5. Avifaunistische Übersichten

5.1 Avifaunistical Records of the WWF Expeditions to Taimyr in the Years 1989, 1990 and 1991

Hermann Hötker

with the assistance of Holger A. Bruns, Christoph Herden, Harro H. Müller, Georg Nehls, Eugeniusz Nowak, Peter Prokosch, Hans-Ulrich Rösner and Martin Stock

Introduction and methods

The earliest avifaunistical records from the Taimyr Peninsula were provided by MIDDENDORF (1851). Since then, especially in the second half of this century, Russian biologists have gathered a great amount of data on the birds of Taimyr. Much of this data, however, is unpublished and remained in the archives of Norilsk and Khatanga. The history of ornithological research on Taimyr is briefly summarised by ILYCHEV & FLINT (1985) and ROGACHEVA (1992). Here we have tried to compile a comprehensive report of our avifaunistical observations on Taimyr during the years 1989, 1990 and 1991. Our report may be regarded as a step towards a monograph of the birds of Taimyr and as an encouragement for our Russian colleagues to continue in this task.

As may be seen from previous chapters of this book, different members of our group stayed at different places (see figure 1) in different years and for different periods of time. Therefore, the quality of ornithological research is not directly comparable between sites and years. This is especially so at places which we visited only briefly, and the bird lists are definitively incomplete. Moreover, the years 1989 - 1991 differed in weather (see chapter 3), and the densities of lemmings varied enormously during these years: very low densities in 1989 (but with many frozen lemmings available), low to moderate densities in 1990 (see chapter 7.2.), and high densities (at least in some regions) in 1991. Geographical differences in bird distributions may have been obscured by the fact that we visited some places only in unfavourable conditions (late spring, no lemmings), while we stayed at others only during more favourable conditions. Therefore in some cases the interpretation of the results is difficult, and we restricted ourselves to presenting just the raw data.

Our observation periods fell into the main breeding season of most of the bird species on Taimyr (chapter 2) so that we could study their breeding distribution and their breeding biology. In 1990, however, we initiated our work at June 1 at Camp Lydia north of the Pyasina delta, well before the majority of birds had arrived. This allowed us to record the arrival dates and the timing of spring migration as well as the establishment of territories for some of the species.

The records from Bikada and Ust' Tareya (compiled by C. HERDEN) originate from the data collections of the field stations at these places. On the maps the general status of the species at both places is shown. Detailed observations are usually not mentioned.

Depending on the stituation in different study sites and years, we concentrated our efforts on several key species. These were Brent Goose, White-fronted Goose, Grey Plover, Little Stint, Curlew Sandpiper, Knot, Dunlin and Turnstone. The results of our investigations of the Brent Goose are summarised in this issue in PROKOSCH (1995), SPILLING & STOCK (1995), BERGMANN et al. (1995) and MOOIJ (1995). A part of the data on Dunlin is already published in KANIA (1990), and many of our data on Little Stints will be incorporated in publications which will be prepared jointly by the members of expeditions from other countries and by ourselves. In addition, data on the birds of the forest reserve of Ary-Mas (GAVRILOV 1995) and on long-term counts of Bewick's Swans, Red-breasted Geese and Peregrines (KOKOREV 1995) are also presented in this volume.

At five of the places which we visited (Malaya Logata, Rysyukov, Camp Lydia, Sterlegova, Shturmanov), we could roughly estimate the density of the most common breeding bird species (table 1). We mapped the territories of the birds on an area which was defined either roughly by natural borders (Malaya Logata, Rysyu-

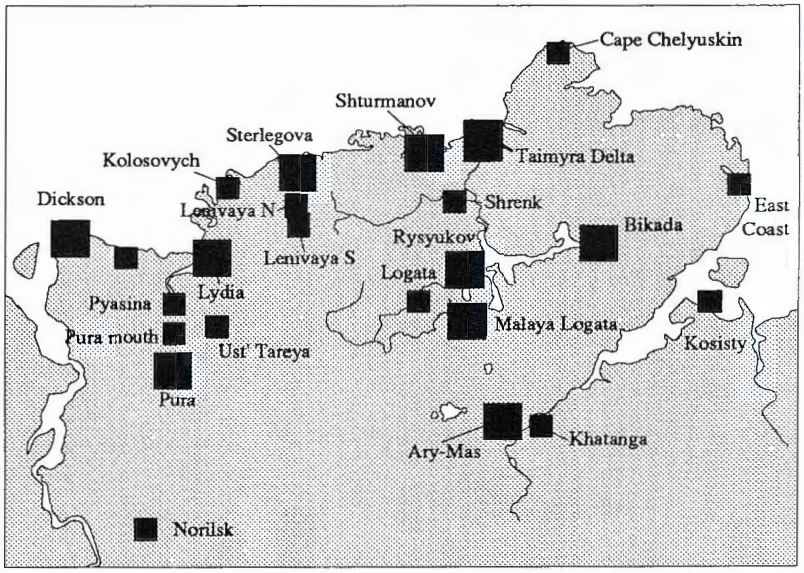


Figure 1. Map of the areas visited in 1989, 1990 and 1991.

Abbildung. 1. Karte der 1989, 1990 und 1991 besuchten Gebiete. Große Quadrate: Aufenthalt mindestens ein Tag; kleine Quadrate: Aufenthalt weniger als ein Tag.

■ visit of at least one day

■ short visit, less than one day

kov, Shturmanov in 1989 and Sterlegova in 1990) or (for greater precision) by lines of poles in the field (Camp Lydia 1990). The numbers of territories per site were estimated by using the maximum counts on single days in sub-sections of the study sites. Only birds showing signs of breeding and/or territoriality were considered.

Due to the long period of field work with a great emphasis on mapping territories and finding nests, the data recorded at Camp Lydia are probably quite accurate. At many other sites the time was too short to mark a study plot and to determine its size. In the following text, therefore, we often give as a rough indication of abundance just the actual numbers of birds or pairs seen at the sites without reference to area measurements.

As a second method to measure the breeding density of some bird species we used rope transects. A rope 50 m long was extended between two persons walking in parallel along a straight line of usually several kilometres. A third person some meters behind the rope recorded birds flushed out by the rope and tried to find their nests. We used this method only in 1989. The results of the rope transects are given in table 2. The densities yielded by the rope transects were usually much higher than those estimated from territory mapping (compare tables 1 and 2). It is therefore very probable that the densities revealed by territory mapping considerably underestimated the true densities. Especially in 1989, our visits to some of the study plots were too late in the season to allow us a full determination of the breeding bird community.

Data on nests are either included in the species accounts (usually in cases of three or less nests found), given in separate tables, or they are evaluated in a short paragraph on the breeding biology in the species' chapter. A clutch was considered to be complete if the number of eggs remained stable over two nest controls at least 48 hours apart. The start of laying was estimated for nests found during the laying period and for nests with a known date of hatching. The relevant data for the length of the laying period and the length of the incubation period were taken from CRAMP & SIMMONS (1977, 1980, 1983), DEMENTYEV & GLADKOV (1966-1970), GLUTZ von BLOTZHEIM, BAUER & BEZZEL (1975, 1977). We calculated the hatching success of species with many nests found, according to MAYFIELD (1975).

In 1989 and 1990 we ringed 1894 birds altogether, mostly Brent Geese, White-fronted Geese and waders (see table 3). Except for the Brent Goose and White-fronted Goose data, which are incorporated in PROKOSCH (1995) and MOOIJ (1995), all other biometric data can be found in appendix 1. Some birds were sexed according to plumage characters (details for Grey Plover and Knots see PROKOSCH 1988) and according to the width of the cloaca (female Little Stints shortly after laying). Sexing according to plumage is not completely accurate in Knots and perhaps also not in Grey Plovers. In all cases, however, we have been able to catch or to see the partners of the sexed birds. We could therefore check the method (under the assumption, that the brighter coloured bird in a pair is

Table 1. Breeding densities of birds in different study sites on the Taimyr Peninsula in 1989 and 1990. a: number of breeding pairs; b: densities (pairs/km^2)
Tabelle 1. Siedlungsdichten der Brutvögel verschiedener Untersuchungsgebiete auf der Taimyr-Halbinsel 1989 und 1990. a: Zahl der Brutpaare; b: Siedlungsdichte (Paare/km^2).

site – *Gebiet*	**Malaya Logata**		**Camp Lydia**		**Rysyukov**		**Sterlegova**		**Shturmanov**	
size – Größe	7 km^2		4.48 km^2		14 km^2		19.8 km^2		12 km^2	
year – *Jahr*	1989		1990		1989		1990		1989	
coordinates – *Koordinaten*	73 23'N 98 25'E		74 09'N 86 53'E		74 22'N 100 05'E		74 26'N 89 09E		76 00'N 96 30'E	
	a	**b**	**a**	**b**	**a**	**b**	**a**	**b**	**a**	**b**
Gavia stellata	-		1		-		1		-	
Gavia arctica	1		-		2		-		-	
Anser albifrons	1		4		-		12	***0.6***	-	
Anas acuta	1		-		-		-		-	
Somateria spectabilis	7	***1.0***	-		?		3		?	
Polysticta stelleri	-		2		-		1		-	
Clangula hyemalis	ca 50	***7.1***	-		?		0-20		?	
Lagopus lagopus	30	***4.3***	-		-		-		-	
Lagopus mutus	5	***0.7***	5	***1.1***	4		25	***1.3***	?	
Charadrius hiaticula	-		3		-		8	***0.4***	12	***1.0***
Pluvialis squatarola	1		1		3		50	***2.5***	6	***0.5***
Pluvialis fulva	30	***4.3***	7	***1.6***	8	***0.6***	-		3	
Calidris canutus	-		-		-		25	***1.3***	2	
Calidris alba	-		-		-		5	***0.3***	-	
Calidris minuta	100	***14.3***	190	***42.4***	11	***0.8***	100	***5.1***	7	***0.6***
Calidris temminckii	12	***1.7***	-		2		-		-	
Calidris melanotos	13	***1.9***	4		-		-		-	
Calidris ferruginea	10	***1.4***	105	***23.4***	-		45	***2.3***	1	
Calidris maritima	-		-		-		2		-	
Calidris alpina	28	***4.0***	9	***2.0***	4		-		-	
Gallinago gallinago	5	***0.7***	-		-		-		-	
Arenaria interpres	-		4		-		45	***2.3***	10	***0.8***
Phalaropus lobatus	11	***1.6***	?		5	***0.4***	-		-	
Phalaropus fulicarius	ca 10	***1.4***	6	***1.3***	?		2		-	
Stercorarius longicaudus	-		1		-		3		-	
Larus heuglini	1		-		3		0-6		-	
Larus hyperboreus	1		-		-		1		-	
Sterna paradisaea	-		-		-		10	***0.5***	4	
Eremophila alpestris	2		30	***6.7***	5	***0.4***	8	***0.4***	6	***0.5***
Motacilla alba	2		-		2				-	
Anthus cervinus	3		-		-		-		-	
Phylloscopus trochilus	many		-		-		-		-	
Luscinia svecica	many		-		1		-		-	
Oenanthe oenanthe	1		-		2		-		-	
Calcarius lapponicus	150	***21.4***	42	***9.4***	ca 40	***2.9***	5	***0.3***	8	***0.7***
Plectrophenax nivalis	-		1		1		150	***7.6***	20	***1.7***
Acanthis hornemanni	3		-		-		-		-	

Table 2. Results of rope transects in 1989. The numbers of individual birds on the transects are given. Figures in parenthesis refer to birds with no signs of territoriality nor breeding. For details of methods see text.
Tabelle 2. Ergebnisse der Seiltransektzählungen aus dem Jahre 1989. Die Zahlen der Vogelindividuen sind angegeben. Die Zahlen in Klammern beziehen sich auf Vögel, die offensichtlich nicht brüteten und kein Revier besaßen. Einzelheiten der Methode siehe Text.

transekt number - *Nr. d. Tr.*	1	2	3	4	5	6	7	8	9	10
location - *Ort*	ML	ML	ML	ML	RY	RY	RY	RY	ST	ST
date - *Datum*	1-7	1-7	3-7	3-7	12-7	12-7	12-7	12-7	19-7	19-7
length - *Länge*	2.4 km	2.2 km	3.5 km	3.5 km	7.0 km	6.0 km	2.0 km	4.2 km	6.0 km	10.0 km
surface - *Fläche*	12 ha	11 ha	17.5 ha	17.5 ha	35 ha	30 ha	10 ha	21 ha	30 ha	50 ha
Gavia arctica	-	-	-	-	-	-	1	-	-	-
Somateria spectabilis	2	-	-	-	-	-	-	-	-	-
Clangula hyemalis	-	-	1	-	-	-	-	-	-	-
Lagopus lagopus	2	8	-	3	-	-	-	-	-	-
Lagopus mutus	1	-	1	-	1	2	-	1	-	-
Pluvialis squatarola	1	-	-	-	-	-	-	1	-	-
Pluvialis apricaria	-	-	-	1	-	-	-	-	-	-
Pluvialis fulva	-	(1)	5	3	-	-	-	1	1	-
Calidris canutus	-	-	-	-	-	-	-	-	(1)	-
Calidris minuta	4	1	23	16	13	1	1	3	-	1
Calidris temminckii	-	12	-	-	-	-	-	-	-	-
Calidris melanotos	1	-	1	1	-	-	-	-	-	-
Calidris alba	-	-	-	-	-	-	-	-	(2)	-
Calidris alpina	1	-	2	4	-	-	-	2	-	-
Calidris ferruginea	-	-	5	1	-	-	-	-	-	1
Philomachus pugnax	1	(1)	-	-	-	-	-	-	-	-
Arenaria interpres	-	-	-	-	-	-	-	-	4	-
Phalaropus fulicarius	3	-	5	6	-	-	1	-	-	-
Phalaropus lobatus	-	-	-	-	-	-	1	-	-	-
Stercorarius longicaudus	-	-	-	-	(1)	-	-	-	-	-
Eremophila alpestris	-	-	-	-	1	-	-	-	1	-
Motacilla alba	-	1	-	-	-	-	-	-	-	-
Anthus cervinus	-	1	-	-	-	-	-	-	-	-
Phylloscopus trochilus	-	4	-	-	-	-	-	-	-	-
Luscinia svecica	-	5	-	-	-	-	-	-	-	-
Calcarius lapponicus	10	7	13	15	2	4	-	3	2	1
Plectrophenax nivalis	-	-	-	-	-	-	-	-	1	-
Acanthis hornemanni	-	2	-	1	-	-	-	-	-	-
total density (individ./ha) *Gesamtdichte (Vögel/ha)*	2.17	3.91	3.20	2.91	0.51	0.23	0.40	0.52	0.43	0.06

ML: Malaya Logata, RY: Rysyukov, ST: Shturmanov

Table 3. Numbers of birds ringed during the expedition to Taimyr in 1989, 1990, and 1991.
Tabelle 3. Zahl der während der Taimyr-Expeditionen 1989, 1990 und 1991 beringten Vögel.

	Ary-Mas	Malaya Logata	Logata	Camp Lydia	Rys-yukov	Sterle-gova	Taimyr delta	Shtur-manov	total
years/Jahre	1989	1989	1989	1990	1989	1990/91	1989/90	1989	
Anser albifrons			80*		93		1 / -		**174**
Anser erythropus			6*						**6**
Branta bernicla							906 / 301		**1207**
Branta ruficollis			1*						**1**
Lagopus mutus				1					**1**
Charadrius hiaticula				2		6/-			**8**
Pluvialis fulva		5		2			1 / -		**8**
Pluvialis squatarola	1			4	3	27/-	- / 1	4	**40**
Calidris canutus						35/12		1	**48**
Calidris alba						1/1			**2**
Calidris minuta		11		61	21	20/-	- / 25	1	**139**
Calidris temminckii		9		1					**10**
Calidris melanotus		2							**2**
Calidris ferruginea		1		49		11/-	- / 7		**69**
Calidris maritima						4/1			**5**
Calidris alpina		11							**11**
Arenaria interpres				7		39/-	- / 5	3	**54**
Phalaropus fulicarius		1		7					**8**
Phalaropus lobatus		9							**9**
Stercorarius longicaudus						1/-			**2**
Stercorarius parasiticus							- / 1		**1**
Larus sabini							- / 3		**1**
Larus heuglini				3			- / 51		**54**
Larus hyperboreus		1							**1**
Eremophila alpestris					6				**6**
Anthus cervinus		1							**1**
Oenanthe oenanthe					10				**10**
Luscinia svecica		3							**3**
Calcarius lapponicus		1							**1**
Plectrophenax nivalis						12/-			**12**
									1894

*ringed with Russian rings

always the male). Moult recording followed the suggestions of GINN & MELVILLE (1983). The measurements have been taken according to the methods described in SVENSSON (1984). We used the maximum chord method for measuring the wings.

In the species' accounts the faunistical data are usually ordered by years. If available, data on breeding biology and food follow. In appropriate cases we compared our findings to data from the literature. We restricted ourselves, however, to readily accessible sources, which were the *Birds of Europe the Middle East and North Africa* (CRAMP & SIMMONS 1977 - 1988), the *Handbuch der Vögel Mitteleuropas* (GLUTZ von BLOTZHEIM et al. 1966 - 1991) as well as ILICEV & FLINT (1985, 1989); ILICEV & ZUBAKIN (1990) and especially ROGACHEVA (1992). After finishing the manuscript of this report, a major publication on the flora and the fauna of Taimyr appeared (ROGACHEVA 1994), which unfortunately could not be considered here.

Acknowledgements

The expeditions to the Taimyr Peninsula would not have been possible without the invaluable help of Academician Prof. Dr. E.E. SYROECHKOVSKY and other members of his Institute of Animal Morphology and Ecology. Many of them contributed to the collection of ornithological data during the expeditions.

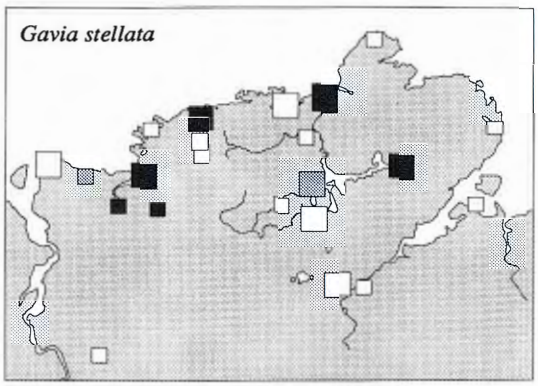
For the kind permission to use their avifaunistical data we are especially grateful to Hans-Heiner BERGMANN, Hendrik BRUNCKHORST, Igor CHUPIN, Bart EBBINGE, Alla GROSHEVA, Andrew IVANOV-SMOLENSKI, Yakov KOKOREV, André MOROZ, Marina RYHKLIKOVA, Andrew ST JOSEPH and Bernard SPAANS.

We would like to thank Nick DAVIDSON, Daniel FRÖHLICH and Jeanine Gesine KELLER for correcting the English and for many comments, and we are grateful to Sybille MIELKE for arranging tables and texts.

Species account

Red-throated Diver
Sterntaucher
Gavia stellata

Red-throated Divers breed commonly all over Taimyr (ILICEV & Flint 1985, ROGACHEVA 1992). KRECHMAR (1966, in ROGACHEVA 1992) gives a density of one to three pairs per ten lakes in western Taimyr. We had the impression that the density of the species was higher along the coast of Taimyr (especially around the Pyasina delta) than inland.



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

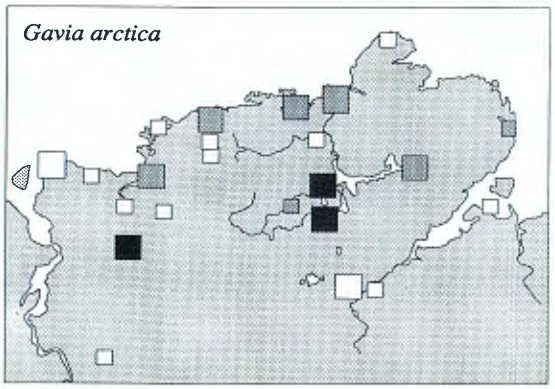
In 1989 we observed the species only once: two individuals on the River Malaya Logata on August 5.

In 1990, two pairs bred on a lake near the mouth of the Lydia River. One nest contained one egg on July 1 and two eggs when it was checked again on July 4. The nest was situated on land on wet and muddy turf 80 cm from the lakeshore. The second nest was found in the same habitat on July 26 with two eggs. Thirty and seven nesting pairs, respectively, were found on two small offshore islands (North and South Beacon Island) north of the Pyasina delta on July 1, 1990. Twenty other non-breeding birds were also present there. The first six birds arrived at Camp Lydia on June 16, 1990. The maximum was ten birds on June 18. A nest containing two eggs was found in Sterlegova on July 15, 1990.

In 1991, Red-throated Divers bred near Bikada, and breeding was suspected at Ust'-Tareya. Single birds were seen in Sterlegova on June 27 and on a river between the Pyasina delta and Dickson 20 km south of the coast on June 30. A pair with a nest containing one egg was found at Pushkin hill on the Pyasina River.

Black-throated Diver
Prachttaucher
Gavia arctica

ROGACHEVA (1992) gives 75 20'N for the northernmost breeding record on Taimyr. We found the species breeding commonly in the cen-



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

tral part of the Taimyr Peninsula. Observations on the coast (where Red-throated Divers were more common) were much rarer.

In 1989, six pairs were seen near Malaya Logata on July 2, and one nest with a broken egg was found there on August 6, 1989. Near Rysyukov on Lake Taimyr, up to nine birds were present on July 12 and two nests, one empty and one with one egg, were found on the same day. During a flight from Chelyuskin to Kosisty on July 25, 1989, we saw more than thirty birds near the coast (some of them, however, might have been Red-throated Divers). Eleven Black-throated Divers were counted on a 78 km boat trip on the River Logata on August 11, 1989.

At Camp Lydia in 1990, only a few individuals were noted: three birds migrating on June 1, eight birds migrating east on June 15, and one bird on June 23.

In 1991, single Black-throated Divers were encountered at Sterlegova on June 27 and 28. A nest was found at Stationar on the River Pura on July 13. The eggs had been destroyed by Eastern Black-backed Gulls. Several observations were made near Bikada in August 1991.

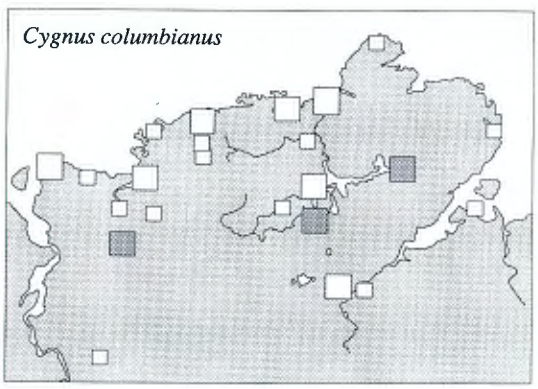
We did not see Black-throated Diver chicks in any of the three years.

White-billed Diver
Gelbschnabeleistaucher
Gavia adamsii

White-billed Divers breed in low densities throughout Taimyr (ILICEV & FLINT 1985, ROGACHEVA 1992). We saw only single birds without any indication of breeding: one on June 30 and July 2, 1989, on a small lake near Malaya Logata. Five birds flew over Camp Lydia on June 11, 1990, and one flew northeast over Camp Lydia on June 12, 1990. Two birds were seen on the Spakeuna River on July 21, 1990.

Bewick's Swan
Zwergschwan
Cygnus columbianus

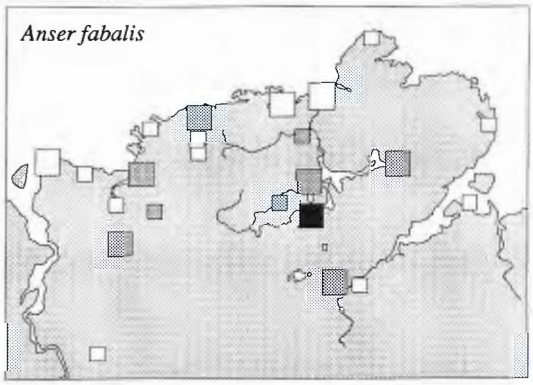
VINOKUROV (cited in ROGACHEVA 1992) found that the Taimyr population of the species consisted of not more than 260 pairs in the late 1970's (c. f. KOKOREV (1995), who reports 400-500 individuals on Taimyr). We encountered Bewick's Swans only four times: one bird flying over Malaya Logata on July 2, 1989, one bird on the River Pura on July 12, 1991, two birds on the River Bystroya on the same day, one bird seen near Bikada in August 1991.



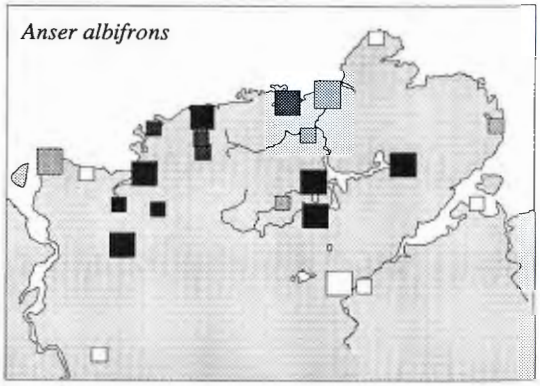
large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

Greylag Goose
Graugans
Anser anser

A single Greylag Goose was observed near Camp Lydia on July 12, 1990. The bird was calling and migrating northwest. Another bird was seen by another observer at the same place three hours later. Greylag Geese do not breed on Taimyr and the northern limit of the range of the species in Central Siberia lies much further south (DEMENTYEV & GLADKOV 1967, CRAMP & SIMMONS 1977). ROGACHEVA (1992) does not mention any record of Greylag Geese on Taimyr.



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

Bean Goose
Saatgans
Anser fabalis

According to DEMENTYEV & GLADKOV (1967) and CRAMP & SIMMONS (1977), Bean Geese breed throughout all Taimyr. ROGACHEVA (1992), however, states that the northern limit of the species' breeding range lies not far to the north of Lake Taimyr. Our observations are in accordance with ROGACHEVA's findings: Bean Geese were abundant only in the southern part of Taimyr. The species was absent in the north. Breeding was confirmed on the cliffs of the Logata River (near the mouth of the Malaya Logata) where a nest was found on July 10, 1989. This nest was lost later as a result of a landslide. In 1989 near Rysyukov and further north, mainly flying (migrating?) birds were observed (e.g. 32 birds at Rysyukov on July 10). The latest observation of Bean Geese in this northern region was on July 14 (six birds). On July 8, 1989, two birds were already moulting in Ary Mas. During a 78 km boat trip on the River Logata on August 11, 1989, 141 birds were counted. According to a hunter, "some hundreds" of Bean Geese moulted on the River Gusikha.

In 1990, the first four birds were seen at Camp Lydia on June 3. Only few observations followed, all within the spring migration period: five birds flying east on June 4, four birds on June 6, one bird on June 7, and five birds on June 9.

Several birds were noted on the River Pura on July 12, 1991.

Fifteen birds shot by a hunter in 1989 and the breeding pair at the Logata River belonged to the subspecies *A. f. rossicus*.

White-fronted Goose
Bläßgans
Anser albifrons

White-fronted Geese breed throughout Taimyr except in the extreme north (ROGACHEVA 1992) . We found the species occurring commonly at nearly all sites we visited on the Taimyr Peninsula.

