



Ecological Dutch-Russian expedition to the Pyasina delta (Great Arctic Reserve)

Report of the expedition in 2007

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Laurent Demongin, Yakov Kokorev, Gerard Müskens, Igor Popov, Aleksandr Prokudin and Johan Thissen

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ИНСТИТУТ ПРОБЛЕМ ЭКОЛОГИИ И ЭВОЛЮЦИИ РАН



Ecological Dutch-Russian expedition to the Pyasina delta (Great Arctic Reserve)

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Abstract

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In 2007 for the 11th time since 1990 a Russian-Dutch expedition was organized to the Pyasina Delta on the Taimyr peninsula in Siberia.

The expedition, which lasted from 26 June till 21 July 2007 was a preparatory one during the International Polar Year. Its main aim was to study the build-up phase of a lemming peak that was expected for 2008 and its impact on breeding birds.

For 2008 a full scale expedition is planned.

At least 292 pairs of Brent Geese were breeding on the Bird Islands, including the Beacon Islands. On Verkhny Island there were 267 nests of Brents. On Farwaterne Island we found three breeding pairs of Brent Geese and 61 breeding pairs of White-fronted Geese. In the 5 km² census plot on Vostochny Cape there were six breeding pairs of White-fronted Geese but no Brent Geese.

Overall there were good numbers of geese on the islands in the delta.

As expected, there were moderate numbers of Siberian Lemmings, after the lemming population crash of 2006. Within the 5 km² census plot on Vostochny Cape no Arctic Foxes were seen. Daily nest survival rates of wader (0.985) and goose nests (0.995) were high, probably because of the low number of Arctic Foxes.

Keywords: brent goose, white-fronted goose, lemmings, arctic fox, high arctic nesting, international polar year.

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Alterra report 2189

Wageningen, August 2011

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1 Introduction

Preface

Joint Russian - Dutch expeditions to the Pyasina delta took place in 1990 - 1995, 2002 and again from the year 2004 until the current year 2007. The long-term joint activities at both the Pyasina delta and Medusa bay are probably the most successful part of the co-operation in the Taimyr under the Russian-Dutch Memorandum of Understanding on Environmental Cooperation (1991). Many Russian and Dutch scientists and conservationists have participated, together with colleagues from many other countries, and had experience of the Arctic ecosystem, which will have a long-term influence on their thinking. They have collected very valuable data on geese and wader ecology, their relationships with lemmings and predators, weather and climate, etc. (Boere, 2007).

Foreword

In the course of their joint three-year project 'Pristine wilderness of the Taimyr peninsula 2004-2006' the Dutch research institute Alterra and the Russian D.S. Likhachev Research Institute for Cultural and Natural Heritage (Heritage Institute) came to the conclusion that their fruitful co-operation on ecological research in the Great Arctic Reserve (Taimyr, Siberia) should be continued.

A major factor in the ecosystem of the Russian high arctic is the fluctuation of the lemming populations, mainly the Siberian Lemming. After one full and normal lemming cycle with moderate numbers in 2004, a high peak in 2005 and a crash in 2006 we understand better the relations between the predators (Arctic Foxes, Least Weasels, Rough-legged Buzzards, Snowy Owls and three species of Skuas) and their main prey that is lemmings and birds. However our knowledge should be further improved for the sake of sound nature management.

Furthermore, continuation of our contribution to the monitoring of the Great Arctic Reserve is helpful to assess whether the ecosystem of the high arctic is at risk, e.g. by global warming. So there are good reasons to continue the Dutch-Russian co-operation in the Great Arctic Reserve.

The International Polar Year and publicity

The current International Polar Year is a large scientific programme focused on the Arctic and the Antarctic from March 2007 to March 2009 (see www.ipy.org). The science division Noorderlicht of the Dutch broadcasting society VPRO has adopted the Polar Year. Because the Dutch expedition members are doing scientific work near the North Pole, VPRO took our expedition as a Polar Year activity. During our stay we delivered reports and pictures by satellite communication to VPRO, which made this information available to the public on the webpage pooljaar.nl/siberie¹ In the radio broadcast of Noorderlicht of 7 August 2007 Gerard Müskens was interviewed about our expedition.

¹ The same webpage will be used for the 2008 expedition.

Getting there and participants

Laurent Demongin (Alterra, volunteer), Gerard Müskens (Alterra, staff) and Johan Thissen (Alterra, volunteer) flew on Saturday 23 June from Amsterdam to Moscow, and on the evening of the next day together with Igor Popov (A.N. Severtsov Institute of Ecology and Evolution RAS, Moscow) on to Norilsk. They arrived at Alykel Airport on the early morning of Monday 25 June. Completed by two staff members of the Extreme North Agricultural Research Institute at Norilsk (Yakov Kokorev and Aleksandr Prokudin) the whole expedition team flew on the afternoon of Tuesday 26 June in a chartered helicopter of the Taimyr Aviation Company from Valyok Airport at Norilsk to Camp Mys Vostochny. The camp is situated at the Lidia Bay in the northern Pyasina delta. On 21 July at 1 pm a helicopter came to Mys Vostochny to get us back to Norilsk. All flights with planes and helicopters were performed as scheduled. In fact this year the transport was very smooth.

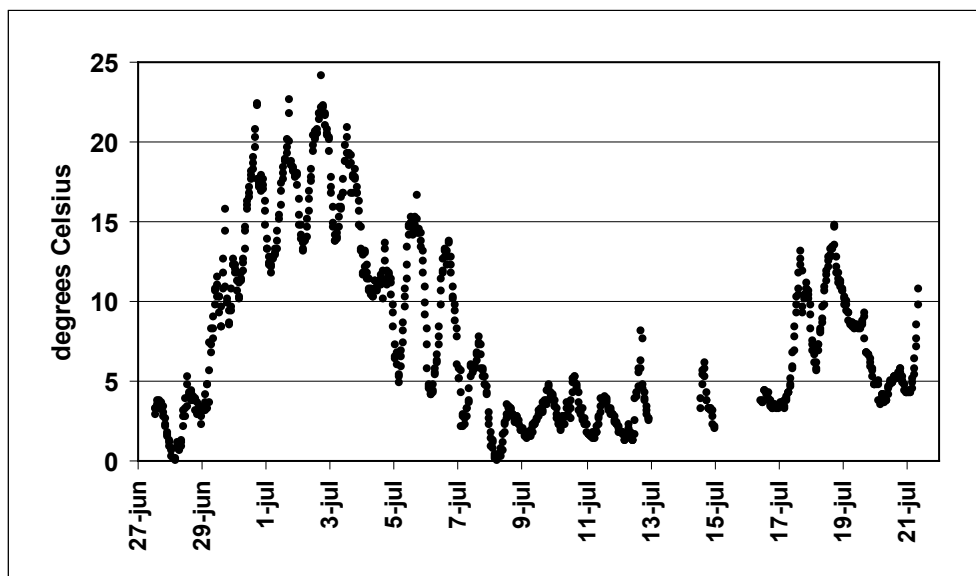
Weather

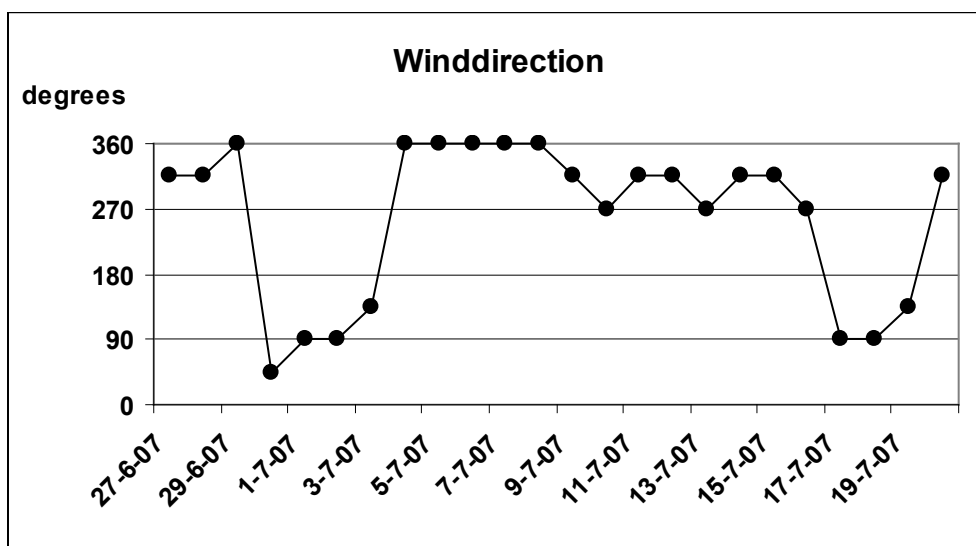
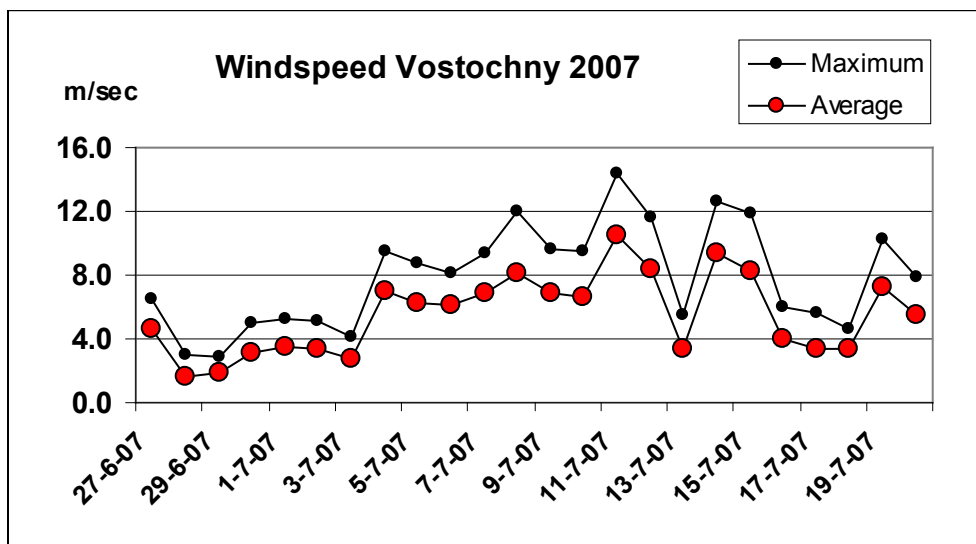
Even for Taimyr standards the weather during our stay was full of extremes. When we arrived on 26 June the snow on the tundra had disappeared. Quite early, on 29 June the ice in Lidia Bay broke. In the first week of July the weather was dry and mild with average 24 hours temperatures between 10 and 18 °C. On four days the maximum temperature rose above 20 °C. On 7 July a cold spell arrived with a bit of rain and snow. This rather bad period lasted until 17 July, however interrupted by one fine and calm day, the 13 July when we could go out by boat to check most of the Bird Islands. 17 and 18 July were good days. On 19 July it started to rain again with a strong wind.

The prevailing wind direction was between north and west. On Mys Vostochny this means wind coming from the sea. This wind repels the mosquitos, but in the bad second week of July it blew ice from the sea into Lidia Bay. It looked as if the bay was freezing again.

During the whole expedition the weather was too bad on four days to work in the field.

Temperature, wind speed and wind direction at camp Mys Vostochny during the expedition of 2007





The warm and sunny days of the first week of July caused an extensive bloom of tundra plants, such as *Cassiope tetragona*.



