

Wader breeding conditions in the Russian tundras in 1997

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For the second year in a row there was a very late spring in the tundras of European Russia and northernmost west Siberia. Despite the fact that spring started extremely early in the southern tundra of west Siberia and on Taimyr, snow storms and very low temperatures returned to Yamal and western Taimyr in late May. Spring was reported as being relatively late and prolonged at most sites further east than Taimyr, but more variable on Chukotka. As a result, many correspondents reported a late start to breeding and low breeding densities in waders in European Russia and in some Siberian areas. The summer was humid and cold in European Russia and in west Siberia; variable but about normal conditions were observed to the east of Taimyr, while it was warm and dry on almost the whole of Taimyr and on Wrangel Island. Harsh weather decreased nest and/or chick survival on Vaigach Island, Yugorsky Peninsula, Yamal, north-west Taimyr, and the lower Olenyok River.

It was predicted that the increase in the lemming (*Lemmus sibiricus*, *Dicrostonyx torquatus*) population which started on central Taimyr and in the Lena Delta in 1996 would spread through larger areas in 1997. This happened, but on a much smaller scale than expected. Peak numbers of lemmings were recorded at locales to the south of the Byrranga Mountains on Taimyr and at the lower Olenyok River. Average lemming densities were found on Yugorsky (Europe), northern Yamal, some areas on Taimyr and the Lena Delta, at lower Indigirka and at Shmidt Cape. However, a decrease in their numbers during the season was noted in most cases. Arctic Foxes *Alopex lagopus* were numerous in European Russia, on Taimyr, in the Lena Delta, at lower Indigirka and on Belyaka Spit (Chukotka). Their breeding in most of these and in some other areas was successful. No sites with high numbers of lemming-specializing avian predators (Snowy Owl *Nyctea scandiaca* and Pomarine Skua *Stercorarius pomarinus*) were found. One or both of these species were breeding in low to moderate numbers on northern Yamal, north-west and central Taimyr, in the Olenyok mouth, in some sections of the Lena Delta, at Shmidt Cape and on Wrangel Island. Thus, the situation with lemmings and predators was very patchy. Breeding success of waders was evaluated as low (up to average for some species) in the western section of the Russian Arctic and in most cases not less than average on central Taimyr and further east. This conclusion is opposite to the prediction made in 1996.

Taking into account the patchy lemming distribution and the increasing Arctic Fox numbers in 1997 it can be predicted that generally moderate wader breeding success in 1998 will be observed with a better breeding output in the European and west Siberian sections. Results in the Central and East Siberian regions will probably be worse than in 1997.

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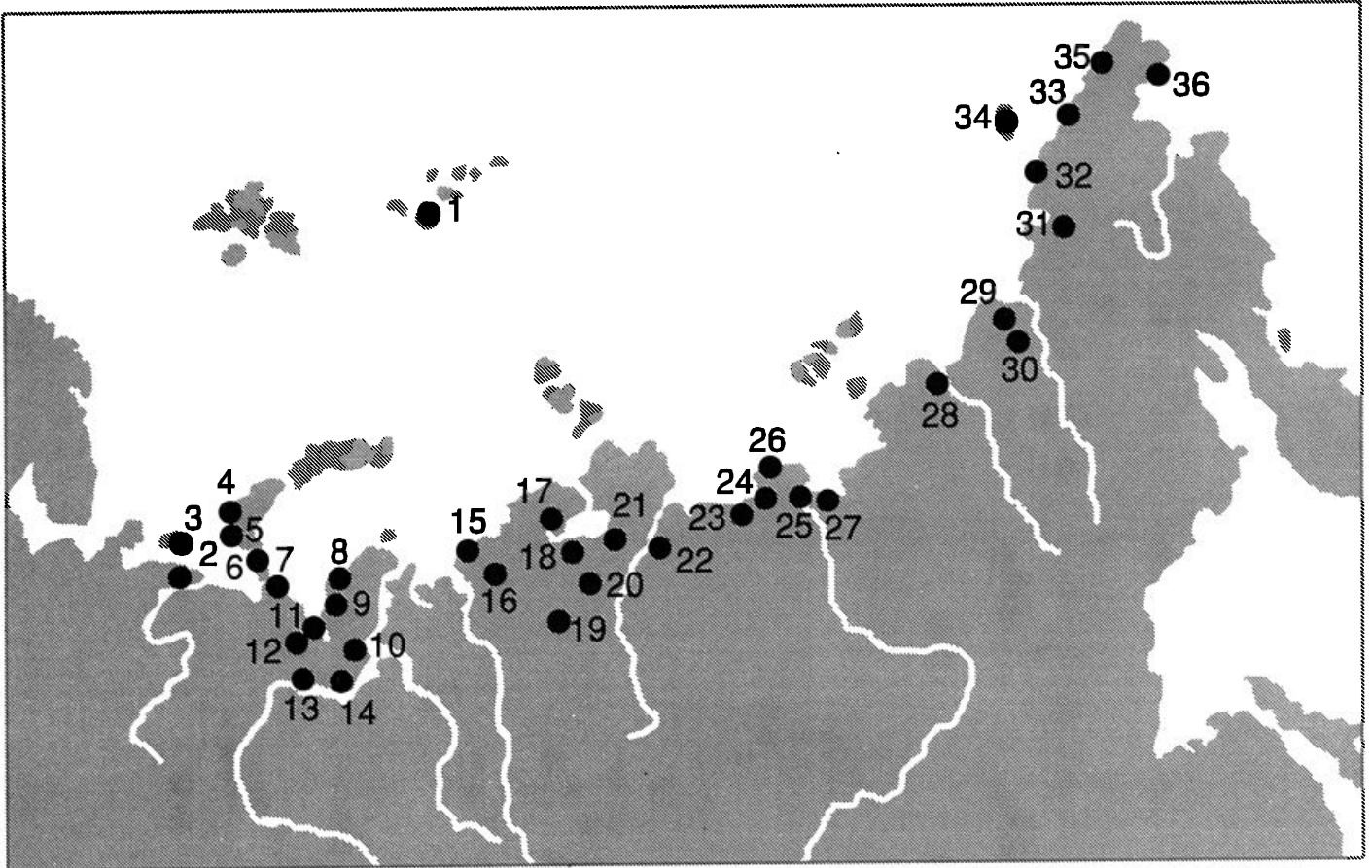
INTRODUCTION AND METHODS

Presented here is the 10th review of wader breeding conditions in the Russian tundra. Ten years of collective efforts focussed on one target demonstrated that this method of annual data collection was viable and its results important. Over the ten year period reports from 185 authors have been received; many of them becoming regular contributors. Two of them (V. V. Morozov and E. E. Syroechkovski, Jr.) have provided their data every year while five more authors (I. V. Dorogoi, Ya. I. Kokorev, S. P. Paskhal'ny, V. K. Ryabitsev and M. S. Stishov) missed only one or two years. This effort has been encouraged by our foreign colleagues and began an international project directed at creation of a database encompassing breeding conditions of Arctic birds in the entire circumpolar region (see Page 43). It is also worth mentioning that the organisational phase of the database development project has received

financial support and, overall, activities in this area should become noticeable to researchers in 1998.

Based on a three-year cycle, in 1997 it was expected that there would be peak population numbers of lemmings in most parts of the Russian Arctic. However, in 1996 the situation with local distribution and population trends was very heterogeneous, an indication of a slight departure from the typical cycle rules. As a result, forecasting for 1997 became complicated. Eventually a suggestion was made that if the weather conditions were typical for the zone, then the summer of 1997 would be favourable for tundra breeding waders of the western sector of the Arctic, while birds nesting in northern Yakutia would suffer poor reproductive success (see *WSG Bull.* 83: 26-36). Information provided by our contributors allows us to assess this prediction.





