VERSLAGEN EN TECHNISCHE GEGEVENS
Instituut voor Taxonomische Zoölogie (Zoölogisch Museum)
Universiteit van Amsterdam

No.32

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December 1981

Verslagen en Technische Gegevens No.32 December 1981
Instituut voor Taxonomische Zoölogie - Plantage Middenlaan 53 Amsterdam

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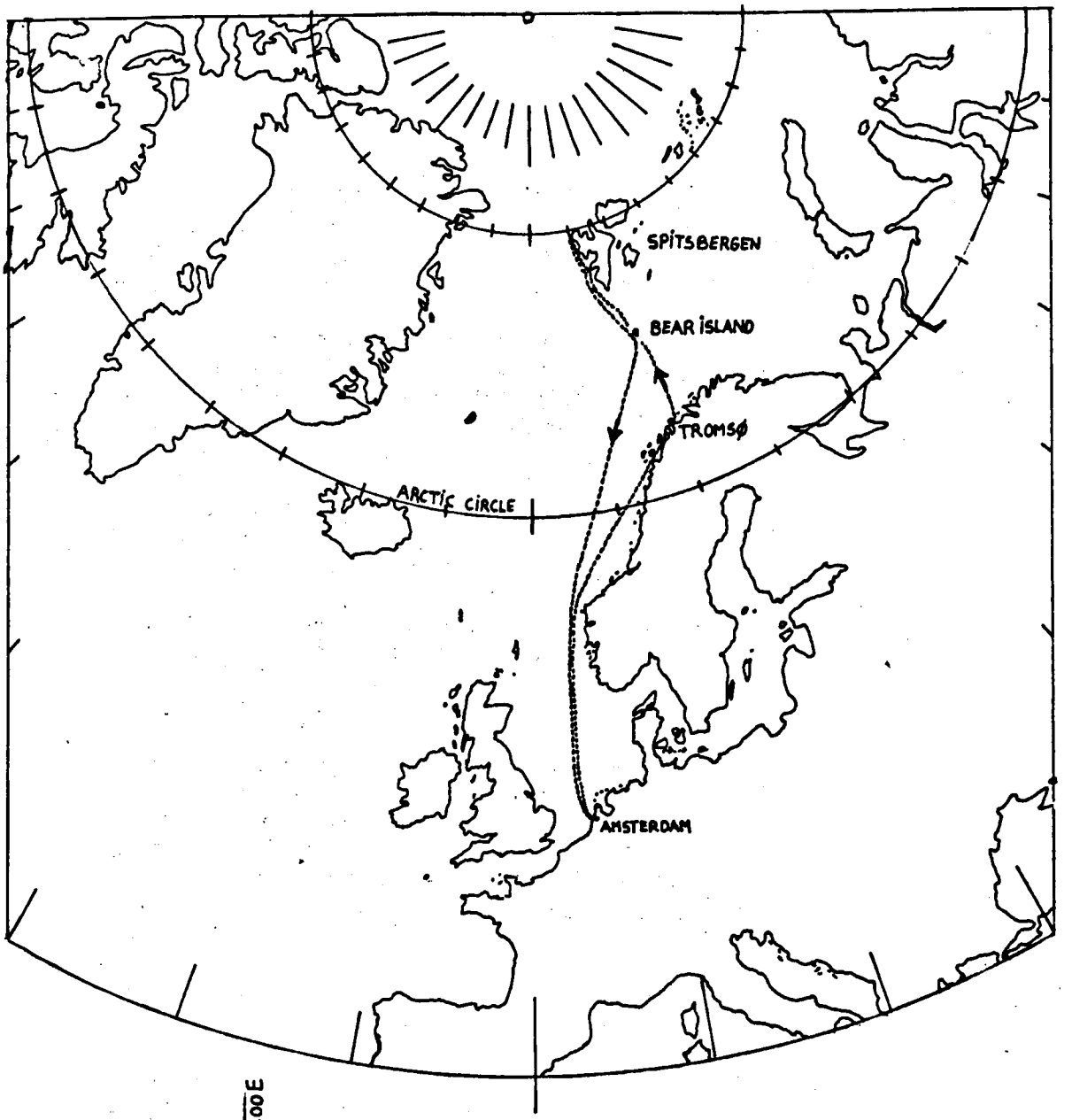
Report on the Fulmarus glacialis-Expedition, Bear Island, July-August 1980. J.A. van Franeker & R. Luttik.

Preface

This report wants to give information to all people connected with - or interested in the Fulmarus glacialis-Expedition to Bear Island during the summer of 1980.
As indicated by the name of our expedition, our main object of study was the Fulmar Fulmarus glacialis (Dutch: Noordse Stormvogel; Norwegian Havhest). Besides this, also special attention was given to counts of seabird-colonies and to the Purple Sandpiper. Ofcourse, also ornithological observations in general were recorded.
We hope that it will be understood that this report cannot give full scientific treatment of all research carried out at Bear Island. We only may give a general impression about our journey and our work. Full treatment of the different topics will be given in future publications. This report summarizes information in a list of bird-species that were observed.
We feel that our trip to the island could not have been successful without the support given to us by many people and institutions. With this report we want to express our gratitude.
Finally we want to apologize for the delay in the publication of this report; some unfortunate circumstances prevented us from working more quickly.

van Franeker & Luttik, oktober 1981.

Contents



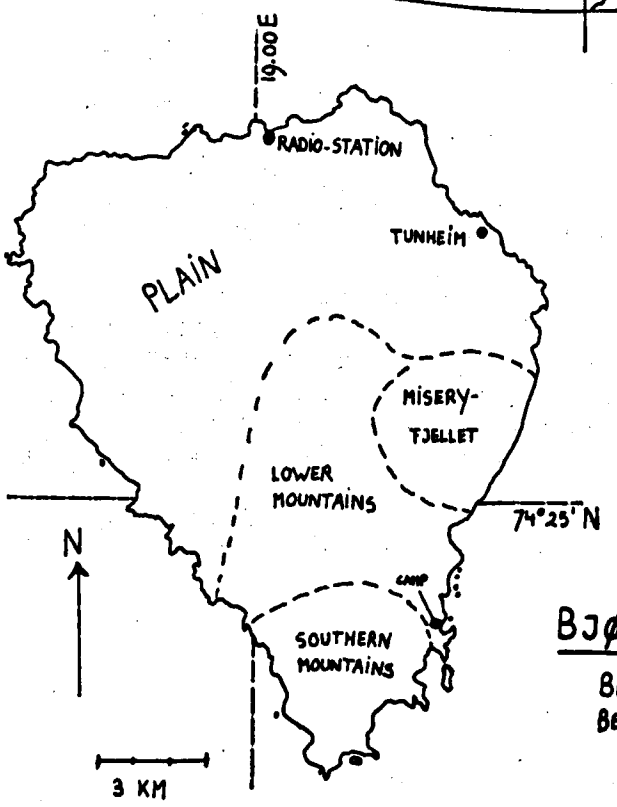


Fig.1.

The situation of Bear Island in the North-Atlantic with the route of the Plancius (dotted line; see Chapter 3.), and some important features of the island.

