Distribution of breeding waders in the north-east European Russian tundras

V.V. Morozov

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Among 21 wader species breeding in the Bol'shezemel'skaya tundra, Yugorskiy Peninsula and Vaigach Island, Ringed Plover *Charadrius hiaticula*, Temminck's Stint *Calidris temminckii*, Ruff *Philomachus pugnax* and Red-necked Phalarope *Phalaropus lobatus* are ubiquitous. The only known breeding records of Purple Sandpiper *Calidris maritima*, however, are from the arctic tundra of Vaigach Island. Turnstone *Arenaria interpres* do not breed further south than the north-western Yugorskiy Peninsula. Grey Plover *Pluvialis squatarola* occur near the Lower More-Yu River, up to 20 km from the sea, and on the western Yugorskiy Peninsula. The southern limit of the breeding range of Little Stint *Calidris minuta* is along the northern part of the southern tundra subzone. The southern limits of breeding Dunlin *Calidris alpina* and Dotterel *Charadrius morinellus* are in the southern part of the southern tundra subzone. The northern limits of the breeding ranges of Spotted Redshank *Tringa erythropus*, Common Sandpiper *Actitis hypoleucos* and Whimbrel *Numenius phaeopus* lie within the southern part of the southern tundra subzone. Terek Sandpiper *Xenus cinereus*, Great Snipe *Gallinago media* and Jack Snipe *Lymnocryptes minimus* occur up to the northern limit of the southern tundra subzone. In some years there are large numbers of the latter two species in the southern subarctic (typical) tundra subzone, but breeding has yet to be confirmed there. Wood Sandpiper *Tringa glareola* and Pintail Snipe *Gallinago stenura* breed as far north as the coast of the Yugorskiy Peninsula, except in extremely cold years, and Golden Plover *Pluvialis apricaria* and Common Snipe *Gallinago gallinago* also breed throughout Vaigach Island, although in some unfavourable years these species do not reach the southern limit of the arctic tundra subzone. During a recent range expansion, Pintail Snipe has reached the western coast of Yugorskiy Peninsula, the Khaypudyrskaya Gulf and the middle reaches of the Chernaya River. One case of breeding by Grey Phalarope *Phalaropus fulicarius* has been recorded on the western coast of the Yugorskiy Peninsula.

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Среди 21 вида куликов, гнездящихся в Большеземельской тундре, на Югорском п-ве и на о. Вайгач, галстучник *Charadrius hiaticula*, белохвостый песочник *Calidris temminckii*, турухтан *Philomachus pugnax* и круглоносый плавунчик *Phalaropus lobatus* встречаются повсеместно. Единственные регистрации гнездования морского песочника *Calidris maritima*, однако, известны только для арктической тундры о. Вайгач. Камнешарки *Arenaria interpres* не гнездятся южнее северо-запада Югорского п-ва. Тулесы *Pluvialis squatarola* встречаются у низовьев р. Море-Ю, до 20 км от моря, и на западе Югорского п-ва. Южная граница гнездовой области кулика-воробья *Calidris minuta* проходит по северной части южной подзоны тундры. Южные границы гнездовых ареалов чернозобика *Calidris alpina* и хрустана *Charadrius morinellus* находятся в южной части южной подзоны тундры. Северные границы гнездовых областей щеголя *Tringa erythropus*, перевозчика *Actitis hypoleucos* и среднего кроншнепа *Numenius phaeopus* лежат внутри южной части южной подзоны тундры. Мородунка *Xenus cinereus*, дупель *Gallinago media* и гаршнеп *Lymnocryptes minimus* встречаются до северной границы южной подзоны тундры. В некоторые годы последние два вида бывают многочисленными в южной субарктической (типичной) подзоне тундры, а гнездование их там еще не было подтверждено. Фифи *Tringa glareola* и азиатский бекас *Gallinago stenura* гнездятся к северу до побережья Югорского п-ва, кроме в крайне холодные годы, и как золотистая ржанка *Pluvialis apricaria*, так и обыкновенный бекас *Gallinago gallinago* также гнездятся повсеместно на о. Вайгач, хотя в отдельные, неблагоприятные годы эти виды не достигают южной границы подзоны арктической тундры. В течение недавнего расселения азиатский бекас достиг западного берега Югорского п-ва, Хайпудырской губы и среднего течения р. Море-Ю. Был зарегистрирован один случай гнездования полсконосого плавунчика *Phalaropus fulicarius* на западном побережье Югорского п-ва.

Introduction

Despite the large number of publications concerning either the regional bird fauna in general (Seebohm & Harvie-Brown 1876; Pearson 1898; Dmokhovsky 1933; Gladkov 1962; Uspensky 1958, 1965; Karpovich & Kokhanov 1967; Biancki & Krasnov 1987; Morozov 1987) or waders in particular (Estafiev 1991; Kalyakin 1988), wader distribution in the tundra of north-eastern European Russia has still not been studied in much detail. There are rather few breeding wader records with which to judge the exact limits of their breeding range; the scale of the annual variation in the location of the northern boundary of the ranges of several wader species is poorly known. Peculiarities in the distribution of many wader species in European tundras also need clarification, as well as the relationship of species' distribution to that of tundra subzones.

Therefore, we analyse here all the published data on the distribution of breeding waders in the tundra of European Russia, east of the Pechora river delta, together with the results of our field expeditions in 1981-1992.

