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# Seabird censuses on Novaya Zemlya 1995

Working Report



The Joint Norwegian - Russian Commission  
on Environmental Cooperation  
The Seabird Expert Group — Report No. 12: 1994/95



**Norwegian Ornithological Society**



Report No. 3-1995

## **NORWEGIAN - RUSSIAN ENVIRONMENTAL COOPERATION THE SEABIRD EXPERT GROUP**

The Agreement on Environmental Cooperation between Norway and USSR was signed in 1988 and later renegotiated between Norway and Russia in 1992. The Commission - the Joint Norwegian-Russian Commission on Environmental Cooperation - is chaired by the Ministry of Environment of the two parties and has annual meetings.

Working groups on different topics have been established in order to contribute to increased collaboration on environmental problems in general, and carry out programmes and projects on different fields (i.e. air pollution, the marine environment, radioactive pollution). The seabird expert group is part of the working group for the marine environment.

The initial aim of the seabird expert group was to establish contact and collaboration between Norwegian and Russian research and management institutions. The expert group aims at contributing to the harmonisation and development of scientific methodology and data bases. Furthermore, mapping of important seabird colonies and the conditions related to seabird habitats, i.e. environmental pollutants and food resources, are important items for the group. Several projects on joint approaches have been initiated within the expert group during the last years.

Annual meetings in the seabird expert group have been arranged since 1989. The delegations from the two countries involve seabird experts from several institutions. On the Norwegian side, the Directorate for Nature Management has the coordinating role in the collaboration and chair the delegations. On the Russian side, VNII Priroda plays the corresponding role. The expert group is chaired by:

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Morten Ekker - Directorate for Nature Management, Trondheim

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Eugeny A. Kuznetsov & Gennady V. Khakin**

## **Seabird Censuses on Novaya Zemlya 1995**

**NORWEGIAN ORNITHOLOGICAL SOCIETY (NOF)  
KLÆBU 1995**

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# PREFACE

The Agreement on Environmental Cooperation between Norway and the USSR was signed in 1988, and later renegotiated in 1992, this time between Norway and Russia. One result of this cooperative agreement was the establishment of an expert group on seabirds. As a part of this environmental joint venture, Bjørn Frantzen from The Norwegian Ornithological Society (NOF) initiated a joint Norwegian - Russian seabird project on Novaya Zemlya.

The project has been carried out by NOF and the All-Russian Research Institute for Nature Protection (VNII Priroda), Moscow. NOF, together with the Norwegian Polar Institute, has the scientific responsibility. The project is, from the Norwegian side, fully financed by the Directorate for Nature Management (DN). The project is part of the strategy and working plan for the Norwegian - Russian seabird expert group, and the work is also included in the working plan of the Russian Ministry of Protection of the Environment and Natural Resources.

The aim of the project is to map selected seabird colonies on the western coast of Novaya Zemlya. The project is planned for three years, with the first field season in the summer of 1994 (see Strøm et al. 1994). This report describes the results of the second field season in 1995.

The plan for the field work in 1995 included the seabird colonies in Arkhangelsk Bay and Vilkitski Bay on the northern island, and implied five weeks of work. However, due to problems with the helicopter transport on Novaya Zemlya, we had to dispense with the working plan. The field work had to be carried out in Gribovaya Bay and Bezymyannaya Bay on the southern island, and due to, for us, unknown reasons, the expedition had to leave Novaya Zemlya after two weeks of field work and a one week stay in Belush'ya, the main military base on the archipelago.

Project leaders on the Norwegian side have been Bjørn Frantzen (until 1 May 1994) and Hallvard Strøm (from 1 May 1994), and the Russian leader has been Gennady V. Khakhin (VNII Priroda). Also participating in the field work in 1995 were Eugeny A. Kuznetsov (VNII Priroda), Valery N. Selin (the Russian Navy), Jon Opheim (NOF) and Ingar Jostein Øien (NOF).

A number of people have contributed to the accomplishment of the project. Special thanks are addressed to Vidar Bakken at the Norwegian Polar Institute, for scientific assistance and support during all phases of the project. Special appreciations are also due to Valery N. Selin (the Russian Navy), Morten Ekker (DN), Agnar Klungland, Jon Atle Kålås, Svein-Håkon Lorentsen, Vera Sandlund, Roar Solheim, Kåre Strøm and Dag Vongraven for their respective contributions to the project. We are also indebted to Helseport AS, Norway, for financial support to the project. Stephen Clayborough, Erik Edvardsen and Kjell Isaksen have proofread the report, and contributed with valuable comments.

Trondheim/Moscow, February 1996

*Hallvard Strøm*

*Gennady V. Khakhin*



## ПРЕДИСЛОВИЕ

Соглашение о сотрудничестве в области охраны окружающей среды между Норвегией и Россией было подписано в 1988 г., а затем подтверждено Россией и Норвегией в 1992 г. Одним из результатов этого соглашения было образование экспертной группы по морским птицам. В рамках этого сотрудничества Бьерном Франценом из Норвежского орнитологического общества /НОБ/ был предложен совместный российско-норвежский проект по морским птицам Новой Земли.

Сотрудничество и планирование было осуществлено НОБ и ВНИИприроды /Москва/. НОБ совместно с Норвежским институтом полярных исследований отвечает за научную часть проекта. Проект полностью финансируется норвежской стороной - Директоратом по управлению природными ресурсами /ДПР/. Сам проект является частью стратегии и плана работ российско-норвежской экспертной группы по морским птицам. Эта работа включена также в план международного сотрудничества Министерства охраны окружающей среды и природных ресурсов Российской Федерации.

Целью проекта является картирование отдельных колоний морских птиц на западном побережье Новой Земли. Проект был рассчитан на 3 года с началом полевых работ летом 1994 г. Данный отчет приводит результаты второго пологового сезона 1995 г.

В 1995 г. были запланированы полевые работы в течение 5 недель в губах Архангельская и Вилькицкого на Северном острове. Однако, из-за трудностей с заброской вертолетом на Новой Земле мы вынуждены были изменить план работ. Полевые работы были проведены в губах Грибовая и Безьянная на Южном острове. К сожалению по неизвестным нам причинам, экспедиция была вынуждена покинуть Новую

Землю через две недели после начала полевых работ и недельного пребывания в пос. Белушка - главной базе архипелага.

Руководителями проекта с норвежской стороны были Бьерн Францен /до 1 мая 1994 г./ и Халлвард Стром /после 1 мая 1994 г./, а с российской - Геннадий В. Хахин /ВНИИприроды/. Участниками полевых работ в 1995 г. были также Евгений А. Кузнецов /ВНИИприроды/, Валерий Н. Селин /ВМФ/, Йон Опхейм /НОб/ и Ингар Йостейн Еисен /НОб/.

Целый ряд людей сделали свой вклад в выполнение проекта. Особую благодарность мы хотим выразить Видару Баккену из Норвежского института полярных исследований за научную помощь и поддержку на всех стадиях проекта. Особая признательность также Валерию Н. Селину /ВМФ/, Мортену Энкеру /ДПР/, Агнару Клунгланду и Каре Стром за их вклад в выполнение проекта. Мы также благодарны фирме Хелспорт А.С. /Норвегия/ за финансовую поддержку проекта. Евгений А. Кузнецов выполнил данный перевод на русский язык. Стефен Клейбороу и Кйел Изаксен прочитали отчет и сделали ценные замечания.

Трондхейм/Москва, январь 1996 г.

Халлвард Стром

Геннадий В. Хахин



# ABSTRACT

This report contains the results from the second joint Norwegian - Russian seabird censusing expedition to Novaya Zemlya. The field work was carried out in Gribovaya Bay and Bezemyannaya Bay in the period July 21 to August 2 1995.

The seabird colonies on the southern shore of Gribovaya Bay and on Shestakova and Veselovo islands were counted, as well as the colonies situated on the sea coast north of Bezemyannaya Bay (the Bezemyannaya North colony).

In Gribovaya Bay the census resulted in the following minimum numbers of the seven seabird species represented in the colonies: 10 pairs of Glaucous Gull *Larus hyperboreus*, 4,368 pairs of Kittiwake *Rissa tridactyla*, 14 ind. of Guillemot *Uria aalge*, 23,517 ind. of Brünnich's Guillemot *Uria lomvia*, 5 ind. of Razorbill *Alca torda*, 35 ind. of Black Guillemot *Cepphus grylle* and 88 ind. of Puffin *Fratercula arctica*.

In Bezemyannaya Bay the census resulted in the following minimum numbers of the six species represented in the colony: 9 pairs of Glaucous Gull, 11,886 pairs of Kittiwake, 81 ind. of Guillemot, 32,054 ind. of Brünnich's Guillemot, 43 ind. of Black Guillemot and 33 ind. of Puffin.

Nine monitoring plots for Kittiwake and Brünnich's Guillemot were established, containing on average 394 pairs of Kittiwakes and 1,415 ind. of Brünnich's Guillemots.

About 1,500 Brünnich's Guillemots were ringed (1,344 adults and 183 chicks). Prey items were collected from adult Brünnich's Guillemots while feeding their chicks. Specimens of eight species of arctic plants were collected for botanogeographical and molecular genetic studies.