White Arctic Mountain Heather (Cassiope tetragona), Mys Vostochny (Pyasina delta), 4 July 2007



*Brent Goose on ice during our visit to the Bird Islands (Pyasina delta) on 13 July 2007.
This ice drifted from the sea into the Pyasina during the bad second week of July.*

2 Ecological research

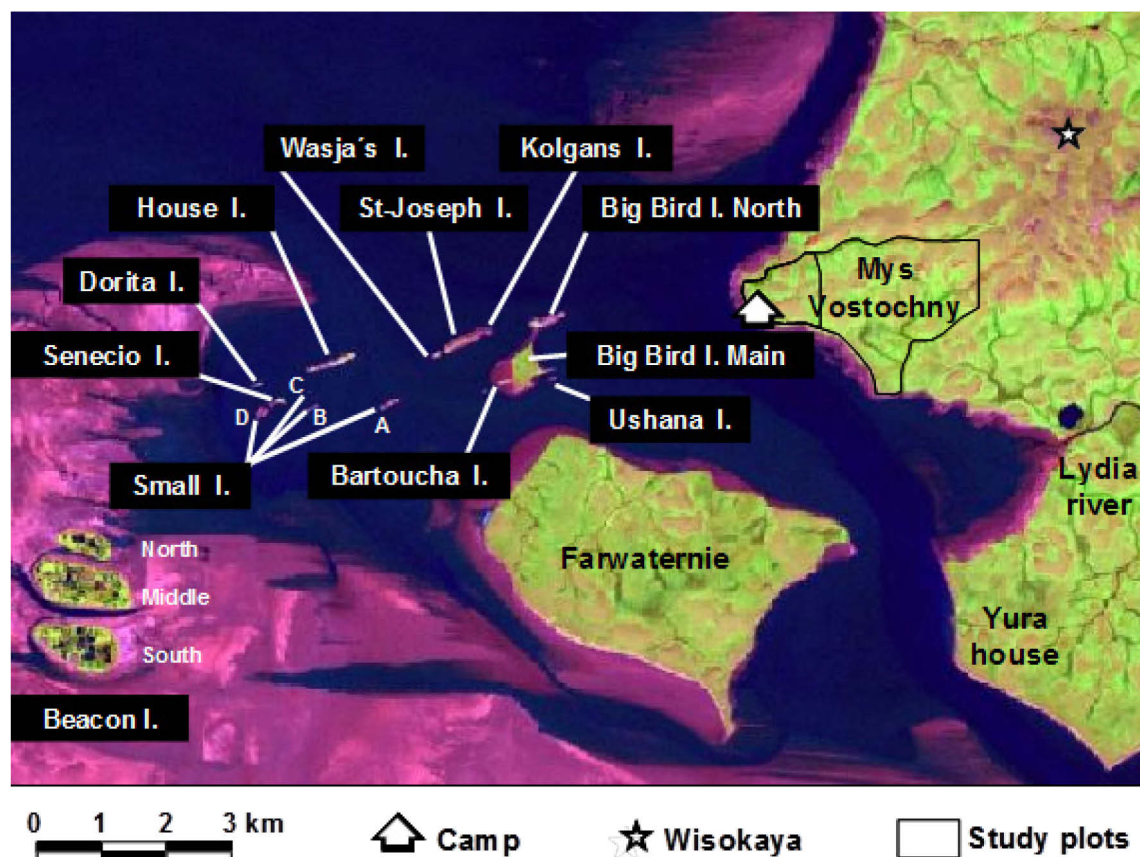
2.1 Study area

We worked in the northeastern part of the delta of the Pyasina river. This stream is about 800 km long and begins near the town of Norilsk.

In the west of our study area there are the so-called Beacon Islands (North, Middle and South), three low and flat alluvial islands. In the centre of the study area there is an archipelago of a dozen rocky islets and one larger low island of 16 ha with a peaty soil, the so-called Big Bird Island. Together they are called the Bird Islands, including the Beacon Islands.

In the east we have the tundra landscape around Lidia Bay: Farwaternie Island, the area around the derelict Lydyia House (= Yura house, after Yura Ostrovsky, the last inhabitant) and Cape East (in Russian Mys Vostochny) with the camp. On Mys Vostochny between the camp and the hill Wysokaya three study plots are situated, one of 1 km² just for the Little Stint, one of 5 km² (including the 1 km²) for all other wader birds and White-fronted Goose and one of 16 km² (including the 5 km²) for raptors and Brent Goose.

The main division in our study area is the tundra landscape in the east (mainland and Farwaternie Island) and the islands in the west (Bird Islands).

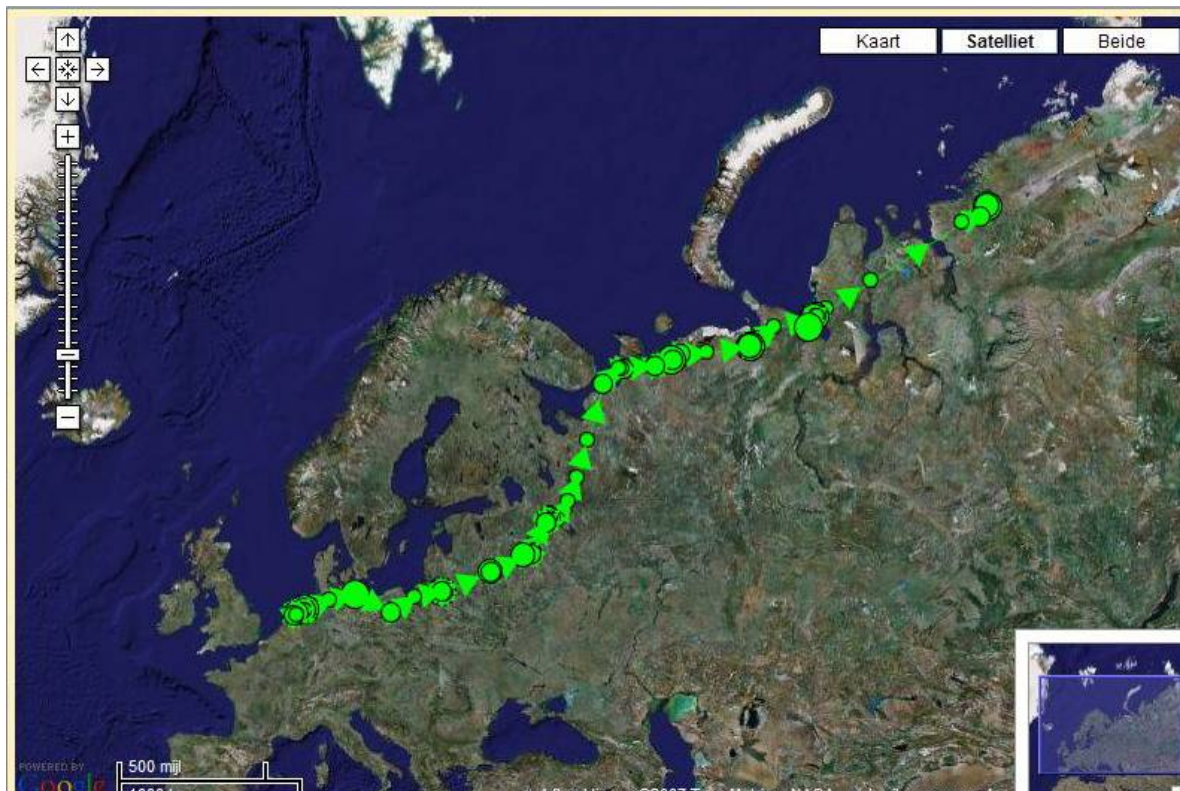


2.2 Goals

Our main goal was to count the number of breeding geese and to assess their breeding success. Three species of geese breed in the Pyasina delta: White-fronted Geese, Brent Geese and Red-breasted Geese. White-fronts and Brent Geese from the Pyasina delta spend a part of the year in the Netherlands. Almost all Brents from Taimyr belong to the subspecies *Branta bernicla bernicla*, the Black-Bellied Brent which winters in Western Europe. The White-fronts are in the Netherlands during winter and the Brent Geese also in winter, but even more in spring. Red-breasted Geese winter more to the east, not in the Netherlands. Their westernmost wintering grounds are in Romania and Bulgaria.

So the White-fronts and the Brent Geese depend on conditions in the Russian high arctic and in the Netherlands. The Russian Federation and the Netherlands have a shared responsibility for those geese. As this year we left the Pyasina delta already in July, it was not possible to catch moulting geese. In other years moulting geese were caught in the first half of August. The Pyasina delta is a very important site for moulting White-fronts and Brent Geese (Kokorev and Ebginge, 2006; 2007). The male White-front named Ale arrived on 16 July 2007 in the Pyasina delta to moult, only 80 km from our camp. This goose was caught in the north of the Netherlands (province of Friesland) in January 2007. By then expedition member Gerard Müskens has equipped goose Ale with a satellite transmitter. His movements can be followed on the website www.blessgans.de

Migration of male White-front Goose Ale from the Netherlands to the Pyasina 2007



A second important goal was the assessment of the density of the lemmings. In 2005 there has been a peak year of the Siberian Lemming and in 2006 there were virtually no lemmings. In view of the regular three year cycle of the population level we expected 2007 to be a year with moderate numbers of lemmings.

Other goals were counts of predators (Arctic Foxes, Least Weasels, Snowy Owls and three species of Skuas), a census of breeding birds, especially waders and an assessment of their breeding success. A certain number of the birds of the wader populations which breed on Taimyr spend a part of the year in Western Europe, e.g. some Grey Plovers, Ruffs, Little Stints, Curlew Sandpipers and Dunlins (Tomkovich et al., 2000), but the link with the Netherlands is not as strong as in the case of Brent Geese and White-fronted Geese. Many waders from Taimyr winter in Eastern Africa, southern Asia, Australia and even South America.

This year we have also contributed to two other projects by taking samples. For the arctic predator isotopes project of the University of Tromsø (Dorothee Ehrich) we have collected samples of Arctic Foxes (moulted winterfur), Snowy Owls and Skuas (feathers) and their prey. For the Birdhealth project of the University of Groningen (Maarten Loonen, www.birdhealth.nl) we have collected samples of waders, King Eiders and a Brent Goose. Expeditions should try to share samples in view of the difficulties to get samples from the high arctic.

Information on the Pyasina expeditions is included in the overview database www.arcticbirds.ru of the International Wader Study Group and Wetlands International's Goose and Swan Specialist groups.

Aleksandr Prokudin at Big Bird Island taking a cloaca swab from a King Eider

In 2006 Aleksandr has taken many swabs for analysis on avian influenza, mainly from moulting White-fronted Geese and Brent Geese. The results have already been published in 2007. Neither influenza A (H5N1) viruses nor any other highly pathogenic AIV were detected in 2006. Only low-pathogenic viruses were found (Layshev and Prokudin, 2007). Some of the samples now taken in 2007 will be analysed in Russia for the Birdhealth project, an international Polar year project with the University of Groningen (NL) as lead institute.



2.3 Effort

Our expedition was small (six persons)² and the period of field work short, from 27 June to 18 July. It was impossible to cover the 16 km² plot on Mys Vostochny completely. But we did achieve good coverage of the 5 km² plot, including the 1 km² plot.

And we have covered Farwaterne Island for predators and breeding geese. The breeding birds of the Bird Islands were counted, except Beacon Island North. One long working day of five persons was just not enough to count more than Beacon Island South and Middle.