Study Area

Our studies were conducted in the eastern Bol'shezemel'skaya tundra, on the Yugorskiy Peninsula, Vaigach Island and the Polar Ural mountains, northwards from the arctic circle to the northern edge of Vaigach Island, eastwards from 60-63°E to the Polar Ural watershed. Areas where data were collected in 1981-1992 are shown in Figure 1. As there is high habitat diversity (Figure 2), several tundra subdivisions are recognised in this area. In defining the different tundra subzones we use the terminology of Chernov (1975, 1985). The characteristic vegetation communities of the southern tundra subzone 'shrub tundra' in which there is a prevalence of circumpolar Dwarf Birch *Betula nana* and several species of willow (*Salix phylicifolia, S. lanata, S. lapponum, S. glauca*). They form different types of tundra according to the amount of Dwarf Birch and willow present in a three-layer structure (Gribova 1980 a,b). All the flat tops of hills and plains, which have poor drainage, as well as various geomorphological depressions, are covered with hillocky bogs, where low, bushy moss-lichen communities (*Ledum decumbens, Rubus chamaemorus, Polytrichum* spp., *Cladonia rangiferina*) have formed on the hillocks and sedge/cotton-grass/ *Sphagnum* associations (*Eriophorum* spp., *Carex rotundata, Sphagnum robustum, S. balticum*) are found in the pools (Rebristaya 1977). These hillocky bogs cover up to 13% of the area (Andreev 1954).

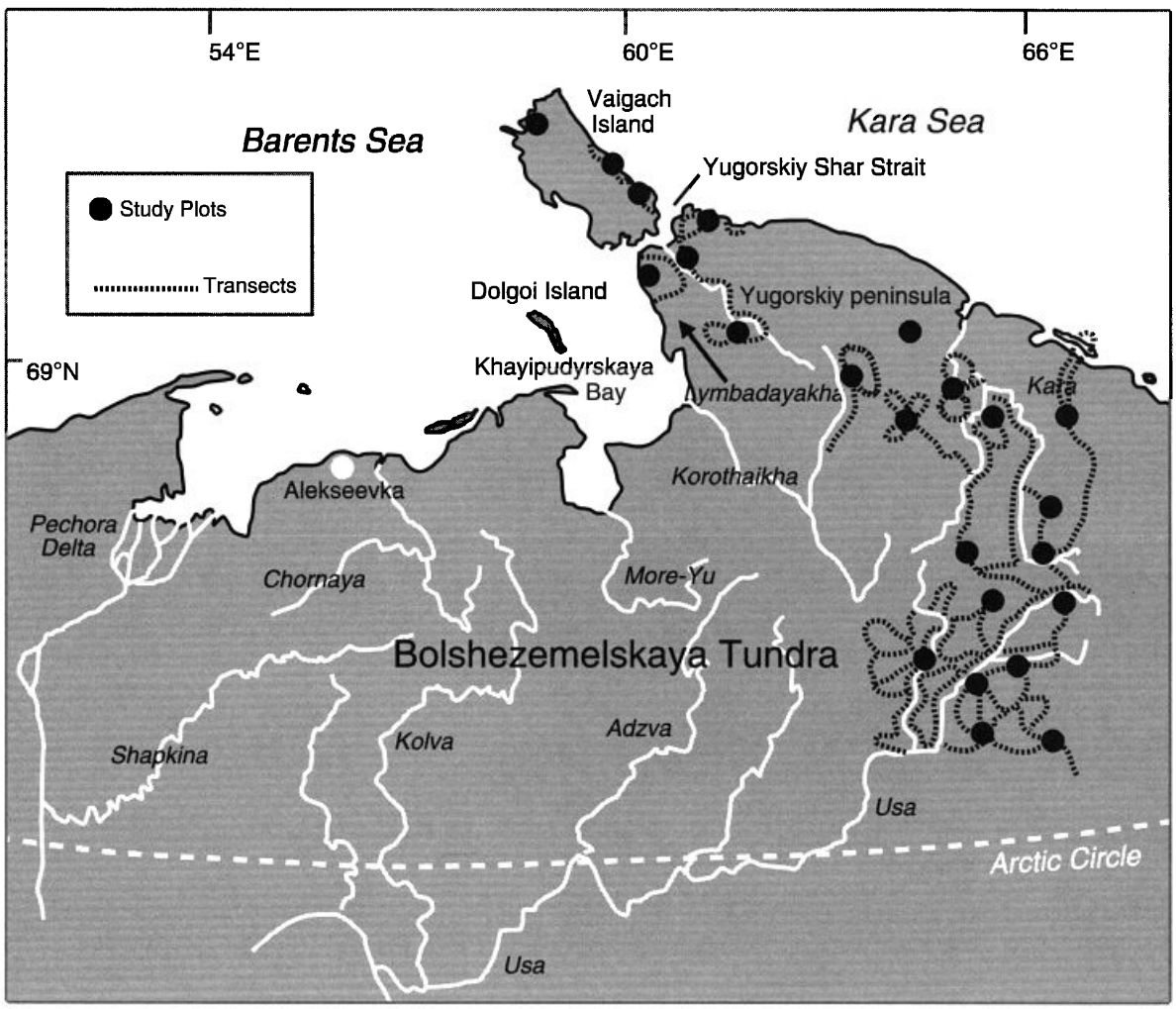

Figure 1. Study area in tundras of north-east European Russia.

In the river valleys, willow thickets with herb or sedge cover and flood-plain and slope meadows prevail. In the most sheltered places, flood-plain willow forests of *Salix dasyclados* up to six to seven metres in height have also developed (Vekhov & Uspensky 1959).

The southern tundra subzone is divided into two belts: adjacent to the forest-tundra is a belt of tall Dwarf Birches and further north there is a belt of smaller Dwarf Birches (Gribova 1977) (Figure 2). The plant communities of these belts differ from each other in the percentage cover of the shrub layer (60-70% in the tall Dwarf Birch tundra compared with 15-25% in the small Dwarf Birch tundra), in the height of indicator species (*B. nana* - 50-70 cm in the south and 25-25 cm in the north) and in the ratio of dominant plant species (Gribova 1980 a,b).

