winter the group had gradually diminished in spite of the fact that they had sheltered under the station building and could eat food of the dogs. One of the birds was said to have survived the winter: because of its extreme shyness it took us to the end of July to detect this survivor, a male. By hiding in a warm chimney of the generator-house, and thanks to the regular supply of food for dogs it had sustained the hardships of winter at Jan Mayen. In the melting snow we have found five of the corpses of his less successful companions. A dead male Blackbird was also found near Søyla. Blackbirds are clearly accidental visitors to Jan Mayen that get lost during migration.

4.46. Redwing TURDUS ILIACUS, Koperwiek, Rødvingetrost.

During our stay we found five dead Redwings at Jan Mayen: two around the station buildings at Trollsletta, two below the wires of the mast that transmits LORAN navigation signals (Borgsletta) and one in Kvalrossbukta. These finds, probably all originating from the autumn before, indicate that it is not uncommon that some Redwings accidentally end up at Jan Mayen.

4.47. Snow Bunting PLECTROPHENAX NIVALIS, Sneeuwgors, Snøspurv.

Snow Buntings were recorded in very small numbers in most localities on Jan Mayen. Just after our arrival, in the beginning of June, at least 15 birds were present around the station on Trollsletta. Later on these numbers declined, so a part of the birds probably did not belong to Jan Mayen. In the first few days of July three singing males were observed in Kvalrossbukta, but after that only once a female Snow Bunting was recorded in this bay. A recently fledged juvenile was seen at Trollsletta in the beginning of August. The actual number of breeding pairs of Snow Bunting at Jan Mayen probably is rather small; we think at about order 2 or possibly order 3.

4.48. Redpoll CARDUELIS FLAMMEA, Barmsijs, Gråsisik.

Two Redpolls, presumably of the Greenland subspecies C.f.rostrata, were observed on 13 June at Røysflya. The brownish colour of these birds was in sharp contrast to the whitish colour of an Arctic Redpoll (see 4.49) that accompanied them. Singing and calling of presumably an individual of this species was heard on the southern slope of Kvalrossen on 1 July, but since we have never heard or seen Redpolls afterwards we assume that the species is not breeding at Jan Mayen, and that our observations concerned migratory birds.

4.49. Arctic Redpoll CARDUELIS HORNEMANNI, Witstuitbarmsijs, ----------Hornemann's Sisik.
An Arctic Redpoll, probably of the subspecies C.h. hornemanni, was observed in association with two Redpolls (4.48) at Røysflya on 13 June. The very white appearance of this bird was in sharp contrast with the brownish feathers of the two Redpolls. Because this was our only observation of this conspicuous species, breeding of Arctic Redpolls at Jan Mayen seems rather unlikely. The bird was probably on its migration to northern Greenland.

4.50. Other records.

Some species that must have been at Jan Mayen, are not listed above since we made no personal observations of these birds. The following species are involved:
- Grey Heron ARDEA CINEREA, Blauwe Reiger, Hegre.
At the meteorological station we found a photograph of one of the station dogs at the beach, carrying an adult Grey Heron. It is not exactly known when the picture was taken.
- White-tailed Eagle HALIAEETUS ALBICILLA, Zeearend, Havørn.
One of the radio operators at Jan Mayen, a keen bird-watcher (Bjørn Opheim) reported having seen a White-tailed Eagle twice in June. Possibly two individuals of this species were observed near Kapp Wien in the beginning of June by commander Stein.
- Oystercatcher HAEMATOPUS OSTRALEGUS, Scholekster, Tjeld.
Ole Rist, operator at the LORAN system, observed a Tjeld at Helenesanden on 27 June.

5. MAMMALS.

- Narwhal MONODON MONOCEROS, Narwal, Narrhval.

On 14 June we were able to observe a female or immature individual swimming close along the shore near Fishburndalen and Presidentsteinen. Possibly on 18 July an individual of this species was shortly present in Kvalrossbukta.

- Bottlenosed Whale HYPEROODON AMPULLATUS, Butskop, Nebbhval.

At least 7 (and possibly 13) Bottlenosed Whales were seen from the ship Plancius when passing the northwestern side of Beerenberg (near Weyprechtbreen).

These are our only observations of mammals at Jan Mayen
A very small number of Polar Fox may be still present at the island. Neither we, or the station crew had seen any Polar Fox, but meteorologist Svein Erik Langmo reported having seen tracks in the snow during a trip along the eastern side of Beerenberg in early summer.
One seal of unknown species was seen in Kvalrossbukta in July by several members of the station crew.

6. COMMENTS.

Several of the species observed by us are new to the avifaunal list of Jan Mayen. Guillemots (Uria aalge) were never reported at the island; only one Razorbill (Alca torda) has been reported (the original observer did not identify this species, but his description of a bird was later said to be a Razorbill). We found both these species breeding at Jan Mayen. It is rather difficult to say if these species recently established themselves on the island or that former observers overlooked them. The common occurrence and breeding of Greater Black-backed Gulls (Larus marinus) and the groups of Lesser Black-backed Gulls (Larus fuscus) are new as well to the island, and may indicate a slight climatic amelioration in the area, enabling new species to breed. On the other hand the expansion of these gulls does not necessarily indicate such a climatic change.
Other new species to the avifaunal list of Jan Mayen, like the Common Scoter (Melanitta nigra), Redshank (Tringa totanus), Common Gull (Larus canus), and Short-eared Owl (Asio flammeus), must be considered as accidental visitors that do not indicate any change, but merely reflect the hours of observations by ornithologists.
This report is the first to give some information on the numbers and distribution of major seabird species at Jan Mayen, which is of importance for both scientific studies and management purposes. In spite of the fact that we were not able to investigate all coastal areas thoroughly, we hope that we have contributed to the knowledge of bird-life at Jan Mayen as well as to its preservation. Gaps in our study should be filled in as soon as possible.

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appendix

birds captured, ringed, or collected

	captured	ringed	collected
Fulmarus glacialis	191	162	29 (+1)
Uria aalge	7	7	-
Uria lomvia	27	25	2
Fratercula arctica	6	4	2
Alle alle	18	9	9 (+2)

(One Fulmar and two Little Auks were found fresh dead below the wires of the Loran mast at Borgsletta and were collected as well)

Apart from these birds many corpses of dead birds were found. Most of them are mentioned in the species accounts in chapt.4. Since most of these corpses were decayed we only collected the remains of a few specimens.

All birds collected are now in the Zoological Museum of the University of Amsterdam, except for the two skins of Uria lomvia which were donated to Stavanger Museum.