



SEABIRD COLONY DATABASES

OF THE BARENTS SEA REGION AND THE KARA SEA

2nd edition

Vidar Bakken, editor



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The Norwegian Polar Institute is Norway's main institution for research and topographic mapping in Norwegian polar regions. The Institute also advises the Norwegian authorities on matters concerning polar environmental management.

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Preface

First edition:

To build up a complete seabird colony database is a long process. Firstly, the historical data should be available and checked, and secondly, all the data must be registered in the database and proofread. To get easy access to the data it is also necessary to prepare a menu driven front-end programme.

Registrations of seabird colonies in the Barents Sea Region have been conducted since the end of the 19th century. Up to date, a lot of data have been collected, and it was a need for a system that could systemise and make the data more easily available for research and management purposes.

This report presents the colony databases that are built up for the Barents Sea Region and the Kara Sea. The Barents Sea Region consists of the Norwegian Sea (north of the Arctic Circle), the Barents Sea and the White Sea. Except from the database covering the Norwegian coast, the editor has supervised and co-ordinated the work to build up the databases for Svalbard, the Russian part of the Barents Sea, the White Sea and the Kara Sea. The editor has also made all the maps in this report.

A lot of persons have taken part in this project. I am grateful to Bente Brekke, Kenneth Eggen, Kjell Isaksen and Hallvard Strøm for registering the historical data of the Svalbard area into the database. Thanks also to all those people who have been out in the field collecting the data. I am grateful to all my Russian colleagues and their institutions for their enthusiasm and hard work to complete this project. Thanks to V.V. Bianki, N.S. Boiko, V.D. Kokhanov, A.E. Panarin, E.V. Shutova and F.N. Sklyarevich for permission to use their data from the White Sea. Thanks also to I.P. Tatarinkova, R.G. Chemyakin and T.D. Paneva for permission to use their data from the Murman coast in the Barents Sea. I am grateful to Rob Barrett for comments to the report.

The Directorate for Nature Management and the Norwegian Polar Institute financed this project. Special thanks to Morten Ekker for showing a lot of patience in waiting for the colony databases and especially this report to be completed.

Second edition:

In the second edition some minor corrections have been made in the text and most of the maps have been updated. Thanks to Kjell Isaksen for proofreading the manuscript. The printing of the second edition was financed by the Norwegian Polar Institute and the Norwegian - Russian Commission for Environmental Cooperation.

Vidar Bakken

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Introduction

A seabird colony database is an important tool for research and management purposes. Computerised data is in general easy accessible, and for example in the case of an marine oil spill during the breeding period, it is in short time possible to identify areas with high concentrations or vulnerable species of breeding seabirds. However, seabird colony data have a larger employment than just showing concentrations of seabirds. The management and research may use the data e.g. to compare areas in relation to biodiversity and densities of seabirds, to identify important areas for rare and vulnerable species, to estimate total populations of seabirds in an area and to analyse population trends and historical data. From the database it is easy to produce source data as basis for any type of maps and tables showing population numbers, trends and colony distribution. The management may use colony data as a source for evaluation of new protected areas or revisions of existing. In the future we will for sure also face new and challenging employment of seabird colony data.

A presupposition for using the colony database as a “first choice” for research and management purposes is that the database always should contain the best available data. A term to be used is a “dynamic colony database”, which actually means that the database always should be updated as soon as new or better data are available.

Mehlum & Fjeld (1987) published the first seabird colony catalogue, covering the Svalbard area. The data was stored in a word processor, but it was desirable to transfer the data into a database. In 1989 a new database (dBase format) was established, and later a front-end programme was developed by the editor in the programming language “Clipper” (Computer Associates) named “COLONY”. After completing the material from Svalbard the database was, in co-operation with Russian research institutions, extended to also include the Russian areas of the Barents Sea Region, including the White Sea. Russian scientists registered all the data from the Russian areas. The present version was completed in 1997, and a total of 1547 colonies are registered. In addition, more than 3000 colony counts and more than 9000 single counts of species are included. In 1997, a similar database was established for the Kara Sea by the Arctic and Antarctic Research Institute (AARI) in St. Petersburg in co-operation with the Norwegian Polar Institute. This database contains 179 colonies, 211 total counts and 321 single counts of species. The seabird species registered in the Barents, White and Kara Seas are listed in Table 1. The institutions that have contributed in the work with the databases are listed in Table 2. In a special version of the database, the seabird colonies along the Norwegian coast north of the Arctic Circle are also included. This material was imported from an independent colony database organised and managed by the Norwegian Institute for Nature Research (NINA) covering the entire Norwegian coast. The location of the colonies and the number of birds

in the colonies along the Norwegian coast, north of the Arctic Circle, to the Russian border are shown in Appendix 1.

The “COLONY” programme is designed for the accumulation and processing of data on seabird colonies. The database consists of five different tables: Colony description, Total counts, Counts in study plots, Photo documentation and References. A total of 25 colony breeding species are registered in the database (Tab. 1).

The geographic scope of the Barents Sea Region database comprises Svalbard, Franz Josef Land, the western coast of Novaya Zemlya, the Nenetski district, the White Sea and the Murman coast (Fig. 1). The Kara Sea database covers the eastern coasts of Novaya Zemlya, the Kara Sea Islands, the Severnaya Zemlya archipelago and the mainland coast from the eastern Yugor Peninsula to the northeastern part of Taimyr as far as 50 km inshore (Fig. 2). The databases allow easy storage and overview of information about the location of seabird colonies, breeding species and the number of breeding pairs in various years. With minor programme changes, “COLONY” may also be adapted to other areas and seabird species.

The colony database for the Barents Sea Region has been used for oil/seabirds impact assessments in the Barents Sea (Isaksen *et al.* 1998), identification of vulnerable areas in relation to oil spills (Moe *et al.* 1999) and for evaluation of the protected areas in Svalbard (Theisen & Brude 1998). In addition, aggregated data from the database are used as basis for figures and maps presented in different magazines and books (e.g. Bernes 1996, Anon 1998). It is also planned to distribute a special version to the local management agencies in Norway and Russia, and to prepare an Arctic colony database for guillemots (*Uria* sp.).

English names of the species are given according to ‘The Bird List 2000’ prepared by the British Ornithologists’ Union Records Committee (BOU 2000). Contrary to most Russian literature (e.g. Yudin & Firsova 1988), we have treated the gull taxon *heuglini* as a sub-species of the lesser black-backed gull *Larus fuscus* and not as a sub-species of herring gull *L. argentatus*. In the colony database of the Kara Sea the lesser black-backed gull *Larus fuscus heuglini* is registered as herring gull, but reported as lesser black-backed gull in this report.

This report presents a summary of selected information stored in the tables for Colony descriptions and Total counts. For each sea area there is a short description of the physical and biological properties and a summary of the number of breeding seabirds as registered in the database. The estimated proportion of the number of colonies and number of breeding individuals registered in the database in relation to the expected total number in the regions is indicated.

In the database, the number of birds in the colonies is registered as “Pairs” or “Individuals”. In addition, a cate-

Table 1. English names, scientific names and abbreviations of the breeding seabird species registered in the databases for the Barents Sea Region and the Kara Sea. The species registered as breeding in the different seas are marked ('+' = breeding and registered, '-' = not breeding).

English name	Scientific name	Abbr.	Barents Sea	White Sea	Kara Sea
Northern fulmar	<i>Fulmarus glacialis</i>	FUGLA	+	-	-
Northern gannet	<i>Morus bassanus</i>	MOBAS	+	-	-
Great cormorant	<i>Phalacrocorax carbo</i>	PHCAR	+	+	-
European shag	<i>Phalacrocorax aristotelis</i>	PHARI	+	-	-
Pink-footed goose	<i>Anser brachyrhynchus</i>	ANBRA	+	-	-
Greylag goose	<i>Anser anser</i>	ANANS	+	-	-
Barnacle goose	<i>Branta leucopsis</i>	BRLEU	+	-	+**
Brent goose	<i>Branta bernicla</i>	BRBER	+	-	+
Red-breasted goose	<i>Branta ruficollis</i>	BRRUF	-	-	+
Common eider	<i>Somateria mollissima</i>	SOMOL	+	+	+
King eider	<i>Somateria spectabilis</i>	SOSPE	+	-	+
Long-tailed duck	<i>Clangula hyemalis</i>	CLHYE	+	+	+
Sabine's gull	<i>Larus sabini</i>	LASAB	+	-	+
Mew gull	<i>Larus canus</i>	LACAN	+	+	-
Lesser black-backed gull	<i>Larus fuscus</i>	LAFUS	+	+	+
Herring gull	<i>Larus argentatus</i>	LAARG	+	+	-
Glaucous gull	<i>Larus hyperboreus</i>	LAHYP	+	-	+
Great black-backed gull	<i>Larus marinus</i>	LAMAR	+	+	-
Black-legged kittiwake	<i>Rissa tridactyla</i>	RITRI	+	-	+
Ivory gull	<i>Pagophila eburnea</i>	PAEBU	+	-	+
Arctic tern	<i>Sterna paradisaea</i>	STPAR	+	+	+
Common guillemot	<i>Uria aalge</i>	URAAL	+	-	-
Brünnich's guillemot	<i>Uria lomvia</i>	URLOM	+	-	+
Razorbill	<i>Alca torda</i>	ALTOR	+	+	-
Black guillemot	<i>Cepphus grylle</i>	CEGRY	+	+	+
Little auk	<i>Alle alle</i>	ALALL	+	-	+
Atlantic puffin	<i>Fratercula arctica</i>	FRARC	+	+	-

*) Species is breeding, but not registered in the colony database.

**) The barnacle goose is breeding in the southwestern part of the Kara Sea. These colonies are registered in the Barents Sea database.

gory named "Unknown" is used for old counts where the unit is unknown. All population estimates in this report, except from Table 10, are given as *breeding individuals*. In this estimate the number of pairs given in the database is multiplied with two and the numbers given as "Individuals" or "Unknown" are added unchanged to the estimates for the total populations. Maps showing the breeding distribution of each species in the Barents Sea Region can be found in Anker-Nilssen *et al.* (2000). Maps showing the species distribution for the Kara Sea are presented in Appendix 2. In addition, a summary table of all colonies with geographical location and breeding species is pre-

sented for each sea area. The size of the breeding populations for each species is also indicated in predefined intervals.

This report is divided into separate chapters for the Barents, White and the Kara Seas, respectively. In each of these chapters a general descriptions of physical and biological conditions, population numbers and a list of all the colonies with the location and the number of breeding individuals for each species is presented. The reference list includes all references cited in the text as well as references used as basis for the data in the databases.

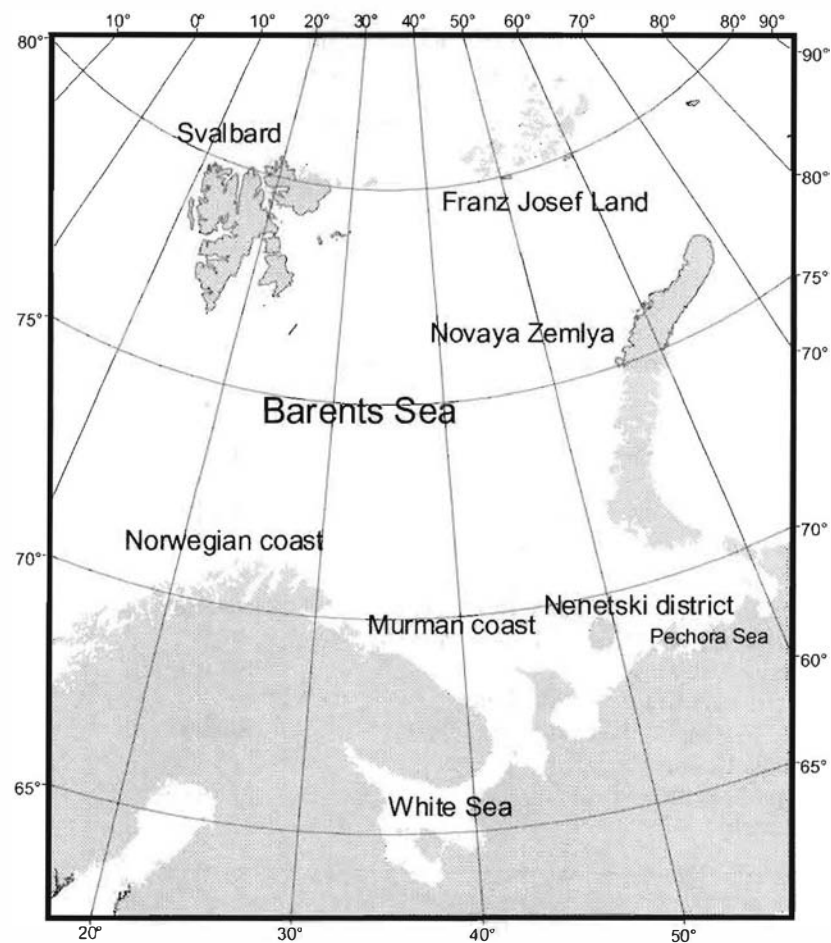


Figure 1. Map of the Barents Sea Region.

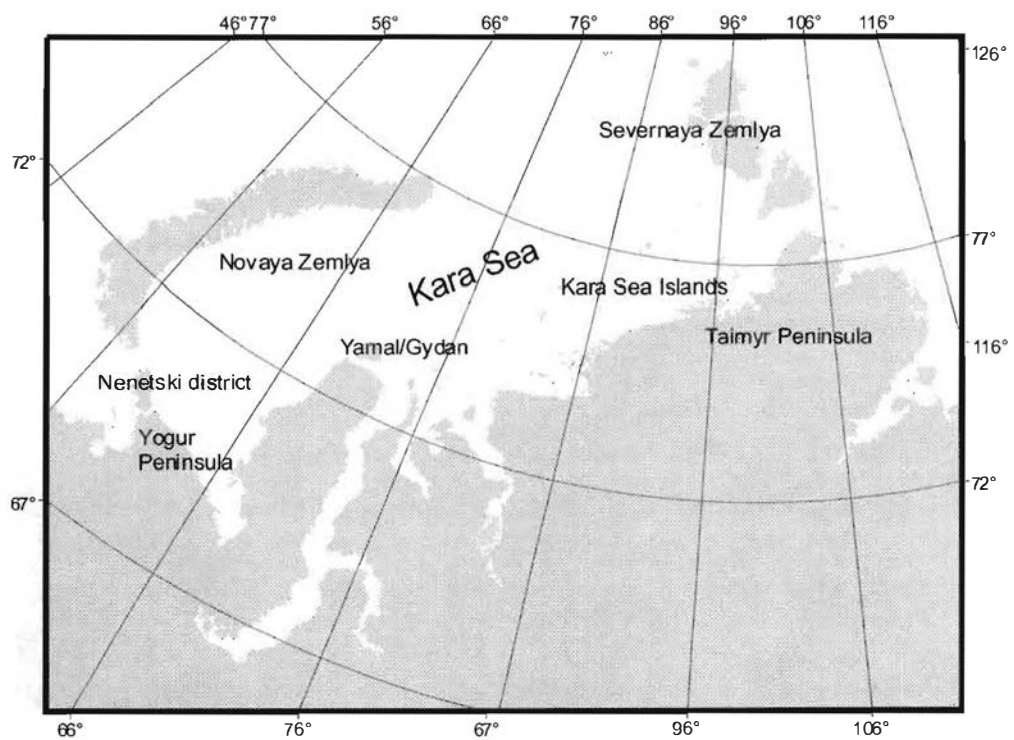


Figure 2. Map of the Kara Sea.

Table 2. Institutions and scientists who have contributed with data to the colony databases for the Barents Sea Region and the Kara Sea ('+' = contribution, '-' = no contribution).

Institutions/scientists	Country	Barents Sea	White Sea	Kara Sea
Arctic and Antarctic Research Institute/ Maria V. Gavrilov	Russia	+	-	+
All-Russian Research Institute of Nature Protection and Reserves/ Irina V. Pokrovskaya and Vladimir Yu. Semashko	Russia	+	+	-
Institute of Geography RAS/ Grigori M. Tertitski	Russia	+	-	-
Kandalaksha State Nature Reserve/ Natalia G. Nikolaeva, Alexander S. Koryakin and Juri V. Krasnov.	Russia	+	+	-
Norwegian Institute for Nature Research/ Svein-Håkon Lorentsen and Tycho Anker-Nilssen	Norway	+	-	-
Norwegian Polar Institute/ Vidar Bakken and Fridtjof Mehlum	Norway	+	-	-
Reserve Museum of Solovki/ Alexander E. Cherenkov	Russia	-	+	-
Tromsø Museum/ Rob Barrett	Norway	+	-	-

The Barents Sea

By Grigori M. Tertitski, Vidar Bakken, Maria V. Gavrilov, Yuri V. Krasnov, Natalia G. Nikolaeva and Irina V. Pokrovskaya

Physical and biological conditions

The information presented also includes the Pechora Sea and is mainly from the Arctic Pilot (1988), Terziev *et al.* (1990), Loeng (1991), Sakshaug *et al.* (1992), Barr (1995) and Potanin (1996).

The Barents Sea (Fig. 1) is a relatively shallow continental sea with an average depth of 230 m and the size is 1 400 000 km². The maximum depth of 500 m is found in the western part of the channel Bjørnøynna. Depths of less than 50 m are found on Spitsbergenbanken and in the southeastern part of the sea. The Barents Sea consists of three main water masses: coastal water, Atlantic water and Arctic water, and each is linked to one of the main current systems. The coastal water is found close to the southern coasts, Atlantic water in the west and central parts, and Arctic water in the north and eastern parts of the Barents Sea.

In general, the currents in the southern part of the Barents Sea are directed north and eastward, while the currents in the northern part are directed westward or south-westward. The Norwegian Atlantic Current flows into the Barents Sea along Bjørnøynna and is called the Nordkapp Current. In the Barents Sea, it divides into two main branches. One goes eastwards parallel to the Coastal Current and changes name to the Murman Current in the Russian part. The other main current turns north along the Hopen Trench and divides into smaller branches. The Norwegian Atlantic Current also continues northwards along the western coast of Spitsbergen until it meets the cold Arctic water.

The transition zone between the Atlantic and the Arctic water masses is called the polar front. The mean position of the front follows mainly the bathymetry in the western part of the sea. From west it goes from Svalbardbanken and south of Bjørnøya, then more northwards towards Storbanken and finally heading southeast and around Sentralbanken. In the western part of the Barents Sea, the polar front is clearly defined and the position is relatively stable. In contrast, the polar front in the eastern part of the Barents Sea creates a broader transition zone between the warm and cold water masses, and the position also changes a lot during the year. The cold Litke current transport waters from the Kara Sea through the Kara Gate Strait. There are also two katabatic offshore currents transporting water from the White Sea and the Pechora River.

The Pechora Sea is situated in the southeastern corner of the Barents Sea (Fig. 1). It differs from the rest of the Barents Sea by a more continental climate and lower salin-

ity due to a strong continental outflow. In general, the hydrology and the bathymetry do not support high biological production. Shallow areas prevent penetration of nutrient rich water of Atlantic origin. The transition zone between warm water from the Barents Sea and cold water of the Litke current in the northern part of the Pechora Sea, is the only stable zone with enhanced pelagic biological productivity. This zone has the highest abundance of seabirds found in the Pechora Sea (Gavrilov *et al.* 1998).

An important oceanographic feature in the Barents Sea is the sea ice that has a major impact on the seabird distribution. Most of the ice is less than one year old and formed locally. There is some multi-year ice that originates from the Arctic Basin or has stayed over the summer in the Barents Sea. The extent of the sea ice varies a lot during the year and between years. The maximum ice extent is in March-May and minimum in September or first part of October. As for the polar front, the largest variation in the ice distribution is in the eastern part of the Barents Sea. The position of the maximum ice extent follows mainly the polar front in the spring period. In the ice-covered areas, there are always some open temporary leads that can be used by the seabirds. In some areas as off the fast ice in the Pechora Sea, off Zhelani Cape (northern part of Novaya Zemlya), around Franz Josef Land and in the Novaya Zemlya straits, there are several recurring polynyas.

The southern coasts of the Barents Sea consist mostly of deep fjords, mostly rocky shores and islands. One exception is the eastern coast from the White Sea to the Kara Gate, which is low and without rocky shores. Kolguev Island, as well as the mainland shores in this eastern area, have either sandy or abrasion shores formed by soft rocks. Both habitats are unsuitable for cliff-breeding birds. In contrast, the western coast of Vaigach Island and the coasts of the Kara Strait and the Yugor Shar straits, consist of rocky shores, but these rocks are not high enough to provide good breeding sites for cliff-breeding seabirds.

Novaya Zemlya is made up of two major islands, the Northern and the Southern Island, and the total length is about 1000 km. The western coast of Novaya Zemlya, which is the eastern border of the Barents Sea, consists of many bays and rocky shores suitable for cliff-breeding seabirds. Franz Josef Land, located in the northeastern corner of the Barents Sea, is an archipelago of 191 islands. The total area of the islands is 16 135 km² and the length of the coastline is 4425 km. The coastline consists mainly of rocky shores and glaciers.

Svalbard, situated in the northwestern corner of the Barents Sea, consists of many islands and the total area is 62 679 km². As for Franz Josef Land, the coastline consists mainly of rocky shores and glaciers. In most parts of Svalbard, as in many other areas in the Barents Sea, cliff-breeding seabirds can find suitable breeding habitats.

The high density of seabirds in the Barents Sea is mainly due to the relative high biological production in the area. The highest biological production occurs in the spring period when the amount of light increases and the melting of the ice starts. For more detailed information, see Sakshaug *et al.* (1992). There are many registrations of high densities of seabirds along the marginal ice edge in spring, but there is also a great variance in the seabird density along the ice edge (Hunt *et al.* 1996, Krasnov & Nikolaeva 1996). The mechanisms regulating the number of seabirds along the ice edge are unknown.

Foraging areas for seabirds are often closely related to oceanographic or bathymetric features. In the Barents Sea, the polar front is of great importance as a foraging habitat for guillemots (Mehlum *et al.* 1998) and also other seabirds. In the northern part of the Barents Sea, glacier faces and river outlets from glaciers are also important foraging areas for seabirds (Hartley & Fisher 1936, Mehlum 1984). The main reason is probably concentrations of prey in the surface waters with low salinity as a consequence of upwelling.

Seabirds consume a lot of different food items in the Barents Sea. However, some prey types seem especially important for many species as some amphipod species, capelin *Mallotus villosus*, polar cod *Boreogadus saida*, herring *Clupea harengus* and sandeel *Ammodytes* sp. The two latter are mainly found in the Atlantic water in the southern parts of the Barents Sea.

Distribution of seabird colonies and number of breeding birds

Murman coast (Table 3, Figure 3)

The Murman coast is one of the best-investigated regions in the Barents Sea in relation to seabird distribution. The major part of the 81 seabird colonies is situated within the Kandalaksha Nature Reserve. Annual monitoring is carried out in the reserve. The seabird colonies outside the reserve are less known and information is lacking for many of the colonies. The total number of breeding seabirds registered in the database is about 388 000 individuals (13 species). The numbers of birds found along the coast decreases eastwards, and the majority is concentrated in two areas, the Gorodetskii Cape (western Murman) and the Seven Island archipelago (eastern Murman).

Black-legged kittiwake *Rissa tridactyla* is the most numerous species and constitutes more than 80% of the total number of seabirds in the region. More than half of the population is located in the colony at Gorodetsky Cape. Other large colonies are situated on Kharlov Island, where more than 25 000 pairs are breeding.

The numbers of common guillemot *Uria aalge* and Brünnich's guillemot *Uria lomvia* are registered in less than 50% of the colonies. The total population registered in the database is about 21 000 breeding individuals, and the ratio between the species (common guillemot/Brünnich's guillemot) is about 3:1. About 37% of all guillemots in this region are breeding in the Seven Islands archipelago.

The islands are populated by herring gulls *Larus argentatus* and great black-backed gulls *Larus marinus* as well as common eiders *Somateria mollissima*, European shags *Phalacrocorax aristotelis*, great cormorants *Phalacrocorax carbo*, Atlantic puffins *Fratercula arctica* and black guillemots *Cephus grylle*. The largest colonies of Atlantic puffins, herring gulls and great black-backed gulls are situated at Ainov islands. Large breeding colonies of Atlantic puffins are located on Bol'shoi Arsky island and in the Semio-strovsky archipelago, and large colonies of herring gulls are known in the Gavrilovsky archipelago.

Nenetski district (Table 4, Figure 4)

Within the Nenetski district there are registered 51 colonies. Of these, 34 (66.7%) have been censused. Data obtained during the last decade are available from 16 colonies only. Only one colony (Shoina River) has been censused two times in subsequent years. Thus, the overall quantitative data quality must be assessed as poor. It is known, however, that some recent data exist (an example is barnacle goose *Branta leucopsis* breeding at Kolguev), but these are not yet published.