To the north of the southern tundra subzone is the typical tundra subzone (Figure 2). Plant vegetation here is represented by grass/moss, subshrub/moss, subshrub/lichen and sparse willow associations (Gribova 1980 a,b). Incomplete grass/moss and polygonal bogs are also widespread and on the Arctic Ocean coast, in areas where there are alluvial deposits, there are coastal meadows (Rebristaya 1977). Arctic tundra occupies the northern part of Vaigach Island. Plant vegetation in this subzone is represented mainly by prostrate arctic-alpine subshrubs *Dryas* spp., *Salix polaris*, sedges *Carex* spp. and cotton-grasses, *Eriophorum* spp. with an admixture of high-arctic plant species *Draba subcapitata, Ranunculus sabinii, Poa abbreviata*. Areas of bare ground and polygonal bogs are widespread, thickets of hypoarctic subshrubs *Vaccinium* spp. and Dwarf Birch *Betula nana* are totally absent on the flat uplands (Aleksandrova 1980).

In the Polar Ural mountains, in the coastal area of Pay-Khoy and along the ridges in the centre of Vaigach Island, there is alpine tundra, which varies from dwarf shrub/bilberry/moss tundra (*Betula nana, Vaccinium myrtillus, Polytrichum* spp., *Hylocomnium splendens*) to stony barren tundra with sparse vegetation and alpine belts.

Methods and Materials

During the study, attention concentrated on clarifying the status of different wader species in the region, *i.e.* whether they were breeding, migrating, vagrants etc. A species was considered to be breeding only when it was confirmed with records of nests and unfledged young. Anxiety behaviour and distraction displays were treated as evidence of breeding in only a few species (Plovers *Pluvalis* spp., Whimbrel *Numenius phaeopus*, shanks *Tringa* spp.). Brood patches were considered to be evidence of

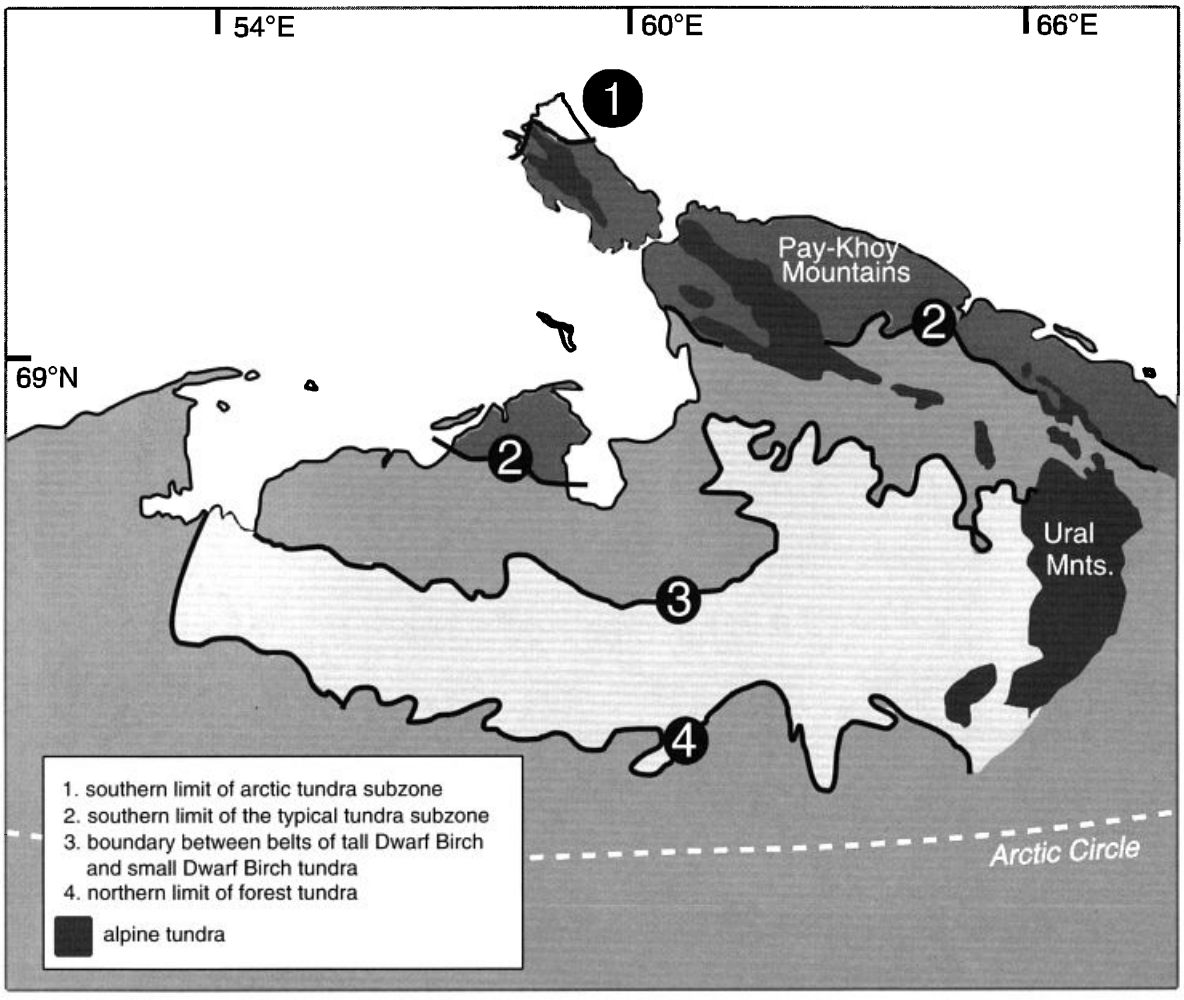

Figure 2. Natural zones in the study area.

breeding only if they were accompanied by observations of anxiety behaviour in the same birds. Male song-flights were not thought to be proof of breeding, because they are often carried out by unpaired or migrating birds. The latter is especially characteristic for shanks and snipe *Gallinago* spp.