RESULTS

1. Franz Jozef Land archipelago. Judging from the heavy ice conditions on 17 - 20 August the summer was cold. Ice on the channels in the western and northern parts of the archipelago never broke. No rodents occur there. Predatory birds (Glaucous Gull *Larus hyperboreus*, Parasitic Skua *Stercorarius parasiticus*) bred successfully. Records of waders during the observation period were rather scarce: one sighting of a Purple Sandpiper *Calidris maritima* and two of Ruddy Turnstones *Arenaria interpres*. Since more Purple Sandpipers were recorded on the Nortbruk island in 1996 (G. M. Tertitski, pers. comm.), it is suggested that in 1997 wader breeding success was poor.

A. E. Volkov

2. At the south-eastern part of the Russki Zavorot peninsula, at Khabuika Lake the spring was late and extended. From mid-June and through early July the weather was cold and with strong, mostly northerly winds. Due to this, plant growth and thawing of permafrost were very slow. The overall predator-rodent situation was similar to the previous year. The abundance of Root Voles *Microtus oeconomus* and Siberian Lemmings *Lemmus sibiricus* remained low. Arctic Foxes *Alopex lagopus* were common and many dens were dug. No Snowy Owls *Nyctea scandiaca* were recorded. Only Parasitic Skuas nested in the area while Long-tailed Skuas *Stercorarius longicaudus* were seen passing through. Numbers of Rough-legged Buzzards *Buteo lagopus* were low and no nesting was documented. Perhaps due to the lower

than usual numbers of young fish in the littoral zone, many fewer gulls were counted in the area. Also, it was not uncommon to see gulls searching the tundra for bird nests. Breeding wader numbers were noticeably lower than in the previous year. This was especially true for Ruff *Philomachus pugnax* and Temminck's Stint *Calidris temminckii*. Lekking in the Ruff was less pronounced and their flocks were smaller in size than in previous years. The start of clutch initiation was delayed by at least two weeks. No wader chicks were seen before mid-June while the timing of hatching in passerines was, as usual, early July.

Yu. M. Schadilov, A. V. Belousova

3. At Kolguev Island the spring was late and prolonged. By the middle of June, the daily temperature did not exceed +3-5° C, dropping below freezing at night. Precipitation was in the form of both rain and snow (the last snowfall occurred on 8 July). The two weeks after 12 July were warm with average daily temperatures of +10-12° C (some days up to +16-18° C); rain and cold returned in late July. Plant development appeared delayed: grasses and sedges emerged and shrub buds began unfolding on upland tundra only in early July attaining full foliage only during the second half of July. This resulted in greater exposure of nests and chicks of waders to avian predators. Isolated snow fields persisted in deeper depressions and on shaded slopes through early July. Full clutches in most waders as well as the first instances of hatching were detected during mid-July. The more common species included Grey Plover *Pluvialis squararola*, Dunlin



Calidris alpina, Red-necked Phalarope *Phalaropus lobatus*, and Ringed Plover *Charadrius hiaticula*, as well as some Little Stints *Calidris minuta* and Ruffs. Separate pairs and small flocks of Oystercatchers *Haematopus ostralegus* were constantly seen along the lower Bugryanka river flow. Their clutches and young apparently fell prey to Herring Gulls *Larus argentatus* and Parasitic Skuas (most Parasitic Skua nests had only one egg or chick). Only one Snowy Owl was seen. The adult bird mortality was mostly due to Peregrines: three Peregrine nests contained remains of Dunlins and a Ruff. With the absence of rodents Rough-legged Buzzards mostly preyed on birds but the two investigated nests contained no wader remains. Arctic Foxes were scarce and their dens contained only goose remains.

V. Glazov

4. At the settlement of Byelush'e in the southern part of Gusinaya Zemlya (Yuzhni island of the Novaya Zemlya archipelago) (71°33' N, 52°32' E) the local meteorological station reported a relatively mild winter, but throughout the month of May snow fell heavily. The first snow-free patches appeared on 8-10 June, goose migration started on 10 June and lasted till 18 June. After the long, cold spring, warmer temperatures (+10-19° C by day) became the norm from 9-15 July. By this time, no snow was left at the settlement, ice in the Kostin Shar straight had gone 2-3 days earlier, and the extent of the ice cover on lakes varied widely. Lemming numbers were low: only two Siberian Lemmings were seen during six brief excursions. Birds were rare near the settlement. Any clutches of Ringed Plovers, Little and Temminck's Stints found did not have any signs of hatching in mid-July. A displaying Common Snipe *Gallinago gallinago*, which was flushed by a local hunter as late as early August, was an unusual spectacle for this latitude. On 11-12 September, small flocks of Purple Sandpipers, one Ringed Plover, Ruddy Turnstones and a Rough-legged Buzzard were sighted in the same area.

V. N. Kalyakin

5. On the east side of the Kostin Shar straight, Yuzhni island of the Novaya Zemlya archipelago (71°10' N, 54°00' E - 71°17' N, 53°24' E) the period between 9 June and 9 September was drier and warmer than a similar period of the previous year: heavy rains occurred on 20 and 30-31 July, it snowed on 22, 24/25 July and 30 August and even during the first week of September the temperature did not drop below +4° C. Lemmings were not found, whereas the previous year (according to survey data) coincided with a peak in their numbers which also resulted in high population numbers of Arctic Foxes, Snowy Owls and Rough-legged Buzzards. This year, Arctic Fox numbers were low and only single dens were occupied. Only one Snowy Owl was observed along a 300 km route. Some single Rough-legged Buzzards were seen, however, two pairs successfully nested at the northern border

of the study area hatching four chicks each. Several nestless Long-tailed Skuas were encountered in the same location. Large gulls were common but mostly did not nest. Few broods of Barnacle Geese *Branta leucopsis*, Common Eiders *Somateria mollissima* and Long-tailed Ducks *Clangula hyemalis* were seen, other geese bred more actively. Most of the waterfowl nests that were discovered were predated. Wader numbers were at their minimum. Single nests of Ringed Plovers, Ruddy Turnstones, Little and Temminck's Stints, Dunlin and Purple Sandpipers were found; likewise, juvenile birds sighted at the end of the season were extremely rare. Some passerine pairs bred successfully. Overall the season turned out to be rather unfavourable for many breeding birds.

V. N. Kalyakin

6. At the north-western end of Vaigach island (upper Dolgaya bay) the weather conditions of the summer were highly unfavourable for breeding birds. The spring arrived rather late with the average daily temperature rising above freezing mark only by 25 June. The mean (\pm SE) June temperature was -0.65° (\pm 0.31°) C, July +2.01° (\pm 0.38°) C. The average maximum temperature in June was +4.54° (\pm 0.54°) C, July +7.57° (\pm 0.73°) C. Heavy blizzards were recorded on 28 June and 3 July and a cold spell with some snow occurred on 25 July, *i.e.* during the time when Temminck's Stint chicks were hatching. Little and Temminck's Stints nested only along river courses and were absent on hill sides. Few Dunlins were present. Only single Dotterels *Eudromias morinellus* nested. In many of them the spring migration apparently transformed into summer nomadic movements. No territorial Purple Sandpipers were recorded, however, single birds were constantly seen along river banks.

The breeding season in many waders was very delayed: the first full clutch of Little Stints was found only on 27 June while the first chick was located on 24 July. The first Temminck's Stint chicks were seen on 25 July while on the north coast of the island (Bolvanski Nos cape) a clutch was found on 9 August. Siberian Lemming numbers were low: during the season only 2-3 individuals were seen. Apparently, most lemmings died during heavy rains in December 1996 and as a result even the traces of their winter activities were absent. In contrast, Arctic Fox numbers were high: one, sometimes two animals were seen on almost every excursion. Arctic Foxes were more numerous in June, then their numbers dropped and only some territorial individuals remained, although they did not breed. Most wader nests were lost to non-breeding skuas - some Pomarine *Stercorarius pomarinus* but mostly Long-tailed. Rough-legged Buzzards and Snowy Owls did not breed. Only four out of 16 Little Stint nests survived till hatching. Out of seven Temminck's Stint clutches five hatched but in three of those seven chicks died immediately after hatching. Overall wader breeding success was low.