The breeding seabirds in this region include nine species with only two cliff-breeding species (black-legged kittiwake and black guillemot), each found in a single colony. The most important breeding area for seabirds in this region is the so-called "Laida" and its seaward part including sandy spits continuing with a system of small lowland sandy isles (called "Koshki"). Rocky habitats (cliffs, small islands and river canyons) are used in restricted areas on Vaigach in the North Yugor zone. Most of the colonies are found in the Vaigach-Yugor zone and on the Kolguev Island. The most numerous species is the barnacle goose *Branta leucopsis* that constitutes as much as 43% of the seabird population in the region according to available data. Next are the glaucous gull *Larus hyperboreus* and the lesser black-backed gull *Larus fuscus heuglini*, which together constitute also slightly more than 40% of the total population in the region. Other species are low in numbers, but one should take into account that species like common eider and Arctic tern *Sterna paradisaea* are probably heavily underestimated.

Most of the colonies consist of one species only, and the highest number of breeding species in a colony is four (two colonies). The most widely distributed species is the barnacle goose that occurs in 60% of the colonies registered. Species with low numbers are brent goose *Branta bernicla*, black-legged kittiwake and black guillemot. In general, the number of breeding individuals in the colonies is low. Only 10 colonies have more than 200 breeding individuals, and only one colony has more than 1000 breeding individuals.

Table 3. Number of seabird colonies and breeding individuals registered on the Murman coast. Within this region 81 colonies are registered in the colony database.

Species	No. of registered colonies	Estimated proportion of the total number of colonies in the region registered in the database*	No. of breeding individuals in the censused colonies (No. of colonies in parenthesis)		Estimated proportion of the total number of breeding individuals in the region registered in the database*
Great cormorant	19	2	3694	(18)	2
European shag	12	2	722	(12)	2
Common eider	16	2	5004	(16)	2
Mew gull	11	2	150	(11)	2
Herring gull	36	3	6568	(18)	4
Great black-backed gull	25	3	3826	(18)	3
Black-legged kittiwake	52	2	323800	(51)	2
Arctic tern	3	5#	1860	(3)	6
Common guillemot	25	2	16714	(12)	4
Brünnich's guillemot	25	2	5080	(12)	4
Razorbill	25	2	730	(15)	4
Black guillemot	52	4	3601	(32)	4
Atlantic puffin	22	2	16374	(17)	3
Total			388123		

*) 1 = ~ 100%, 2 = 75-100%, 3 = 50-75%, 4 = 25-50%, 5 = 0-25%, 6 = Unknown, # = Uncertain data

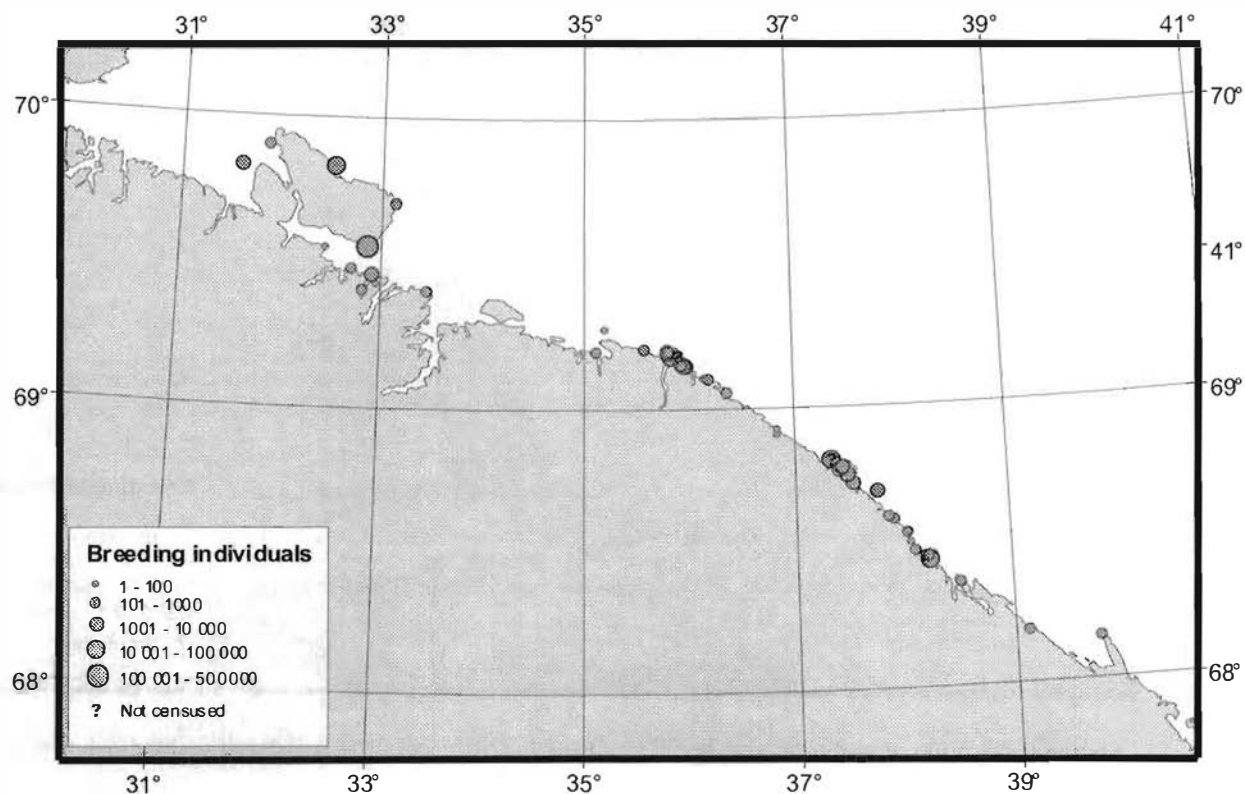


Figure 3. Location of and total number of breeding individuals in the registered seabird colonies on the Murman coast.

Novaya Zemlya (Table 5, Figure 5)

Novaya Zemlya is one of the regions in the Barcnts Sea Region with the highest density of breeding seabirds. In total, 61 colonies with a total number of 1.4 million seabirds (based upon 53 censused colonies) are registered in the database. During the last two decades only 16 colonies have updated information and these comprise probably only about 1/3 of the total number of breeding seabirds on Novaya Zemlya. Parts of the western coast of Novaya Zemlya, especially the southern part, are poorly mapped.

Brünnich's guillemot comprises 91% of the total number of seabirds on Novaya Zemlya. The largest colonies are situated in Bezymyanaya Bay, Arkhangelskaya Bay, Sakhanikha Bay, Pukhovyi Bay and Oransk Islands.

Black-legged kittiwake is the second most numerous species and is registered in 27 colonies all along the western coast. It often breeds together with Brünnich's guillemot. The largest breeding colonies of black-legged kittiwake are found in the Bezymyanaya Bay and Vilkitski Bay. Also black guillemot and glaucous gull often breed together with Brünnich's guillemots, but these populations are much smaller. Common guillemots are also breeding in small in numbers and can be found particularly on the Southern Island breeding together with Brünnich's guillemots. One breeding colony is known on the Northern Island, though the registration is from 1950 and the colony has not been

investigated since (Cape Lavrova). The Atlantic puffin is also breeding on Novaya Zemlya, but only in small numbers.

No more than four colonies of little auk *Alle alle* are registered on Novaya Zemlya, all situated in the northern part. Northern fulmars *Fulmarus glacialis* are only registered in one colony. This registration is from the beginning of the 20th century. Since then, no registrations of breeding birds have been recorded, but it is possible that the species may still breed in the area. Common eider is breeding along the western coast of Novaya Zemlya (Demme 1946, Pokrovskaya & Tertitski 1993, Strøm *et al.* 1994, 1995, 1997), but counts exist from one colony only, situated on the Southern Island. According to Demme (1946) the total population of common eider was estimated at 25 000 pairs in the early 1940s. Ivory gulls *Pagophila eburnea* are common along the western coast of the Northern Island during the ice-covered period (Uspenski 1969), but no breeding colonies are registered. One colony at the northeastern corner of the Northern Island is registered in the Kara Sea database. Barnacle goose is spread all over the western coast of the Southern Island and at least up to Krestovaya Bay at the Northern Island. In the colony database 11 colonies are registered on the Southern Island, which is much less than existed earlier.

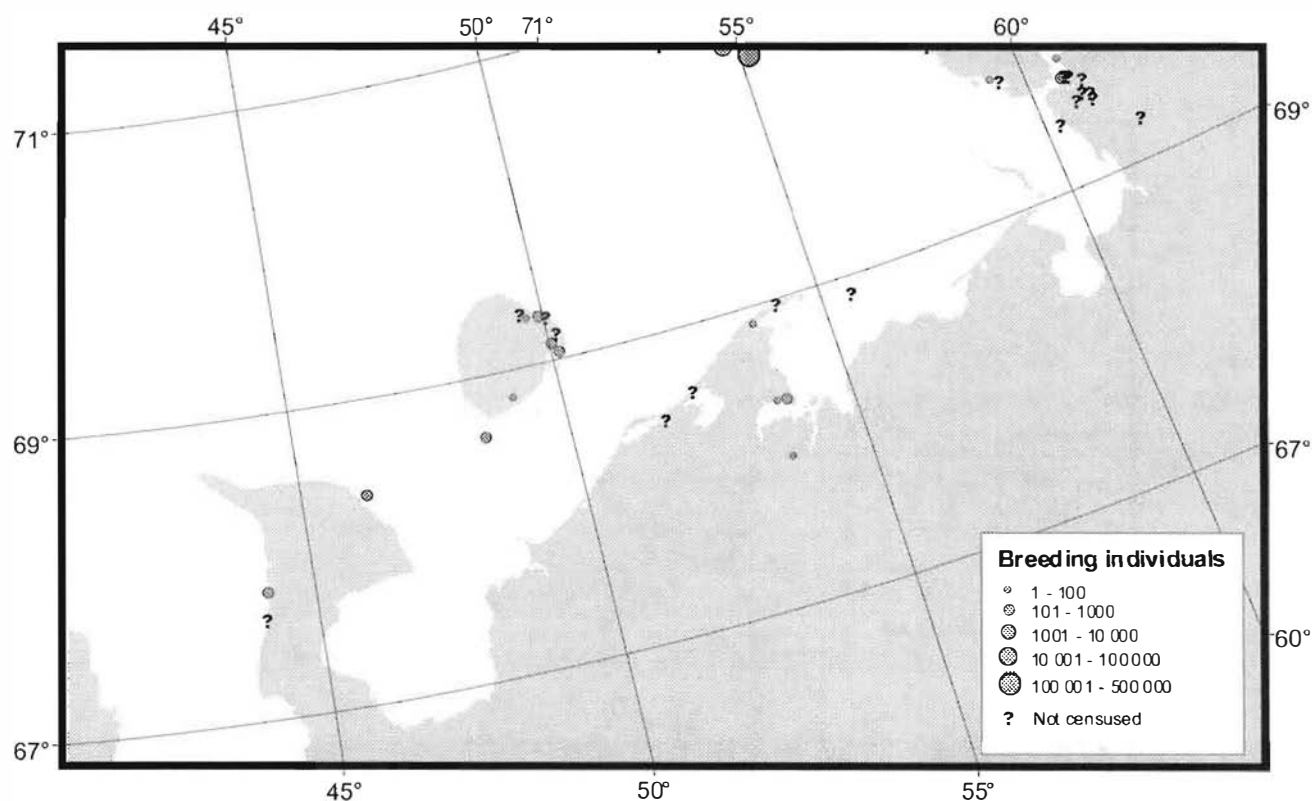


Figure 4. Location of and total number of breeding individuals in the registered seabird colonies in the Nenetski district.

Table 4. Number of seabird colonies and breeding individuals registered in the Nenetski district. Within this region 51 colonies are registered in the colony database.

Species	No. of registered colonies	Estimated proportion of the total number of colonies in the region registered in the database*	No. of breeding individuals in the censused colonies (No. of colonies in parenthesis)	Estimated proportion of the total number of breeding individuals in the region registered in the database*
Brent goose	2	3#	6 (2)	4#
Barnacle goose	31	2-3	2194 (13)	5#
Common eider	9	5	324 (3)	5
Lesser black-backed gull	9	5	666 (7)	5#
Glaucous gull	15	5	1410 (13)	4#
Great black-backed gull	1	5#	2 (1)	5#
Black-legged kittiwake	1	4#	20 (1)	5
Arctic tern	10	5	432 (5)	5
Black guillemot	1	5	0 (0)	5
Total			5054	

*) 1 = ~ 100%, 2 = 75-100%, 3 = 50-75%, 4 = 25-50%, 5 = 0-25%, 6 = Unknown, # = Uncertain data

Franz Josef Land (Table 6, Figure 6)

Franz Josef Land is the northernmost archipelago in the Barents Sea Region. The severe climatic conditions exclude many species. The distribution of the seabird colonies is limited by the presence of suitable breeding areas, ice conditions in the straits and surrounding waters and the prey availability.

In total, 87 colonies are registered in Franz Josef Land and 10 seabird species are found breeding. Only 35 colonies (40%) are censused. The probably most numerous species is the little auk (62 colonies), but counts exist from 14 colonies only. The second most numerous species is probably black-legged kittiwake, and in the database about 68 000 individuals are registered distributed in 13 colonies. However, a total of 26 colonies with breeding black-legged kittiwakes are registered. Brünnich's guillemot is found breeding in the southern parts of Franz Josef Land only (20 colonies) due to the heavy ice conditions in the northern areas. Black guillemot is found breeding all over Franz Josef Land, except the easternmost islands. Parts of the Franz Josef Land is poorly mapped, and there are probably still many seabird colonies to be discovered.

The northeastern part of the archipelago is the most high arctic area. Sea ice during the breeding period and that large glaciers form many islands, exclude many cliff-breeding seabirds from this area. The central and northern parts of Franz Josef Land are characterised by the combination of sea ice and many cliffs along the coasts. Many colonies, populated mostly by little auks and black guillemots, are located in this area. There are only a few Brünnich's

guillemot colonies as they are dependent on open water during the fledging period.

The south and southwestern parts of the archipelago have less sea ice compared to the northern areas and many steep cliffs with ledges that are suitable for seabird breeding. In this area we find the largest seabird colonies in Franz Josef Land, but the number of breeding birds is relatively low compared to many colonies in the southern Barents Sea (Gavrilo *et al.* 1993).

Svalbard (Table 7, Figure 7)

Svalbard borders to the Barents Sea in the east and south and to the Greenland Sea in the west. In the colony database all of Svalbard is included. Svalbard is an important area for seabirds, and in the database 18 species are registered as breeding in a total of 579 colonies. Of these, 533 colonies (92%) are censused, and the region is one of the best mapped in the Barents Sea Region.

The most numerous species is probably little auk (207 colonies), but only 50% of the registered colonies have been censused. About 900 000 breeding individuals are registered, but the actual number is much higher. The largest colonies are situated on the western coast of Spitsbergen. The second most numerous species are Brünnich's guillemot, which are registered in 146 colonies. According to the database, the total population is about 1 370 000 breeding individuals, which probably is a relatively reliable estimate. The species are found all over Svalbard except from the easternmost areas. The reasons are probably

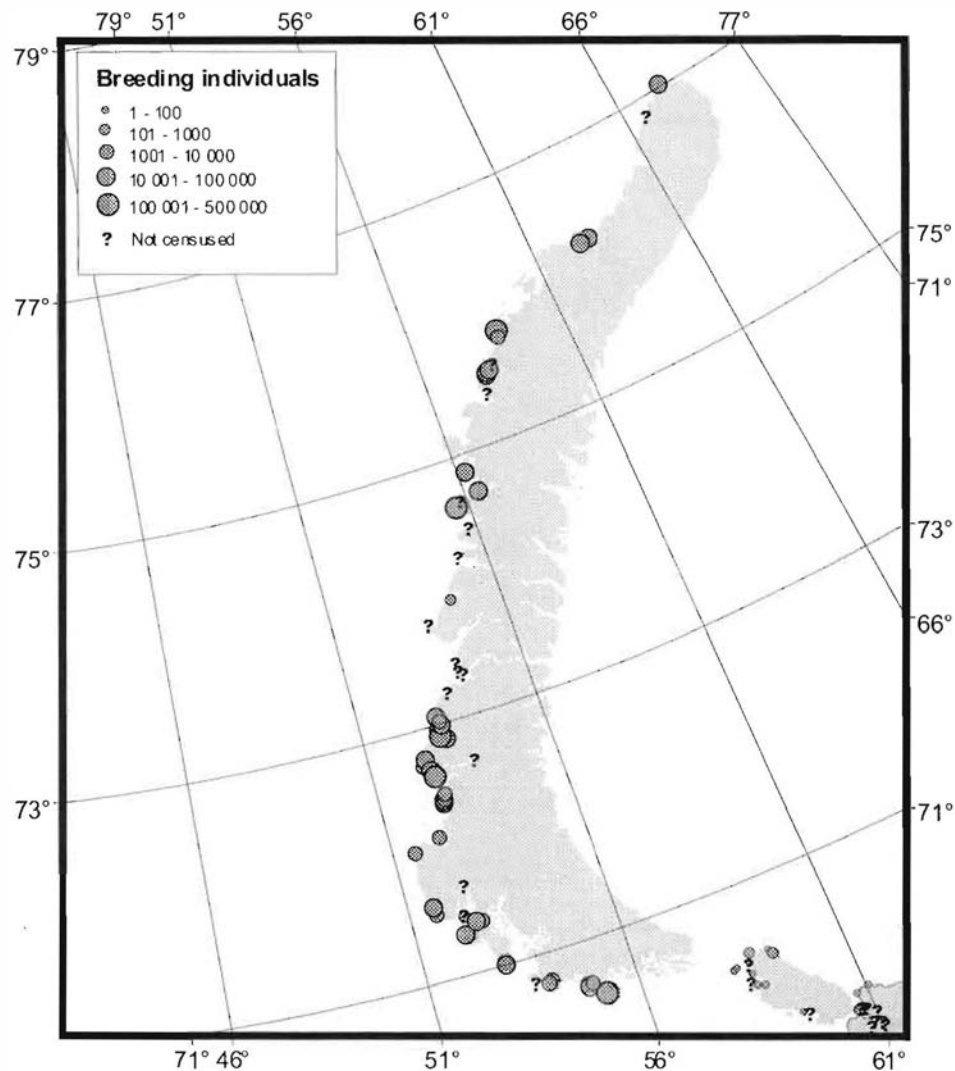


Figure 5. Location of and total number of breeding individuals in the registered seabird colonies on Novaya Zemlya (western coast) and Vaigach.

partly lack of suitable breeding areas and often heavy ice conditions during the fledging period. The largest colonies are situated in Storfjorden, on Bjørnøya and on Hopen. Also the common guillemot breeds in Svalbard. The main colony is on Bjørnøya where they breed in mixed colonies with Brünnich's guillemot. Common guillemots are also registered in small numbers in three colonies on the northwestern part of Spitsbergen. Black guillemot breeds all over Svalbard (202 colonies), but the total number of birds registered in the database (about 9000) is far too low. Razorbill *Alca torda* breeds in small numbers in Svalbard. The largest colony is on Bjørnøya, but the number of birds is only about 100 individuals. Razorbill is also registered in two colonies along the western coast of Spitsbergen. Svalbard is probably the northernmost breeding area for razorbill in the world. Atlantic puffin breeds in Svalbard in small numbers and a total of 107 colonies is registered. The number of breeding individuals registered is about 8300, which is too low. Bjørnøya is one of the few areas in the

Atlantic Ocean where all the Atlantic auk species are found breeding.

The population numbers for king eider *Somateria spectabilis* and pink-footed goose *Anser brachyrhynchus* are too low as not all colonies are registered in the database. The same apply partly for barnacle goose and brent goose.

Another numerous species in Svalbard is black-legged kittiwake, and this species is registered in 214 colonies. In total, more than 500 000 breeding individuals are registered in the database. Northern fulmars are registered in 129 colonies and breed almost all over Svalbard. Glaucous gulls also breed along the coast all over Svalbard (224 colonies), and the largest colony is situated on Bjørnøya (about 4000 breeding individuals). Great black-backed gull breeds in small numbers along the western coast of Spitsbergen as well as on Bjørnøya (25 colonies). Sabine's gull *Larus sabini* are only found in small numbers in two colonies on the islands Møffen

and Lågøya (one pair in 1998), north in the Svalbard archipelago. These are the only known breeding colonies in the Barents Sea. Ivory gull is registered in 44 colonies, but many of the registrations are old. In the database less than

2000 breeding individuals are registered. By adding all the actual numbers for each species in the database, more than 3.1 million seabirds breed in the Svalbard area.

Table 5. Number of seabird colonies and breeding individuals registered on Novaya Zemlya (western coast). Within this region 61 colonies are registered in the colony database.

Species	No. of registered colonies	Estimated proportion of the total number of colonies in the region registered in the database*	No. of breeding individuals in the censused colonies (No. of colonies in parenthesis)		Estimated proportion of the total number of breeding individuals in the region registered in the database*
Northern fulmar	1	6	0	(0)	6
Barnacle goose	11	5	80	(1)	5
Common eider	1	5	110	(1)	5
Herring gull	1	6	0	(0)	6
Glaucous gull	54	5#	436	(12)	5
Great black-backed gull	1	6	2	(1)	6
Black-legged kittiwake	27	2-3	87582	(17)	4#
Common guillemot	11	3	435	(4)	4-5
Brünnich's guillemot	56	2	1276726	(44)	3#
Razorbill	1	6	5	(1)	6
Black guillemot	53	5	477	(7)	5
Little auk	4	4	34074	(2)	5
Atlantic puffin	11	3	262	(7)	4
Total			1400189		

*) 1 = ~ 100%, 2 = 75-100%, 3 = 50-75%, 4 = 25-50%, 5 = 0-25%, 6 = Unknown, # = Uncertain data

Table 6. Number of seabird colonies and breeding individuals registered in Franz Josef Land. Within this region 87 colonies are registered in the colony database.

Species	No. of registered colonies	Estimated proportion of the total number of colonies in the region registered in the database*	No. of breeding individuals in the censused colonies (No. of colonies in parenthesis)	Estimated proportion of the total number of breeding individuals in the region registered in the database*
Northern fulmar	15	3	1504 (4)	5
Brent goose	1	5#	35 (1)	5#
Common eider	8	4-5	184 (6)	4-5
Glaucous gull	28	5#	244 (8)	5
Black-legged kittiwake	26	2-3	68454 (13)	4
Ivory gull	10	3#	1904 (3)	4#
Arctic tern	4	4-5	174 (4)	4-5
Brünnich's guillemot	20	2	53130 (5)	5
Black guillemot	49	5	4272 (13)	5
Little auk	62	3	55552 (14)	5
Total			185453	

*) 1 = ~ 100%, 2 = 75-100%, 3 = 50-75%, 4 = 25-50%, 5 = 0-25%, 6 = Unknown, # = Uncertain data

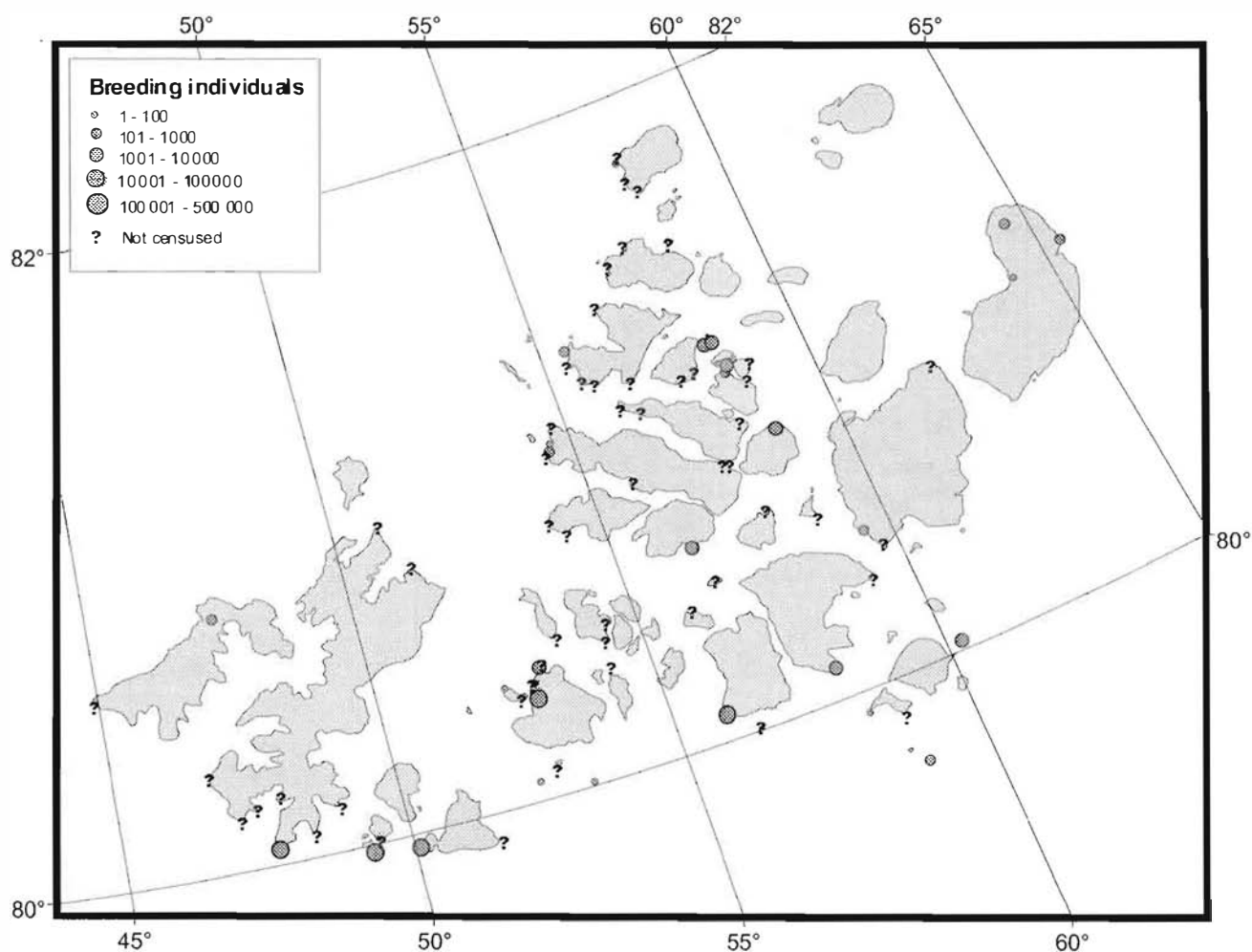


Figure 6. Location of and total number of breeding individuals in the registered seabird colonies in Franz Josef Land.