1. BEAR ISLAND

Bear Island, in Norwegian called 'Bjørnøya' and in Dutch 'Bereneiland', is situated in the Barents Sea at 74°25' N and 19°00' E. The island is rather isolated: about 450 km to the south the most nearby land is the Norwegian Nordkapp and to the north about 230 km of sea must be crossed before reaching the Sørkapp, the most southern point of Spitsbergen.
Bjørnøya belongs geographically to Svalbard (meaning "Cold Coast"), the group of islands in the Arctic Ocean under Norwegian sovereignity. The most important and best known island of this group is Spitsbergen. The name of the island was established in 1596 when two Dutch sailing-vessels discovered the island during an attempt to find a passage east to China along the north. Gerrit de Veer was writer on board of one of these ships of which the captain was Jacob Heemskerck and the navigator Willem Barentsz. De Veer accurately described the killing of a "white bear" near the island and tells that they consequently named the island "Beyren Eylandt".
The Polar Bear (IJsbeer, Isbjørn) is still frequently seen during winter: the record-book of Bjørnøya-Radio mentioned over 60 sightings in the winter of '79-'80. However, in summer, when the sea-ice retreats to the north, normally no bears remain on the island. Also this summer no bear was present.
The island is triangle-shaped and measures from north to south only 20 km, the largest distance east-west being about 15 km.
The northern half of the island is rather flat and varies between 20 and 50 metres height above sea-level. This part of the island has very many lakes. Southeast of this 'plain' there is a high, plateau-shaped mountain with the ominous name Miseryfjellet (Elendighetensfjell) reaching up to 536 m above sea-level. More to the south there are several other mountains of which Hambergfjellet with its 440 m is the highest one. Between Miseryfjellet, the southern mountains, and the plain there is an area of lower mountains mainly consisting of bare and loose rocks.
All around the island the coast consists of steep cliffs; rather low in the northern half of the island but up to 400 m high in the south. Access to land therefore is only possible in few places. On the other hand these steep cliffs, in combination with favourable biological conditions, offer a breeding-place to huge numbers of seabirds.
Compared to the coast the inland parts are rather poor with life: vegetation is scarce and most of the ground is covered with bare and loose stones. Only a small number of animal species is able to survive in such a hostile environment.
The climate at the island is not very comfortable; apart from the low temperatures thick fog and rather strong winds are frequent phenomena. In July and August, the warmest months of the year, mean temperatures do not rise above 4.3°C while fog may be present for over 20% of the time in this period. In winter temperatures reach a minimum in March when a mean of -7.5°C is measured. During winter the island is situated in or near the edge of the sea-ice.
For these reasons the island is not very suitable for inhabitation; there have been living some people at the island for the purpose of

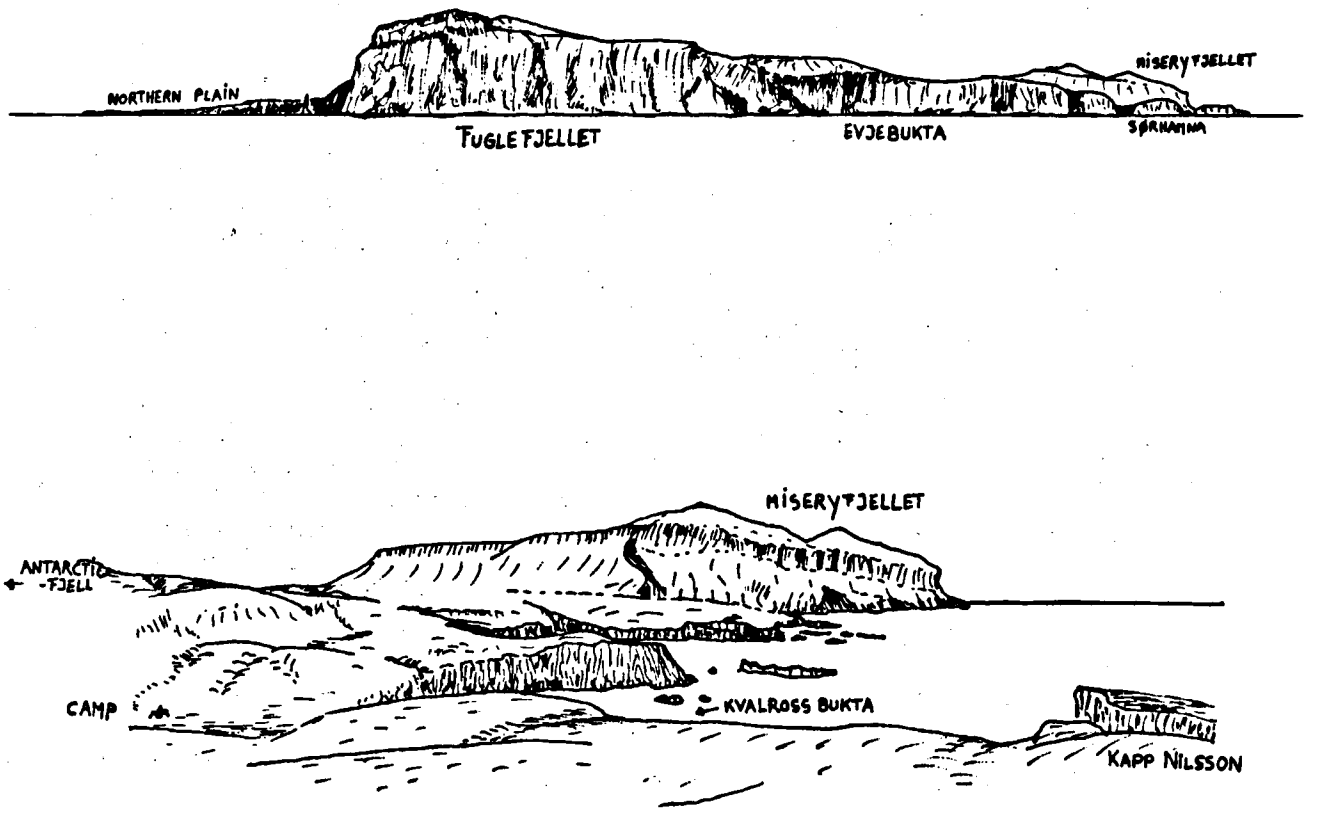


Fig.2. Characteristic views of Bear Island (compare the map in Fig.3.)
Above: Bear Island seen from the south: the southern coast consists of steep cliffs offering a breeding-place to millions of seabirds. Left of Fuglefjellet a part of the flat and stony northern plain can be seen. To the right the entrance of Sørhamna is visible.
Below: Miseryfjellet seen from Kapp Nilsson with in front Kvalrossbukta and our camp.

hunting (Walrusses, whales, bears, foxes) and of mining-activity (in Tunheim in the northeast). Nowadays no one is living at the island except for the crew of the radio- and meteorological station at the north coast.

2. Why research at Bear Island?

From the description above it is apparent that Bjørnøya is not the most comfortable place to go to for living in a tent for two months. Why then did we go there while the main-species of our research, the Fulmar, also lives far more to the south like in Britain?
The reason is that not all Fulmars are alike: there is a large degree of geographical variation in the Fulmar meaning that there are large differences in morphology in different geographical areas. In the southern part of its breeding-area in the Atlantic (Iceland, Britain) the Fulmar has a very light appearance (white head and underparts) while in the north (e.g. Spitsbergen) most of the birds look dark (grey on the head and often also on the underparts). Also birds in the south are larger than those in the north. These differences are often interpretated to be the consequence of different evolution in two (formerly isolated) groups of the Fulmar.
Areas where two of such different forms of a species meet are of special interest for the biologist. The appearance of the birds in such a place and the nature of the contacts between the different forms may give some understanding in the pathways of evolutionary differentation.
For the Fulmar Bear Island is such a place of contact between the southern group (subspecies auduboni) and the northern group (subspecies glacialis).
Apart from this special reason to go to Bear Island it is of fundamental importance in biology to acquire knowledge on the occurrence and morphology of species in different areas. In the Arctic, like on Bear Island, this descriptive phase of biology is far from complete. In our case we were especially interested in cliff-breeding seabirds and in the Snow-bunting and Purple Sandpiper.
Knowledge on the occurrence of different species is not only important in biological studies; it is also indispensable for a proper wildlife-management, which is necessary even in the arctic.