The limits of breeding range are estimated mainly on the basis of confirmed breeding records, with the exception of a few species (Jack Snipe *Lymnocryptes minimus*, Great Snipe *Gallinago media*), in which it was always rather difficult to confirm breeding due to their low numbers and reticent behaviour. All published data were analysed using the same approach.

Results

In the tundra of European Russia east of the Pechora river delta, a total of 34 wader species have been recorded, 21 (62%) of which can be considered confirmed breeders. Among the breeding waders, Ringed Plover *Charadrius hiaticula*, Ruff *Philomachus pugnax*, Temminck's Stint *Calidris temminckii* and the Red-necked Phalarope *Phalaropus lobatus* are found throughout Bol'shezemel'skaya tundra, Yugorskiy Peninsula and Vaigach Island. However, there are some peculiarities in the distribution of other species.

Southern range limits

The southern range limits of six wader species occur within the study area.

Purple Sandpiper *Calidris maritima*

This is a species which is only typical of the arctic tundra on the northern and north-western parts of Vaigach Island and which apparently does not breed at the southern limit of this subzone. All nest and brood records occur from barren habitat types on the coastal parts of the island, similar in character to polar deserts. The species has also been recorded on the small nearby Chernyshova, Morozova and Oleny Islands (Uspensky 1958; Karpovich & Kokhanov 1967) (Figure 3). The record of Purple Sandpiper on 22 June 1984 at the Tonky cape of Yugorskiy Peninsula (Kalyakin 1988) is of great interest because the bird was behaving as though it had a nest. It is possible that it occasionally breeds in this area.

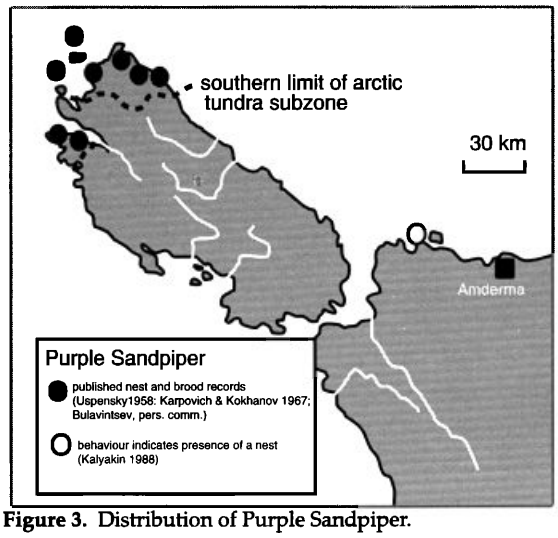

Figure 3. Distribution of Purple Sandpiper.

Grey Plover *Pluvialis squatarola*

The breeding range of the Grey Plover is not known precisely (Kozlova 1961; Cramp & Simmons 1983). Owing to the low number of breeding records, the exact distribution of this species has not yet been determined. Until now, it has been found in only three areas: in the tundra east of the village of Alekseevka, 68°35' N, 56°20' E (Seebohm & Harvie-Brown 1876); on the southern coast of Khaypudyrskaya Bay and in the lower More-Yu river within 20 km of the sea (Estafiev 1991); in the west part of Yugorskiy Peninsula in the Lymbadayakha and Bel'kovskaya river valleys (Uspensky 1965), near Chaika point (Estafiev 1991; Kalyakin pers. comm.) and near Pyrkov point (own data) (Figure 4).

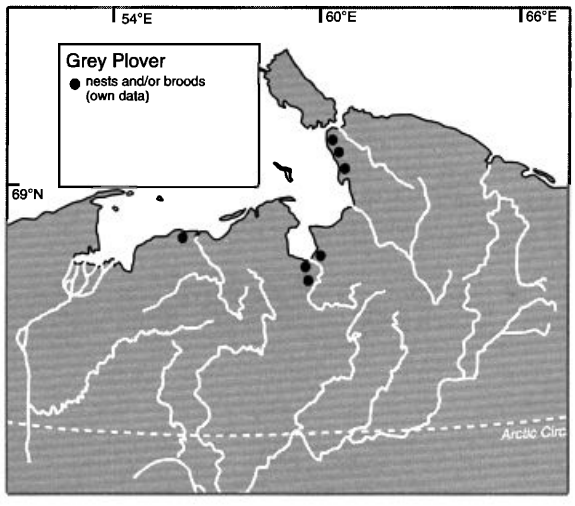

Figure 4. Distribution of Grey Plover.

Turnstone *Arenaria interpres*

Until now, Turnstone distribution in the European tundra has been poorly studied. According to Estafiev (1991), it has not been found breeding in the whole of the area between the White Sea and Yugorskiy Peninsula. However, on Yugorskiy Peninsula, Turnstones' nests were found at Chaika point near the mouth of Lymbadayakha river (Uspensky 1965; Estafiev 1991), near the Yugorskiy Shar polar station (this clutch is now at the Zoological Museum of Moscow University), and on the mainland tundra, 10-12 km south-east of Yugorskiy Shar strait (Kalyakin 1988). On the western coast of Vaigach Island it is considered by Kalyakin (1988) to be locally common, up to Bolvanskiy Nos point, although no nests or chicks were found. Nevertheless, far from the sea in the central part of the island he observed a brood (Kalyakin 1988) (Figure 5). I found Turnstones' nests in 1991 in the north-west of Vaigach on the Dolgaya Bay coast (Figure 5). Thus we can assume that the Turnstone breeds on all the western and northern coasts of Vaigach Island and also on the coasts of Yugorskiy Shar strait, up to the Lymbadayakha river mouth at Yugorskiy Peninsula.