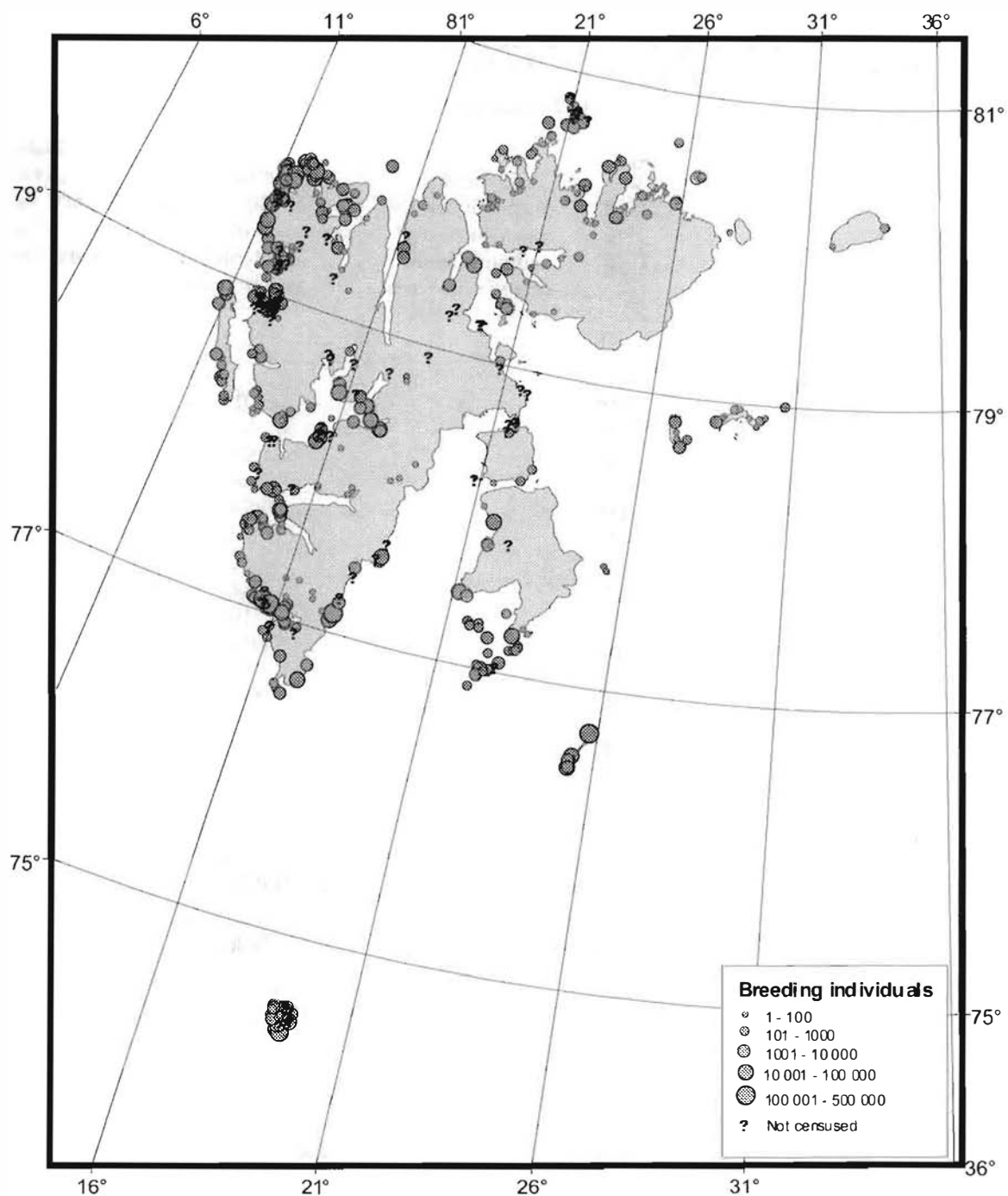


Figure 7. Location of and total number of breeding individuals in the registered seabird colonies in Svalbard.

Table 7. Number of seabird colonies and breeding individuals registered in Svalbard. Within this region 579 colonies are registered in the colony database.

Species	No. of registered colonies	Estimated proportion of the total number of colonies in the region registered in the database*	No. of breeding individuals in the censused colonies (No. of colonies in parenthesis)	Estimated proportion of the total number of breeding individuals in the region registered in the database*
Northern fulmar	129	3#	163017 (92)	6
Barnacle goose	69	2	7878 (69)	2
Brent goose	36	2	935 (36)	3#
Pink-footed goose	17	5	688 (14)	5
Common eider	119	3	44897 (116)	2#
King eider	7	5	182 (7)	5
Sabine's gull	2	2	13 (2)	2#
Glaucous gull	224	2	8421 (163)	2#
Great black-backed gull	25	2	104 (24)	2#
Black-legged kittiwake	214	1	550140 (174)	2
Ivory gull	44	2#	1904 (34)	6
Arctic tern	80	4#	8715 (78)	6
Common guillemot	23	1	74383 (23)	2
Brünnich's guillemot	146	1	1374059 (123)	2
Razorbill	4	1	103 (3)	2
Black guillemot	202	4	9204 (141)	3-4
Little auk	207	2	896523 (104)	5#
Atlantic puffin	107	3#	8375 (79)	4#
Total			3149541	

*) 1 = ~ 100%, 2 = 75-100%, 3 = 50-75%, 4 = 25-50%, 5 = 0-25%, 6 = Unknown, # = Uncertain data

Seabird colonies in the Barents Sea

The list includes colony name, location and the breeding species. The number of breeding individuals is aggregated in 8 categories: 1=1-10, 2=11-100, 3=101-1000, 4=1001-10000, 5=10001-100000 and 6=100001-1000000, X = Species is breeding in unknown number and P=Previous breeder in the colony. The last column (Species) indicates the total number of breeding species registered in the colony.

[illegible]

Colony name	Coordinates	FUGLA	MOBAS	PHCAR	PHARI	BRIEUV	BRER	ANBRA	ANANS	SOMOL	SOSPE	LAFWS	LAARG	LAHYP	LACAN	LASAB	RITRI	PAERW	STIPAR	ALALL	ALTOR	URRAL	UPLON	CEGRY	FRARC	Species
AUSTRE LOVÉNREEN N	N7854 E1212	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	X	-	-	2
AVDALEN	N7422 E1901	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	3	4	-	5
AVDALEN S	N7422 E1901	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	4	-	-	6
BALLONGKOLLEN, DANSØYA	N7941 E1045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	3	2	-	5
BARENTSFJELLET S	N7851 E1036	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	4	-	3	3
BARONFJELLET	N7738 E1820	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	4
BECKERFJELLET	N7957 E2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
BEFORE, CHERNAYA BAY	N7039 E5445	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	X	-	3
BEICHERFJELLET	N7713 E1723	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	2
BELL ISLAND	N7959 E4918	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	X	-	-	-	4	3	-	6
BELL ISLAND, S	N7959 E4917	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	5	4	-	5
BELLSUNDHUSTEN	N7733 E1411	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	3
BEN NEVIS	N7939 E1226	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
BENEFJELLET	N7712 E1634	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	2	-	-	-	-	-	-	1
BENTSENBUKTA, VEST	N8007 E2138	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
BERTELTOPPEN	N7853 E1202	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	1
BESPOKONINAYA BAY	N7547 E5846	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	3
BEZNYANAYAYA BAY - KUTOVI ISLAND	N7253 E5315	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	X	-	4
BEZNYANAYAYA BAY - N. COAST	N7257 E5306	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	2	5	-	6
BEZNYANAYAYA BAY - S. COAST	N7254 E5306	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	3	6	-	5
BIRDVÅGEN	N8028 E1945	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	1
BISKAYERRAUGEN	N7949 E1223	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
BJØRNDALEN	N7811 E1518	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
BJØRNSKANKA	N7836 E1222	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
BJØRNØYA RADIO	N7431 E1901	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
BJØRNØYA SOUTH	N7421 E1905	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	X	-	-	5	6	-	12
BLAUØDDEN	N8008 E2148	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	4
BLANKUTEN	N7758 E2121	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	4
BLESSINGBERGET	N7944 E1115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
BLOMSTRANDHALVØYA SW	N7859 E1290	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
BLOMSTRANDHAMNA 1	N7900 E1206	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
BLOMSTRANDHAMNA 2	N7900 E1202	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	3	1	-	7
BLOMSTRANDHAMNA 3	N7900 E1201	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	2	1	-	3
BLOMSTRANDHAMNA BIRD SANCT.	N7900 E1205	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
BOCKFJORDEN	N7926 E1324	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
BOGEVIGA	N7851 E1203	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
BOHEMAN	N7424 E1856	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	3
BOILINRYGGEN	N7822 E1438	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
BOLSHAYA	N7733 E1426	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
BOLSHAYA OYU RIVER, 1	N7713 E2200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
BOLSHAYA OYU RIVER, 2	N6915 E6140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
BOLSHAYA OYU RIVER, 3	N6930 E6102	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
BOLSHAYA OYU RIVER, 4	N6932 E6100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
BOLSHOI GUSNETS ISLAND	N6933 E6050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
BOLSHOI OLENII ISLAND	N6910 E3559	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
BOLTODDEN, KVALVÅGEN	N6304 E3623	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	2
BORGEN	N7730 E1812	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
BOTNREEN E	N7847 E1515	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
BOTNREEN N	N7853 E1215	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
BOTNFJELLET E	N7851 E1217	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	1
BOUVIERFJELLA	N7920 E1220	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	1
BOYDFJELLET	N8019 E2451	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	2
BRAGEBØYA	N7945 E1911	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
BRAGNESET	N7944 E1843	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
BRAVAISBERGET	N7739 E1449	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
BREITBOGEN	N7948 E1237	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	2
BREITINGSDALEN, BJØRNØYA	N7426 E1916	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
BROCHØYA	N8027 E2600	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
BROSH ISL., N-E FART	N8105 E5820	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
BROSH ISLAND	N8106 E5823	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
BRØKMOHOLMANE	N7704 E2230	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
BRØGGERFJELLET N	N7854 E1145	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
BRØGGERFJELLET S	N7854 E1138	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
BUCHANANHALVØYA	N7942 E1210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3

Colony name	Coordinates	FUGIA	MOBAS	PHCAR	PHARI	BRIEU	BRBER	ANBERA	ANANS	SOMOL	SOSPE	LAPFS	LAARG	LAHYP	LAMAR	LACAN	LASAB	RITRI	PAEBU	STPAR	ALALL	ALTOR	URUAL	ORLOM	CEGRY	FRARC	Species
BUELFJELLET S	N7816 E2154	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
BUGRINKA RIVER MOUTH	N6849 E4905	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
BÖLSCHEGYA	N7713 E2200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
CADIOPYNTEN N	N7913 E1142	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
CAPE BRITVIN	N7243 E5225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
CAPE CHERNETSKOGO	N7436 E5537	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
CAPE LAVROVA	N7356 E5431	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
CAPE LILJE	N7128 E5218	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
CAPE MOROZ'OVA	N7128 E5227	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
CAPE MUCHNOI	N7047 E5333	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
CAPE NE BAZAR SALE	N7132 E5140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
CAPE PROKOEVA	N7414 E5511	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
CAPE SAKHANINA	N7033 E5510	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
CAPE SEREBRYANI	N7322 E5405	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
CAPE SUKHOI NOS	N7347 E5343	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
CAPE VAL KOVO	N7123 E5245	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
CASIMIR - PERIERKAMEN E	N7908 E1153	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
CASIMIR - PERIERKAMEN W	N7908 E1152	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
CATALINABUKT'YA	N7959 E1834	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
CHAEVA BAY	N7613 E6251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
CHAIACHIY ISLAND	N6821 E5350	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
CHAMP ISLAND, S	N8036 E5625	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
CHERNAYA BAY	N7039 E9451	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
CHERNAYA RIVER MOUTH	N6942 E6043	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
CHERNAYA RIVER, 1	N6938 E6058	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
CHERNAYA RIVER, 2	N6941 E6045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
CHERNAYA RIVER, 3	N6941 E6044	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
CHERNOE LAKE	N6946 E6258	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
CHERVANAJA BAY	N6831 E3803	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
CHIROCHII ISLAND	N7022 E5815	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
CHRISTIAN MICHELSEN FUELLA	N7918 E1210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
CHYDENIUSREEN, SOUTH	N7912 E1810	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
COLLETHGDA	N7850 E1230	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
CONWAYFJELLET	N8017 E2410	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
CUMMINGØYA	N7949 E1130	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
DAMHAUGEN	N8009 E2416	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
DANSKØYA	N7940 E1050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
DAUDMANSØYRA (MAINLAND)	N7815 E1300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
DAUDMANSØYRA, BÅKEVATNA	N7813 E1302	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
DAUDMANSØYRA, GUDRUNDHOLMEN	N7819 E1249	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
DAUDMANSØYRA, MARINERHOLMANE	N7820 E1248	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
DAUDMANSØYRA, MARSTRANDODDEN	N7817 E1255	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
DAUDMANSØYRA, SNAUODDEN	N7819 E1251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
DAUDMANSØYRA, STEINPYNTEN-DAUDM.ØDDEN	N7813 E1255	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
DAUDMANSØYRA, STEINPYNTVIKA	N7811 E1255	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
DAUDMANSØYRA, TORDENSKJØLDBUKTA	N7818 E1256	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
DEAD SEAL ISLAND	N8022 E5219	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
DEINBOLITOPFANE	N7755 E1646	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
DEPOTODDEN	N8024 E1927	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
DEPOTODØYA	N8023 E1925	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
DIABASODDEN	N7822 E1608	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
DIABASPYNTEN (ISLETS)	N7746 E1343	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
DIETRICHOLMEN	N7555 E1202	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
DIGERSKNATTEN	N7918 E1110	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
DISCO BUKTA	N7750 E2200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
DOLGAYA BAY	N7010 E5850	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
DOTTEN	N7657 E1603	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
DUNDERBUKTA (ISLETS)	N7727 E1400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
DUNDRABETISEN	N7729 E1359	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
DUNDRAFJELLET	N7728 E1408	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
DUNØYANE, DUNØYSKJERA	N7702 E1505	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
DUNØYANE, FJØRSHOLMEN	N7704 E1500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
DUNØYANE, NORDRE DUNØYA	N7704 E1456	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
DUNØYANE, STORE DUNØYA	N7703 E1458	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
DVOROVAYA BAY (WEST)	N6827 E3814	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
DVOROVOI CAPE	N6827 E3814	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6

Colony name	Coordinates	FUGIA	MORAS	PCICAR	PHARI	BRLEU	BRBER	ANBRA	ANANS	SOMOL	SOSPE	LAFUS	LARAG	LARIYP	LIIMAR	LACIN	LASAB	RITIYI	PABBU	STPAR	ALALI	ALTOR	UTRAL	URLOM	CEGRY	FRASC	Species
HÅVA	N7652 E2142	-	-	-	-	2	2	-	-	3	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	4	-
Høystakken	N7935 E1101	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	1	-
Idunfjellet	N7945 E2004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	1	2	1	-
Indre Norskøya N	N7951 E1138	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	1	2	4	-
Indre Norskøya S	N7950 E1134	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	X	7	2	-
Ingeborgefjellet	N7746 E1423	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	5	-	-	5	3	7	-
Innvikøya	N8006 E2312	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-
Isbjørnhamna - Hvitevika (Islets)	N7700 E1520	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-
Island Near Cape Lilje	N7128 E5217	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	X	3	3	-
ISMÅSETJELLET	N7942 E2103	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	3	-	-	2	-	3	-
ISMÅSETOPPEN	N8008 E2111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	X	-	5	-
ISØYANE, ISØYKALVEN	N7708 E1449	-	-	-	-	2	-	-	-	2	-	-	-	2	1	-	-	-	-	-	2	-	-	-	-	1	-
ISØYANE, ISØYSJØFRA	N7707 E1452	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-
ISØYANE, NORDRE ISØYA	N7709 E1448	-	-	-	-	3	-	-	-	3	-	-	-	2	1	-	-	-	-	-	2	-	-	4	3	1	-
IVERSENFJELLET S, W & N	N7627 E2454	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	5	5	-
IVERSENFJELLET SE	N7627 E2457	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	2	-	-	4	X	5	-
JACKSON ISL., OLIE CAPE	N8109 E5630	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
JACKSON ISL., STERKEN CAPE	N8111 E5550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	2	-
JACKSON ISLAND, CAPE HELLAND	N8124 E5622	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	X	4	4	-
JACKSON ISLAND, CAPE MILL	N8116 E5526	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	X	-	-	X	4	4	-
JACKSON ISLAND, CAPE NORVEGIA	N8112 E5535	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	X	5	5	-
JACOBENTØYENE	N8008 E1922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	1	-
JAKINOVITTSØYANE	N7812 E2029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
JACKSON ISL., BYSTROV CAPE	N8119 E5530	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-								

Colony name	Coordinates	FUGIA	MOBAS	PHCAR	PHARI	BRLEJU	ABREA	ANUNIS	SOMOL	SOSPE	LAFUS	LAANG	LAHPY	LAMAR	LAQAN	LASAB	RITRI	PABBU	STPAR	ALALL	AUTOR	URRAL	CEGRY	FRARC	Species													
MACCLINTOCK ISLAND, CAPE DILLON	N8005 8555S	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	5	-	X	3	-													
	N7934 81100	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	6													
	KAI-NAVOLOK CAPE	N6950 83231	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2												
		N6828 83811	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	4	3	-	3												
		MAINLAND NEAR DVOROVAYA BAY (1)	N6828 83811	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5											
			N6828 83812	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	1	X	2	-											
			MAINLAND NEAR DVOROVAYA BAY (2)	N7950 81150	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	4	-	-	-	4	1	2	-										
				N6932 86042	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4										
				MAKAROV ISLAND	N6932 86042	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7									
					N7025 85912	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1									
					KALVI BOIVANSKIY NOS CAPE	N7225 85241	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1								
						N7225 85244	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5								
						KALVI KARMAKUL'SKY BAY, BAZARNYI ISLAND	N7225 85244	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5							
							N7227 85843	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5							
							KALVI KARMAKUL'SKY BAY, NORTHERN COAST	N7227 85843	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5						
								N7022 85835	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2						
								MALVI VORONOV ISLAND	N7657 81625	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1					
									N7741 81448	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1					
									MARIAHOLMEN (VAN MIJENFJORDEN)	N7741 81448	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5				
										N7820 81244	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2				
										MARINEHOLMENE, MIDDLE-PART	N7820 81244	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2			
											N7820 81245	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2			
											MARINEHOLMENE, NORTHERN MOST-ISLANDS (2)	N7820 81245	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3		
												N7819 81245	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3		
												MARINEHOLMENE-SOUTH	N7819 81245	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	
													N7819 81245	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	
													KARINOVA S	N7819 81245	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
														N7910 81430	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
MARTENSØYA														N8040 82115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
														N8040 82107	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
	MARTENSØYA, SOLVBERGET													N8041 82115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
														N8041 82115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
		MARTENSØYA, SOLVBERGET												N8040 82107	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
														N8041 82115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
			MARTENSØYA, SOLVBERGET											N8040 82107	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
														N8041 82115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
				MARTENSØYA, SOLVBERGET										N8040 82107	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
														N8041 82115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
					MARTENSØYA, SOLVBERGET									N8040 82107	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
														N8041 82115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
						MARTENSØYA, SOLVBERGET								N8040 82107	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
														N8041 82115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
							MARTENSØYA, SOLVBERGET							N8040 82107	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
														N8041 82115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
								MARTENSØYA, SOLVBERGET						N8040 82107	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
														N8041 82115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
									MARTENSØYA, SOLVBERGET					N8040 82107	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
														N8041 82115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-</					

Colony name	Coordinates	FUGLA	MOBAS	PHICAR	PHART	BRIEU	BRBER	ANERS	SOMOL	SOSPE	LAFUS	LAARG	LARYP	LAMER	LACAN	LASAB	RITRI	PAEBW	STPAR	ALALL	ALTOR	URRAL	ØRIOM	CEGRY	FRARC	Species
NOKUEV ISLAND	N6822 E2930	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	3
NORDAUSTPYNTEN, KONGSØYA	N7855 E2937	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	X	-	-	-	-	-	-	-	2
NORDBREEN	N7938 E1550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	3
NORTHBROOK ISLAND, CAPE BARENTS	N7955 E5129	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	4
NORTHEROOK ISLAND, CAPE FLOEA	N7958 E5005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
NORDENSKJØLDEREN	N7843 E1727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
NORDENSKJØLD BAY	N7523 E5743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
NORDENSKJØLDØYA W	N7913 E1922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
NORUKAPP	N8032 E2000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
NORDKAPP, KAPP OLSEN	N7431 E1907	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
NY-ÅLESDUND	N7855 E1155	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
NØISDALEN	N7821 E1705	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
ØSSED YÄ BAY	N7208 E5215	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
OBSERVATORIEFJELLET	N7729 E1439	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
ØDHØLMANE	N7724 E-358	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
ØLE HANSEN-KAMMEN	N7909 E1153	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
ØLSHOLMEN	N7714 E1416	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
ØRANSK ISLANDS	N7702 E6742	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
ØSLIAN SARSEJELLET	N7856 E1229	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
PALANDERDALEN NW	N7934 E2031	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
PALEVODDEN-GASHANNA	N7655 E1540	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
PARRYØYA	N8038 E2049	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
PAIER ISL., S-E	N8107 E5745	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
PAIER ISL., SOUTH	N8106 E5727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
PENMIKANPYNTØYA	N7946 E2133	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
PENINSULA SOUTH BEZYMANNAYA BAY	N7245 E5229	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
PERSKJØRET	N7938 E1100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
PESCHANKA RIVER	N6907 E5001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
PESCHANKA RIVER	N7314 E5340	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
PESCHANOE LAKE 1	N6918 E5002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
PESCHANOE LAKE, 2	N6917 E5003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
PESCHANOE LAKE, 3	N6910 E5010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
PHIPPØYA	N8043 E2050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
PHIPPØYA, GRANITBERGET	N8044 E2050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
PHIPPØYA, HYTTERBERGET	N8043 E2050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
PHIPPØYA, HØGERGET	N8043 E2055	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
PHIPPØYA, SJØHÅNØEN	N8043 E2047	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
PHIPPØYA, TROLLNYKEN	N8042 E2100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
PHIPPØYA, TRYGVE GRAN FJELLET N	N8046 E2035	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
PHIPPØYA, TRYGVE GRAN FJELLET SE	N8044 E2040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
PHIPPØYA, TRYGVE GRANFJELLET NE	N8046 E2035	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
PHIPPØYA, W(NW)	N8043 E2037	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
PHIPPØYA, W(SW)	N8041 E2044	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
PIKSHUEV CAPE	N6933 E3226	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
PILARBERGET NE	N7813 E1516	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
PILARBERGET SW	N7812 E1514	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
PILARBERGET (438)	N7813 E1518	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
PLANCUSBUKTA	N8012 E2135	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
PLANKHOLMANE	N7812 E1157	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
PODPAKHTA BAY	N6909 E3556	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
POLAKKFJELLET	N7715 E1606	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
PRINS HEINRICHØYA	N7855 E1148	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
PRØKHODNOY ISLAND	N6836 E4827	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
PUKHØVAYA BAY-CAPE EASTERN	N7237 E5243	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
PUKHØVAYA BAY-CAPE JUPAVLEVA	N7239 E5235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
PUKHØVAYA RIVER	N7239 E5346	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
PUKHØVØYI ISLAND	N7237 E5239	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
PURCHASNESØYA	N8022 E1819	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
PAFENODDEN-RARSØDEN (ISLETS)	N7650 E1540	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
RAGØZINA ISLANDS	N7017 E5837	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
RAKKERDALEN	N7748 E2128	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
RANDBERGET N	N7644 E1703	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
RANDBERGET S	N7644 E1703	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
RAUDBERGET	N7916 E1820	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
REINUSØYANE	N7745 E1414	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
REINSDYREFLYA	N7947 E1330	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