3. Short diary.

At June 29, after three moths of thorough preparation we embark the Plancius, the ship that is going to bring us to Bear Island and that will pick us up two months later. The Plancius is hired by the Dutch Smeerenburg Expedition of the 'Arctisch Centrum' (R.U.Groningen) and travels from Amsterdam to Spitsbergen (see Fig.1.) for archeological research in former whaling-settlements.
Due to some delay in Tromsø, Norway, it takes nine days before we reach Bear Island. At July 9, 00.30 h, the Plancius anchors in Sørhamna, a 'natural harbour' at the southeastern side of the island. With a small boat we are brought ashore in the nearby Kvalrossbukta with all our luggage (food for two months, tents, and working equipment)(Fig.2&3).

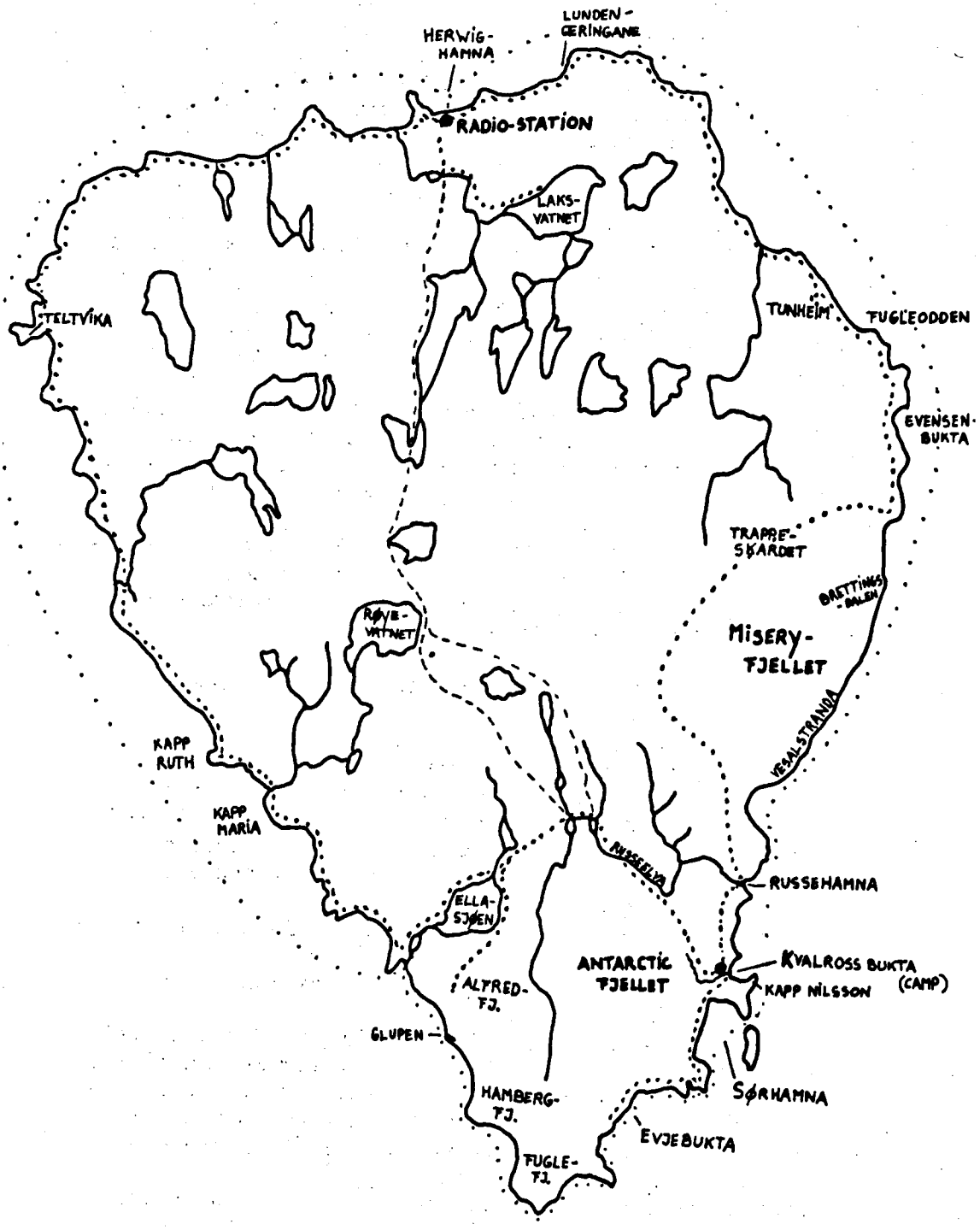


Fig.3. Bear Island, with routes of walking- and boat-trips (dotted lines; see Ch.3.) and names of places mentioned in text.

Some hours later the Plancius leaves for Spitsbergen and we start building our camp.
The first few days we try to get used to our work at the island; we learn how to catch Fulmars with long-handled nets and a series of nest-sites of Fulmars is selected for a study of their breeding. Also we practise the counting of seabird-colonies since we want to leave as soon as possible for a 'walking-tour' around the island for bird-counting. It is important to do this counting as soon as possible since presence of birds is highest in earlier stages of their breeding.
At July 13 we start our walking tour northwards along the east coast. Since it appears to be impossible to walk the Miseryfjellet along the coast we have to make a detour and only start counting birds north of the mountain. On our way north we stay one day near Tunheim, an old, totally deserted, and ruinous mining-village.
After counting the colonies in the northeast the crew of the radio-station at Herwighamna receives us with great hospitality; on July 17 they even take us on a boat-trip around the island. Unfortunately Miseryfjellet is covered with fog but when we reach the high cliffs in the south the fog disappears and then we experience something magnificent: the huge stone walls are covered with incredible numbers of birds (Guillemots, Thick-billed Guillemots, and Kittiwakes) and also sea and air around us are filled with them. The sight of it is enough to make any bird-lover lyrical...and any bird-counter desperate; we try to make counts but in the short time available it is an impossible task. We decide that later on we have to try to make some counts from land to get a reasonable impression of the number of birds.
After our stay at the radio-station we continue our trip along the coast south to Ellasjøen. From there we also make a walk up Alfred-fjellet to get an impression of the number of birds on the cliffs below. The 22th of July we return to our camp in Kvalrossbukta.
From then on we are mainly busy with routine-work for the Fulmar-research; each day the selected nests for breeding-study are visited and we catch Fulmars for ringing and taking measurements. Some of the birds have to be collected for our research and it takes a lot of time to clean out their skins.
Due to foggy weather we have to wait until the 2th of August before we are able to make a trip to the seabird-colonies in the south in order to make additional counts. Unfortunately already many birds had left the colonies by then.
For our Fulmar-research the area near Kvalrossbukta and Sørhamna is ideal and we are also able to do a lot of work with Purple Sandpipers However, no Snowbuntings are present in the vicinity and therefore we decide to go some days earlier than planned to the radio-station. We have to go there anyway to make radio-contact with the Plancius and we know that Snowbuntings do occur in that area.
During our stay at the station from 20 to 23 August we are able to catch some Snowbuntings and from a radio-contact with the Plancius we learn that we will be picked up at midday of August 27th.
Once back in our camp we finish our work on the Fulmar and Purple Sandpiper. Somewhat delayed, the Plancius arrives early morning August 28th to pick us up. The evening of September 2th we are "back home".