The report also summarises all observations of birds and mammals made during the field work. Twenty-seven or twenty-eight species of birds and four species of mammals were observed during the two weeks stay in Gribovaya and Bezemyannaya Bay.

## РЕЗЮМЕ

Отчет содержит результаты второй совместной норвежско-русской экспедиции по учету морских птиц на Новой Земле. Полевые работы проводились в губах Грибовая и Безымянная с 21 июля по 2 августа 1995 г. Был проведен учет колоний морских птиц на южном берегу губы Грибовой, островах Шестакова и Веселово, а также на морском берегу к северу от губы Безымянной /Северный Безымянный базар/.

В губа Грибовой было учтено следующее минимальное количество семи видов морских птиц: бургомистр /*Larus hyperboreus*/ - 10 пар, моевка /*Rissa tridactyla*/ - 4368 пар, гагарка /*Alca torda*/ - 5 особей, тонкоклювая кайра /*Uria aalge*/ - 13 особей, толстоклювая кайра /*U. lomvia*/ - 23517 особей, чистик /*Serphus grylle*/ - 35 особей, тупик /*Fratercula arctica*/ - 88 особей.

В губа Безымянной было учтено следующее минимальное количество шести видов морских птиц: бургомистр - 9 пар, моевка - 11886 пар, тонкоклювая кайра - 81 особь, толстоклювая кайра - 32054 особи, чистик - 43 особей, тупик - 33 особей. Были заложены девять площадок для учета толстоклювой кайры и моевки со средним количеством кайр 1415 особей и моевок - 394 пары.

Было окольцовано около 1500 толстоклювых кайр /1000 взрослых птиц и 500 птенцов/. Образцы питания толстоклювой кайры были собраны во время кормления птенцов взрослыми птицами. Были собраны образцы 3 видов арктических растений для геоботанических и молекулярно-генетических исследований.

Отчет включает также все наблюдения других птиц и млекопитающих, сделанные во время полевых работ. За две недели полевых работ в губах Грибовая и Безымянная был зарегистрирован 21 вид птиц и 5 видов млекопитающих.

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# 1. INTRODUCTION

## 1.1 BACKGROUND

The Barents Sea is one of the most productive waters in the world and supports large populations of seabirds (Norderhaug et al. 1977, Mehlum & Gabrielsen 1995). The seabirds breed in numerous colonies throughout the whole region, and the Barents Sea constitutes a larder for large populations of seabirds both during the summer and the winter seasons. The seabirds play a central part in the arctic ecosystem as a link between the marine and the terrestrial ecosystems. They transport large quantities of nutrients to the vegetation on land, particularly in the vicinity of the colonial breeding sites.

The huge seabird populations in the Barents Sea are increasingly exposed to environmental influences by fisheries, ship traffic, oil-related activity and pollution. The need to investigate the seabird population in the Barents Sea has therefore increased during recent decades. The responsibility for the management of the seabird resources in the Barents Sea is shared between Norway and Russia. In recent decades, a considerable effort has been made to map seabird colonies and monitor population trends of certain seabird species. This work has mainly been carried out in the Norwegian territory.

A significant part of the seabird populations in the Barents Sea region breeds on Novaya Zemlya. Some of the largest seabird colonies in the northern hemisphere are situated here (Uspenski 1956). Since the Soviet Navy took control of the area in 1954, and the nuclear test sites were established, no significant seabird work has been undertaken in this area. Thus we have currently very limited knowledge of the status and trends of the seabird populations on Novaya Zemlya. For these reasons, the Norwegian Ornithological Society (NOF) initiated a joint Norwegian - Russian seabird project on Novaya Zemlya in 1992.

The time schedule of the project is three years, and the work will be carried out in 4-6 selected seabird colonies on the west coast of Novaya Zemlya. The project has the following aims:

- to estimate the size of the breeding populations of auks and gulls in the colonies
- to establish a monitoring program for long term studies of Kittiwake *Rissa tridactyla* and Brünnich's Guillemot *Uria lomvia*
- to map the migration routes and wintering areas of Brünnich's Guillemots breeding on Novaya Zemlya
- to map the genetic characteristics of Kittiwakes and Brünnich's Guillemots through blood sampling and biometrical studies
- to identify food preferences of Guillemots *Uria aalge* and Brünnich's Guillemots
- to map the bird and mammal fauna in the visited regions

The project will also carry out minor tasks for other projects/institutions.

## 1.2 FIELD WORK 1995

The 1995 expedition was accomplished during the period July 18 to August 8, with field work in the period of July 21 to August 2. The 1995 working plan included the seabird colonies in Arkhangelsk Bay and Vilkitski Bay on the northern island, and implied five weeks field work. However, due to problems with the helicopter transport on Novaya Zemlya, we had to dispense with the working plan. The field work had to be carried out in Gribovaya Bay and Bezemyannaya Bay on the southern island, and due to, for us unknown reasons, the expedition had to leave Novaya Zemlya after two weeks of field work and a one week stay in Belush'ya, the main military base on the archipelago.



*Figure 1. The camp at Cape Astafieva, Gribovaya Bay. Photo: Jon Opheim.*

Transport was accomplished by commercial aircraft to Belush'ya and further by Navy helicopter to Gribovaya Bay, where the base camp was established (Figure 1). The weather conditions during the stay were extremely unstable. As a rule, the days were rainy, foggy and windy. The

temperature averaged  $+8.5^{\circ}\text{C}$ , the extremes being  $+14^{\circ}\text{C}$  and  $+4.5^{\circ}\text{C}$ . The weather conditions delayed and made it difficult to perform the work, but are not considered to have exerted significant influence on the accuracy of the collected data material.

## 2. THE STUDY AREA

### 2.1 NOVAYA ZEMLYA

Novaya Zemlya is a group of islands consisting of two large islands, Severny (northern island) and Yuzhny (southern island), in addition to a number of small islands. The islands stretch out in a north-northeasterly direction, from 70°30' N to 77°00' N (Figure 2). The northern and southern islands are separated by the narrow Matochkin Shar strait, which is only 1-2 km wide. The two large islands extend about 900 km, and cover an area of 82,179 square km. In addition, the smaller islands have a total area of 1,000 square km. Novaya Zemlya therefore covers a total area of over 83,000 square km. A more comprehensive description is given in Strøm et al. (1994).

### 2.2 GRIBOVAYA BAY

Gribovaya Bay is situated on the north-western coast of the southern island, about 40 km south of the Matochkin Shar strait (73°00' N) (Figure 2). The bay is about 9 km long and about 3 km wide. Three islands are located in the bay. The largest one, Golets Island, is situated in the outer part of the bay, while the two smaller ones, Shestakova and Veselovo Islands, are located in the inner parts of the bay (Figure 3).

The mountains surrounding the bay reach heights of about 700 metres above sea level. The coastline of both the north and the south side of the bay is characterized by steep cliffs, only broken by short stretches of sandy beach (Figure 4, 5 and 6). The cliffs vary considerably in height, but are on average 20-30 metres in most parts of the bay. On the north side of the bay one can see the remains of the old military weather station, closed down in 1993.

The sea coast to the south of Gribovaya Bay, between Gribovaya and Bezymyannaya Bay, is also dominated by steep cliffs, reaching heights up to 40 metres (Figure 7).

### 2.3 BEZMYANNAYA BAY

Bezymyannaya Bay is situated 15 km south of Gribovaya Bay (72°55' N) (Figure 2). The bay is about 14 km long and the width is about 3 km. Kutoff Island is situated in the middle of the bay, in the inner part. Several rivers, among them the river Bezymyannaya, have built up a major delta in the inner part of the bay. As in Gribovaya Bay, the coastline in Bezymyannaya Bay is dominated by steep cliffs. On the south shore they start 500 metres east of Cape Nordenskiöld and goes all the way to the inner parts, but are decreasing in height. On the northern shore the cliffs start in the inner parts and goes all the way to the sea coast. A more comprehensive description of the bay is given in Strøm et al. (1994).

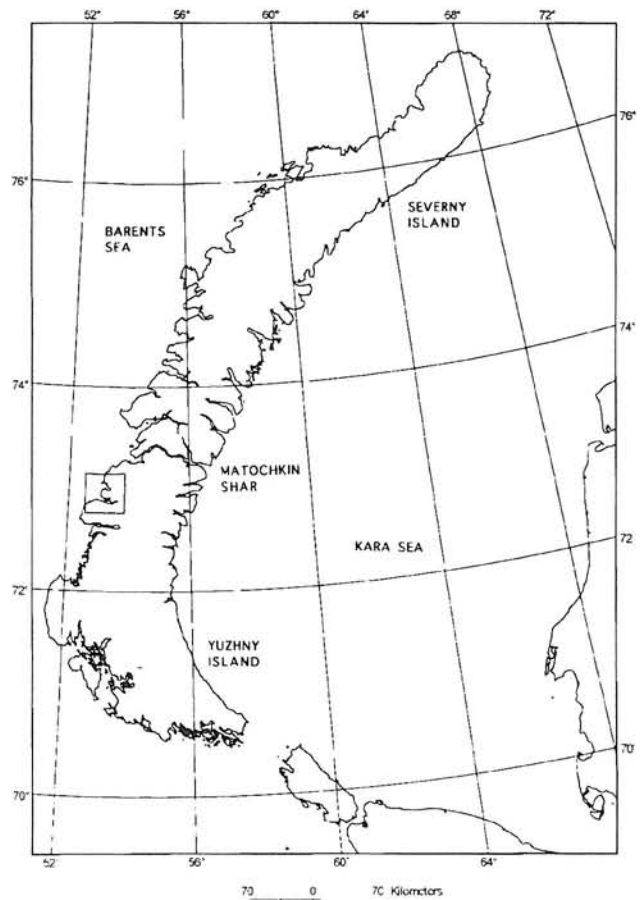


Figure 2. Novaya Zemlya. The square indicates the location of Gribovaya Bay and Bezymyannaya Bay.