Colony name	Coordinates	FUGLA	MOBAS	PHICAR	PHARI	BRLEU	BRBER	ANERA	ANANS	SOMOL	SOSPE	LATVS	LAARG	LAHYP	LAMAR	LACAN	LASAB	RITRI	PABBU	STPAR	ALALL	ALTOR	URAAL	URLOM	CEGRY	FRARC	Species
REMJAUNGSKII CAPE	N6911 E3555	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	2	
RETZIUSBREEN	N7946 E1050	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
RETZIUSFJELLET, KONGSØYA	N7853 E2807	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	2	-	3	
RJUPFJORDEN, BOTTOM	N7958 E2230	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
RISFJELLA	N7924 E1353	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	2	-	-	-	-	-	-	-	2	
RISEN	N7953 E1129	-	-	-	-	1	1	-	-	3	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	4	
RODOLPH ISLAND, CAPE AUK	N8144 E5756	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
RODOLPH ISLAND, CAPE BROROK	N8142 E5806	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
RODOLPH ISLAND, CAPE GERMANIA	N8149 E5800	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
RODOLPH ISLAND, CAPE GERMANIA 1	N8149 E5800	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
RODOLPH ISLAND, CAPE SAULEN(STOLBOVOI)	N8148 E5754	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	
ROGACHEVA BAY	N7142 E5233	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
ROSENFJELLA	N7948 E2040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
ROTJESFJELLET	N7701 E1523	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
RUCH 1 BAY	N6829 E3806	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
RUNDISEN NW	N7854 E2905	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
RUSSEHOLMANE, EASTERN ISLAND	N7717 E2120	-	-	-	-	2	2	-	-	2	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	
RUSSEHOLMANE, MIDDLE ISLAND	N7717 E2118	-	-	-	-	-	-	-	-	2	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	6	
RUSSEHOLMANE, WESTERN ISLAND	N7717 E2117	-	-	-	-	1	1	-	-	2	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	5	
RUSSEHOLMANE, ØKONGEN	N7716 E2123	-	-	-	-	2	2	-	-	3	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	5	
RUSSEHOLMANE, BAY-BOGATYI ISLAND	N7613 E6235	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	4	
RUSSKIY ZAVOROT	N6858 E5408	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
RYKE YSEØYANE (NW ISLAND)	N7749 E2503	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	
RYKE YSEØYANE (S ISLAND)	N7747 E2508	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	
RYNDA	N6855 E3650	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
ROHSSBERGET	N7946 E1112	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
RØRENBURKA	N7726 E1735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
RØYEVATNET, BJØRNØYA	N7426 E1859	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
SADOVSKY BAY	N7452 E5615	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
SALISBERY ISL., NORTH OF FISHERI CAPE	N8102 E5430	3	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	4	
SALISBURY, BETWEEN FISHERI & MCCLINTOCK	N8103 E5435	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	
SALISBURY ISL., KOVALGY CAPE	N8051 E5548	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	
SALISBURY ISLAND, CAPE FISHER	N8101 E5426	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
SALISBURY ISLAND, CAPE MCCLINTOCK	N8106 E5444	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
SALISBURY ISLAND, ROODS STREAM	N8049 E5734	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
SALPYNTEN - AITKENODDEN (ISLETS)	N7814 E1150	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
SANIN ISLAND	N6822 E5339	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	2	
SAURIEDALEN	N7829 E1521	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
SAVIKHA BAY	N6811 E3907	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
SCHAREHOLMANE, BLØKKØYA	N7659 E2212	-	-	-	-	-	-	-	-	2	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	6	
SCHAREHOLMANE, HAVMØRRA	N7700 E2215	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
SCHAREHOLMANE, KVALBEINØYA	N7700 E2211	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	
SCHETELIGFJELLET	N7855 E1145	-	-	-	-	2	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	5	
SCHIVERUKTA	N7426 E1916	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
SCHØNROCKFJELLET	N7722 E1736	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	
SCOTT-KELTIE ISLAND	N8019 E5232	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
SELANDERNESET N	N7936 E1941	X	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
SELEZNEVA BAY - N	N7047 E5358	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	
SELEZNEVA BAY - S	N7046 E5354	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	
SENGEISKIY STRAIT	N6826 E5140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	
SEVEN ISLS, KHARLOV	N6849 E3720	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	
SEVEN ISLS, KUVSHIN	N6844 E3732	-	-	-	-	2	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
SEVEN ISLS, LITSKII BOLSHOI	N6842 E3744	-	-	-	-	1	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	
SEVEN ISLS, LITSKII MALII	N6842 E3746	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	
SEVEN ISLS, VESHNYAK	N6846 E3730	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	
SEVEN ISLS, ZELENETS BOLSHOI	N6847 E3725	-	-	-	-	3	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	
SEVEN ISLS, ZELENETS MALII	N6847 E3727	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	
SHANTSÅ BAY	N7439 E5547	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	
SHEL'PINSKAYA PAKHTA CAPE	N6907 E3610	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	
SHEL'PINSKAYA BAY	N6906 E3612	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	
SHOINA	N6750 E4410	-	-	-	-	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
SHUBINSKIE ISLS	N6856 E3650	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
SJUKOVSKIFJELLÅ, KVALHOVDEN	N7733 E1817	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	
SJØGRENFJELLET, KONGSØYA	N7851 E2755	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	
SKANSEBURKA N	N7832 E1605	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	
SKANSEBURKA W	N7832 E1557	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	

Colony name	Coordinates	FUGLA	MOBAS	PHCAR	PEARI	BRLEU	BRBER	ANBRA	ANANAS	SOMOL	SOSPE	LAFUS	LAARUG	LARYP	LAMAR	LACAN	LASAB	RITREI	PAEBU	STPAR	ALALL	AUTOR	URRAL	UJLOM	CEGRY	FRANC	Species
SKARPEGGA	N7935 E1056	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	1
SKARVHOLMEN	N7711 E1432	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
SKIFERTOPPEN - KNUTEN	N7852 E1157	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
SKJOLDKOLLEN, (NORDDALSFLYA)	N7947 E1300	2	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	X	1	-	5
SKODDEFJELLET	N7702 E1528	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
SKORPA	N/939 E1043	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-	-	1
SKRENTHØGDA	N7709 E1720	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	2
SKRÅHOLMEN	N7701 E2222	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	1
SLÅTTOFJELLET	N7853 E1207	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	1
SMØRSTABBen	N7926 E1310	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	1
SNYTA	N7430 E1846	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
SOFIEKAMMEN	N7701 E1553	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
SOKOLII ISLAND	N4950 E6043	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
SREDNYAYA BAY	N7227 E5243	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
ST . HANS HOLMANE	N7752 E1337	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
STAKAN CAPE	N7023 E5915	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
STASJONSØYANE	N7941 E1340	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
STEENFJELLET	N7852 E1153	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
STEGGHOLMEN	N7949 E1131	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
STEINBEISFJELLET	N7834 E2109	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
STEINVIKA (ISLETS)	N7702 E1509	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
STELLINGFJELLET	N7706 E1720	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
STEFANOVFJELLET	N7711 E1724	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
STERNECKØYA	N7734 E1501	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
STOLICHKY ISLAND	N8111 E5818	-																									

[illegible]

Colony name	Location
WIRE NORØYØY N	WIRE NORØYØY N
STEFKOLLEN	STEFKOLLEN
YUNO-VAKHA RIVER MOUTH	YUNO-VAKHA RIVER MOUTH
ANOV	ANOV
AY	AY
ISL	ISL
SSW	SSW
MSW	MSW
ØY	ØY
CAPE	CAPE
ISLAND, NW	ISLAND, NW
ISLAND, RODS STRAIT	ISLAND, RODS STRAIT
(DANSØYØY N)	(DANSØYØY N)
ØY	ØY
ØYANGEN	ØYANGEN

The White Sea

By Alexander S. Koryakin, Vladimir Yu. Semashko, Alexander E. Cherenkov and Vidar Bakken

Physical and biological conditions

The White Sea is a small sea (91 000 km², maximal length is 600 km, maximal width is 450 km), situated south and east of the Kola Peninsula (Fig. 1). The line between Svyatoj Nos Cape and Kanin Nos Cape is the conventional border between the White Sea and the Barents Sea. The White Sea has substantial differences in fauna and oceanographic features compared to the neighbouring Barents Sea.

The White Sea may be divided into seven areas (Fig. 8) according to its overall shape and oceanographic features (The White Sea 1995 a, b; The White Sea Pilot 1964). The outer part of the sea includes the Voronka and the Mezen Bay. The inner consists of the Dvina, the Onega and the Kandalaksha Bays and the Basin. A relatively narrow strait, the Gorlo connects the outer and inner parts, where mixing of water masses from the White and the Barents Seas takes place. The White Sea is shallow with a mean depth of 67 meter. The deepest areas are in the Basin and in the southern part of the Kandalaksha Bay. The maximum depth in the White Sea is 340 m.

The water has a low salinity (25-30‰), and decreases even more (<10‰) near the river mouths. The main fresh water current flows through the Dvina Bay and out through the Gorlo. Mainly during the winter, the water masses from the Barents Sea enter through the Gorlo and sink down to the bottom in the Basin and the Kandalaksha Bay.

In winter (November-May) sea ice covers up to 90% of the sea. Large stable polynyas exist in the Onega Bay, along the Karelian Shore of the Basin, near the southwestern coast of the Dvina Bay, at the western coast of the Voronka and at the southern coast of the Mezen Bay. Wintering seabirds mainly use the polynyas in the shallow waters in the Onega Bay.

The seabird colonies in the White Sea are mainly situated on islands that are non-accessible to mammalian predators and rarely visited by humans. The Voronka, the Gorlo and the Dvina Bay (numerous islands in the mouth of Dvina River are intensively used by humans) have no such islands. Suitable breeding islands in the Basin are found near the Karelian coast only (region Pon'goma Kalgalaksha-Gridino). A large number of islands are situated in the Onega Bay and in the northern part of the Kandalaksha Bay. These islands vary in size from tens of square meters to tens of square kilometres. The large islands are usually covered by forest and the smaller are with or without herbaceous vegetation. The majority of the seabirds breeds on small and medium sized islands. The highest breeding densities are observed on small grassy islands (up to several

hundred square meters in size), far from human settlements or kept under special protection (territories of state nature reserves).

The highest densities of macrobenthos accessible for birds is in the littoral and sublittoral zones (depths down to 20 m). Shallow areas that are important feeding areas for birds feeding on invertebrates are situated in the Onega Bay and in the inner part of the Kandalaksha Bay. For larger gulls and Arctic tern *Sterna paradisaea*, the main prey items in the breeding period are the White Sea herring *Clupea pallasii maris-albi*, three-spined *Gasterosteus aculeatus* and nine-spined *Pungitius pungitius* sticklebacks. Specialised fish-eating birds may feed on the White Sea cod *Gadus morhua maris-albi*, the navaga *Eliginus navaga* and other species. The White Sea cod and the navaga do not form dense aggregations in the water surface. Gulls breeding in protected areas close to human settlements may also feed on garbage.

Distribution of seabird colonies and number of breeding birds

The outer part (Voronka & Mezen Bay) and Gorlo

These parts of the White Sea are not attractive to fish-eating birds due to a lack of stable concentrations of fish in the breeding period. However, a few places are suitable for cliff-breeding seabirds. There are not many islands in this area (islands in the Lumboskij Bay and the Three Islands archipelago). The Veshnyak Island (Three Islands archipelago) has only been visited by ornithologists in the 1970s and a few pairs of common eiders *Somateria mollissima*, glaucous gull *Larus hyperboreus* and herring gulls *Larus argentatus* were registered in 1978-1979 (A.V. Filchagov, pers. comm.). Some islands are situated in the outlet of the rivers Ponoj and Shoina, and common eider (ca. 100-200 pairs), mew gull *Larus canus*, herring gull, and great black-backed gull *Larus marinus* breed on these islands. Small colonies also exist on inland lakes. The bird colonies in the outer part and the Gorlo have not been censused, but some old data may be found in the literature. No data from these areas are registered in the database.

Dvina Bay

There are no suitable places for seabird colonies in the Dvina Bay. Many islands concentrated in the outlet of the Dvina River are used frequently by humans and there are no protected areas where birds may breed in high density. The water in the delta of the Dvina River is almost fresh. The delta has not been studied in the purpose of locating

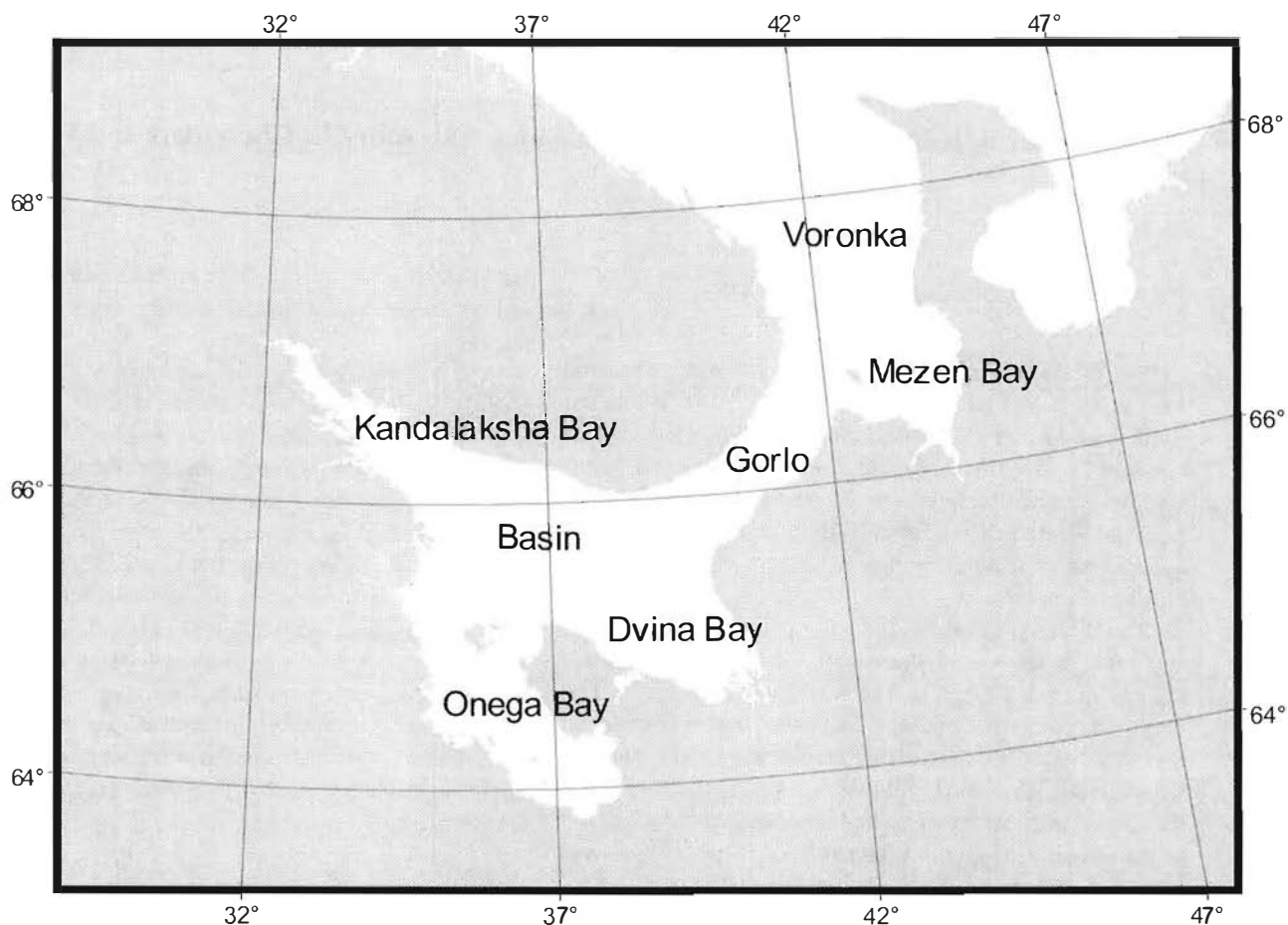


Figure 8. Map of the White Sea.

seabird colonies. Migrating birds use the delta region frequently. About 1500-2000 barnacle geese were observed on the meadows between Archangelsk and Isagorka 17-22 May 1997. No data from this area are registered in the database.

Onega Bay (Table 8, Figure 9)

The Onega Bay is shallow and about 1900 islands are scattered in the area. Of these, about 370 are suitable as breeding areas for seabirds. Other islands, which are easily accessible for mammalian predators or close to settlements, have no bird colonies. The main archipelago is the Solovetskij archipelago (five main and about 120 smaller islands). In this bay about 500 islands have been surveyed. Of these, 300 are classified as "most suitable for seabird breeding". The total number of breeding seabirds is about 40 000 pairs. Three to 10 species breed on most of the islands. Colonies with only one breeding species are rare. A.E. Cherenkov and V. Yu Semashko have censused the Solovetskij archipelago and islands in the northern part of the Onega Bay annually from 1989. Bianki (1963) published the sizes of the breeding populations from ultimo 1950s to the start of the 1960s.

Great cormorants *Phalacrocorax carbo* (300-400 pairs, increasing in number) breed on a few small rocky offshore islands. Common eiders (5000 pairs, stable in number)

breed on islands, preferably small, covered by herbaceous vegetation, especially when additional shelter (shrubs, heaps of boulders or trunks) is present. Common eiders do not breed close to settlements. Great black-backed gulls (ca. 100 pairs, increasing in number) prefer offshore islands and breed as single pairs in colonies of other seabirds. Herring gulls (about 5000 pairs, the number has stabilised after increasing several fold in 1960-1980) breed on different types of islands, preferring islands with herbaceous or tundra-like vegetation separated from the mainland. The largest colonies consist of 120-150 pairs. Lesser black-backed gulls *Larus fuscus* (1700-1800 pairs, increasing in number) prefer offshore grassy islands. Most birds breed in several large colonies with 150-250 pairs in each. Mew gulls (4000 pairs, stabilising in number after a doubling in number in 1960-1990) usually breed on rather large islands with meadows in connection with the mainland. Arctic tern is the most numerous species, but the population is probably decreasing. Arctic terns breed both as solitary pairs and in colonies. The largest colonies are situated in the northern part of the bay (Zjizjgin island-Solovetsky archipelago-Zjuzjmui archipelago) and the number of pairs in some colonies are more than 1000. Black guillemot *Cephus grylle* (2500 pairs, stable in number) usually breed on offshore islands. Razorbills *Alca torda*

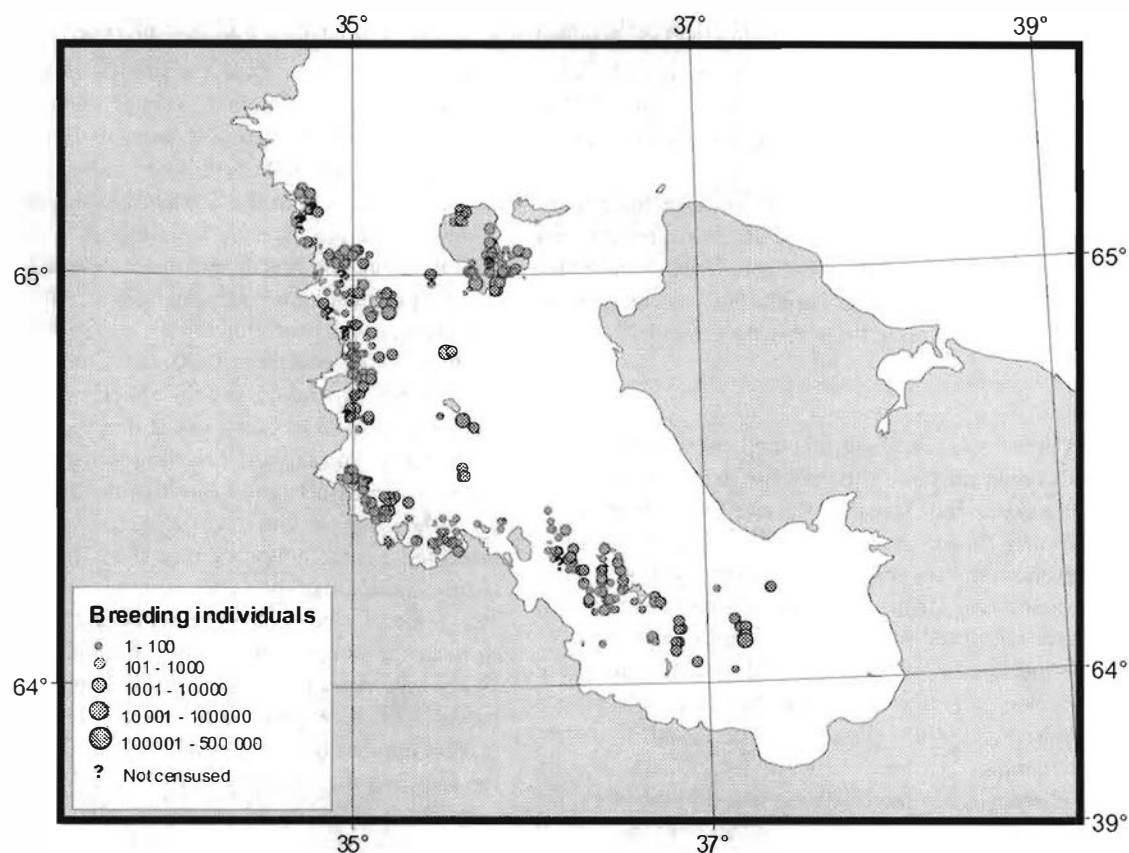


Figure 9. Location of and total number of breeding individuals in the registered seabird colonies in the Onega Bay.

Table 8. Number of seabird colonies and breeding individuals registered in the Onega Bay. Within this region 333 colonies are registered in the colony database.

Species	No. of registered colonies	Estimated proportion of the total number of colonies in the region registered in the database*	No. of breeding individuals in the censused colonies (No. of colonies in parenthesis)	Estimated proportion of the total number of breeding individuals in the region registered in the database*
Great cormorant	3	1	598 (3)	2
Common eider	275	2	8534 (266)	2
Mew gull	210	2	6462 (199)	2
Lesser black-backed gull	69	2	2836 (66)	2
Herring gull	291	2	8586 (282)	2
Great black-backed gull	64	2	138 (58)	2
Arctic tern	186	2	9056 (183)	2
Razorbill	52	2	4934 (50)	2
Black guillemot	183	2	3974 (177)	2
Total			44944	

*) 1 = ~ 100%, 2 = 75-100%, 3 = 50-75%, 4 = 25-50%, 5 = 0-25%, 6 = Unknown, # = Uncertain data

(3000 pairs; increased about 150% during the last decades) breed in heaps of rocks or trunks on offshore islands. Most of the birds breed in eight large colonies with 120-350 breeding pairs each. Atlantic puffin *Fratercula arctica* (2-3 pairs) breeds on Malaja Sennukha Island only.

The Onega Bay is the most important area for migrating and wintering seabirds in the White Sea. The majority of common eiders (about 30 000-40 000 birds) and black guillemots (ca. 10 000) of the populations breeding in the White Sea are wintering in the stable polynyas in the area.

Basin

Colonial breeding seabirds in this area are only numerous on islands along the coastline between the Onega Bay and the Kandalaksha Bay from Pon'goma to Gridino settlements (Bianki 1963). There are no data on the number of breeding birds in Pon'goma-Kalgalaksha-Gridino region. On 10 islands near Gridino village, 225 nests of common eiders were registered in 1995 (V.P. Dudin, pers. comm.). Possibly, the number of breeding eiders in the region is 500-1000 pairs. The total number of breeding gulls (*Larus* sp.) is probably 1000-2000 pairs (not censused). Possibly, great cormorants, Arctic tern, lesser black-backed gulls, black guillemots and razorbills also breed in this area, but so far no surveys have been conducted for these species. No data from this area are registered in the database.