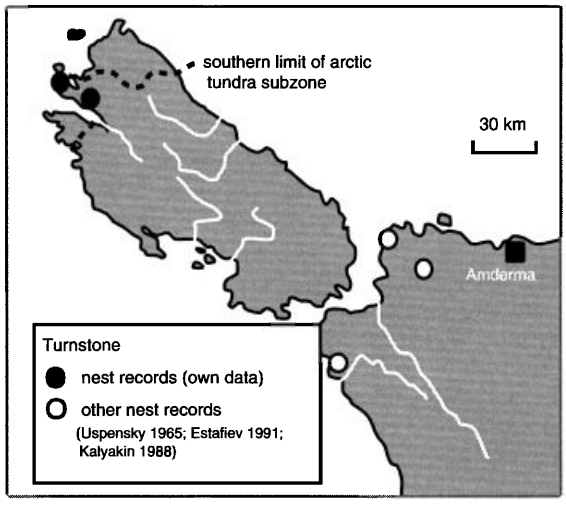

Figure 5. Distribution of Turnstone.

Little Stint *Calidris minuta*

The southern limit of the Little Stint's breeding range in the east European tundra lies within the small Dwarf Birch tundra belt of the southern tundra subzone, where it is a local breeder. The highest numbers are in the typical tundra of Vaigach Island, north-west and west of Yugorskiy Peninsula (Figure 6) (Pearson 1898; Uspensky 1965; Karpovich & Kokhanov 1967; Estafiev 1991).

Of particular note are the records of Little Stints alarming and showing elements of distraction displays in the southern tundra around Vorkuta (Estafiev 1991). Our long-term observations of alarming birds in this area showed that, unlike individuals near nests or broods, they were displaying in a different place every time, which were sometimes up to 100 m apart and covered with high dense shrubs through which chicks would not have been able to pass. These displays would last for 20 minutes to 1.5 hours before the birds would leave the area and fly away for apparently no reason. This behaviour was observed mainly in the middle of July, when the birds had obviously recently arrived in the study plots. We assume that they were failed breeders that had already started dispersing. At the same time they were still in

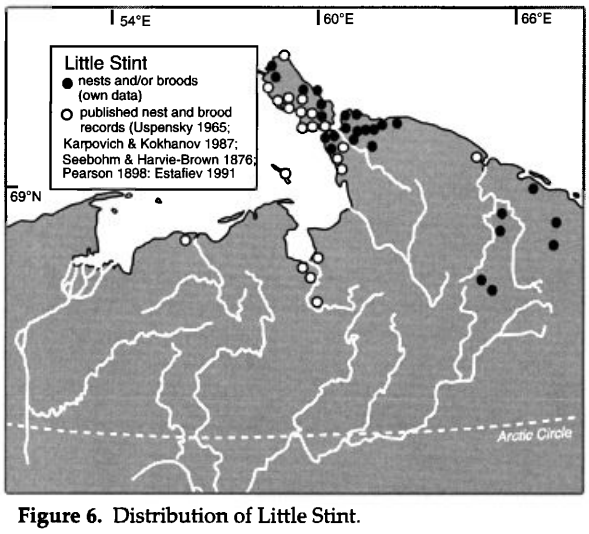

Figure 6. Distribution of Little Stint.

"breeding condition" such that, in the presence of an observer or predator, they would start alarming and even give distraction displays.

Similar observations were made for the Curlew Sandpiper *Calidris ferruginea* near the settlement of Amderma. Thus, the suggestion made by some colleagues that Curlew Sandpipers are probably nesting on Vaigach Island and Yugorskiy Peninsula (Estafiev 1991; Kalyakin 1988) are, to my mind, rather optimistic. Despite making a special attempt to find nests or chicks of Curlew Sandpiper, none have been found.

Dunlin *Calidris alpina*

The southern limit of the Dunlin breeding range, east of the Pechora river mouth, passes within the Dwarf Birch tundra belt (Figure 7), although this species, like the Little Stint, is common only in the typical tundra subzone. In the southern tundra subzone, it is rather common only in coastal areas, while on the mainland tundra it is an extremely rare breeding species. This can be explained by the lack of their preferred breeding habitat of large areas of cotton-grass/*Sphagnum* bogs with sparse cotton-grass.

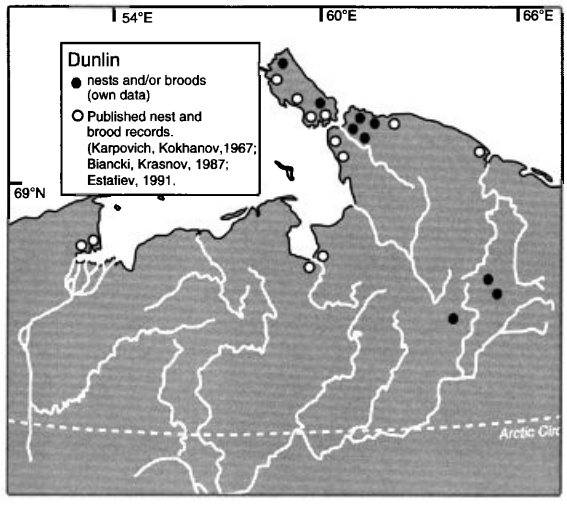

Figure 7. Distribution of Dunlin.

Dotterel *Charadrius morinellus*

On the plains of the Bol'shezemel'skaya tundra, Yugorskiy Peninsula and Vaigach Island, the general zonal patterns of distribution of this species (Figure 8) are similar to those of Dunlin, although in habitat preference they differ considerably (Karpovich & Kokhanov 1967; Morozov 1987; Estafiev 1991). The Dotterel also inhabits alpine tundras almost everywhere, penetrating southwards to the Northern Ural mountains (Kozlova 1961).