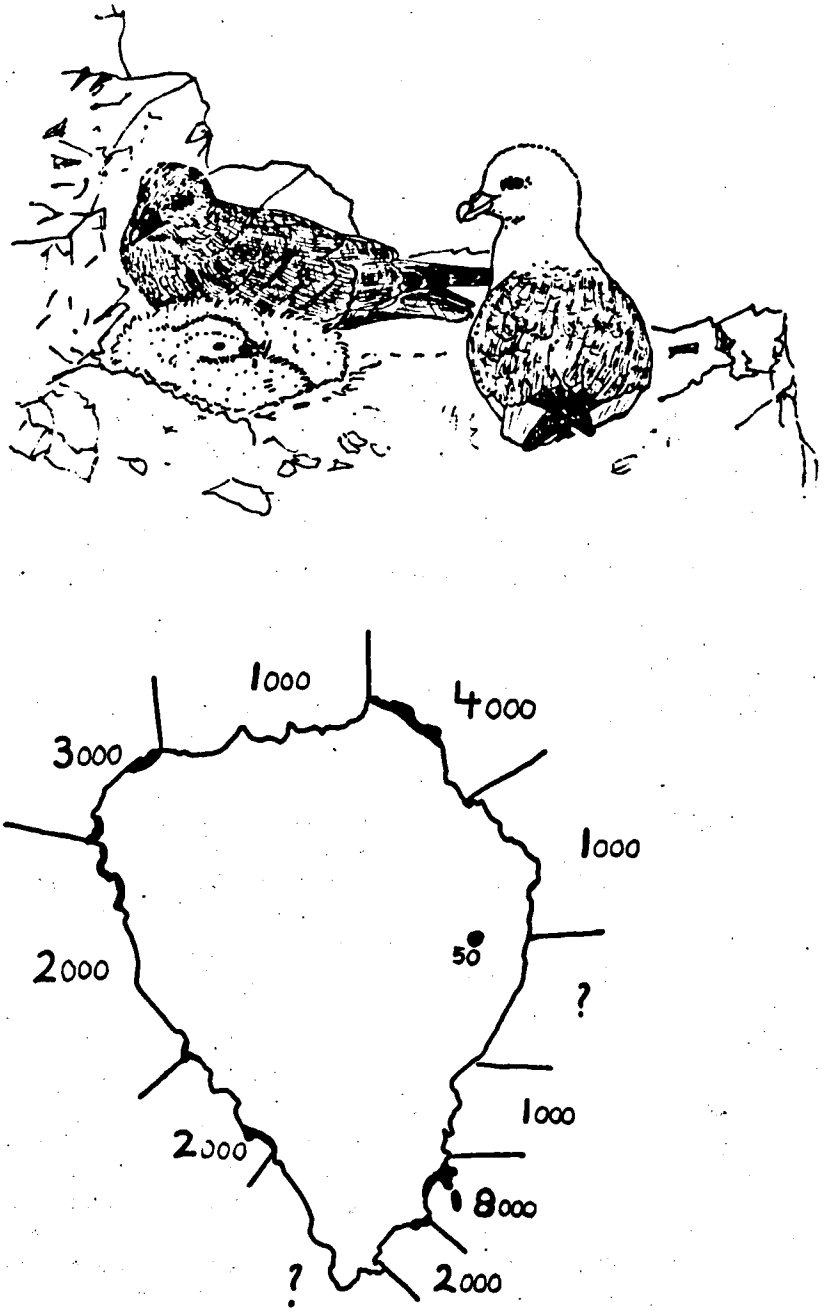


Fig.4. Fulmarus glacialis

Above: a pair of differently coloured Fulmars with their young. Interbreeding of the different colour-types occurs freely in the Bear Island population.

Below: Map of Bear Island showing the approximate numbers of nest-sites of Fulmars in different sections of the coast (numbers counted, July 1980). The coast-line is blackened in areas which are densely populated by Fulmars. Also the inland-colony of Trappeskardet is indicated.

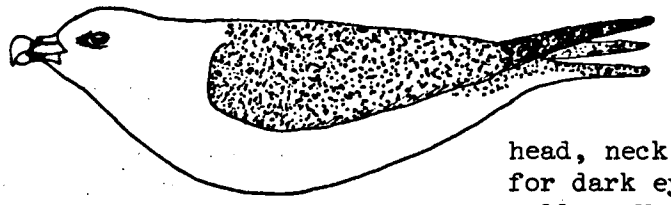
4. The Birds.

In this chapter all bird-species are listed that were observed by us during our stay at Bear Island. It is not a complete avifaunal list of the island (see in this respect: Williams, A.J., 1971, Ornithological observations on Bear Island 1970, Astarte 4: 31-36). First the most common cliff-breeding seabirds are described, followed by other common breeders. For each of these birds the English, the Latin, the Dutch, and the Norwegian name is given. Successively Fulmar, guillemots (Uria aalge + U.lomvia), Kittiwake, Little Auk, Black Guillemot, Puffin, Glaucous Gull, Great Black-backed Gull, Arctic Tern, Arctic Skua, Great Skua, Red-throated Diver, Eider, Purple Sandpiper, and Snowbunting are dealt with.
Our list is finally completed by an enumeration of observed birds of which the status is uncertain (occasional breeders, visitors).

4.1. Fulmar Fulmarus glacialis, Noordse Stormvogel, Havhest.

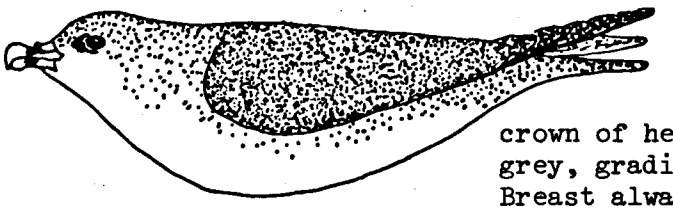
Numbers and distribution.
Our actual counts of nest-sites of the Fulmar result in a total of 22.955 sites. Estimating for the parts of the coast that were not counted we conclude that 30.000 nest-sites at the most were present at that time. However, our counts were made during- or just after the period of hatching of the eggs; from research in the Orkneys it is known that more than 50% of the nests may fail before this time. Assuming that a similar percentage of failure occurs on Bear Island it seems reasonable to estimate the Fulmar population there at 50.000 to 60.000 breeding pairs. Apart from these birds there is a considerable number of non-breeding Fulmars of which it is impossible to give an estimate (but certainly several tens of thousands).
The Fulmars are well distributed all around the coast of the island which may be illustrated by Fig.4. Only few coastal areas are not inhabited by Fulmars. There are however some areas with large concentrations of breeding Fulmars. These dense colonies are often situated on or near inaccessible islands or peninsulas. On one occasion we discovered a small colony inland about 2 km from sea (at Trappeskardet)

Colourphases.
Colour-variation in the Fulmar is not simply a case of two different colour-types as somewhat suggested in Chapter 2 (viz. light versus dark). On the contrary, there is a continuous variation in colour with innumerate intermediate types between the light and dark extremes.
It is difficult to deal with this large amount of variation when describing a Fulmar population. Therefore we used a system in which all colourvariation is divided arbitrarily into four groups (colourphases). These four colourphases are shown and described in Fig.5.