B. Konyukhov, K. E. Litvin, E. N. Gurtovaya



7. Yugorsky peninsula, Byely Nos cape (69°36' N, 60°13' E). The spring was late, cold and prolonged, and the summer was cold as well. The snow cover was thinner than in the previous year, yet it persisted for rather a long time: on 24 June 90% of the tundra surface was still snow-covered (a 10-year record according to polar station information). Active melting of snow began on 25 June after heavy, warm rain. Later on, the summer temperature was below the average norm by 5-7° C with the maximum reaching +16.8° C. Showers, fogs and storms were common, a few thunderstorms were recorded as well. Overall the weather did not favour successful wader breeding. Only in late July did the temperatures warm up and that probably had a positive effect on survival of remaining wader young. The spring arrival was on time with only the phalaropes being noticeably late. The time of nest/clutch initiation was delayed by 10 days in all locally breeding waders.

The breeding density of large and medium-size waders (Dunlin, Ruff, Dotterel and Grey Plover) was as usual, only the number of nesting Ringed Plovers dropped due to the prolonged snow cover on their nesting habitat. Judging from the physiological condition of captured birds, no clutches in this group were abandoned due to the weather conditions; only one Ringed Plover nest was deserted after being flooded during a rain storm. Nesting of small, 20-50 g body mass, waders (Temminck's Stint, Little Stint, Red-necked Phalarope) was badly affected by the adverse weather conditions. Their nesting densities were extremely low and later in the season some nests were abandoned.

Early in the season, the Siberian Lemming numbers were about average (for the last three years of observation) which corresponded with a population growth stage after a depression during the previous year. Notwithstanding this, their numbers apparently declined by the end of the summer. A record high number of breeding Arctic Foxes for the last three years was noted: four dens stretching in a line with a distance of 1.5 to 2 km in between were found. In July, each of them contained at least 3-4 pups. By late July some of the pups in one den had died. Non-breeding Snowy Owls could be seen around the field station all summer. The Rough-legged Buzzard breeding density was close to average but by early August only one nest remained with one chick in it. Some pairs of Parasitic Skuas managed to fledge their young. Pomarine Skuas appeared in numerous flocks in early and mid-June. Small groups of Long-tailed Skuas could be seen throughout the season. Wader nest survival varied greatly among species. In large and medium-sized species with the exception of Dunlin (29%) up to 60% of nests survived to hatching. In small species the proportion was 10-17%. Overall the season was rather unfavourable for all wader species, especially for the smaller ones. The larger waders achieved average breeding success even in those conditions.

V. V. Gavrilov

8. In the Kharasavei area (71°10' N, 67°50' E) of the Arctic Yamal tundra, meteorologists recorded a late and prolonged spring which gradually turned into a cold and windy summer. Snow fields remained until mid-June and in some gullies probably throughout the summer. However, according to observations taken on 31 July - 7 August lemming numbers (mostly Siberian Lemming) were not below average and in some places were even high (15-20 individuals per 100 trap-days). This was a result of their successful breeding under the snow judging from the high number of winter nests. No Arctic Fox dens were found. The density of Pomarine Skuas that apparently nested on the coastal tundra was high (1.8 pair/km²). One Rough-legged Buzzard eyrie with two large nestlings was investigated. Herring and Glaucous Gulls mostly kept to the coastline. Snowy Owls and other avian predators were absent.

Early in the season wader numbers and their species diversity were low. Little Stints made up the bulk of all encounters (40.4%), with some Ringed Plovers (23.4%) seen near the settlement, and also some Ruffs with broods (10.6%); Dunlin, Red-necked Phalaropes and Ruddy Turnstones were more rare. The general opinion was that the breeding success of most waders was low, probably due to the unfavourable weather conditions. Little Stints and Ringed Plovers did slightly better than other waders.

S. P. Paskhal'ny

9. Bovanenkovo area (70°23' N, 68°20' E). At the lower Seyakha-Mutnaya river, spring and summer conditions did not differ from the rest of the Yamal peninsula. Lemming population numbers roughly estimated on 3-6 August were low: signs of their summer activities and winter nests were few and far between. Narrow-skulled Vole *Microtus gregalis* numbers were high and active colonies of this rodent were ubiquitous, especially so in the meadow-like tundras of anthropogenic origin. These were the voles that made up most of the Rough-legged Buzzard (chicks) and Arctic Fox diet. Two Arctic Fox dens investigated had litters. In two surveyed areas the Rough-legged Buzzard breeding density was rather high: 0.33-0.43 pair/km². A single Snowy Owl was observed; no skuas were seen.

Wader abundance early in the season was low. The more commonly seen species included Ringed Plover (31.6% of all sightings), Temminck's Stint (26.3%) and Wood Sandpiper *Tringa glareola* (17.5%). The less abundant species were Ruff (8.8% that appeared to be nesting), Red-necked Phalaropes, Dunlin and Little Stints. Wader breeding success was deemed poor. Judging from the number of birds behaving distractively, Common Ringed Plovers and Temminck's Stints fared better than the other species. The factors explaining such results were the unfavourable weather conditions and perhaps heavy predator pressure during the first half of the summer.

S. P. Paskhal'ny



10. The upper Yuribei river, middle Yamal. According to survey data, the river ice at Tarko Sale broke unusually early - 7 May (!) - although later the cold, winter weather returned

Judging by the few snow patches remaining during the observation period (1-17 July), snow melted, as usual, by mid-June. By early July, all lakes were already free of ice, but the water level remained high; emergence of the foliage in alder, birch and willow was noted. The spring was prolonged and cold, and a mass mosquito hatch took place on 16-17 July. The windy and rainy weather with air temperatures of $0\pm 5^{\circ}\text{C}$ prevailed in July. On 7-8 July, 6-8 cm of snow fell and remained on the ground for four days.

No Siberian Lemmings were trapped and the other species numbers remained low: four Narrow-skulled Voles, four Bank Voles *Clethrionomys glareolus* and one Collared Lemming *Dicrostonyx torquatus* were caught (1.5 individuals per 100 trap-days). Out of ten Arctic Fox dens only one had a litter, although the pups were dead. Nesting predatory birds included Rough-legged Buzzard (one nest with chicks) which bred at a lower than usual density and Parasitic Skua; nomadic Parasitic and Long-tailed Skuas were common. Only single Snowy Owls were seen.

Common breeders included Ringed Plover, Wood Sandpiper, Red-necked Phalarope, Temminck's Stint and Dunlin. Species that were absent from the area included European *Pluvialis apricaria* and Pacific *P. fulva* Golden Plovers, Little Stint and Pintail Snipe *Gallinago stenura*. By mid-July only Wood Sandpiper and Temminck's Stint chicks were found, while all other waders continued incubation.

M. G. Golovatin, V. G. Shtro

11. The lower Yenzor-Yakha river (SW Yamal peninsula, 15 km from the Baydaratskaya bay). In the shrubby tundra belt both the tundra and riverine zones were free from snow by 4 June, the river valley lakes were partially ice-free and upland lakes were completely ice-bound. In June, the weather was windy and cold with a lot of precipitation in the form of rain and snow, night-time frosts and temporary snow accumulation of up to 10 cm (17 June). During the observation period (until 24 June) only two days (9 and 19 June) were warm and sunny (up to $+15^{\circ}\text{C}$).

No lemmings were trapped, vole numbers were low: two Middendorff's *Microtus middendorfi* and one Narrow-skulled Vole were captured over 500 trap-days. Four Arctic Fox sightings were made in the river valley and all of the 12 investigated dens turned out to be empty. Other noted predators included Parasitic Skua and Herring Gull (common), Long-tailed and Pomarine Skua (less common), Snowy Owl (single individuals), Hen Harrier *Circus cyaneus* (1 pair) and a female Merlin *Falco columbarius*. The Rough-legged Buzzard breeding density was 0.13 pair/km² and the five eyries searched contained smaller-than-usual clutches (four eggs or

less). Despite the cold weather in June, timing of migration and start of the nesting season was on time. Common breeders included European Golden Plovers, Ringed Plovers, Wood Sandpipers, Red-necked Phalaropes, Ruff, Temminck's Stints, Dunlin and Common Snipe. Little Stint, Sanderling *Calidris alba*, Curlew Sandpiper, single Spotted Redshanks *Tringa erythropus* and Ruddy Turnstones were seen on passage. Water-logged patches formed around the railway under construction and slopes of its sand-and-gravel base created favourable conditions for roosting of transient and breeding of local waders.