The map of all the nests found gives an impression about our efforts. And it shows that the northernmost part of the 5 km² plot on Mys Vostochny (including the 1 km² plot) was almost devoid of nests.

All the bird nests found in 2007: Bird Islands and tundra (Pyasina delta) in 2007



² For example the 2006 expedition was attended by in total 25 persons.

2.4 Geese and ducks on the tundra

As usual there were no nests of Brent Geese in the plots on Mys Vostochny, but there were three on the tundra of Farwaternie Island.

Six White-fronted Geese bred in the 5 km² plot. This is equal to the average number of the earlier years 1993-1995 and 2004-2006. On Farwaternie we have found 61 nests of White-fronted Geese, but we certainly have not found every nest. We have spend two days (6 and 7 June) to search this tundra island for geese nests, but this effort is not enough to find all nests. Sixty-one recorded nests of Whitefronts on Farwaternie is a high number compared to other years. This breeding season there were no foxes on Farwaternie, whereas in 2004-2006 they were present. The situation on Farwaternie is now more or less comparable to the period 1993-1995 when there were also no foxes in the breeding season. On 16 July we have checked 23 nests of White-fronted Geese on Farwaternie. None had been predated.

As in most other years there were no nests of ducks and Red-breasted Geese on the tundra.

Numbers of nests of geese and ducks on Mys Vostochny

Species	1993	1994	1995	2004	2005	2006	2007	Plot
Brent Goose	2	0	0	0	14	0	0	16 km ²
Red-breasted Goose	0	0	0	0	1	0	0	16 km ²
Steller's Eider	1	5	0	0	5	0	0	5 km ²
White-fronted goose	9	5	4	4	12	1	6	5 km ²

The Mayfield daily nest survival of the White-fronted Geese on Mys Vostochny and Farwaternie was 0.995 (SD 0.04). Assuming an average breeding period of 28 days this means a hatching probability of 86%. This is a rather high figure.

*Map of nests of White-fronted Geese on the tundra (Mys Vostochny and Farwaternie)
(Pyasina delta) in 2007*



On the pictures an incubating female White-fronted Goose at the left and on the right a clutch.

2.5 Raptors on the tundra

The number of breeding raptors was very low. In the plots on Mys Vostochny we did find only a Pomarine Skua nest. But for this species we have only covered the 5 km² plot completely, not the whole of the 16 km² plot. There were no breeding Rough-legged Buzzards and Snowy Owls. We have not even seen a Rough-legged Buzzard and just one Snowy Owl.

On Farwaternie island there were two breeding Arctic Skuas.

There were many non-breeding skuas around. Probably skuas were this year more important predators of bird nests than Arctic Foxes. We have seen Pomarine Skuas eating the eggs of White-fronted Goose and Little Stint.

Numbers of nests of raptors on Mys Vostochny

Species	1993	1994	1995	2004	2005	2006	2007	plot
Rough-legged Buzzard	1	2	0	0	1	0	0	16 km ²
Long-tailed Skua	0	1	0	2	1	1	0	16 km ²
Pomarine Skua	0	17	0	0	31	0	1	5 km ²
Snowy Owl	0	4	0	0	5	0	0	16 km ²

Map of nests of Pomarine Skuas (square) and Arctic Skuas (dot) on Mys Vostochny and Farwaternie (Pyasina delta) in 2007



On the pictures a nest with young and egg of a Pomarine Skua and an alarming adult.

2.6 Waders on the tundra

The low number of breeding Little Stints on the 1 km² plot, which is especially laid out for this one species, was astonishing. We think that the number of only five nests is more or less real and not caused by too little effort. The 1 km² plot has been searched thoroughly in the right time period, from 27 June to 18 July. The numbers of nests of the other regular³ wader species based on the 5 km² plot are around the yearly average (the three species of plovers, Curlew Sandpiper, Dunlin and Grey Phalarope) or relatively high (Pectoral Sandpiper). The number of nests of Temminck's Stint was remarkably high compared to other years. All in all we had good numbers of breeding waders, except from the Little Stint. These good numbers are also an indication that our search effort has been high enough. About the Ruff we are almost sure that there were at least two nests in the 5 km² plot, but we could not find them. Ruffs are real masters in hiding their nests.

Numbers of nests of waders on Mys Vostochny

Species	1993	1994	1995	2004	2005	2006	2007	plot
Curlew Sandpiper	3	7	7	5	16	6	6	5 km ²
Dotterel	3	0	0	0	0	0	0	5 km ²
Dunlin	0	0	3	2	0	4	4	5 km ²
Grey Phalarope	0	1	2	0	4	16	5	5 km ²
Grey Plover	2	3	1	5	4	3	4	5 km ²
Little Stint	8	9	23	39	50	35	5	1 km²
Pacific Golden Plover	4	3	4	2	6	4	5	5 km ²
Pectoral Sandpiper	1	5	0	1	3	0	7	5 km ²
Red-necked Phalarope	0	3	0	0	0	0	0	5 km ²
Ringed Plover	4	2	1	2	3	3	4	5 km ²
Ruff	0	0	0	0	1	1	0	5 km ²
Temminck's Stint	0	0	0	0	0	1	4	5 km ²
Turnstone	0	0	1	0	0	1	0	5 km ²

The Mayfield daily nest survival of all waders on Mys Vostochny, including the nests outside the plots, was 0.985 (SD 0.04). Assuming an average breeding period of 21 days this means a hatching probability of 72%. This is a rather high figure.

³ Nests found in at least three years.

Map of nests of Ringed Plovers on Mys Vostochny (Pyasina delta) in 2007



This year all found nests of Ringed Plovers were on the shore, their preferred habitat.

Map of nests of Pacific Golden Plovers on Mys Vostochny (Pyasina delta) in 2007

Nests of Pacific Golden Plovers were found only on the dry parts of the tundra, mainly in Dryas vegetations



A clutch with one hatched young of an eastern Golden Plover and an adult female.

Map of nests of Grey Plovers on Mys Vostochny (Pyasina delta) in 2007

The Grey Plovers nested as usual mainly on almost bare spots in tundra that looks black



A clutch of a Grey Plover and an adult female.

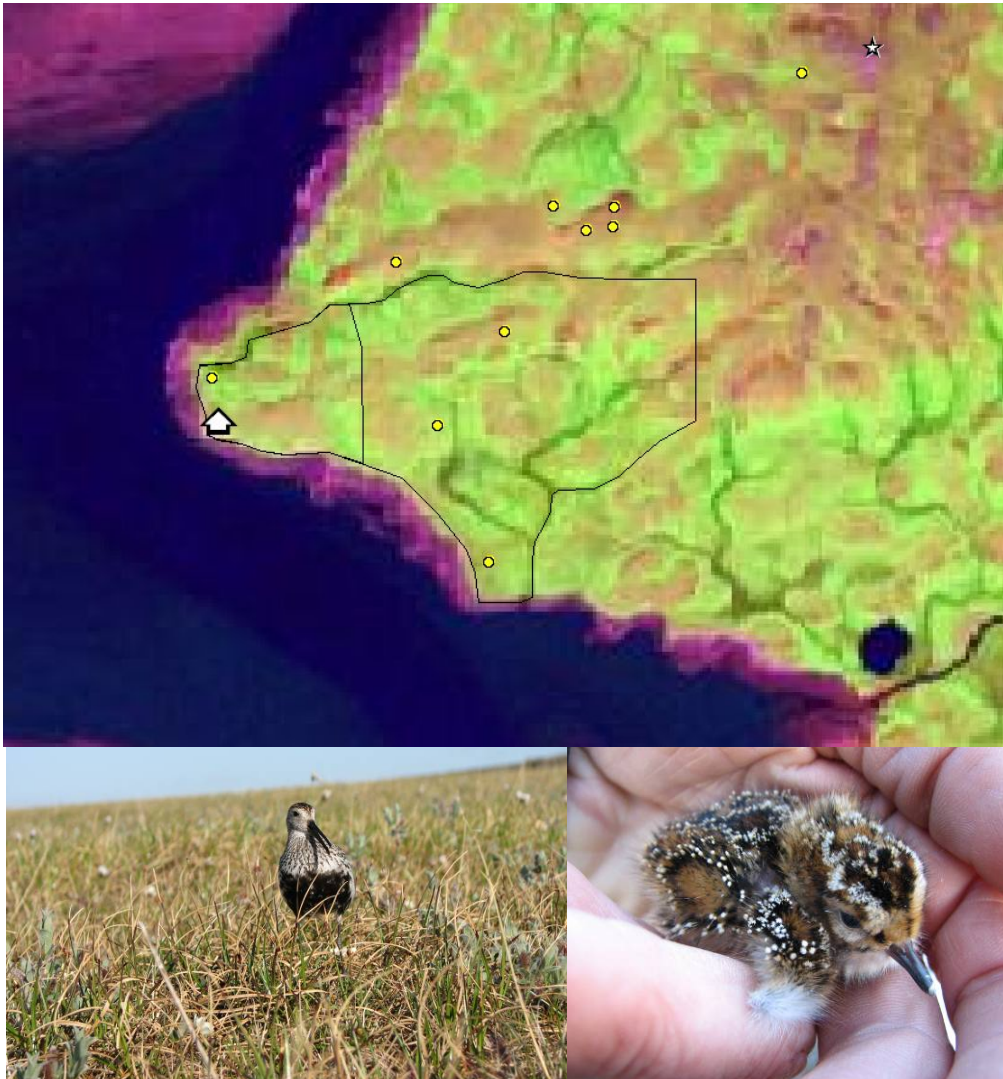
Map of nests of Curlew Sandpipers on Mys Vostochny (Pyasina delta) in 2007

Curlew Sandpipers nested in a variety of habitats, but mainly in dry Dryas tundra



A caught Curlew Sandpiper and a clutch.