Northern range limits

The group of waders which have their northern range limits in the study region includes ten species. For Spotted Redshank *Tringa erythropus*, Common Sandpiper *Actitis hypoleucos* and Whimbrel *Numenius phaeopus*, the northern limit of the breeding range passes within the tall Dwarf Birch

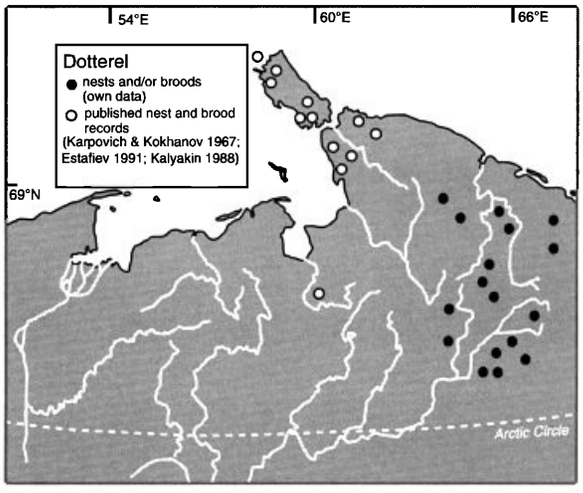

Figure 8. Distribution of Dotterel.

tundra belt (Figures 9-11). Common Sandpipers, which inhabit the river-valleys, are absent in interfluvial areas, penetrating to the tundra zone only along the large rivers with well-developed flood-plains. Fluctuations in the breeding range limits are also typical: during the study period they were absent from the tall Dwarf Birch tundra belt in 1981-1982, 1984 and 1986-1987.

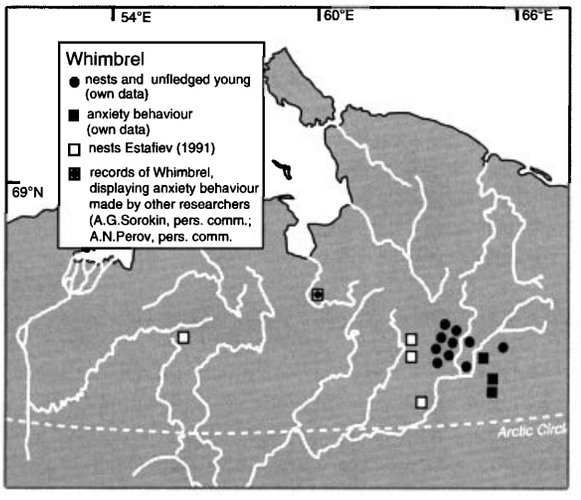

Figure 11. Distribution of Whimbrel.

We assume that two species, Great Snipe and Jack Snipe, breed as far north as the northern boundary of the southern tundra subzone (Figures 12 & 13). Great Snipe have been recorded before at least as far north as Pay-Khoy (Kertselli 1911) and we found the same during our studies. In the west of the Bol'shezemel'skaya tundra, both species occur as far

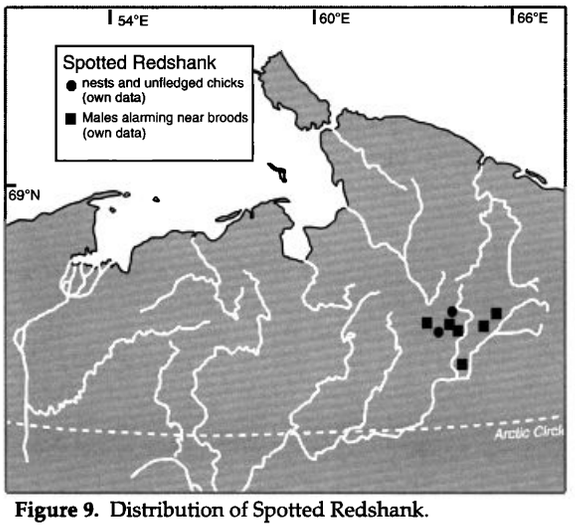

Figure 9. Distribution of Spotted Redshank.

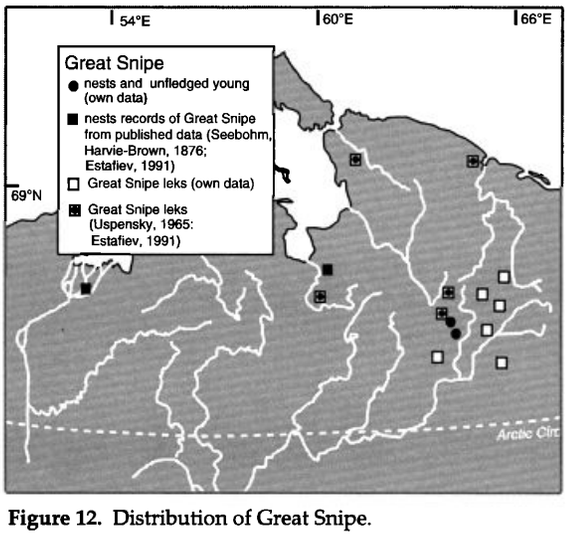

Figure 12. Distribution of Great Snipe.

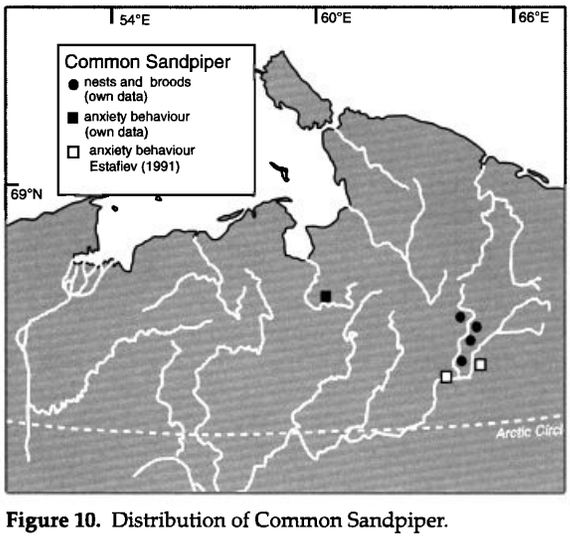

Figure 10. Distribution of Common Sandpiper.