I. Yu. Karagodin, E. V. Nesterov, S. P. Paskhal'ny

12. The eastern Urals foothills ($66^{\circ} 30' - 68^{\circ} 30' \text{N}$). In the forest-tundra and southern tundra subzone the spring was prolonged and cold. It warmed up in late April - early May after which there was a long period of cold and windy weather with frequent rain and snowfall. Despite this, the ice on the Ob river near Salekhard broke on 16 May, *i.e.* two weeks earlier than normal.

Wader migration was as in previous years: first Wood Sandpipers were noted on 19 May, Ruff and Terek Sandpiper *Xenus cinereus* - 28 May, Temminck's Stint and Great Snipe *Gallinago media* - 31 May. The mass wader migration fell on the last days of May - first days of June. June and July saw cold, moderately rainy weather with constant, strong winds and gales. It snowed more than once in June (heavy snowfall on 13-14 June) and at times the temperature dropped below freezing. As a result the growth and blossoming of plants were delayed by as much as 7-10 days. No lemmings were seen and the number of voles was low (2-3 Middendorff's and one Narrow-skulled Vole per 100 trap-days). Few Hen Harriers and Rough-legged Buzzards nested (checked clutches of the latter contained 1 - 4 eggs); nomadic Long-tailed and Parasitic Skuas were common. Non-territorial Arctic Foxes were seen only at the northern edge of the study area.

The following species had an average breeding density: Temminck's Stint, Wood Sandpiper, Ringed Plover, Red-necked Phalarope, Ruff, European Golden Plover, Pintail and Common Snipes and Dunlin (in the northern part of the area). Breeding densities of Whimbrel *Numenius phaeopus* and Bar-tailed Godwits *Limosa lapponica* were below average. A highly patchy distribution was found in Dotterel, Spotted Redshank, Common Sandpiper *Actitis hypoleucos*, Terek Sandpiper, and Little Stint. Overall wader breeding conditions were assessed as unfavourable and their breeding success below average.

S. P. Paskhal'ny

13. The Schuch'ya river catchment area, southern Yamal. Owing to the long warm spells in late April and early May the tundra was mostly free of snow by late May. Nevertheless, the



highest water level in the Schuch'ya river was achieved on 6-8 June and ice on lakes was finally gone only after 20 June. The spring was prolonged and generally cold; extensive warm spells in May and early June, when the temperature climbed up to +23° C were followed (after 10 June) by a two-week cold stretch with daily snowfalls, gale-force winds and night frosts. Daily temperatures did not exceed +6° C. The water level on the river during spring floods was average. The summer turned out to be cold and wet: in July there were no more than seven sunny days, hurricane-force winds and prolonged torrential rains were a common occurrence. Only the month of August was warmer and drier than the rest of the season.

Lemmings were not seen and their remnants not found in raptor pellets and food remnants. Narrow-skulled and Northern Red-backed Voles *Clethrionomys rutilus* were only trapped in river valleys, very locally, in areas of suboptimal (temporary) habitat. A very few Rough-legged Buzzard pairs attempted breeding and none fledged young. Hen Harriers did not nest. Large numbers of Long-tailed and Parasitic Skuas were moving about the tundra in small groups in June and July with almost no nesting attempts (the only known Long-tailed Skua nest was destroyed by a Herring Gull). Few gulls nested and even in those that hatched young, some chicks subsequently died of starvation. No Snowy Owls were seen; two Short-eared Owls were noted during migration. Breeding densities of Hooded Crows *Corvus cornix* and Ravens *C. corax* nesting in the wooded valley of the Schuch'ya river were normal. No Arctic or Red Foxes *Vulpes vulpes* were seen and their dens were empty.

If compared with the previous years, most waders had rather patchy distribution and low population numbers. Bar-tailed Godwit, Red-necked Phalarope, Jack Snipe *Lymnocyptes minima*, Pintail Snipe and Ruff were especially rare. Only European Golden Plovers had a high breeding density. In June and July, one could regularly see moving flocks of non-breeding European Golden Plovers and Bar-tailed Godwits. In some locales in the Schuchya river valley, all Golden Plover and Whimbrel clutches were destroyed by Hooded Crows. Judging from the pellets and food remains of Hooded Crows, Wood Sandpiper and Pintail Snipe nests also suffered high predation rates. In the watershed areas many wader clutches were taken by skuas.

The weather also had a negative effect on breeding waders because the instances of heaviest snowfalls, below freezing temperatures, cold showers, and storms took place during the egg-laying stage, early incubation (second and third weeks of June) and the start of the hatching period (first half of July). As a result, numbers of attending/brooding adults of all species of waders except for the European Golden Plover, Ringed Plover and Wood Sandpiper were very low. In July and August only 1-2 broods of Whimbrel, Ruff, Pintail and Common Snipes were seen. It can be concluded that the

overall breeding success in most waders was very low.

V. V. Morozov

14. Yarsale settlement area (66°51' N, 70°50'E), south-eastern Yamal. During the first half of June the weather was mostly cold, windy and rainy. Population numbers of all rodents were deeply depressed. No Arctic Foxes were seen. Rather few Long-tailed skuas were encountered and waders were somewhat uncommon too. An average breeding density was found in Ringed Plovers, Wood Sandpipers, Ruff, snipes. Numbers of Grey and European Golden Plover, Red-necked Phalaropes, Temminck's Stints, Terek Sandpipers and Whimbrel were low. Flocks of Whimbrel and Bar-tailed Godwits were noted on 11-12 July. Wader breeding success was apparently below average.

S. P. Paskhal'ny

15. Medusa bay area (73°04' N, 80°30' E), north-western Taimyr. By the time the field season started on 18 June, the ice on the Meduza river had already broken and snow cover remained on 70% of tundra, *i.e.* the start of spring was the same as in most previous years. The last heavy snowfall took place on 19 June and caused desertion of the first incomplete Pacific Golden Plover clutches. The summer was cold: over a 40 day period only 5-6 days were clear with temperatures of about +10° C, and the last frost was on 2 July. Egg hatching in most waders (12-18 July) took place during a period of cold (+1-5° C) and foggy weather.

The Siberian Lemming population levels were clearly below the previous year's: only during the last third of June (peak snowmelt period) could 10-15 individuals be seen per day. In July, very few lemmings were seen of which only one was a young individual. The scarcity of lemmings greatly increased the Arctic Fox predation pressure on waders. Foxes were noted regularly, up to four individuals at a time, however, no active dens were found. No Snowy Owls were observed. The number of Long-tailed and Pomarine Skuas breeding in the field station area was much lower than in good years; and the outcome of their nesting was in most cases negative anyway. Brant nests were only found on the Olenii and north-eastern islands in Herring Gull colonies.

Due to the prolonged spring and cold summer, the number of nesting Curlew Sandpipers and Little Stints was very low. During the period between the onset of spring and autumn migration, density in these two species was no more than 2.6 and 2.4 pairs or males/km² respectively. At the same time, nesting of only one Little Stint pair was confirmed while all local Curlew Sandpipers disappeared by 10 July. A similar situation was noted with the Ruddy Turnstone, Ringed Plover and Dunlin (0.9-1.3 pairs/km²) and this is considering that 50-90% of all individuals either did not breed at all or lost their clutches early. The Pacific Golden Plover density did not



differ from usual (5.5-6.3 pairs/km²). Grey Plovers and Dotterel did not nest. A Pectoral Sandpiper *Calidris melanotos* exhibiting distractive behaviour was noted on the Big Olenii island on 24 July. The probability of a clutch surviving till hatching was 35% (n=11) in Pacific Golden Plovers, 54% (n=3) in Ringed Plovers. Overall, by 20 July when hatching was probably over, the 66 Pacific Golden Plover pairs nesting in the study area had probably lost half of their broods. A potential link between researchers' activities and Arctic Fox predation on clutches could not be excluded.