Kandalaksha Bay (Table 9, Figure 10)

There are several hundred islands in the Kandalaksha Bay and most of them are scattered in the northern part. More than half of the islands are included in the territories protected by the Kandalaksha State Nature Reserve. Almost all the protected islands have been monitored annually from the beginning of the 1980s. Data obtained make it possible to analyse the population development for the main seabird species since the 1950s. The Kandalaksha State Nature Reserve has population data on common eider from the middle of the 1930s. Data on the population development of gulls and waders in the 1950-1960s (Bianki 1967) and on common eider (Karpovich 1987, Koryakin *et al.* 1989) are published.

The seabird colony database for the Barents Sea Region contains data from 1995 from about 350 protected islands in the Kandalaksha Bay collected by the staff in the reserve (V.V. Bianki, N.S. Boiko, A.S. Koryakin, V.D. Kokhanov, A.E. Panarin, F.N. Shklyarevich and E.V. Shutova) and published in the Nature Chronicle of the Kandalaksha Reserve 1995 (1996). Information about the majority of unprotected areas in the northern part of the bay (about 150 islands) is not registered in the database. Data from these islands were collected in 1990-1994 (Koryakin *et al.* 1996) and are presented in Table 10. Population trends have been analysed on the basis of data from the last decade. Seabirds have bred on about 550 islands in the Kandalaksha Bay during the last two decades. Most of the colonies have several breeding species (4-9 species). The total number of breeding seabirds has been between 15 000 and 20 000 pairs. About 80% of the birds breed within the borders of the Kan-

dalaksha State Nature Reserve. In 1990-1995 the number of breeding birds in the Kandalaksha Bay was not more than 10% in relation to the figures given in Table 10.

Great cormorants (ca. 280 pairs in 1996, increasing in number) breed on offshore rocky islands. The largest colony (up to 250 nests) is at the Srednie Ludy archipelago in the middle of the bay, outside the Reserve. Great cormorants do not use all the breeding colonies every year. Common eider is the most numerous species (ca. 5000 pairs; population stable in the protected territories; about 500 pairs bred on unprotected islands in 1990-94). Common eiders breed on all types of islands, but the species is very vulnerable to human disturbance and avoid unprotected islands near settlements. The highest breeding density is observed on small protected offshore islands in the Tarasikha archipelago. Black-legged kittiwakes *Rissa tridactyla* bred on one protected island in Por'ya Bay from 1987 to 1991. The highest number of breeders was 42 pairs (Shklyarevich 1991). Great black-backed gulls (about 150 pairs, 130 of them in the Reserve, increasing in number) usually breed as separate pairs in colonies of other gulls. Herring gulls (about 4000-4300 pairs, 3600 of them in the Reserve, population number began to decrease recently) breed all over the bay and the breeding density increases from inshore to offshore. The largest colony is situated in Por'ya Bay and consists of 200 pairs. Lesser black-backed gulls bred in the bay in the first half of this century only. Mew gulls (ca. 2800 pairs, 2100 of them in the Reserve, decreasing in number) prefer grassy islands not far from the mainland. Arctic terns (about 2000 pairs, ca. 1400 in the Reserve in 1995) have decreased in number during the last 5 years. The largest colony in 1995, situated at Namuki Island, consisted of 130 pairs. The decline of the Arctic tern population started in the end of the 1960s when the vast seagrass (*Zostera marina*) in the bay disappeared. As a consequence, the biomass of three-spined stickleback *Gasterosteus aculeatus*, that was the main feeding item for terns decreased heavily. The Arctic tern population was estimated at 6000 pairs in the end of the 1950s (Bianki 1967). The largest colony registered in 1995 totalled 130 pairs. Black guillemots (ca. 500 pairs, 90% of them in the reserve; population trend is unknown) breed on different types of islands where they find sheltered sites. The breeding density decreases from inshore to offshore. Razorbills (70-90 pairs, 58 pairs bred in the Reserve in 1995, and no clear population trend) breed on small rocky islands offshore.

The exploitation of seabirds by the rural people increased strongly in 1994-1998 as a consequence of the overall decline in the Russian economy. In the Kandalaksha Bay seabird hunting (mainly common eider) and harvesting of eggs increased a lot. The majority of the unprotected colonies in the southern part of the Knyazjaya Bay were totally abandoned. Also some colonies in the reserve have been destroyed (example is the Kem'ludy archipelago). There is no doubt that seabird colonies in the Kandalaksha Bay will be exploited more heavily in the future years. As a consequence, seabirds may only breed successfully inside the reserve, as also was the situation before the 1960s.

Table 9. Number of seabird colonies and breeding individuals registered in the Kandalaksha Bay. Within this region 355 colonies are registered in the colony database.

Species	No. of registered colonies	Estimated proportion of the total number of colonies in the region registered in the database*	No. of breeding individuals in the censused colonies (No. of colonies in parenthesis)	Estimated proportion of the total number of breeding individuals in the region registered in the database*
Great cormorant	5	1	348 (5)	1
Common eider	311	2	10150 (311)	2
Mew gull	294	2	4190 (294)	2
Herring gull	306	2	7038 (306)	2
Great black-backed gull	220	1	248 (220)	1
Arctic tern	289	3	2212 (289)	3
Razorbill	8	2	92 (8)	1
Black guillemot	69	1	795 (69)	2
Total			25073	

*) 1 = ~ 100%, 2 = 75-100%, 3 = 50-75%, 4 = 25-50%, 5 = 0-25%, 6 = Unknown, # = Uncertain data

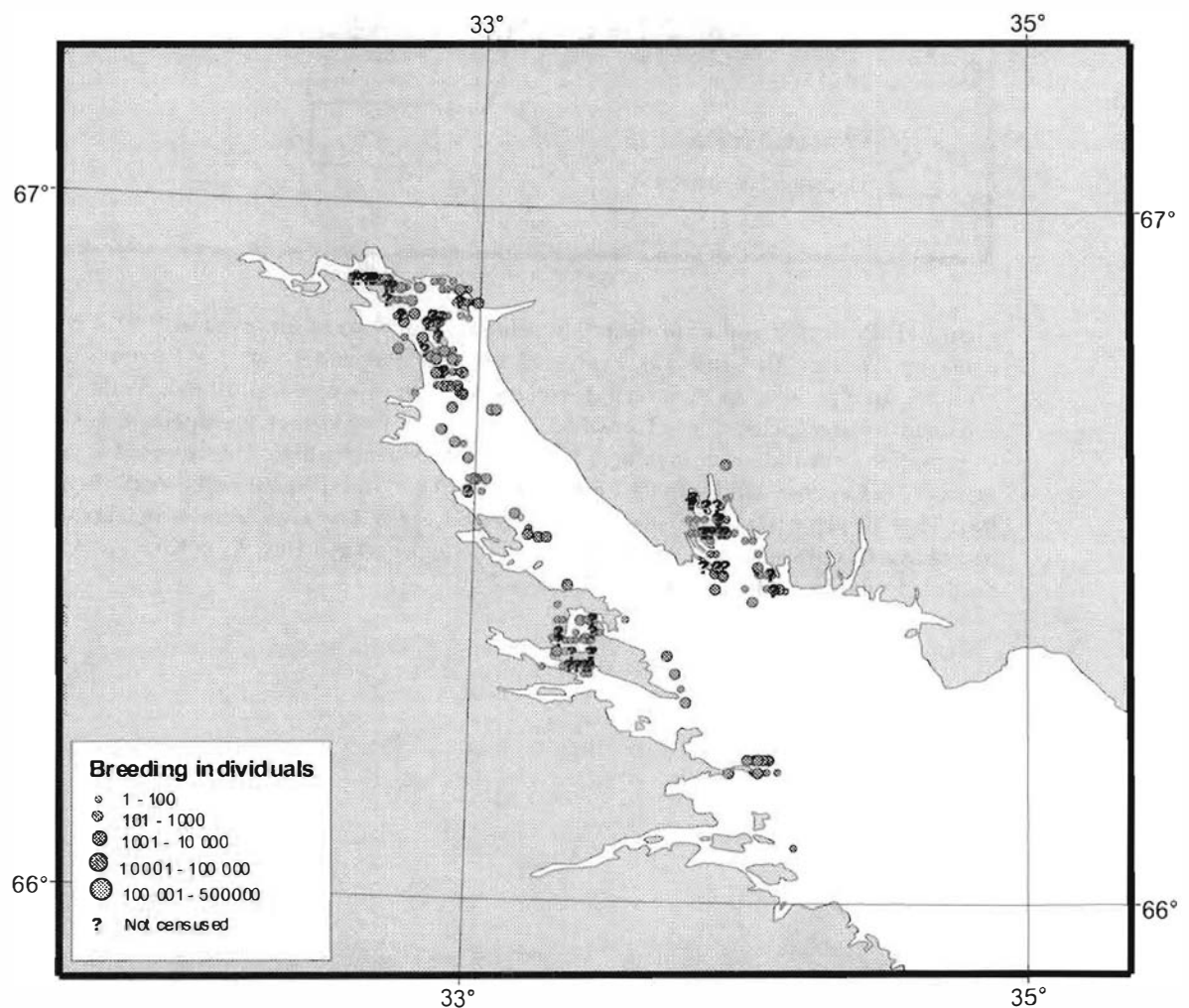


Figure 10. Location of and total number of breeding individuals in the registered seabird colonies in the Kandalaksha Bay.

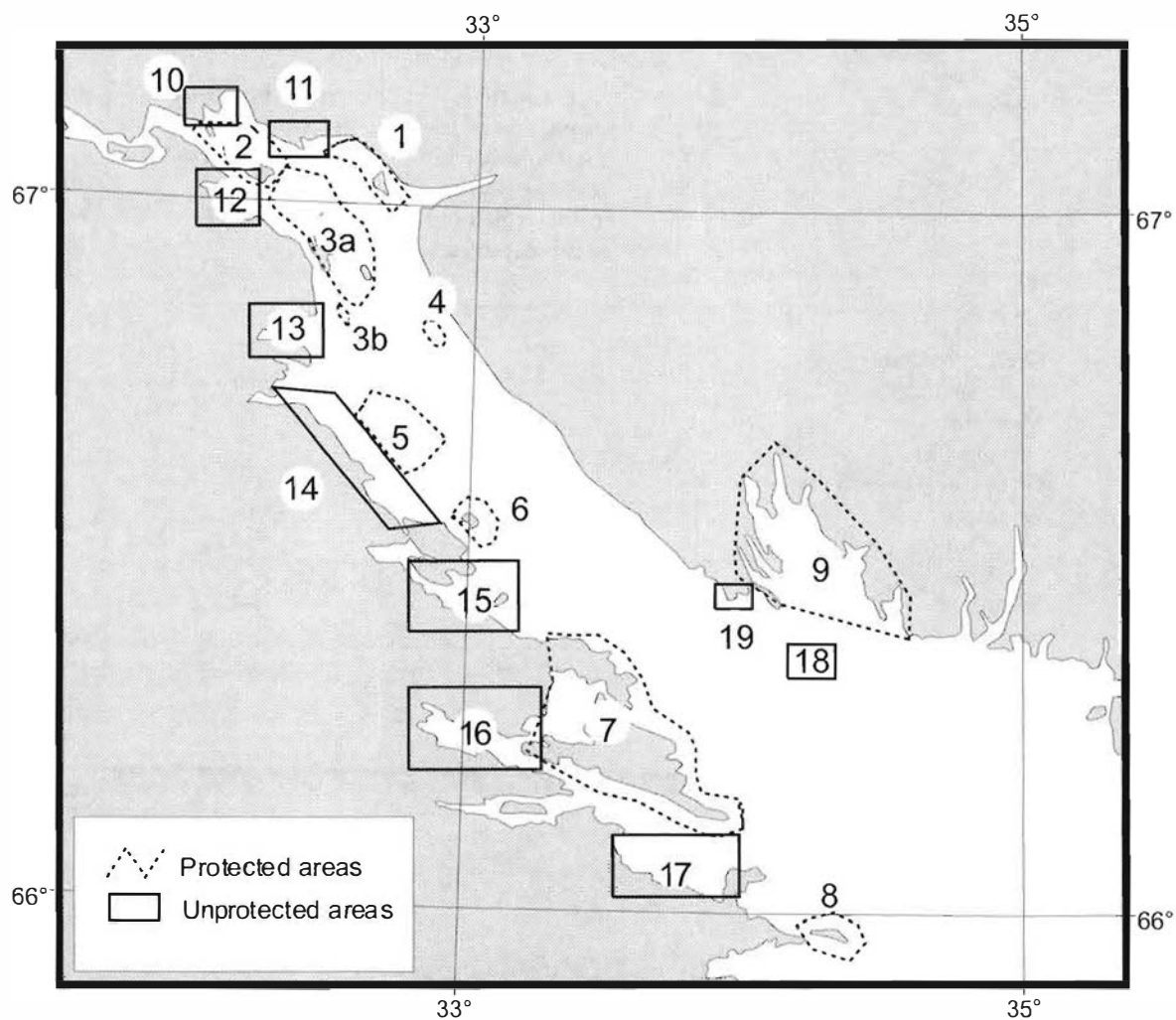


Figure 11. Protected and unprotected archipelagos and areas surveyed in 1991-1995 in the Kandalaksha Bay (see also Tab. 10). Protected archipelagos and areas: 1 = Luvenga archipelago, 2 = Olenij archipelago, 3a = Severnyj archipelago, 3b = Knyazjegubskaya Sedlovataya Luda, 4 = Kibrinsky archipelago, 5 = Tarasikha archipelago, 6 = Vachev archipelago, 7 = Veliky Island Region, 8 = Kem'ludy archipelago, 9 = Por'ya Bay archipelago. Unprotected archipelagos and areas: 10 = Lupchi islands. and Kanda Bay area, 11 = Malyj island and Pitcul' Bay, 12 = Palkina Bay, 13 = Kapsha Bay and Voron'ya Bay region, 14 = The area from Knyazjaya Bay to Nishchevskaya Bay, 15 = Kovda archipelago, 16 = Rugozerskaya Bay, 17 = Kuzokotskaya Bay, 18 = Srednie Ludy, 19 = The area near Il'insjaya Bay.

Table 10. Numbers and distribution of seabirds in the Kandalaksha Bay in the protected areas (1995) and unprotected areas (1991-1994). See Table 1 for species abbreviations. In addition, ruddy turnstone *Arenaria interpres* (ARINT) and Eurasian oystercatcher *Haematopus ostralegus* (HAOST) are included. Numbers in pairs. See also Figure 11.

Year	Islands	PHCAR	SOMOL	ARINT	HAOST	LAMAR	LAARG	LACAN	STPAR	ALTOR	CEGRY
PROTECTED TERRITORIES (Nature Chronicle of the Kandalaksha Reserve 1995 (1996))											
1. LUVENGA ARCHIPELAGO (surveyed by A.S. Koryakin)											
1995	38	0	388	16	190	7	124	342	36	0	7
2. OLENIJ ARCHIPELAGO (A.S. Koryakin)											
1995	50	0	512	10	156	15	199	236	15	0	0
3. SEVERNYJ ARCHIPELAGO (a) AND KNYAZJEGUBSKAYA SEDLOVATAYA LUDA (b) (V.V. Bianki & E.V. Shutova)											
1995	65	0	1841	26	263	25	615	431	100	0	45
4. KIBRISKY ARCHIPELAGO (A.S. Koryakin)											
1995	5	0	174	5	23	3	116	4	4	0	20
5. TARASIKHA ARCHIPELAGO (A.S. Koryakin)											
1995	11	29	371	1	13	6	265	2	66	57	20
6. VACHEV ARCHIPELAGO (V.D. Kokhanov)											
1995	5	0	298	14	46	11	214	180	156	0	124
7. VELIKY ISLAND REGION (V.D. Kokhanov & A.E. Panarin)											
1995	76	0	546	26	84	9	507	492	457	0	37
8. KEM'LUDY ARCHIPELAGO (V.D. Kokhanov)											
1995	24	0	71	23	92	13	698	259	265	1	89
9. POR'YA BAY (F.N. Shklyarevich)											
1995	77	0	817	30	76	37	794	147	254	0	146
TOTAL FOR PROTECTED TERRITORIES											
1995	351	29	5018	151	948	126	3544	2105	1353	58	488
UNPROTECTED AREAS (Koryakin <i>et al.</i> 1996)											
10. LUPCH ISLANDS AND KANDA BAY AREA (A.S. Koryakin)											
1991	19	0	46	11	37	2	54	41	13	0	0
11. MALYJ ISLAND AND ISLANDS IN PITKUL' BAY (A.S. Koryakin)											
1991	3	0	6	4	11	1	5	8	18	0	0
12. PALKINA BAY (A.S. Koryakin)											
1991	10	0	79	9	48	1	41	169	40	0	1
13a. KAPSHA BAY REGION (V.V. Bianki)											
1991-94	4	0	123	2	14	1	36	50	11	0	4
13b. VORON'YA BAY (V.V. Bianki)											
1991	2	0	2	1	3	0	2	7	20	0	0
14. INSHORE AREA FROM KNYAZJAYA BAY TO NISHCHEVSKAYA BAY (A.S. Koryakin)											
1993	18	0	153	9	42	4	18	117	91	0	24
15a. KOVDA ARCHIPELAGO (eastern part) (V.D. Kokhanov)											
1991	17	0	17	7	24	1	17	24	213	0	0
15b. KOVDA ARCHIPELAGO (western part) (V.D. Kokhanov)											
1993	10	0	0	7	18	2	42	16	15	0	5
16. RUGOZERSKAYA BAY (A.E. Panarin)											
1991	35	0	46	10	24	0	41	50	124	0	0
17. KUZOKOTSKAJA BAY (V.D. Kokhanov)											
1994	24	0	6	8	21	0	8	139	121	0	3
18. SREDNIE LUDY ARCHIPELAGO (V.D. Kokhanov)											
1992	3	130	14	0	0	5	260	0	0	27	26
19. AREA NEAR IL'INSKAYA BAY (F.N. Shklyarevich)											
1992-93	4	0	19	4	9	2	36	5	57	0	0
TOTAL FOR THE UNPROTECTED AREAS											
1991-94	150	130	511	73	263	19	564	628	737	27	64
TOTAL NUMBERS FOR ALL THE SURVEYED TERRITORIES IN THE KANDALAKSHA BAY											
1990-95	501	159	5529	224	1211	145	4108	2733	2090	85	552

Colony name	Coordinates	FUGIA	MORAS	PHCAR	PHARI	BRER	ANBRA	ANWAS	SOMOL	SOSPE	LAFUS	LAHYP	LANAR	LACAN	LASAB	RITRI	PABEU	STPAR	MIALL	ALTOR	URDAL	CEROY	FRARC	Species
AFANASKA I-S.A.	N6703 E3234	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
AFANASKA II-S.A.	N6703 E3234	-	-	-	-	-	-	-	2	-	-	-	1	2	-	-	-	-	-	-	-	-	-	4
AKUL'JA	N6457 E3501	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	2	-	-	-	1	-	3
ANNANINA BOLSHAYA-R.V.	N6641 E3346	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
ANNANINA MALAYA-R.V.	N6641 E3507	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
ANNANISIMOV-S.A.	N6704 E3235	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
ANNANISIMOV-S.A.	N6704 E3235	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
ANNANISIMOV-S.A.	N6704 E3235	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
ANNANISIMOV-S.A.	N6704 E3235	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
ANNANISIMOV-S.A.	N6704 E3235	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
ANNANISIMOV-S.A.	N6704 E3235	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
ANNANISIMOV-S.A.	N6704 E3235	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
ANNANISIMOV-S.A.	N6704 E3235	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
ANNANISIMOV-S.A.	N6704 E3235	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
ANNANISIMOV-S.A.	N6704 E3235	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
ANNANISIMOV-S.A.	N6704 E3235	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
ANNANISIMOV-S.A.	N6704 E3235	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
ANNANISIMOV-S.A.	N6704 E3235	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
ANNANISIMOV-S.A.	N6704 E3235	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
ANNANISIMOV-S.A.	N6704 E3235	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
ANNANISIMOV-S.A.	N6704 E3235	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
ANNANISIMOV-S.A.	N6704 E3235	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
ANNANISIMOV-S.A.	N6704 E3235	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
ANNANISIMOV-S.A.	N6704 E3235	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
ANNANISIMOV-S.A.	N6704 E3235	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
ANNANISIMOV-S.A.	N6704 E3235	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
ANNANISIMOV-S.A.	N6704 E3235	-	-	-	-	-	-	-	3	-	-	-	-	-										

Colony name	Coordinates	FUGIA	NORAS	PHCAR	PHARI	BRIEU	BRBER	ANBRA	ANANS	SOMOL	SOSPE	LATUS	LAARG	LAHYP	LAHAN	LACAN	LASAB	RITRI	PABEU	STPAR	ALALL	ALTOR	URAAI	BEJON	CEGRY	FRARC	Species
ARCH.UGLOVYE KORG1,IUBA1	N6431 E3502	-	-	-	-	-	-	-	-	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	2	
ARCH.UGLOVYE KORG1,IUBA2	N6431 E3501	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	3	
ARCH.UGLOVYE KORG1,UGLOVOY	N6432 E3500	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	
ARCH.VARBARLUDY:BOL'SHAYA VARBARLUDA	N6445 E3505	-	-	-	-	-	-	-	-	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	5	
ARCH.VARBARLUDY:KENTOVY	N6446 E3506	-	-	-	-	-	-	-	-	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	4	
ARCH.VARBARLUDY:LUDA 1	N6444 E3504	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	
ARCH.VARBARLUDY:LUDA 2	N6445 E3504	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	5	
ARCH.VARBARLUDY:LUDA 3	N6445 E3506	-	-	-	-	-	-	-	-	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	4	
ARCH.VONVATCHI: LUDA 1	N6510 E3445	-	-	-	-	-	-	-	-	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	4	
ARCH.VONVATCHI: LUDA 2	N6511 E3445	-	-	-	-	-	-	-	-	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	4	
ARCH.VONVATCHI: LUDA 3	N6510 E3446	-	-	-	-	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	4	
ASAF'EV BOLSHOY-K.L.	N6626 E3350	-	-	-	-	-	-	-	-	2	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	5	
ASAF'EV MALYY-K.L.	N6626 E3350	-	-	-	-	-	-	-	-	2	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	5	
ASAF'EVA I-K.L.	N6626 E3351	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	2	
ASAF'EVA II-K.L.	N6626 E3351	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	2	
ASAF'EVA PEREYMA-K.L.	N6626 E3350	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	4	
AVARIYNAYA-P.G.	N6642 E3340	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	4	
BAB'YA LUDA-B.M.	N6636 E3311	-	-	-	-	-	-	-	-	3	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	4	
BAKIYSH GOLOMYANY-S.A.	N6701 E3238	-	-	-	-	-	-	-	-	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	3	
BAKIYSH VORONII-S.A.	N6701 E3237	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	2	
BARZJA-L.I.	N6706 E3242	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	3	
BATOZNIZA	N6452 E3458	-	-	-	-	-	-	-	-	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	5	
BELAYA LUDA	N6406 E3625	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
BELOGUBSKIY-B.M.	N6634 E3313	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	4	
BELOGUBZICHKA	N6452 E3506	-	-	-	-	-	-	-	-	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	5	
BELOKAMENAYA-P.G.	N6647 E3333	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	4	
BELOSHCHELNAYA-S.A.	N6702 E3229	-	-	-	-	-	-	-	-	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	5	
BELOZERSKAYA-P.G.	N6644 E3339	-	-	-	-	-	-	-	-	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	4	
BEREZKA-P.G.	N6649 E3334	-	-	-	-	-	-	-	-	3	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	0	
BEREZOVYY BOLSHOY-L.I.	N6706 E3232	-	-	-	-	-	-	-	-	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	4	
BEREZOVYY-B.M.	N6636 E3311	-	-	-	-	-	-	-	-	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	4	
BEREZOVYY-P.G.	N6648 E3337	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	
BEZMYANAYA I-P.G.	N6641 E3353	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	3	
BEZMYANAYA II-P.G.	N6641 E3353	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	2	
BEZMYANAYA	N6448 E3509	-	-	-	-	-	-	-	-	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	3	
BEZMYANYI BAKIYSH-P.G.	N6641 E3353	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	3	
BLIZNETS BOLSHOY-L.I.	N6706 E3240	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	
BLIZNETS MALYY-L.I.	N6706 E3240	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	
BLIZNETS SEVERNIY-T.A.	N6649 E3247	-	-	-	-	-	-	-	-	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	4	
BLIZNETS YUZNIY-T.A.	N6649 E3247	-	-	-	-	-	-	-	-	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	3	
BOGOMOLIKHA MALAYA-S.A.	N6704 E3231	-	-	-	-	-	-	-	-	3	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	2	
BOGOMOLIKHA-S.A.	N6704 E3231	-	-	-	-	-	-	-	-	3	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	3	
BORSHOVZ DLINNY	N6423 E3608	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
BORSHOVZ2 GOLOMYANNY	N6429 E3607	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	4	
BORSHUTICHA	N6429 E3504	-	-	-	-	-	-	-	-	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	2	
BREVNUSHKA-S.A.	N6659 E3238	-	-	-	-	-	-	-	-	X	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	2	
BRUSNICHNIY-B.M.	N6635 E3313	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	0	
CHAYACH'YA-B.M.	N6638 E3312	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	4	
CHAYACH'YA-P.G.	N6646 E3334	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	5	
CHAYACH'YA-T.A.	N6650 E3246	-	-	-	-	-	-	-	-	3	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	4	
CHERNAYA-S.A.	N6703 E3234	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	
CHERNYAIKHA-P.G.	N6642 E3351	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	
CHIRKOVAIA-B.M.	N6638 E3313	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	5	
D'YACHIKHA-P.G.	N6645 E3345	-	-	-	-	-	-	-	-	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	1	
DALEKAYA-P.G.	N6647 E3335	-	-	-	-	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	5	
DALNY	N6430 E3505	-	-	-	-	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	5	
DEMEHIKHA BOLSHAYA-S.A.	N6702 E3236	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	
DEMEHIKHA MALAYA-S.A.	N6702 E3236	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	
DEVICH'YA-S.A.	N6659 E3237	-	-	-	-	-	-	-	-	3	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	5	
DLINNAYA RISH-LUDA (N-E CAPE)	N6431 E3500	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	3	
DOBUSHKA-S.A.	N6657 E3232	-	-	-	-	-	-	-	-	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	3	
DOKUCHIRKHA-S.A.	N6658 E3239	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
DOLGAYA KORGA	N6431 E3458	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	5	
DOLGAYA KORGA-L.I.	N6707 E3237	-	-	-	-	-	-	-	-	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	3	
DOLGAYA LUDA-O.I.	N6706 E3226	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	2	
DOLGAYA FRIEBELJNAYA-K.L.	N6625 E3343	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	3	