In 1989, however, we located only two nests

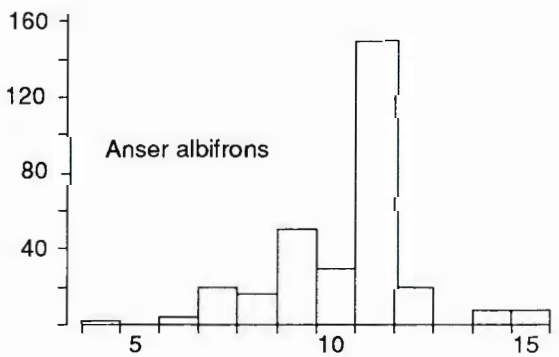


Figure 2. Numbers of White-fronted Geese in the study area at Camp Lydia in June 1990. The hatched column shows the number of breeding birds.
Abbildung 2. Anzahlen von Bläßgänsen im Untersuchungsgebiet bei Camp Lydia im Juni 1990. Die schraffierte Säule zeigt die Zahl der Brutvögel.

Table 4. White fronted Goose *Anser albifrons* nests found on Taimyr.
Tabelle 4. Daten zu Nestern der Bläßgans Anser albifrons auf Taimyr.

location *Ort*	**nest/brood found on** *Nest/Brut gefunden am*	**with (nest contents)** *mit (Nestinhalt)*	**clutch size** *Vollgelege*	**hatching date** *Schlupfdatum*	**remarks on nest site** *Bemerkungen zum Nistplatz*
Malaya Logata	3.7.1989	1 egg			between ponds on a plateau
Malaya Logata	4.7.1989	4 eggs	4		on a peninsula
Lydia	1.7.1990	6 eggs	6		open tundra
Lydia	17.7.1990	eggs		ca July 20	sedge tundra
Lydia	20.7.1990	eggs		21.7.	river ridge
Sterlegova	9.7.1990	6 eggs	6		near a creek
Sterlegova	10.7.1990	6 eggs	6		near a creek
Sterlegova	11.7.1990	6 eggs	6		slope, near a creek
Sterlegova	11.7.1990	6 eggs	6		slope, near a creek
Sterlegova	15.7.1990	5 eggs	5		in a valley near a creek
Sterlegova	15.7.1990	4 eggs	4		small dry hill in a valley near a creek
Sterlegova	17.7.1990	5 eggs	5		swamp on a peninsula
Sterlegova	17.7.1990	3 chicks		15.-16.7.	
Sterlegova	17.7.1990	2 chicks		15.-16.7.	
Sterlegova	18.7.1990	5 eggs	5		near a swamp, 200m from the coast
Taimyr Delta	20.7.1990	6 chicks		17.-19.7.	
Taimyr Delta	20.7.1990	4 chicks			
Taimyr Delta	20.7.1990	4 chicks			
Taimyr Delta	20.7.1990	5 chicks			
Taimyr Delta	20.7.1990	6 chicks			
Sterlegova	26.6.1991	7 eggs			
Sterlegova	28.6.1991	3 eggs			

(see table 4) and five chicks (age three to four weeks, Rysyukov, July 14) of the White-fronted Goose. At Malaya Logata, two pairs bred in an area of about ten km^2. In many areas we found White-fronted Geese which we supposed to be non-breeders (135 at Malaya Logata on July 2; 60 at Ptitsy Lake on July 10; 41 on Shturmanov on July 19). Judging by the numerous non-breeders and the absence of chicks, 1989 appears to have been a very poor breeding season for the species on Taimyr.

White-fronted Geese were already migrating to their moulting areas in the delta of the Taimyr River at Lake Taimyr when we arrived there on July 10; more than 100 migrating Geese were seen within a few hours on that day. The first (20) flightless birds were seen at the same place when we surveyed it for the first time on July 14. This is considerably earlier than published dates for the beginning of moult: July 22 (for unmated birds; DEMENTYEV & GLADKOV 1967); July 25 (CRAMP & SIMMONS 1977). Our latest observation of flightless White-fronted Geese was on August 10, 1989 at Malaya Logata. For more details see MOOIJ (1995).

On several helicopter flights during our expedition in 1989 we were able to count the moulting White-fronted Geese in some areas in the eastern part of the Taimyr Peninsula. We encountered the greatest number of birds on Lake Taimyr. The results are given in table 5. Altogether we saw about 30,000 moulting individuals. Our survey, however, was not complete, because we could not check all of the many inland lakes where White-fronted Geese may also have moulted. The number of Geese we saw accounts

Table 5. Helicopter counts of moulting White-fronted Geese in the eastern part of the Taimyr Peninsula in 1989.
Tabelle 5. Hubschrauberzählungen mausernder Bläßgänse auf Ost-Taimyr 1989.

location	date	number of Geese
delta of the Taimyra River at the coast	July 24	4,000
between Tshelyuskin and Kosisty	July 25	2,700
delta of the Taimyra River at Lake Taimyr	July 28	15,000
southern shore of Lake Taimyr	Aug. 2	5,300
Logata River	Aug. 7 and 10	2,150
River Gusikha (according a local hunter)		5,000

for roughly 7% of the total population of the species on Taimyr, which is estimated at about 430,000 birds (between 1978 and 1981, MARTYNOV 1983 in ROGACHEVA 1992). Most of the Taimyr White-fronted Geese moult in the Pyasina delta, where 230,000 geese (of various species) were found in 1984 (BORZHONOV & VINOKUROV 1984 in ROGACHEVA 1992).

In 1990 when we arrived in western Taimyr on June 1, many White-fronted Geese were already present. On that day we saw at least 40 birds on our helicopter flight from Dickson to Camp Lydia. Most of the White-fronted Geese were feeding on the coastal ridges, which were the only areas of tundra free of snow at the beginning of June. The geese continued to arrive until about June 20. Spring migration peaked on June 10 and 11 (see also figure 2). These data are in agreement with DEMENTYEV & GLADKOV (1967), who state that the arrival of White-fronted Geese in western Taimyr was recorded from May 23 to 25 and on May 28. For Lake Taimyr they give June 10. KRECHMAR (1966, cited in ROGACHEVA 1992) found that the dates of the arrival show considerable variation between years. In the Pyasina River basin in three consecutive years the first White-fronted Geese arrived on June 9, May 28, and June 5 respectively. Further, mass migration was noted between June 9 and 22, between June 5 and 10, and on June 6 and 7.

In 1990, White-fronted Geese commonly bred near Camp Lydia, reaching a density of 0.3 pairs/km^2 (table 1). The birds preferred lowlands or creek valleys as breeding sites. Most of the pairs were scattered over the study plot. Two nests, however, were found no more than 200 m apart in the marshes near the mouth of the River Lydia. One nest was found on each of two of the small islands near Camp Lydia.

White-fronted Geese also bred abundantly at the other areas visited in 1990, for example at Sterlegova, where the breeding density was 0.6 pairs/km^2 (table 1).

The breeding success of White-fronted Geese in 1990, as far as we could determine, seemed to be higher than in 1989.

The first White-fronted Geese started to migrate to their moulting areas on July 7, 1990.

In 1991, eight territorial pairs (with six nests found) and a flock of eleven adults and three second year birds were seen on the gravel slopes in Sterlegova on June 27. On June 30, ten pairs were seen during a brief stop at the middle reaches of the Lenivaya River and two pairs on the river's lower reaches. Furthermore, on June 30, three pairs with nests, one further pair, and a flock of 15 individuals were noted on the Pyasina River near Pushkin hill. On July 2, 1991, 60 birds migrated eastwards near Dickson. Two pairs with goslings about six days old, and several further birds, were encountered on the River Pura on July 12.

The breeding densities of White-fronted Geese which we were able to measure (0.2, 0.3, and 0.6 pairs/km^2) lie within the huge range of densities cited in ROGACHEVA (1992). Obviously there are not only geographical variations in density but also changes from year to year which may be even 25-fold, depending of the character of the spring (BORZHONOV 1974 in ROGACHEVA 1992).

Details on the nests of the White-fronted Geese found in 1989 - 1991 are summarized in table 4. The mean size of completed clutches was 5.3 eggs (n=10; SD= 0.82; range 4 - 6 eggs). In 1990, five clutches hatched between July 15 and 21; the mean date was July 18. Most of the nests were situated on the elevated levee-like structures separating polygon ponds within damp

areas, often near a stream.

The ringing recoveries and the biometric data of the White-fronted Geese caught in 1989 are presented MOOIJ (1995).

Lesser White-fronted Goose
Zwerggans
Anser erythropus

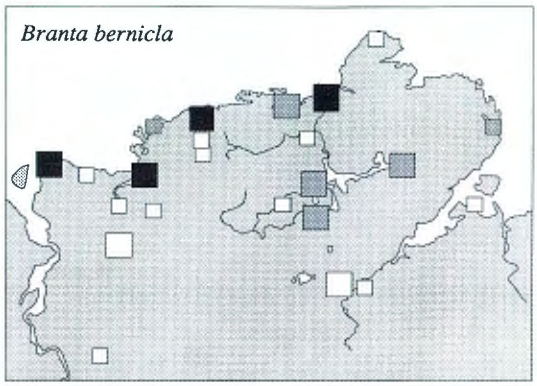
ROGACHEVA (1992) gives breeding records of Lesser White-fronted Geese only for the southern part of Taimyr. ROGACHEVA (l.c.) places the northern limit of the species' range on Taimyr at 71 N. According to the same author, Lesser White-fronted Geese often fly northwards to moult in the tundra. We found such a flock of moulting birds on the River Logata near Malaya Logata. Of the 400-500 Lesser White-fronted Geese seen on August 4, 1989, about half were able to fly, the others were moulting their primaries. Six of them were caught and ringed. During the following days some of the moulting birds were seen near the field station.

A hunter reported about 10 Lesser White-fronted Geese among other moulting geese on the River Gusikha during the first half of August 1989.

Brent Goose
Ringelgans
Branta bernicla

ROGACHEVA (1992) mentioned only *Branta bernicla bernicla* as subspecies occurring on Taimyr; likewise we also found no other subspecies other than the Dark-bellied Brent Goose. Even on the most eastern part of Taimyr that we reached during our expeditions, the Maria Prontechova Bay, we checked in 1989 a flock of more than 2000 moulting geese and did not find a single individual of *Branta bernicla nigricans*, the subspecies other authors (e.g. in SMART 1979) supposed bred in East-Taimyr and eastwards.

Significant differences occurred in the breeding behaviour of brents during the three years: in 1989 we did not find any breeding, but saw large concentrations of up to 45,000 individuals (Lower Taimyra delta) moulting in relatively small areas (PROKOSCH 1995). In 1990 nests of Brent Geese were found on all places along the coast where we stayed for longer periods of time (Lower Taimyra delta, Sterlegova, Lydia). In the same year only 4,000 geese came together in the Lower Taimyra delta for moulting. In 1991, Sterlegova and the surroundings of Dickson also had nesting Brents. In Sterlegova more geese were breeding in 1990 than in the following year. In a valley where at least 34 pairs nested in the first year, only four were found in 1991. Nevertheless, the overall breeding success in 1991 was better than in 1990 as the proportions of first year birds in the wintering areas showed (pers. observations).



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

The Brent Geese bred on the mainland coast (in small colonies and as single pairs in the open tundra of wet valleys and slopes) as well as on offshore islands. But there seems to be a tendency to breed as far out in the sea as possible. At Lydia many more geese were breeding on the offshore islands than on the mainland. Only in the very good breeding season, 1991, were quite a few also breeding on the mainland (B. EBBINGE studies this in detail). Also the leader of the Sterlegova Polar Station, Eugene I. SUYEV, confirmed that many Brents are breeding offshore on the ice-surrounded islands. He reported that he had seen hundreds of pairs during the years 1980-1990 on Isachenco Island/Archipel Kirova, with the exception in 1989 (when none were breeding). He also reported at least 100 pairs breeding on Malyj-Island southeast of Svernaya Semlya. His friend also reported many breeding pairs from the Isvesti-Islands about 200km north of Dickson in the Kara-Sea.

Hatching in 1990 took place around July 20. In a colony at Sterlegova checked on July 17 all pairs were still incubating. On an island just offshore Sterlegova on July 19 we saw six pairs incubating, and three families showed one or two day old goslings (1x1, 1x3 and 1x4). On the banks of the Lower Taimyra delta a nest with just hatching chicks was found on July 20. On an island in the delta on July 22 four pairs still were sitting on eggs (1x1, 1x2, 1x3 and 1x5) and six

pairs were already guarding chicks (1x1, 1x2, 2x3, 2x4). Fishermen living on the same island reported that in 1989 about 20 pairs had started breeding on average with clutches of only two eggs, and gave up breeding after a cold spell on June 28. On a neighbouring island in 1990 Brents had a nest with three eggs almost in the centre of a 120 pairs Herring gull colony. - Detailed studies on breeding ecology were performed in the Lydia area by the group of B. EBBINGE and will be published later.

Sightings of Brent Geese far inland from the shore have been rare. At the inland site Malaja Logata we saw in July 1989 a flock of eleven individuals passing by. We observed moult migration in 1989 along the shore at Shturmanov and in both years, 1990 and 1991, at Sterlegova. Almost all brents in July passing these sites were heading eastwards (possibly to the moulting grounds of the Lower Taimyra delta). We observed continuous eastward migration e.g. on July 7, 1990 along the coast of Sterlegova: between 19.30 and 23.50 h nine flocks with 527 individuals altogether (60, 40, 45, 90, 9, 105, 20, 103, 55). Six more flocks followed the next day (18,12, 25, 12, 40, 30) and two on July 9 (50, 30). Even with total fog (10 July, 1990) we heard migrating flocks and again saw 23 individuals. Up to the 16 July, we saw one to three small flocks passing by every day. In 1991 we saw Brents flying east in small flocks of up to 40 on June 27. On June 28 a flock of 150 passed by and on June 30 a total of 211 (5, 11, 16, 180). There have, however, also been indications of small groups of geese moulting near the Sterlegova breeding grounds. For example, on the 19July three flocks (35, 25, 15) gathered south of Cape Sterlegova at the mouth of the Lenivaya River.

More information on Brent Geese is given in PROKOSCH (1995), SPILLING & STOCK (1995) and BERGMANN et al. (1995).

Red-breasted Goose
Rothalsgans
Branta ruficollis

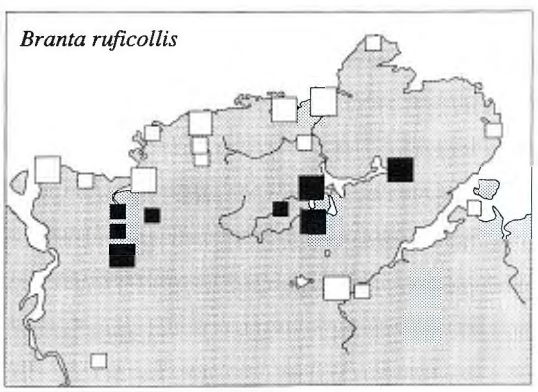
The breeding range of the Red-breasted Geese is more or less restricted to the southern part of the Taimyr Peninsula northwards to the Byrranga Mountains (DEMENTYEV & GLADKOV 1967; CRAMP & SIMMONS 1977).

Red-breasted Geese commonly visited Malaya Logata between June 30 and July 5 in 1989 (50 birds grazing on June 30). Breeding was confirmed near Rysyukov on a small, steep island (50 m x 30 m) in Lake Taimyr, where four nests were found. Two of these were empty; one contained a recently hatched chick, an intact egg, and one that was probably destroyed by gulls; and the fourth nest was being incubated by an adult. A family with three goslings about two weeks old was seen near the colony. This island also supported a breeding colony of 25-30 pairs of Eastern Black-backed Gulls and possibly also several Glaucous Gulls. Another Red-breasted Goose family with two chicks was seen on the Logata River on August 7, 1989.

On a 78 km boat trip on the River Logata on August 11, 1989, 665 Red-breasted Geese were counted. At least 70 of them were able to fly; the others were probably moulting. A hunter reported several hundred moulting Red-breasted Geese on the River Gusikha.

In 1991, many Red-breasted Geese were encountered on the River Pura: 26 pairs were nesting on an island covered with *Salix*-scrub near Stationar on July 11. Within the colony, nests of Eastern Black-backed Gulls and King Eiders were also found. Three nests of Red-breasted Geese were situated near a Peregrine eyrie on the bank of the River Pura (July 12, 1991). On the lower reaches of the River Pura, three eggs out of a clutch of seven eggs hatched on July 15. Close to the nest there was a Peregrine eyrie and a Snowy Owl nest. A pair of Red-breasted Geese with five goslings were encountered on the River Pyasina at the mouth of the River Pura. Red-breasted Geese were also found breeding near Bikada and Ust'-Tareya in August 1991.

520 flightless (moulting) Red-breasted Geese (groups of 180, 120, 80, 70, 70, 40, 40, 20, 20, 20, 15, and 7 birds) were found on the River Pura on July 12, 1991.



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

Wigeon
Pfeifente
Anas penelope

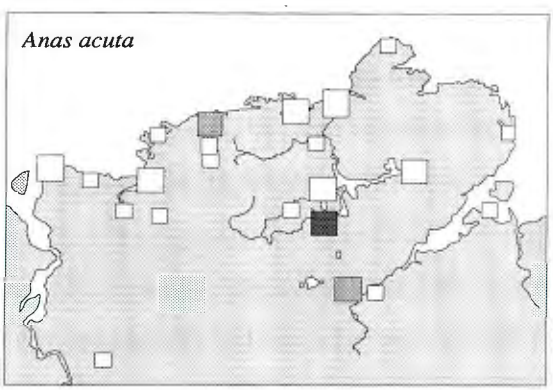
According to DEMENTYEV & GLADKOV (1967) and CRAMP & SIMMONS (1977) Wigeons breed in the southern part of Taimyr. We saw a pair in Ary Mas on July 8, 1989.

Teal
Krickente
Anas crecca

ROGACHEVA (1992) supposes the northern limit of the breeding range to lie in southern Taimyr. We saw three males and three females near Malaya Logata on June 30, 1989.

Pintail
Spießente
Anas acuta

As for the Teal, ROGACHEVA (1992) describes the breeding range of the Pintail as extending to the southern and central parts of Taimyr. We saw a pair at Malaya Logata on both June 30, 1989, and July 2, 1989, and a female at the same place on July 3, 1989. In Ary Mas, 34 birds were encountered on July 7, and 15 birds on July 8, 1989. Then in 1990 we found Pintails outside their described breeding range: 40 birds were observed on an ice-free patch on the coast near Sterlegova on July 16.



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

Garganey
Knäkente
Anas querquedula

We saw a pair of Garganey on the Norilsk airport on June 23, 1991. This is far to the north of the known northern border of the species' breeding range (ROGACHEVA 1992).

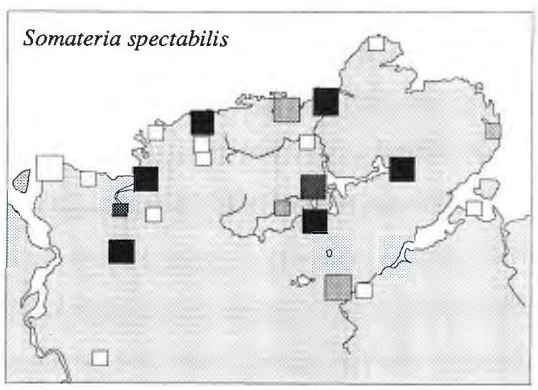
Scaup
Bergente
Aythya marila

According to ROGACHEVA (1992), Scaup breed in the southern part of the Taimyr Peninsula. We saw Scaup only at two sites; 60 birds (males and females) were encountered at Ary-Mas on July 8, 1989, and a clutch of six eggs was found at Stationar on the River Pura on July 10, 1991.

King Eider
Prachteiderente
Somateria spectabilis

King Eiders breed both in coastal and inland areas of the Taimyr Peninsula (ROGACHEVA 1992). We found King Eiders breeding at many places we visited.

In 1989, up to 40 birds were seen at Malaya Logata (on July 2), where three nests were also found (see table 6). At Malaya Logata, we found seven pairs on an area of about 7 km^2. This was the highest density that we recorded; it was considerably higher than at the coast (see below and table 1). Two hundred and fifty King Eiders were encountered on Lake Taimyr near Rysyukov on July 12, 1989. More than 5000 birds (possibly moulting, as only 1% of them were males in breeding plumage) were seen off the eastern coast of Taimyr between Chelyuskin and Kosisty on July 25, 1989. After July 20, 1989, hardly any males in breeding plumage were observed at all, so moulting was probably initiated before that date.



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

Table 6. King Eider *Somateria spectabilis* nests found on Taimyr.
Tabelle 6. Daten zu Nestern der Prachteiderente Somateria spectabilis auf Taimyr.

location *Ort*	**nest/brood found on** *Nest/Brut gefunden am*	**with (nest contents)** *mit (Nestinhalt)*	**clutch size** *Vollgelege*	**start of laying** *Legebeginn*	**hatching** *Schlupfdatum*	**remarks on nest site** *Bemerkungen z. Nistplatz*
Malaya Logata	1.7.1989	6 eggs				small island in a pond
Malaya Logata	1.7.1989	3 eggs				dike between two ponds
Malaya Logata	1.7.1989	3 eggs				peninsula in a pond
Beacon Isl., Camp Lydia	1.7.1990	not noted				
Camp Lydia	4.7.1990	4 eggs	5	ca 30.6.		
Sterlegova	9.7.1990	not noted				near a creek between trunks
Sterlegova	17.7.1990	2 chicks			15.7.	
Taimyr River Delta	22.7.1990	5 eggs				
Sterlegova	27.6.1991	9 eggs				

In 1990, two nests were found near Camp Lydia (see table 6), one on the mainland and one on North Beacon Island. At least five pairs were seen on July 1 on South Beacon Island, where the breeding density was higher than on the mainland. Breeding birds or pairs with pulli were seen on the Big Bird Island on July 19, 1990 (five pulli) and at the mouth of the Lydia River on July 22, 1990 (one male with three pulli).

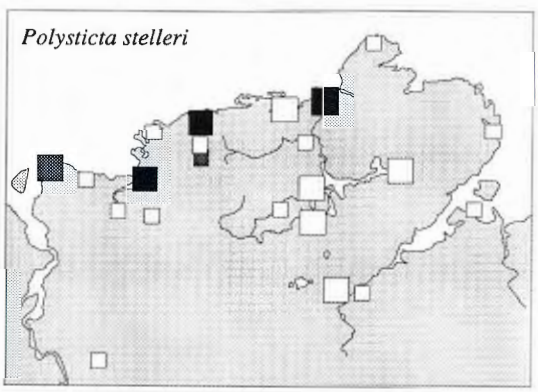
In 1990, the first King Eiders arrived near Camp Lydia on June 10. Migratory movements of this species were noted between June 10 and 18 (see figure 3). Birds actively migrating were seen mainly on June 11 and 12. All these dates correspond to arrival data cited in DEMENTYEV & GLADKOV (1967)

In 1991 at Sterlegova, four pairs and a single female were seen between June 26 and 30. On June 30, 1991, one pair was observed at the Pyasina River near the Pushkin Hill. Several nests were found within a colony of Red-breasted Geese on an island in the River Pura on July 11, 1991.

Steller's Eider
Scheckente
Polysticta stelleri

The status of Steller's Eider on Taimyr was unclear until recently. According to DEMENTYEV & GLADKOV (1967), the species is (or was) nesting in the delta of the Taimyr River. The Taimyr Peninsula is not included in the species' breeding range in the distribution map in CRAMP & SIMMONS (1977), and ROGACHEVA (1992) does not mention any substantiated breeding records on Taimyr before 1990. In recent years Steller's Eiders have been found breeding on the Taimyr, Gydan and Yamal peninsulas (YÉSOU & LAPPO 1992).

We did not see the species in 1989. In 1990, however, we found Steller's Eiders breeding commonly at several places. One of these sites was the mouth of the Lydia River, where two pairs bred in a survey area of 4.48 km^2. A nest with seven eggs was found on June 30 (control on July 1: seven eggs). The nest was placed on a levee between two polygonal ponds. At least 22 pairs were seen on North Beacon Island near



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

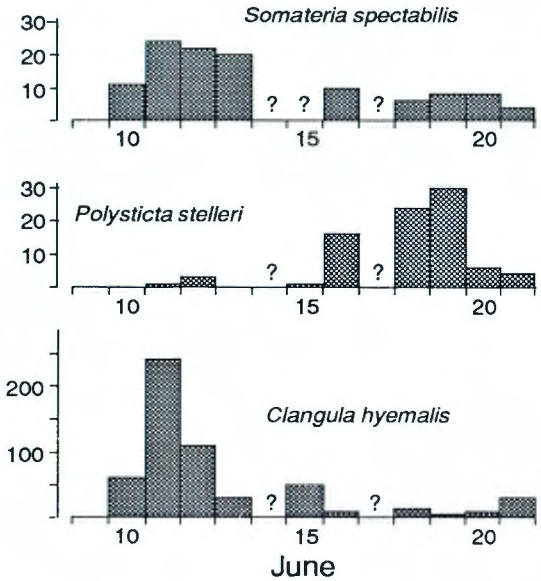


Figure 3. Spring migration and arrival of ducks at Camp Lydia in 1990. The columns show the number of birds recorded near the Camp.
Abbildung 3. Frühjahrszug und Ankunft von Enten bei Camp Lydia 1990. Die Säulen zeigen die Anzahlen der in der Nähe des Camps registrierten Vögel.

Camp Lydia on July 1. Up to five pairs (on 19.8 km^2) were estimated to breed at Sterlegova. A clutch of five eggs was found in the Taimyr River delta on July 21, 1990.

Other breeding sites (nests found) in 1990 were in the Gusinaya River basin near the Knipovicha Bay and the eastern shore of the Taimyr Bay (ROGACHEVA 1992).

The first birds arrived at Camp Lydia on June 11, 1990. Peak numbers of resting birds at this site occured between June 16 and 19 (see figure 3).

On June 24 and July 2, 1991, three pairs and a male were encountered north of Dickson near a small river. One pair was found at the southernmost stop at the Lenivaya River on June 30, 1991.

Long-tailed Duck
Eisente
Clangula hyemalis

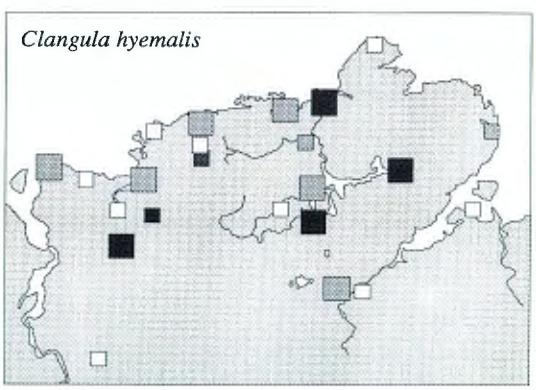
Long-tailed Ducks breed throughout all Taimyr (ROGACHEVA 1992).

In 1989, Long-tailed Ducks were common at all places we visited: 15 pairs on July 8 at Ary Mas; 200 birds on July 2 at Malaya Logata; 18 birds on July 10 at Rysyukov; 93 birds on July 22 at Shturmanov; more than 200 birds on July 24 in the Taimyr Delta. We saw about 1000 birds along the coastline between Chelyuskin and Kosisty during a helicopter flight on July 25. At Shturmanov in the second half of July, observations of males largely outnumbered observations of females (210 against 4). One clutch with four eggs was found on a dry tundra flat near Malaya Logata on July 9, 1989.