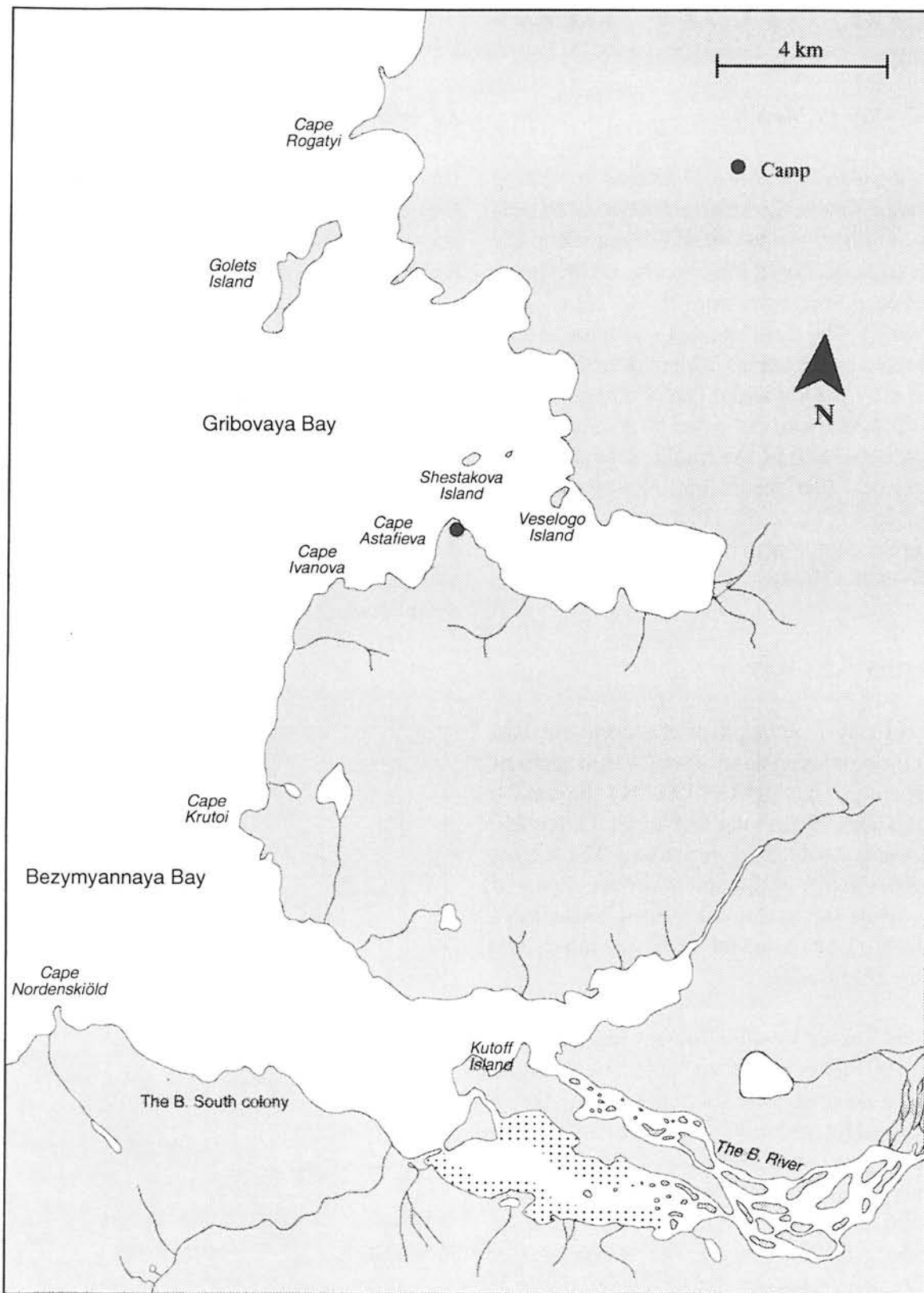


Figure 3. Gribovaya Bay and Bezmyannaya Bay.

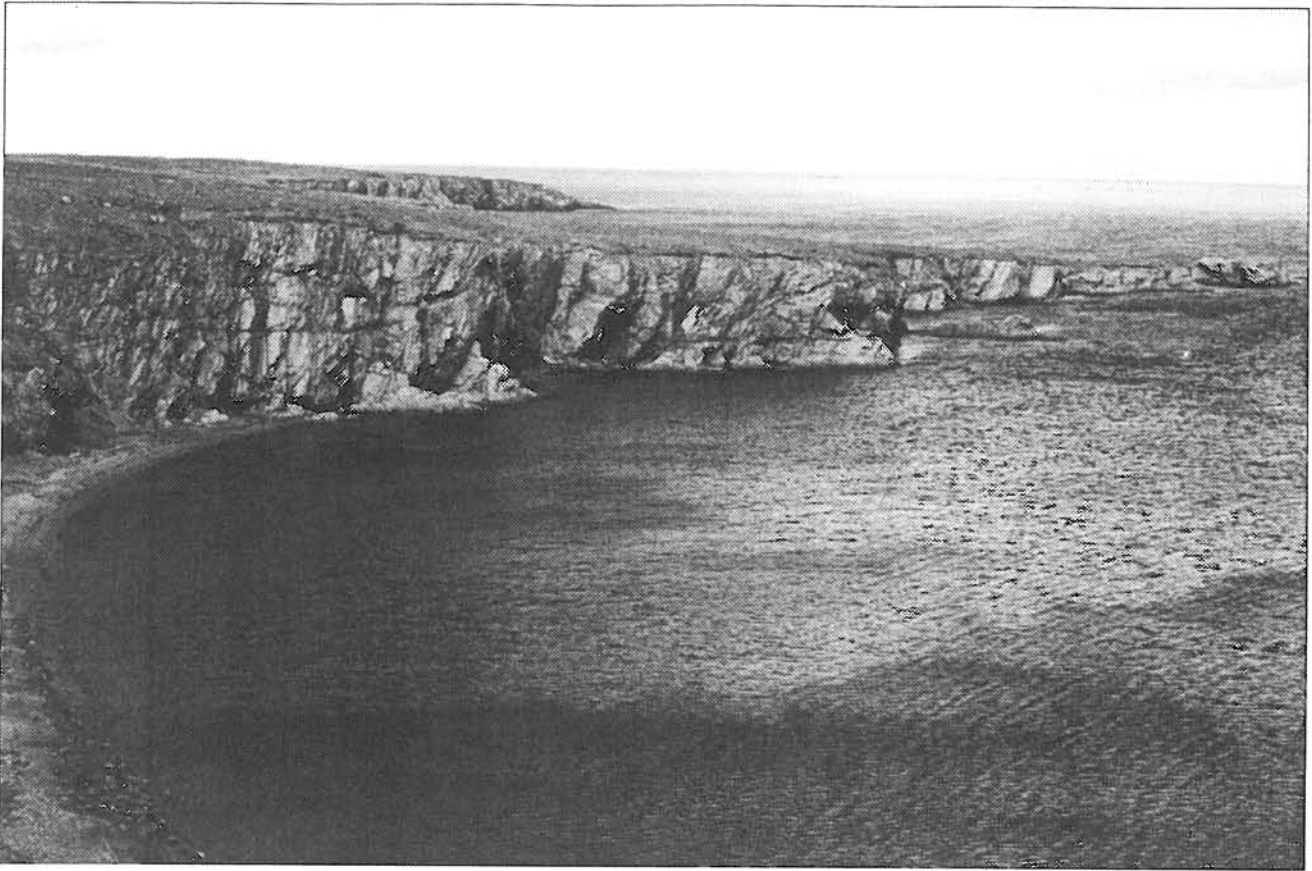




*Figure 4. Picture taken from Cape Astafieva, showing the inner parts of Gribovaya Bay. Photo: Hallvard Strøm.*



*Figure 5. The middle part of Gribovaya Bay and Shestakova Island. The picture is taken from the south. Photo: Hallvard Strøm.*



*Figure 6. The picture shows the outermost parts of the south shore of Gribovaya Bay. Photo: Hallvard Strøm.*



*Figure 7. The sea coast to the south of Gribovaya Bay, between Gribovaya Bay and Bezmyannaya Bay (the Bezmyannaya North colony). The picture is taken from south. Photo: Hallvard Strøm.*

# 3. COLONY COUNTS

## 3.1 INTRODUCTION

A comprehensive description of the Novaya Zemlya seabird colonies is given by Portenko (1931) and Uspenski (1956). Based on his own field work during the years 1941 and 1948-50, response to questionnaires and previously published data, Uspenski (1956) state that a total number of 47 seabird colonies were to be found along the western coast of Novaya Zemlya in 1950. He further assessed the minimum number of Brünnich's Guillemots, the dominant seabird species in the colonies, to be about 2,000,000 birds.