Colony name	Coordinates	WJELA	MOBAS	PHCAR	PHARI	BRLEU	BRBER	ANERA	SOMOL	SOSPE	LAFUS	LAARG	LAHYP	LAMAR	LACAN	LASAB	RITRI	PAEUB	STPAR	ALALL	ALTOR	URJAL	URJOM	CEGRY	FRARC	Species
DOLGAYA-P.G.	N6646 E3341	-	-	-	-	-	-	-	2	-	-	2	-	-	2	-	-	1	-	-	-	-	-	2	-	5
DOMNIN(E)	N6455 E3506	-	-	-	-	-	-	-	2	-	-	2	-	-	-	-	-	-	1	-	-	-	-	1	-	4
DOMNIN(W)	N6455 E3505	-	-	-	-	-	-	-	1	-	-	1	-	-	1	-	-	-	2	-	-	-	-	2	-	5
DRESTNOY BAKLYSH-T.A.	N6653 E3243	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
DVOINOY-P.G.	N6642 E3348	-	-	-	-	-	-	-	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	3
ELOVAYA SEVERNAYA-O.I.	N6705 E3230	-	-	-	-	-	-	-	3	-	-	2	-	1	1	-	-	-	1	-	-	-	-	-	-	5
ELOVAYA VOSTOCHNAYA-O.I.	N6705 E3230	-	-	-	-	-	-	-	3	-	-	2	-	1	1	-	-	-	1	-	-	-	-	-	-	4
ELOYVY-B.M.	N6638 E3310	-	-	-	-	-	-	-	2	-	-	2	-	1	3	-	-	-	1	-	-	-	-	-	-	4
ELOYVY-O.I.	N6705 E3230	-	-	-	-	-	-	-	2	-	-	2	-	1	2	-	-	-	1	-	-	-	-	-	-	5
FARVATERNAYA-S.A.	N6705 E3229	-	-	-	-	-	-	-	-	-	-	2	-	1	2	-	-	-	-	-	-	-	-	1	-	5
FIGURNYY-P.G.	N6648 E3337	-	-	-	-	-	-	-	2	-	-	1	-	-	1	-	-	-	1	-	-	-	-	1	-	5
GAGA	N6502 E3452	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	2	-	-	-	-	-	-	3
GAGACHKA-B.M.	N6636 E3309	-	-	-	-	-	-	-	2	-	-	2	-	1	1	-	-	-	1	-	-	-	-	-	-	5
GAGARYA SEVERNAYA-B.M.	N6636 E3312	-	-	-	-	-	-	-	1	-	-	1	-	-	1	-	-	-	1	-	-	-	-	-	-	4
GAGARYA YUZUNAYA-B.M.	N6636 E3312	-	-	-	-	-	-	-	1	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	1
GAGARKINA-T.A.	N6650 E3248	-	-	-	-	-	-	-	2	-	-	2	-	1	2	-	-	-	-	-	-	-	-	-	-	4
GNIDINSKAYA LUDA-O.I.	N6706 E3225	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	3
GNIDRA-O.I.	N6706 E3225	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2
GNIDULA SEVERNAYA-O.I.	N6706 E3225	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	0
GNIDULA YUZUNAYA-O.I.	N6706 E3225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
GOGOLINAYA-B.M.	N6634 E3311	-	-	-	-	-	-	-	1	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	1
GOLAYA-B.M.	N6638 E3311	-	-	-	-	-	-	-	1	-	-	1	-	-	1	-	-	-	2	-	-	-	-	-	-	4
GOLAYA-S.A.	N6704 E3238	-	-	-	-	-	-	-	2	-	-	1	-	-	2	-	-	-	-	-	-	-	-	-	-	3
GOLOMYANNAYA LUDA-O.I.	N6705 E3226	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
GOLOVIN-S.A.	N6658 E3241	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
GOLOVINKA-S.A.	N6657 E3241	-	-	-	-	-	-	-	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	3
GOLYE LUDY-P.G.	N6643 E3348	-	-	-	-	-	-	-	2	-	-	2	-	1	1	-	-	1	-	-	-	-	2	-	-	6
GORBATAVA-P.G.	N6647 E3337	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	2
GORBATYV-B.M.	N6634 E3309	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	1
GORBUSHA-T.A.	N6650 E3245	-	-	-	-	-	-	-	3	-	-	2	-	-	-	-	-	-	-	-	-	2	-	-	-	4
GORELAYA-S.A.	N6704 E3228	-	-	-	-	-	-	-	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	4
GORELYV-L.I.	N6706 E3241	-	-	-	-	-	-	-	2	-	-	1	-	-	3	-	-	-	1	-	-	-	-	1	-	5
GOMELY-S.A.	N6704 E3237	-	-	-	-	-	-	-	3	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	2
GORODETSKIY-R.V.	N6634 E3302	-	-	-	-	-	-	-	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	1
GRUMAND-K.I.	N6625 E3353	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
GRYAZNUKHA-S.A.	N6658 E3241	-	-	-	-	-	-	-	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	1
GULMAKHA MALAYA-S.A.	N6701 E3240	-	-	-	-	-	-	-	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	1	-	3
GULMAKHA-S.A.	N6700 E3240	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
GUSINYY-K.I.	N6626 E3350	-	-	-	-	-	-	-	1	-	-	3	-	1	1	-	-	1	-	-	-	-	2	-	-	6
HACHATANENKA	N6503 E3452	-	-	-	-	-	-	-	-	-	-	2	-	1	2	-	-	-	3	-	-	2	-	-	-	7
HIEBNAYA LUDA	N6413 E3643	-	-	-	-	-	-	-	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	1
IRIN'IN-S.A.	N6703 E3229	-	-	-	-	-	-	-	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2
IRINENOK-S.A.	N6703 E3229	-	-	-	-	-	-	-	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	1
IRINKA-S.A.	N6703 E3229	-	-	-	-	-	-	-	2	-	-	2	-	-	1	-	-	-	1	-	-	-	-	-	-	5
IRVASIKHA-S.A.	N6659 E3242	-	-	-	-	-	-	-	3	-	-	2	-	1	-	-	-	-	-	-	-	-	-	-	-	4
IZBYANOV-K.L.	N6625 E3349	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	2
IZVILISTYY-P.G.	N6647 E3340	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	0
KAMEN-LUDA-B.M.	N6634 E3311	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
KAMENNY-B.M.	N6706 E3241	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
KAMENNY-L.I.	N6634 E3311	-	-	-	-	-	-	-	1	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	2
KANDA VOSTOCHNAYA-O.I.	N6707 E3218	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
KANDA ZAPADNAYA-O.I.	N6707 E3218	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
KARBONATNAYA-P.G.	N6644 E3338	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
KEMET'SKIJ BAKLYSH	N6618 E3357	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
KHEDOSTROV BOLSHOY-P.G.	N6643 E3339	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
KHEDOSTROV MALYY-P.G.	N6643 E3337	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
KHLEBETS BOLSHOY-P.G.	N6642 E3350	-	-	-	-	-	-	-	2	-	-	2	-	1	1	-	-	-	1	-	-	-	-	-	-	5
KHLEBETS KRAVNIY-P.G.	N6641 E3350	-	-	-	-	-	-	-	2	-	-	1	-	1	-	-	-	-	1	-	-	-	-	-	-	3
KHLEBETS SREDNIY-P.G.	N6642 E3350	-	-	-	-	-	-	-	2	-	-	2	-	-	-	-	-	-	1	-	-	-	-	-	-	5
KIDRINSKAYA SEVERNAYA-K.	N6656 E3249	-	-	-	-	-	-	-	2	-	-	2	-	-	1	-	-	-	-	-	-	-	-	-	-	4
KIDRINSKAYA SMORODINNAYA-K.	N6656 E3250	-	-	-	-	-	-	-	2	-	-	2	-	1	1	-	-	-	1	-	-	-	-	-	-	5
KIDRINSKAYA STVORNAYA-K.	N6656 E3250	-	-	-	-	-	-	-	2	-	-	2	-	1	1	-	-	-	-	-	-	-	-	-	-	5
KIDRINSKAYA VOSTOCHNAYA-K.	N6656 E3250	-	-	-	-	-	-	-	2	-	-	2	-	1	1	-	-	-	-	-	-	-	-	-	-	6
KIVREIKHA-V.A.	N6645 E3300	-	-	-	-	-	-	-	3	-	-	2	-	1	3	-	-	-	3	-	-	-	-	-	-	6
KIVREY	N6427 E3519	-	-	-	-	-	-	-	-	-	-	2	-	-	1	-	-	-	-	-	-	-	-	-	-	6

Colony name	Coordinates	WGLA	MOBAS	PHCAR	PHARI	BRLEU	BRBER	ANBRA	ANANS	SOMOL	SOSPE	LAFUS	LAARG	LAHYP	LAMAR	LACAN	LASAB	RITRI	PABBU	STPAR	ALALL	ALTOR	URDAL	URLOM	CSGRY	FRARC	Species
LOTSMANSKIE-S.A.	N6704 E3237	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	2	
LUDA-VODOCHLEBKA	N6457 E3503	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	
LUKOVATY	N6447 E3459	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	1	3	
LUNNYE-S.A.	N6705 E3229	-	-	-	-	-	-	-	2	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	3	
MALAYA-K.L.	N6626 E3349	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-	-	-	-	-	-	-	-	-	1	
MALY KUSMIN	N6413 E3642	-	-	-	-	-	-	-	1	-	-	-	-	2	-	1	-	-	-	3	-	-	-	-	1	5	
MALYSHKA-S.A.	N6659 E3238	-	-	-	-	-	-	-	2	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	2	
MALYUTKA-P.G.	N6647 E3339	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
MARTINA LESNAYA-B.M.	N6635 E3305	-	-	-	-	-	-	-	2	-	-	-	-	1	-	1	-	-	-	1	-	-	-	-	-	4	
MARTINA MALAYA-B.M.	N6635 E3305	-	-	-	-	-	-	-	1	-	-	-	-	1	-	1	-	-	-	1	-	-	-	-	-	4	
MARTINA VOSTOCHNAYA-B.M.	N6635 E3305	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	
MEDVEZHIY BOLSHOY-S.A.	N6700 E3240	-	-	-	-	-	-	-	2	-	-	-	2	-	1	2	-	-	-	1	-	-	-	-	-	4	
MEDVEZHIY MALY-S.A.	N6659 E3240	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
MEDVEZHIY-P.G.	N6643 E3341	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	
MELPAU	N6411 E3622	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	2	
MELKAYA-S.A.	N6703 E3236	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	
MERTVETSKAYA KORGA-O.I.	N6706 E3226	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	
MERTVETSKAYA SKALA-O.I.	N6706 E3226	-	-	-	-	-	-	-	1	-	-	-	1	2	-	1	2	-	-	-	-	-	-	-	-	4	
MERTVYAKHAYA LUDA	N6511 E3445	-	-	-	-	-	-	-	2	-	-	-	1	2	-	1	2	-	-	2	-	-	-	1	-	6	
MEZHENNY BOLSHOY-P.G.	N6644 E3348	-	-	-	-	-	-	-	1	-	-	-	-	2	-	1	-	-	-	2	-	-	-	-	-	4	
MEZHENNY MALY-P.G.	N6644 E3348	-	-	-	-	-	-	-	2	-	-	-	-	1	-	1	-	-	-	1	-	-	-	-	-	4	
MOLOCHNITSA-R.V.	N6641 E3307	-	-	-	-	-	-	-	2	-	-	-	3	-	1	2	-	-	-	3	-	-	-	2	-	6	
MORJENEZ	N6403 E3656	-	-	-	-	-	-	-	2	-	-	2	-	-	-	-	-	-	-	3	-	-	-	-	-	7	
MORYANKA-L.I.	N6704 E3241	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	1	-	-	-	1	-	4	
MOZJJEVELOVAYA-P.G.	N6648 E3334	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	3	
NACHALNAYA-S.A.	N6659 E3237	-	-	-	-	-	-	-	2	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	2	
NATALINA-L.I.	N6707 E3239	-	-	-	-	-	-	-	1	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	3	
NAUMIKHA-P.G.	N6646 E3343	-	-	-	-	-	-	-	2	-	-	-	3	-	1	2	-	-	-	1	-	-	-	-	1	5	
NAUMIKHA-R.V.	N6635 E3329	-	-	-	-	-	-	-	-	-	-	-	-	3	-	1	2	-	-	3	-	-	-	2	-	6	
NAVLOCHNAYA-S.A.	N6701 E3240	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
NIZINNAYA-B.M.	N6634 E3312	-	-	-	-	-	-	-	2	-	-	-	1	-	-	2	-	-	-	1	-	-	-	-	-	4	
NIZOVOY BOLSHOY	N6453 E3500	-	-	-	-	-	-	-	1	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	3	
NIZOVOY MALY	N6453 E3459	-	-	-	-	-	-	-	1	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	4	
NJAPA	N6402 E3709	-	-	-	-	-	-	-	X	-	-	-	X	-	-	X	-	-	-	-	-	-	-	-	X	5	
NOKHCALUDA MALAYA	N6450 E3506	-	-	-	-	-	-	-	2	-	-	-	1	-	-	-	-	-	-	2	-	-	-	-	-	3	
NOVAYA LUDA-B.M.	N6638 E3313	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	
OBZITTOY-P.G.	N6645 E3347	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	2	
ODINOKAYA-P.G.	N6646 E3337	-	-	-	-	-	-	-	2	-	-	-	-	1	-	1	-	-	-	1	-	-	-	-	-	4	
OGORODNAYA-B.M.	N6634 E3311	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	
OLENEK MOKHATYV-O.I.	N6705 E3226	-	-	-	-	-	-	-	1	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	3	
OLENEK OTDELNYV-O.I.	N6705 E3225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	
ONEGA BAY 1 (NAME IS ABSENT)	N6407 E3641	-	-	-	-	-	-	-	2	-	-	1	2	-	-	1	-	-	-	-	-	-	-	1	-	5	
ONEGA BAY 2 (NAME IS ABSENT)	N6406 E3642	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	
ONEGA BAY 3 (NAME IS ABSENT)	N6412 E3643	-	-	-	-	-	-	-	2	-	-	1	1	-	-	1	-	-	-	-	-	-	3	-	-	6	
ONEGA BAY 4 (NAME IS ABSENT)	N6412 E3644	-	-	-	-	-	-	-	2	-	-	-	-	1	-	-	-	-	-	2	-	-	-	2	-	5	
ONEGA BAY 5 (NAME IS ABSENT)	N6411 E3638	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	3	
ONEGA BAY 6 (NAME IS ABSENT)	N6411 E3628	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	
ONEGA BAY 7 (NAME IS ABSENT)	N6411 E3629	-	-	-	-	-	-	-	-	-	-	-	2	-	-	1	-	-	-	2	-	-	-	-	-	2	
ONEGA BAY 8 (NAME IS ABSENT)	N6411 E3625	-	-	-	-	-	-	-	2	-	-	-	-	2	-	-	-	-	-	-	-	-	1	-	-	6	
ONEGA BAY 9 (NAME IS ABSENT)	N6412 E3627	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	4	
ONEGA BAY10 (NAME IS ABSENT)	N6413 E3626	-	-	-	-	-	-	-	2	-	-	2	2	-	-	-	-	-	-	2	-	-	-	-	-	7	
ONEGA BAY11 (NAME IS ABSENT)	N6413 E3627	-	-	-	-	-	-	-	-	-	-	1	1	-	1	1	-	-	-	-	-	-	-	1	-	4	
ONEGA BAY12 (NAME IS ABSENT)	N6414 E3625	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	
ONEGA BAY13 (NAME IS ABSENT)	N6414 E3623	-	-	-	-	-	-	-	2	-	-	1	1	-	1	1	-	-	-	1	-	-	-	-	-	4	
ONEGA BAY14 (NAME IS ABSENT)	N6414 E3620	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	
ONEGA BAY15 (NAME IS ABSENT)	N6415 E3625	-	-	-	-	-	-	-	2	-	-	-	-	1	-	1	-	-	-	2	-	-	-	-	-	5	
ONEGA BAY16 (NAME IS ABSENT)	N6415 E3627	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	4	
ONEGA BAY17 (NAME IS ABSENT)	N6416 E3624	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	5	
ONEGA BAY18 (NAME IS ABSENT)	N6414 E3632	-	-	-	-	-	-	-	2	-	-	1	1	-	-	3	-	-	-	-	-	-	-	-	-	4	
ONEGA BAY19 (NAME IS ABSENT)	N6414 E3631	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	
ONEGA BAY20 (NAME IS ABSENT)	N6415 E3632	-	-	-	-	-	-	-	2	-	-	-	-	1	-	1	-	-	-	3	-	-	-	-	-	1	
ONEGA BAY21 (NAME IS ABSENT)	N6416 E3632	-	-	-	-	-	-	-	2	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	5	
ONEGA BAY22 (NAME IS ABSENT)	N6417 E3631	-	-	-	-	-	-	-	-	-	-	1	2	-	1	-	-	-	-	1	-	-	-	-	-	7	
ONEGA BAY23 (NAME IS ABSENT)	N6418 E3630	-	-	-	-	-	-	-	1	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	6	
ONEGA BAY24 (NAME IS ABSENT)	N6417 E3624	-	-	-	-	-	-	-	-	-	-	-	2	-	-	2	-	-	-	1	-	-	-	-	-	5	
ONEGA BAY25 (NAME IS ABSENT)	N6417 E3625	-	-	-	-	-	-	-	1	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	3	

Colony name	Coordinates	FUGIA	MOBAS	PHCAR	PHARI	BRLEU	BRBER	ANBRA	ANRNS	SOMOL	SOSPE	LAFUS	LAARG	LAHYF	LAJAR	LACAN	LASAB	RITBI	PABBU	STPAR	MAALL	ALTOR	URNAL	CGRY	FRANC	Species
SUMSKAYA GUBA-KOROVY 3	N6421 E3532	-	-	-	-	-	-	-	-	1	-	-	2	-	-	1	-	-	-	-	-	-	-	-	-	3
SUMSKAYA GUBA-LUDA1 (NAME IS ABSENT)	N6423 E3535	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	2	-	-	-	-	-	3
SUMSKAYA GUBA-LUDA2 (NAME IS ABSENT)	N6423 E3529	-	-	-	-	-	-	-	-	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	3
SUMSKAYA GUBA-LUDA3 (NAME IS ABSENT)	N6423 E3531	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	3
SUMSKAYA GUBA-LUDA4 (NAME IS ABSENT)	N6423 E3530	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
SUMSKAYA GUBA-LUDA5 (NAME IS ABSENT)	N6422 E3530	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	4
SUMSKAYA GUBA-LUDA6 (NAME IS ABSENT)	N6422 E3529	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
SUMSKAYA GUBA-LUDA7 (NAME IS ABSENT)	N6421 E3529	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
SUMSKAYA GUBA-NARUGNJAYA KORGA	N6421 E3529	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
SUMSKAYA GUBA-OVETSHY 1	N6422 E3522	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	3
SUMSKAYA GUBA-OVETSHY 2	N6422 E3521	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
SUMSKAYA GUBA-SENNUCHA	N6422 E3531	-	-	-	-	-	-	-	-	2	-	-	-	-	-	2	-	-	-	1	-	-	-	-	-	4
SUMSKAYA GUBA-VEHLUDA1	N6421 E3535	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
SUMSKAYA GUBA-VEHLUDA2	N6420 E3535	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	4
TARASENOK-T.A.	N6649 E3244	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	5
TARASTIKHA-T.A.	N6649 E3244	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
TELKA BOGATAYA-O.I.	N6707 E3220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	2
TERROICHA	N6503 E3500	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
TERVONEZ 1(SW)	N6502 E3457	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	5
TERVONEZ 2(NE)	N6502 E3458	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	5
TIT-LUDA	N6426 E3606	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
TITKOV BAKLYSH-R.V.	N6638 E3320	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
TOLOKNYANKA SEVERNAYA-O.I.	N6707 E3222	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	4
TOLOKNYANKA YUZNAYA-O.I.	N6707 E3222	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
TOLOKONITSA BOLSHAYA-O.I.	N6707 E3222	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
TOLOKONITSA MALAYA-O.I.	N6707 E3222	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
TONECHKA SEVERNAYA-O.I.	N6707 E3225	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
TONECHKA YUZNAYA-O.I.	N6707 E3225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	5
TONECHKA ZAPADNAYA-O.I.	N6707 E3224	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
TORNAYA LUDA-O.I.	N6707 E3224	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
TOP BOL'SHOY	N6500 E3527	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	5
TOP Maly	N6459 E3527	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	3
TOPA BOLSHAYA-B.M.	N6637 E3309	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	5
TOPA MALAYA-B.M.	N6638 E3306	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
TRAVYANAYA LITORALNAYA-L.I.	N6705 E3244	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	3
TRAVYANAYA-K.L.	N6625 E3348	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
TRAVYANAYA-L.I.	N6705 E3245	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	4
TSENTRALNAYA VOSTOCHNAYA-K.L.	N6625 E3349	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
TSENTRALNAYA ZAPADNAYA-K.L.	N6625 E3349	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
TSENTRALNAYA-S.A.	N6703 E3236	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
TSYSP-LUDA-S.A.	N6703 E3236	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
TUKACHENOK-B.M.	N6637 E3313	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
TUKACHEVAYA-B.M.	N6637 E3313	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
TURPANIY BOLSHOY-R.V.	N6634 E3306	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
TURPANIY MALYY-R.V.	N6634 E3306	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	2
UCHKONEZ BEREGNOY	N6408 E3651	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
UCHKONEZ BESMYANNY	N6408 E3650	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
UCHKONEZ GOLOMYANNY	N6409 E3650	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
UG-KORGA	N6425 E3535	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	2
UTENOK SEVERNYY-L.I.	N6705 E3243	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
UTENOK VOSTOCHNYY-L.I.	N6705 E3243	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
UTENOK ZAPADNYY-L.I.	N6705 E3242	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
UTINAYA-B.M.	N6638 E3313	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
UZJEMTSEVA SEVERNAYA-B.M.	N6636 E3304	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
UZJEMTSEVA YUZNAYA-B.M.	N6636 E3304	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
UZKAYA-P.G.	N6647 E3337	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	4
VACHEV-V.A.	N6647 E3255	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
VANKA-O.I.	N6706 E3226	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	1
VELICHAIKHA BOLSHAYA-R.V.	N6631 E3333	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
VELICHAIKHA MALAYA-R.V.	N6632 E3332	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
VERSLYUD-T.A.	N6650 E3244	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
VERSOVAYA-S.A.	N6659 E3238	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
VIRMA GUBA: LUDA1 (NAME IS ABSENT)	N6421 E3513	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
VIRMA GUBA: LUDA2 (NAME IS ABSENT)	N6421 E3512	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
VIRMA GUBA: LUDA3 (NAME IS ABSENT)	N6422 E3512	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2