Map of nests of Dunlins on Mys Vostochny (Pyasina delta) in 2007
Dunlins nested on grassy places

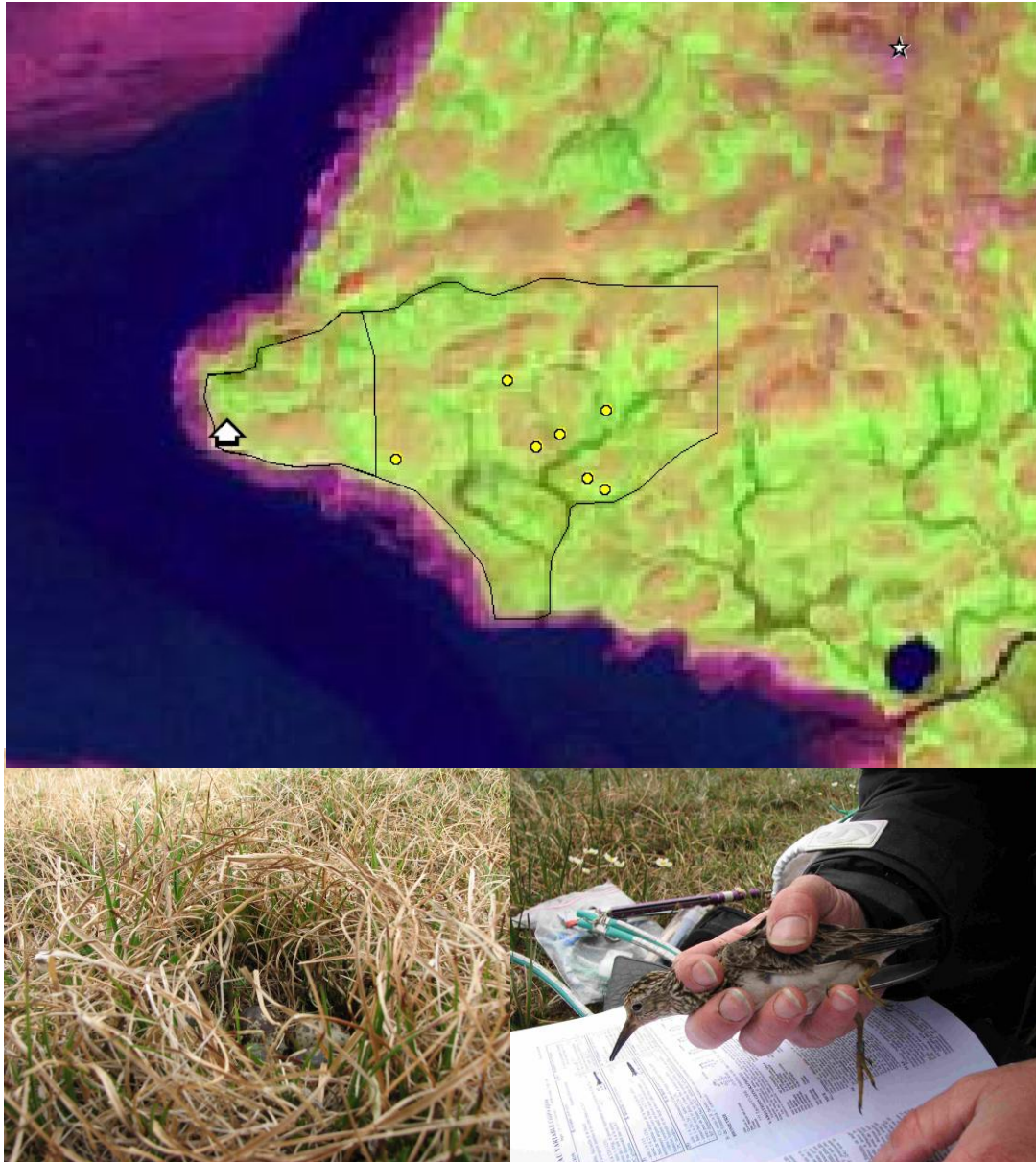


A Dunlin near her hatching clutch and a just hatched young.

Map of nests of Pectoral Sandpipers on Mys Vostochny (Pyasina delta) in 2007

This year was the best year ever for finding nests of Pectoral Sandpipers. Apparently the numbers can vary a lot between years. Pectoral Sandpipers are nomadic in the choice of their breeding place. The nests were on grassy places and in willow vegetations.

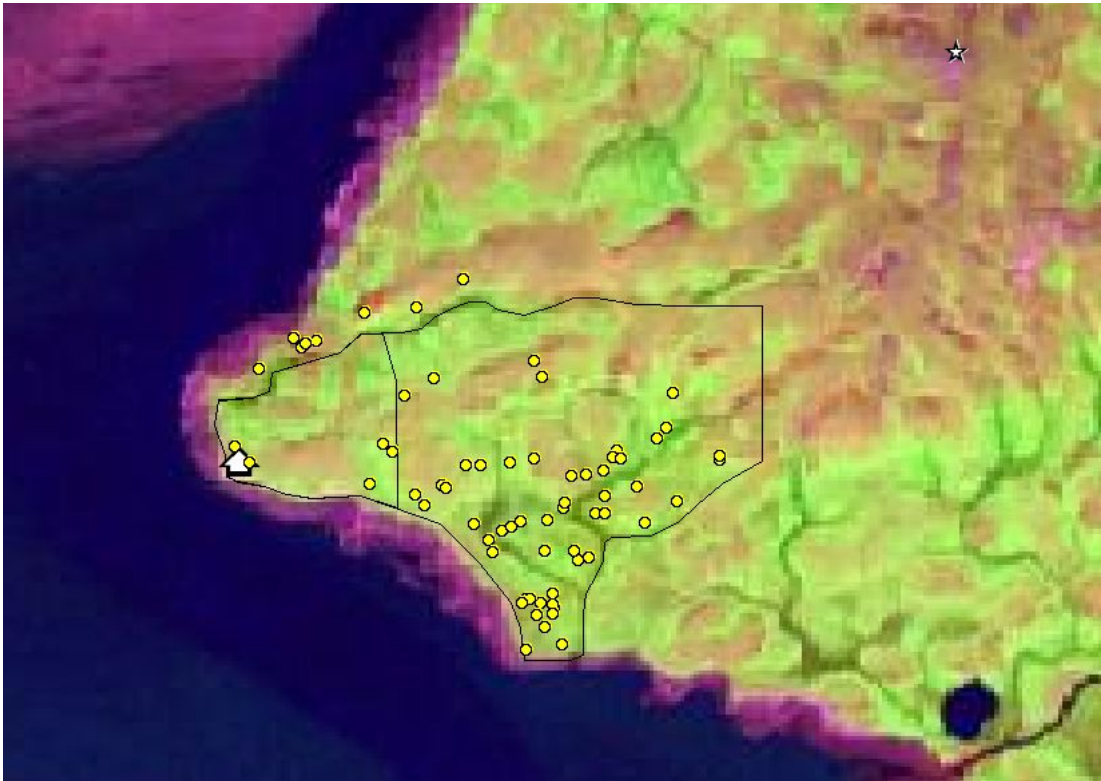
On the picture Laurent Demongin is checking the sex of a caught Pectoral Sandpiper. In the back a string with bird rings and a spring balance.



A clutch of a Pectoral Sandpiper and a caught bird.

Map of nests of Little Stints on Mys Vostochny (Pyasina delta) in 2007

There were very few Little Stints in the northern part of the 5 km² study plot. They breed in a variety of habitats



A Little Stint near her nest and a clutch with one other coloured egg.

Map of nests of Temminck's Stints on Mys Vostochny (Pyasina delta) in 2007

Four of the five Temminck's Stints on Mys Vostochny had their nest in the driftwood zone on the beaches.

One was breeding on the northern shore of the stream north of the camp, just outside the 5 km² plot.

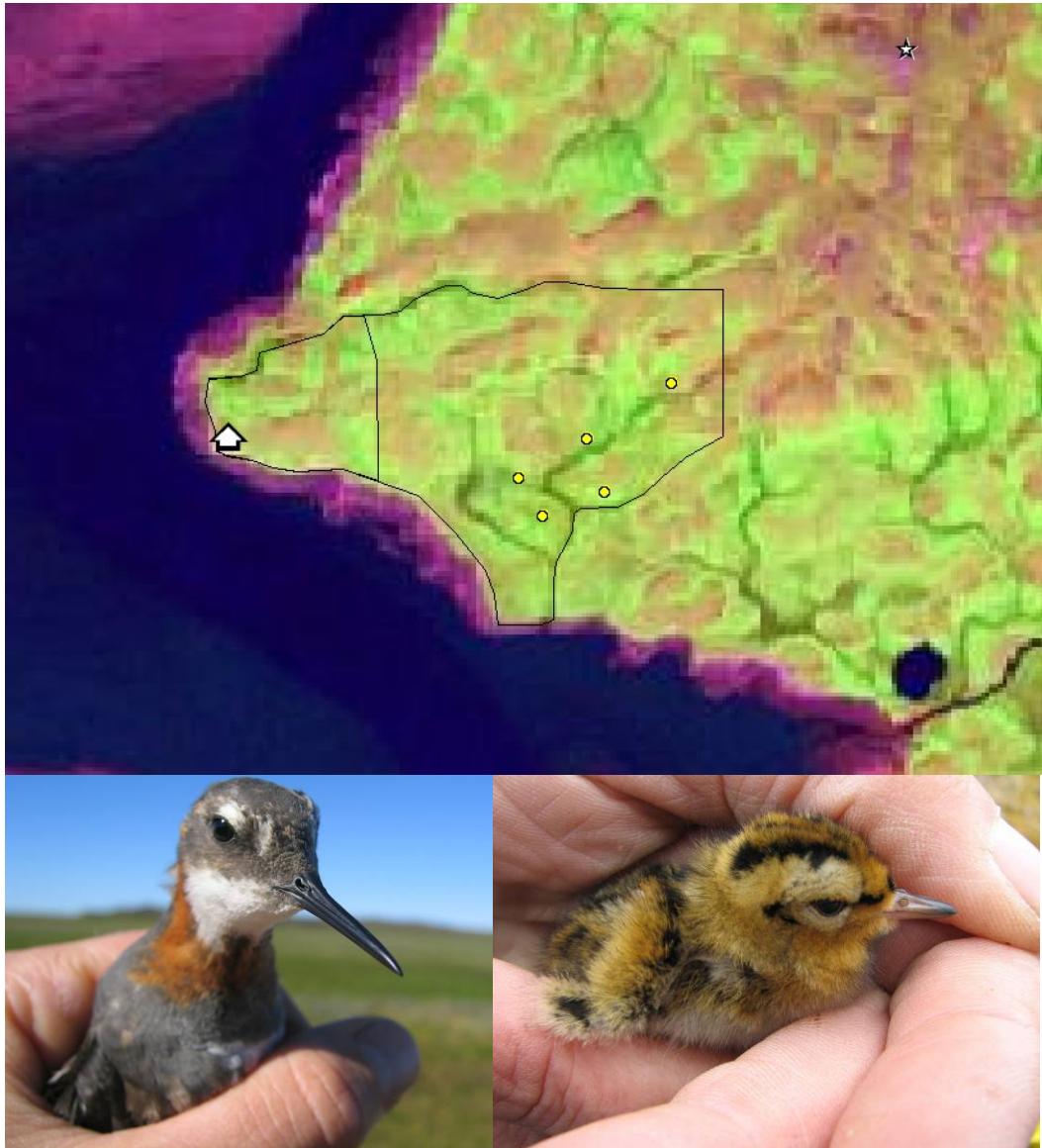
Outside the tundra, near the bird observation house on Big Bird Island, there was a nest of a Temminck's too.



A Temminck's Stint foraging and a clutch with the typical coloured eggs of this species.

Map of nests of Grey Phalaropes on Mys Vostochny (Pyasina delta) in 2007

Grey Phalaropes nested as usual on wet places, mainly in willow vegetations



A caught Grey Phalarope and a just hatched young.

2.7 Song birds on the tundra

As we have only figures for song bird nests from the period 2005-2007 we can not yet say much about trends. Furthermore song bird nests were not searched systematically, except Snow Bunting. This year we have spend some more time on the Snow Bunting, as it is not difficult to find many nests.

The one White Wagtail bred in a nest box in the camp, as did one Snow Bunting. A Wheatear bred in a hole in the shore, very near to the camp. An other Wheatear was breeding in a rocky outcrop outside the 5 km² plot.

Numbers of nests of song birds on Mys Vostochny (Pyasina Delta) in 2007

Species	2005	2006	2007	plot
Shorelark	2	8	1	5 km ²
Red-throated Pipit	0	7	1	5 km ²
White Wagtail	1	1	1	5 km ²
Wheatear	0	1	1	5 km ²
Snow bunting	(6)	15	26	5 km ²
Lapland bunting	2	13	6	5 km ²

The Mayfield daily nest survival in the egg phase of all song birds on Mys Vostochny, including the nests outside the plots, was 0.98 (SD 0.08). Assuming an average breeding period of 14 days this means a hatching probability of 76%. This is a rather high figure.