The seabird colonies at Gribovaya Bay were first described by Uspenski (1956), even though L. O. Belopolski visited the bay in 1942 and provided an estimate of the breeding population of Brünnich's Guillemots (Uspenski 1956). The colonies are situated on Golets, Shestakova and Veselovo Islands, and on the southern shore of the bay. The latter start at Cape Astafieva and end about 1.5 km south of Cape Ivanova. It has a total length of about 5.5 km. (Figure 8).

The seabird colonies at Bezymyannaya Bay were, at the beginning of this century, considered to be the largest in Novaya Zemlya (Uspenski 1956). Markham (1881), Pearson (1899) and others, assessed the colonies in Bezymyannaya Bay to be the largest in the northern hemisphere. The colonies are situated along the sea coast to the north of Bezymyannaya Bay (the Bezymyannaya North colony) and on the south shore of the bay (the Bezymyannaya South colony). Additionally there is a small colony on Kutoff Island. The Bezymyannaya North colony start 1.5 km south of Cape Ivanova and end 1.7 km south of Cape Krutoi. The total length of the Bezymyannaya North colony is about 7 km. (Figure 8).

There has been a long tradition of economic exploitation of the Novaya Zemlya seabird colonies, and those in Bezymyannaya Bay were for a long time the focal point for this industry

(Uspenski 1956). The colonies in Gribovaya Bay were to a lesser extent exploited, and only in 1942 was there a larger economic expedition there. A more comprehensive description of the historical background of the Novaya Zemlya seabird colonies is given in Strøm et al. (1994).

This year's work was carried out in the colonies on the south shore of Gribovaya Bay and on the sea coast to the north of Bezymyannaya Bay (the Bezymyannaya North colony). It was not possible to visit Golets, Shestakova and Veselovo Islands, but the colonies at Shestakova and Veselovo Islands were counted from the mainland.

## 3.2 METHODS

The work followed international standardized methods (see Bibby et al. 1992, Walsh et al. 1995). The counting unit used for Glaucous Gull *Larus hyperboreus* and Kittiwake was apparently occupied nest sites. For Guillemot, Brünnich's Guillemot and Razorbill *Alca torda* the counting unit was adult birds present on the breeding ledges. For Black Guillemot *Cepphus grylle* and Puffin *Fratercula arctica* the counting unit was adult birds present at the colony.

The entire colony was photographed from the land side with polaroid colour prints and with colour slide film. The polaroid photographs made up the basis for dividing the colony into smaller sections in order to facilitate the countings. The slides taken from the land side comprises material for control and reference, both for this year's counts and for future work. To ensure accurate geographic positioning we used a Garmin hand held GPS receiver to plot the extreme points of the colony.

The counts were undertaken from the land side, mainly from a point above the colony, but in certain cases also from below. Usually, binoculars were used, but where the distances were extremely short, the counts were carried out without bino-

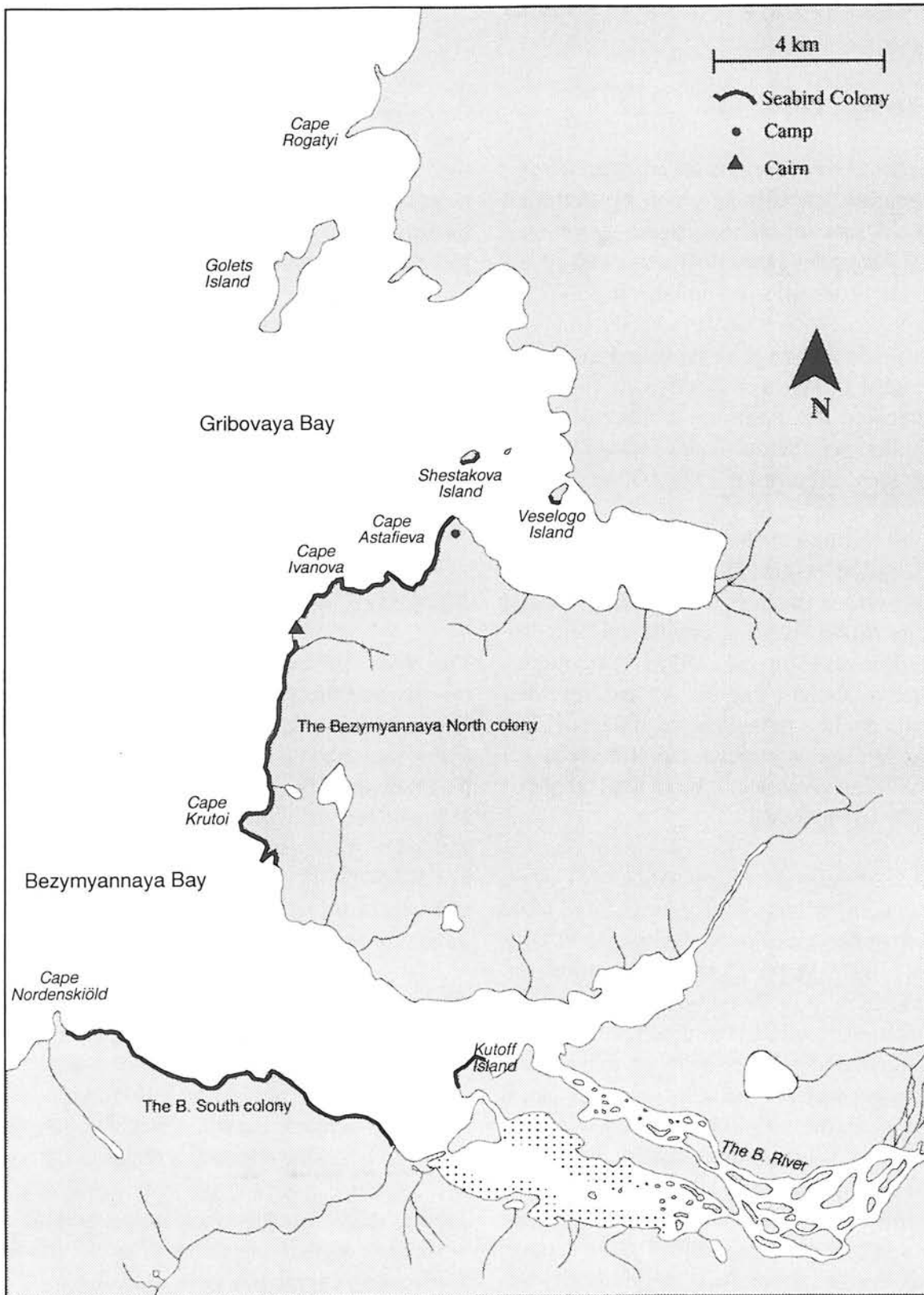
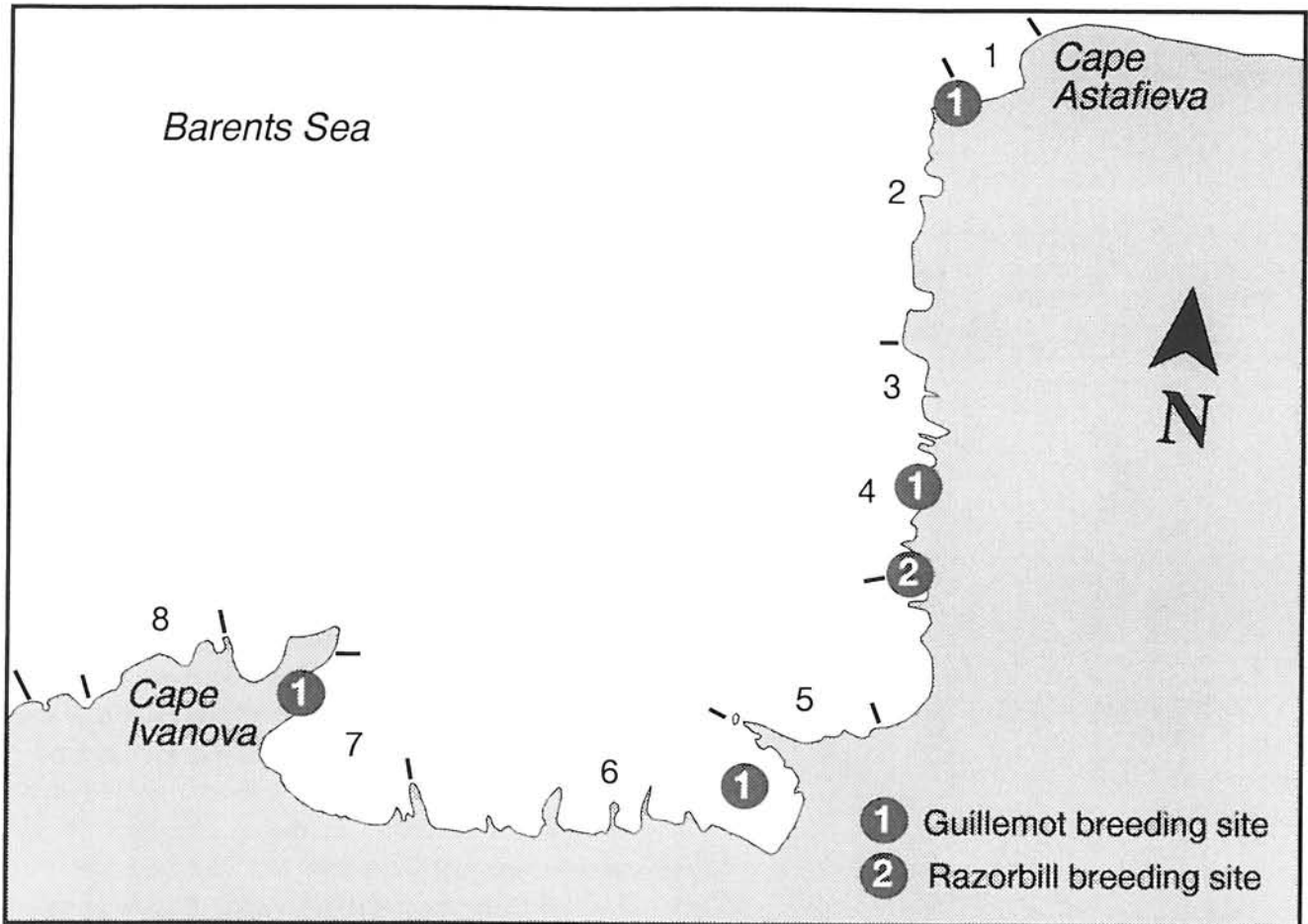