Colony name	Coordinates	FUGLA	MOBAS	PHCAR	PHARI	BRLEU	BRBER	ANBRA	ANANS	SOMOL	SOSPE	LAFUS	LAARG	LAHYP	LAMAR	LACAN	LASAB	RITRI	PAEPU	STPAR	ALALL	ALTOR	URPAAL	URLOM	CEGRY	FEARC	Species
VIADA-L.I.	N6706 E3241	-	-	-	-	-	-	-	2	-	-	1	-	-	-	2	-	-	-	-	-	-	-	-	-	-	4
VIADYKA-L.I.	N6705 E3241	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	0
VIASIKHA MALAYA-L.I.	N6705 E3243	-	-	-	-	-	-	-	1	-	-	1	-	-	-	2	-	-	-	-	-	-	-	-	-	-	3
VIASIKHA-L.I.	N6705 E3243	-	-	-	-	-	-	-	1	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	3
VLASOV BEREZNOY-L.I.	N6705 E3242	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	3
VLASOV GOLOMANYY-L.I.	N6704 E3243	-	-	-	-	-	-	-	2	-	-	2	-	-	1	1	-	-	-	-	-	-	-	-	-	-	4
VLASOV KRUGLIY-L.I.	N6705 E3243	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
VLAZJNAYA GOLAYA-L.I.	N6705 E3240	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	2
VLAZJNAYA KROSHKA-L.I.	N6705 E3241	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	2
VLAZJNAYA LESNAYA-L.I.	N6705 E3241	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
VLAZJNAYA SRENNAYA-L.I.	N6705 E3241	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
VORONICHNAYA-S.A.	N6704 E3229	-	-	-	-	-	-	-	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
VORONICHNIK VOSTOCHNYY-O.I.	N6707 E3221	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	1	-	-	-	-	-	-	3
VORONICHNIK ZAPADNYY-O.I.	N6707 E3221	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
VORONICHNITSA-O.I.	N6707 E3221	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
VORONTY-S.A.	N6701 E3228	-	-	-	-	-	-	-	2	-	-	2	-	-	-	2	-	-	-	-	-	-	-	-	-	-	3
VORONKA-S.A.	N6701 E3238	-	-	-	-	-	-	-	3	-	-	2	-	-	-	-	1	-	-	-	-	-	-	-	-	-	4
VORONY BOLSHOV	N6413 E3629	-	-	-	-	-	-	-	1	-	-	1	-	-	-	2	-	-	-	-	-	-	-	-	2	-	4
VOSTOCHNAYA-S.A.	N6658 E3239	-	-	-	-	-	-	-	1	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	3
VREDNAYA-O.I.	N6706 E3226	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
VSTANKA-O.I.	N6705 E3226	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
VYSKOCHKA-L.I.	N6705 E3242	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
VYSOKIY I-P.G.	N6642 E3351	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1
VYSOKIY II-P.G.	N6642 E3351	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	3
YAGODNAYA I-P.G.	N6647 E3340	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
YAGODNAYA II-P.G.	N6647 E3340	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
YAGODNAYA III-P.G.	N6647 E3341	-	-	-	-	-	-	-	1	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	2
YAGODNYY BOLSHOV-P.G.	N6646 E3340	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	4
YAGODNYY MALYY-P.G.	N6606 E3341	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
YATKO-LUDA BOLSHAYA	N6417 E3617	-	-	-	-	-	-	-	2	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	2	-	4
YATKO-LUDA MALAYA	N6417 E3618	-	-	-	-	-	-	-	2	-	-	-	3	-	-	-	-	-	-	-	-	-	-	2	-	-	4
YUNNATKA-B.M.	N6636 E3307	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
YUZJNAYA BOLSHAYA-P.G.	N6646 E3341	-	-	-	-	-	-	-	2	-	-	2	-	-	1	-	-	-	-	1	-	-	-	-	-	-	5
YUZJNAYA I-K.L.	N6625 E3351	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
YUZJNAYA II-K.L.	N6625 E3351	-	-	-	-	-	-	-	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
YUZJNAYA MALAYA-P.G.	N6646 E3340	-	-	-	-	-	-	-	2	-	-	-	2	-	1	-	-	-	-	-	-	-	-	1	-	-	4
YUZJNAYA-S.A.	N6658 E3237	-	-	-	-	-	-	-	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	1	-	0
ZAPADNYY-B.M.	N6637 E3305	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	3
ZELENNY BOLSHOV-B.M.	N6636 E3308	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2
ZELENNY DVOIHOY-B.M.	N6636 E3308	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
ZELENNY I-P.G.	N6648 E3333	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
ZELENNY II-P.G.	N6648 E3334	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
ZELENNY III-P.G.	N6648 E3334	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
ZELENNY MALYY-B.M.	N6636 E3308	-	-	-	-	-	-	-	2	-	-	-	1	-	-	1	-	-	-	1	-	-	-	-	-	-	4
ZELENNY-K.L.	N6625 E3349	-	-	-	-	-	-	-	1	-	-	-	3	-	-	2	-	-	-	-	-	-	-	-	-	-	0
ZIMNICHNAYA KROSHKA-O.I.	N6706 E3225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
ZIMNICHNAYA LUDA-O.I.	N6706 E3225	-	-	-	-	-	-	-	1	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	3

The Kara Sea

By Maria V. Gavrilov and Vidar Bakken

Physical and biological conditions

The information concerning physical conditions and oceanographic features are mainly from Nikiforov & Shapaikher (1980), Matishov *et al.* (1989) and Pavlov *et al.* (1996).

The Kara Sea is one of the Siberian Arctic Seas (Fig 2). It borders to the Arctic Ocean and the largest portion is situated at the continental shelf. It is a relatively shallow sea with an average depth of 111 m and the size is 883 000 km². Approximately 82% of the area is at the shelf zone with depths of less than 200 meter. About 64% of the Kara Sea area has depths of less than 100 m and only 2% has depths deeper than 500 m. A characteristic feature of the bottom topography is the presence of deep-water troughs. St. Anna is situated in the northern part of the sea with a maximum depth of 620 m, which is the deepest point in the Kara Sea. The deep-water through Voronin runs along the eastern Novaya Zemlya coast (down to 450 m). In between is a Central Kara Upland with depths of less than 50 m. The southern and the eastern parts adjacent to the mainland are both shallow.

There are many islands in the Kara Sea and most are small and located along the shores. However, several relatively big islands are situated in the northern part of the sea. Two big archipelagos, Novaya Zemlya and Severnaya Zemlya, border the Kara Sea to the west and east, respectively. Compared to other Arctic seas, the Kara Sea has the highest ratio between coastline length and sea area (Gakkell & Govorukha 1970). Deep fjords are mostly found in the eastern Severnaya Zemlya archipelago. The coasts are formed by different types of rocks and belong to different morphological shore types. The shores of Yamal and Gydan are basically low and formed by soft sediments. The shores in Taimyr are generally higher, and both soft and hard types of rocks occur. Cliffs facing the sea are found in the northern Taimyr and on the eastern coast of the Novaya Zemlya and Severnaya Zemlya archipelagos, while the coastline of western Severnaya Zemlya is relatively low. Cliff-breeding seabirds are only found at Novaya Zemlya, Severnaya Zemlya and at Troinoy Island.

The water structure in the Kara Sea is influenced by the inflow of water from the Arctic Basin and the Barents Sea, as well as the continental run-off. Five different types of water masses can be identified: Barents Sea water, water from the rivers, surface water from the Arctic Basin and the Siberian Shelf seas, and mixed water. Their distribution in the surface layer varies significantly between seasons. One special feature of the Kara Sea is a strong continental outflow, which is the greatest registered in the Arctic seas. The

annual river run-off to the sea averages 1350 km³, which is 2.8 times higher than in the Barents Sea, and constitutes almost half of the total river water discharge into the Russian Arctic seas. The rivers Ob, Yenisei, Pyasina, Pur, Taz and numerous smaller ones run into the Kara Sea. Ob and Yenisei are the largest rivers in Russia accounting for 75% of the freshwater inflow to the Kara Sea (Ivanov 1996).

By receiving a great amount of fresh and warm river discharge, the Kara Sea is characterised by an unstable saline regime in the upper layer. Surface water outside the rivers Ob and Yenisei rivers has a salinity of 7-10‰ and a temperature of 5-8° C. Below the level of heated and desalinated surface layer, a drop in temperature and an increase of salinity is recorded in the entire Kara Sea. The influence of the desalinated surface layer can be followed hundred of kilometres from the river mouths.

Well-pronounced summer stratification and extensive ice formation during the cold winter period strongly effect on the mixing of the water masses. Strong vertical stratification prevents high biological production in the upper layer of the water column. Considerable amounts of nutrients and organic matter concentrate in layers low in the water column and near the bottom. In years with heavy ice conditions, a strong stratification of water masses is observed. This in turn prevents vertical mixing and the warm and nutrient-rich water stays in the deep (Abramov 1985).

A system of permanent currents in the Kara Sea is a result of combined influence of winds, water exchange, ice-cover dynamics and river run-off, with the latter being much more important compared to the Barents Sea. In the southwestern part of the Kara Sea is an anticlockwise gyre (The Kara Sea gyre) between the Yamal Peninsula and the Southern Island of Novaya Zemlya. It consists of relatively warm Barents Sea water penetrating through the Novaya Zemlya straits as well as Atlantic sub-surface water from the St. Anna trough. Another warm inflow from the Barents Sea is well pronounced north off Zhelania Cape. Part of the water from the Kara Sea Gyre reaches the area close to the Kara Gate Strait, and then flows parallel with the cold Lithke Current into the Barents Sea.

In the Ob-Yenisei region katabatic currents govern circulation. In the central part, the surface water is transported northward into the Arctic Basin by the St. Anna Current. Another major water transport is heading northeast along the continental coast to the Severnaya Zemlya archipelago, and parts of the water masses pass through the Vilkitskiy Strait.

The sea ice formation starts in September in the northern part of the Kara Sea, and this area is ice covered until June. From October to May almost the entire sea is ice cov-

ered. The coastal zone is occupied by fast ice. Stranded ice, mostly created in the eastern part of the sea, breaks up during the summer. Outside the stranded ice there is a zone of open water or young ice which forms a system of recurring polynyas. Pack ice is represented mainly by first-year ice of local origin with a maximum thickness of 1.5-2 m. The minimum ice extent is in September, but in the northern regions drift ice may be found all year.

The ice cover is an important oceanographic factor affecting the Arctic marine organisms. It strongly impacts on the foraging conditions and thus distribution of seabirds in the Kara Sea. A few surveys conducted in the Kara Sea (Bakken and Gavrilov 1995, Decker *et al.* 1998) showed that offshore the birds tended to concentrate in the ice-covered waters. It is shown that the ecosystems of the recurring polynyas as well as those along the marginal ice edge are characterised by enhanced biological productivity. Seabird colonies in the high Arctic are often found in association with recurring polynyas (Kupetskiy 1959, Brown & Nettle-ship 1981 and others). The only large seabird colony in the Kara Sea is located at the northern tip of the Novozemelskaya polynya. The colonies at Severnaya Zemlya are located close to the Eastern Severozemelskaya polynya along the boundary of the continental slope. Seabirds have been recorded as early as April in the polynya north off Severnaya Zemlya at 82°N (Urvantsev 1935, Ushakov 1951). The Ob-Yenisei polynya seems to be an important staging area for the king eiders in spring (R. Borisov, pers. comm.).

Compared to the Barents Sea, the prey availability for seabirds in the Kara Sea is not that abundant and diverse. According to different studies, the average biomass of zooplankton and zoobenthos was found to be much lower than in the Barents Sea (Yashnov 1940, Zenkevich & Filatova 1957, Fomin 1989).

Most fish species which are important prey items for seabirds in the Barents Sea, such as capelin *Mallotus villosus*, herring *Clupea harengus* and sandeel *Ammodytes marinus*, migrate into the Kara Sea along with the warm water currents that pass through the Kara Gate, Yugor Shar Strait, Matochkin Shar Strait and occasionally north off Zhelaniya Cape (Antonov & Chernova 1989, Neelov & Chernova 1997). Hence, these species have only a limited distribution in the Kara Sea and are in general not important as prey items for seabirds in the Kara Sea. On the other hand, sympagic (under-ice) fishes such as polar cod *Boreogadus saida*, Arctic seasnail *Liparis fabricii* and some other species are very numerous and found both in the coastal and the pelagic areas of the Kara Sea. The sympagic biota is an important link in the food web in northern ice-covered oceans (Melnikov 1989). Young age classes of polar cod are the principal prey item for many marine predators in Arctic seas (Klumov 1937, Mehlum & Gabrielsen 1993). Polar cod feeds on sympagic plankton and is often found in leads and in cavities under the ice (Lønne & Guliksen 1989). As the ice melts, polar cod move into deeper water (Klumov 1937, Ponomarenko 1968) and large aggregations of polar cod are found within the ice melt zone

(Butorin 1965). Available data suggest that polar cod and sympagic crustaceans are likely to be the most important prey items for seabirds in the Kara Sea. High densities of seabirds are found in the ice-covered waters of the Kara Sea (Bakken & Gavrilov 1995, Decker *et al.* 1998).

In contrast to the low-productive pelagic region of the Kara Sea, adjacent estuaries seem to support higher biological productivity based on organic matter carried out by the rivers (Vinogradov *et al.* 1994). Juvenile whitefish (*Coregonidae*) use estuaries as nursery areas (Moskalenko 1958, Pirozhnikov 1974). These young fishes are very numerous in the Ob and Yenisei Bays and are probably important prey for piscivorous birds feeding in these estuaries.

The intertidal zone of the Kara Sea, in contrast to the southern Barents Sea and the White Sea, is quite narrow due to small tidal differences. The benthic fauna is almost absent in the open littoral zone due to the scouring effect of the ice. Under such conditions the bottom epifauna shift to the sub-littoral zone, thus become inaccessible to some seabirds.

Distribution of seabird colonies and number of breeding birds (Tables 11-16, Figure 12, Appendix 2)

The data stored in the database do not accurately reflect the actual distribution of colonies and the number of marine birds in the Kara Sea. Within the area under consideration, there are registered 179 colonies. Of these, 127 colonies (71%) have been censused.

The area with least information is the eastern coast of Novaya Zemlya where only six colonies are registered in the northern part from studies in the 1930s. The southern part has not yet been surveyed for seabird colonies. The Severnaya Zemlya archipelago is apparently the best studied region with 71 colonies registered. In addition, several others are probably not registered on the islands, either remote or inshore in the Kara Sea Islands and Taimyr. These regions provide good breeding habitats for birds, but are not well investigated.

The colonial data is poor for larger gulls (*Larus sp.*) and Arctic tern *Sterna paradisaea*, while the major breeding colonies of ivory gulls *Pagophila eburnea* and little auks *Alle alle*, and probably also of Brünnich's guillemots *Uria lomvia* and black-legged kittiwakes *Rissa tridactyla*, seem to be registered. However, it is likely that more colonies exist along the eastern coast of Novaya Zemlya, particularly near Matochkin Shar Strait. Black guillemots *Cephus grylle* must be expected to have a wider distribution than documented in the database. Among wildfowl species included in the database, only brent goose *Branta bernicla* and common eider *Somateria mollissima* breed in colonies within the relatively narrow coastal zone. The colony distribution of the brent goose is relatively well known, but one should take into account that the degree of colonial

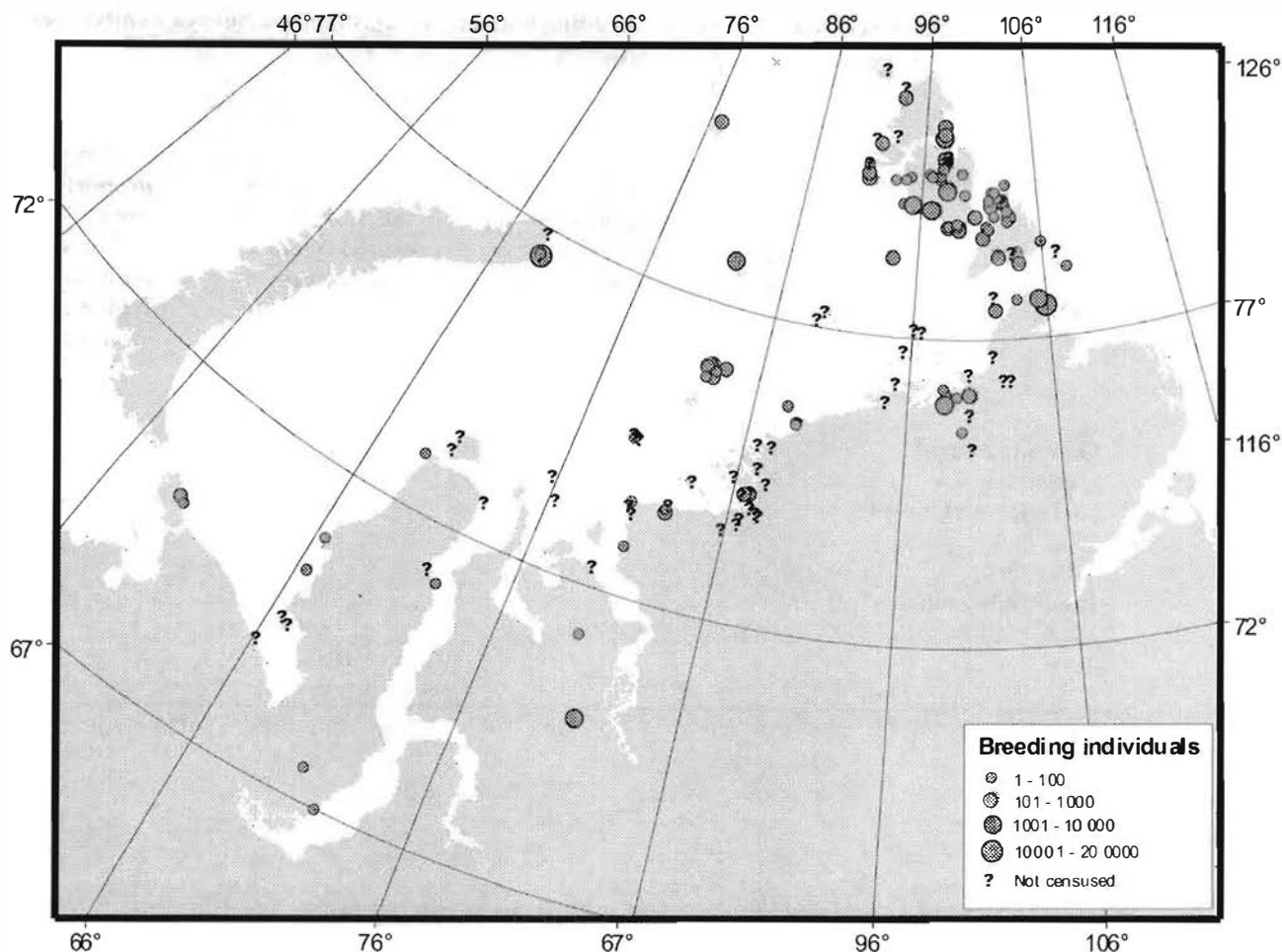


Figure 12. Location of and total number of breeding individuals in the registered seabird colonies in the Kara Sea.

breeding varies a great deal annually depending on the lemming cycle. King eider *Somateria spectabilis* and long-tailed duck *Clangula hyemalis* breed dispersed on tundra, and in the database they are only registered as additional species found in mixed colonies with other species. Red-breasted goose *Branta ruficollis* breeds further inland than the area covered by the database, but recently the species has expanded its breeding area and may reach the coast in some sites. Some breeding colonies close to the coast are included in the database, but these data do not represent the general breeding distribution of this species.

Only ivory gull and black-legged kittiwake are registered with population numbers. Poor census methodology for little auk is mainly responsible for the lack of quantitative data for this species, but there is a relatively good knowledge on the distribution of the colonies. For other species, the poor coverage of the colony distribution does not allow to estimate the real population number. Thus, available data stored in the database probably reflects the colony distribution patterns of true seabirds, both cliff-breeding (auks and black-legged kittiwake) and the mostly flat ground breeding ivory gull, as well as brent goose. As mentioned, the eastern coast of Novaya Zemlya is poorly

mapped and additional colonies may be found here.

The number of seabird species breeding in the Kara Sea is relatively low. Only 13 species are registered in the database, hence the number of breeding species is about the half of the number found in the Barents Sea. Red-breasted goose is the only new breeding species compared to the Barents Sea. Ten species may generally be categorised as seabirds. Wildfowl such as red-breasted goose, brent goose and long-tailed duck also use terrestrial habitats during parts of the year. To some extent also larger gulls may be classified in this category. The common eider has recently been established as a breeding species in the Kara Sea. Due to the heavy ice conditions in the Kara Sea, common eider may have different foraging habits and breeding biology compared to their conspecifics in the Barents Sea.

Cliff-breeding auks and black-legged kittiwakes mostly breed in the archipelagos and in the northernmost part of Taimyr, mainly as a consequence of available breeding habitats. The ivory gull, a typical high Arctic bird connected to ice-covered waters, find suitable breeding areas on islands in the Kara Sea and this is probably the core breeding area in the world for this species. Larger gulls are widely distributed along the coasts occupying different

Table 11. Number of seabird colonies and breeding individuals registered on Novaya Zemlya (eastern coast). Within this region six colonies are registered in the colony database.

Species	No. of registered colonies	Estimated proportion of the total number of colonies in the region registered in the database*	No. of breeding individuals in the censused colonies (No. of colonies in parenthesis)	Estimated proportion of the total number of breeding individuals in the region registered in the database*
Common eider	1	5	2 (1)	5
Glaucous gull	2	5	16 (1)	5
Black-legged kittiwake	2	5	3000 (1)	5
Ivory gull	1	6	2 (1)	6
Arctic tern	1	5	0 (0)	5
Brünnich's guillemot	1	5	7500 (1)	5#
Black guillemot	2	5	60 (1)	5
Total			10580	

*) 1 = ~ 100%, 2 = 75-100%, 3 = 50-75%, 4 = 25-50%, 5 = 0-25%, 6 = Unknown, # = Uncertain data

Table 12. Number of colonies and breeding individuals registered in the Nenetski district. Within this region three colonies are registered in the database.

Species	No. of registered colonies	Estimated proportion of the total number of colonies in the region registered in the database*	No. of breeding individuals in the censused colonies (No. of colonies in parenthesis)	Estimated proportion of the total number of breeding individuals in the region registered in the database*
Brent goose	1	6	0 (0)	5
Glaucous gull	2	5	168 (2)	5
Total			168	

*) 1 = ~ 100%, 2 = 75-100%, 3 = 50-75%, 4 = 25-50%, 5 = 0-25%, 6 = Unknown, # = Uncertain data

habitats, including small lowland isles in river mouths, river canyons and cliffs. For Arctic tern, only a small portion of the colonies are mapped and thereby registered in the database.

Colonies of auks, black-legged kittiwakes and ivory gulls (69 registered in the database) are mostly found on islands. All but one colony (black guillemot in the Dickson area) are registered north of 75°45' N. Most of them are found in the Severnaya Zemlya archipelago (48), and the rest are found on Novaya Zemlya, the Kara Sea Islands and in Northern Taimyr (5-9 colonies in each region).

Among the cliff-breeding seabirds, black-legged kittiwakes and little auks are the most numerous species with the former having a wider distribution, but in total little auks are more numerous. The only known Brünnich's guillemot colony is located at the northern tip of Novaya Zemlya. This colony must be seen as a continuation of the colonies located along the western coast of Novaya Zemlya, registered in the Barents Sea database. A total of 22 colonies with ivory gulls are registered in the database. All are found in the northern part of the Kara Sea, mainly on flat ground, but some are also found in canyons or in cliffs.

The favourable environmental features for seabird colonies in the northern part of the Kara Sea (including the northwestern part of the Laptev Sea) may be characterised as:

1. Suitable breeding habitats such as steep cliffs with ledges facing the sea, which are found in the Novaya Zemlya and Severnaya Zemlya archipelagos and on the coast of Taimyr Peninsula north of Sterligova Cape.
2. Favourable feeding conditions due to oceanographic features:
 - Recurring polynyas north of Novaya Zemlya and north and east of the Severnaya Zemlya archipelago (the major colonies of auks are located in these areas).
 - Marginal ice-edge zone and ice-covered waters during the breeding season, such as the sympagic fauna, is of great importance to some bird species.
 - Frontal zones associated with the shelf break, which come relatively close to the northern coasts of the large archipelagos.
 - Supply of warm and nutrient-rich waters from the Barents Sea (the only known colony of Brünnich's guillemot at the northeastern part of Novaya Zemlya is situated within the influence zone of water from the Barents Sea).

The habitats along the southwestern part of the Kara Sea (Nenetski district, Yamal-Gydan and Western Taimyr) are not suitable for cliff-breeding seabirds. However, numerous sand isles and spits attract larger gulls, terns and brent geese. The oceanographic features in this area are characterised by shallow areas, warm and less saline waters. During the summer this area becomes ice-free. The frontal

zone outside the rivers is not fixed in space and the position varies highly in and between years. All the above characteristics suggest unfavourable conditions for stable concentrations of prey, and hence, poor feeding conditions for seabirds.