S. V. Khomenko, S. A. Dylyuk, S. B. Rozenfeld

16. In the Pura river catchment area and at the lower Pyasina river, western Taimyr, the abundance of rodents in the winter was average or above and as a consequence Arctic Foxes started visiting their dens in the spring. Everything seemed to point to a successful year for rodent-dependent predators. However, an unusually long warm spell (three weeks) with rains and temperatures of up to +6°, even at the Pura mouth, occurred in April. Such a situation had not been seen in Norilsk and Dudinka area since 1943. On the Yenissei, ice broke on 20-21 May, *i.e.* 4-5 days earlier than in 1943. Then temperatures went down again.

No Snowy Owls were seen but there was an unconfirmed report of a nest in the Pyasina delta. It was the latter location where the lemming situation was better than elsewhere, evidence of which was a good year in Herring Gull colonies (large colonies, full clutches) near the Shakhta Severnaya settlement to the north. In the same area and/or in the Pyasina delta, on islands one could see active nesting by Red-breasted Goose *Rufibrenta ruficollis*, Brant *Brenta bernicla*, and White-fronted Goose *Anser albifrons*, *i.e.* the general situation was much better than in the Pura basin where the breeding density of geese was low and clutches were small. Many Rough-legged Buzzards nested in the Pura basin and their clutches were relatively large but by the end of the season the young suffered high mortality rates. Single Herring Gulls and skuas nested there and the predator pressure exerted by these species and Arctic Foxes on clutches of other birds was high (for example, all known nests of Long-tailed Ducks and King Eiders *Somateria spectabilis* near the Pura field station were depredated).

The phenology of the spring events was as usual and the conditions in the summer looked rather favourable. At the same time the breeding density of waders was low: in riparian habitats the density was close to average, whereas in upland areas it was very low. The more abundant species included Ruff, both phalaropes, Pectoral Sandpiper. Only two nests of Little Stint were found and one brood of Temminck's Stint and Dotterel was seen. Overall, despite a seemingly favourable summer the tundra appeared empty.

Ya. I. Kokorev

17. In the Fad'yu-Kuda river valley (74°03' N, 96°57' E) - the left tributary of the Upper Taimyra, Byrranga foothills, the spring was relatively early; by the start of the observation period (22 June) snow on the watersheds was practically gone. The summer was very warm and dry, the average daily temperature was +15° C. The Upper Taimyra reached its low by early August and some marsh polygons remaining water-logged which usually dried out. An area of c. 200 km² had 20 active nests of Rough-legged Buzzard, three of Peregrine and one of Snowy Owl - all with broods of no less than three chicks. The abundance of apparently nesting Long-tailed Skuas was low.

Out of 33 Arctic Fox dens, 22 had litters. All predators seemed to rely heavily on Siberian Lemmings which were very numerous that season and, as a result, only a few bird nests were depredated. On the patchy tundras of the watershed areas, an average of 19 lemmings were caught per 100 trap-days and visual encounters with these animals occurred daily. No Collared Lemmings were found. Judging from the lower frequency of visual observations and fewer Arctic Fox dens and pups per den, the lemming numbers were not as high to the south, towards the Upper Taimyra. Surveys and brief visits even farther south, to the Malaya Logata river indicated even lower lemming population numbers. When the observations started waders had already laid full clutches. The more numerous species of lowland tundras and marshes included Grey Plovers (2-3 pairs/km²), Dunlin, Curlew Sandpipers, and Bar-tailed Godwits; whereas on stream gravel beds and limestone plateaux Ringed Plovers (5 pairs/km²) were most numerous. Many juvenile birds from successfully fledged broods left the study area by the end of the third week of August.

I. N. Pospelov, M. N. Koroleva

18. The Malaya Logata mouth area (73°26' N, 98°22' E). On the typical tundras of the central Taimyr, ice on the lakes and the thin snow cover were gone much earlier than in an average year. The last patches of packed snow and snow fields in gullies disappeared by mid-July. There were no floods on rivers in the spring and summer.

By the spring time lemming (only Siberian Lemmings were seen) population levels contracted many-fold in comparison with the peak numbers of 1996 and continued declining through the summer. Arctic Foxes were slightly less abundant than the summer before, their litters comprising of five to seven pups. Out of nine surveyed dens, eight were active. Wolves *Canis lupus* were common and bred. Rough-legged Buzzards and Peregrines nested successfully having three-four and three chicks respectively. The nesting density of Long-tailed Skuas was low while Parasitic and Pomarine Skuas were practically absent from the area in mid-summer. Nesting Herring Gulls were common, much less so were Glaucous Gulls. Only one Snowy Owl was seen. The most common



wader species included Pectoral Sandpiper, Temminck's Stint, and Ruff; Grey and Pacific Golden Plovers, Little Stint, both phalaropes, Common Snipe, and Dunlin were common and Ringed Plover, Curlew Sandpiper and Spotted Redshank were rare. The predator pressure on wader nests increased through the summer and was especially high during the second and third weeks of July, i.e. the end of incubation and first days of hatching. Clutches of Grey Phalaropes *Phalaropus fulicarius*, Temminck's Stints and Ruffs suffered especially heavy predation. Because of this, many adult birds departed from the area early. Wader breeding success and their numbers overall were probably close to average.

A. I. Artyukhov

19. South-central and south-eastern Taimyr. The climatic conditions in the northern forest-tundra (500 km stretch of the Kheta river between Putorana Mountains and the mouth, lower Boganida river and the area between the Kheta, Dudypta and Boganida rivers) were rather unusual. The snow accumulation was three to six times less than usual which together with extremely high temperatures in April and May (+10-15° C) created the situation of an atypically early spring. Most of the snow cover in the region disappeared by 15 - 20 May and new autumn snow (10 - 20 cm) did not stay long. Before 20 June, the temperature dropped below zero (-1-4° C) only a few times. The ice movement on the Kheta river near Volochanka started on 19-20 May. Ice on small lakes melted in May, on larger ones by 22-25 June. The water level increase in rivers was insignificant. Larches along the middle Kheta flow started turning green on 22-23 June. Most spring phenology events were 15-30 days earlier than in average years. The summer and autumn for the most part were dry and warm. For the first time in many decades, many tens of thousands of reindeer overwintered in the area (up to 10-15 June) seriously disrupting the vegetation cover over large spans of tundra.

Sorex shrews were rare while the Siberian Lemming and vole numbers were close to average, i.e. higher than in 1996 and even more so than in 1995. The density of nesting Rough-legged Buzzards and Long-tailed Skuas was low. The Short-eared Owl *Asio flammeus* and Hawk-Owl *Surnia ulula* were rare and Snowy Owl was seen only once. Herring Gulls nested successfully. Non-breeding Common Gulls *Larus canus* were seen regularly, Glaucous Gulls and Parasitic Skuas were less common. No Arctic Foxes were encountered. The abundance of bears *Ursus arctica*, wolverines *Gulo gulo*, stoat *Mustella erminea* and especially lynx *Linx linx* and sable *Martes zibellina* were estimated as low or very low throughout the region. Wolves on the other hand were quite common. The most common breeding waders included Ruff, Terek Sandpiper, Temminck's Stint; common - Wood Sandpiper, Red-necked Phalarope, Spotted Redshank, and Common Snipe; rare or with highly patchy distribution - Ringed Plover, European Golden Plover, Whimbrel, Pintail and Jack Snipe. For the first time Great Snipe was recorded in the area.

Compared to 1995, Terek Sandpipers, Spotted Redshanks and in some areas Bar-tailed Godwits were more common while a Common Sandpiper was seen only once. The overall impression was that breeding success in many waders was above average or high.