Map of nests of Snow Buntings on Mys Vostochny (Pyasina delta) in 2007

The Snow Buntings breed mainly on rocky outcrops (in holes between the stones) and under driftwood on the shore



A singing Snow Bunting and a clutch found under drifted wood.

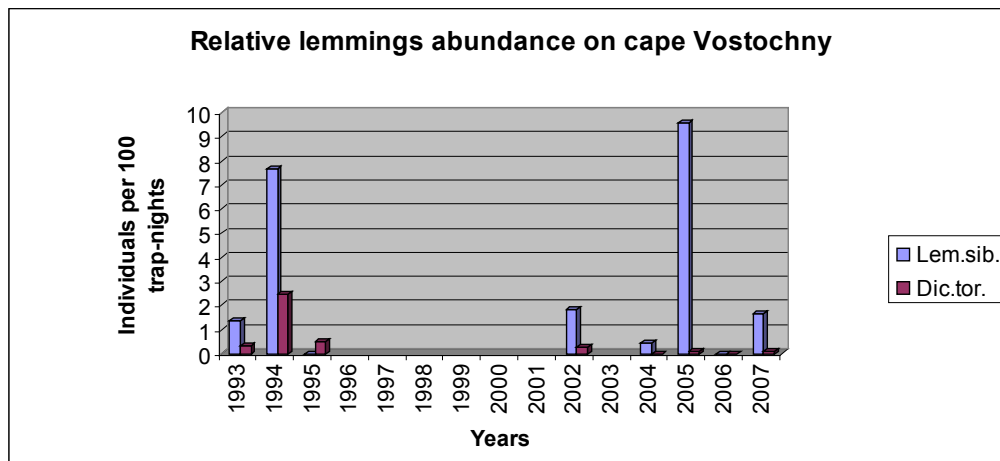
2.8 Lemmings on the tundra

In the field season (27 June - 18 July) of 2007 we continued our lemming research on Mys Vostochny. We caught animals by two different methods: by snap-traps on the trap lines (100 traps in each) and on the square plots (0.25 ha, 121 traps). We worked by the same methods and on the same lines and plots, which we used in the previous years (1993-1995, 2002, 2004-2006) (Popov, 1998; Rykhlikova and Popov, 2000). Overall data about catching (the numbers of captures and trap-nights) are presented and compared with earlier years in the table below.

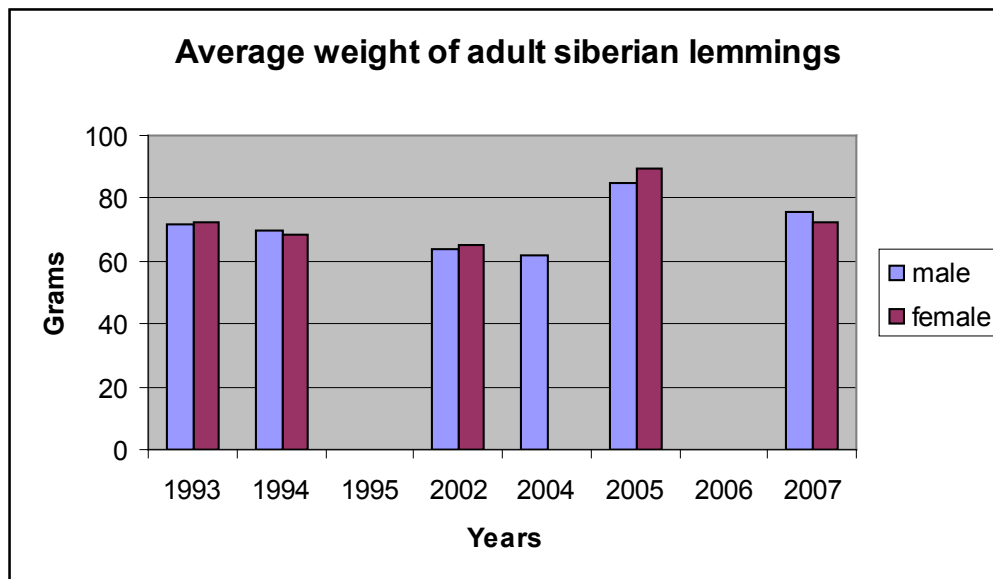
Number of caught lemmings and trap-nights

Years	Total number of trap-nights	Total number of animals	
		Lemmus sibiricus	Dicrostonyx torquatus
1993	2824	22	9
1994	2286	138	41
1995	2286	0	9
2002	1563	22	3
2004	1563	5	0
2005	1963	190	1
2006	2652	0	0
2007	1963	20	1

In the figures below are presented relative number of lemmings (per 100 trap-nights) on the permanent trap-lines. As we expected, in 2007 the abundance of lemmings (especially for Siberian Lemming) began to increase after a very deep depression in 2006.



Almost all caught Siberian Lemming were adult (only one sub adult male and totally 40% female and 60% male). The one Collared Lemming was a sub adult male. All females of Siberian Lemming were pregnant and almost all had given birth before. Average size of litter was noticeably less then in other years - only 6.07. Average weight of adult Siberian Lemmings was 74.13 g, that is a little bit higher than in most of all previous years (exclude peak year 2005).



Therefore we consider that 2007 was a normal year after a crash. Lemmings had a good condition and breeding success. And we can expect new peak year next year. However, everything will depend of weather situation during next autumn, winter and spring.

Siberian Lemming at camp Mys Vostochny (Pyasina delta) in 2007



2.9 Arctic Foxes on the tundra

In 2005 Yakov Kokorev, Sim Broekhuizen and Jaap Mulder made a detailed inventory of all burrows of the Arctic Fox in the surroundings of Mys Vostochny. Most burrows are situated around the hill Wysokaya and on the bank of the Spokoinaya river, a tributary of the Pyasina. In 2007 most of those burrows were visited at least once, mainly by Yakov Kokorev and Gerard Müskens. For the arctic predator isotopes project we collected winterfur on the burrows.

There were few Arctic Foxes. Only one burrow was occupied by foxes with young. This was on the bank of the Spokoinaya river, more than 10 km from Mys Vostochny. Around the Wysokaya hill, which is near our bird study plots, most fox burrows did show some activity, but there was no permanent occupancy by foxes. On burrow 7 one Polar Fox was seen on 29th June, but judging from the few footprints in the surrounding snow, the fox was not living permanently there. On the 5 km² bird study plot no fox was observed. Apparently this year there was no fox on Farwaterne Island during summer, but some moulted winterfur on the empty burrow showed that there had been at least one during last winter.

Nr.	General location	N-Latitude*	E-Length*	Checked	Status	Winterfur collected
1	Aaround Wysokaya hill	74.13251	86.86556		No activity	
2	Around Wysokaya hill	74.13833	86.86598		Empty, visits of single fox	
3	around Wysokaya hill	74.14086	86.87084		Empty, visits of single fox	Yes
4	Around Wysokaya hill	74.13766	86.88435		Empty, visits of single fox	
5	Around Wysokaya hill	74.14231	86.88834	No		
6	Around Wysokaya hill	74.14192	86.90523		No activity	Yes
7	Around Wysokaya hill	74.14442	86.91762		Solitary animal seen, but no permanent occupancy	Yes
8	Around Wysokaya hill	74.15572	86.90075		Empty, visits of single fox	Yes
9	Around Wysokaya hill	74.15546	86.88128	No		
10	Around Wysokaya hill	74.15540	86.87642		Empty, visits of single fox	Yes
11	Around Wysokaya hill	74.14825	86.87894		No activity	
13	Farwaterne island	74.07983	86.66782		No activity	Yes
14	Spokoinaya river	74.06882	86.93571		No activity	Yes
15	Spokoinaya river	74.07214	87.03224		No activity	Yes
16	Spokoinaya river	74.07287	87.06816		No activity	Yes
17	Spokoinaya river	74.07197	87.08179	No		
18	Spokoinaya river	74.06697	87.16006		C. 3 young foxes	Yes
19	Spokoinaya river	74.07018	87.26292		Empty, visits of single fox	
20	Spokoinaya river	74.07140	87.29078		Empty, visits of single fox	Yes
21	Spokoinaya river	74.07483	87.30420		No activity	
22	Spokoinaya river (upper part)	74.15418	87.39296	No		

* In decimal degrees.

Burrow nr. 12 at the coordinates 74.15032 86.76949, that still existed in 2005, is now gone by erosion of the sea coast.

Map of fox burrows at Mys Vostochny



Arctic Fox on burrow 18 on the mouth of the Spokoinaya river, a tributary to the Pyasina river. This was the only fox burrow with young. It was far outside the study area



Arial photograph of the Bird Islands

In front Big Bird Island with at the right Big Bird Island - North and in the back the hat shaped peninsula Bartoucha. Just before Big Bird Island there is Ushana. Directly behind Big Bird Island three islands in a close row, from left to right Vasya's Island, St. Joseph and Kolgans. Behind those three the long House Island. To the left the Small Islands and the islets Dorita and Senecio. Very vague in the far left the flat Beacon Islands.



Brent Geese on the islands

Nests of Brent Geese are rather vulnerable to predation. Brents have three alternative ways to cope with this.

1. Breed in colonies on isolated small islands, where in summer no Arctic Foxes will come. However on those islands Brents have to cope with gulls, which breed there too.
 2. Breed solitarily on the mainland. Generally those nest will be predated by Arctic Foxes.
 3. Breed in small colonies around the nest of Snowy Owl. The owls will chase away Arctic Foxes.
- However, Snowy Owls tend to breed only in lemming peak years.

In 2007 the Brent Geese opted almost exclusively for strategy 1, the small islands. On 2 July we visited the Beacon Islands (South and Middle, not North), where we found 66 nests and we visited the other Bird Islands on 13 July, where we found 226 nests.

The only exceptions on breeding on small islands were three pairs, which bred solitarily on the tundra of the larger Farwaterne Island. Of the 66 nests on the Beacon Islands none was predated when we found them on 2 June. However eleven days later, on 13 July, 58 of the 226 Brent's nests on the other Bird Islands were already predated.

Nests of Brent Geese on Bird Islands (Pyasina Delta) in 2007

Place	2002	2004	2005	2006	2007
Big Bird Island - main	76 ¹	140	60	33	101
Big Bird Island North	7	13	9	8	6
Big Bird Island - Bartucha		6	6	6	5
Ostrov Ushana		0	0	0	0
Kolgans Island	?	5	2	3	4
St. Joseph Island	18	47	29	28	43
Wasja's Island	3	3	3	2	6
House Island	28	66	42	32	52
Senecio Island	?	5	5	3	7
Dorita Island	?	5	3	1	2
Beacon Island South	?	219	82	14	28
Beacon Island Middle	?	170	?	21	38
Beacon Island North	?	52	?	0	?
4 Small Islands	?	5	1	0	0
Total	> 132	736	> 242	151	> 292

¹ Including Bartoucha and Ushana.

² Including North.

Map of nests of Brent Geese on Bird Islands and Farwaterne (Pyasina delta) in 2007



Brent Geese clutches on the Bird Islands varied from 1-6 eggs with a mean of 2.8 eggs for nests with at least one egg (n = 230). This mean is quite normal for a year, that is not a lemming peak year.