Figure 8. The seabird colonies in Gribovaya Bay and Bezymyannaya Bay. The colony on Golets Island is not indicated.



*Figure 9. The colony on the south shore of Gribovaya Bay. The map shows the main counting sections used during the field work and the breeding sites of Guillemot and Razorbill.*

culars. The colonies at Shestakova and Veselovo Islands were counted by using a telescope (15-45x) from the mainland. The counting units were registered in groups of 10 on hand tally counters, which we used in order to facilitate and ensure the accuracy of the counts. All species occurring in the colony were counted this way.

### 3.3 RESULTS

The counts in Gribovaya Bay were completed in four days during the period July 22-25, the Bezymyannaya North colony in five days during the period July 25-30. The counts were carried out in the time period from 12 a.m. to 12 p.m. (Moscow time). Three to four people participated simultaneously in the counts.

In Gribovaya Bay we divided the colony at the south shore into 8 main sections and 42 sub-sections (Figure 9). The Bezymyannaya North colony was divided into 9 main sections and 48 sub-sections (Figure 10). The colony on the south shore of Gribovaya Bay is difficult to separate from the Bezymyannaya North colony, since the seabirds breed more or less continuously all the way from Cape Astafieva to 1.5 km south of Cape Krutoi. We defined the end of the colony in Gribovaya Bay to be about 1 km south of Cape Ivanova, where a large cairn is built (Figure 11). This is the same point that Krasovski used during his work in the colonies in 1933-34 (Krasovski 1937). Only the parts seen from the mainland were counted on Shestakova and Veselovo Islands, and the colonies were not divided into sections. The number of birds from these two islands are included in the total numbers presented in Table 1.

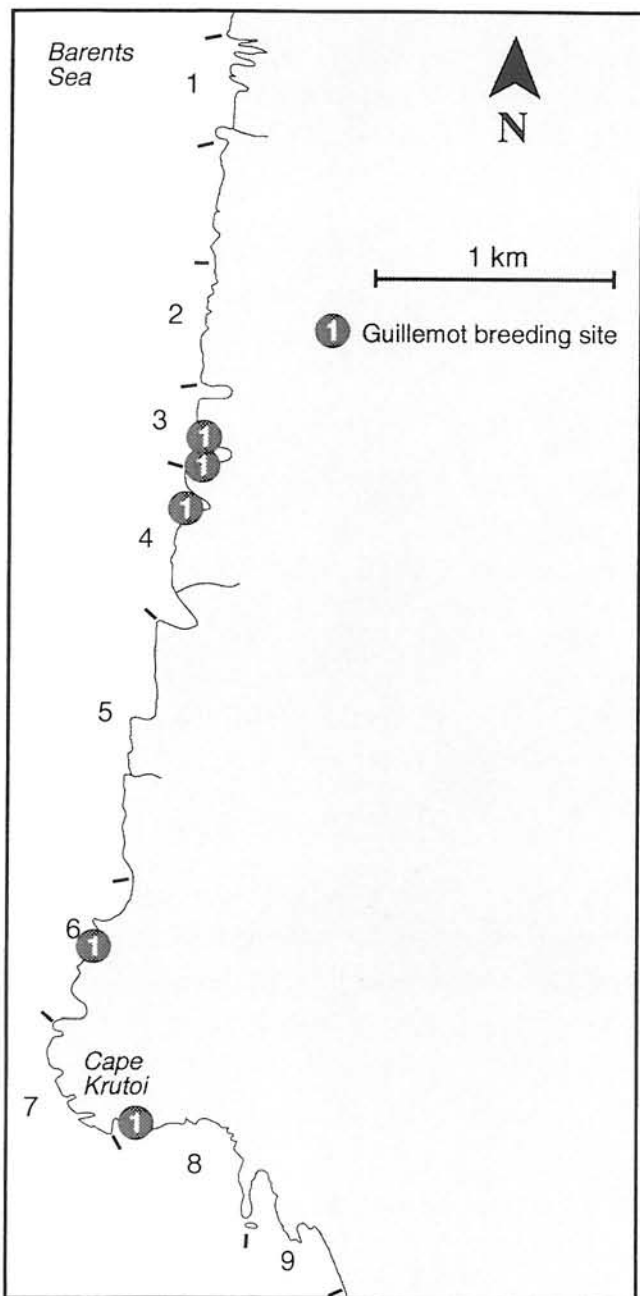


Figure 10. The Bezymyannaya North colony. The map shows the main counting sections used during the field work and the breeding sites of Guillemot.

The numbers of registered birds in the main sections are presented in Appendix 1 and 2. The total numbers from the counts of the seven registered species are presented in Table 1. The population numbers are minimum numbers. The species are presented below.

**Glaucous Gull *Larus hyperboreus*:**

Bred scattered throughout both colonies. The counts resulted in 10 occupied nests in Gribovaya Bay and 9 occupied nests in the Bezymyannaya North colony. All nest sites were situated in close association with the seabird colonies. A small colony with three nests were found on a cliff ridge in section 4 in Gribovaya Bay, and a small colony with four pairs were situated on a stack top in section 5 in the Bezymyannaya North colony. The young of the Glaucous Gulls were about 2-3 weeks of age at the onset of the field work.

**Kittiwake *Rissa tridactyla*:**

Bred in small and medium sized colonies in the steepest walls throughout both colonies. The species bred both in association with Brünnich's Guillemots and in colonies consisting almost exclusively of Kittiwakes. In Gribovaya Bay the highest densities were found in the northern part of the colony (section 4), and in the Bezymyannaya North colony in the central part of the colony (section 3, 4 and 5). The nests of the Kittiwakes were mostly situated in the lower parts of the colonies, but some of the large colonies covered the cliff wall from top to bottom. In Gribovaya Bay a total of 4,368 occupied nests were registered, and in the Bezymyannaya North colony a total of 11,886 occupied nests were counted. When we arrived, most of the nests contained newly hatched or up to one week old chicks.

**Guillemot *Uria aalge*:**

The Guillemot occurred in small numbers, and the counts gave a total of 14 birds on nesting ledges in Gribovaya Bay and 81 birds in the Bezymyannaya North colony. The former had 8 (57,0 %) birds of the bridled form, the latter had 49 (60,5%) birds of the bridled form. In Gribovaya Bay the Guillemots were found only at four sites within the colony, all on open, flat ledges (Figure 9). The situation was the same in the Bezymyannaya North colony, but here the birds were distributed through five different localities (Figure 10). All localities were dominated by Brünnich's Guillemots, but with a few Guillemots.



**Figure 11.** The first part of the Bezymyannaya North colony. The large cairn was used as the start point for the Bezymyannaya North colony. Photo: Hallvard Strøm.

**Brünnich's Guillemot *Uria lomvia*:**

The Brünnich's Guillemot was the dominant species in both colonies, and the counts gave a total of 23,517 birds on breeding ledges in Gribovaya Bay and 32,054 in the Bezymyannaya North colony. The species bred throughout the whole colony, but the density varied considerably, and sections with high and low density of birds were mixed together. In Gribovaya Bay the highest densities were found in section 1, 4 and 7. In the central parts, the occupied ledges were more scattered, which is probably associated with the suitability of the rock as nesting site. The Brünnich's Guillemot bred mainly on relatively narrow ledges, where there was space for one row of birds only. When we arrived, most chicks were about one week of age. Chicks leaving the ledges by jumping and gliding to the sea, were first registered in Gribovaya Bay during the evening of August 1. Mass jumping probably started after we had left the colony on August 2.

**Table 1.** Colony counts in Gribovaya Bay and the Bezymyannaya North colony, 1995. For Guillemot the proportion of the bridled form is given in brackets.