In 1990, the first birds near Camp Lydia were observed on June 10 (see figure 3). Until June 13 nearly all the birds seen were migrants flying over the camp, only a few later rested on the river. The arrival dates at Camp Lydia are in accordance with literature data, those for the west coast of Taimyr given by DEMENTYEV & GLADKOV (1967) cover the period June 5 - 13.

Near Sterlegova up to 116 birds were counted at different places on the coast. A nest containing five eggs was found on an island in the Taimyr River Delta on July 22, 1990.

In 1991, three pairs and one male were seen on the southernmost stop on the River Lenivaya. Six birds migrated eastwards on the coast north of Dickson on June 24. Four birds migrated in the same direction on the coast near Sterlegova on June 27, 1991. A nest was found at the River Pura on July 10.



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

Common Scoter
Trauerente
Melanitta nigra

We encountered Common Scoters only once, far north of their breeding range, which includes the southern part of Taimyr (ROGACHEVA 1992). Eighty birds were seen on the sea near the coast between Chelyuskin and Kosisty on July 25, 1989.

Velvet Scoter
Samtente
Melanitta fusca

We saw a group of four male and three female Velvet Scoters at the northern limit of the species' breeding range (ROGACHEVA 1992) at Ary Mas on July 8, 1989. In addition, one Velvet Scoter had joined a group of Common Scoters at sea (seen while on a helicopter flight from Chelyuskin to Kosisty on July 25, 1989).

Rough-legged Buzzard
Rauhfußbussard
Buteo lagopus

Rough-legged Buzzards breed in the southern and central parts of the Taimyr Peninsula (ROGACHEVA 1992).

In 1989, we saw three birds and found two unused eyries in Ary Mas on July 7. At Malaya Logata one bird was seen on June 30 and two birds on July 10. We found a disused eyrie on a small hill. At Rysyukov we observed two birds on July 14, and one in the Byrranga Mountains on July 30.

In Camp Lydia nine birds were noted between June 3 and 20, 1990. Two birds were seen near the Norilsk airport on July 7, 1990, one of which was attacked by two Long-tailed Skuas. A further bird was seen at the same place on July 26.

On June 30, 1991, an eyrie containing three eggs was found on a river cliff between Dickson and the River Pyasina. On the same day a bird was observed flying near the River Pyasina close to the Pushkin Hill. Twelve territories were encountered during a 115 km long boat trip on the River Pura on July 15, 1991.

Merlin
Merlin
Falco columbarius

Merlins breed only in the south of the Taimyr Peninsula (ROGACHEVA 1992). We saw one bird near the edge of the breeding range in Ary-Mas on July 7, 1989. The species was also observed quite far north of its breeding range at Bikada in August, 1991.

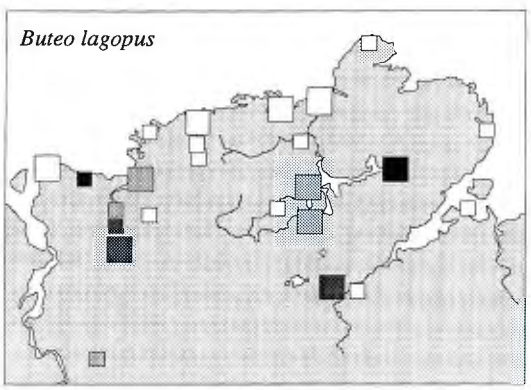
Peregrine
Wanderfalke
Falco peregrinus

KOKOREV (1995) gives a detailed description of the occurrence of Peregrines on Taimyr.

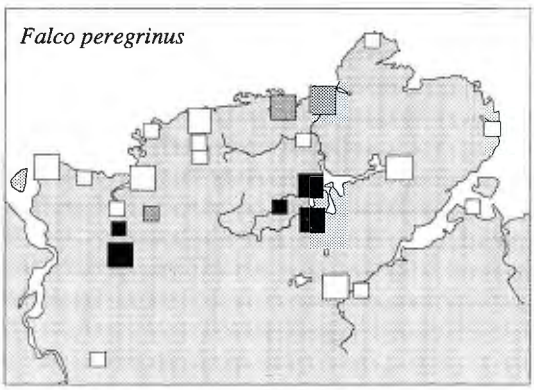
In 1989, Igor CHUPIN showed us eyries of Peregrines on the cliffs of the River Logata near the mouth of Malaya Logata and in the Byrranga Mountains near Levinson-Lessing Lake. At the first site the nest was situated at the top of a cliff, and the single hatched chick fell victim to a landslide. An adult was still present on August 5. At the second site we saw an eyrie with three nestlings about two weeks old on a steep rock face on July 30. In addition to the parents a third adult was present. Two to three more pairs were found on the Logata River during a 78 km boat trip downstream from the mouth of the Malaya Logata on August 11. One of the pairs had three nestlings.

Additional observations in 1989 include: one bird each on July 22 on Shturmanov, on July 24 in the delta of the Taimyr River, and on August 8 in Malaya Logata.

In 1990, when we visited more northern places, we did not encounter the species.



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

In 1991, four eyries were found along 115 km of the lower reaches of the River Pura. One of them, on July 12, contained three nestlings, five to seven days old. Another eyrie was seen with an intact egg and some egg shell fragments on July 15.

Willow Grouse
Moorschneehuhn
Lagopus lagopus

ROGACHEVA (1992) portrays the northern limit of the breeding range as lying between 73 30'N and 74 30'N. According to ROGACHEVA, the species does not breed on the lower reaches of the Pyasina River. Our observations support ROGACHEVA's view. We encountered Willow Grouse nearly exclusively at the southernmost points we visited.

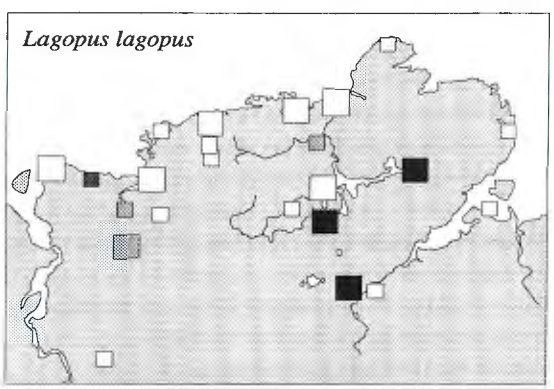
In 1989 Willow Grouse were breeding commonly near Malaya Logata, where at least 30 pairs were counted in seven km^2 (4.3 pairs/km^2), as well as at Ary Mas. The species was missing in the North (exception: one bird on July 10 near Ptitsy Lake). Willow Grouse preferred the flat lowland tundra near lakes and rivers. Where the two species co-occurred, Ptarmigans, in contrast, were more often seen on small hills and ridges. For details of the nests found see table 7. In 1989 the first chicks were seen on August 5.

On June 30, 1991, one pair and one male were observed on the counting stop between the Pyasina River and Dickson; on the same day one male was also observed at the Pushkin Hill near the Pyasina River. The species was seen at the River Pura on July 10.

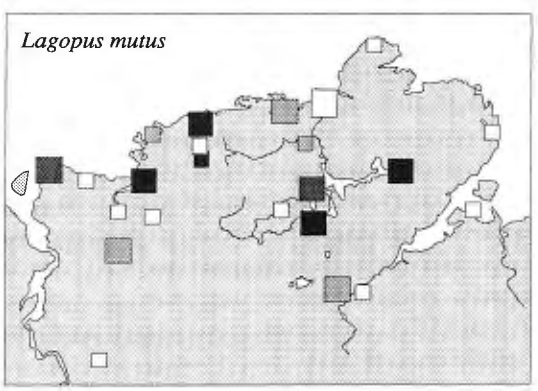
Ptarmigan
Alpenschneehuhn
Lagopus mutus

Ptarmigans breed throughout Taimyr (ROGACHEVA 1992). We saw them commonly at nearly all the places we visited.

In 1989, breeding was confirmed near Malaya Logata (for nest details see table 8), where at least five pairs were found in seven km^2 (0.7 pairs/km^2). In 1989 many Ptarmigans gathered in flocks which either consisted only of males (15 males in Malaya Logata on July 2) or were



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

Table 7. Willow Grouse *Lagopus lagopus* nests found on Taimyr.
Tabelle 7. Daten zu Nestern des Moorschneehuhns Lagopus lagopus auf Taimyr.

location *Ort*	**nest/brood found on** *Nest/Brut gefunden am*	**with (nest contents)** *mit (Nestinhalt)*	**remarks on nest site** *Bemerkungen zum Nistplatz*
Malaya Logata	1.7.1989	8 eggs	willow scub at the river bank
Malaya Logata	4.7.1989	9 eggs	dry tundra on a peninsula in a lake
Malaya Logata	9.7.1989	6 eggs	on a polygon dam

Table 8. Ptarmigan *Lagopus mutus* nests found on Taimyr.
Tabelle 8. Daten zu Nestern des Alpenschneehuhns Lagopus mutus auf Taimyr.

location *Ort*	**nest/brood found on** *Nest/Brut gefunden am*	**with (nest contents)** *mit (Nest-inhalt)*	**clutch size** *Voll-gelege*	**breeding success** *Brut-erfolg*	**remarks on nest site** *Bemerkungen zum Nistplatz*
Malaya Logata	9.7.1989	6 eggs			
Lydia	29.6.1990	7 eggs	7	unknown	open moss sedge tundra
Lydia	5.7.1990	10 eggs	10	no	open moss sedge tundra
Lenivaya (south)	25.6.1991	10 eggs		unknown	

mixed flocks (30 birds on Rysyukov on July 26).

In 1990, Ptarmigans bred at Camp Lydia in a density of 1.1 pairs/km^2 and in Sterlegova in a density of 1.3 pairs/km^2 (see table 1).

In 1991, Ptarmigans were abundant in the northern part of the Taimyr Peninsula. Five pairs were seen around the camp in Sterlegova, where one nest was also found. On June 25, at the southern counting stop on the Lenivaya River, six pairs and a nest were found. Three territorial cocks were sighted north of Dickson on June 24, 1991. The species was seen at the River Pura on July 10.

In areas where Ptarmigans and Willow Grouse occurred sympatrically, Ptarmigans tended to occupy the small hills rarther than the lowlands. Near Camp Lydia, where no Willow Grouse were seen, Ptarmigans also nested in the lowlands.

For the biometric data see appendix 1.

Ringed Plover
Sandregenpfeifer
Charadrius hiaticula

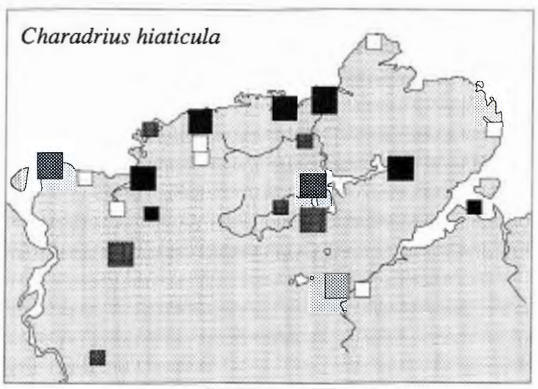
Ringed Plovers breed through all Taimyr except in the northernmost coastal area (ROGACHEVA 1992). We found the species at nearly all places we visited.

In 1989, Ringed Plovers were common on the coastal gravel beaches of the Shturmanov Peninsula (at least twelve pairs on about seven km of coastline; density 1.0 pairs/km^2). In the Byrranga Mountains, four pairs held territories on the gravel beds of a small stream. At Malaya Logata and along the River Logata breeding pairs were located on the upper parts of the river banks. At Kosisty, a nest was found on July 25, 1989.

In 1990, Ringed Plovers were found breeding at Camp Lydia (three pairs on 4.48 km^2), in Ust' Tareya, in Sterlegova (density 0.4 pairs/km^2; table 1), in the Taimyr River delta, and in Bikada. At the Norilsk airport, one bird making alarm calls was observed on July 26.

At the end of June 1991, four pairs were found on the gravel slopes of the hills at Sterlegova. Some of these birds occurred on the coastal sand beaches, which were still 98% frozen. On June 24, 1991, four pairs were sighted north of Dickson. These birds were mainly seen running in the tracks of the tracked vehicles. On June 30, 1991, two pairs were noted on the island Kolosovych, and one bird was recorded south of Dickson on July 1. Six pairs bred at Stationar on the River Pura (July 10, 1991).

Most of the breeding territories and all nests (for details, see table 9) were found on gravel – either on the coast or on riverbanks. Near Camp Lydia some pairs held territories in the hills on areas of patchy and stony tundra.



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

Table 9. Ringed Plover *Charadrius hiaticula* nests and broods found on Taimyr.
Tabelle 9. Daten zu Nestern und Bruten des Sandregenpfeifers Charadrius hiaticula auf Taimyr.

location *Ort*	**nest/brood found on** *Nest/Brut gefunden am*	**with (nest contents)** *mit (Nest-inhalt)*	**clutch size** *Voll-gelege*	**start of laying** *Lege-beginn*	**hatching date** *Schlupf-datum*	**remarks on nest site** *Bemerkungen zum Nistplatz*
Shturmanov	19.7.1989	1 egg	1			gravel beach
Kosisty	25.7.1989	4 eggs	4			gravel near a house
Lydia	17.6.1990	3 eggs	4	15.6.		gravel beach
Lydia		4 eggs				gravel beach
Sterlegova	16.7.1990	4 chicks			14.-15.7.	moss on gravel beach
Sterlegova	16.7.1990	3 chicks				moss on gravel beach
Sterlegova	17.7.1990	2 chicks			15.-16.7.	moss on gravel beach

The phenology of the spring arrival of Ringed Plovers was studied at camp Lydia in 1990 and agrees roughly with the scarce and scattered literature data cited in DEMENTYEV & GLADKOV (1969) and ROGACHEVA (1992): the first Ringed Plover near Camp Lydia was sighted on June 4. Migrating birds were observed between June 4 and 12 (see figure 4), and breeding territories were established around June 10 (figure 5).

Both members of a breeding pair which had been caught together in one trap on a nest near Camp Lydia in 1990 were recaptured together again on the same place on June 26, 1991.

Little Ringed Plover
Flußregenpfeifer
Charadrius dubius

Two Little Ringed Plovers were seen on a river bank near the camp at Malaya Logata on August 6, 1989. This is an observation from far north of the species' breeding range (DEMENTYEV & GLADKOV 1969, CRAMP & SIMMONS 1983). ROGACHEVA (1992) does not mention any records for the species on Taimyr.

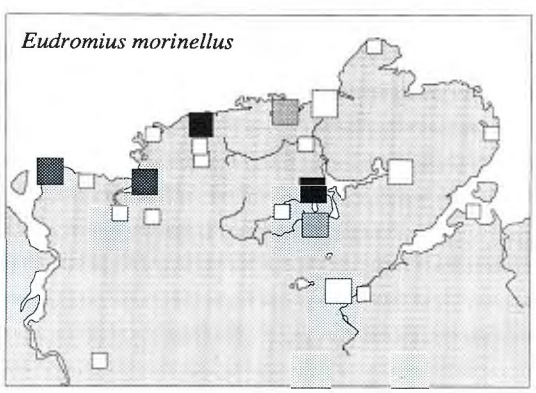
Dotterel
Mornell
Eudromias morinellus

Dotterels are widespread on Taimyr, but distributed irregularly (ROGACHEVA 1992) .

In 1989, we saw Dotterels at several places in the northern part of the Taimyr Peninsula. One nest containing three eggs was found by Igor CHUPIN in the Byrranga Mountains near Ryasyukov on July 30, 1989. Up to 17 birds in small flocks were observed at the same place on July 14. We saw up to seven birds (on June 30) near Malaya Logata, and one bird on Shturmanov. All birds which we checked were moulting their inner primaries.

In 1990, Dotterels at Camp Lydia were first seen on June 10. Up to eight displaying birds (June 18) could be observed on the hills near the camp. The latest observation was three birds on June 26.

In 1991, four displaying pairs were seen at Sterlegova. A nest with two eggs incubated by a male was found there on June 29. One pair was encountered near the Dickson rubbish dump on July 2, and one pair and a third bird was seen at the helicopter airport within Dickson itself.



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

Lesser Golden Plover
Pazifischer Goldregenpfeifer
Pluvialis fulva

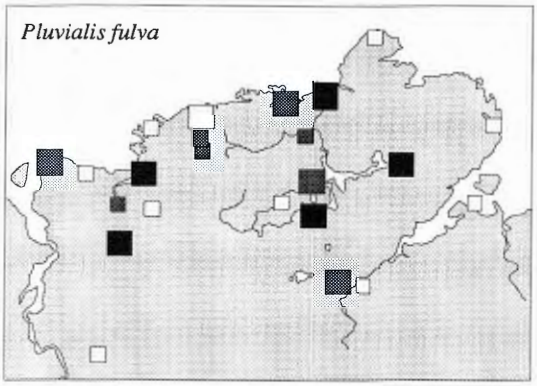
Lesser Golden Plovers breed throughout Taimyr except along the northern coastline (ROGACHEVA 1992).

We found Lesser Golden Plovers breeding commonly at all places visited for more than one day, except Sterlegova. The density seemed to decrease towards the North. Observations in 1989: ten pairs at Ary Mas; about 30 pairs in about 7 km² (4.3 pairs/km²) near Malaya Logata; eight pairs near the Camp in Rysyukov in about 14 km² (0.6 pairs/km²); six pairs on July 14 and 20 pairs on July 30 on two trips through the Byrranga Mountains; two to three pairs near Ptitsy Lake and three pairs in about 12 km² (0.25 pairs/km²) on the Shturmanov Peninsula at the coast (see also table 1).

In 1990, seven pairs held territories near Camp Lydia (1.6 pairs per km²). Lesser Golden Plovers seemed to prefer the small hills rather than the lowland. Four pairs held territories in 1.48 km² of the uplands (elevation >10m above sea level), and only three pairs bred in 3.00 km² of lowlands.

In 1990 and 1991, there were no sightings of the species in Sterlegova. In 1991 the densities clearly increased from North to South. In 1991 the highest densities were found north of Dickson (13 territories on June 24) and at the southern stop at the River Lenivaya (11 territories on June 25). Breeding habitats were always stoneless tundras. A nest was found at the River Pura on July 10.

Near Camp Lydia in 1990, the first Lesser Golden Plover was seen on June 4. Migrating birds



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

were observed between June 7 and 12 (see figure 4). In the study area, the number of birds reached the ultimate breeding population size on June 9 (see figure 5).

On July 19, 1990, a territorial pair of Lesser Golden Plovers near Camp Lydia displayed obvious signs of body feather moult. On the same day a further female was seen to be in body feather moult; her mate had clearly not yet started moulting. Like the Grey Plover, the Lesser Golden Plover is known to already start its post-nuptial moult on the breeding grounds (KOZLOVA 1957, CRAMP & SIMMONS 1983)

All nests were situated on the flat ground of open and rather dry tundra flats. All birds used lichens as nesting material. The clutch sizes we found (2x3 eggs, 2x4 eggs) were rather small.

Table 10. Lesser Golden Plover *Pluvialis fulva* nests found on Taimyr.
Tabelle 10. Daten zu Nestern des Pazifischen Goldregenpfeifers Pluvialis fulva auf Taimyr.

location *Ort*	**nest/brood found on** *Nest gefunden am*	**with (nest contents)** *mit (Nestinhalt)*	**clutch size** *Vollgelege*	**hatching success** *Bruterfolg*	**remarks on nest site** *Bemerkungen zum Nistplatz*
Malaya Logata	4.7.1989	3 eggs	3	unknown	on the edge of a polygon pond
Taimyr delta	24.7.1989	3 eggs		unknown	dry hill slope
Malaya Logata	5.8.1989	4 chicks			
Camp Lydia	18.6.1990	3 eggs	3	unknown	open moss sedge tundra
Camp Lydia	22.6.1990	4 eggs	4	deserted	open moss sedge tundra
Camp Lydia	11.7.1990	3 eggs	4	unknown	open moss sedge tundra
Camp Lydia	19.7.1990	4 eggs		unknown	dry grass moss tundra

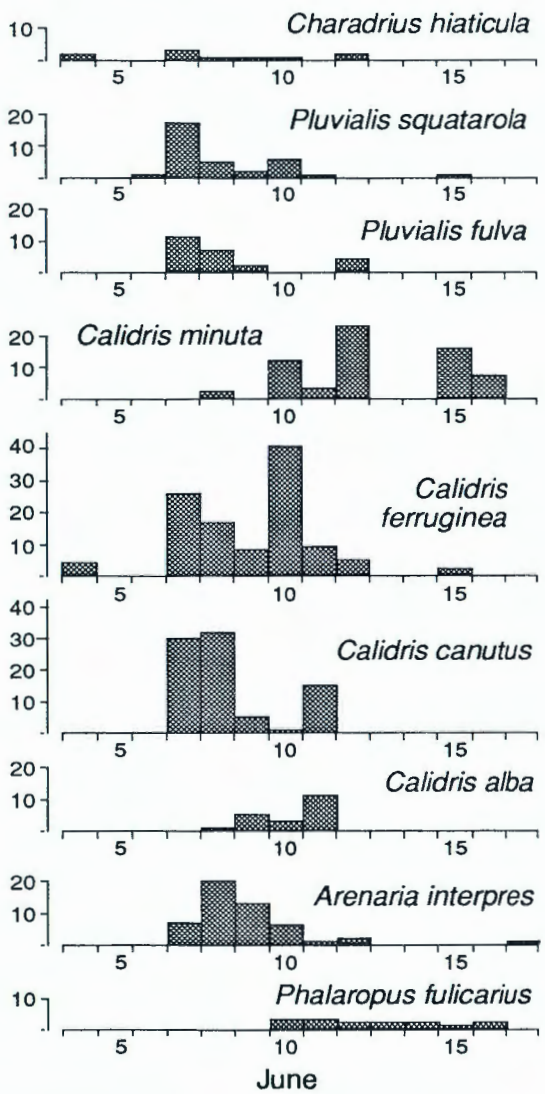


Figure 4. Phenology of migrating waders at Camp Lydia in 1990. The columns give the number of birds recorded flying over the study area.
Abbildung 4. Phänologie ziehender Limikolen bei Camp Lydia 1990. Die Säulen zeigen die Zahl der Vögel, die ziehend über dem Untersuchungsgebiet gesichtet wurden.

According to GLUTZ v. BLOTZHEIM, BAUER & BEZZEL (1975), the clutch size of Lesser Golden Plovers is four eggs. For more details on the nests found see table 10.

For morphometrical data of the birds caught on the nest see appendix 1.

Golden Plover
Goldregenpfeifer
Pluvialis apricaria

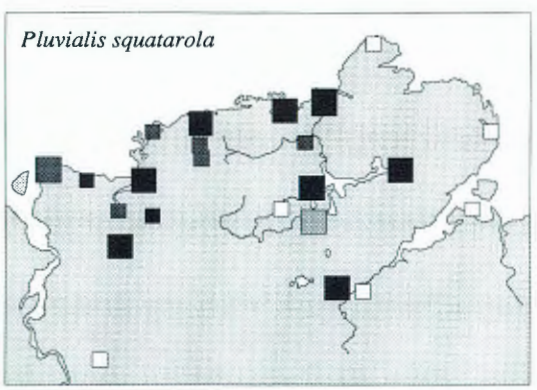
Seen only in 1989; five pairs were recorded in Ary Mas (July 7); up to three birds (two of them singing) were observed near Malaya Logata (July 3); and one pair was located in the delta of the Lower Taimyra (July 24). The last two locations are situated north of the known breeding range of the species (ROGACHEVA 1992).

Grey Plover
Kiebitzregenpfeifer
Pluvialis squatarola

Grey Plovers breed throughout all Taimyr (ROGACHEVA 1992).

In 1989, we found Grey Plovers at most of the places that we visited. We estimated the following breeding densities: six pairs in 12 km^2 on Shturmanov (0.5 pairs/ km^2), three pairs in 14 km^2 near the camp on Rysyukov (0.2 pairs/km^2). At least eleven pairs were noted on a transect between the camp on Rysyukov and the Byrranga Mountains. In the southern part of Taimyr Grey Plovers seemed to nest in lower densities. We found only one territorial pair each at Malaya Logata, along the cliffs of the River Logata near the mouth of Malaya Logata, and in Ary-Mas.

In 1990, eight pairs held territories in 38 km^2 (0.2 pairs/km^2) around Camp Lydia; six pairs were recorded on the island of Farvaterny; and one breeding pair was found on Big Bird Island. Both islands are situated north of the Pyasina delta. Grey Plovers were most common at Sterlegova where the breeding density was as



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

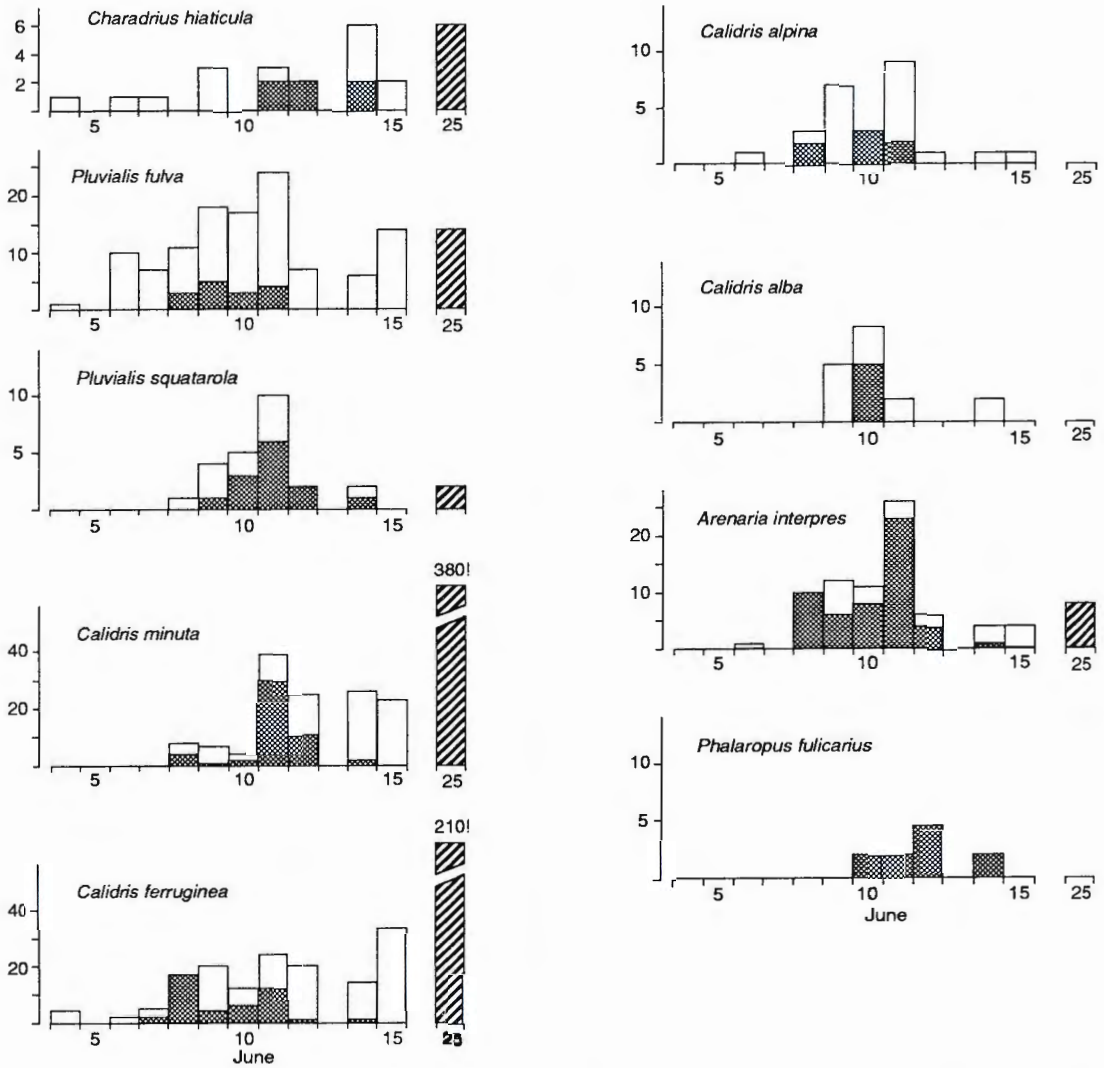


Figure 5. Spring arrival of waders at Camp Lydia in 1990. The columns show the numbers of birds in the study area. The shaded parts of the columns give the numbers of birds seen in a resting site at the mouth of Lydia River. The hatched columns show the numbers of breeding birds.
Abbildung 5. Frühjahrsankunft der Limikolen in Camp Lydia 1990. Die Säulen zeigen die Anzahlen der Vögel im Untersuchungsgebiet. Der graue Teil der Säulen gibt die Bestände in einem Rastgebiet an der Lydiamündung an. Die schraffierten Säulen markieren die Anzahlen der Brutvögel.

high as 2.5 pairs/km^2 (see table 1).