Brent Goose		Number of Brent Goose-nests grouped by clutch size							N-nests with eggs	N-nests all	Mean clutch size of nests with at least one egg
Island	Date	0	1	2	3	4	5	6			
BBI Main	13-jul-07	30	17	24	12	13	5		71	101	2.5
BBI-North+Koligans	13-jul-07		2	3	1	3	1		10	10	2.8
BBI-Bartoucha	13-jul-07			1		1	3		5	5	4.2
Beacon-Middle	2-jul-07	2	5	9	17	5			36	38	2.6
Beacon-South	2-jul-07	2	2	12	6	2	4		26	28	2.8
Ostrov Dorita	13-jul-07		1			1			2	2	2.5
House Island	13-jul-07	12	4	10	14	9	3		40	52	2.9
Senecio Island	13-jul-07			1	4	2			7	7	3.1
St.Joseph Island	13-jul-07	16	5	2	10	6	3	1	27	43	3.1
Vasya Island	13-jul-07			2	2	1		1	6	6	3.3
Total		62	36	64	66	43	19	2	230	292	2.8

This year we left the study area too early to assess the survival of the Brent's goslings, but we did expect it would be low as almost all Brent Geese in the area were breeding on islands with gulls.

2.10 Red-breasted Geese, King Eiders and Red-throated Divers on the islands

On the Bird Islands we have found 47 nests of Red-throated Divers (on Beacon Island South and Middle, Beacon Island North has not been counted), ten King Eiders nests and eleven Red-breasted Geese nests. The Red-breasted Goose is a newcomer on the Bird Islands, which did not yet nest here in the early 1990s. It was not until 1995 that the first two nests were discovered by us.

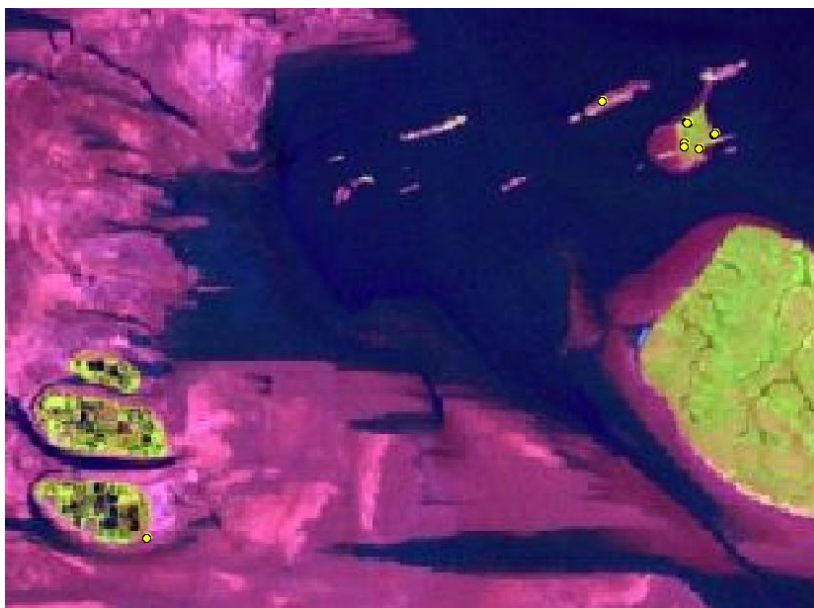
Numbers of nests of Red-throated Divers, Red-breasted Geese and King Eiders on the Bird Islands (Pysina Delta), 2004-2007

Species	2004	2005	2006	2007
Red-breasted Diver	?	?	36	47
Red-breasted Goose	4	4	6	11
King Eider	20	?	11	10

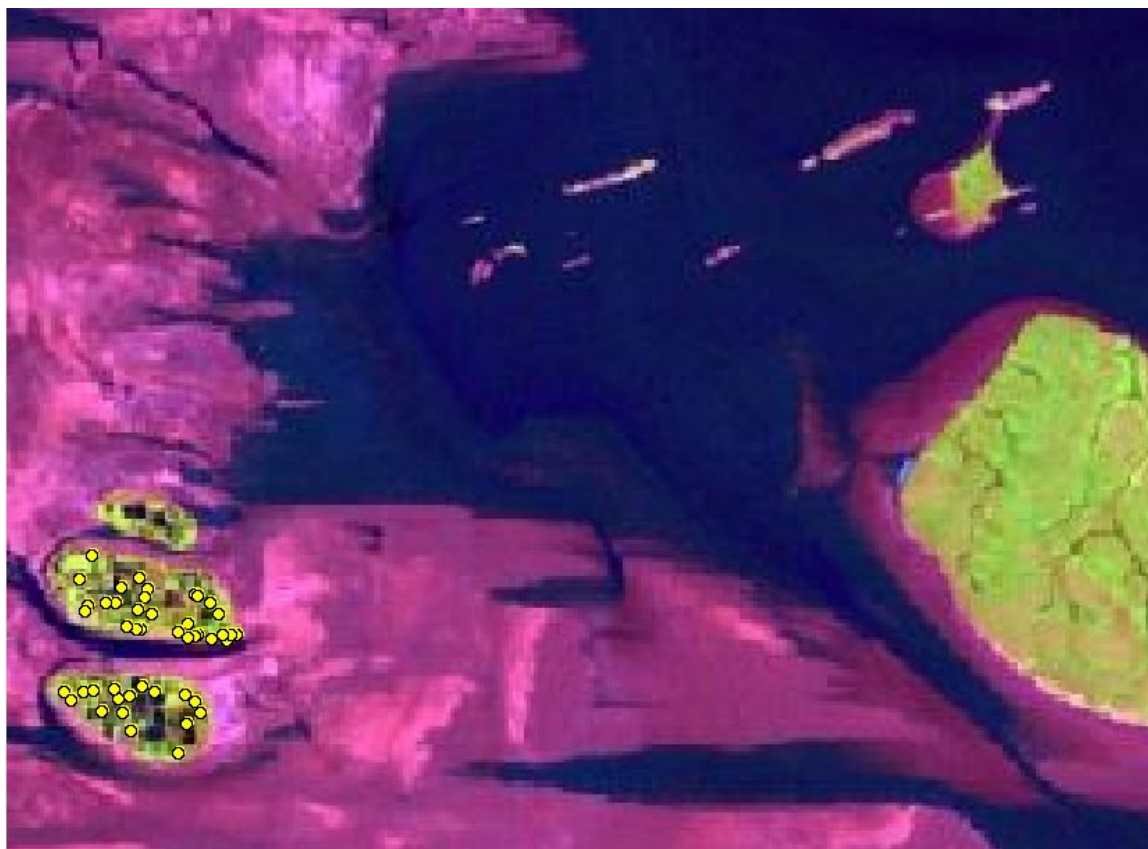
Map of nests of Red-breasted Geese on Bird Islands (Pyasina delta) in 2007



Map of nests of King Eiders on Bird Islands (Pyasina delta) in 2007



Map of nests of Red-throated Divers on Bird Islands (Pyasina delta) in 2007



2.11 Gulls on the islands

On 2 July (Beacon Island South and Middle) and 13 July (other Bird Islands) we have counted 1753 nests of Taimyr Gulls and 20 nests of Glaucous Gulls. It looks as if the Taimyr Gulls are decreasing. This decrease is happening on the Beacon Islands, not on the other Bird Islands.

Number of Taimyr Gull nests on the Bird Islands in 2007

Place	2002	2004	2005	2006	2007
Big Bird Island - main	135 ¹	102	118	106	91
Big Bird Island - North	239	254	290	232	215
Big Bird Island - Bartoucha		39	43	36	41
Ostrov Ushana		30	22	20	19
Kolgans Island	?	17	15	19	25
St. Joseph Island	76 ²	94	101	93	94
Wasja's Island	86	61	78	76	69
House Island	429	394	412	340	328
Senecio Island	?	60	84	52	58
Dorita Island	45	85	88	79	68
Beacon Island South	?	508	642	393	324
Beacon Islands Middle	?	527	?	444	374
Beacon Islands North	?	257	?	195	?
Four small islets	?	90	92	57	47
Total	> 1010	2518	> 1985	2142	> 1753

¹ Including Bartoucha and Ushana.

² Including Kolgans Island.

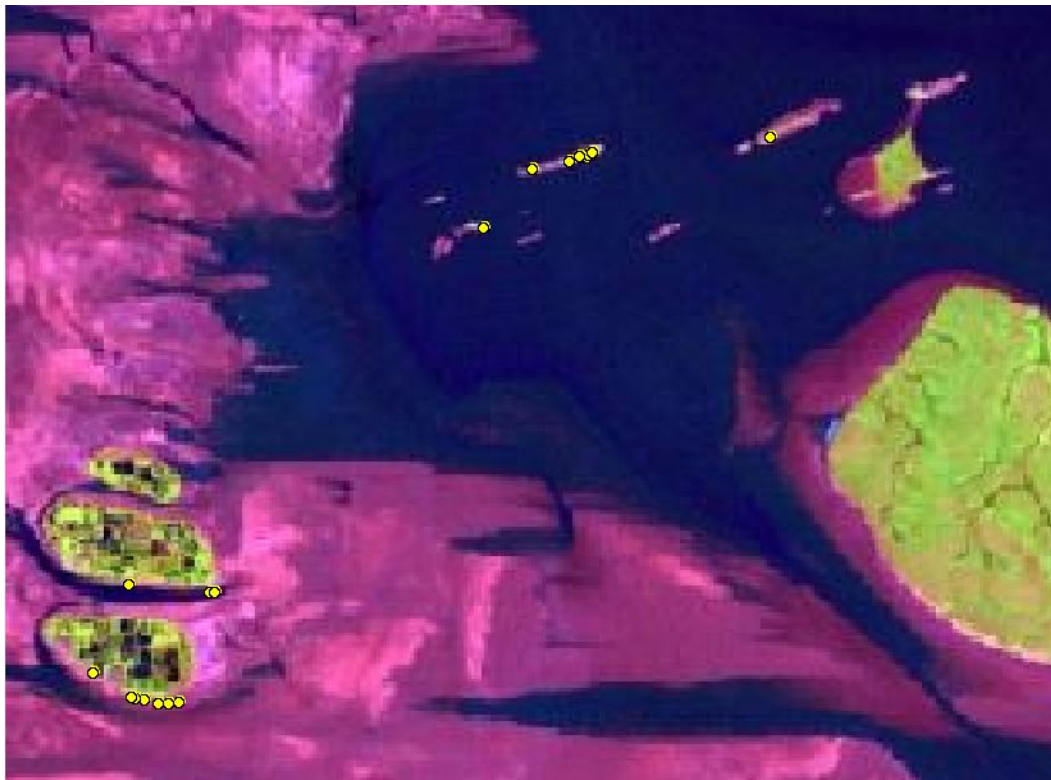
Taimyr Gull clutches on the Bird Islands varied from 1-4 eggs with a mean of 2.1 eggs for nests with at least one egg (n = 1227). This mean is a rather low figure.