A. I. Artyukhov

20. Central and eastern Taimyr. The spring in the sub-Arctic tundra was unusually early. The ice movement on the Upper Taimyra river started on 17 June and on 25 June the river was completely free of ice (usually this happens in early July). The summer was warmer than average, with a small amount of precipitation. In the northern section of the sub-Arctic tundra lemmings were numerous and Arctic Foxes bred successfully. It was also a good year for raptors and waders. A distinguishing trait of the season was low Willow Grouse *Lagopus lagopus* and Rock Ptarmigan *L. mutus* numbers. There were very few lemmings in the southern section of the sub-Arctic tundra (Novaya river middle flow).

A. A. Gavrilov

21. In Khantanga area the spring arrived early (survey data) but a cold spell in late May delayed the start of snowmelt until the usual dates. In the forest-tundra and southern tundra zones snow melted rapidly and in June-July the weather was predominantly warm. According to rough estimates, vole population levels in the forest-tundra near the Khatanga settlement, Big Romanikha river mouth and Popigay depression were low or average. Tracks of wolves and bears were common and Arctic Foxes rare along the Kheta river middle flow.

A trip to Portnyagino lake (74°15' N, 107°20' E) in late July revealed a great abundance of Siberian Lemmings and nesting Snowy Owls, Pomarine and Long-tailed Skuas. Wader broods were common everywhere. A survey among the local inhabitants showed that the lemming situation in typical and southern tundras of the eastern Taimyr was patchy. In particular, sites with average to high lemming population levels and active Arctic Fox dens were observed along the middle flow of the Bolshaya Balakhnya river.

E. E. Syroechkovski, Jr.

22. South-eastern Taimyr. In the Bludnaya river mouth (72°51' N, 106°02' E) this was a phenologically early spring. Low snow accumulation over the winter lead to quick melting and minimal flooding. As a result, for the first time in the last four years, the Bludnaya river valley was not flooded. Incubation in waders started in mid-June, which, judging from four years of observations, can be considered early for the region. The general breeding density was low: in phalaropes and Ruff this could be a result of their shift to a water-free river valley. The summer was relatively warm and dry, without snowfall and heavy rains during the breeding season.



Judging from the number of lemmings noted in the area, their numbers dropped noticeably *ca.* three-fold in the Siberian Lemming, Collared Lemming was seen only once) in comparison with the previous, peak, year; nevertheless they were periodically observed during the summer, although sometimes not for a few days in a row. Rodent-dependent raptors did not nest with the exception of a few pairs of Rough-legged Buzzards. No owls were seen. Only a few Long-tailed Skua pairs nested in the area. Encounters with Arctic Foxes were regular throughout the summer, and one pup was seen. The high Arctic Fox abundance caused low breeding success in waders (8-18% in common nesting species).

M. Y. Soloviev, V. V. Golovnyuk, T. A. Pronin

23. At the **lower Olenyok river** both the rodents and their potential predators were distributed unevenly. In the forest-tundra near Tyumyati settlement (71°37' N, 123°34' E), the spring thaw was followed by heavy snowfall (10 June) that completely carpeted the ground until 12 June. Apparently because of the snow, many clutches of waders were deserted (after the snow melted, abandoned incomplete Temminck's Stint and Pacific Golden Plover clutches with some cracked eggs were found). Subsequent wader nesting in the area was successful. Vole numbers were high and Rough-legged Buzzards and Short-eared Owls nested in the area.

Few Collared Lemmings were found down the Olenyok flow, on tundra near Taimylyr settlement (72°37' N, 121°52' E). Seventy km to the north-west, near Ust'-Olenyok settlement (72°59' N, 119°49' E) and on the islands in the Olenyok delta, high numbers of Collared and in some places Siberian Lemmings were recorded. Snowy Owls nested in the area. Four checked nests contained 4-5 egg clutches. Rough-legged Buzzards, Long-tailed and Pomarine Skuas nested as well. An active Arctic Fox den was found near Ust'-Olenyok settlement, and adult animals were seen as well. Wader breeding density was high. No nest predation was noted.

E. G. Lappo, E. E. Syroechkovski, Jr., K. Zöckler, T. Tree, M. Stensmyr

24a. In the **western part and the southern periphery of the Lena delta** numbers of lemmings and their potential predators were highly uneven. On the coast, 100 km east from Ust'-Olenyok, near Ystanakh-Khocho settlement (72°59' N, 121°43' E), population levels of both lemming species in the early summer were average and increasing. Pomarine Skuas began incubation only in early July. Long-tailed Skuas were common nesting and nomadic birds. Nesting waders were successful, although their numbers on the watershed tundra were not high. Lemmings were rare on islands adjacent to the Lena delta near the end of the Olenyok channel, while nesting of waders there went well.

Near the northern edge of the Primorski ridge, at the Stolb ("Pole" - *translator's comment*) field station (72°24' N, 126°49' E), no lemmings were seen during excursions in the first half of July. Avian rodent-eaters did not nest, very few wader broods were seen.

In the south-eastern part of the delta, on islands near Bykov Mys settlement (72°00' N, 129°07' E), single Siberian Lemmings were encountered and no avian predators nested. Many brooding waders were found. Instances of Herring Gull and skua predation on ducklings and attempts to catch wader chicks were noted.

E. G. Lappo, E. E. Syroechkovski, Jr., K. Zöckler, T. Tree, M. Stensmyr

24b. The **southern Lena delta.** On 17 June to 25 July, conditions near the Lena-Nordenskiöld research station (72° 11' N, 127° 04' E) were favourable for birds; average daily temperatures were above zero. The subsequent cooling that occurred from mid-July brought lows of down to -1.3° C. On 17 June, less than 10% of tundra was snow-covered. Heavy rains fell on 22 June (19 mm) and 17-22 July (15 mm). Lemming numbers were low, contrasting with Arctic Foxes which were rather common (regular sightings). Only one observation each of Snowy Owl and Peregrine was made. No Rough-legged Buzzards nested. The common predators foraging in the area were all three skua species, Herring Gulls, Glaucous Gulls, and Ravens. Research there was primarily directed at the Grey Plover, breeding density of which was *ca.* 1 pair/km² (0.8 - 1.7 pair/km²). Density of Pacific Golden Plovers was 2-3 times higher. Hatching success in 13 Grey Plover nests was 38.5% (predation rates = 46%). Fledging success was below 20%. Therefore, despite the fair weather conditions, the season turned out to be poor for waders.

K.-M. Exo, I. Hertzler, O. Stepanova

25. In the **central Lena delta** (Bykov channel) this was an average spring. Ice on the Lena broke early and was gone by 4 June with a modest water level increase. June was slightly warmer than usual. No abnormal weather events were noted. The population level of Siberian Lemmings was low. No Pomarine Skuas and Snowy Owls nested in the area. Rough-legged Buzzard breeding density (0.06 nest/km²) and success were low. Many dispersing Arctic Foxes were seen, their productivity was low (one and three pups in two dens). Grey Plovers and Dunlins nested at a high density: 2.6 pair/km² and 22.2 pair/km² respectively. Densities of Temminck's Stint, Red-necked and Grey Phalaropes were average: 7.4, 6, and 34 pair/km² respectively. No reproductive success data were collected but it was assessed as average.

D. V. Solovyeva, S. V. Volkov, V. I. Pozdnyakov, O. Gilg, B. Sabard, R. San



26. In the northern part of the Lena delta the spring was much colder than in normal years with the average temperature of the first half of June close to 0° C. The snow cover on the tundra remained until 25-28 June, channels opened up at an average time - 20 June - but the water level was low. Air temperatures in the summer were normal. The Siberian Lemming numbers were generally low, reaching medium or medium-high levels at some sites: during the snowmelt period up to three animals were seen at a time. Dead lemmings were found after the snow was gone and their numbers appeared to be dropping throughout the summer. Rough-legged Buzzards, Snowy Owls and Peregrines did not nest. No Arctic Foxes dens were noted, although the animals themselves were common. Pomarine Skuas nested only at the sites with medium lemming population levels at least; their density was 0.14 pair/km². Parasitic Skuas had the same density but nested throughout the surveyed area. Other commonly breeding species included the Grey Plover (1.1 pair/km²), Ruddy Turnstone (1.5 pair/km²), Curlew Sandpiper (3.1 male/km²), Little Stint (16.2 nest/km²), and Red-necked Phalarope (29.6 pair/km²). In the Grey Plover 37.5% of nests found produced chicks. An unusual occurrence for the Lena delta, was large flocks of Pectoral Sandpipers which appeared in July and were more abundant than all the other species.