In 1991, territorial pairs of Grey Plovers were again found at nearly all places visited: twelve pairs at Sterlegova, two pairs on Kolosovych Island, one pair and three adults at the Pyasina River near the Pushkin Hill, three pairs at the southern stop at the Lenivaya River, four pairs at the middle part of the Lenivaya River, and one pair each to the north and south of Dickson. A nest was found at the River Pura on July 10.

The nesting densities that we could measure lie within the range of densities cited in ROGACHEVA (1992). Our data clearly suggest a south-north trend in densities, which is in accordance with ROGACHEVA's finding that Grey Plovers are more common in the arctic

Table 11. Time-activity-budgets of waders at Camp Lydia in the pre-breeding season (June 1 to 15) of 1990.
Tabelle 11. Zeit-Aktivitäts-Muster von Limikolen bei Camp Lydia in der Vorbrutzeit (1. bis 15. Juni) 1990.

	percentage of time spent *Zeitanteil für*					
species, sex *Art, Geschlecht*	**feeding** *Nahrungs-suche*	**resting, preening** *Rasten, Putzen*	**social behaviour** *Sozial-verhalten*	**alert** *Wachen*	**others** *übriges Verhalten*	**bird minutes** *Vogel-minuten*
Pluvialis squatarola	**47**	**47**	**4**	**1**	**1**	**295**
P. squatarola, males	30	61	6	1	1	139
P. squatarola, females	59	39	1	0	1	137
Pluvialis fulva	**56**	**20**	**7**	**16**	**1**	**152**
Calidris minuta	**76**	**14**	**7**	**1**	**2**	**493**
Calidris ferruginea	**60**	**24**	**3**	**10**	**3**	**346**
Arenaria interpres	**68**	**22**	**5**	**1**	**4**	**175**

tundra subzone than in the typical tundra subzone.

In 1990, at Camp Lydia, the first Grey Plovers which were seen were migrating over the study plot on June 6. Resting birds occurred two days later. Migrating Grey Plovers were seen between June 6 and June 15 with a peak on June 7 (see figure 4). Obviously, some birds used the study plot as a stopover site during spring migration, especially at the mouth of the River Lydia. Resting numbers peaked on June 11 (see figure 5).

DEMENTYEV & GLADKOV (1969) write that Grey Plovers may arrive on Taimyr as early as May 18. Most of the scarce literature data, however, shows arrival dates closer to our results (May 31 - June 6; June 4; June 7; June 15, (DEMENTYEV & GLADKOV 1969, ROGACHEVA 1992). DEMENTYEV & GLADKOV (1969) mention Taimyr to be the breeding area where Grey Plovers arrive latest.

Shortly after their arrival, the Grey Plovers spent most of their time feeding. After some days the feeding time diminished, and resting, preening and social behaviour became more important. In the pre-breeding period, females spent about twice as much time feeding than did males (see table 11).

One of the four Grey Plovers ringed at Camp Lydia in 1990 (male, ring 6326001) was recaptured at the same place on June 25, 1991.

Most of the nests of Grey Plover found (six in 1989; fifteen in 1990) were situated in very open surroundings, usually gentle slopes or lowlands, that allowed the incubating bird to detect predators at distances of several hundreds of metres. Grey Plovers did not use more than a few bits of lichens as nest material.

The start of laying and hatching could be recorded only in 1990. Egg laying in ten clutches started between June 12 and June 24 (mean: June 14.6; SD= 3.6 days; median: June 13). Seven of these dates were calculated from the hatching date allowing 32 days for egg laying and incubation. Two laying intervals could be recorded; in one nest two eggs were laid within three days; two eggs of another clutch were laid at least two days apart. The length of the incubation period could only be measured accurately in one nest, it was 27 days. Hatching dates were available for eight nests; the dates ranged from July 14 to July 18 (mean: July 15.4; SD=1.4 days; median: July 15). Seventeen full clutches consisted of one (2x), two (1x), three (1x) and four eggs (13x); the mean clutch size was 3.5 eggs (n=17; SD=1.1). It cannot be excluded that clutches of less than four eggs had become victims of partial predation. This is unlikely, however, because we never recorded losses of single eggs in nests that we controlled for a longer time. The clutch size differed markedly between the years. All eleven complete clutches found in 1990 consisted of four eggs. All clutches of less than four eggs were found in 1989 (mean clutch size in 1989: 2.5 eggs). The difference in clutch size between 1989 and 1990 is statistically significant (U-test; z=-2.974; p=0.0029). To our knowledge such a small mean clutch size as in 1989 has not previously been reported (HUSSEL & PAGE 1977, CRAMP & SIMMONS 1977). It is possible that the very late spring of 1989 caused the reduction in clutch size.

The hatching success calculated using the MAYFIELD (1975) method with the assumption of a period of 32 days between the start of egg laying and the hatching date was 40% for the combined data of 1989 and 1990 and 58% for 1990 alone (the data of 1989 alone was insufficient to calculate nest survival rates).

Some Grey Plovers began their post-nuptial moult on the nest (see also CRAMP & SIMMONS 1977). Among eight Grey Plovers caught on the nest between July 7 and 21, 1989, three were already moulting their primaries (primaries 1 and 2) and parts of their body feathers (see appendix 1). On July 19, 1990, a territorial pair near Camp Lydia had obviously already started their body feather moult. On the same day a further female was seen to be in body feather moult, but her male obviously had not yet begun to moult. Two of the 16 adults ringed between June 19 and July 16, 1990, had started their moult. An early start of the post-nuptial moult of some Grey Plovers on their breeding grounds had already been supposed by BRANSON & MINTON (1976) and BOERE (1976) who caught birds in arrested wing moult on arrival at moulting sites in Western Europe (see also KOZLOVA 1957 and CRAMP & SIMMONS 1977).

For the biometric data of the 24 Grey Plovers caught on the nest, see appendix 1.

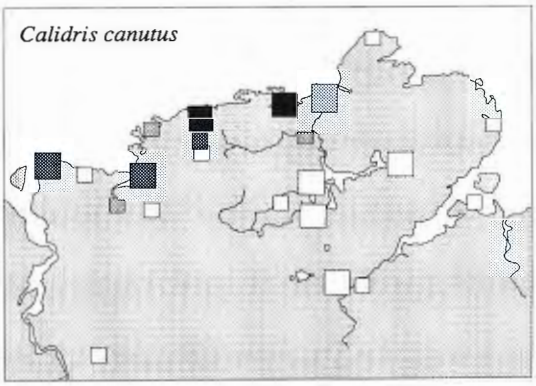
Knot
Knutt
Calidris canutus

Knots were found breeding on the northern part of the Taimyr Peninsula. The only breeding record in 1989 was a nest with three eggs on the Shturmanov Peninsula on July 18. A second pair was alarming nearby. At the same time big flocks of non-breeding Knots were spotted, e.g. a mixed group of 1000 Knots and Bar-tailed Godwits were seen from the helicopter near Shturmanov on July 18, 1989. On Shturmanov itself, up to 90 non-breeding Knots were counted (July 20, 1989).

By far the best breeding site of Knots we found in 1990 was at Sterlegova. Thirteen nests or broods were found and 25 pairs estimated in an area of 12 km² (mostly near the edges of blackish stone fields on slopes).

In 1990, at Camp Lydia we studied the timing of migration to Taimyr. Most Knots passed by between June 7 and 11 (see Figure 4). The last migrating birds were seen on June 20 (seven birds flying northwards).

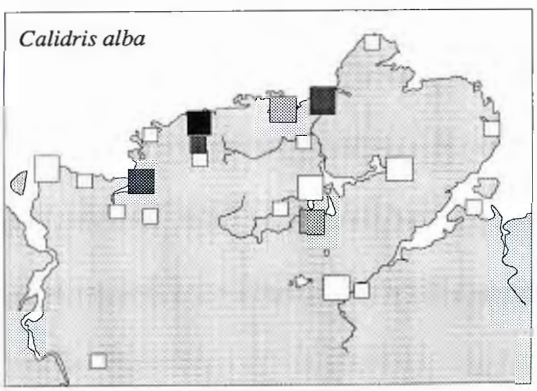
In 1991, seven nests were found near Sterlegova where ultimately 25 pairs were located. One adult male was retrapped on a nest just 10m from its previous year's nest, where we had ringed it. Displaying birds were also seen in the coastal hills north of Dickson (two on June 24 and one on July 2). Five birds on Kolosovych Island were recorded on June 30, as were six pairs near the middle part of the Lenivaya River and a single bird near Pushkin Hill on the same day.



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

Sanderling
Sanderling
Calidris alba

The Sanderling is a breeding bird of the northern (coastal) part of the Taimyr Peninsula (ROGACHEVA 1992).



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

Table 12. Knot *Calidris canutus* nests and broods found on Taimyr.
Tabelle 12. Daten zu Nestern und Bruten des Knutts Calidris canutus auf Taimyr.

location *Ort*	nest/brood found on *Nest gefunden am*	with (nest contents) *mit (Nestinhalt)*	clutch size *Vollgelege*	hatching date *Schlupfdatum*	remarks on nest site *Bemerkungen zum Nistplatz*
Shturmanov	18.7.1989	3 eggs	3		swampy slope
Sterlegova	7.7.1990	4 eggs	4		near gravel on slope facing the sea
Sterlegova	8.7.1990	1 egg			patchy tundra, slope facing the sea
Sterlegova	8.7.1990	4 eggs	4		near gravel on slope facing the sea
Sterlegova	10.7.1990	4 chicks		8.7.1990	swamp on a plateau
Sterlegova	13.7.1990	3 chicks			plateau with gravel
Sterlegova	15.7.1990	4 eggs	4		dry patchy tundra, top of a hill
Sterlegova	15.7.1990	1 egg and 2 chicks (2d)		13.7.1990	patchy tundra, slope
Sterlegova	17.7.1990	3 chicks			swamp
Sterlegova	17.7.1990	4 chicks (3-4d)		13.7.1990	lowland, grass moss tundra
Sterlegova	16.7.1990	3 chicks			patchy tundra on a plateau
Sterlegova	16.7.1990	4 chicks		15.7.1990	grass tundra
Sterlegova	16.7.1990	2 chicks			
Sterlegova	18.7.1990	2 chicks			dry moss sedge tundra
Sterlegova	26.6.1991	4 eggs	4		strip of vegetation in a gravel slope
Sterlegova	26.6.1991	4 eggs	4		broken tundra with stones
Sterlegova	26.6.1991	4 eggs	4		edge of a gravel slope
Sterlegova	27.6.1991	4 eggs	4		between stones
Sterlegova	27.6.1991	4 eggs	4		dry moss with small stones
Sterlegova	27.6.1991	4 eggs	4		between stones
Sterlegova	27.6.1991	4 eggs	4		on a hummock

In 1989 we did not find any breeding Sanderlings. Our observations from 1989: one bird at Malaya Logata on June 30, one pair in the delta of the Taimyr River on July 24 and at Shturmanov, up to nine individuals on July 20.

At least two displaying pairs were seen on the hills near Camp Lydia on June 9 and 10, 1990. A nest scrape was found there on June 18, but later no further signs of nesting were noticed. At Camp Lydia the first Sanderling was seen on June 9, 1990. We observed passing migrants between June 8 and 11, 1990 (figure 4).

A nest with four eggs was observed at Sterlegova from July 9 - 19, 1990. At seven controls the same bird (probably a female) was breeding. On several occasions this bird was feeding while the nest was left unattended. Up to seven Sanderlings at one time showed territorial behaviour or chased each other on a plateau at Sterlegova.

In late June 1991, four pairs were seen near Sterlegova on slopes covered with gravel or vegetation. A nest containing four eggs was found on June 28. A pair was sighted on the Lenivaya River on June 25, 1991.

Red-necked Stint
Rotkehlstrandläufer
Calidris ruficollis

Two Red-necked Stints (presumably in two different breeding territories) were seen in the Byrranga Mountains on July 30, 1989 (Igor CHUPIN); one bird was observed near Camp Lydia on June 20, 1990. According to older literature data (DEMENTYEV & GLADKOV 1969; FLINT et al. 1984) the species was recorded only on eastern Taimyr and near the mouth of the River Yenisey. ROGACHEVA (1992), however, mentions several more recent sightings from various parts of Taimyr.

Little Stint
Zwergstrandläufer
Calidris minuta

Little Stints breed in the northern part of the Taimyr Peninsula except in the polar deserts (ROGACHEVA 1992). We found the species nesting commonly at nearly all places visited, and at some of them it was the most abundant bird species.

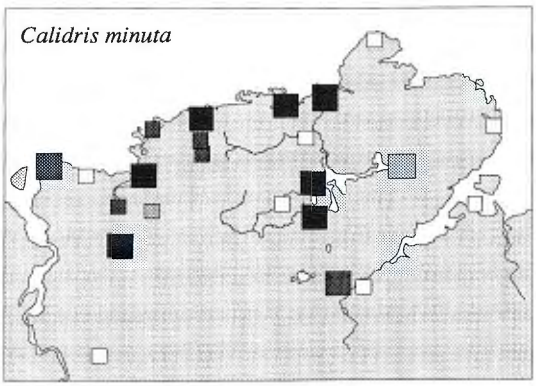
The breeding system of Little Stints on Taimyr is not yet well known (CHYLARECKI, KANIA, TOMKOVICH pers. comm.). It is likely, however, that many females lay more than one clutch, the extra clutches being incubated by the males (HILDÉN 1988). We found pairs of Little Stints only in the beginning of the breeding season. We never saw clutches or broods that were attended by more than one adult. All our density records refer to pairs. The number of nests could in theory be (and was in reality in certain parts of the study plots) twice as high as the number of pairs recorded.

In 1989, the breeding densities were highest near Malaya Logata where about 100 pairs nested in about seven km^2 (14.3 pairs/ km^2). Densities decreased towards the North; thus we found only eleven pairs (0.8 pairs/ km^2) at Rysyukov and seven pairs (0.6 pairs/km^2) at Shturmanov. Data obtained by the rope transects (from table 2) also indicated a similar geographical trend: Malaya Logata 76 pairs/km^2, Rysyukov 17 pairs /km^2, Shturmanov 1 pair/ km^2. In Ary Mas the densities of Little Stints, however, seemed to be much lower than in Malaya Logata, with only one singing male recorded.

In 1990, Little Stints were found breeding in very high densities near Camp Lydia (42.4 pairs/km^2). At Sterlegova about 5.1 pairs nested per km^2 .

In 1991 too, Little Stints were found in nearly all sites visited. Near Sterlegova about 20 pairs nested, and on the southern stop at River Lenivaya thirteen pairs were seen.

Our observations suggest that Little Stints reach their maximum densities on Taimyr at about 72 -75 N. Some of the densities that we recorded are higher than literature data (summarised in ROGACHEVA 1992). Densities of Little Stints are known to show high inter-annual variation (TOMKOVICH pers. comm. and ROGACHEVA 1992), so that the concentrations at Camp Lydia may have been an ephemeral phenomenon. Few if any of the breeding adults of 1990 returned to the same site in the following breeding season. None of the 52 individually colour ringed Little Stints were seen on the study



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

plot in 1991 (CHYLARECKI, KANIA, van de KAM pers. comm.). The lack of breeding site fidelity in Little Stints was already recorded in northern Norway by HILDÉN (1988) and on Yamal by RYABITSEV & ALEKSEEVA (1992).

Little Stints preferred to nest on lowland tundra (60.3 pairs/km^2 in an area of 3.00 km^2 at an altitude of less than 10 m vs. 6.1 pairs/km^2 in an area of 1.48 km^2 at an altitude above 10 m; Camp Lydia 1990). In all years and at all places territories were most common where relatively dry tundra slopes bordered damp marshes, polygonal ponds or river shores.

In 1990, near Camp Lydia, the first Little Stint was seen on June 6. Birds continued to occupy breeding territories until the end of June, mostly between June 15 and 25 (see figure 5), just before the females started laying (see below). Arriving birds in the beginning of June concentrated on the snow-free belt on the coastal ridge and on the partly flooded lowlands of the River Lydia. They spent by far most of their time feeding (see table 11). From June 8 to 16, passing migrants flying inland were noted (see figure 4). Most of the few available published dates of arrival on Taimyr are later than our 1990 records: May 31 - June 11, June 9, June 10 - 16, June 12, June 14 (taken from cited data in DEMENTYEV & GLADKOV 1969 and ROGACHEVA 1992).

Figure 6 shows the dates of the start of laying in four nests in 1989 (mean: July 2.8; SD: 1.7 days) and of 42 nests in 1990 (mean: June 24.3; SD: 4.3 days). The start of laying was either recorded directly or was calculated from the hatching date (start of laying = hatching date - 25 days). Laying started significantly earlier in 1990 than in

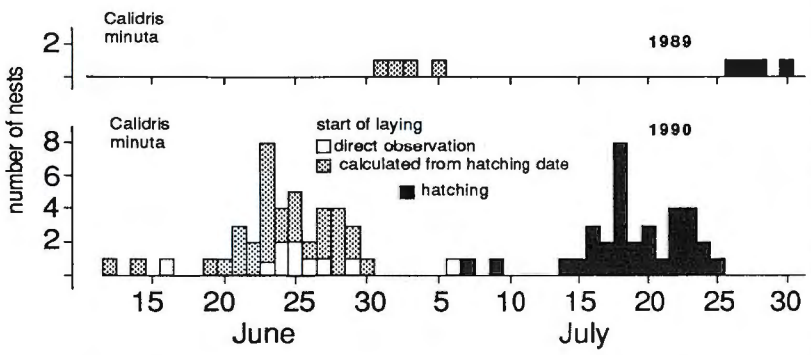


Figure 6. Phenology of laying and hatching of Little Stints on Taimyr in 1989 and 1990.
Abbildung 6. Phänologie von Eiablage und Schlupf der Zwergstrandläufer auf Taimyr 1989 und 1990. Die weißen Säulenanteile zeigen die direkt ermittelten Eiablagetermine (Gelegefund in der Legephase). Die grauen Säulenabschnitte stehen für die aufgrund bekannter Schlupfdaten berechneten Eiablagetermine. Schlupfdaten sind durch schwarze Säulen dargestellt.

1989 (Mann-Whitney-U-test; z=-3.26; p=0.011). Observations at eleven nests which were repeatedly controlled during the laying period suggested laying intervals of one day. At two nests the period between the completion of the clutch and hatching was 22 and 24 days; this is longer than described in the literature (HILDÉN 1978, CRAMP & SIMMONS 1983). The incubation usually started with the laying of the third egg (birds were found incubating incomplete clutches of three eggs in eight out of ten controls). Clutches prior to that state were sometimes incubated for shorter periods of time. Dates of a replacement clutch: start of laying of first clutch June 16, complete clutch of four eggs destroyed on June 20, start of laying of the replacement clutch (adult individually colour ringed) ca 300m away from the first clutch on June 28, clutch size three eggs.

The clutch sizes of Little Stints on Taimyr (table 13) did not differ from literature data (HILDÉN 1988). We did not find "super-clutches" of more than four eggs.

The hatching success (calculated according MAYFIELD 1975) did not differ between the years: 1989: 60% (493 exposure egg days); 1990: 61% (1789 exposure egg days); both years 61%.

After hatching the parents guided the chicks to wet lowlands, mostly wet sedge-willow-moss tundra, close to open water. In the first days the families preferred areas that had been previously flooded after the snow melt. During incubation these had been the places where the adult birds went when they left the nest for feeding. Changes in habitat use (e.g. from wet to dry tundra) as the chicks grew older were difficult to detect because the water level of the rivers in the study area at Camp Lydia fell continuously in July, and many previously flooded areas dried out. In the first week after hatching had started (July 15 to 20, 1990) almost all chicks at Camp Lydia regardless of age (maximum weight was 19g) were found in wet grass-willow-moss vegetation (n = 57). One chick that weighed 21.5 g on July 20 was encountered at a somewhat higher and drier locality, but still in the same type of vegetation. Later, during the time from July 21 to 26, small chicks were also found in drier habitats, although most of them still remained on the moist land (figure 7). A higher proportion of the older chicks then (weight of 10 g is reached after 5 days) were seen on dry parts of the tundra. All chicks caught in the dry vegetation on the slopes of the hills (*Cassiope*) weighed more than 15 g (age 8 to 9 days). So there seems to be a general trend for the chicks to move to drier habitats as they grow older.

Little Stint chicks grew fast. At Lydia the weight increase started in the first day of life, though still slower than after the third day (fig-

Table 13. Sizes of complete clutches of Little Stints on Taimyr.
Tabelle 13. Vollgelegegrößen von Zwergstrandläufern auf Taimyr.

	3 eggs	4 eggs	mean	SD
1989	1	16	3.94	0.24
1990	4	41	3.91	0.29
total	5	57	3.92	0.27

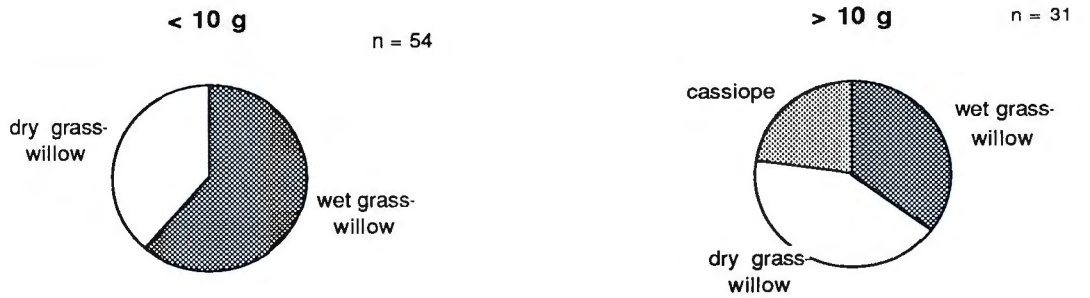


Figure 7. Habitat choice of Little Stint chicks in relation to weight (age). The sizes of the sectors refer to the numbers of chicks caught in the different habitats at Camp Lydia between July 21 and 26, 1990.
Abbildung 7. Habitatwahl von Zwergstrandläuferküken unterschiedlichen Gewichts (Alters). Die Sektorengrößen beziehen sich auf die Zahlen der Küken, die bei Camp Lydia vom 21. bis zum 26. Juli 1990 in den verschiedenen Lebensräumen gefangen wurden.

ure 8). The first bird flew at an age of 15 days. A sibling that was still only able to flap a few meters could be caught. It weighed 25.5 g on July 23, 1990. This was the heaviest unfledged chick caught. Minimum fledging weight is given by GLUTZ von BLOTZHEIM et al. (1975) with 19g, average fledging weight with 23.8g, juvenile weight on migration with 28.7g (Switzerland), in winter 23 - 25g (Carmargue). If 24g is taken as asymptotic weight a chick reaches and taking into account that *Calidris* chicks fledge with about 75% of that (see BEINTEMA & VISSER 1989) a Little Stint chick would fledge with a weight of 18g and an age of ten to eleven days. However, several chicks with a weight of more than 20g that could not fly were caught so that fledging age is estimated at twelve to fifteen days.

Little Stint chicks were guarded by one parent. On one occasion two adults were seen brooding four chicks shoulder to shoulder in the night. On three occasions it was noted that families mixed:

- 22.7.90 chick 9F46771 (8g) was caught with chicks 9K82381, 82 + 84 (6g) and guarded by one adult (y-g-r; b +)
- 23.7.90 chick 9F46636 (8.5g) caught with chicks 9K82389+90 (9g), guarded by adult y-y-y,b +
- 23.7.90 six chicks of 5 to 8 g were brooded by one adult in the night

For biometric data of the adults see appendix 1.

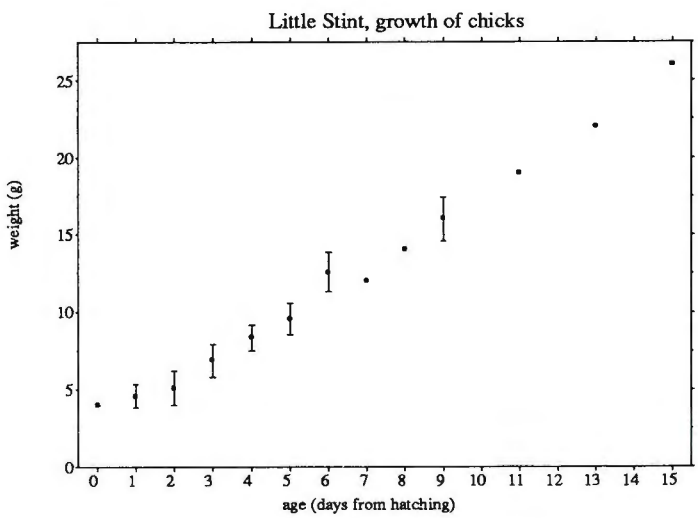


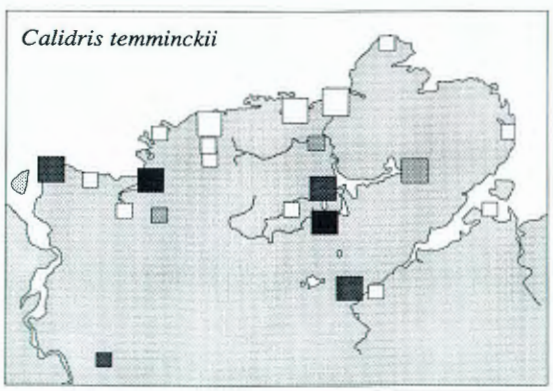
Figure 8. Weight development of Little Stint chicks. The dots show the mean weights of chicks of known age. The bars give the standard deviations.
Abbildung 8. Gewichtsentwicklung von Zwergstrandläuferküken. Die Punkte zeigen die mittleren Gewichte der Küken bekannten Alters. Die Linien geben die Standardabweichungen an.