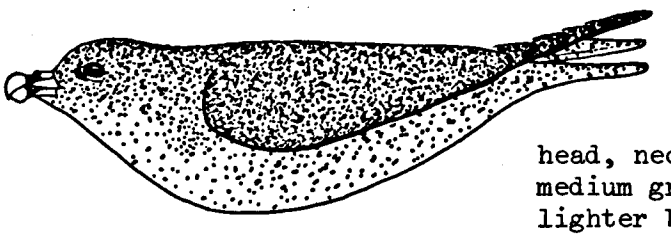
LL

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



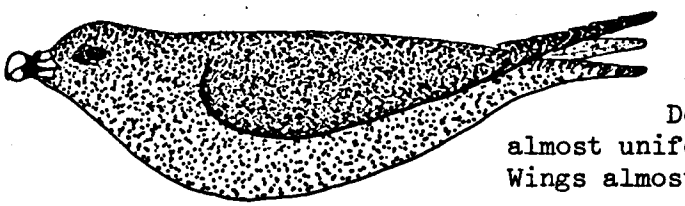
L

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.
(based on Fisher, J., 1952, The Fulmar, Collins, London)

During our counts of seabirds in the colonies along the coast we now and then used well observable Fulmar colonies for determining the percentages of each of the colourphases. In such colonies each sitting Fulmar was observed and attributed to one of the four types. Thus, on several places around the island almost 1500 individuals were counted. In these birds the mean percentage of each of the colourphases is:

LL - double light - 7.7%
L - light - 28.1%
D - dark - 54.0%
DD - double dark - 10.2%.

There were no remarkable differences between the colonies.
These percentages illustrate the somewhat intermediate position of the Bear Island population of the Fulmar between the southern light group (100% LL in Britain) and the northern dark group (almost 100% L, D, and DD in Spitsbergen).

Other aspects.
During our stay at Bear Island we carried out a lot of other research on the Fulmar but it would go too far to explain all that in detail in this context.
We studied for example the interbreeding of light and dark individuals and the appearance of the young. It appeared that interbreeding occurs freely between all different colour-types. In most cases (though not all) the young of two differently coloured parents had an intermediate colour-shade.
We also captured many Fulmars (175) with long-handled nets in order to make an accurate description of their plumage and of their measurements. Afterwards most of these birds were released with a Norwegian ring. Twentytwo of them were collected in order to establish the relation between sexe and measurements. The data thus collected do not only reveal the position of the Bear Island Fulmar in the pattern of geographical variation of the North Atlantic Fulmar; it may also give an opportunity to study the variation within a geographically restricted population (ranges in variation; relations between sexe, measurements, colour, and age). One of the results of measuring was that the Fulmars of Bear Island are remarkably large and therefore similar to the southern light subspecies auduboni, while concerning their colour they are much more like the northern dark subspecies glacialis. This makes it very difficult to discern the subspecies, because normally they are separated on the basis of colour and measurements. Therefore it is difficult to say to which of the subspecies the Bear Island population belongs.
These and other aspects of the morphology and ecology of the Fulmar at Bear Island will be dealt with in detail in future publications.

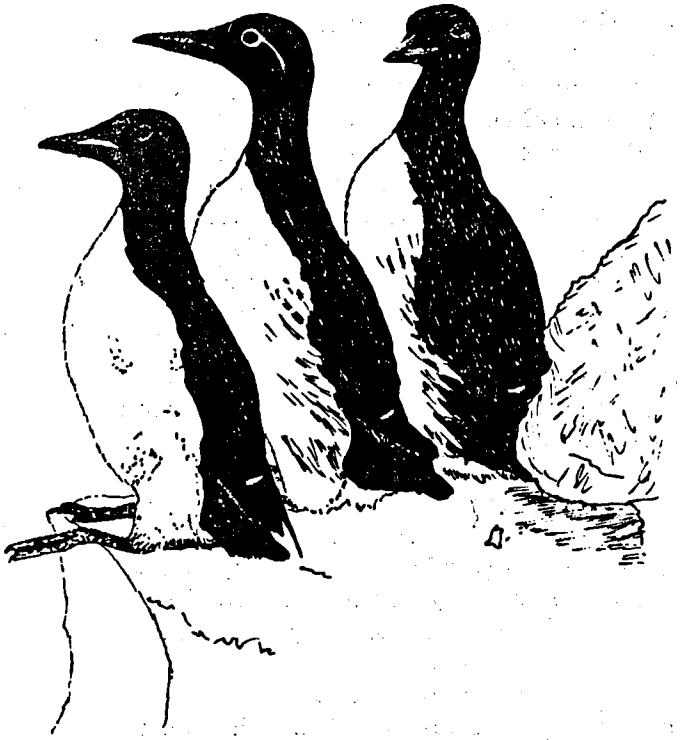
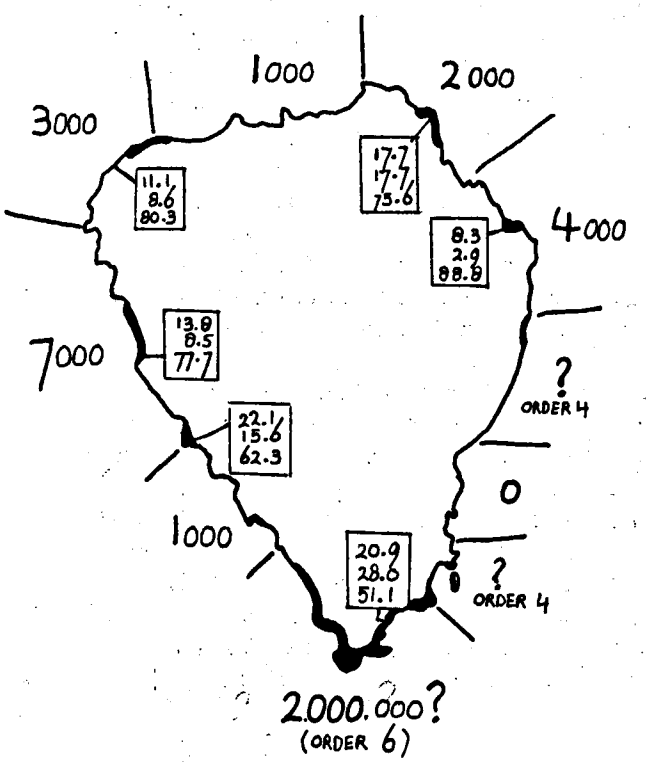


Fig.6. Uria aalge and Uria lomvia

From left to right: Brünnichs Guillemot (Uria lomvia) and both the bridled and unbridled morph of the Guillemot (Uria aalge)



Map of Bear Island showing the approximate numbers of individuals of guillemots (Uria spec.), counted July 1980. The 2 million individuals for the southern section is not the number of birds counted but a rough estimate (see text). Coastal areas densely populated by guillemots are blackened in the map. Inside the squares the percentages of U.aalge unbridled, U.aalge bridled and U.lomvia respectively are given for some of the colonies.

order 0 = 1-10,
order 1 = 10-100
order 2 = 100-1000
order 3 = 1000-10.000
order 4 = 10.000-100.000
etc.