D. V. Solov'eva, S. V. Volkov, V. I. Pozdnyakov, G. Aishorn, Yu. N. Sofonov, O. Gilg, B. Sabard, R. San

27. Near Tiksi, early June was associated with rapid melting of snow and relatively warm weather with few snow storms. All thawed patches bore signs of lemming activities but Siberian Lemmings themselves were fairly uncommon (were not seen daily). A Short-eared Owl, skuas and a Stoat were seen successfully hunting lemmings. No Snowy Owls were seen. Long-tailed Skuas established territories while Parasitic and Pomarine Skuas were only seen during passage. Common species included Pacific Golden Plover, Ruff, Red-necked Stint *Calidris ruficollis*, and Pectoral Sandpiper. Seeing territorial Curlew Sandpipers in the area was rather unusual. No lemmings were seen during brief excursions in mid and late July. Brooding waders were common.

E. G. Lappo, E. E. Syroechkovski, Jr., S. V. Volkov, K. Zöckler, T. Tree, M. Stensmyr

28. At the lower Indigirka (50 km north from Chokurdakh settlement) May and early June were rather cold (snow was gone by 10-17 June) but in the second half of June and July the air temperature was above average, without sudden cold spells which improved bird breeding conditions. The Indigirka opened up on 12 June, the water level was high and it remained that way atypically long - about one-and-a-half months. Large lakes became ice-free only on 8-12 July.

Wader migration was brisk but there was a slight delay in nesting initiation. Common breeding waders included Red-

necked and Grey Phalaropes, Pectoral Sandpipers and Ruff (large leks were formed). Temminck's Stints and Long-billed Dowitchers *Limnodromus scolopaceus* were less common but bred successfully. Normal breeding was discerned in Ross's Gulls *Rhodostethia rosea*, King and Spectacled *Somateria fischeri* Eiders, Long-tailed Ducks, Peregrine *Falco peregrinus* and passerines. Lemming numbers had increased compared with the previous year. During the first half of June, up to a dozen of these rodents could be seen on a single excursion, whereas only one-two animals were seen in July. Numbers of Arctic Foxes increased as well but had not reached their peak levels: up to two-three sightings per week were made and known dens were occupied. No Snowy Owls and Rough-legged Buzzards were found. Predation by Arctic Foxes, Snowy Owls, gulls and skuas was of medium intensity and caused no noticeable damage in nesting birds. Overall the season was favourable for breeding waders.

A. G. Degtyarev, N. G. Egorov, S. M. Sleptsov

29. Along the middle flow of the Bolshaya Chukoch'ya river (near Chayguurgino factory), Kolyma lowland, the end of June was cold. A short field trip revealed that the Siberian Lemming and Narrow-skulled Vole numbers were close to average, no Collared Lemmings were seen (uncommon in the area even in good years). Long-tailed and Parasitic Skuas as well as Rough-legged Buzzards nested in the area. No Snowy Owls were seen and one Arctic Fox was recorded. Common waders included Pectoral and Sharp-tailed *Calidris acuminata* Sandpipers and Red-necked Phalaropes.

I. V. Dorogoi

30. At the lower Bolshaya Chukoch'ya river, Kolyma lowland, the spring was prolonged (survey data): the river near Great Chukoch'ya factory opened at the end of the third week of June, *i.e.* a week later than normally and high water levels were observed on 19-20 June. During the observation period on 22-25 June no lemmings, Snowy Owls or Arctic Foxes were seen. Apparently four pairs of Long-tailed and three pairs of Parasitic Skuas nested within a 5 km radius of the factory. Numbers of common waders (both phalaropes, Grey Plover, Little Stint, Dunlin, Pectoral Sandpiper, Spotted Redshank) were an order of magnitude lower than in 1983-1985.

I. V. Dorogoi.

31. In Chaun lowland, local inhabitants indicated a prolonged spring and a cold summer which was confirmed by observations on 26-27 June. No lemmings, voles, owls or foxes were seen. One breeding pair of Parasitic Skuas was found. Common species (both phalaropes, Grey Plover, Ruddy Turnstone, Ruff, Temminck's Stint, Dunlin, Common Snipe, Long-billed Dowitcher) numbers were an order of magnitude below normal levels.

I. V. Dorogoi



32. At Cape Yakan (northern coast of Chukotka) the weather during the last days of June was very cold and windy. No lemmings or predators were noted. Common waders included Pacific Golden Plovers, Dotterel, Buff-breasted Sandpiper *Tryngites subruficollis*, Red-necked Stint and Dunlin.

I. V. Dorogoi

33a. In the Mys Schmidt area the snowy winter was followed by a cool summer or at least its first half. According to early July observations population levels of the Yellow-bellied *Lemmus chrysogaster* and Collared Lemmings were about average. Snowy Owls were numerous: a 10 km stretch of the road between Cape Ryrkarpi and the Chyornaya Rechka site yielded 65 birds and three nests. Long-tailed and Parasitic Skuas nested in the area; one potentially nesting Pomarine Skua pair was also observed. The most common waders included Ringed Plover, Grey Phalarope, Ruddy Turnstone, Red-necked Stint, Dunlin, Temminck's Stint, Pectoral Sandpiper and Common Snipe.

I. V. Dorogoi

33b. Near Mys Schmidt, the Arctic coast of Chukotka, the spring arrived early. By early June snow was absent not only from the lowland areas but from the northern mountain slopes as well. The weather throughout June was warm, without snowfalls or blizzards. Starting from mid-June, because of the breaking of ice in the Long Straight, coastal fogs, typical for the area, became more frequent. During short field trips to the environs of the settlement no lemmings were observed. Detailed searches for their active burrows on wet lagoon shores yielded nothing. At the same time breeding Snowy Owls were quite common. Some nests were located right on the outskirts of the settlement, hundreds of metres from multi-story apartment buildings and only dozens of metres from gravel roads with relatively heavy traffic.

M. S. Stishov

34. On Wrangel Island, the timing of the onset of spring did not differ from average annual values. Snowmelt began in early June soon after the heavy blizzards and negative temperatures of late May. The summer was warm with a small amount of precipitation, no snow and few foggy or windy days. The slump in lemming numbers continued for the second year in a row: during the second half of July in the central part of the island only one lemming was caught per 400 trap-days (a Collared Lemming of the summer generation). The abundance of rodent-dependent predators was low as well. Pomarine Skuas were absent completely, Long-tailed were very few (one nesting pair per 40 km² in the central part of the island). Two non-breeding Arctic Foxes were found in the same area. The entire territory of the island over the whole summer yielded only two Snowy Owl nests and their population density in the central part of the island was one bird

per 10-15 km². Owl nests contained only remnants of birds - waders and passerines. Due to the favourable weather conditions and low predator numbers, breeding success of common waders appeared to be good. In the Neizvestnaya river valley broods of Grey Plovers, Ruddy Turnstones and Dunlin were noticeable more common than usual.

M. S. Stishov.

35. At Belyaka spit of Kolyuchinskaya gulf there was little snow during the winter. The end of June was cold. Lemming numbers apparently were medium judging from the Arctic Fox litters, each of which had eight pups. One pair of Parasitic Skuas nested, and nomadic flocks of Long-tailed Skuas were seen. The high number of Arctic Foxes could be one of the reasons behind the low numbers of previously common wader species (Spoon-billed Sandpiper *Eurynorhynchus pigmeus*, Western Sandpiper *Calidris mauri*, Ruddy Turnstone, Dunlin).