Temminck's Stint
Temminckstrandläufer
Calidris temminckii

The breeding range of the Temminck's Stint on Taimyr extends north to 74°N (ROGACHEVA (1992). We found the species breeding commonly in the southern part of the Taimyr Peninsula. Temminck's Stints were usually associated with willow thickets along the rivers.

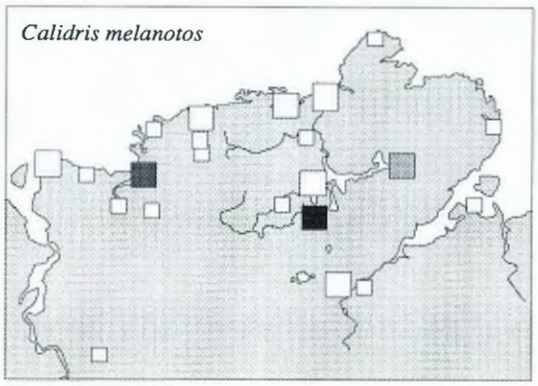
In 1989, twelve pairs were counted in 7 km² (1.7 pairs/ km²) at Malaya Logata and two pairs in 14 km² (0.1 pairs/ km²) at Rysyukov, close to the northern boundary of the breeding range. One pair bred near Camp Lydia in 1990. Four territorial birds were seen near Norilsk on July 26, 1990.

A nest in which laying started on June 22 was found on a coastal ridge near Camp Lydia (André MOROZ). In two nests at Malaya Logata chicks hatched on August 2 and 3, respectively. An adult with three chicks two to three days old, was seen at the same place on August 3. At the beginning of August 1989, the observation of eight alarming adults at Malaya Logata indicated quite high hatching success. The parents led their chicks to the muddy banks and the puddles near the river. The chicks of each "family" were guarded by a single parent each.



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

In 1991, Temminck's Stints were found only in Dickson, where the species was very common (eight pairs north of the town on June 24) even in the centre of the town (six pairs on July 1). The males used electricity poles and other anthropogenic structures as song posts.



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

Pectoral Sandpiper
Graubruststrandläufer
Calidris melanotos

Pectoral Sandpipers breed in the southern part of Taimyr (ROGACHEVA 1992). We found a quite high density of 1.9 pairs/km² (thirteen pairs on 7 km²) only at Malaya Logata in 1989. Near Camp Lydia up to four different displaying males could be sighted at the end of June 1990. Additionally, up to two displaying males were seen on "St. Joseph Island" near Camp Lydia. No sign of nesting, however, was found in the sites visited in 1990. All birds at Malaya Logata and at Camp Lydia were seen in the lowlands where they occurred in the same habitats as Dunlins. Pectoral Sandpipers arrived on June 10, 1990 (Camp Lydia).

At Malaya Logata, two nests were found. The first contained one egg on July 1, two eggs on July 3, three eggs on July 5 (incubation activity was already obvious) and four eggs on July 6. The second nest was found with four eggs on July 5.

Curlew Sandpiper
Sichelstrandläufer
Calidris ferruginea

Curlew Sandpipers breed most commonly in the northern part of Taimyr (ROGACHEVA 1992).

One of the difficulties in censusing breeding Curlew Sandpipers is the fact that females behave very cryptically while males show very conspicious courtship behaviour which includes flights far away from their territories (PORTENKO 1959, TOMKOVICH 1988 and own observa-

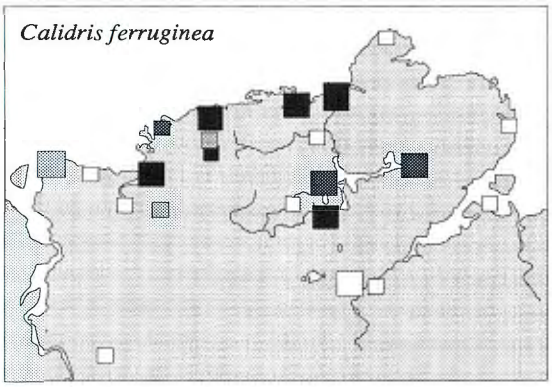
tions). We saw far fewer females than males. All our density records refer to territorial males, and it cannot be excluded that some or even many of these males were not paired.

In 1989, we recorded surprisingly high densities of Curlew Sandpipers in central Taimyr at Malaya Logata where ten males had territories in 7 km² (1.4 males/km²). One nest was found (see table 14). The breeding of Curlew Sandpipers near Malaya Logata in 1989 was considered to be exceptional by Igor CHUPIN, who has been studying the bird fauna of that area for many years. Near Rysyukov, Curlew Sandpipers did not breed in 1989. A possibly breeding bird (judging by its behaviour) was seen in the nearby Byrranga Mountains on July 30. On Shturmanov, only one pair was found on 12 km². Our visit on Shturmanov was too late, however, to count displaying males.

In 1990, densities were especially high near Camp Lydia where 23.4 displaying males/km² were counted (table 1) and near the mouth of

Table 14. Curlew Sandpiper *Calidris ferruginea* nests and broods found on Taimyr.
Tabelle 14. Daten zu Nestern und Bruten des Sichelstrandläufers Calidris ferruginea auf Taimyr.

location *Ort*	**nest/brood found on** *Nest gefunden am*	**with (nest content(s)** *mit (Nestinhalt)*	**clutch size** *Vollgelege*	**hatching date** *Schlupfdatum*	**hatching success** *Bruterfolg*
Malaya Logata	5.7.1989	4 eggs			
Shturmanov	19.7.1989	3 eggs			
Camp Lydia	18.6.1990	4 eggs	4 eggs	7.7.1990	hatched
Camp Lydia	18.6.1990	4 eggs	4 eggs	7.7.1990	hatched
Camp Lydia	23.6.1990	4 eggs			
Camp Lydia	26.6.1990	4 eggs	4 eggs	19.7.1990	hatched
Camp Lydia	29.6.1990	4 eggs	4 eggs	16.7.1990	hatched
Camp Lydia	4.7.1990	4 eggs	4 eggs		
Camp Lydia	8.7.1990	3 eggs	3 eggs		
Camp Lydia	9.7.1990	4 eggs	4 eggs	16.7.1990	hatched
Camp Lydia	11.7.1990	4 eggs	4 eggs	14.7.1990	hatched
Camp Lydia	16.7.1990	4 eggs	4 eggs	20.7.1990	hatched
Camp Lydia	18.7.1990	4 eggs		18.7.1990	hatched
Camp Lydia	23.7.1990	4 eggs			hatched
Sterlegova	8.7.1990	4 eggs			
Sterlegova	9.7.1990	4 eggs	4 eggs		
Sterlegova	14.7.1990	1 chick			
Sterlegova	15.7.1990	4 chicks		15.7.1990	
Sterlegova	15.7.1990	4 eggs			
Sterlegova	17.7.1990	4 eggs			
Sterlegova	18.7.1990	4 eggs	4 eggs		
Sterlegova	17.7.1990	2 chicks		16.7.1990	
Sterlegova	18.7.1990	2 chicks			
Taimyr Delta	20.7.1990	2 chicks			
Taimyr Delta	20.7.1990	2 chicks			
Taimyr Delta	21.7.1990	3 chicks		20.7.1990	
Pyasina	27.7.1990	2 chicks			
Lenivaya	25.6.1991	4 eggs			
Sterlegova	27.6.1991	4 eggs			
Sterlegova	30.6.1991	4 eggs			



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

Taimyr River. At Camp Lydia the densities in the lowland tundra (3.00 km², altitude < 10 m above sea level) were higher than on the uplands (1.48 km²) (27.0 males/km² vs. 16.2 males/km²). The density at Sterlegova (table 1) reached 2.3 birds/km²; most birds were found in the lowland.

In 1991, 30 - 40 breeding pairs were found near Sterlegova (two nests, each with four eggs found on June 27 and 30, respectively). Twenty pairs were seen at our stop at the southern part of the Lenivaya river (1 nest with 4 eggs found on June 25), and three displaying birds were observed on the Kolosovych Island northeast of the Pyasina delta. Several non-territorial birds were found at other sites. The breeding pairs clearly preferred the low-lying areas.

In contrast to ROGACHEVA (1992), who assumed that in adverse years the southern breeding areas are not occupied, the data from 1989 suggest just the opposite. In 1989, a year with a late spring, with low numbers of lemmings, but with many Arctic foxes, Curlew Sandpipers tended to nest further south than in normal years and were relatively scarce in the north (i.e. on Shturmanov).

The first Curlew Sandpipers arrived at Camp Lydia on June 3, 1990. The majority of breeding birds followed between June 15 and 25 (see figure 5), just before the start of egg laying. Birds migrating towards the northern coast of Taimyr (62% of birds heading north east, n = 69) were seen between June 4 and 15 (see figure 4). The published dates of first arrival on Taimyr show more or less the same time span as our records (June 1, 2, 5, 6, 7, 8, 12, 13, 14; DEMENTYEV & GLADKOV 1969; ROGACHEVA 1992). According to DEMENTYEV & GLADKOV (1969) the main influx is completed by June 20, and females start to lay immediately after arrival.

Most Curlew Sandpipers were already paired on arrival (see also TOMKOVICH 1988). Immediately after arrival Curlew Sandpipers spent most of their time feeding (see table 11).

Egg laying started around June 12, 1990. Hatching occurred between July 7 and 20 (n=11; mean=July 15.2; SD=4.5 days, median July 16). Eleven complete clutches contained four (10x) and three (1x) eggs. The hatching success seemed to be high; no eggs or clutches were lost during our observation period (466 egg days). For more details see table 14.

After egg laying the males seemed to intensify their display activities. They often gathered in groups of up to eleven males following a single female, or displayed on the ground. After such a display, males often returned to their territories. From June 30 onwards, groups of non-displaying males were seen on the tundra, and from July 1 onwards, departing groups of males (all in southwesterly directions) were recorded: 39 on July 1; 23 on July 2; 15 on July 3; 10 on July 4; 12 on July 5; 60 on July 6.

Purple Sandpiper
Meerstrandläufer
Calidris maritima

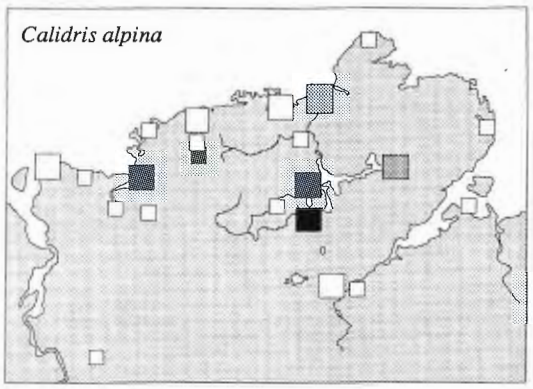
A bird incubating a clutch of four eggs was found on a pebble slope in the Byrranga Mountains near Rysyukov on July 14, 1989. In 1990, a pair with four newly hatched chicks and another female were found on the north coast of Sterlegova on July 17. In 1991, five pairs were found in Sterlegova. A nest with four eggs was found there on June 27, 1991. The birds occurred only on slopes covered with gravel.

ROGACHEVA (1992) only mentions areas on the coast of Taimyr as breeding sites for the species.

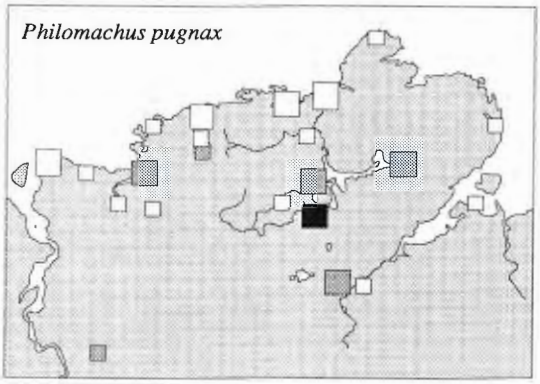
Dunlin
Alpenstrandläufer
Calidris alpina

Dunlins breed in the southern part of the Taimyr Peninsula. We found them within the known boundaries of their breeding range (ROGACHEVA 1992).

In 1989, breeding could only be proven at Malaya Logata. The breeding density was at least 28 pairs in about 7 km² (4.0 pairs/km²). Singing males were also observed at Rysyukov, and in the Byrranga Mountains. In spite of intensive



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

searching, nests could not be found at these sites. The same held true at Camp Lydia in 1990. Dunlins, however, bred in Lydia in 1991 (KANIA and CHYLARECKI pers. comm.). Dunlins were not found in the north at Sterlegova, and just one single bird was encountered in the Taimyr Delta on July 21, 1990.

In 1991 Dunlins were seen only at the southernmost stop on the Lenivaya River, five territorial males on June 25.

At Malaya Logata most Dunlins bred on the lowland plains. They also settled on the slopes of the small hills, but not on the tops. At Rysyukov and in the Byrranga Mountains, we saw Dunlins only in the small valleys which were wetter and more richly vegetated that the surrounding areas.

All birds caught or seen in the nests were moulting their primaries. For more details of moult, biometrics and breeding biology see KANIA (1990).

At Camp Lydia, the first Dunlin was seen on June 4, 1990, and the majority of birds arrived on June 7, 1990 (figure 5).

Ruff
Kampfläufer
Philomachus pugnax

Ruffs breed in the southern part of the Taimyr Peninsula. On migration they may be found further north (ROGACHEVA 1992).

We noted a breeding Reeve only at Malaya Logata (in 1989) where a nest was found by our colleagues from the Black/Azov Sea Ornithological Station (pers. comm.). Groups of displaying birds were seen at Malaya Logata (maximum of 115 birds, mostly males, on July 2, 1989) and near Camp Lydia (1990). Many birds were observed migrating northwards in early July 1989; 100 at Malaya Logata on July 5, 50 at Ary Mas on July 7, ten at Ary Mas on July 8, and 40 at Malaja Logata on July 9. The proportions of males and females in the flocks were equal.

In 1990 the first bird was seen on 11 June near Camp Lydia.

Only two observations in 1991: one Ruff and three Reeves at the Norilsk airport on June 23; one bird at the southernmost stop at the Lenivaya River on June 25.

Common Snipe
Bekassine
Gallinago gallinago

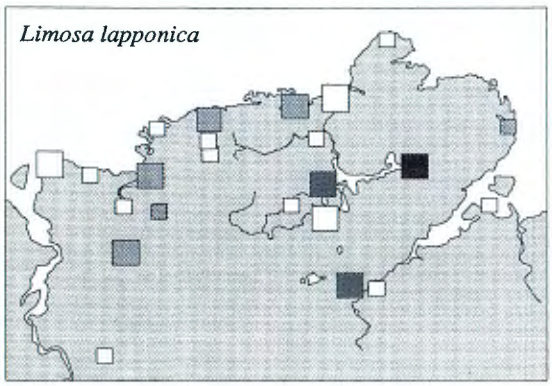
Common Snipes reach the northern limit of their breeding distribution in the southern part of the Taimyr Peninsula (ROGACHEVA 1992). We heard and saw drumming Common Snipes at Ary Mas (three birds on July 7, one bird on July 8, 1989) and at Malaya Logata (between July 2 and 7, 1989). In the lowland plains of Malaya Logata up to five birds (on about 7 km^2) were seen in one day.

Pintail Snipe
Stiftbekassine
Gallinago stenura

Seen near Bikada in August 1991.

Bar-tailed Godwit
Pfuhlschnepe
Limosa lapponica

Bar-tailed Godwits breed on Taimyr south of 75 N (ROGACHEVA 1992).



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

We found two territorial pairs at Ary-Mas on July 7 and 8, 1989, and four alarming birds near Rysyukov on July 5, 1989. From July 19, 1989, onwards, big flocks with up to several hundred individuals (July 25) partly mixed with Knots were seen feeding in wet parts of the tundra on the northern coast of Taimyr, for example on Shturmanov. The ratio of the sexes in the flocks was about equal. All these birds seemed to be either non-breeders or failed breeders. We did not observe as many flocks in 1990 nor in 1991, so that their occurrence might be caused by the adverse conditions of the year 1989 (late spring and few lemmings, but many Arctic foxes).

In 1990, at Camp Lydia, only a few, mostly migrating birds were observed. Records are one bird flying southeast on June 9, single migrating birds heard in the first two weeks of July, flocks of up to 17 birds migrating to the North seen between July 20 and 23 and four males and two females feeding in a wet part of the tundra in late July.

A pair was seen at the mouth of the River Bystroya on July 12, 1991.

Spotted Redshank
Dunkler Wasserläufer
Tringa erythropus

We recorded Spotted Redshanks at Malaya Logata close to the northern border of their breeding range (ROGACHEVA 1992) between June 30 and July 4, 1989, with a maximum of five birds (four of them singing) on July 2. Spotted Redshanks were obviously quite abundant at Ary Mas: seven birds on July 7, 1989, with one pair probably breeding.

Wood Sandpiper
Bruchwasserläufer
Tringa glareola

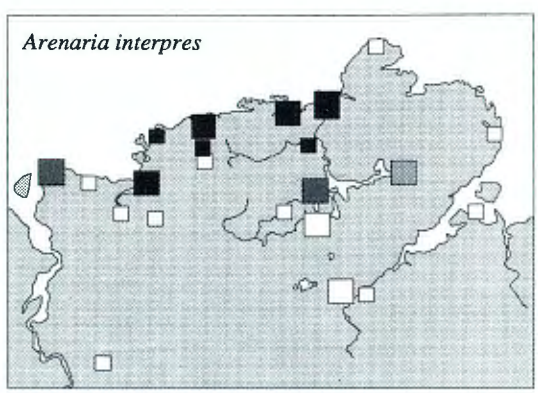
One singing male and two alarming birds were found near the Norilsk airport on July 7, 1990 – well within the breeding range of the species (ROGACHEVA 1992). Two Wood Sandpipers were seen at the same place on July 26, 1990, and on June 23, 1991.

Turnstone
Steinwälzer
Arenaria interpres

Turnstones breed along the entire coastline of Taimyr as well as at some inland places (ROGACHEVA 1992). We found Turnstones breeding commonly in the northern part of the Taimyr Peninsula, especially on the coast. On Shturmanov Peninsula, we located ten territorial pairs in about 12 km^2 (0.8 pairs/km^2) in 1989. In 1990, near Camp Lydia, eight pairs bred on 38 km^2 (0.2 pairs/km^2), and in Sterlegova 45 pairs bred on 19.8 km^2 (2.3 pairs/km^2). Near Camp Lydia, Turnstones nested in the hills near the camp. We could not find any territories in the lowlands.

In 1991 Turnstones were seen most commonly at Sterlegova where about forty pairs bred. Territorial birds were also found north of Dickson (sixteen pairs), south of Dickson (4 pairs), on the Kolosovych Island (three pairs and three non-territorial birds), and in the middle section of the Lenivaya River.

In 1990, the first Turnstone near Camp Lydia was seen on June 6. Most birds arrived on June 8. Arriving birds first concentrated on the coast-



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

Table 15. Turnstone *Arenaria interpres* nests and broods found on Taimyr.
Tabelle 15. Daten zu Nestern und Bruten des Steinwälzers Arenaria interpres auf Taimyr.

location *Ort*	**nest/brood found on** *Nest/Brut gefunden am*	**with (nest contents)** *mit (Nestinhalt)*	**clutch size** *Vollgelege*	**start of laying** *Legebeginn*	**hatching date** *Schlupfdatum*	**remarks** *Bemerkungen*
Shturmanov	19.7.1989	4 eggs	4			on moss within a stony field
Shturmanov	20.7.1989	4 eggs	4			on hummock in a pond
Camp Lydia	26.6.1990	4 eggs	4		ca 7.7.	patchy tundra in the hills
Camp Lydia	26.7.1990	2 chicks				
Sterlegova	8.7.1990	3 eggs	4	6.7.		nest empty on 12.7.
Sterlegova	10.7.1990	4 eggs	4			
Sterlegova	11.7.1990	1 egg hatching, 3 chicks			11.7.	
Sterlegova	11.7.1990	3 chicks				
Sterlegova	13.7.1990	4 chicks				
Sterlegova	14.7.1990	1 egg, 3 chicks			14.7.	
Sterlegova	15.7.1990	2 eggs, 2 chicks			15.7.	
Sterlegova	15.7.1990	4 chicks				
Sterlegova	15.7.1990	2 chicks				
Sterlegova	15.7.1990	3 eggs, 1 chick			15.7.	
Sterlegova	16.7.1990	4 chicks			15.7.	
Sterlegova	17.7.1990	2 chicks				
Sterlegova	17.7.1990	4 chicks			16.7.	
Taimyr Delta	20.7.1990	2 chicks				
Taimyr Delta	20.7.1990	1 chick				
Taimyr Delta	21.7.1990	1 chick				
Taimyr Delta	21.7.1990	1 chick				
Taimyr Delta	22.7.1990	2 eggs				
Sterlegova	1991	4 eggs	4			

line, especially near the mouth of the Lydia River where we counted up to 26 birds (mostly feeding). A bird which was colour ringed at that place on June 10 was later found breeding in the hills near the camp about 3 km from the ringing place. Birds passed Camp Lydia on their migration to the North and to the East mainly between June 7 and 12, 1990 (see figure 4). A review of literature data on arrival dates of Turnstones at Taimyr (see ROGACHEVA 1992) gives roughly the same results as our observations.

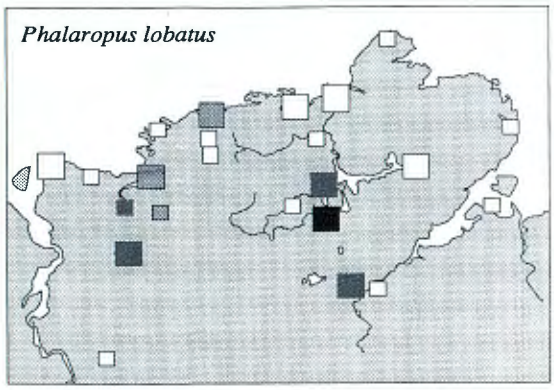
All six completed clutches of Turnstones contained 4 eggs. The mean hatching date of seven clutches was July 13.3 (SD=3.2 days). For further details of breeding biology see table 15.

Red-necked Phalarope
Odinshühnchen
Phalaropus lobatus

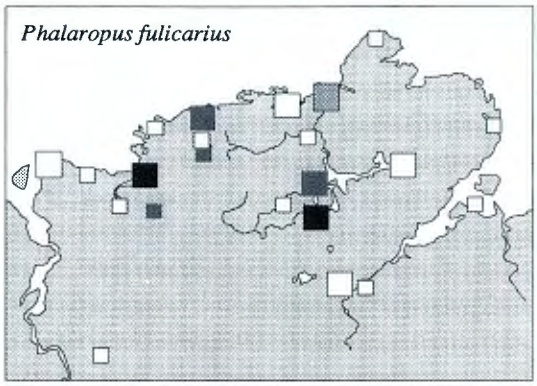
The breeding range of the Red-necked Phalarope includes the Taimyr Peninsula south of the Byrranga mountains (ROGACHEVA 1992).

In 1989 we found Red-necked Phalaropes breeding commonly at Malaya Logata (at least eleven pairs on about 7 km^2). The species was probably also breeding at Rysyukov (at least five pairs) and at Ary Mas (two birds on 8 July). In 1989 at least four males were seen with chicks at Malaya Logata on August 3, 6 and 7.

In 1990 at Camp Lydia the first Red-necked Phalarope was seen on 3 June. Breeding birds were also found on "St. Joseph Island" near Camp Lydia on June 26 and on July 18.



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

In 1991 four pairs were seen near the Pushkin hill at the River Pyasina on June 30, and one pair was recorded far north of the species' breeding range at Sterlegova on June 27, but not on the other days. Eight to ten pairs were encountered near the mouth of the River Pura on July 16.

Grey Phalarope
Thorshühnchen
Phalaropus fulicarius

The breeding range of the Grey Phalarope includes the greater part of the Taimyr Peninsula (ROGACHEVA 1992). We found the species to be abundant in the low tundra of Malaya Logata in 1989, up to 20 pairs were observed on July 2. On July 9, 1989, five pairs were still present near the station and four pairs in the nature reserve. Groups of females (fifteen, nine and three females) were seen near Rysyukov on July 14, 1989. In 1989, the breeding success of Grey Phalaropes probably was very low, no more than one newly fledged juvenile could be seen at Malaya Logata (August 9, 1989).

Table 16. Grey Phalarope *Phalaropus fulicarius* nests and broods found on Taimyr.
Tabelle 16. Daten zu Nestern und Bruten des Thorshühnchens Phalaropus fulicarius auf Taimyr.

location *Ort*	**nest/brood found on** *Nest/Brut gefunden am*	**with (nest contents)** *mit (Nestinhalt)*	**clutch size** *Vollgelege*	**start of laying** *Legebeginn*	**hatching date** *Schlupf-Datum*	**hatching success** *Schlupferfolg*	**remarks on nest site** *Bemerkungen zum Nistplatz*
Malaya Logata	1.7.1989	1 egg		1.7.1989			
Malaya Logata	3.7.1989	1 egg		3.7.1989			
Malaya Logata	2.7.1989	4 eggs					
Malaya Logata	5.7.1989	4 eggs	4 eggs				
Malaya Logata	6.7.1989	4 eggs					
Camp Lydia	30.6.1990	4 eggs	4 eggs		17.7.1990	4	polygon swamp
Camp Lydia	8.7.1990	4 eggs	4 eggs				wet grass tundra
Camp Lydia	14.7.1990	3 eggs	3 eggs		19.7.1990	3	wet grass willow marsh
Camp Lydia	19.7.1990	4 eggs	4 eggs				wet willow segde marsh
Camp Lydia	23.7.1990	3 eggs, 1 chick			23.7.1990		wet grass willow marsh
Camp Lydia	20.7.1990	4 chicks			20.7.1990		wet grass willow marsh

In 1990, at Camp Lydia, the first bird was spotted on June 10. Passing migrants were noticed between 10 and 16 June (figure 4). At least six pairs, probably many more, nested on the study site (table 1). Many birds were observed at Sterlegova in July 1990, the largest flock consisted of 145 birds on July 17, 1990.

In 1991 only one male was spotted at Sterlegova (June 27), and one pair was seen at the southern stop at the Lenivaya River on June 25.

For details of breeding biology see table 16. The biometrical data of birds caught are compiled in the appendix.

Pomarine Skua
Spatelraubmöwe
Stercorarius pomarinus

DEMENTYEV & GLADKOV (1969) and ILYCHEV & ZUBAKIN (1990) give 74 30' N as the northern boundary of the breeding distribution of Pomarine Skuas on Taimyr.

In 1989 Pomarine Skuas were observed only rarely; one bird at Malaya Logata on July 1, 2 and 3, three birds at Shturmanov on July 19; one bird on July 20 and three birds on July 21. Signs of breeding could not be ascertained. Four birds belonged to the light phase and three to the dark phase. A Pomarine Skua was seen feeding on a dead (probably frozen) lemming.

In 1990 near Camp Lydia, Pomarine Skuas occurred very commonly, up to 101 birds were seen (June 10). Of 275 birds checked 263 (96%) belonged to the light phase and twelve (4%) to the dark phase. Again, there was no indication of breeding near Camp Lydia in 1990. When we arrived at Camp Lydia on June 1, 1990, flocks of one, one, two, four, eleven and fifteen birds were observed migrating southeast (between 8 and 9 p.m.). Migrating birds were also seen on June 3 (25 birds) and on June 6 (18 birds). At Sterlegova, Pomarine Skuas were regularly observed but did not breed in 1990.