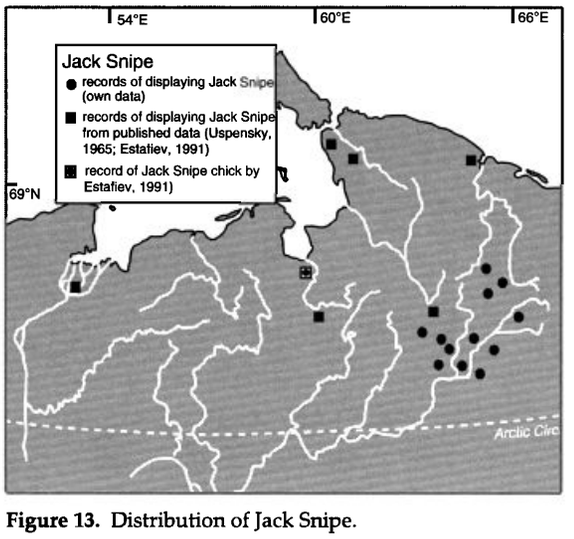

Figure 13. Distribution of Jack Snipe.

as the sea coast (Dmokhovsky 1933; Estafiev 1991), although there are still few records of nests and chicks. In some years, Great Snipe and Jack Snipe appear in noticeable numbers in the south of the typical tundra subzone (on the Yugorskiy Peninsula) but breeding has not yet been proved there (Estafiev 1991). I did not record a single individual of either species during my studies on the Yugorskiy Peninsula in 1988-1991.

Terek Sandpiper *Xenus cinereus* breeds only just south of the northern boundary of the southern tundra subzone (Figure 14), mostly inhabiting fairly wide river-valleys with well-developed flood-plain habitats. Its patterns of distribution are mainly determined by the presence of mudflats with willow thickets or meadows with sparse vegetation.

Wood Sandpiper *Tringa glareola* and Pintail Snipe *Gallinago stenura* occur as far north as the sea coast; although breeding of the latter species has not been yet been proved on the Yugorskiy Peninsula (Figures 15 & 16). In typical tundras and the northern part of the southern tundra subzone both species are locally common; in some extremely cold years (*e.g.* 1985, 1992) they do not penetrate to the typical tundra at all. The main areas which support

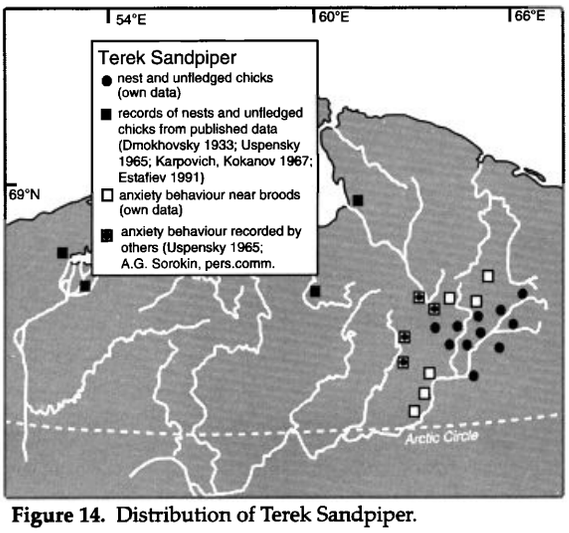

Figure 14. Distribution of Terek Sandpiper.

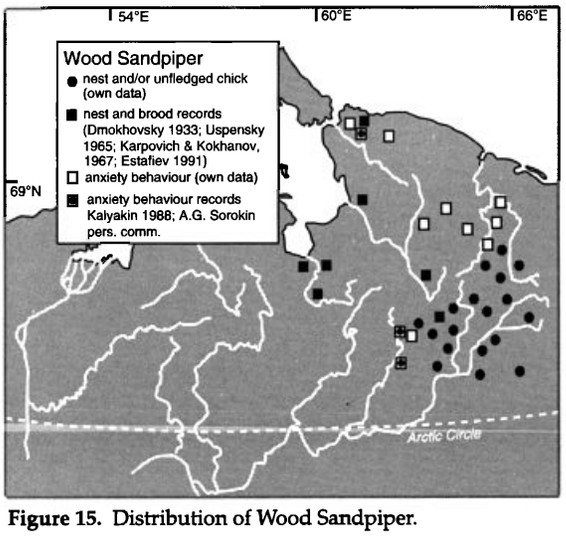

Figure 15. Distribution of Wood Sandpiper.

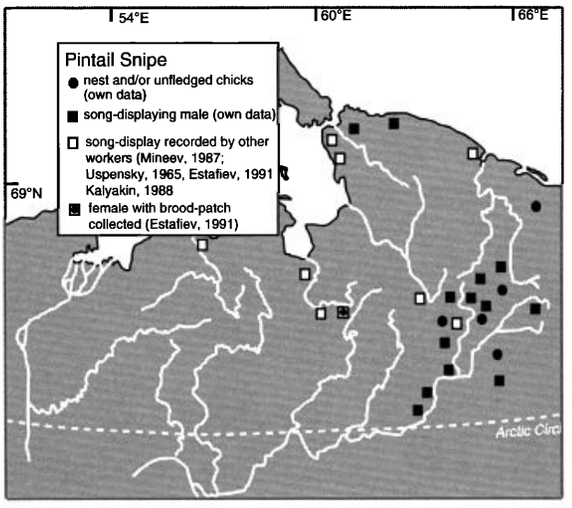

Figure 16 Distribution of Pintail Snipe.

high and stable numbers of these species are the tall Dwarf Birch tundra although Pintail Snipe only occupy areas close to the Ural mountains (67°-68°N).