Species	Gribovaya Bay	The Bezymyannaya North colony
Glaucous Gull <sup>1)</sup>	10	9
Kittiwake <sup>1)</sup>	4,368	11,886
Guillemot <sup>2)</sup>	14 (8)	81 (49)
Brünnich's Guillemot <sup>2)</sup>	23,517	32,054
Razorbill <sup>2)</sup>	5	-
Black Guillemot <sup>3)</sup>	35	43
Puffin <sup>3)</sup>	88	33

1) Apparently occupied nest sites

2) Adult birds present on the breeding ledges

3) Adult birds present at the colony.



**Figure 12.** The southern parts of the Bezymyannaya North colony, showing the typical coastline. These parts of the colony had a high breeding density of Brünnich's Guillemot. Photo: Hallvard Strøm.

**Razorbill *Alca torda*:**

The Razorbill was only registered in Gribovaya Bay. Three individuals were found on a breeding ledge in section 4 on July 24 (Figure 9 and 13). They were observed on the same ledge later during the field work. Two individuals were also observed on two different breeding ledges in section 1. We were not able to confirm whether the birds were breeding or not, due to the inaccessibility of the breeding cliff.

**Black Guillemot *Cephus grylle*:**

The Black Guillemot were few in numbers, scattered throughout both colonies. The number of birds counted totalled 35 in Gribovaya Bay and 43 in the Bezymyannaya North colony. In Gribovaya Bay the highest density was found in the eastern part of the colony, in Bezymyannaya the highest density was observed in the southern half of the colony.



**Figure 13.** Razorbill in Gribovaya Bay, July 24 1995. Photo: Hallvard Strøm.



### **Puffin *Fratercula arctica***

At the south shore of Gribovaya Bay the species bred few in numbers in two different parts of the colony (section 1, 2, 5 and 6). In addition, 44 birds were counted on Shestakova Island. On the south shore of the bay the Puffin bred on rocky cliff sites or boulder screes, but on Shestakova Island it was breeding on the earthy slopes of the island. A total number of 88 birds were counted.

In the Bezymyannaya North colony the puffin bred few in numbers in the southernmost part of the colony. The highest density was found in section 9, but due to bad weather and the abruptness of the field work, we were not able to count this section as good as desired. As in Gribovaya, the species bred on rocky cliff sites or boulder screes. A total number of 33 birds were counted.

### **3.4 DISCUSSION**

In the assessment of the total numbers given in Table 1 and Appendix 1, it is important to be aware of that only the parts seen from the mainland were counted on Shestakova and Veselovo Islands. This means that the number of birds presented for these islands are too low. In addition comes the sources of error associated with the use of telescope at long distances. According to Uspenski (1956) there should also be a colony on Golets Island. This colony was not censused by us.

The colony attendance of all the seven species represented in the colonies varies during the day, and it would probably be best to census the different species at different times of day (Bibby et al. 1992). Because of the limited time available and the extreme weather conditions during the field work, it was not possible to take this into consideration, and the numbers presented in Table 1

and Appendix 1 and 2 are not adjusted to what time of day the counts were undertaken.

The counts were carried out from land, which implies that certain sections of the colony were out of sight of the observers. This problem arose merely a few times, and is not any significant source of error. As mentioned in chapter 1, the weather conditions during the stay were severe and extremely variable. However, the weather conditions probably had no significant effect on the reliability of the censuses, as the countings were stopped when the weather conditions became too harsh.

The resemblance between the Guillemot and the Brünnich's Guillemot makes it easy to overlook Guillemots breeding among large groups of Brünnich's Guillemots. The problem arises primarily when the counts are accomplished at long distances. This even though the Guillemot has a clear preference for breeding at open, flat ledges which can be thoroughly checked during the census. For these reasons our number of Guillemots may be somewhat low. The same problem also applies to Razorbill, which were found in very low numbers in Gribovaya Bay.

Regarding the Black Guillemot, counting the breeding population is difficult because the nests are situated in cracks and gullies, generally hidden from the observers. Additionally the species generally nests at low density. Thus our numbers are probably too low also for the Black Guillemot.

This year's counts were carried out thoroughly, and probably give a reliable estimate of the number of birds present when we counted the colonies. Even considered the above mentioned potential sources of error, it is unlikely that the margin of error for our censuses exceeds 10%.

## 4. MONITORING PLOTS

Seven monitoring plots were established in Gribovaya Bay and two plots were established in the Bezymyannaya North colony.

The monitoring plots are well defined areas where the number of apparently occupied nest sites (Kittiwake) and the number of birds (Guillemot, Brünnich's Guillemot and Razorbill) were counted with high accuracy several times throughout the breeding season. The purpose of these monitoring plots is to detect possible population changes by regular countings over a period of several years. This year's counts will serve as a reference for the population size in the visited colonies.

In Gribovaya Bay the plots were established in section 1, 2, 3, and 4. In the Bezymyannaya North colony plots were established in section 6 (Figure 9 and 10). All plots were photographed with both polaroid colour prints, colour slides and black and white film. The plots were accurately marked on the polaroid prints, and the counting points were marked by metal rods. The counting points were also photographed.

All nine monitoring plots contained Brünnich's Guillemots, while six plots contained Kittiwakes. Guillemots and Razorbills occurred in one plot each. The nine plots contained a mean total of 1,415 Brünnich's Guillemots, which gives an average of 157 birds per plot. The six plots where Kittiwakes were represented contained a mean total of 394 Kittiwakes. The results of the counts in the monitoring plots are given in Table 2.

The monitoring plots should be randomly distributed throughout a colony in order to be representative for the entire colony (Bibby et al. 1992, Walsh et al. 1995). However, this is often difficult to achieve. Considering future work in the colony, and the limited time available during this year's field work, the monitoring plots in Gribovaya Bay were located in the eastern parts of the colony, relatively close to the established camp. This simplified the work and made counting the plots several times during the field period possible. Only two monitoring plots were established in the Bezymyannaya North colony and they were only counted once. This was due to the abrupt termination of the field work.

**Table 2.** Counts of monitoring plots in Gribovaya Bay (Plot 1-7) and in the Bezmyannaya North colony (Plot 8-9). For Guillemot the proportion of the bridled form is given in brackets.

Mon. plot no.	Species	No. of counts	Mean	Min.	Max.
1	Kittiwake <sup>1)</sup>	4	2	2	2
	Br. Guillemot <sup>2)</sup>	4	178	159	190
2	Guillemot <sup>1)</sup>	6	5 (1)	4 (1)	6 (1)
	Br. Guillemot <sup>2)</sup>	6	107	98	122
3	Kittiwake <sup>1)</sup>	6	57	55	59
	Br. Guillemot <sup>2)</sup>	6	110	92	119
4	Br. Guillemot <sup>2)</sup>	5	158	146	170
5	Kittiwake <sup>1)</sup>	1	176	-	-
	Br. Guillemot <sup>2)</sup>	1	73	-	-
6	Kittiwake <sup>1)</sup>	1	64	-	-
	Br. Guillemot <sup>2)</sup>	1	328	-	-
7	Kittiwake <sup>1)</sup>	1	3	-	-
	Br. Guillemot <sup>2)</sup>	1	100	-	-
	Razorbill <sup>2)</sup>	1	1	-	-
8	Kittiwake <sup>1)</sup>	1	92	-	-
	Br. Guillemot <sup>2)</sup>	1	22	-	-
9	Br. Guillemot <sup>2)</sup>	1	339	-	-
<b>Total</b>	<b>Kittiwake</b>		<b>394</b>		
	<b>Guillemot</b>		<b>5 (1)</b>		
	<b>Br. Guillemot</b>		<b>1415</b>		
	<b>Razorbill</b>		<b>1</b>		

1) Apparently occupied nest sites

2) Adult birds present on the breeding ledges

## 5. RINGING

A total of 1,527 Brünnich's Guillemots (1,347 adults and 183 chicks) were ringed during the stay. The ringing of adult birds was undertaken during the period July 21-August 1. The ringing of chicks was carried out during the period July 28-August 1. In addition, 5 Glaucous Gull chicks, 2 adult Kittiwakes, and one adult Guillemot were ringed. The ringing of Brünnich's Guillemots was carried out in the upper parts of all suitable sections both in Gribovaya Bay and Bezymyannaya North. The Glaucous Gull chicks were ringed in section 4 in Gribovaya Bay.

The ringing of Brünnich's Guillemots is part of an international programme, initiated by the Circumpolar Seabird Working Group (CSWG), aimed at mapping the migratory routes and wintering grounds of this species.

The accessibility of the seabird colonies both in Gribovaya Bay and in the Bezymyannaya North colony is highly variable. Steep cliffs descending straight into the sea, where ringing is impossible, dominate. However, it is possible to ring birds on the upper ledges in some of these cliffs, and a few cliffs allow ringing on the lower ledges.

The ringing of adult Brünnich's Guillemots and Glaucous Gull chicks was accomplished through the use of a telescopic glass-fibre fishing rod, with a metal hook at the end. The metal hook was, however, unsuitable for catching the Brünnich's Guillemot chicks. We therefore used a neck snare at the end of the telescopic rod for this purpose.