In 1991, Pomarine Skuas were seen more commonly than Long-tailed Skuas. The highest densities were found around Dickson; seven pairs north of Dickson (a nest with two eggs was found on June 24), four pairs and six non-territorial birds south of Dickson, eight pairs at the southern stop at the River Lenivaya, four pairs at the central stop at River Lenivaya and three pairs at the Pushkin Hill at the River Pyasina. The species was seen at River Pura on July 10.

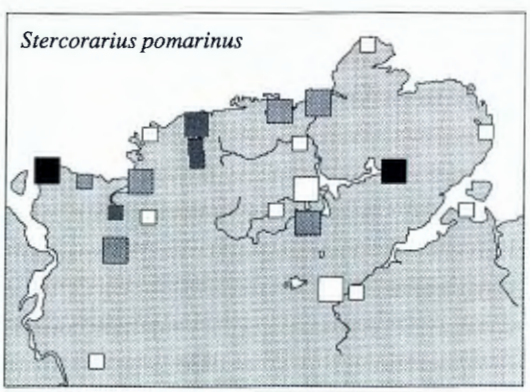
As with the Long-tailed Skua, the density and the breeding of the Pomarine Skua tracked the density cycle of the lemmings (see also ILYCHEV & ZUBAKIN 1990).

Arctic Skua
Schmarotzerraubmöwe
Stercorarius parasitus

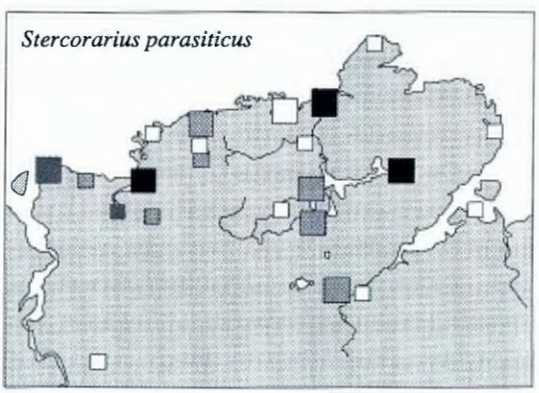
Arctic Skuas breed throughout all of Taimyr except in the North (ILYCHEV & ZUBAKIN 1990).

In 1989, single Arctic Skuas (up to four) were observed at several places (15 observations with a total of 28 birds). The observed birds were probably not breeding. Four birds belonged to the dark phase and four to the light phase, two were intermediate.

In 1990, the first Arctic Skua near Camp Lydia was seen on June 6. Later, Arctic Skuas



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

occurred regularly on the study plot at Camp Lydia, up to five birds were seen on June 20, 1990. One pair bred in a small mainland Brent Goose colony near the mouth of River Lydia. On July 20, one pair with one chick (weight 127g on July 21) was found in the delta of the River Taimyra, north of the known breeding range.

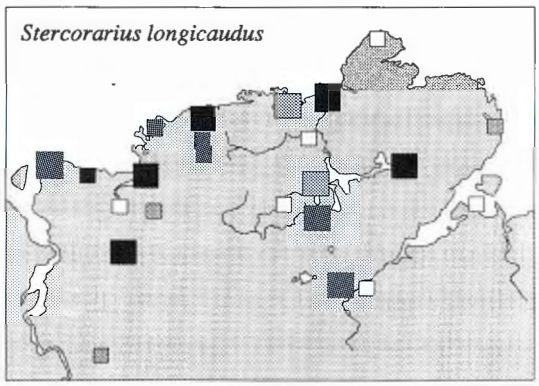
In 1991, as in the preceding years, Arctic Skuas were the least common skua. Territorial pairs were observed north of Dickson (one pair), and on the Pushkin Hill at the Pyasina River (two pairs). Additionally, seven non-territorial birds were encountered at different places.

We made some observations on the diet of Arctic Skuas. In 1989 an Arctic Skua was seen successfully hunting and eating a Lapland Bunting. In 1990 during a control of the Brent Goose colony at the mainland near Camp Lydia, the Skuas nesting in this colony robbed a Brent Goose nest with two eggs and probably another clutch, although the eggs had been completely covered by down. The victimised nests had been left unattended by the Brent Geese. In the colony, the local Arctic Skuas frequently chased single Brent Geese. We never observed, however, that the skuas attacked breeding females on the nests. A breeding Arctic Skua pair was seen taking small food items (probably Tipulidae) from the ground in flight for a period of at least 45 min.

Long-tailed Skua
Falkenraubmöwe
Stercorarius longicaudus

Long-tailed Skuas breed through all Taimyr (ILICHEV & ZUBAKIN 1990; ROGACHEVA 1992).

We saw Long-tailed Skuas at nearly all the areas we visited. Usually they were by far the most common skua species. In 1989, we observed up to 30 birds at Malaya Logata (on July 9), ten birds at Ary-Mas on July 8, more than 35 birds at Rysyukov on July 14, three birds near Ptitsy Lake on July 10, four birds on the River Schrenk on July 10, more than 20 birds in the delta of River Taimyra on July 24, and 41 birds on Shturmanov Peninsula on July 22. More than 50 birds were seen during the helicopter flight along the east coast of the Taimyr Peninsula. Except for one, all birds observed belonged to the light phase. During June and early July most birds occurred singly or in pairs. Later on, more flocks appeared (e.g. 36 birds at Shturmanov on July 22). In 1989 no indication of breeding was found with the exception of one bird obviously carrying nesting material and six birds showing courtship behaviour at Malaya Logata on June 30.



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

Table 17. Long-tailed Skua *Stercorarius longicaudus* nests found on Taimyr.
Tabelle 17. Daten zu Nestern der Falkenraubmöwe stercorarius longicaudus auf Taimyr.

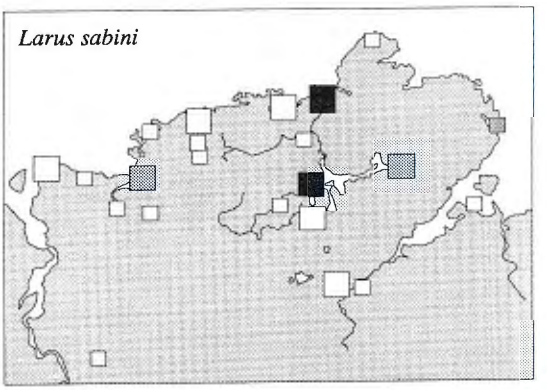
location *Ort*	**nest/brood found on** *Nest/Brut gefunden am*	**with (nest contents)** *mit (Nestinhalt)*	**clutch size** *Vollgelege*
Camp Lydia	29.6.1990	2 eggs	2 eggs
Sterlegova	18.7.1990	2 eggs	2 eggs
Taimyr Delta	20.7.1990	2 eggs	
Sterlegova	27.6.1991	1 egg	
Dickson	30.6.1991	2 eggs	

In 1990 at Camp Lydia, the first long-tailed Skua was observed on June 6; earlier than the arrival dates mentioned in DEMENTYEV & GLADKOV (1969). After June 8, large numbers of birds (up to 45 on June 16) were regularly seen flying over the study site at Camp Lydia as well as on "St. Joseph Island" near Camp Lydia and at the Spakeuna River. One pair bred near the camp. Three pairs were found in the enlarged study site of Sterlegova (19.8 km^2, see table 1). A nest found on July 18 had a full clutch of two eggs. The Skuas were often seen attacking passing large gulls. Four birds were seen at the Norilsk airport on July 7, 1990, two of them attacked a Rough-legged Buzzard.

Long-tailed Skuas were found breeding commonly in many places in 1991; six pairs at Sterlegova, five pairs at the Central Lenivaya River stop, six pairs at the southern stop at the Lenivaya River, two pairs on the Kolosovych Island, two pairs at the stop between the Pyasina delta and Dickson, three pairs north of Dickson, two pairs south of Dickson and one clutch at Stationar on the River Pura on July 10. In addition, single, probably non-breeding birds, were observed, including three adults on the Norilsk airport on July 4. For the details of the nests found in 1990 (four) and 1991 (two) see table 16.

The observations show that many Long-tailed Skuas bred in 1991, probably fewer did so in 1990 and very few, if any, nested in 1989. The number of breeding Skuas clearly tracked the lemming density, which reached a minimum in 1989 and peaked, at least in parts of Taimyr, in 1991.

Some observations of foraging Long-tailed Skuas show the wide range of food items utilised by this species on Taimyr. In 1989, several birds were seen feeding on frozen lemmings which appeared in the melting snow. Two Long-tailed Skuas together attempted cleptoparasitism of a Taimyr Lesser Black-backed Gull, and another bird tried to catch one-day old Little Stint chicks. In 1990 the adults of the pair breeding close to the camp at Sterlegova persistently fed on the reindeer meat of the expedition, although the meat was hidden in the snow. The Skuas preferred the reindeer meat over the fish which was also available at the same place. On July 23, 1990, a flock of 21 Long-tailed Skuas was seen feeding in the marshes of a small river near Camp Lydia. At least one of the birds took small food items (probably Tipulidae) from the ground in flight. In 1991 north of Dickson, a bird was observed eating a lemming.



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

Sabine's Gull
Schwalbenmöwe
Larus sabini

Different authors show different distribution maps for the Sabine's gull on Taimyr. DEMENTYEV & GLADKOV (1969) and YÉSOU (1991) mention breeding sites along the lower reaches of the River Taimyra. ILYCHEV & ZUBAKIN (1990) add sites around the mouth of the River Khatanga, and CRAMP & SIMMONS (1983) give only the Khatanga area as the breeding range on Taimyr. Breeding Sabine's Gulls have also been reported from the Bikada River near Taimyr Lake (ROGACHEVA 1992).

In 1989 we found a new breeding site. On July 14, a colony of four pairs was encountered on an island at the mouth of the Upper Taimyr River at Lake Taimyr. In addition, three birds were observed on the coast northeast of the delta of the River Taimyra on July 16, and one bird was noted in the eastern part of the delta on the same day. More than 30 birds were seen in the western part of the delta on July 24. Another four birds were seen on a flight along the east coast of Taimyr from Chelyuskin to Kosisty on July 25.

In 1990 we made several observations of single birds near Camp Lydia between June 16 and 21. A single bird was encountered on the River Spakeuna on July 21, 1990. A colony with at least fifteen adults and eleven chicks was found at a lake within the Taimyr delta marshes on July 11 (weights of three chicks: 60g, 75g, 55g). Another colony with at least 27 scattered nests

and at least 40 pulli was sighted on a small (ca. 0.5 km²) island within the delta of the River Taimyra on the same day.

Eastern Black-backed Gull
Östliche Heringsmöwe
Larus heuglini

The systematic status of the Herring Gull complex on Taimyr is in dispute. DEMENTYEV & GLADKOV (1969), ILYCHEV & ZUBAKIN (1990) and ROGACHEVA (1992) called them Herring Gulls (*Larus argentatus taimyrensis*); GLUTZ VON BLOTZHEIM & BAUER (1982) and CRAMP & SIMMONS (1983) considered them to be Lesser Black-backed Gulls (*Larus fuscus taimyrensis*), and STEPANYAN (1990) considered them to be *Larus heuglini heuglini* (Eastern Black-backed Gull). We cannot contribute new arguments to the systematic discussion. For reasons of simplicity we follow STEPANYAN.

Eastern Black-backed Gulls breed through all Taimyr (ILYCHEV & ZUBAKIN 1990, FILCHAGOV et al. 1992).

In 1989, we saw Eastern Black-backed Gulls at nearly all places we visited. Breeding was confirmed at Malaya Logata (a clutch found on July 9 and one pair with a chick on August 6 near to a pair of Glaucous Gulls), at Rysyukov (two clutches on July 14, one destroyed clutch found on July 26, 25-30 breeding pairs on a small island in Lake Taimyr), and on an island in the River Taimyra near the mouth of the River Schrenk (30 pairs). In the delta of the River Taimyra, more than 250 breeding pairs were observed on a small island. Many birds were present nearly everywhere on the northern and eastern coastline of Taimyr between Shturmanov and Kosisty (July 16 - 26).

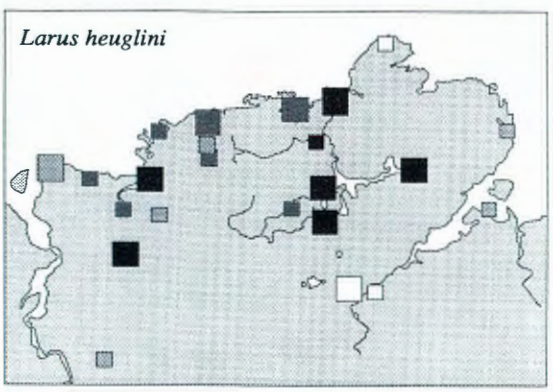
In 1990 large colonies of Eastern Black-backed Gulls were found on two offshore islands near Camp Lydia (473 and 282 breeding pairs on July 1). Many birds were also present on the mainland where up to 71 individuals were counted in the 4.48 km² study site on June 11. Eastern Black-backed Gulls were already present when we arrived on Taimyr. We saw about 200 birds during a helicopter flight between Dickson and Camp Lydia on June 1. In addition, five birds were seen at the Norilsk airport on July 7, 1990.

In 1991 alarming and attacking Eastern Black-backed Gulls were found at the following places; southern stop at River Lenivaya (two pairs), Sterlegova (one bird), island Kolosovych (one bird), Pushkin hill at the River Pyasina (one pair), at the stop between the River Pyasina and Dickson (five pairs) and at Stationar on the River Pura (twelve pairs on four small lakes, several pairs in a colony of Red-breasted Geese in the vicinity of a Pergrine eyrie). Further, 148 obviously non-breeding birds were observed at different places, most of them in a flock of 110 individuals including all age classes in the harbour of Dickson on June 24, 1991.

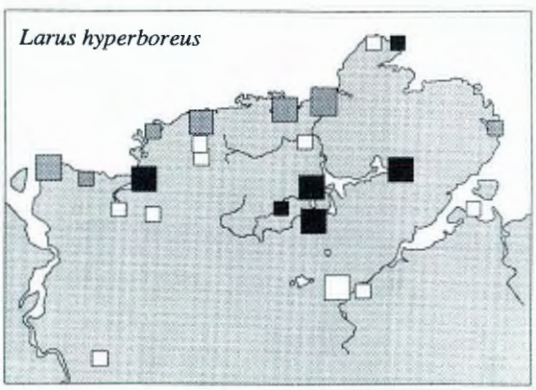
Glaucous Gull
Eismöwe
Larus hyperboreus

Glaucous Gulls breed through all Taimyr (ILYCHEV & ZUBAKIN 1990, ROGA-CHEVA 1992).

In 1989, we saw Glaucous Gulls at nearly all places visited. We collected the following breeding records; one pair at Malaya Logata on Au-



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

gust 5 and one pair with a chick on August 6, three breeding pairs (and 21 other birds) on 78 km of the River Logata (August 7 and 11), one pair (probably) breeding at Rysyukov, a breeding colony of ca 40 pairs on a small island in the western part of Taimyr Lake, five breeding pairs with eggs just hatching on a small island east of Cape Chelyuskin on July 25 and one pair on a small island at the delta of the River Taimyra on July 24.

In 1990 we recorded one breeding pair on "South Beacon Island" (near Camp Lydia) on July 1. Glaucous Gulls were already present at Dickson and at Camp Lydia when we arrived on June 1. In the study area of Camp Lydia we saw up to five birds.

In 1991, five Glaucous Gulls altogether, were seen at various places.

Ross's Gull
Rosenmöwe
Larus roseus

Four birds of this northeast Siberian species were encountered in Ary Mas on July 8, 1989.

Kittiwake
Dreizehenmöwe
Rissa tridactyla

We saw a colony of about 17,000 birds at the coast approximately 50 km southeast of Cape Chelyuskin on July 25. About 200 were encountered at sea, east of Cape Chelyuskin on the same day.

The breeding of Kittiwakes near Chelyuskin is as indicated by ROGACHEVA (1992).

Ivory Gull
Elfenbeinmöwe
Pagophila eburnea

In 1989 we saw at least twelve birds in Chelyuskin on July 16. No observations were made in 1990; but in 1991 one adult was seen near Sterlegova on June 25.

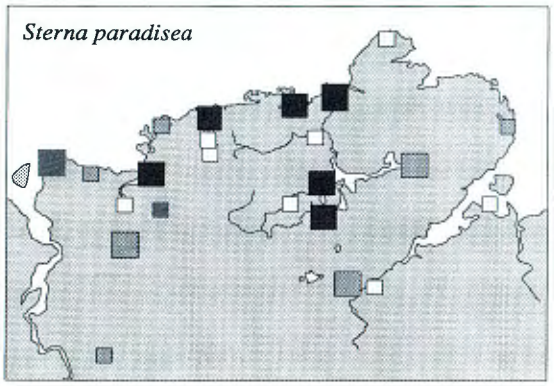
ROGACHEVA (1992) denies the existence of mainland colonies of Ivory Gulls on Taimyr.

Arctic Tern
Küstenseeschwalbe
Sterna paradisea

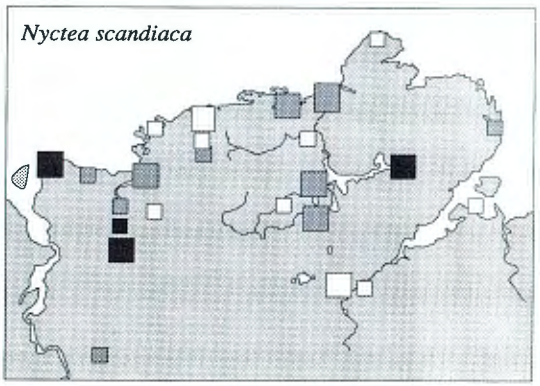
Arctic Terns commonly breed throughout all of Taimyr (ILYCHEV & ZUBAKIN 1990, ROGACHEVA 1992). We observed many Arctic Terns at nearly all areas we visited. In 1989, up to 20 birds were seen at Malaya Logata (July 9), up to ten birds at Ary Mas (July 7 and 8), up to 17 birds at Rysyukov (July 14) and up to fourteen birds at Shturmanov (19 July). Six Arctic Terns were encountered in the delta of the River Taimyra on July 27 and more than 100 birds were seen during a helicopter flight from Chelyuskin to Kosisty on July 25). For the details of the nests found see table 18. At Shturmanov several nest depressions which did not contain eggs were found in 1989.

Table 18. Arctic Tern *Sterna paradisea* nests found on Taimyr.
Tabelle 18. Daten zu Nestern der Küstenseeschwalbe Sterna paradisea auf Taimyr.

location *Ort*	**nest/brood found on** *Nest/Brut gefunden am*	**with (nest contents)** *mit (Nestinhalt)*	**remarks on nest site** *Bemerkungen zum Nistplatz*
Malaya Logata	9.7.1989	1 egg	
Rysjukov	14.7.1989	1 egg	small island
Rysjukov	14.7.1989	2 eggs	small island
Beacon Island (near Camp Lydia)	1.7.1990	1 egg	offshore island
Sterlegova	17.7.1990	1 egg	small gravel peninsula
Sterlegova	17.7.1990	2 eggs	small gravel peninsula
Sterlegova	17.7.1990	2 eggs	small gravel peninsula
Sterlegova	17.7.1990	2 eggs	small gravel peninsula
Sterlegova	17.7.1990	2 eggs	small gravel peninsula
Sterlegova	17.7.1990	2 eggs	small gravel peninsula
Sterlegova	17.7.1990	2 eggs	small gravel peninsula



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

In 1990, Arctic Terns were seen regularily near Camp Lydia (first observation on June 9, maximum: eleven birds on June 11). Eight birds migrating eastwards were seen on June 10. Two breeding pairs were found on "St. Joseph Island" (near Camp Lydia) in 1990. In Sterlegova, nests of Arctic Terns were found on small gravel peninsulas, for example six nests were found on a small peninsula checked on July 17.

Three Arctic Terns were observed taking small food items (probably Tipulidae) from the ground in flight near Camp Lydia on July 11 and 12, 1990.

In 1991, a colony of 25 (probably) breeding Arctic Terns was found north of Dickson on an offshore gravel island, on June 24. In Sterlegova up to ten birds were seen, but nests were not found. Single birds were also seen at other places, including the Norilsk airport. On June 28, 1991, Arctic Terns were observed taking insects from snow fields at Sterlegova.

Snowy Owl
Schnee-Eule
Nyctea scandiaca

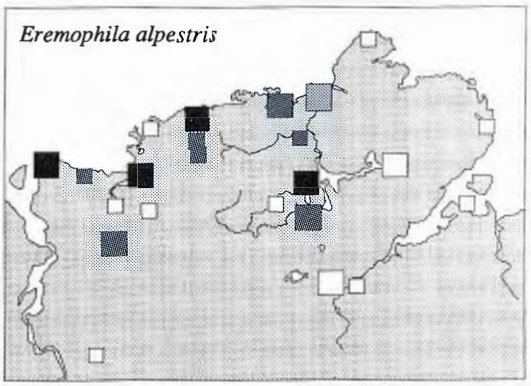
Snowy Owls breed through all Taimyr except in the central part of the peninsula (ROGACHEVA (1992) . In 1989 we found Snowy Owls to be abundant only along the coast from Chelyuskin to Kosisty (20 birds during a helicopter flight on July 25). Single birds were seen at Malaya Logata, at Rysyukov, at Shturmanov, and in the western part of the Taimyr delta. At Malaya Logata a female stayed from July 1 to 5 and a male from August 2 to 5. The birds often sat for hours on the same perch. Indications of breeding were not found in 1989.

In 1990 several birds (up to three) were observed near Camp Lydia and in the Taimyr delta (one bird on July 21). Again, signs of breeding were not found.

In 1991 several observations of Snowy Owls indicated a good breeding season. A nest containing ten eggs was found in the coastal hills north of Dickson. A control on July 2 revealed three hatchlings and a newly hatching egg. In addition to the breeding pair another adult was observed. The adults were under heavy attack by Pomarine Skuas. A nest with eight chicks of different sizes was found on the banks of River Bystraya on July 12. Eight breeding territories were found along 115 km of the lower reaches of the River Pura on July 15. Two nests, each with seven chicks, were situated not more than 2 km apart. One of the nests was close to a Peregrine eyrie. Further observations of Snowy Owls in 1991 showed, one bird at the stop between the River Pyasina and Dickson (attacked by Herring Gulls) and three birds on the flight from there to Dickson. Pellets were found on the Pushkin Hill at the Pyasina River and at the southern stop at the Lenivaya River. One adult was seen south of Norilsk on June 23.

Short-eared Owl
Sumpfohreule
Asio flammeus

One Short-eared Owl was seen near Camp Lydia on June 11, 1990. ROGACHEVA (1992) mentions breeding sites of the species in the delta of the Pyasina River. The northern border of the regular breeding range of Short-eared Owls is situated south of Taimyr (DEMENTYEV & GLADKOV 1966).



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

Shorelark
Ohrenlerche
Eremophila alpestris

ROGACHEVA (1992) assumes the northern limit of the breeding distribution of the Shorelark on Taimyr to be at 75 30' N with some exceptions along the lower Taimyra River.

In 1989 we found Shorelarks to be scarce at Malaya Logata, only two pairs (in 7 km^2) were observed between June 30 and July 3. Shorelarks were abundant on the cliffs of River Logata, where at least five pairs were seen on July 10. The species also bred commonly near Rysyukov (at least five breeding pairs in 14 km^2) and in the Byrranga Mountains (ten pairs seen on July 14, and eight pairs, including one with just fledged chicks, on July 30). Two pairs were seen at Ptitsy Lake and one bird near the River Schrenk, all on July 10. Shorelarks bred abundantly at the Shturmanov Peninsula (76 00' N) where six pairs (in 12 km^2) were counted on July 22.

In 1990 Shorelarks were found breeding commonly near Camp Lydia (density 6.7 pairs/km^2). Many Shorelarks were already present in the study site when we arrived, 100 birds on 3 June, for example. Near Sterlegova the Shorelark was the second most abundant passerine with a density of 0.5 pairs/km^2.

In 1991 we found breeding Shorelarks north of

Table 19. Shore Lark *Eremophila alpestris* nests found on Taimyr.
Tabelle 19. Daten zu Nestern der Ohrenlerche Eremophila alpestris auf Taimyr.

location *Ort*	**nest/brood found on** *Nest/Brut gefunden am*	**with (nest contents)** *mit (Nestinhalt)*	**clutch size** *Vollgelege*	**start of laying** *Legebeginn*	**hatching date** *Schlupfdatum*	**breeding success** *Schlupferfolg*	**remarks on nest site** *Bemerkungen zum Nistplatz*
Rysyukov	11.7.1989	4 eggs	4		ca July 20	chicks eaten by a dog	tundra ridge near the lake
Rysyukov	15.7.1989	1 egg, 3 chicks			ca July 10	robbed	tundra ridge
Lydia	13.6.1990	3 eggs	5	June 11	ca June 24	5 young, fledged on July 4	patchy tundra
Lydia	14.6.1990	3 eggs	5	June 12	ca June 24	4 young fledged on July 4	hummock sedge tundra on a coastal ridge
Lydia	20.6.1990	5 eggs				eggs robbed	patchy tundra
Lydia	29.6.1990	1 egg, 4 chicks			ca June 27		willow sedge tundra on a coastal ridge
Lydia	8.7.1990	4 eggs					dry grass tundra
Sterlegova	16.7.1990	3 fledged chicks					
Dickson	2.7.1991	1 chick					in an area covered by waste

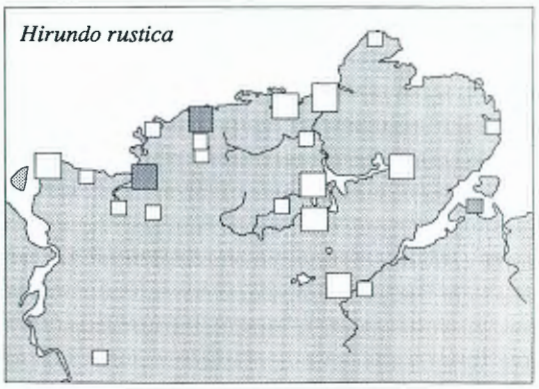
Dickson (ten birds observed here on June 24). Further observations of birds which most probably were breeding included five adults south of Dickson, one pair at the stop between Dickson and the River Pyasina, two adults at the southern stop at the River Lenivaya, two pairs at the central stop at the River Lenivaya and two pairs and one adult at Sterlegova. The species was seen at River Pura on July 10.

Shorelarks began breeding much earlier than all other bird species that we found on Taimyr. Egg laying in three clutches in 1990 started on June 11, 12 and 15 (see also table 19). In two nests the young hatched only ca. twelve days and ca. thirteen days, respectively, after the start of egg laying. If incubation started with the laying of the last egg, the incubation periods were no more than eight and nine days, respectively, much shorter than data given in the literature (GLUTZ von BLOTZHEIM & BAUER 1985; PÄTZHOLD 1987). With nestling periods of ten and eleven days the Shorelarks needed only 22 and 23 days to complete a nest cycle from the first egg to the fledging of the last young. Therefore, in theory, the Shorelarks had much time for renesting after the fledging of the first brood. The clutch found on July 8, 1990, could well have been a second clutch. *Eremophila alpestris flava* is assumed to be double-brooded in the more southern and more western parts of its breeding range (GLUTZ von BLOTZHEIM & BAUER 1985; PÄTZHOLD 1987). The extremely short breeding cycle may be an adaptation connected to this double-broodedness. It is very likely that Shorelarks are the only double-brooded bird species on Taimyr. The very late spring of 1989 probably prevented an early start of breeding in that year. The nests found in 1989 therefore presumably were late first or repeat clutches.