4.2. Guillemot Uria aalge, Zeekoet, Lomvi and Thick-billed Guillemot Uria lomvia, Dikbekzeekoet, Spitsberglomvi.

These two species are taken together in this chapter because of their combined occurrence in colonies. On their ledges Uria aalge and Uria lomvia are breeding side by side. Since both the bridled and the not-bridled morph of U. aalge are common three differently looking types of birds are mixed in the colonies (illustrated in Fig.6.).
The combined number of both species of birds is estimated by us at at least 2.000.000. individuals! Accurate counts were impossible due to inaccessibility of some of the cliffs, the very dense breeding (often several rows on one ledge) and the fact that we arrived too late at some of the colonies. For example, we counted Uria-numbers in the direct surroundings of Glupen: Glupen is a tiny spot on the map but there alone we already counted 30.000 guillemots (21th of July). We both felt sure that this colony could not represent much more than about one percent of the guillemots that we had seen during out boat-trip with the radio-men. On the other hand we only counted 150.000 guillemots in Evjebukta on August 2th (which would not justify an estimate of over 2 million for the total population) but since many young could already be seen at sea at that time this count is undoubtedly a strong underestimate of the actual breeding-population of Evjebukta. We are sure that the size of the Uria-population of Bear Island is somewhere low in order 6 and we think that two million is a reasonable estimate.
On several places along the east-, north-, and west-coast colonies of guillemots are present but these are very small compared to the huge colonies on the high cliffs in the south. Also on Miseryfjellet there are no colonies comparable to those in the south; below the cliffs of this mountain no considerable numbers of guillemots at sea were seen and judging from some "long-distance-counts" from the northern and southern side of the mountain the colonies are probably somewhere in order 4. (see Fig.6.).
In the smaller colonies around the island normally Uria lomvia is the main species (60 to 90%) but our counts in Evjebukta showed almost equal numbers of U.lomvia and U.aalge. In our estimate of numbers this means about a million U.lomvia and about a million U.aalge in the Bear Island population. (see Fig.6.). Often Uria lomvia showed some preference for the higher ledges on the cliffs.
In the southern colonies the bridled morph of Uria aalge seemed a bit more numerous than the unbridled one (28.0 and 20.9% respectively in the counts of Uria spec. in Evjebukta) but in the other smaller colonies an opposite trend is visible (see Fig.6.).
During our visit to Evjebukta we ringed a small number of Thick-billed Guillemots and we captured 22 U.aalge for the seabird-research at our University. Also two specimens of U.lomvia that were found sick in Kvalrossbukta were obtained for the collection of our institute.
In spite of our incomplete counts it may be clear that Bear Island is a very large and important breeding place for both the common and the Thick-billed Guillemot.

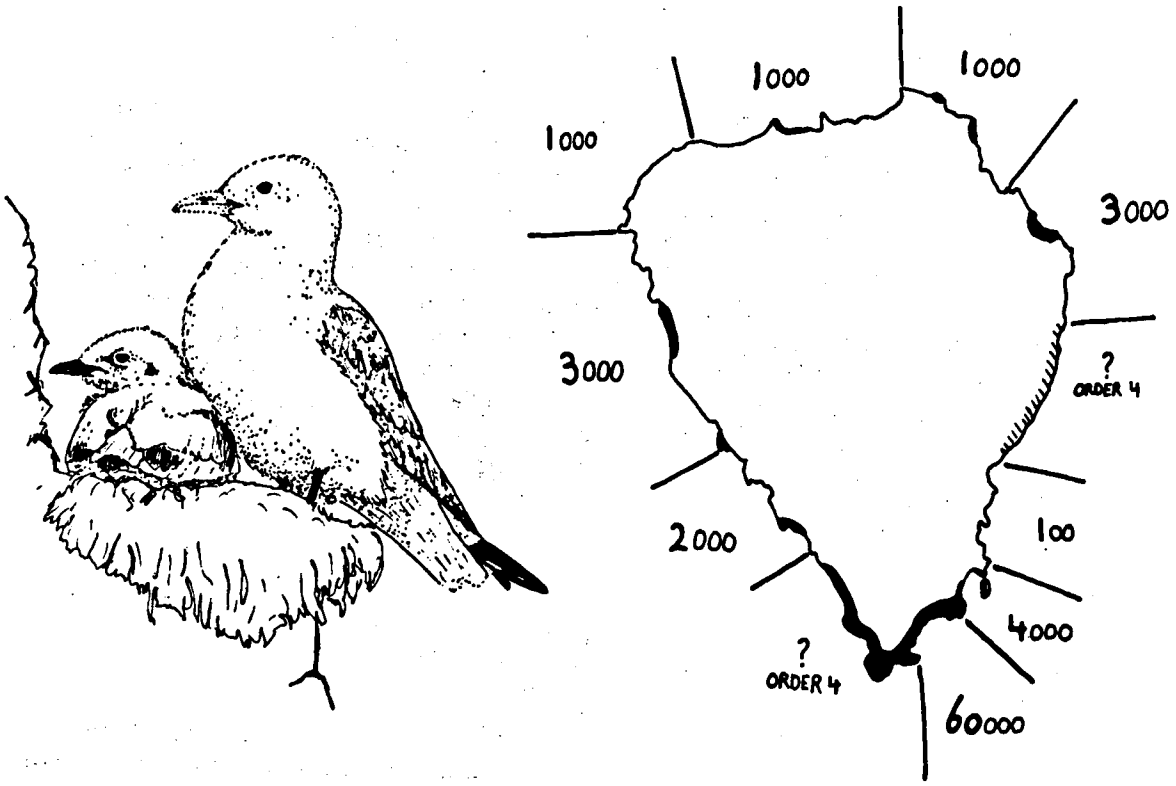
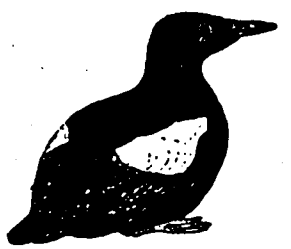


Fig.7. Rissa tridactyla
Kittiwake at nest-site and map of Bear Island showing the number of nest-sites of Kittiwakes counted during July 1980 for different parts of the coast. Areas which are densely populated by Kittwakes are blackened in the map.
(order 4 = 10.000-100.000.)

LITTLE AUK



BLACK GUILLEMOT

PUFFIN

4.3. Kittiwake Rissa tridactyla, Drieteenmeeuw, Krykkje.

Colonies of the Kittiwake are found all around the island, but again the largest colonies are present on the high cliffs in the south. There they breed almost from sealevel up to the top of the cliffs. In Fig.7. our counts of nest-sites for the different sections of the coast are given. In Evjebukta we counted about 60.000 nest-sites on August 2th (many birds had left their nests by then but the nests are reasonably visible). When extrapolating for the parts of the coast which were not counted but densely populated by Kittiwakes (the southwestern cliffs and Miseryfjellet) we reach the conclusion that the Bear Island population should at least be estimated at 200.000. breeding-pairs of Kittiwakes.
Only four Kittiwakes could be captured with our nets: these birds were measured, ringed and released. Two injured Kittiwakes were obtained for the collection of our Institute.

4.4. Little Auk Plautus alle, Kleine Alk, Alkekonge.

The Little Auk can be found breeding in small numbers all along the coast of the island; only in three places larger colonies were observed by us. One at Vesalstranda, the eastern slope of Miseryfjellet with "thousands" of pairs, and another -inland-cololy at the northern slope of Alfredfjellet above the lake Ellasjøen with at least 3000 pairs. A third 'colony' was found near Tunheim and this one consists of several smaller 'sub-colonies'. Very interesting was that one of these smaller colonies was found in the remnants of old buildings of Tunheim itself! Several nests were discovered between the stones of old walls. In total several hundreds of pairs are breeding near Tunheim.
We estimate the Bear Island population of the Little Auk low in order 4, but it has to be emphasized that this bird, like other hole-nesting species is extremely difficult to count.
Two Little Auks were captured at request of the Stavanger Museum, Norway.

4.5. Black Guillemot Cepphus grylle, Zwarte Zeekoet, Spitsbergenteist.

The Black Guillemot is found breeding in small numbers everywhere along the coast but it hardly shows any concentrations. The total population may be estimated at several hundreds of pairs (at least 300).
Only one young Black Guillemot could be ringed.

4.6. Puffin Fratercula arctica, Papegaaiduiker, Lundegugl.

Also the Puffin is breeding in small numbers along all parts of the coast but now and then smaller concentrations do occur, for example

near Tunheim (at Fugleodden and Siloodden).
In total we estimate that at least 600 pairs are breeding at Bear Island.
Only one adult Puffin could be captured; this bird was released after ringing and measuring.