Taimyr Gull		Number of Taimyr Gull nests grouped by clutch size						N-nests with eggs	Mean clutch size of nests with at least one egg	N-nests all
Island	Date	0	1	2	3	4	chicks			
BBI-Bartoucha	13-jul-07	21	5	6	8		1	19	2.2	41
BBI-Main	13-jul-07	8	11	22	43	1	6	77	2.4	91
BBI-North	13-jul-07	30	60	58	54		13	172	2.0	215
Beacon-Middle	2-jul-07	112	95	86	78	3		262	2.0	374
Beacon-South	2-jul-07	117	73	71	58	5		207	2.0	324
Ostrov Dorita	13-jul-07	12	14	20	21		1	55	2.1	68
House Island	13-jul-07	96	53	73	96	3	7	225	2.2	328
Kolgans Island	13-jul-07	10	4	3	8			15	2.3	25
Senecio Island	13-jul-07	15	8	11	23		1	42	2.4	58
Small islet A	13-jul-07	8	2	1				3	1.3	11
Small islet B	13-jul-07	5	3	5	4			12	2.1	17
Small islet C	13-jul-07	1			1			1	3.0	2
Small islet D	13-jul-07	10	2	5				7	1.7	17
St. Joseph Island	13-jul-07	22	13	18	36		5	67	2.3	94
Ushana Island	13-jul-07	1	3	8	5	1	1	17	2.2	19
Vasya Island	13-jul-07	16	11	13	22		7	46	2.2	69
Total		484	357	400	457	13	42	1227	2.1	1753

Map of nests of Taimyr Gulls on Bird Islands (Pyasina delta) in 2007



Map of nests of Glaucous Gulls on Bird Islands (Pyasina delta) in 2007



2.12 Ringing of birds

For many bird species that breed at high-arctic latitudes a clear picture of migratory routes and wintering grounds is lacking (Tomkovich et al., 2000). Ringing of birds is a laborious but feasible method to reveal their impressive wanderings, despite the fact that recovery rates are low. During our expedition we aimed to ring as many birds as possible.

Most birds were ringed as chicks. Unfledged young were ringed in the nest or captured by hand after they had left the nest.

Three methods were used to catch adult birds. Firstly, incubating waders were caught on their nest using a small clapnet (catching area about 30 x 30 cm). This clapnet (in Russian luchok) was triggered by the bird itself at its return to the nest or in case of not so shy birds by means of pulling a 40 m long rope. Secondly three incubating King Eiders were caught with a simple handheld net. Thirdly two incubating Red-breasted Geese were caught by hand. Incubating King Eiders and Red-breasted Geese are generally very tame.

Metal rings were generously provided by the Russian ringing centre (inscription MOSKVA). In total we ringed 279 individual birds, divided over fifteen species.

Birds ringed during the expedition to the northern Pyasina delta 2007

Species	Adult	Chick	Total
Red-breasted Goose	2		
King Eider	3		
Grey Plover	7		7
Pacific Golden Plover	9	3	12
Ringed Plover		3	3
Dunlin	3	14	17
Curlew Sandpiper	4	4	7
Pectoral Sandpiper	1	3	4
Grey Phalarope		4	4
Little Stint	3	36	39
Turnstone		3	3
White Wagtail		5	5
Shore Lark		6	6
Lapland Bunting		32	32
Snow Bunting		135	135
TOTAL	32	247	279

Few data are available about the condition of high-arctic breeding birds throughout the breeding season. For that reason biometrics were collected for all birds caught or found dead.

2.13 The remarkable returns of a Dunlin and a Snow Bunting

On 16th July Laurent Demongin observed a Dunlin in the 5 km² plot with on the left leg three color rings (Pink, Yellow, Yellow) and on the right leg two color rings (Yellow, Pink) and a metal ring. It had four chicks which had left the nest. Laurent and Maud Poisbleau had caught this Dunlin last year on its nest and provided it with the color rings and the metal ring KS 09953. It shows that Dunlins can be quite conservative in the yearly choice of their breeding place.

On 9th July a Snow Bunting with a metal ring was found dead in one of the lemming traps. This Snow Bunting had been caught by Laurent last year as an adult in a mist net near the camp.

3 **Conclusions**

- Moderate numbers of lemmings
- No nesting Snowy Owls and Rough-legged Buzzards
- Just one nesting Pomarine Skua
- No Weasels observed
- Few Arctic Foxes
- Good breeding success for waders and song birds
- Good breeding success for White-fronted Geese
- Poor breeding success for Brent Geese expected

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Annex 1 Numbers of nests found on the Bird Islands* in the Pyasina delta 2007

ISLAND	Arctic Tern	Brent Goose	Glaucous Gull	King Eider	Little Stint	Red-breasted Goose	Red-throated Diver	Taimyr Gull	Temminck's Stint	Total
Bartoucha		5				2		41		48
Beacon Middle	1	38	3				29	374		445
Beacon South		28	7	1			18	324		378
Big Bird Island Main		101		8	1	4		91	1	206
Big Bird Island North		6				1		215		222
Dorita		2						68		70
House		52	8			1		328		389
Kolgans		4						25		29
Senecio		7	1					58		66
Small A								11		11
Small B								17		17
Small C								2		2
Small D								17		17
St-Joseph		43	1	1		3		94		142
Ushana								19		19
Wasja's		6						69		75
Total	1	292	20	10	1	11	47	1753	1	2136

* Beacon Island North not counted.

Annex 2 Numbers of nests found on the tundra at the Pyasina delta 2007

Species	5 km ² plot*	Farwaterne	Out of study area	Total	1 km ² plot *
Arctic Skua		2		2	
Brent Goose		3		3	
Curlew Sandpiper	6	2	9	17	1
Dunlin	4	1	6	11	1
Grey Phalarope	5			5	
Grey Plover	4	2	6	12	
Lapland Bunting	6		5	11	5
Little Stint	59	13	12	84	5
Pacific Golden Plover	5		5	10	2
Pectoral Sandpiper	7		1	8	
Pomarine Skua	1			1	
Red-throated Pipit	1		1	2	1
Ringed Plover	4		2	6	3
Shore Lark	1		2	3	1
Snow Bunting	26		28	54	9
Temminck's Stint	4		1	5	3
Turnstone		1	1	2	
Wheatear	1		1	2	1
White Wagtail	1			1	1
White-fronted Goose	6	61	12	79	2
Total	141	85	92	318	35

* Part of 5 km² plot.

Annex 3 Overview of birds observed at the Pyasina delta in 2007

During the expedition we made notes about the birds we observed. The actual observation period was 27 June to 18 July. As we started rather late in the season we have few observations of migrating birds. Outside our proper study area we have visited two more islands in the Pyasina delta: Vjerschny (once) and Tsjajka Island (twice). Some observations on breeding birds of those two islands have been included in our overview. A remarkable record is the breeding of at least five pairs of Sabine's Gulls on Tsjajka.

B = breeding abundant (>10 pairs)

b = breeding rare/occasional (<10 pairs)

O = non-breeding but observed regularly (>10 times)

o = non-breeding and observed occasionally (<10 times)

m = observed during migration

v = vagrant

*Pair of Black Brents (*Branta bernicla nigricans*, at the right) on one of the Beacon Islands 2th July 2007*
*At the left the usual Black-bellied Brents *Branta bernicla bernicla**



Species	Status	Remarks
Red-throated Diver	B	Common breeder on Beacon Islands. Regularly seen in Lidia Bay
White-fronted Goose	B	Common breeder on Farwaterne Island, but few breeding on the mainland
Red-breasted Goose	B	Eleven nests on the Bird Islands. Six - eight nests Vjerchny Island
Brent Goose	B	Common breeder on the Bird Islands. 267 nests on Vjerchny Island Two birds of subspecies <i>nigricans</i> on Beacon Islands on July 2
King Eider	B	Common breeder on Bird Islands
Steller's Eider	o	Fifteen at Beacon Islands on July 2
Long-tailed Duck	O	Regularly seen in Lidia Bay
White-tailed Eagle	o	One individual in the Pyasina delta on July 3, about 15 km south of the camp
Ptarmigan	b	Resident in small numbers on the tundra
Ringed Plover	b	Breeding on the shore of Mys Vostochny , Farwaterne and Lydyya House
Dotterel	m/o	Several observations on stony places. No territorial behavior seen. Maximum of about ten birds at Wysokaya hill on June 29, possibly on migration
Pacific Golden Plover	B	Common breeder on Mys Vostochny, Farwaterne and near Lydyya House
Grey Plover	B	Common breeder on Mys Vostochny, Farwaterne and near Lydyya House
Turnstone	b	Breeding on Mys Vostochny and on Farwaterne
Red Knot	m	One flock of five on Farwaterne on July 6
Curlew Sandpiper	B	Common breeder on Mys Vostochny, Farwaterne and Lydyya House
Dunlin	B	Common breeder on Mys Vostochny and Farwaterne. Probably breeding near Lydyya House
Little Stint	B	Common breeder on Mys Vostochny, Farwaterne and near Lydyya House
Temminck's Stint	b	Breeding on the shore of Mys Vostochny and on Big Bird Island - main
Pectoral Sandpiper	b	Breeding on Mys Vostochny and near Lydyya House. Seen on Farwaterne.
Ruff	b/O	Presumed breeder on Mys Vostochny. During whole expedition there were days with at least 30-50 staging Ruffs on Mys Vostochny. By the end of June some birds in lecks
Bar-tailed Godwit	M	Some flocks (flock size up to 22 birds) on Mys Vostochny and Farwaterne
Grey Phalarope	b	Breeding on marshy places of Mys Vostochny and Farwaterne
Red-necked Phalarope	O	Maximum of six birds on one day on Mys Vostochny. No breeding behaviour observed
Long-tailed Skua	O	Roaming around in low numbers
Arctic Skua	b/O	Two nests on Farwaterne. Roaming around on Mys Vostochny
Pomarine Skua	b/O	One breeding on Mys Vostochny. Many roaming around on Mys Vostochny and Farwaterne
Sabine's Gull	b	At least five nests on Tsjaika Island
Taimyr Gull	B	Many pairs on the Bird Islands
Glaucous Gull	B	Breeding on Bird Islands
Arctic Tern	B	One nest found on Beacon Island Middle. Presumably breeding on other Bird Islands too
Snowy Owl	o	One seen on June 29 near the camp. No proof of breeding
Shorelark	B	A very common breeding bird on the tundra
Barn Swallow	v	One on June 29 above tundra
Red-throated Pipit	B	Several pairs breeding on Mys Vostochny
White Wagtail	b	One breeding in nestbox in camp
Bluethroat	o	Observed on Mys Vostochny during the whole of our stay. No evidence of breeding
Wheatear	b	Breeding near the camp and on rocks in the tundra
Arctic Redpoll	m	One seen at shore of Mys Vostochny on 4 July
Lapland Bunting	B	Common breeder on the tundra
Snow Bunting	B	Common breeder on the tundra, on rocky outcrops and under driftwood on the shore