All nests we found were situated on ridges or slopes (see also ROGACHEVA 1992).

Barn Swallow
Rauchschwalbe
Hirundo rustica

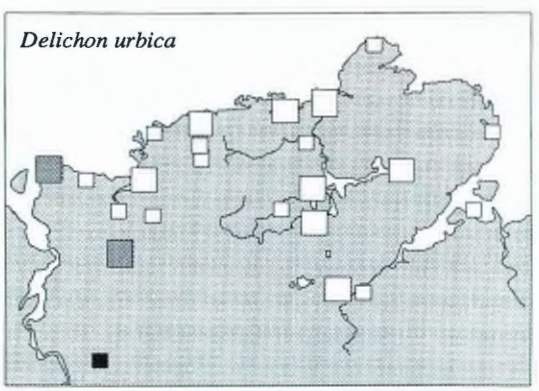
Barn Swallows breed only in the far south of Taimyr; but stragglers have been reported northward up to Chelyuskin (DEMENTYEV & GLADKOV 1968, ROGACHEVA 1992). We saw three birds in Kosisty on July 25, 1989. One bird was seen in Camp Lydia on June 11, 13 and 15, 1990. Victor GALETZKI (pers. comm.) found a dead Barn Swallow at his house in Sterlegova on May 28, 1991.



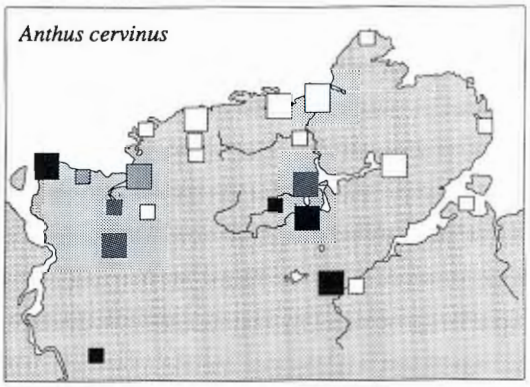
large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

House Martin
Mehlschwalbe
Delichon urbica

Three House Martins were seen at the Norlisk airport on July 26, 1990. One bird was observed in the town of Dickson on July 2, 1991. In Norilsk at the northern border of the species' breeding range (ROGACHEVA 1992), eight nests attended by adults were found in 1991. Altogether three second year birds and 19 other adults were seen there on June 24, 1991. One bird was encountered at Stationar on the River Pura on July 11 and 13, 1991.



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

Red-throated Pipit
Rotkehlpieper
Anthus cervinus

Red-throated Pipits breed throughout Taimyr except in the northernmost parts of the peninsula (ROGACHEVA 1992) .

We found Red-throated Pipits breeding abundantly in the southern part of the Taimyr Peninsula. In 1989 at Malaya Logata, three pairs were noted in the willow scrub on the banks of the river. A nest found with five eggs on July 4 was inundated the same day, on August 5, three pairs were seen feeding recently fledged chicks. Red-throated Pipits were also found breeding at the cliffs of the River Logata (three pairs, one of them feeding chicks on July 10) and at Ary Mas (two pairs and one nest were found on July 8). At Rysyukov, two singing males were observed on July 14 and 29.

In 1990, a singing male was seen near Camp Lydia on June 29. Two singing males and at least three pairs showing distress were recorded near the Norilsk airport on July 7.

In 1991, Red-troated Pipits were found breeding commonly near and in Dickson. Altogether nine adults were seen here on June 24 and on July 1 and 2. A nest containing five eggs was found on June 24. Two pairs were seen near the Pushkin Hill at the River Pyasina (June 30), and a single bird was observed on the same day between the River Pyasina and Dickson. Four birds including one carrying food were seen on the Norilsk airport on July 4, 1991. The species was seen at River Pura on July 10.

Yellow Wagtail
Schafstelze
Motacilla flava

Two pairs giving alarm calls were seen at the Norilsk airport on July 7, 1990. Five birds were seen at the same place on July 4, 1991. Norilsk is situated close to the northern border of the breeding range of Yellow Wagtails (ROGACHEVA 1992).

Citrine Wagtail
Zitronenstelze
Motacilla citreola

Citrine Wagtails breed in the southern and eastern parts of Taimyr (ROGACHEVA 1992). From August 6 to 11, 1989, up to two birds were seen associated with White Wagtails in the willow scrub along the River Malaya Logata. In 1990, two pairs fed hatchlings or fledglings at the Norilsk airport. One adult was recorded at the same place on July 7 and four fledglings were seen there on July 26, 1990. On July 7, 1991, an adult was seen again on the Norilsk airport.

Grey Wagtail
Gebirgsstelze
Motacilla cinerea

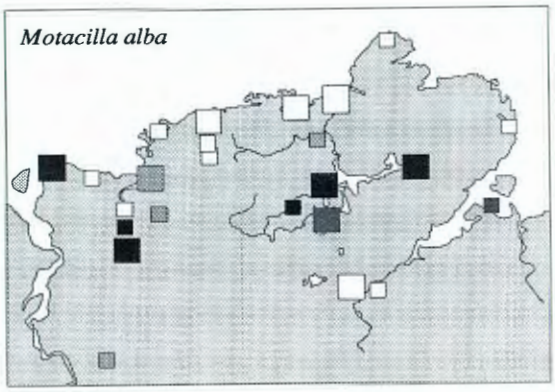
One pair was found on July 5, 1991, at a small river in a hilly area northeast of Norilsk. ROGACHEVA (1992) stated the species as rarely breeding "north right up to the arctic circle", that means further south than this record.

White Wagtail
Bachstelze
Motacilla alba

White Wagtails breed throughout all of Taimyr except the northern (coastal) parts (ROGACHEVA 1992). We found the species to occur commonly in the southern and central parts of Taimyr. In 1989 we saw White Wagtails at Malaya Logata (two pairs, one of them feeding young on August 2), at the cliffs of the Logata River (two pairs), at Ary-Mas (one bird on July 7 and 8), at Rysyukov (two pairs, one nest in the station building with a full clutch of five eggs on July 10), at Bikada (one nest in the station building), near the River Schrenk (two birds on July 10) and in Kosisty (more than five birds on July 25).

In 1990 up to three birds were observed at Camp Lydia.

On July 1, 1991, a fledgling was spotted in the harbour of Dickson near a sewage inlet. Altogether 3 adults were seen in Dickson on July 1



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

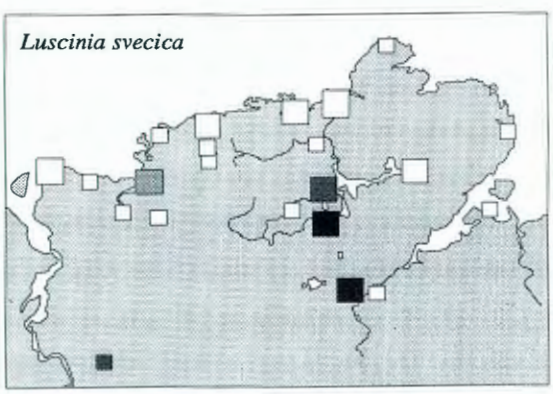
and 2. An adult White Wagtail was seen in Norilsk on June 24 and four, northeast of Norilsk, on July 5. A nest with chicks was found at Stationar on the River Pura on July 10 and 11, 1991.

Bluethroat
Blaukehlchen
Luscinia svecica svecica

Bluethroats breed on Taimyr north to the Byrranga Mountains (ROGACHEVA 1992).

In 1989 we found many Bluethroats in Malaya Logata (see table 2), in the Logata cliffs, and Ary-Mas (five singing males and a nest found on July 7). In addition, we noticed a singing male at Rysyukov on July 5 and 10. At Malaya Logata Bluethroats were found in the willow scrubs along the riverbanks. Some nests may have suffered from the high floods in early July.

Observations near Camp Lydia; one on June 10, 1990, and two on June 11, 1990. Two first-year birds were seen at the Norilsk airport on July 26, 1990.



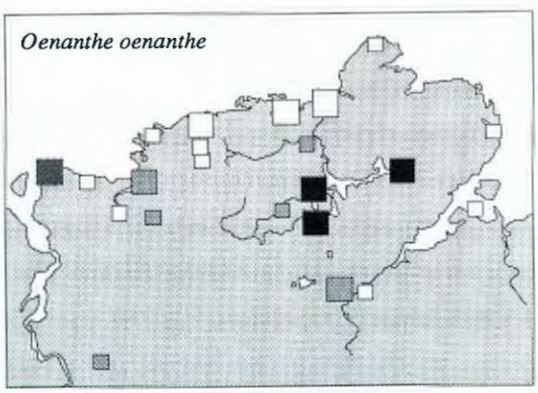
large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

Wheatear
Steinschmätzer
Oenanthe oenanthe

Wheatears breed regularly in the southern part of Taimyr and also, as new research has shown, north up to the polar deserts (ROGACHEVA 1992). In 1989 Wheatears bred at Malaya Logata (one pair), in the Logata cliffs (four birds on July 10) and at Rysyukov (two pairs). Observations of single birds were made at Ary-Mas (July 7) and at the River Shrenk (July 10). Nests were only found at Rysyukov (one with seven nestlings, five days old, on July 28, and one with five nestlings seven days old plus one egg on July 29) and Malaya Logata (one pair with fledged juveniles on August 6). The nests at Rysyukov were destroyed by a weasel and by dogs (of fishermen).

In 1990 single birds were spotted at Camp Lydia between 7 and 13 June.

On July 1, 1991 a pair was seen on a gravel field southeast of Dickson, and a female was observed at the Norilsk airport on July 4.



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

Naumann's Thrush
Naumanndrossel
Turdus naumanni

Three pairs were seen in the larch forests of Ary-Mas, a breeding site given in the literature

(ROGACHEVA 1992), on July 7, 1989. A nest was found in a larch the same day. Probably one bird of this species was seen on July 1, 1991, east of Dickson.

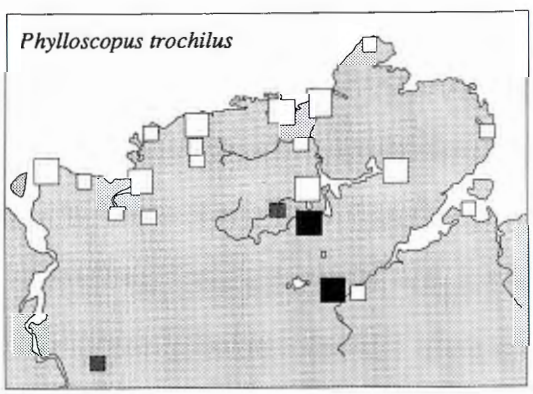
Arctic Warbler
Nordischer Laubsänger
Phylloscopus borealis

One Arctic Warbler was seen near Camp Lydia on June 10, 1990. Six singing birds were heard and seen in a Taiga area northeast of Norilsk on July 5, 1991. The species is known to breed in the southern part of the Taimyr Peninsula (ROGACHEVA 1992).

Willow Warbler
Fitis
Phylloscopus trochilus

ROGACHEVA (1992) mentions breeding sites of Willow Warblers as far north as 74 15' N on Taimyr. In 1989, we found Willow Warblers breeding at Ary-Mas (one clutch on July 7, more than six singing males) and at Malaya Logata (adults seen carrying food for the chicks on August 4 and 11, fledged young seen on August 12). At Malaya Logata and near the Logata cliffs, Willow Warblers bred in quite high densities (see table 2) in the willow belts along the rivers in the same habitat as Bluethroats and Redpolls. Some pairs may have lost their first clutches as a result of flooding.

One singing male was recorded on the Norilsk airport on July 4, 1991.



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

Hooded Crow
Nebelkrähe
Corvus corone cornix

One Hooded Crow was observed near Camp Lydia on June 7, 1990. Hooded Crows breed south of Taimyr, but have been reported from Taimyr several times (ROGACHEVA 1992).

Raven
Kolkrabe
Corvus corax

One Raven was observed at Ary-Mas on July 7 and 8, 1989. Two birds were seen at the Norilsk airport on July 7, 1990, one at the same place on July 26, 1990, and one northeast of Norilsk on July 5, 1991, all of them within the species' breeding range (ROGACHEVA 1992).

House Sparrow
Haussperling
Passer domesticus

In 1990 the hunter Victor GALETZKI reported that he had found House Sparrows quite frequently at his house or the Arctic Station in Sterlegova in recent years. Sterlegova is far north of the species' breeding range, but ROGACHEVA (1992) mentions observations near Dickson and in the delta of the River Pyasina.

Tree Sparrow
Feldsperling
Passer montanus

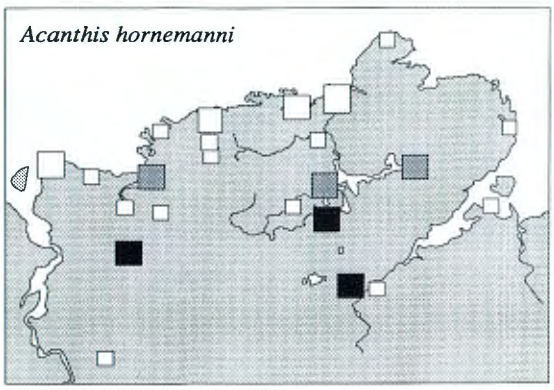
On July 4 and 5, 1989, one Tree Sparrow was seen at the buildings of the field station at Malaya Logata. The species is breeding in the southern part of the Taimyr Peninsula and a successful breeding attempt has been reported from Ust' Tareya (ROGACHEVA 1992).

Brambling
Bergfink
Fringilla montifringilla

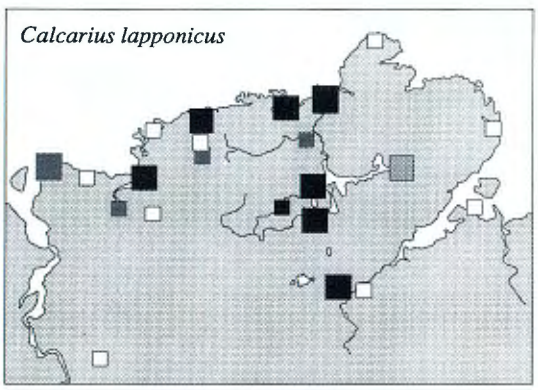
On July 5, 1991, two males were seen in the extreme northern Taiga northeast of Norilsk, just within the breeding range according to ROGACHEVA (1992).

Redpoll
Birkenzeisig
Acanthis flammea

Five Redpolls were observed in Dickson on June 24, 1991, and four birds were seen at the same place on July 2, 1991. Redpolls breed in



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

the southern part of Taimyr (ROGACHEVA 1992).

Arctic Redpoll
Polarbirkenzeisig
Acanthis hornemanni

We found Arctic Redpolls at several places within their breeding range (ROGACHEVA 1992) in the southern part of the Taimyr Peninsula. In 1989, three pairs were recorded in the willow scrub near the river banks at Malaya Logata on July 1. At Ary-Mas, fifteen pairs were encountered on July 7. One nest was found in the larch forest. At Rysyukov a bird which had obviously just died was found on July 15. Fledglings of Arctic Redpoll were noted at Malaya Logata on August 10.

In 1990 at Camp Lydia, eleven birds were seen migrating on June 6, and one bird was observed on June 10. Two further observations on "St. Joseph Island" near Camp Lydia: July 4 and 17, 1990.

A nest with 4-6 days old chicks was found at Stationar on the River Pura on July 10, 1991.

Lapland Bunting
Spornammer
Calcarius lapponicus

Lapland Buntings are breeding throughout all of Taimyr (ROGACHEVA 1992) .

We found Lapland Buntings breeding commonly at nearly all places we visited. In 1989, we saw more than eight singing males at Ary-Mas (July 7). At Malaya Logata at least 150 pairs nested on 7 km^2 (21.4 pairs/km^2), at Rysyukov at least 40 pairs bred on 14 km^2 (2.9 pairs/km^2), and at Shturmanov, we found only eight breeding pairs on 12 km^2 (0.7 pairs/km^2).

In 1990, we recorded breeding densities of 9.4 pairs/km^2 at Camp Lydia and 0.25 pairs/km^2 at Sterlegova. Like in 1989, the data suggest a trend of decreasing densities from the South to the North (see also table 1).

The observations of 1991 again show that Lapland Buntings are more common in the South than in the North of the Taimyr Peninsula. Around Dickson at least 17 pairs were found, only one bird, however, was seen at the coast 6 km north of Dickson. Further, ten pairs were found at the southern stop at the Lenivaya River, three pairs on the Pushkin Hill at the Pyasina River, and just one record in Sterlegova, a male on June 29.

In 1990, the first Lapland Bunting was seen at Camp Lydia on June 6, later than the arrival data cited in DEMENTYEV & GLADKOV (1970). By June 10, the majority of birds had arrived. Egg laying started on June 11 (J. KOKOREV pers. comm.). The mean size of full clutches was 5.0 eggs (SD=0.7 eggs, n=9). In 1989 fledglings were observed on July 26 and 29 (Rysyukov) and on August 2 - 5 (Malaya Logata). For further details of breeding biology see table 20. Moulting adults were seen on August 7 and 9 at Malaya Logata.

Snow Bunting
Schneeammer
Plectrophenax nivalis

DEMENTYEV & GLADKOV (1970) include all Taimyr in their map showing the Snow Bun-

Table 20. Lapland Bunting *Calcarius lapponicus* nests found on Taimyr.
Tabelle 20. Daten zu Nestern der Spornammer Calcarius lapponicus auf Taimyr.

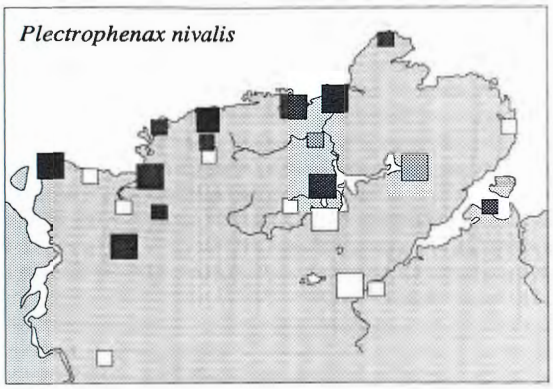
location *Ort*	**nest/brood found on** *Nest/Brut gefunden am*	**with (nest contents)** *mit (Nest-inhalt)*	**clutch size** *Voll-gelege*	**start of laying** *Lege-beginn*	**hatching date** *Schlupf-datum*	**remarks on nest site** *Bemerkungen zum Nistplatz*
Malaya Logata	1.7.1989	1 egg		July 1		under a birch
Malaya Logata	1.7.1989	4 eggs				on turf hummock
Malaya Logata	2.7.1989	5 eggs	6	June 28		
Malaya Logata	2.7.1989	5 eggs				
Malaya Logata	2.7.1989	4 eggs	4			in dry grass humock
Malaya Logata	2.7.1989	4 eggs	4			
Malaya Logata	3.7.1989	5 eggs				in dry grass
Malaya Logata	3.7.1989	5 eggs				on hummock under dry grass
Malaya Logata	3.7.1989	4 eggs				in dry grass
Malaya Logata	4.7.1989	4 eggs				
Malaya Logata	4.7.1989	5 eggs	5			
Malaya Logata	5.7.1989	4 eggs				in hummock
Malaya Logata	6.7.1989	6 eggs				in sedge hummock
Malaya Logata	9.7.1989	4 eggs				in grassy hummock
Malaya Logata	9.7.1989					
Malaya Logata	12.7.1989	5 eggs	5			in hummock
Rysyukov	12.7.1989	5 eggs	5			in hummock
Lydia	16.6.1990	4 eggs	5	June 13	ca June 29	hummock sedge tundra
Lydia	17.6.1990	1 egg	6	June 17		hummock sedge tundra
Lydia	25.6.1990	5 eggs	5		ca June 29	moss sedge tundra

ting's breeding range; ROGACHEVA (1992) is unsure about the breeding status in southern Taimyr.

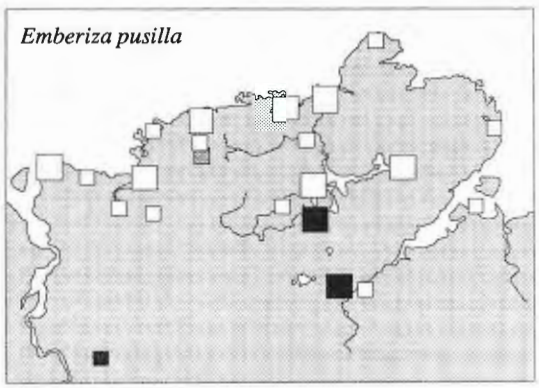
We found Snow Buntings only in the northern part of Taimyr, where they were breeding abundantly, especially near or on rocky outcrops or comparable habitat structures. In 1989, we saw one pair at Rysyukov on the stony bank of Lake Taimyr from July 10 to 15. Snow Buntings were abundant in the Byrranga Mountains (15 pairs seen on July 14). Six pairs were observed on the rocky banks of the River Schrenk on July 10. At Shturmanov about 20 pairs inhabited the stone fields of the peninsula (density for the whole study area, 1.7 pairs km^2); groups of four to six moulting Snow Buntings (altogether up to 24 birds on July 22) were noted at the same place. In the western part of the delta of the River Taimyra, some pairs and a non-breeding group of seven were seen on July 24, 1989. Snow Buntings were common at Chelyuskin and at Kosisty in 1989. A just fledged juvenile was seen near Kosisty on July 25, 1989.

In 1990, several pairs were found near Camp Lydia and on the adjacent offshore islands. Snow Buntings were already present in high numbers at Dickson and at Camp Lydia when we arrived on June 1, 1990. Up to 700 birds (on June 4) were seen feeding on the coastal ridge near Camp Lydia. During the first days of June the number decreased; 120 birds on June 6, 35 birds on June 7, 30 birds on June 8, and 25 birds on June 9. The birds clearly selected the spots of tundra which were free of snow near the coast before continuing their migration or before heading for inland breeding sites. Snow Buntings already arrive in mid April on Taimyr (DEMENTYEV & GLADKOV 1970).

Near Sterlegova, Snow Buntings were by far the most abundant passerines in 1990 with a density of 7.6 pairs/km^2 (see table 1). At some places, breeding pairs settled very densely (see



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found



large squares: visit of at least one day; small squares: short visit, less than one day; white: species not seen, light grey: species seen; dark grey: likely breeding; black: eggs or chicks found

table 21). All nest were well hidden. About half of the nests were not accessible to humans because they were placed deeply in piles of stones or wood. For details of the nests found see table 22. The first fledged Snow Buntings were seen on July 17.

In 1991, Snow Buntings were found breeding abundantly in many places. In Dickson they were found breeding under the roofs of houses. Four females carrying food were observed on June 24 and on July 1. Six pairs were found in the creek valley in the town. On a 6 km walk from Dickson to the coast on June 24, 27 Snow Buntings were encountered. Nine pairs were observed at the middle stop at the River Lenivaya, and 18 pairs were found on the Pushkin Hill at the River Pyasina. In Sterlegova at least 75 pairs were breeding, most of them near areas covered by gravel or on small rocky outcrops; single pairs even occupied the vegetated tundra. The species was seen at River Pura on July 10.

Table 21. Numbers of breeding pairs of Snow Bunting *Plectrophenax nivalis* in some rocky outcrops of different size (Sterlegova 1990).
Tabelle 21. Brutpaarzahlen von Schneeammern Plectrophenax nivalis in einigen Felsflächen unterschiedlicher Größe (Sterlegova 1990).

size of the rocky outcrop *Größe der Felsfläche*	**number of breeding pairs** *Zahl der Brutpaare*
1.2 ha	4
0.25 ha	2
0.28 ha	1
0.05 ha	1

Little Bunting
Zwergammer
Emberiza pusilla

Little Buntings were common at Ary-Mas where some territorial birds were found on July 7, 1989 (one nest with four eggs). On August 7 to 11, one pair fed fledglings near the field station at Malaya Logata in the willow scrub along the river banks. Six breeding pairs were seen at the Norilsk airport on July 26, 1990. One male was seen on the southern stop at the River Lenivaya in willow scrub on June 25, 1991. All these observations were well within the known breeding range of the species (ROGACHEVA 1992).

Summary

This paper reports details of the ornithological studies carried out during three expeditions to various places (see figure 1) on the Taimyr peninsula, Northern Siberia, in the years 1989, 1990, and 1991. The main results concern the distribution of the species (given in the text or on maps), the density of breeding birds (see tables 1 and 2), aspects of the breeding biology (especially *Anser albifrons, Pluvialis squatarola, Calidris canutus, Calidris minuta, Calidris ferruginea*), the arrival and the spring migration of birds on Taimyr (see figures 2 to 5). The biometrical data of the adult birds caught during the expeditions are given in appendix 1. The main results of the research on White-fronted Geese and Brent Geese are detailed in separate chapters of this report.

Обобщение

Данные об орнитологической фауне, собранные во время WWF-экспедиций на Таймыр в 1989, 1990 и 1991 годах.

В этой главе представлены подробности орнитологических исследований во время 3-х экспедиций в различные районы (см. иллюстр. 1) полуострова Таймыр в Северной Сибири, в 1989, 1990 и 1991 гг. Самые значительные результаты представлены по распространению видов птиц (в тексте и на картах), по плотности обитания гнездующихся птиц (см. Таб. 1 и 2), по аспектам биологии гнездования (прежде всего *Anser albifrons, Pluvialis squatarola, Calidris canutus, Calidris minuta, Calidris ferruginea)* и по прилёту и весеннему пути птиц на Таймыр (иллюстр. 2-5). Биометрические данные во время экспедиций отловленных "старых" птиц перечислены в приложении 1 этой части. Самые значительные результаты исследований по белолобым гусям и чёрным казаркам приводятся в отдельных главах этой части.

Zusammenfassung

In diesem Kapitel werden Einzelheiten der ornithologischen Untersuchungen während dreier Expeditionen zu verschiedenen Orten (siehe Abbildung 1) der Taimyr-Halbinsel, Nordsibirien, in den Jahren 1989, 1990 und 1991 vorgestellt. Die wichtigsten Ergebnisse beziehen sich auf die Verbreitung der Vogelarten (dargestellt im Text oder auf Karten), auf die Siedlungsdichte der Brutvögel (siehe Tabellen 1 und 2), auf Aspekte der Brutbiologie (vor allem von *Anser albifrons, Pluvialis squatarola, Calidris canutus, Calidris minuta* und *Calidris ferruginea*) und auf Ankunft und Frühjahrszug der Vögel auf Taimyr (Abbildungen 2 bis 5). Die biometrischen Daten der während der Expeditionen gefangenen Altvögel sind in Anhang 1 dieses Berichtes angeführt. Die wichtigsten Untersuchungsergebnisse für Bläß- und Ringelgänse finden sich in separaten Kapiteln in diesem Bericht.

References

BEINTEMA, A.J. & G.H. VISSER (1989): Growth parameters in chicks of Charadriiform birds. Ardea 77: 169-180.