4.7. Glaucous Gull Larus hyperboreus, Grote Burgemeester, Blåmåke.

The Glaucous Gull is a common breeder along the coast. It breeds on the top of the cliffs and is especially abundant on some islands and peninsulas like Teltvika (250 pairs), Kapp Maria (160 pairs), and near Sørhamna (175 pairs). In total the population must be estimated at about 2000 pairs. This rather large breeding population ows its existence to the huge numbers of Guillemots and Kittiwakes; their eggs in an earlier stage of breeding and later on certainly their young are the main source of food for the Glaucous Gulls. This may be concluded from the vomits of the indigestable parts of their food: the ground near the Glaucous Gull colonies is covered with vomitted lumps of feathers and bones of young guillemots and Kittiwakes.
On several occasions we found dead adult Glaucous Gulls (5 in Kvalrossbukta alone!) without any sign of external damage. Also internally no cause of their death could be found. Probably there was some sickness. We collected two skins of these birds; from the others measurements and moult were recorded.

4.8. Great Black-backed Gull Larus marinus, Grote Mantelmeeuw, Svartbak.

During our counts of seabird-colonies we have seen about 70 individuals of this species. In spite of the fact that we did not find actual proof of breeding we have listed this Gull with the common breeders. Breeding is highly probable since almost always birds were seen in pairs and not in larger groups and because of the fact that some first-calendaryear juveniles were seen.

4.9. Arctic Tern Sterna paradisea, Noordse Stern, Rørnebbeterne.

Only two small colonies of Arctic Terns were found; one in the north near the radio-station with about 30 pairs and one near Kapp Ruth in the west (only seven pairs seen). No other breeding was found but everywhere along the coast now and then Arctic Terns could be observed.

4.10. Arctic Skua Stercorarius parasiticus, Kleine Jager, Tyvjo.

The Arctic Skua was found breeding mainly in the rather small areas with wet, tundra-like vegetations around Miseryfjellet and the mountains in the south. Espcially along the northern side of Miseryfjellet many pairs were found breeding. Outside these areas only occasionally a breeding pair was found.
We estimate the population between 30 and 50 pairs.
Almost all individuals belong to the light colour-phase, that is to say that all had white belly's and throats; many birds showed a lighter grey band on the upper-breast. Only twice a completely dark-phase Arctic Skua was seen, without proof of breeding.

4.11. Great Skua Stercorarius skua, Grote Jager, Storjo.

In contrast with the Arctic Skua the Great Skua mainly occurs in the flat and stony northwestern part of the island. In spite of the many lakes in this area the ground is dry and is only scarcely covered with vegetation. Only a small zone, directly bordering the lakes has a richer vegetation.
The occurrence of this species on Bear Island is of rather recent origin; about 30 years ago it was only rarely observed. First breeding was proved in 1970.
During our stay the population consisted of at least 20 pairs.

4.12. Red-throated Diver Gavia stellata, Roodkeelduiker, Smålom.

This diver we found breeding in very small numbers along the freshwater lakes. Since we did not investigate all inland-parts we cannot give an exact number but we have seen only two breeding pairs (at Røyevatnet and at Grøntjørna, a small lake north of Laksvatnet).
In our opinion there are certainly less than 10 breeding pairs.
During our walks along the coast we only rarely observed Red-throated Divers (3x); if more divers were breeding at the island one would certainly expect to see more of them during their conspicuous feeding-trips to sea.

4.13. Eider Somateria mollissima, Eidereend, Aerfugl.

During our counts we observed about a thousand Eiders, mainly flocks of moulting males and immatures at sea. Several times we found nests or females with young. Probably the island is used as a moulting-area by birds from other localities. The number of males seen certainly does not reflect a similar number of breeding females at the island. Due to the inconspicuous and scattered breeding of the females it is very hard to estimate their number (minimum 25, maximum 250 nests).

4.14. Purple Sandpiper Calidris maritima, Paarse Strandloper, Fjaereplytt

Everywhere on the island the Purple Sandpiper may be found breeding. Near our camp in Kvalrossbukta two pairs were present. Since large inland-areas were not visited by us we cannot give an accurate estimate of the number of breeding pairs. We think that at least a 150 pairs must breed at the island.
In August some sleeping/moulting areas were found were up to 40 individuals could be observed.
In order to study measurements an moulting a total of 64 Purple Sandpipers was captured and released after measuring and ringing.
The measurements of the birds were very similar to those of the Purple Sandpipers of Spitsbergen, Greenland and Norway. Females are larger than males in all their measurements (bill, wing, tarsus, weight).
Concerning the moult of their primaries we found that the inner few primaries were moulted at the island; from our results however it seems probable that the outer primaries are moulted later on in the wintering-area further south. Probably in the second half of August there were several birds from other origin in our material (Spitsbergen?).

4.15. Snowbunting Plectrophenax nivalis, Sneeuwgors, Snøspurv.

The Snowbunting is only seen in those areas of the island where loose rocks are present. The cavities formed by the rocks offer a proper breeding place. Therefore in the south and in the west of the island little or no Snowbuntings are seen. Near places like the radio-station, Tunheim and especially around Miseryfjellet it is a rather common bird.
Again an estimate of the number of breeding pairs is hard to give since many inland parts were not visited; some tens of breeding-pairs are certainly present but the bird can hardly be called abundant.
Near the Radio-station we captured 13 Snowbuntings which were released with Norwegian rings after describing their plumage and taking their measurements.

4.16. Other species.

Apart from the bird-species dealt with above we observed a number of less common birds. Some of these will be rare or occasional breeders, others are only accidental visitors. None of the species observed by us is new to the avifaunal list of Bear Island (Williams, loc.cit.).
Below we deal with these birds in a short list of observations.

-Tufted Duck Aythya fuligula, Kuifeend, Toppand.
At the end of August a group of eleven individuals was seen at Røyevatnet

-King Eider Somateria spectabilis, Koningseidereend, Praktaerfugl.
At least 5 different males were seen both in July and August, and

always they were in or near to a flock of common Eiders. Possibly these males had breeding females at Bear Island but it is equally possible that they originated from other localities.

-Long-tailed Duck Clangula hyemalis, IJseend,Isand.
Several times Long-tailed Ducks were observed along the coast, both males and females, but breeding of this species was not observed.

-Ringed Plover Charadrius hiaticula, Bontbekplevier, Sandlo.
During July three times Ringed Plovers (up to three individuals) were present near our camp in Kvalrossbukta.

-Oystercatcher Haematopus ostralegus, Scholekster, Tjeld.
One Oystercatcher was seen at mid-july near Ellasjøen.

-Turnstone Arenaria interpres, Steenloper, Steinvender.
In July only once a pair of Turnstones in breeding-plumage was seen near Evensenbukta but no proof of actual breeding was found.
After the second week of August in total six individuals were seen, but these were all in winter-plumage and probably were migrants from other localities.

-Redshank Tringa totanus, Tureluur, Rødstilk.
At the end of August two individuals were seen twice near the radio-station.

-Black-headed Gull Larus ridibundus, Kapmeeuw, Hettemåke.
On July 28th and 29th one adult Black-headed Gull in summer-plumage was present in Kvalrossbukta. This accidental visitor must have been drifted northwards by the rather strong southern winds during that period

-Lesser Black-backed Gull Larus fuscus,Kleine Mantelmeeuw, Sildemåke.
At least three different individuals of this species were present at Bear Island; one adult in Kvalrossbukta and twoo adults near Kapp Ruth at the west coast. Almost certainly these were not breeding-birds.