Thus, according to the distribution of the seabird colonies we can divide the Kara Sea into two zones:

- Southern and western part (shallow, desalinated, warmer and less ice-covered, surrounded mainly by lowland shores) inhabited by optionally colonial opportunistic-feeding seabirds (larger gulls, Arctic terns) and marine geese not trophically related to the sea.
- Northern and eastern part (more variable depths, less pronounced river-outflow influence, heavily ice-covered, with steep cliffs and ledges along the shores and more indented coastline) inhabited by seabirds, mainly colonial breeders.

Generally, the colony distribution and the low number of birds support the fact that the productivity in the Kara Sea is low. The main species are different species of waterfowl and larger gulls, while cliff-breeding seabirds are almost absent.

Human impact and future studies

At present, humans do not exploit the Kara Sea intensively. However, there are planned activities, which may influence on the birds:

- Increased gas and oil exploration (currently on land, offshore in the future)
- Increased shipping activity. The first step is probably an increased transport out from the large river. The next step may include transit traffic along the International Northern Sea Route.
- Increased tourism to new areas in the Kara Sea.

A main difference compared to the Barents Sea is that the fisheries in the Kara Sea are much less developed. There are no pelagic fisheries and low harvest of anadromous fish. In the future we must expect increased pollution, increased disturbance and area claim conflicts, especially in the southwestern part of the Kara Sea.

Consequently, future mapping of colonies (distribution and numbers) should be focused on:

- Regions: Eastern Novaya Zemlya, Yamal-Gydan and the Kara Sea Islands, both inshore and offshore
- Species: Most of the species should be better mapped, either by the breeding distribution and/or preferably by the number of breeding birds. In particular, brent goose, herring gull, glaucous gull, Arctic tern and little auk should be given high priority.

Table 13. Number of colonies and breeding individuals registered in the Yamal/Gydan. Within this region 15 colonies are registered in the database.

Species	No. of registered colonies	Estimated proportion of the total number of colonies in the region registered in the database*	No. of breeding individuals in the censused colonies (No. of colonies in parenthesis)		Estimated proportion of the total number of breeding individuals in the region registered in the database*
Brent goose	8	4	38	(2)	5
Red-breasted goose	2	5	6	(1)	5
King eider	1	5	0	(0)	5
Long-tailed duck	1	5	62	(1)	5
Lesser black-backed gull	6	5	52	(3)	5
Glaucous gull	4	5	0	(0)	5
Arctic tern	2	5	4	(1)	5
Total			162		

*) 1 = ~ 100%, 2 = 75-100%, 3 = 50-75%, 4 = 25-50%, 5 = 0-25%, 6 = Unknown, # = Uncertain data

Table 14. Number of colonies and breeding individuals registered in the Kara Sea Islands. Within this region 23 colonies are registered in the database.

Species	No. of registered colonies	Estimated proportion of the total number of colonies in the region registered in the database*	No. of breeding individuals in the censused colonies (No. of colonies in parenthesis)		Estimated proportion of the total number of breeding individuals in the region registered in the database*
Brent goose	12	5	426	(10)	5
Common eider	4	5	12	(4)	5
King eider	2	6	32	(2)	6
Lesser black-backed gull	7	5	98	(7)	5
Glaucous gull	10	5	80	(9)	5
Black-legged kittiwake	1	6	810	(1)	6
Ivory gull	8	3#	4304	(7)	2-3
Arctic tern	12	4-5	672	(9)	4#
Black guillemot	1	5	0	(0)	5
Total			6406		

*) 1 = ~ 100%, 2 = 75-100%, 3 = 50-75%, 4 = 25-50%, 5 = 0-25%, 6 = Unknown, # = Uncertain data

Table 15. Number of colonies and breeding individuals registered in Taimyr. Within this region 60 colonies are registered in the database.

Species	No. of registered colonies	Estimated proportion of the total number of colonies in the region registered in the database*	No. of breeding individuals in the censused colonies (No. of colonies in parenthesis)		Estimated proportion of the total number of breeding individuals in the region registered in the database*
Brent goose	34	4-5	814	(8)	5
Red-breasted goose	6	4#	6	(2)	5
Lesser black-backed gull	17	5	6760	(16)	5
Glaucous gull	9	5	119	(9)	5
Black-legged kittiwake	2	3#	20000	(2)	2#
Ivory gull	3	4#	200	(1)	5#
Arctic tern	7	5	76	(7)	5
Black guillemot	2	5	80	(2)	5
Total			28055		

*) 1 = ~ 100%, 2 = 75-100%, 3 = 50-75%, 4 = 25-50%, 5 = 0-25%, 6 = Unknown, # = Uncertain data

Table 16. Number of colonies and breeding individuals registered in Severnaya Zemlya. Within this region 72 colonies are registered in the database.

Species	No. of registered colonies	Estimated proportion of the total number of colonies in the region registered in the database*	No. of breeding individuals in the censused colonies (No. of colonies in parenthesis)		Estimated proportion of the total number of breeding individuals in the region registered in the database*
Brent goose	6	4	48	(6)	4-5
Common eider	1	6	2	(1)	6
King eider	1	5	2	(1)	5
Lesser black-backed gull	3	6	8	(3)	6
Glaucous gull	36	5	600	(25)	4#
Black-legged kittiwake	24	3-4	10824	(21)	3-4
Ivory gull	10	3-4	932	(7)	4
Arctic tern	4	5	6	(3)	5
Black guillemot	25	5	1246	(13)	5
Little auk	10	3-4	5000	(1)	5
Total			18688		

*) 1 = ~ 100%, 2 = 75-100%, 3 = 50-75%, 4 = 25-50%, 5 = 0-25%, 6 = Unknown, # = Uncertain data

60 Seabird colonies in the Kara Sea

The list includes colony name, location and the breeding species. See Table 1 for species abbreviations. In addition, common gull *Larus ridibundus* (LARID), little gull *L. minutus* (LAMIN), bean goose *Anser fabalis* (ANFAB) and greater white-fronted goose *A. albifrons* (ANALB) are registered as species in the table, but there are no registrations of these species in the database. The number of breeding individuals is aggregated in 8 categories: 1=1-10, 2=11-100, 3=101-1 000, 4=1 001-10 000, 5=10 001-100 000 and 6=100 001-1 000 000. X = Species is breeding in unknown number and P=Previous breeder in the colony. The last column (Species) gives the total number of breeding species registered in the colony.

Co_lony name	Coordinates	FUGLA	LARID	LAMIN	BRRUF	BRLIEU	BRBER	ANFAB	ANALIB	SOMOL	SOSPE	CLHYE	LATYS	LAHYP	LACAN	LASAB	RITRI	PAREBU	STPAR	ALALL	ALTOR	UPLOM	CERYI	FRARC	Species
AKHMATOVA BAY, N	N7927 E10246	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
AKHMATOVA BAY, S	N7895 E10255	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
AMBA BAY, COAST	N7914 E10142	-	-	-	-	-	1	-	-	-	-	-	-	X	-	-	-	-	1	-	-	-	-	-	3
AMBA BAY, ISLAND	N7914 E10143	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	2
BAKLUND PENINSULA, DALNYAYA BAY	N7606 E 9819	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	2
BAKLUND PENINSULA, GUSINAYA RIVER MOUTH	N7605 E 9812	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
BAZARNAYA MOUNTAIN	N7948 E 9735	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	3	-	-	X	4	-	X	-	4
BAZARNAYA MOUNTAIN, GOLUBOE LAKE	N7947 E 9730	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	X	-	-	X	-	2
BAZOVAYA RIVER	N7906 E10232	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
BELY ISLAND, I	N7324 E 7008	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
BELY ISLAND, SW	N7310 E 7000	-	-	-	-	-	-	-	-	-	-	-	1	2	-	-	-	-	-	-	-	-	-	-	2
BOLSHOY ISLAND	N7738 E10132	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	X	-	-	-	-	-	-	2
BUDENNOGO CAVE	N8004 E 9100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
MUNGUE RIVER MOUTH	N7512 E 9955	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	1
CAPE BISMARK (ISLAND SOUTH)	N7624 E 6836	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	X	4	-	-	-	X	X	-	2
CAFE ZUB	N7919 E10142	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	2
CHAEK ISLAND	N7342 E 8633	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
CHAEVOY ISLAND	N7632 E 6904	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
CHAYASHNY ISLAND	N6959 E 9107	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	1
CHISTIKOV ISLAND	N8021 E 9720	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
DIABAZOVIYE ISLANDS	N8013 E 9724	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	2
DONASHNIY ISLAND, ROCKS	N7927 E 9100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
DONASHNIY ISLAND, TUNDRA I	N7927 E 9100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	1
EKARYAUTAKHA RIVER	N7117 E 8000	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
FJORDOVOE LAKE E	N7921 E 9748	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	4	-	-	-	-	-	-	-	2
FJORDOVOE LAKE N	N7931 E 9713	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	2
GELBERGA ISLANDS, VOSTOCHNYI ISLAND	N7727 E10140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	1
GENSKERK ISLAND	N7631 E 6904	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	4	-	-	-	-	-	-	-	5
GOLOMTANNY ISLAND, ROCKS	N7940 E 9040	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	2
GOLOMTANNY ISLAND, TUNDRA	N7940 E 9040	-	-	-	-	-	E	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	2
GOLOVINA CAPE	N7254 E 6850	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	2
GOLUBOE LAKE	N7631 E 6858	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	2
GORISTYI CAPE	N8010 E 9713	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
GREMVAASHCHAYA RIVER	N7933 E 9430	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
GREMVAASHCHAYA RIVER	N7933 E 9430	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	2
ISCHENKO ISLAND	N7712 E 8915	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
IZMENCHIVOE LAKE	N7907 E 9404	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
IZMENCHIVOE LAKE	N7907 E 9404	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
IZMENCHIVOE LAKE, RIVER CANYON	N7905 E 9502	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	3	-	-	-	-	-	-	-	3
KAMMENY ISLAND	N7407 E 8320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
KARLA LIBKNEKHTA CAPE	N8056 E 9312	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	4
KARLA LIBKNEKHTA CAPE	N8056 E 9312	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
KELKHA RIVER MOUTH	N7643 E10120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
KHALEONGO ISLAND	N7238 E 7250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
KHUTUDABIGA RIVER	N7420 E 8740	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
KNIFOVICH BAY	N7610 E 9805	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
KNIFOVICH BAY, MALT SPRING	N7604 E 9811	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
KNIFOVICH BAY, NO NAME SPRING MOUTH	N7604 E 9811	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
KOLOSOVYKH ISLAND	N7455 E 8640	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
KONSTANTIN CAPE (SOUTH OF)	N7631 E 6858	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
KONSTANTINA CAPE	N7632 E 6558	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
KRASNAYA BAY, N	N7951 E 9730	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	3	-	-	-	-	-	-	-	3
KRASNAYA BAY, NE	N7947 E 9730	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
KRUGOVAYA RIVER	N8000 E 9140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	1
LAGERNAYA RIVER	N7823 E10331	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
LEDNIKOVAYA RIVER	N7933 E 9713	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
LENINGRADSKAY RIVER LOWER REACHES	N7620 E10200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
LESKINA CAPE	N7220 E 7930	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

Colony name	Coordinates	FUGLA	LARID	LAMIN	BRUF	BRIEU	BRER	ANTAB	ANALB	SOMOL	SOSPE	CIRYE	LAFUS	LAHYP	LAMAR	LACAN	IASAB	RITRI	PABBU	STPAR	ALALL	ALTOR	WRAAL	URLOM	CEGRY	FRARC	Species
LIDIYA BAY, SMALL ISLAND 1	N7409 E 8653	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	1	
LIDIYA BAY, SMALL ISLAND 2	N7409 E 8654	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	1	
LIDIYA BAY, TUNDRA	N7409 E 8656	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	
LITKE ISLAND	N6928 E 6710	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
LOKVUD ISLAND	N7737 E10317	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	3	2	
MACHTOVY ISLAND	N8015 E 9725	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	2	
MALINOVSKOGO RIVER	N7602 E 9855	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
MALYI Taimyr ISLAND	N7806 E10720	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
MARRESALSKE KOSHKI ISLANDS	N6932 E 6650	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
MATUSEVICHIA RIVER	N7937 E 9615	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	1	
MAUD BAY	N7730 E10520	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
MEDUZA BAY	N7320 E 8035	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
MIDDENDORF BAY	N7555 E 9410	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
MIDDENDORF BAY, SMALL ISLAND	N7557 E 9806	-	-	-	-	-	-	-	-	-	-	-	4	2	-	-	-	-	-	-	-	-	-	-	-	2	
MIRA MOUNTAIN	N7953 E 9743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
MORDY-YAKHA RIVER MOUTH	N7022 E 6640	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
MOROZOVA CAPE	N7830 E10520	-	-	-	-	-	-	-	-	-	-	-	1	2	-	-	-	-	-	-	-	-	-	-	-	1	
MOROZOVA CAPE	N7613 E 9450	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
NANSEN ISLAND	N7651 E 6838	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
NAITALIA BAY	N7651 E 6838	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
NEUPKOEVA ISLAND	N7307 E 7620	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
NIZHNYAYA TAIMYRA RIVER DELTA, 1	N7605 E 9948	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	1	
NIZHNYAYA TAIMYRA RIVER DELTA, 2	N7605 E 9947	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
NIZHNYAYA TAIMYRA RIVER DELTA, 3	N7606 E 9947	-	-	-	-	-	1	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	2	
NORTHERN OLENIY ISLAND	N7846 E 9754	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	2	
OKRUGLY BAY	N7545 E 9945	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
OLOVANNY CAPE	N7855 E10000	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	3	
OSKARA PENINSULA	N7624 E 9940	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
OSTANTSOVAYA RIVER, ROCK	N7910 E10220	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	4	
OSTANTSOVAYA RIVER, TUNDRA	N7910 E10221	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	
OSTANTSOVAYA RIVER LOW REACHES	N7902 E 9636	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	3	
OZERNAYA RIVER	N7737 E10455	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
PAPANINA CAPE	N7737 E10455	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
PAPARIZHESKOY KOMMUNY CAPE	N7927 E 9318	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
PARTIZANSKIY FJORD	N7907 E10127	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	3	
PLOSOKAYA MOUNTAIN	N7917 E 9908	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
PLOSOKAYA MOUNTAIN	N7917 E 9908	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
PRADVY ISLAND	N7705 E 9550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
PRIMA STATION	N7918 E10134	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
PTICH' I ISLS., OFF VOSTOCHNY CAPE	N7407 E 8638	-	-	-	-	-	X	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
PTICH'Y ISLAND	N7407 E 8625	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
PYASINA DELTA ISLAND 2	N7350 E 8734	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
PYASINA DELTA ISLANDI	N7350 E 8725	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
PYASINA-DELTA	N7435 E 8700	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	
RINGNES ISLAND	N7538 E 8800	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	
ROGOZINKA RIVER LOW REACHES	N7248 E 8050	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	
RUSSKIY ISLAND	N7703 E 9620	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
RYBNY BAY	N7618 E10230	-	-	-	-	-	X	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	1	
SEVERNAYA ZEMLYA ARCHIPELAGO	N8113 E 9103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
SEVERO-VOSTOCHNY ISLAND, CENTER	N7332 E 8029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
SEVERO-VOSTOCHNY ISLAND, W	N7332 E 8028	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	3	
SHAKHTA SEVERNAYA	N7420 E 8541	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
SHARAPOVY KOSHKI N	N7057 E 6637	-	-	-	-	-	2	-	-	-	-	-	X	X	-	-	-	-	-	-	-	-	-	-	-	5	
SHIROKAYA RIVER	N7457 E 8730	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
SHPENK RIVER MOUTH, 1	N7531 E 9312	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	
SHPENK RIVER MOUTH, 2	N7531 E 9914	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-	3	
SHUMNAYA RIVER	N7820 E10300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	
SKALISTAYA RIVER	N7812 E10330	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
SKAZOCHNAYA BAY, E	N7945 E 9745	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
SKAZOCHNAYA BAY, NE	N7945 E 9745	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
SKAZOCHNAYA BAY, NO NAME SPRING	N7942 E 9715	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
SKAZOCHNAYA BAY, S	N7943 E 9735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
SKAZOCHNAYA BAY, W	N7943 E 9720	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	3	
SKAZOCHNAYA BAY, S	N7943 E 9720	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
SKAZOCHNAYA BAY, W	N8046 E 9320	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	1	
SKRYTAYA BAY	N7850 E10247	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
SLOZHNYA RIVER	N7850 E10247	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
SLOZHNYIY ISLAND	N7705 E 8840	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
SLUSKIY	N7336 E 8628	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					

Colony name	Coordinates	FUGLA	LARID	LAMIN	BRUF	BRLEU	BRBER	ANFAB	ANALB	SOMOL	SOSPE	CIHYE	LAFUS	LAHPY	LAMAR	LACAN	LASAB	RITRI	PAEBO	STPAR	ALALL	ALTOR	URAAI	WLOM	CEGRY	FRARC	Species
SMALL ISLE 2, OFF SVERDLOVA ISL.	N7843 E 9844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	2
SOUTHERN OLENIY ISLAND	N7845 E 9755	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
SPARTAK FJORD	N7856 E10140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	2	-	2
SREDNIY ISLAND, ROCKS	N7932 E 9050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	1
SREDNIY ISLAND, TUNDRA	N7940 E 9040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
STAKORADOMSKOGO ISLAND	N7820 E10630	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
STERLIGOVA CAPE, OFFSHORE ISLAND	N7524 E 9843	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	1
STERLIGOVA CAPE, POLAR STATION	N7523 E 9849	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
STERLIGOVA CAPE, SPIT	N7522 E 9846	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
STUDIENAYA RIVER	N7836 E10040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	2
SVERDLOVA CAPE	N7846 E 9832	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
SVERDLOVA ISLAND	N7848 E 9840	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
SVERDRUP ISLAND 1	N7431 E 7935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
SVERDRUP ISLAND 2	N7431 E 7935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
SVERDRUP ISLAND, 3	N7431 E 7926	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
SVERDRUP ISLAND, 4	N7433 E 7920	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
SVERDRUP ISLAND, 5	N7432 E 7924	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
TALATA-KARSKAYA RIVER MOUTH	N7011 E 5942	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
TELMANA FJORD N	N7847 E10100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
TELMANA FJORD, S	N7844 E10116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
TETKA SOPKA	N7343 E 8634	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
TORA RIVER	N7818 E10200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
TORASAVEY ISLAND	N6902 E 6615	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
TRAPFOVY UTES	N7330 E 8542	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
TROINOV ISLAND 1	N7600 E 8236	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
TROINOV ISLAND, BEAR HILL N	N7547 E 8256	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
TROINOV ISLAND, BEAR HILL S	N7547 E 8256	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
TROINOV ISLAND, ISTHMUS CAMP	N7548 E 8255	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
TROINOV ISLAND, POLAR STATION	N7548 E 8252	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
TROINOV ISLAND, FIRST CAPE	N7549 E 8253	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
TROVNOY ISLAND, FRANTZEN CAPE	N7600 E 8231	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
TROVNOY ISLAND, HORN CAPE	N8557 E 8218	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
TROVNOY ISLAND, LONG LAKE, W	N7555 E 8300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
TROVNOY ISLAND, MIDNIGHT CAPE	N8558 E 8329	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
TROVNOY ISLAND, POLYARNIK BAY	N7554 E 8259	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
TROVNOY ISLAND, UGLOVATOE LAKE, S	N7546 E 8225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
TROVNOY ISLAND, UGLOVATOE LAKE, W	N7547 E 8224	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
TUMANNYE MOUNTAINS	N7938 E 9855	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
TVERDOE LAKE	N7915 E10200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
UBOINAYA RIVER 1	N7331 E 8227	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
UBOINAYA RIVER 2	N7332 E 8227	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
UBOINAYA RIVER 3	N7333 E 8227	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
UBOINAYA RIVER MOUTH	N7337 E 8228	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
UDJENIENIYA ISLAND	N7739 E 8202	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
USHAKOVA RIVER	N7934 E 9632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
UZLOVAYA BAY	N8010 E 9258	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
VENJUEVOYAKHA RIVER MOUTH	N7109 E 7230	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
VERKHNY ISLAND	N7356 E 8700	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
VERN ISLAND	N7328 E 8020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
VILKITSKOGO ISLAND 1	N7328 E 7540	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
VILKITSKOGO ISLANDS	N7645 E 9510	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
VIZE CAPE	N7911 E10122	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
VIZE ISLAND	N7940 E 7700	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
VOIK RIVER MOUTH	N7007 E 5957	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
VORONINA ISLAND	N7812 E 9340	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
VOGKHOD BAY	N6706 E 7159	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
VOYTSKHOVSKOGO GLACIER	N7900 E10240	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
YADAYAKHODYAKHA RIVER UPPER REACHES	N6738 E 7045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
YATBARY	N7118 E 7145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
ZHILLOY PENINSULA	N7930 E 9404	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

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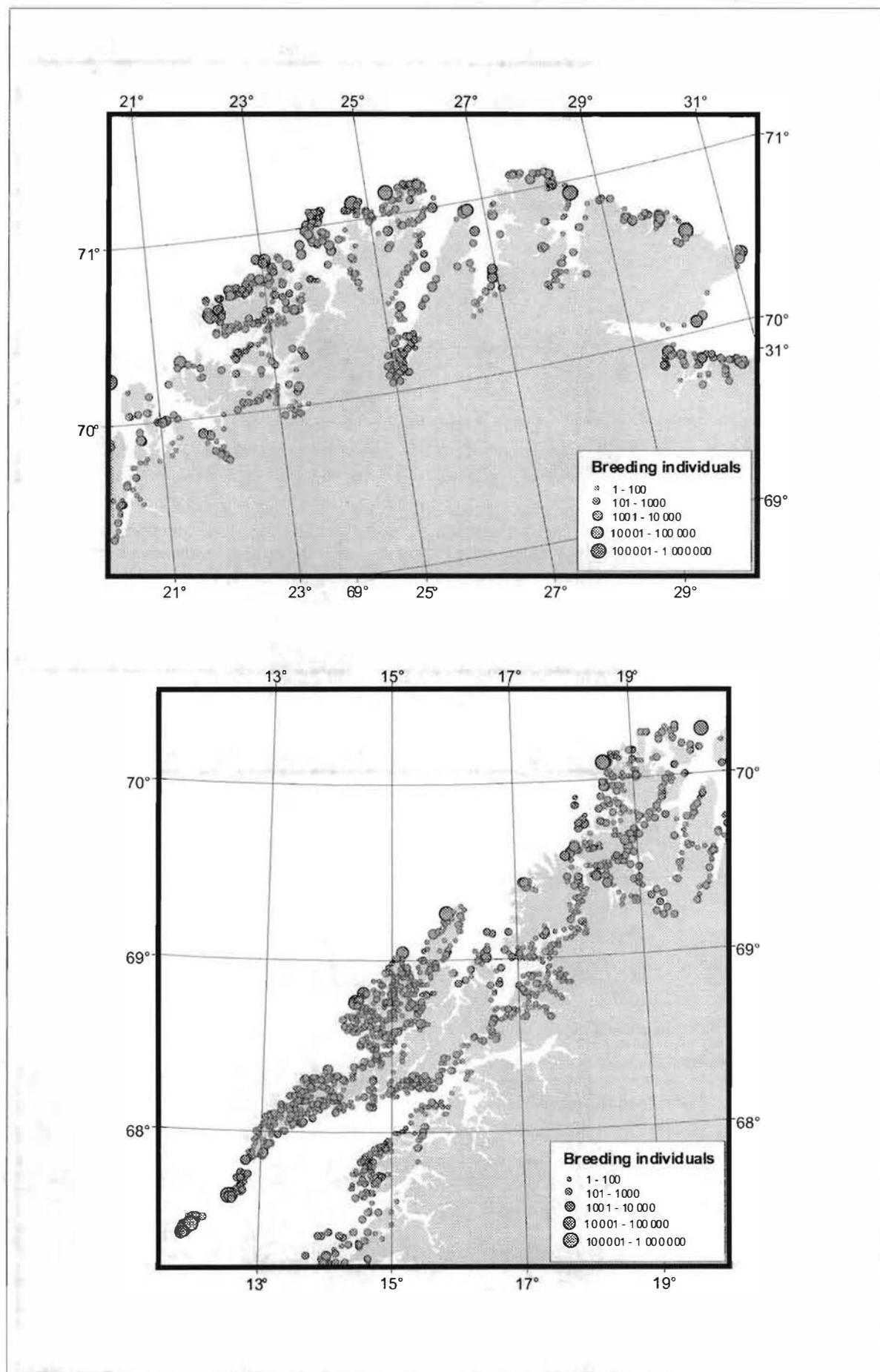
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Appendix 1. Location of seabird colonies and the number of breeding individuals along the Norwegian coast north of the Arctic Circle.



Appendix 2. Location of seabird colonies and the number of breeding individuals in the Kara Sea.