BOERE, G.C. (1976): The significance of the Dutch Waddenzee in the annual life cycle of arctic, subarctic and boreal waders. Part 1. The function as a moulting area. Ardea 64: 210-291.

BORZHONOV, B.B. (1974): On the factors influencing the intensity of reproduction of geese in Taimyr. In: Biological problems of the North, part 1. Yakutsk. (cited from ROGACHEVA 1992).

BORZHONOV, B.B. & A.A. VINOKUROV (1984): The Pyasina delta in Taimyr as a mass moulting site of geese. In: Present state of waterfowl resources. Moscow. (cited from ROGACHEVA 1992).

BRANSON, N.J.B.A. & C.D.T. MINTON (1976): Moult, measurements and migrations of the Grey Plover. Bird Study 23: 257-266.

CRAMP, S. & K.E.L. SIMMONS (1977, 1980, 1983, 1986, 1991): Handbook of the Birds of Europe the Middle East and North Africa. Vols. I, II, III, IV, V. Oxford University Press, Oxford.

DEMENTYEV, G.P. & N.A. GLADKOV (1966-1970): Birds of the Soviet Union. Vol. I. (1966), Vol. III (1969), Vol. IV (1967), Vol. V (1970), Vol. VI (1968). Israel Program for Scientific Translations, Jerusalem.

BERGMANN; H.-H:, B.S. EBBINGE, B.. SPAANS & M. STOCK (1995): Synethie bei Ringelganspartnern (Branta b. bernicla) im Überwinterungs- und Brutgebiet. Corax 16, Sonderheft: 137-142.

FILCHAGOV, A.V., P. YÉSOU & V.I. GRABOVSKY (1992): Le Goéland du Taimyr Larus heuglini taimyrensis: répartition et biologie estivales. L'Oiseau et R.F.O. 1992: 128-148.

GAVRILOV (1995): Sommer-Vogelbestände der Waldgebiete bei Ary-Mas/ Ost-Taimyr. Corax 16, Sonderheft: 90-97.

GINN, H.B. & D.S. MELVILLE (1983): Moult in Birds. BTO, Tring.

GLUTZ von BLOTZHEIM, U.N., K.M. BAUER & E. BEZZEL (1975, 1977): Handbuch der Vögel Mitteleuropas. Vol. 6, Vol. 7. Akademische Verlagsgesellschaft, Wiesbaden.

GLUTZ von BLOTZHEIM, U.N. & K.M. BAUER (1982): Handbuch der Vögel Mittel-europas. Band 8/I. Akademische Verlagsgesellschaft, Wiesbaden.

GLUTZ von BLOTZHEIM, U.N. & K.M. BAUER (1988): Handbuch der Vögel Mittel-europas. Band 10/I. Aula, Wiesbaden.

HILDÉN, O. (1978): Småsnäppans förekomst och häckningsbiologi i Norge. Anser, Suppl. 3: 96-100.

HILDÉN, O. (1988): Zur Brutbiologie des Zwergstrandläufers, *Calidris minuta*, in Finnmark. Vogelkundliches Tagebuch Schleswig-Holstein 16: 245-265.

HUSSEL, D.J.T. & G.W. PAGE (1976): Observations on the breeding biology of Black-bellied Plovers on Devon Island, N.W.T., Canada. Wilson Bulletin 88: 632-653.

ILICEV, V.D. & V.E. FLINT (1985): Handbuch der Vögel der Sowjetunion. Band 1. Ziemsen, Wittenberg.

ILICEV, V.D. & V.E. FLINT (1989): Handbuch der Vögel der Sowjetunion. Band 4. Ziemsen, Wittenberg.

ILICEV, V.D. & V.A. ZUBAKIN (1990): Handbuch der Vögel der Sowjetunion. Band 6/Teil 1. Ziemsen, Wittenberg.

KANIA, W. (1990): The primary moult of breeding Dunlins *Calidris alpina* in the central Taymyr in 1989. Wader Study Group Bulletin 60: 17-19.

KOKOREV (1995): Zur Bestandsituation des Wan-

derfalken (*Falco peregrinus*), der Rothalsgans (*Branta ruficollis*) und des Zwergschwanes (*Cygnus bewickii*) auf Taimyr. Corax 16, Sonderheft: 98-107.

KOZLOVA, E.V. (1957): Inter-relationship of the periods of seasonal migrations with the periods of moulting in Palaearctic Charadriiformes. Trans. 2nd Baltic Ornith. Conference, 153-158.

KRETCHMAR, A.V. (1966): Birds of western Taymyr. Annals of the Zoological Institute, USSR Acad. Sci.: vol 39, Biology of birds. Nauka Pub., Leningrad. (cited from ROGACHEVA 1992).

MARTYNOV, A.S. (1983): Waterfowl of the Krasnoyarsk Territory: an essay of a cadaster evaluation. Biol. Doct. Thes., Moscow. (cited from ROGACHEVA 1992).

MAYFIELD, H.F. (1975): Suggestions for calculating nest success. Wilson Bulletin 87: 456-466.

MIDDENDORFF, A.T. (1851): Sibirische Reise. Bd. 2. Säugethiere, Vögel und Amphibien. St. Petersburg.

MOOIJ, J. H. (1995): Rückmeldungen und biometrische Daten von auf Taimyr gefangenen Bläßgänsen (*Anser albifrons albifrons*). Corax 16, Sonderheft: 160-168.

PÄTZHOLD, R. (1987): Die Ohrenlerche. Ziemsen, Wittenberg.

PORTENKO, L.A. (1959): Studien an einigen seltenen Limicolen aus dem nördlichen und östlichen Sibirien II. Der Sichelstrandläufer - *Erolia ferruginea* (Pontopp.). Journal f. Ornithologie, 100: 141-172.

PROKOSCH, P. (1995): Mauser,Gewicht und Ringfunde von Ringelgänsen (Branta bernicla bernicla) auf Taimyr. Corax 16, Sonderheft: 108-131.

ROGACHEVA, E.V. (1992): The Birds of Central Siberia. Husum Druck, Husum.

ROGACHEVA, E.V. (ed.,1994): Arctic Tundras of Taimyr and Kara Sea Islands: Nature, Fauna and Conservation Problems. Russian Academy of Sciences, Moscow.

RYABITSEV, V.K. & N.S. ALEKSEEVA (1992): Nesting density dynamics and site tenacity in waders of the middle and northern Yamal. Wader Study Group Bulletin 65: 17.

SMART, M. (ed.) (1979): Proc. First Techn. Meeting on Western Palearctic Migratory Bird Management. IWRB, Slimbridge.

SPILLING, E. & M. STOCK (1995): Die Nahrung Dunkelbäuchiger Ringelgänse (Branta bernicla bernicla) im Brutgebiet auf der Taimyr Halbinsel: erste Ergebnisse. Corax 16, Sonderheft: 132-136.

STEPANYAN, L.S. (1990): Conspectus of the USSR avifauna. Nauka Pub., Moscow.

SVENSSON, L. (1984): Identification Guide to European Passerines. BTO, Tring.

TOMKOVICH, P.S. (1988): Breeding relations and partners role in care for nestlings in curlew sandpiper. In ANDREEV, A.V. & A.Ya. KONDRATYEV (eds.): Studies and Protection of Birds in Northern Ecosystems. Institute of Biological Problems of the North. Vladivostok: Far Eastern Branch, USSR Acedemy of Sciences.

VINOKUROV, A.A. (1982): Present status of *Branta rufficollis*: population status and measures for its conservation. Aquila 89: 115-122.

YÉSOU, P. (1991): Reproduction de la Mouette de Sabine *Larus sabini* dans l'estuaire de la Taimyra, Sibérie. L'Oiseau et R.F.O. 61: 142-148.

YÉSOU, P. & H.G. LAPPO (1992): Nidification de l'Eider der Steller *Polysticta stelleri* du Taimyr à la péninsule de Yamal, Sibérie. Alauda 60: 193-198.

Appendix

Biometrical and moult data auf birds caught on Taimyr in 1989, 1990 and 1991

ring	date	region	sex	age	wing	bill	total head	foot	tarsus	weight	primary moult score
					mm	*mm*	*mm*	*mm*	*mm*	*g*	
Lagopus mutus											
bird shot	12.7.1989	Rysyukov	m	4	199	18,2	53,2	64		460	
bird shot	12.7.1989	Rysyukov	m	4	211	17.2	53	65		480	
bird shot	12.7.1989	Rysyukov	m	4	192	17,7	54,3	67		470	
bird shot	12.7.1989	Rysyukov	m	4	208	18,1	53,5	66		500	
5295701	12.6.1990	Camp Lydia	f	4	195	11	49	35		524	
Charadrius hiaticula											
81116305	27.6.1990	Camp Lydia	f	4	134	13	39,4	45	24,5	59	
81116306	27.6.1990	Camp Lydia	m	4	130	14	39,8	48	26,9	59	
Pluvialis fulva											
6325101	7.7.1989	Malaya Logata	f	4	163	23	55,7	73	42,2	122	
6325108	24.7.1989	Taimyr Delta	f	4	165	24	59,7	80		158	
6326002	19.6.1990	Camp Lydia	f	4	168	22	56,5	72	42,1	151	
6326005	27.6.1990	Camp Lydia	f		165	23	56	73	45,9	143	
Pluvialis squatarola											
6325102	7.7.1989	Ary-Mas	f	6	195	27	64,7	76	45,1	202	
6325103	15.7.1989	Rysyukov	f	6	211	28	68,5	85		238	
6325104	15.7.1989	Rysyukov	f	6	213	30	69,5	83	49	225	
6324901	20.7.1989	Shturmanov	m	6	196	29	69	88		225	1000000000
6325105	20.7.1989	Shturmanov	m	6	205	29	69,9	82	48,1	220	4200000000
6325106	20.7.1989	Shturmanov	m	6	199	29	69,8	84	49,4	212	
6324902	21.7.1989	Shturmanov	f	6	208	28	68,7	86		235	
6324903	21.7.1989	Rysyukov	f	6	202	29	70,2	92		220	2200000000
6326001	19.6.1990	Lydia	m	6	206	30	69,6	87	51,4	237	
6326003	21.6.1990	Lydia	f	6	209	29	66,9	81	49	235	
6326004	27.6.1990	Lydia	m	6	210	28	68,5	86	51	231	
6326006	28.6.1990	Lydia	m	6	207	29	69,9	84	50	229	
6325201	8.7.1990	Sterlegova	f	6	203	28	66,7	79		226	
6325202	8.7.1990	Sterlegova	m	6	226	32	70,8	80		247	
6325203	9.7.1990	Sterlegova	f	6	206	30	69,3	81		236	
6325204	11.7.1990	Sterlegova	f	6	204	30	69,1	82		253	
6325207	12.7.1990	Sterlegova	m	6	208	30	70,5	84		231	
6325251	14.7.1990	Sterlegova	f	6	204	31	72,5	88			
6325210	15.7.1990	Sterlegova	f	6	208	31	71,6	87		249	
6325253	15.7.1990	Sterlegova	f	6	201	31	65,5	82		234	
6325259	15.7.1990	Sterlegova	m	6	205	31	70,1	83		207	1300000000
6325260	15.7.1990	Sterlegova	f	6	209	29	66,6	85			
6325261	15.7.1990	Sterlegova	m	6	200	31	70,4	86		227	3200000000
6325215	16.7.1990	Sterlegova	f	6	209	31	70,6	85		217	

ring	date	region	sex	age	wing	bill	total head	foot	tarsus	weight	primary moult score
					mm	*mm*	*mm*	*mm*	*mm*	*g*	
Calidris canutus											
7698101	19.7.1989	Shturmanov	f	4	169	32,7	63,3	63		120	
7698501	7.7.1990	Sterlegova	m	6	169	35,1	65,1	58		141	
7698503	8.7.1990	Sterlegova	f	6	176	37,1	66,7	61		151	
7698504	8.7.1990	Sterlegova		6	174	35,9	65,4	59		132	
7698505	10.7.1990	Sterlegova		6	169	30,8	62,1	59		145	
7698510	11.7.1990	Sterlegova		6	167	33,5	62,7	58		121	
7698504	14.7.1990	Sterlegova			176	36,2	65,5	60		132	
7698533	17.7.1990	Sterlegova	m	6		36,1	65,3	59		136	
7697306	27.6.1991	Sterlegova	f	6	174	36,6	66,7	61		147	
7697301	27.6.1991	Sterlegova	f	6	163	35,1				148	
7697302	27.6.1991	Sterlegova	m	6	168	33,3	63,9	60		140	
7697303	27.6.1991	Sterlegova	f	6	173	35,5	65,7	60		167	
7697304	27.6.1991	Sterlegova	m	6	167	36	65,3	57		140	
7697307	27.6.1991	Sterlegova	f	6	162	33,6	64,3	62		128	
7697308	28.6.1991	Sterlegova	f	6	177	33,5		58		142	
7697309	28.6.1991	Sterlegova	m?	6	167	33,3	63,4	57		125	
7697310	29.6.1991	Sterlegova	f	6	167	34,4	64,6	56		145	
7697311	29.6.1991	Sterlegova	m	6	170	34,6	66	59		129	
7698505	29.6.1991	Sterlegova	m	6	167	30	62,1	58		145	
7697312	30.6.1991	Sterlegova	f	6	168	34,4	62,9	56		135	
Calidris alba											
81251501	11.7.1990	Sterlegova	f	4	131	26	526	46		66	
81431301	28.6.1991	Sterlegova		6	126	22	48	43		61	
Calidris minuta											
9k82401	1.7.1989	Malaya Logata		4	96	18,3	39,4	40		28,5	
9k82301	2.7.1989	Malaya Logata		4	102	22,3	39,3			28	
KJ95101	3.7.1989	Malaya Logata		4	96	17	38,3	39		24	
9k82302	4.7.1989	Malaya Logata		4	96	16,6	37,2			28	
9k82303	4.7.1989	Malaya Logata	m?	4	98	18	39,2			29	
9k82304	4.7.1989	Malaya Logata		4	94	18,1	37,8			25	
9k82402	7.7.1989	Malaya Logata		4	96	18,1	39,6	40		25	
9k82403	7.7.1989	Malaya Logata	f?	4	100	18,6	39,1	40		29	
9k82305	9.7.1989	Malaya Logata		4	109	18,8	39,6	44		29	
9k82404	12.7.1989	Rysyukov	m?	4	97	17,6	38,2	39	21,1	24,3	
9k82405	12.7.1989	Rysyukov	f?	4	101	20,7	41,7	43	24	28,2	
9k82406	12.7.1989	Rysyukov	f?	4	101	19,7	40,5	40	22,2	28,4	
KJ95103	12.7.1989	Malaya Logata	f	4	100	18	38,5	40		25	
9k82407	13.7.1989	Rysyukov	f?	4	102	17,7	38,5	38	21,2	29,1	
9k82408	13.7.1989	Rysyukov	m?	4	95	17,5	38	39	20	22,3	
9k82306	14.7.1989	Rysyukov	m?	4	96	18,4	39,4	47		27	
9k82307	14.7.1989	Rysyukov	m?	4	94	16,1	38,1	43		26	
KJ95106	15.7.1989	Malaya Logata		4	98	18	39,1	38		28	
9k82409	19.7.1989	Shturmanov	f?	4	100	18,3	38,8	40		24,5	
KJ95129	20.7.1989	Malaya Logata	f	4	99	18	38,7	38		27	
KJ95131	20.7.1989	Malaya Logata	f	4	102	18	38,5	39		27	
9F46701	11.6.1990	Camp Lydia	f?	4	97	17	38,4	40	22	24,5	
9F46702	19.6.1990	Camp Lydia		5	97	17,6	37,5	39	21,6	29,5	
9F46703	21.6.1990	Camp Lydia			99	18,2	39	40	21,2	25,8	
9F46704	23.6.1990	Camp Lydia	f	4	99	18,6	39,4	39	21,6	32,5	
9F46705	27.6.1990	Camp Lydia			96	18,2	38,9	41	22,6	29,7	

ring	date	region	sex	age	wing	bill	total head	foot	tarsus	weight	primary moult score
					mm	*mm*	*mm*	*mm*	*mm*	*g*	
Calidris minuta continued											
9F46706	28.6.1990	Camp Lydia			100	18,5	38,5	40	22	29,3	
9F46707	28.6.1990	Camp Lydia			101	17,5	38,9	42	23	30,3	
9F46708	29.6.1990	Camp Lydia			98	18,3	39,1	38	21,5	26	
9F46709	29.6.1990	Camp Lydia			95	17,1	38,2	40	21,5	28,3	
9F46710	29.6.1990	Camp Lydia	f		103	17,5	38,3	41	22,2	37,3*	
9F46711	30.6.1990	Camp Lydia			99	18,8	39,7	41	22	27,6	
9F46712	30.6.1990	Camp Lydia			98	17	37,1	38	20,8	28	
9F46713	30.6.1990	Camp Lydia			103	17,6	38,5	39	21,6	28,5	
9F46714	2.7.1990	Camp Lydia			101	17,9	39,4	41	22,4	31,4	
9F46715	2.7.1990	Camp Lydia	f	5	102	18,8	40,2	41	22,5	30,2	
9F46716	2.7.1990	Camp Lydia			102	18,7	40,3	40	21,8	30,6	
9F46717	2.7.1990	Camp Lydia			101	19,4	39,6	40	22	27	
9F46718	3.7.1990	Camp Lydia			104	19,6	41,4	43	24	32,8	
9F46720	7.7.1990	Camp Lydia		4	100	20,3	42	41		29	
9F46721	7.7.1990	Camp Lydia		4	100	17,1	37,4	44		30	
9F46722	7.7.1990	Camp Lydia		4	96	16,8	36,5	39		27	1000000000
9K.82422	7.7.1990	Sterlegova	m	4	86	17,6	37,4	40		29	4200000000
9F46723	8.7.1990	Camp Lydia		4	99	20	40,4	44		30	
9F46724	8.7.1990	Camp Lydia		4	104	18,7	39,5	43		31	
9F46725	8.7.1990	Camp Lydia		4	101	19,1	40,2	41		31	2200000000
9F46726	9.7.1990	Camp Lydia		4	101	19,4	44,8	41		35	
9F46727	9.7.1990	Camp Lydia		4	102	18,7	39,4	40	25,5	32	
9F46732	9.7.1990	Camp Lydia		4	96	18	39,2	41	24	29,5	
9K.82423	9.7.1990	Sterlegova		4	98	17,9	38,8	40		30	
9F46733	10.7.1990	Camp Lydia		4	96	17,9	38,5	39	23,3	25	
9K.82424	10.7.1990	Sterlegova	f	4	103	18,8	40,1	41		310	
9K.82425	10.7.1990	Sterlegova	m	4	100	18,2	38,8	41		285	
9K.82426	10.7.1990	Sterlegova	m	4	101	19,1	39,3	40			
9F46734	11.7.1990	Camp Lydia		4	99	18,1	38,7	40	24	28	
9F46735	11.7.1990	Camp Lydia		4	100	17,1	37,2	40		25	
9F46736	11.7.1990	Camp Lydia		4	99	18	38,8	42	25,2	25,5	
9F46737	11.7.1990	Camp Lydia		4	95	17,7	38,1	40	23,5	26	
9F46738	11.7.1990	Camp Lydia		4	100	18,3	38,4	41	25,1	28,5	1300000000
9K.82427	11.7.1990	Sterlegova		4	98	18,3	38,8	42		280	
9F46739	12.7.1990	Camp Lydia		4	101	18,1	39,1	40		28,5	3200000000
9F46740	12.7.1990	Camp Lydia		4	95	17,8	38,8	41	23,3	29,5	
9F46741	12.7.1990	Camp Lydia		4	99	17,7	39	42	24,1	34	
9F46742	12.7.1990	Camp Lydia		4	96	18,3	39,1	41	24	30,5	
9F46743	12.7.1990	Camp Lydia		4	101	17,7	39,6	42	26,6	37,5	
9K.82428	12.7.1990	Sterlegova	f	4	101	18,6	39,6	40		30,1	
9K.82429	13.7.1990	Sterlegova	m	4	101	18,3	39,3	41		29,2	
9F46744	14.7.1990	Camp Lydia		4	96	17,8	38,3	42	24,2	30	
9K.82430	14.7.1990	Sterlegova		4	114	19,2	40,7	42		28	
9K.82431	14.7.1990	Sterlegova	m	4	100	18,1	38,8	41		29	
9K.82432	15.7.1990	Sterlegova	m	4	107	19,1	41,1	42		34	
9K.82451	15.7.1990	Sterlegova	f	4	104	19,3	38,8	40		27	
9F46753	16.7.1990	Camp Lydia		4	99	17,6	38,3	42		32	
9F46754	16.7.1990	Camp Lydia		4	100	17,3	38,1	41	22,5	33	
9F46764	17.7.1990	Camp Lydia		4	102	19,1	40	41	24,8	31	
9K.82433	17.7.1990	Sterlegova	m	4	97	17,9	38,5	40		29	
9K.82434	17.7.1990	Sterlegova	m	4	98	17,6	38,3	39			

ring	date	region	sex	age	wing	bill	total head	foot	tarsus	weight	primary moult score
					mm	*mm*	*mm*	*mm*	*mm*	*g*	
Calidris minuta continued											
9K.82435	17.7.1990	Sterlegova	f	4	105	19,5	40,8	41			
9F46773	18.7.1990	Camp Lydia		4	95	17,6	35,5	39		30,5	
9F46778	18.7.1990	Camp Lydia		4	102	18,6	39,2	42		28,5	
9F46783	18.7.1990	Camp Lydia		4	96	17,8	37,9	41		27	
9K.82424	18.7.1990	Sterlegova		4						31,9	
9K.82436	18.7.1990	Sterlegova	f	4	103	19,1	40,3	39		27,4	
9K.82452	18.7.1990	Sterlegova	f	4	98	17,6	38,9	39			
9K82356	19.7.1990	Camp Lydia		4	101	20	40.7	44		34	
9K82357	19.7.1990	Camp Lydia		4	100	18,7	38,9	40		33	
9K82358	19.7.1990	Camp Lydia		4	97	16,7	36,6	38		31	
9F46764	21.7.1990	Camp Lydia		4						30	
9K82398	21.7.1990	Camp Lydia		4						28	
9F46613	22.7.1990	Camp Lydia		4	96	17.9	38,1	38		31	
9F46638	23.7.1990	Camp Lydia		4	102	17,9	37,7	41		30	
9K.82471	25.7.1990	Pyasina delta		4	100	17,5	38	39			
Calidris temminckii											
9F46719	5.7.1990	Camp Lydia		4	106	18	39,6	37	19.6	30,5	
Calidris ferruginea											
81310602	5.7.1989	Malaya Logata	f	5	136	40	64,8	56	31,9	69	
81116303	19.6.1990	Camp Lydia	f	4	132	40	65,3	56	31,5	65	
81116304	27.6.1990	Camp Lydia	f	4	136	42	65,4	54	32	63	
81116307	27.6.1990	Camp Lydia	f	4	139	42	66	57	33	72	
81116313	2.7.1990	Camp Lydia	f	4	129	37	61,2	55	32,1	68	
81116314	2.7.1990	Camp Lydia	f	4	135	42	67,1	54	30,5	59	
81116318	5.7.1990	Camp Lydia	f	4	134	40	64,2	55	31,4	64	start of moult
81251712	15.7.1990	Sterlegova		4	134	37,1	62,2	53		65	
81251503	15.7.1990	Sterlegova		4	132	37,5	62,2	53		60	
Calidris alpina											
81251901	2.7.1989	Malaja Logata	m	4	119	30,5	54,4	48		46	2222000000
81251902	4.7.1989	Malaja Logata	m	4	121	31,7	56,5	48		54	1111000000
81251903	4.7.1989	Malaja Logata	m	4	119	31,8	55,5	48		51	1111000000
81251801	5.7.1989	Malaja Logata	f	4	119	34,9	58,3	53		53	1111000000
81251802	6.7.1989	Malaja Logata	m	4	114	32,3	57,4	51		41	3321000000
81251904	6.7.1989	Malaja Logata	f	4	119	33,5	58,3	49	26,1	48	4443210000
8125906	9.7.1989	Malaja Logata	f	4	120	33,3	57,5	49	26,9	58	2222100000
81251803	9.7.1989	Malaja Logata	f	4	124	37,2	61,1	54		60	2222100000
Calidris maritima											
7697305	27.6.1991	Sterlegova		6	135	33	61	52		92	
Calidris melanotus											
81310601	5.7.1989	Malaya Logata	f	4	131	28	52,2	53	27,4	58	

ring	date	region	sex	age	wing	bill	total head	foot	tarsus	weight	primary moult score
					mm	*mm*	*mm*	*mm*	*mm*	*g*	
Arenaria interpres											
7698201	19.7.1989	Shturmanov	f	4	161	20,8	50,6	51	26,9		
6325107	21.7.1989	Shturmanov	f	4	156	21,1	50,7	53	26,3	114	
7698102	21.7.1989	Shturmanov	m	4	150	18,9	48,8	57		123	
7698401	9.6.1990	Camp Lydia	m	4	161	21,5	51	53	26,5	102	
7698402	9.6.1990	Camp Lydia	f	5	161	23,1	53,3	53	26,1	110	
7698404	10.6.1990	Camp Lydia	m	4	155	21,5	51,3	54	28	115	
7698405	10.6.1990	Camp Lydia	f	4	159	24	51,9	53	27	113	
7698406	27.6.1990	Camp Lydia	f		155	22,8	51,5	52	26,9	114	
7698502	8.7.1990	Sterlegova		4	159	22,4	50,1	52		106	
7698521	11.7.1990	Sterlegova	m	4	158	21,8	52,1	54		114	
6325206	12.7.1990	Sterlegova	f	4	157	22,5	51,1	53		124	
7698553	14.7.1990	Sterlegova	f	4	157	20,3	50,5	52			
7698554	14.7.1990	Sterlegova	m	4	151	21	49,3	54			
6325208	15.7.1990	Sterlegova	m	4	155	21,6	49,6	52		112	
6325209	15.7.1990	Sterlegova	f	4	158	21,8	51,5	52		105	
7698557	15.7.1990	Sterlegova		4	150	21,3	50,1	52		120	
7698574	16.7.1990	Sterlegova	m	4	156	19,4	49,7	51		133	
7698579	17.7.1990	Sterlegova	f	4	154	22,2	49,6	49		110	
7698580	17.7.1990	Sterlegova	m	4	143	21,9	50,8	48		108	
Phalaropus fuligula											
81310801	5.7.1989	Malaya Logata	m	4	127	23,2	47,7	47		54	
81116301	12.6.1990	Lydia	m	4	140	23,5	48,4	48	23,1	45	
81116302	13.6.1990	Lydia	f	4	141	24	48,9	48	22,9	53	
81116319	7.7.1990	Lydia	m	4	132	21	45,1	45		50	
81116323	7.7.1990	Lydia	m	4	133	21	43,9	49		57	
81116331	14.7.1990	Lydia	m	4	131	22	45,4	46	26,3	57	
81116323	15.7.1990	Lydia	m	4	130	22	45,5	44	25,2	51	
Stercorarius longicauda											
5295702	12.7.1990	Sterlegova		4	337	29,5		860		3800	
Larus heuglinii											
3091601	29.6.1990	Lydia		8	454	45	126	129		935	
3091602	29.6.1990	Lydia		8	468	57,8	138	151		1380	
3091603	29.6.1990	Lydia		7	430	50,5	122	127			