Golden Plover *Pluvialis apricaria* (Figure 17) and Common Snipe *Gallinago gallinago* breed as far north as the northern coast of Vaigach Island, although in some unfavourable years they do not breed beyond the southern boundary of the arctic tundra (Kalyakin 1988). In the typical tundra of Vaigach Island and Yugorskiy Peninsula, even in the small Dwarf Birch tundra belt, Golden Plovers are rare and become common only in the tall Dwarf Birch tundra belt of the southern tundra subzone. Common Snipe have probably spread northwards up to the arctic tundras of Vaigach Island during the last 30-35 years. In 1957, Uspensky (1965) did not find it breeding to the north of Belyy Nos Cape (the Yugorskiy Shar strait); in 1960, Karpovich & Kochanov (1967) recorded displaying males near Amderma and in the south of Vaigach, but only autumn migrating birds were observed in the centre and north of the island. In 1986, the species was common up to the extreme north of the island and a nest was found near Dolgaya Bay (Kalyakin 1988). I proved that Common Snipe were breeding in the same place in 1991.

Western range limits

This group includes only two wader species, whose ranges only slightly penetrate the European tundras.

Pintail Snipe *Gallinago stenura* (Figure 16) had a more westerly distribution 35 years ago but did not occur further than 63°E (Uspensky 1965). It recently reached the western coast of the Yugorskiy Peninsula (Kalyakin 1988; our data), the middle reaches of the More-Yu river and Khaypudyrskaya Bay (Estafiev 1991) and the lower Chernaya river (Mineev 1988). Nevertheless, breeding records were made mainly in the area close to the Ural mountains. Only displaying males were observed to the west (Figure 16) although a female with a brood patch was collected near the Syabu-Yu river (Estafiev

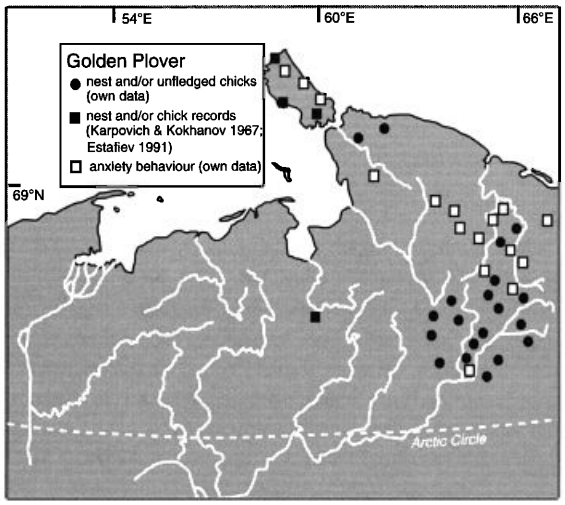

Figure 17. Distribution of Golden Plover

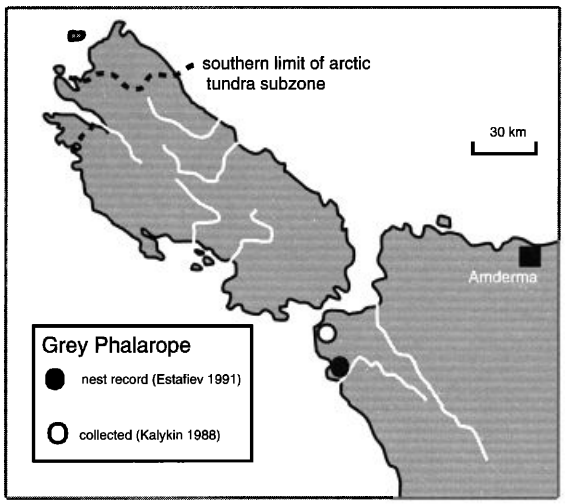

Figure 18. Distribution of Grey Phalarope

All known records of Grey Phalarope *Phalaropus fulicarius* (Figure 18) indicate that they do breed (Estafiev 1991; Kalyakin 1988), however, I treat them as occasional breeders.

Discussion

The characteristic distribution patterns of different wader species shown in Figures 3-10 only give a general picture and reflect the significant gaps in knowledge of wader distributions in the region. Lack of information from the western and central parts of the Bol'shezemel'skaya tundra and Yugorskiy Peninsula close to the Pay-Khoy and northern coasts, means that we are unable to plot the exact limits of the breeding ranges. It is possible only to outline them, mainly on the basis of our intuition rather than on the basis of concrete data.

Nevertheless we can confirm that for one group of species (Spotted Redshank, Terek Sandpiper, Purple Sandpiper, Dunlin and Whimbrel) the range limits are fairly stable because no fluctuations were recorded during the study period even in different weather conditions (early or late springs *etc.*).
A second group of species (Dotterel, Golden Plover, Wood Sandpiper, Common Sandpiper, Little Stint and Common Snipe) show slight fluctuations in the northern or southern breeding range limits following differences in spring weather, although they are less pronounced than on the Yamal Peninsula (Danilov *et al.* 1984).

A third group (Great Snipe, Jack Snipe and Pintail Snipe) have the sharpest fluctuations in northern range limits due to the expansion of numerous unpaired males into the typical tundra in some years.

Analysis of wader distribution for the last 10 to 30 years shows a slow expansion of the breeding range of Pintail Snipe to the west and of Common Snipe to the north.

Information about the distribution of Bar-tailed Godwit *Limosa lapponica* within the area from the Pechora river to the Ural mountains is still vague, despite the fact that the breeding range is shown as continuous across the region by Cramp & Simmons (1983). It is unclear what data this map was based on. As for the tundra and taiga zones of north-eastern European Russia, there are only a few records of this species and these are for the migration period only (Estafiev 1991). Thus, we assume that the breeding range is interrupted in the area from the Kanin to Yamal Peninsulas. Unfortunately, we cannot prove this opinion, as the forest-tundra zone of European Russia is still one of the least ornithologically studied regions.

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