Annex 4 English, scientific, Dutch and Russian bird names

English name	Scientific name	Dutch name	Russian name *
Arctic Redpoll	<i>Carduelis hornemanni</i>	Witstuitbarmsijs	Пепельная чечетка
Arctic Skua	<i>Stercorarius parasiticus</i>	Kleine jager	Короткохвостый поморник
Arctic Tern	<i>Sterna paradisaea</i>	Noordse stern	Полярная крачка
Bar-tailed Godwit	<i>Limosa lapponica</i>	Rosse grutto	Малый веретенник
Barn Swallow	<i>Hirundo rustica</i>	Boerenzwaluw	Деревенская ласточка
Bewick's Swan	<i>Cygnus bewickii</i>	Kleine zwaan	Малый лебедь
Bluethroat	<i>Luscinia svecica</i>	Blauwborst	Обыкновенный соловей
Brent Goose	<i>Branta bernicla</i>	Rotgans	Черная казарка
Curlew Sandpiper	<i>Calidris ferruginea</i>	Krombekstrandloper	Краснозобик
Dotterel	<i>Eudromias morinellus</i>	Morinelplevier	Хрустан
Dunlin	<i>Calidris alpina</i>	Bonte strandloper	Чернозобик
Glaucous Gull	<i>Larus hyperboreus</i>	Grote burgemeester	Бургомистр
Grey Phalarope	<i>Phalaropus fulicarius</i>	Rosse franjepoot	Плосконосый плавунчик
Grey Plover	<i>Pluvialis squatarola</i>	Zilverplevier	Тулес
King Eider	<i>Somateria spectabilis</i>	Koningseider	Гага-гребенушка
Lapland Bunting	<i>Calcarius lapponicus</i>	IJsgors	Лапландский подорожник
Little Stint	<i>Calidris minuta</i>	Kleine strandloper	Кулик-воробей
Long-tailed Duck	<i>Clangula hyemalis</i>	IJseend	Морянка
Long-tailed Skua	<i>Stercorarius longicaudus</i>	Kleinste jager	Длиннохвостый поморник
Pacific Golden Plover	<i>Pluvialis fulva</i>	Pacifische goudplevier	Бурокрылая ржанка
Pectoral Sandpiper	<i>Calidris melanotos</i>	Gestreepte strandloper	Дутиш
Pintail	<i>Anas acuta</i>	Pijlstaart	Шилохвость
Pomarine Skua	<i>Stercorarius pomarinus</i>	Middelste jager	Средний поморник
Ptarmigan	<i>Lagopus mutus</i>	Alpensneeuwhoen	Тундряная куропатка
Red Knot	<i>Calidris canutus</i>	Kanoet	Исландский песочник
Red-breasted Goose	<i>Branta ruficollis</i>	Roodhalsgans	Краснозобая казарка
Red-necked Phalarope	<i>Phalaropus lobatus</i>	Grauwe franjepoot	Круглоносый плавунчик
Red-throated Diver	<i>Gavia stellata</i>	Roodkeelduiker	Краснозобая гагара
Ringed Plover	<i>Charadrius hiaticula</i>	Bontbekplevier	Галстучник
Rough-legged Buzzard	<i>Buteo lagopus</i>	Ruigpootbuizerd	Зимняк
Ruff	<i>Philomachus pugnax</i>	Kemphaan	Турухтан
Sabine's Gull	<i>Larus sabini</i>	Vorkstaartmeeuw	Вилохвостая чайка
Shore Lark	<i>Eremophila alpestris</i>	Strandleeuwerik	Рогатый жаворонок
Snow Bunting	<i>Plectrophenax nivalis</i>	Sneeuwgors	Пуночка
Snowy Owl	<i>Bubo scandiaca</i>	Sneeuwuil	Белая сова
Steller's Eider	<i>Polysticta stelleri</i>	Stellers eider	Сибирская гага
Taimyr Gull	<i>Larus taimyrensis</i>	Taimyr meeuw	Восточная клуша
Temminck's Stint	<i>Calidris temminckii</i>	Temminks strandloper	Белохвостый песочник
Turnstone	<i>Arenaria interpres</i>	Steenloper	Камнешарка
White Wagtail	<i>Motacilla alba</i>	Witte kwikstaart	Белая трясогузка
White-fronted goose	<i>Anser albifrons</i>	Kolgans	Белолобый гусь
White-tailed Eagle	<i>Haliaeetus albicilla</i>	Zeearend	Орлан-белохвост

* Source: The birds of Central Siberia <<http://birds.krasu.ru/www/>>

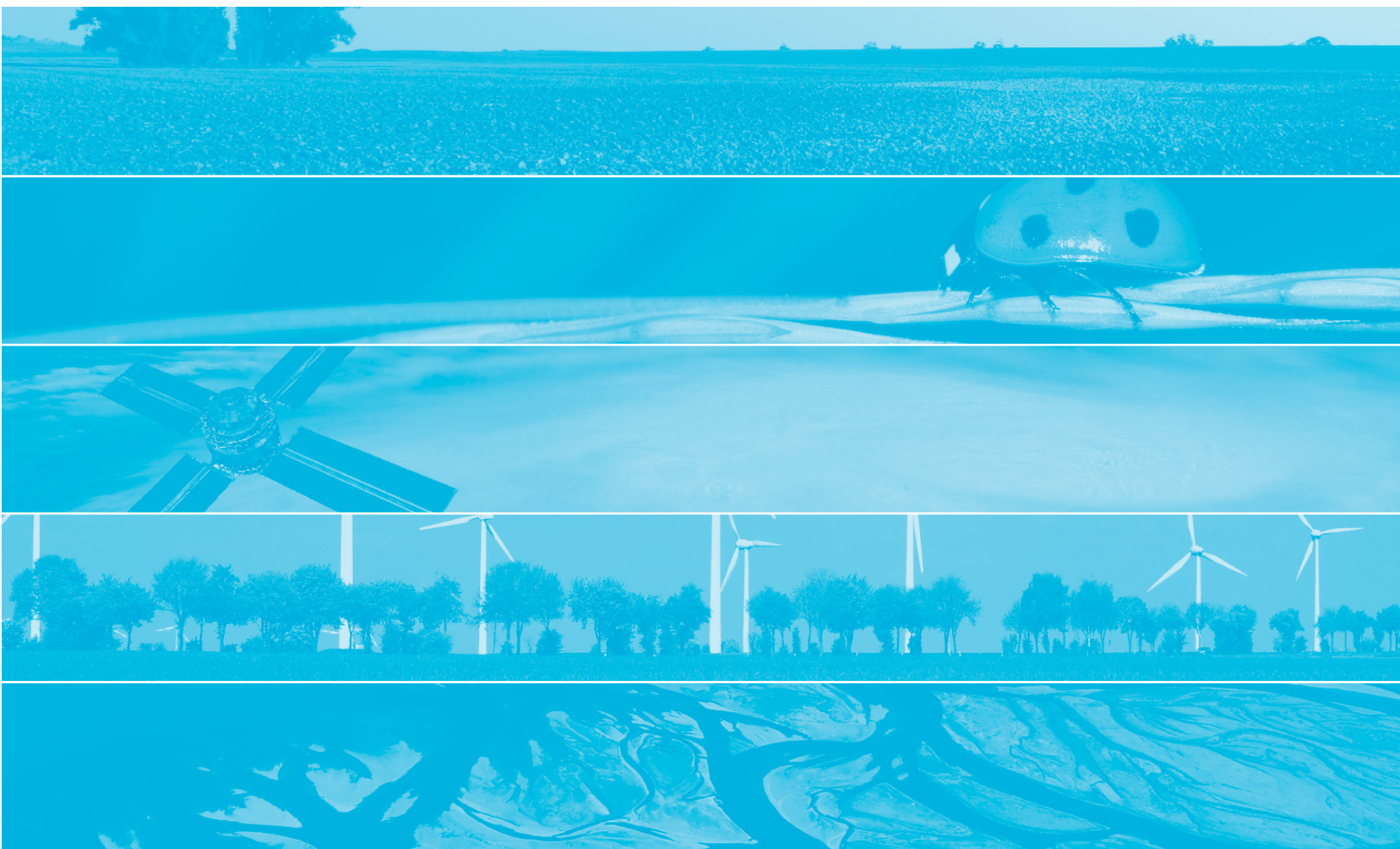
Annex 5 Origins of colour marked Brent Geese, observed on Birds Islands (Pyasina Delta) July 2007

Code	Nest	Sex	Date	Observing- place	Remarks	Ringling-place	Ringling- date
GHY1	JTS133	Female	13-07-07	St. Joseph Island	Nest: 5 eggs	Big Bird Island, Pyasina delta, Taimyr, Russia	9-7-2004
GKYK		Male	13-07-07	Big Bird Island		Terschelling, Netherlands	19-5-2005
GKYK	JTG201 or GMG216	Male	18-07-07	Big Bird Island	Paired with unringed female	Terschelling, Netherlands	19-5-2005
GNYA	SPG086	Female	13-07-07	Big Bird Island	Nest: 5 eggs	Big Bird Island, Pyasina delta, Taimyr, Russia	2-7-2005
GNYY	LDG231	Female	13-07-07	Big Bird Island	Nest: 3 eggs	Terschelling, Netherlands	17-5-2002
L=B7	GMH143	Male	13-07-07	House Island	Nest: 3 eggs	House Island, Pyasina delta, Taimyr, Russia	5-8-2006
L1BF	GMW149	Female	13-07-07	Wasja's Island	Nest: 3 eggs	Big Bird Island, Pyasina delta, Taimyr, Russia	9-8-1995
L1BJ		Female	13-07-07	House Island	Pair with L5BF	Beacon Island Middle	31-7-2006
L5BF		Male	13-07-07	House Island	Pair with L1BJ	House Island, Pyasina delta, Taimyr, Russia	5-8-2006
L6B6	GMH143	Female	13-07-07	House Island	Nest: 3 eggs	House Island, Pyasina delta, Taimyr, Russia	5-8-2006
L7BK	GMW147	Female	13-07-07	Wasja's Island	Nest: 2 eggs	House Island, Pyasina delta, Taimyr, Russia	5-8-2006
LCBT		Female	13-07-07	St. Joseph Island	Pair with LYBX	Big Bird Island, Pyasina delta, Taimyr, Russia	3-8-2005
LKB(?N)			13-07-07	Big Bird Island		Lidia Bay, Pyasina delta, Taimyr, Russia	7-8-2005
LKB=			18-07-07	Big Bird Island		Mys Wostochny, Pyasina delta, Taimyr, Russia	3-8-2006
LKBC		Male?	18-07-07	Big Bird Island	Pair with LNBN	Lidia Bay, Pyasina delta, Taimyr, Russia	7-8-2005
LKBN		Male?	18-07-07	Big Bird Island	Pair with LKBN, 2 goslings	Lidia Bay, Pyasina delta, Taimyr, Russia	7-8-2005
LKBP	LDG268	Female	13-07-07	Big Bird Island	Nest: 3 eggs	Lidia Bay, Pyasina delta, Taimyr, Russia	7-8-2005
LKBP		Female?	18-07-07	Big Bird Island	Pair with LKBP, 2 goslings	Lidia Bay, Pyasina delta, Taimyr, Russia	7-8-2005
LNBN		Female?	18-07-07	Big Bird Island	Paired with LKBC	Lidia Bay, Pyasina delta, Taimyr, Russia	7-8-2005
LPBA	LDH130	Female	13-07-07	House Island	Nest: 3 eggs	House Island, Pyasina delta, Taimyr, Russia	4-8-2005

Code	Nest	Sex	Date	Observing- place	Remarks	Ringling-place	Ringling- date
LXB9		Female	13-07-07	St. Joseph Island	Pair with a male with metal ring only	Big Bird Island, Pyasina delta, Taimyr, Russia	9-8-1995
LYB-		Female	18-07-07	Big Bird Island		Mys Wostochny, Pyasina delta, Taimyr, Russia	3-8-2006
LYBX		Male	13-07-07	St. Joseph Island	Pair with LCBT	Big Bird Island, Pyasina delta, Taimyr, Russia	3-8-2005
WARN		Female	18-07-07	Big Bird Island	Pair with metal ringed male ; one chick	Terschelling, Netherlands	16-5-1989
WCRY			13-07-07	Wasja's Island		Terschelling, Netherlands	17-5-1989
Y XV	GMV279	Female	13-07-07	Big Bird Island	Nest: 4 eggs	Big Bird Island, Pyasina delta, Taimyr, Russia	12-7-2002
Y3GF	GMW151	Female	13-07-07	Wasja's Island	Nest: 6 eggs	Schiermonnikoog, Netherlands	23-5-2001

All adults

* all part of Pyasina delta, Taimyr, Russia



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