-Herring Gull Larus argentatus, Zilvermeeuw, Gråmåke.
At least seven different individuals were seen at different places around the island. All the birds were adults. Near our camp in Kvalrossbukta at Kapp Nilsson, the whole of July and August, a pair of Herring Gulls was present. Probably these birds did not actually breed (or failed in the beginning?) but they certainly acted like breeders. Breeding must be expected in other years.

-Common Gull Larus canus, Stormmeeuw, Fiskemåke.
At the end of August one subadult Common Gull was seen at the Radio-station.

-Razorbill Alca torda, Alk, Alke.
This species may breed in very small numbers at Bear Island. Four times we observed this species: one flying near Sørhamna, one flying near Evjebukta; four at the cliffs of Fugleodden, and eight at the cliffs of Lundenoeringane. Breeding was not observed but is very well possible

-Snowy Owl Nyctea scandiaca, Sneeuwuil, Snøugle.
At the end of August one female (or juvenile?) was seen in the valley of the Russeelva.

-House Martin Delichon urbica, Huiszwaluw, Taksvale.
One House Martin was seen on July 18th flying in the vicinity of the radio-station.

-Wheatear Oenanthe oenanthe, Tapuit, Steinskvett.
During the whole of July and August one male Wheatear was present near our camp in Kvalrossbukta and completed its moult during this time. We captured and ringed this bird in the beginning of July. No other Wheatears were seen, so probably this species is not breeding at Bear Island.

-Phylloscopus spec.
At the end of august one Phylloscopus was shortly observed in Kvalrossbukta. Species-determination was not possible.

5. Mammals

Bear Island appeared to be much poorer with mammals that we had expected. Only four mammal-species were observed.

-Arctic Fox Alopex lagopus, Poolvos, Hvitrev
Only once we observed an Arctic Fox; this animal shortly visited our camp during a period of fog. If the relative tameness of this particular animal is characteristic for all Arctic Foxes than this species must be very rare at Bear Island.

-Beluga Delphinapterus leucus, Witte Dolfijn, Hvitfisk.
We observed one "white whale" while counting birds at the cliffs of Teltvika. The animal was 4 to 5 metres long and was feeding for several hours in the bay called Grytvika.

-Common Seal Phoca vitulina, Gewone Zeehond, Selhund.
Two Common Seals were seen along the coast north of Kapp Ruth (July 20th).

-Bearded Seal Erignathus barbatus, Baardrob, Storkobbe.
In August we made two observations of a solitary Bearde Seal; one in Kvlarossbukta and one in Sørhamna. These records may concern the same individual.

6. Comments.

Some of our counts of seabirds are rather different from those of earlier ornithologists visiting Bear Island.
Williams (A.J., 1971, Ornithological Observations on Bear Island 1970, Astarte 4:31-36) summarized all data of the birds of Bear Island. Strikingly different are his and our opinion on the number of guillemots (Uria spec.): Williams estimated the combined populations of Uria aalge and U.lomvia at about 310.000 birds; we think there are at least two million of them! In our opinion there are also much more Kittiwakes than mentioned by Williams (200.000 compared to 100.000 nest-sites).

The number of these birds clearly needs more investigation but we are rather sure that the guillemots must be counted in millions and not in thousands. Lütken (E., 1969, Birdlife on Bjørnøya 1965, Norsk Polar Inst. Arbok 1967: 151-165) has a similar opinion.
Lütken also mentions a large colony of Little Auks in Brettingsdalen (Miseryfjellet) which was not observed by us; therefore our figures for this species are very different. It seems strange that we did not observe this colony from the boat; we did observe a colony, but that was at Vesalstranda, a bit more south.
Glaucous Gulls (2000 pairs) and Greater Black-backed Gulls (70 individuals) were more numerous than mentioned by Williams (500 and 5 pairs respectively). Whether these figures indicate an actual increase or failures in countings is hard to judge.
It is remarkable that we did not observe any Phalaropes; maybe this is caused by the fact that the Grey phalaropes seem to breed in a very restricted area near Laksvatnet (Lütken, loc.cit.). When we visited Laksvatnet heavy fog prevented proper observations.
Species probably decreasing are the Arctic Tern (160-180 pairs in 1965) the Eider and the Long-tailed Duck. Maybe such a decrease should be due to the increasing number of Great Skuas. Lütken vividly described the robbing of nests in Eider-colonies by Great Skuas.
When reading our inland-observations one should be aware of the fact that we did not thoroughly investigate the inland; our main object of study was the coast and the number of seabirds breeding there.

It has to be emphasized that Bear Island is one of the largest seabird-colonies in the North-Atlantic! The density of birds on the high cliffs in the south (from Ellasjøen to Kvalrossbukta) is unequalled.
In spite of the fact that we are not able to provide accurate figures for all species it is beyond doubt that their numbers are enormous: counting in breeding individuals there are in our opinion at least:

1.000.000. Guillemots (Uria aalge),
1.000.000. Thick-billed Guillemots (Uria lomvia),
400.000. Kittiwakes,
and 100.000. Fulmars.

It should be clear that these figures indicate that the Bear Island population is of vital importance for these seabird-species (especially when considering the increasing losses in southern populations due to oil-pollution). Without neclecting the importance of other birds at the island, the four species mentioned above already justify a protectional status for Bear Island and its surroundings. We hope that our report somehow attributes to the safeguarding of the unique bird-life of Bear Island.

7. Aknowledgements.

As expressed before we feel that our expedition could not have been succesful without the support given to us by so many people and institutions.
Financially, the Fulmarus glacialis research was supported by a grant from the Netherlands Organization for the Advancement of Pure Research (ZWO). Furthermore we are very grateful for the material support and help of:
-R.T.Barrett, Tromsø Museum, (advice),
-Bjørnøen A/S, Oslo (permission)
-Borsumij Foto BV., Roelofarendsveen (use of CANON-photographic equipment),
-Carl Denig BV., Amsterdam (camping equipment),
-Dehyfood Company NV., Rotterdam (dried food),
-Domo Melkprodukten Bedrijf, Beilen (milk-powder),
-L.Haquebord, Arctisch Centrum, Groningen, and all the members of the Smeerenburg Expedition to Spitsbergen,
-H.Holgersen, Stavanger Museum (rings),
-Intendance der Rijkspolitie, Apeldoorn (gun),
-Instituut voor Taxonomische Zoölogie, Amsterdam, -many people helped and advised us when we prepared our expedition; we would like to thank especially Jan Wattel and Ko de Korte,
-Koninklijke Verkade Fabrieken BV., Zaandam (food),
-M.P.D.Meyering, Max Planck Inst.,Schlitz (advice),
-Miljøvern Department, Oslo (permission),
-Ministerie van Defensie, Den Haag (food; postponement of compulsory military service and later on permission for study during service for van Franeker),
-Nederlandse Stichting voor Arctisch Natuurwetenschappelijk Onderzoek, (P. Oosterveld), Zeist (advice and materials),
-Norsk Polar Institutt, Oslo (advice, maps and aerial photographs)
-Mrs.J.C.Ollason, University of Aberdeen (advice),
-Plancius Mariteam BV., Amsterdam -captain and crew of the Plancius-
-Radio and Meteorological Station Bjørnøya (help and hospitality of all the members of the crew),
-Sysselmannen pa Svalbard, Lonyearbyen (permission),
-Temova Etablissement Holland BV., Eindhoven (special underwear),
-Top Foods Elburg BV., Elburg (dried food),
-Unilever Vleesgroep Nederland BV., Oss (food),
-W.Vader, Tromsø Museum (advice),
-Vervarslinga for Nord Norge, Tromsø (permission),
-Zeiss Nederland BV., Weesp (binoculars and telescope).