## 6. COLLECTION OF FOOD ITEMS

In connection with the other work carried out in the colony, observation and sampling of food items given by adult Brünnich's Guillemots to their young was undertaken. Due to lack of time allocated to this work, only a few samples were obtained.

Eleven items were collected, and two items were identified through direct observations of feeding. In the direct observations it was only possible to identify the food items as fish. All registered food

items were fish. Represented in the sample were Polar Cod *Boreogadus saida* (n=5) and Two-horn Sculpin *Icelus bicornis* (n=3). Also represented were Capelin *Mallotus villosus* (n=1), Spotted Snake Blenny *Leptoclinus maculatus* (n=1) and Sand Lance *Ammodytes sp.* (n=1).

The material from this year's field work is too limited to make any general conclusions concerning food preferences of the Brünnich's Guillemots breeding on Novaya Zemlya.

## 7. COLLECTION OF ARCTIC PLANTS

During the field work, plants were gathered for botanogeographical and molecular genetic studies, as part of a research project run by the University of Oslo.

Current knowledge about genetic population structure in arctic plant species is scarce. The aim of this project is to reveal patterns of genetic variation within and between populations of some common arctic plant species by using the DNA-techniques RAPDs and SCARs. The main scientific purpose is to test some basic hypotheses con-

cerning plant dispersal and evolution in the Arctic, which has a unique and turbulent climatic history featuring frequent glaciations and deglaciations.

Five specimens from each of the following species were collected: *Cerastium alpinum*, *Saxifraga cernua*, *S. cespitosa*, *S. oppositifolia* and *S. hieracifolia*. In addition, one specimen of each species was collected for the Herbarium of the University of Oslo to be used as control material.

## 8. OBSERVATIONS OF BIRDS AND MAMMALS

All observations of birds and mammals during the field work are summarised below, including observations from walking tours to areas outside the colony as well as observations from the helicopter during the flight to Gribovaya Bay. The areas visited during the field work are shown in Figure 14.

The helicopter flight route on July 21 went in a nearly straight line between Belush'ya and Gribovaya Bay, yet following the coastline. The return flight on August 2 made no observations due to the cloud cover. Both flights lasted about one hour.

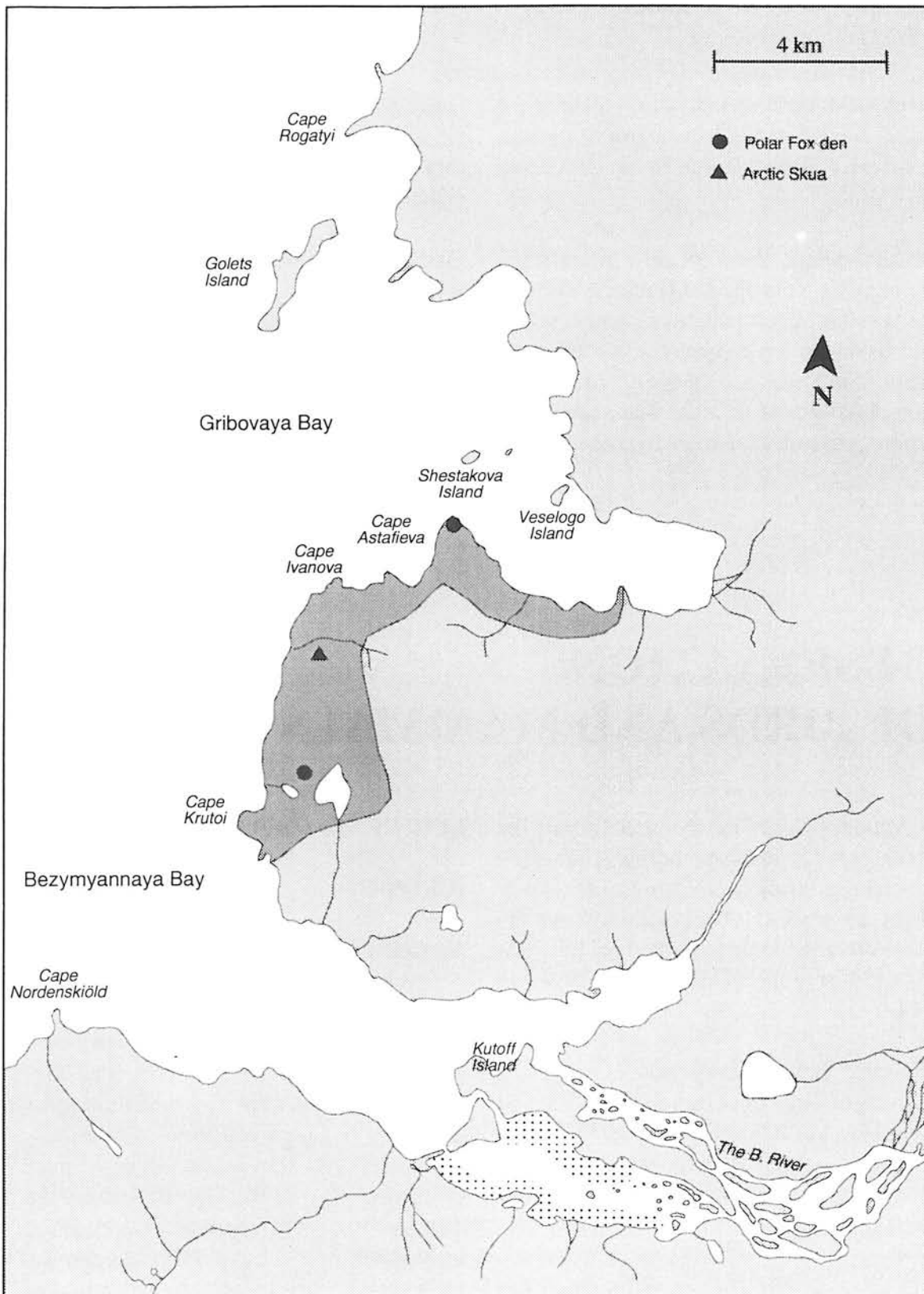
A total of 27 or 28 bird species and 4 species of mammals were observed. In addition, we found footprints and faeces from Polar Bear *Ursus maritimus* and faeces indicating Ptarmigan or Willow Grouse *Lagopus sp.*

### LIST OF SPECIES WITH COMMENTS:

#### BIRDS:

##### **Bewick's Swan** *Cygnus columbianus*

About eight pairs were observed from the helicopter during the transport from Belush'ya to Gribovaya Bay 21.07. One pair was observed at the big lake in Bezymyannaya Bay 25.07 and 29.07. Two birds were observed flying eastwards along the northern coastline of Gribovaya Bay 27.07, and two flew in an easterly direction in Gribovaya Bay 28.07. One Bewick's Swan was observed in a small tundra lake close to the colony in Bezymyannaya Bay 30.07, and one was seen flying southwards in Gribovaya Bay 01.08. Three birds were observed in a small lake near the settlements at Belush'ya 05.08. The swans spotted from the helicopter could not be identified as Bewick's Swans, but considering the known



*Figure 14. Gribovaya Bay and Bezymyannaya Bay. The areas visited during the field work are shown in dark grey.*

distribution of this species and that of the Whooper Swan, we conclude that the swans observed during the flight were Bewick's Swans.

**Bean Goose** *Anser fabalis*

**White-fronted Goose** *Anser albifrons*

Three groups of «grey geese», containing six adults and two young, nine adults and eight young and four adults, were observed from the helicopter during the transportation between Belush'ya and Gribovaya Bay 21.07. The birds most likely belong to one or both of these species.

**Barnacle Goose** *Branta leucopsis*

Some few birds were observed from the helicopter during the transport from Belush'ya to Gribovaya Bay 21.07. Six + two birds were observed in Gribovaya Bay 21.07 and eight + four birds were observed in Gribovaya Bay 22.07. Four were observed in Gribovaya Bay 24.07, and three close to the camp at the same date. About 163 birds were registered in the big lake in Bezmyannaya Bay 25.07. Four birds were seen at Shestakova Island in Gribovaya Bay 26.07. Four adults + three young in Bezmyannaya Bay 27.07. About 170 adults + six-eight young in the big lake in Bezmyannaya Bay 29.07. A few birds were giving call in Gribovaya Bay 31.07.

**Common Eider** *Somateria mollissima*

One female with nine young were observed close to the camp 21.07. Fifteen males (eclipse) and two-three females with young (2-3 days old) in Gribovaya Bay 23.07 (in a group of King Eiders). One female with two young and four females with four young in Gribovaya Bay 24.07. Three females with brood (seven, five and one young) in Gribovaya Bay 25.07, and two females with brood (three and two young) close to the camp 26.07. Four females with six young near the camp in Gribovaya Bay 27.07. Four males in Bezmyannaya Bay 27.07. One female with two-three young in Gribovaya Bay 28.07. Between twenty and thirty birds in Bezmyannaya Bay 29.07. One female with three young close to the camp in Gribovaya Bay 29.07. Two birds observed in Bezmyannaya Bay 30.07 and two females + four young, one female + three young, one female + one young and two females + four young close to the camp 01.08.