I. V. Dorogoi

36. Eastwards from Providenia settlement (64° 26' N, 172° 30' E), southern Chukotka peninsula the weather conditions between 10 June and 25 August were warmer than usual (+9.9° C versus the average of +7.4° C). No other abnormal weather events were recorded. Numbers of large mammalian predators (foxes, wolves and brown bears) in the area are very low and herbivores are practically absent. In comparison with the previous decades, the intensity of track-based vehicle traffic on the tundra had dropped considerably. No lemmings were seen, prey collected by a Stoat family contained only voles. Arctic Ground-Squirrels *Spermophilus parryii* were common throughout the area but especially on south-facing slopes and in river valleys where their density reached 10-12 individuals/ha. No Snowy Owls and skuas were seen. Overall the situation was favourable for breeding birds. Nonetheless the wader density was extremely low: only two pairs of Ringed Plover and one of Mongolian Plover *Charadrius mongolus* were noted; according to Tikhomirov (1957) this is a typical situation for the area.

D. V. Karelin, D. G. Zamolodchikov

37. Around Krest bay, near Egvekinot settlement the winter was snowy and spring prolonged (survey data). Cold weather remained during the observation period in early July. Neither voles nor the always-rare lemmings were found. Rough-legged Buzzards or other raptors did not nest. Typical wader species (Ringed Plover, Red-necked Stint, Temminck's Stint, Mongolian Plover) were uncommon, while Pacific Golden Plovers, Dotterel, Spoon-billed and Baird's Sandpipers were not seen at all.

I. V. Dorogoi

38. Near Anadyr airport, the summer was colder and rainier



than in previous years, although the difference from the annual average values was not substantial. According to observations conducted on 8-9 July two skua species (Long-tailed and Parasitic) nested in the area. No lemmings were seen. High numbers of Ruff were noticeable, Red-necked Phalaropes, Whimbrel and Long-toed Stints *Calidris subminuta* were common. The spring water level along the middle Anadyr was very high - Markovo settlement was flooded. However, the lower part of the river was not affected.

I. V. Dorogoi, A. V. Kodratyev

DISCUSSION

After two years of decline in the number of reports on wader breeding conditions in the tundras of Russia, a reverse process finally took place: in 1997, information was received from 38 locations versus 27 in 1996. The best-described areas were Yamal and Taimyr peninsulas and the Lena delta; relatively numerous reports arrived from Chukotka but unfortunately most of these were sketchy due to the brief nature of field trips there. This year, no reports were received from Kola and Kanin peninsulas, and parts of the European Russia tundras (Bolshezemel'skaya), as well as Gydan and some high-Arctic regions of Siberia (Taimyr north from Byrranga mountains, Severnaya Zemlya, New Siberian islands).

Weather conditions of the spring and summer differed on both regional and local scales. In European Russia and northern Yamal, all researchers unanimously reported a late (even later than in 1996), cold and prolonged spring. In southern Yamal and most of Taimyr (except for the extreme north-west) quite the opposite was observed: a record early onset of spring events including the warm weather, snowmelt and de-icing of rivers took place. However, later on in southern Yamal and western Taimyr the warm period was followed by a sudden cold spell while in central and eastern Taimyr the early spring conditions held on. The spring in most of northern Yakutia, Chaun lowland and Krest bay (Chukotka) was late and prolonged. Elsewhere in Chukotka the situation varied locally.

In accordance with the weather conditions, a delay in wader breeding was observed in European Russia and at lower Indigirka. Apparently, these were the weather conditions that determined the widely reported suppressed population numbers of breeding waders throughout the European tundra to western Taimyr and in some locations in the Kolyma lowland and Chukotka. Increased breeding densities of some waders were reported from southern Taimyr, Lena delta and Anadyr.

During the summer, the weather was mostly cold and rainy in the European north, Yamal, and north-western Taimyr; it was normal or slightly warmer than usually almost everywhere to the east from Taimyr and was characterised by high temperatures and some dryness in most of Taimyr and on Wrangel. Instances of clutch desertion by small waders and

hatchling mortality due to the cold weather were noted on Yugorsky peninsula and Vaigach respectively. Persistence of deep snow cover on Yamal after snowfalls in late June - early July and north-western Taimyr in mid-June undoubtedly led to desertion of some wader clutches. Abandonment of early, incomplete clutches of some waders was observed during June snow storms at Olenyok river.

The start of the increase in lemming numbers noted in 1996 in central Taimyr and Lena delta was thought to precede a spread of a "lemming wave" through the surrounding areas. In reality, in 1997 a true rise in population levels of these rodents was noted in only a few locations south of the Byrranga mountains, Taimyr, and at the lower Olenyok river, Yakutia. By the start of the snowless season, a climb in the abundance of Siberian Lemming populations to medium levels also occurred on Yugorsky peninsula (European Russia), northern Yamal, west Taimyr (except the extreme north-west), in forest-tundra of southern Taimyr, near Tiksi and at lower Indigirka in Yakutia, and at Mys Schmidt on Chukotka. Local areas with considerable lemming population level gains remained in south-eastern Taimyr, Lena delta and Kolyma lowland. At the same time, almost all contributors indicated declining lemming numbers through the summer. Lemming depression continued in southern Yamal and Wrangel island. Voles were numerous in only four areas: middle Yamal, southern Taimyr, Olenyok forest-tundra and middle flow of the Bolshaya Chukoch'ya river in Yakutia.

An opinion has been expressed that the premature drop in lemming numbers in western Taimyr was connected with the return of cold conditions after an unusually early and very warm spell in April. The absence of an increase in rodent numbers on Vaigach island was possibly predetermined by the December warm spell. If the above-mentioned factors did indeed have an important limiting effect on rodent population numbers, then undoubtedly their influence could be felt much more widely in geographical terms.

Arctic Foxes were numerous at Pechora delta, on Vaigach and Yugorsky peninsula (European Russia), Taimyr (except the southern part), Lena delta, lower Indigirka, and Belyaka spit, Chukotka. In all these areas, except for Vaigach, north-western and south-eastern Taimyr and Lena delta, Arctic Foxes bred in numbers and successfully. Single incidences of denning which not always were successful were noted on Novaya Zemlya, middle Yamal, south-eastern Taimyr and Lena delta.

Population levels of rodent-specialising predatory birds were not high. Both Snowy Owls and Pomarine Skuas nested only at Olenyok mouth. Good numbers of nesting Snowy Owls were also noted at Mys Schmidt, Chukotka, single nests were found on Wrangel island and in central Taimyr. Nesting Pomarine Skuas were suspected or confirmed for northern Yamal, north-western Taimyr, northern and south-western



Lena delta, and Mys Schmidt. Their density was high only in the first area mentioned. Long-tailed and/or Parasitic Skuas nested at most study sites; however, nobody reported their numbers as high. Nesting Rough-legged Buzzards were abundant or common on Yugorsky peninsula, northern Yamal and the central tundra belt of Taimyr. Reports about small clutch size and low breeding success in this species came from areas with low and/or declining lemming numbers.

Wader breeding success, being dependent on climatic conditions and even more so on Arctic Fox and skua predation pressure, was described by correspondents as low or sometimes as medium-low to medium in some species for all of the western Arctic (west to Taimyr). Most reports from central and eastern Taimyr indicated medium or above medium wader breeding success values; only at the Bludnaya river was it low. The few reports from more easterly areas suggested a favourable season for waders there. To sum up: in the western part of the Russian tundra the outcome of this season's (1997) breeding in waders was poor; in the eastern part it was good. This picture is the reverse of what was expected.

A further increase in lemming numbers can be expected in 1998 at Indigirka, on Wrangel and some parts of Chukotka; it cannot be fully excluded for southern Yamal and some European regions. However, one should keep in mind the beginning of a decline of lemming numbers in almost all areas where their population levels were high and mass breeding of foxes in many areas. This suggests that in 1998 the predator pressure on breeding waders will remain uneven throughout the regions. It seems highly possible that in the Russian European north and western Siberia wader and other land-breeding birds will be much more successful in 1998 than in 1997 but will not reach the highest levels. In central and eastern Siberia productivity of birds will decline but not to its lowest. Therefore a medium level of breeding success is expected for the majority of the Russian tundra with possible considerable local variations.

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