**King Eider** *Somateria spectabilis*

About 30 males flying southwards in Gribovaya Bay 21.07. A flock containing 50-70 birds, mostly males, in Gribovaya Bay 22.07. About 60 males and 10 females 23.07 in Gribovaya Bay. A group of 20-30 birds in Gribovaya Bay 24.07. A flock of 240 in Bezmyannaya Bay 27.07, a flock of 160 birds 29.07 and eight birds 30.07 at the same place.

**Long-tailed Duck** *Clangula hyemalis*

Two males were observed in the southern parts of Gribovaya Bay 24.07. Twenty-five birds were observed in Bezmyannaya Bay 27.07, 35 ind. 29.07 and 30 ind. 30.07.

**Goosander** *Mergus merganser*

One male was observed in Gribovaya Bay 21.07 and one female in Bezmyannaya Bay, together with King Eiders, 29.07.

**Rough-legged Buzzard** *Buteo lagopus*

One ind. was observed 22.07 and 23.07 in Gribovaya Bay.

**Ptarmigan/Willow Grouse** *Lagopus sp.*

Faeces were found on several occasions during the field work, indicating one of the two species Ptarmigan *Lagopus mutus* or Willow Grouse *Lagopus lagopus*.

**Ringed Plover** *Charadrius hiaticula*

Along with Purple Sandpiper the most common wader species. Ringed Plovers were observed scattered, but regularly in all visited areas during the field period. One bird + young in Gribovaya Bay 24.07. Between ten and fifteen birds in Gribovaya Bay 25.07.

**Sanderling** *Calidris alba*

Only two observations: one seen in Gribovaya Bay 23.07 and one close to the camp 27.07.

**Purple Sandpiper** *Calidris maritima*

Along with Ringed Plover the most common wader species. The Purple Sandpiper were observed scattered, but regularly in all visited areas during the field work. A group of eight birds + two-three single birds in Gribovaya Bay 23.07. A group of 12-15 birds in Gribovaya Bay, and a

group of 10 birds in Gribovaya Bay 24.07. A group of 12 birds close to the camp, in addition to some single birds, 25.07. Between fifteen and twenty birds scattered in Bezymyannaya Bay 26.07. One adult with four young (capable of flight) close to the camp 30.07.

#### **Pomarine Skua** *Stercorarius pomarinus*

Some few Pomarine Skuas were observed from the helicopter during the transport from Belush'ya to Gribovaya Bay 21.07. Several observed in Gribovaya Bay 21.07, and two-three birds observed 22.07. Two in Gribovaya Bay 25.07 and 27.07.

#### **Long-tailed Skua** *Stercorarius longicaudus*

One observed at the airport near Belush'ya 21.07. Two were seen from the helicopter during the transport from Belush'ya to Gribovaya Bay 21.07. One near the camp at 21.07 and 22.07. One + six + ten birds observed flying southwards, close to the camp, 24.07. Thirteen birds flying southwards in Gribovaya Bay 25.07. One in Gribovaya Bay 27.07 and 28.07.

#### **Great Skua** *Stercorarius skua*

Single individuals and small groups of Great Skuas were observed regularly during the field work, and one pair gave alarm call in Gribovaya Bay 21.07, 22.07 and 23.07. One ind. was observed in Gribovaya Bay 24.07, 25.07, 26.07, 27.07, 30.07 and 31.07. One pair was observed close to the camp 24.07. One bird was observed in Bezymyannaya Bay 27.07 and 29.07. Three birds were observed close to the camp 29.07. One close to the camp and one pair in Bezymyannaya Bay 30.07. One near the camp 31.07 and three birds in Gribovaya Bay 01.08. Great Skuas behaved aggressively and were probably breeding when G. V. Khakhin and S. M. Uspenski visited Gribovaya Bay in 1992.

#### **Arctic Skua** *Stercorarius parasiticus*

One pair showing breeding behaviour in Bezymyannaya Bay 25.07, 26.07, 27.07 and 29.07 (both sexes were of the pale phase).

#### **Glaucous Gull** *Larus hyperboreus*:

See colony counts (Chapter 3)

#### **Great Black-backed Gull** *Larus marinus*

One adult observed in Gribovaya Bay 21.07, 23.07 and 24.07.

#### **Kittiwake** *Rissa tridactyla*:

See colony counts (Chapter 3)

#### **Guillemot** *Uria aalge*:

See colony counts (Chapter 3)

#### **Brünnich's Guillemot** *Uria lomvia*:

See colony counts (Chapter 3). A partly albino bird was caught during the ringing in Gribovaya Bay (Figure 15).

#### **Razorbill** *Alca torda*:

See colony counts (Chapter 3)

#### **Black Guillemot** *Cepphus grylle*:

See colony counts (Chapter 3)

#### **Little Auk** *Alle alle*

About 30 observed on the sea in Gribovaya Bay 21.07 and 10 on the sea in Gribovaya Bay 22.07. Seven ind. were seen in Gribovaya Bay 27.07.



**Figure 15.** Partly albino Brünnich's Guillemot caught during ringing. Photo: Valery N. Selin.



**Puffin** *Fratercula arctica*

See colony counts (Chapter 3)

**Snowy Owl** *Nyctea scandiaca*

Six observed from the helicopter during the transport from Belush'ya to Gribovaya Bay 21.07. Due to the high speed of the helicopter we were not able to confirm whether the birds were breeding or not. One ind. observed in Bezemyannaya Bay 23.07 and one old male was observed both in Gribovaya Bay and Bezemyannaya Bay 27.07. One male was observed in Gribovaya Bay 02.08, and one male in the settlements of Belush'ya 04.08.

**Shore Lark** *Eremophila alpestris*

Relatively common in all the visited areas. One bird was observed in Gribovaya Bay 24.07 and 27.07, and three in Gribovaya Bay 25.07. Five observed in Bezemyannaya Bay 26.07 and two-three at the same place 27.07. One in Gribovaya Bay 28.07 and four at the same place 02.08. Two in Bezemyannaya Bay 29.07 and two pairs in Bezemyannaya Bay 30.07.

**Snow Bunting** *Plectrophenax nivalis*

Common in all the visited areas.

**MAMMALS:**

**Reindeer** *Rangifer tarandus*

Two observed in Gribovaya Bay 22.07 and three bucks at the same place 26.07. Nine bucks were observed in Gribovaya Bay 29.07.

**Arctic Fox** *Alopex lagopus*

Two dens were found during the field work. One close to the camp in Gribovaya Bay, containing five pups, and one in Bezemyannaya Bay. Prey remnants showed that the Arctic Fox were preying upon Brünnich's Guillemots and Barnacle Geese.

**Polar Bear** *Ursus maritimus*

Faeces were found on several occasions, probably from the winter 1994/95.

**Arctic Lemming** *Dicrostonyx torquatus*

One caught in a trap 01.08 at the camp in Gribovaya Bay.

**Siberian Lemming** *Lemmus sibiricus*

One caught in a trap 27.07 at the camp in Gribovaya Bay.

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## 10. APPENDICES.

*Appendix 1. Colony counts in Gribovaya Bay 1995. For Guillemot, the proportion of the bridled form is given in brackets.*

Section	Glaucous Gull <sup>1)</sup>	Kittiwake <sup>1)</sup>	Guillemot <sup>2)</sup>	Brünnich's Guillemot <sup>2)</sup>	Razorbill <sup>2)</sup>	Black Guillemot <sup>3)</sup>	Puffin <sup>3)</sup>
1 (A-E)	1	354	6(2)	5,748	2	2	2
2 (A-D)		124		1,458		2	2
3 (A-D)		370		1,913		3	
4 (A-I)	5	1,549	3(3)	4,385	3	5	
5 (A-D)	1	76		363			10
6 (A-G)	1	461	1	2,016		2	30
7 (A-F)		195	4(3)	2,303		17	
8 (A-C)		41		966		4	
Shestakova Island	1	45		1,835			44
Veselovo Island	1	1,153		2,530			
<b>Total</b>	<b>10</b>	<b>4,368</b>	<b>14 (8)</b>	<b>23,517</b>	<b>5</b>	<b>35</b>	<b>88</b>

1) Apparently occupied nest sites

2) Adult birds present on the breeding ledges

3) Adult birds present at the colony.

*Appendix 2. Colony counts in the Bezmyannaya North colony 1995. For Guillemot, the proportion of the bridled form is given in brackets.*

Section	Glaucous Gull <sup>1)</sup>	Kittiwake <sup>1)</sup>	Guillemot <sup>2)</sup>	Brünnich's Guillemot <sup>2)</sup>	Black Guillemot <sup>3)</sup>	Puffin <sup>3)</sup>
1 (A-E)		1,382		1,849	2	
2 (A-D)		103		750	1	
3 (A-E)	1	1,895	26 (20)	4,015		
4 (A-G)		2,949	13 (7)	6,831		
5 (A-F)	5	2,351		4,825	10	
6 (A-F)	2	1,136	22 (15)	7,506	4	
7 (A-E)		795		2,921	7	1
8 (A-F)		1,250	20 (7)	2,936	15	1
9 (A-D)	1	25		421	4	31
<b>Total</b>	<b>9</b>	<b>11,886</b>	<b>81 (49)</b>	<b>32,054</b>	<b>43</b>	<b>33</b>

1) Apparently occupied nest sites

2) Adult birds present on the breeding ledges

3) Adult birds present at the colony.

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