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Volume 97, 1997
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Breeding Distribution, Migrations and Conservation Status of the Great Knot *Calidris tenuirostris* in Russia

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Summary: All known published and unpublished Great Knot *Calidris tenuirostris* breeding records, and probable breeding indications, have been reviewed. For 15 sites, breeding is confirmed by nests or unfledged chicks. The available information allows a general delineation of the breeding range to be made, although in some cases this is very approximate. The species occupies alpine and sub-alpine habitats in north-east Siberia and north Far East Russia at, and above, the upper tree line, at altitudes below 1000 m asl in the eastern half and usually above 1000 m asl in the western half of the breeding range. Vegetation mapping is used to assist in defining the probable breeding range. Literature, specimens and unpublished data from several observers are used to characterise the migrations of Great Knot within the Russian part of the East Asian–Australasian Flyway. On northward migration, birds pass non-stop through the region for a few days in late May; a limited

number of emergency stop-over sites have been identified. In contrast to previous views, only a few non-breeding Great Knots occur on the Russian Far East coast. Post-breeding migration starts in late June and seems to occur in three waves in the northern Sea of Okhotsk up to early September. There are indications that non-breeders, failed breeders and females migrate southward first, followed by males which have bred successfully. The final wave consists of young birds. In the more southern regions, the first migration wave is not pronounced, and migration of young birds lasts through October. Estuaries and bays in the north-eastern and north-western parts of the Sea of Okhotsk and in northern Sakhalin Island are very important staging areas on southward migration. These are almost certainly being used for refuelling before long non-stop flights further south towards Australia.

The Great Knot *Calidris tenuirostris* is one of the most numerous wader species in the East Asian–Australasian Flyway with an estimated population size of 319 000 (Watkins 1993) but very little has been published about its breeding distribution and biology (Cramp & Simmons 1983). Only three nest records have been published to date (Schaaning 1954; Andreev 1980; Flint et al. 1980; Kistchinski 1980). As a result, the breeding distribution is poorly known. Breeding distribution maps published in non-Russian literature (Hayman et al. 1986; Marchant 1986; Lane 1987; Pringle 1987) resemble that given in Johnsgard (1981), which was based on information supplied and later published by Kistchinski (1988).

Much valuable information on the migration routes and non-breeding distribution of the Great Knot has been obtained through the banding activities of the Australasian Wader Studies Group. However, while band recoveries have been obtained from throughout the migration range, the proportion north of China is small (Lowe 1989; Dettman 1993, 1995).

Recently, additional data on breeding records and migratory movements within Russia have become available through the author's own research activities

and from additional published and unpublished information obtained through contacts between the author and other Russian ornithologists. Important data have also been taken from bird skins in the following collections: British Museum of Natural History (BMNH), Zoological Institute of the Russian Academy of Sciences (ZIR) in St Petersburg, Institute of Biology and Pedology of the Russian Academy of Sciences (IBPR) in Vladivostok, Institute of Zoology of the Academy of Sciences of the Ukraine (IZU) in Kiev, Zoological Museum of Moscow University (ZMMU), Geography Faculty of Moscow University (GFMU) and the Moscow Pedagogical State University (MPU).

The aim of this paper is to summarise the available information on the breeding distribution and migratory movements of Great Knots in Russia and from this information determine the most important areas for conservation.

Breeding distribution

Nests and/or non-fledged chicks from 15 sites scattered through the mountains of north-east Siberia have now been located and their positions are shown in Table 1

Table 1 Breeding records for Great Knots.

No.*	Date	Observation	Altitude, m asl	Source
1	15/6/87	Pair		Dorogoi 1991
2	9-10/6/76	Three and one birds		Tomkovich & Sorokin 1983
3	14/7/70	Male with large brood patches collected		ZMMU; Tomkovich & Sorokin 1983
4	15-24/6/75	Singing males; pairs; birds with brood patches	300-450	Kistchinski et al. 1983
5	13/6/76	Nest with eggs	400-850	Flint et al. 1980 Kistchinski 1980
6	19/7/76	Unfledged chick	450	Kistchinski 1980; PT pers. obs.
7	30/6/71	Male with brood patches collected, probably near nest		GFMU; Kolonin 1980
8	12/7/32	Downy chicks	480-580	Portenko 1933
9	27/6/93	Downy chicks	550	PST pers. obs.
10	30/6/87	Nest with eggs	660	V.G. Krivosheev, in litt.
	12/6/93	Nest with eggs	650	PST pers. obs.
	1-31/7/93	Unfledged chicks from 13 broods	640-800	PST pers. obs.
	4-28/6/94	Five nests	650-740	PST pers. obs.
	28/6-2/8/94	Downy chicks from 21 broods	500-760	PST pers. obs.
	30/5-21/6/95	Seven nests	500-660	PST pers. obs.
	26/6-30/7/95	Chicks from 21 broods	500-760	PST pers. obs.
11	9/7/81	Two alarming males (with brood patches) were collected, probably near broods	600-1000	Artyukhov 1990
12	14-15/6/88	Singing males, pairs	700-800	A.I. Artyukhov, in litt.
13	28/6/91	Pair		Dorogoi 1993
14	6/7/84	Half-grown chick collected		Kretchmar et al. 1991
15	21/7/88	Two broods with fledglings	650-700	A.I. Artyukhov, in litt.
16	19/6/17	Nest with eggs		Schanning 1954
	7/7/92	Distraction displays	350	Holohan & Schmidt 1993
17	20/6/91	Four pairs attacking a bird of prey		G. Th. de Roos, in litt.
	22/6/92	Five nests with eggs	600-650	S.I. Mochalov, in litt.
	5/7/93	Four broods with downy chicks		S.I. Mochalov, in litt.
	26/6/95	Brood of downy chicks		S.I. Mochalov, in litt.
	14/6/96	Three nests with eggs	800	S.I. Mochalov, in litt.
18	29/6-1/7/74	Downy chicks		Kretchmar et al. 1978
	10/6/77	Nest with eggs	550-700	Andreev 1980
	30/6/77	Downy chicks		Andreev 1980
19	16/7/59	Unfledged chicks	350-500	Portenko 1964
20	10-11/7/76	Downy chicks		Lobkov 1983, 1986
21	28/7/63	Half-grown chicks	1000	Kistchinski 1968
22	12/7/64	Downy chicks	1100-1500	Kistchinski 1968
23	29/6/89	Downy chicks	1600	V.V. Kontorschikov, in litt.
24	c. 26-28/6/86	Nest with eggs		S.O. Maksimov, information from A.A. Nazarenko, in litt.
25	24/6/58	Male with brood patches, collected from a pair	1300	Vorobiev 1963
26	5/6/56	Male with brood patches, collected from a pair	c. 1000	Vorobiev 1963
27	22/6/91	Two pairs		G. Th. de Roos, in litt.
28	11-23/6/77	Voices and a pair		Tomkovich 1988
29	5-7/6/96	Pairs, singing males	500-700	E.E. Syroechkovsky Jr., in litt.
30	9 and 15/6/96	Distraction displays, singing males		E.E. Syroechkovsky Jr., in litt.

* See Figure 1 for locations.

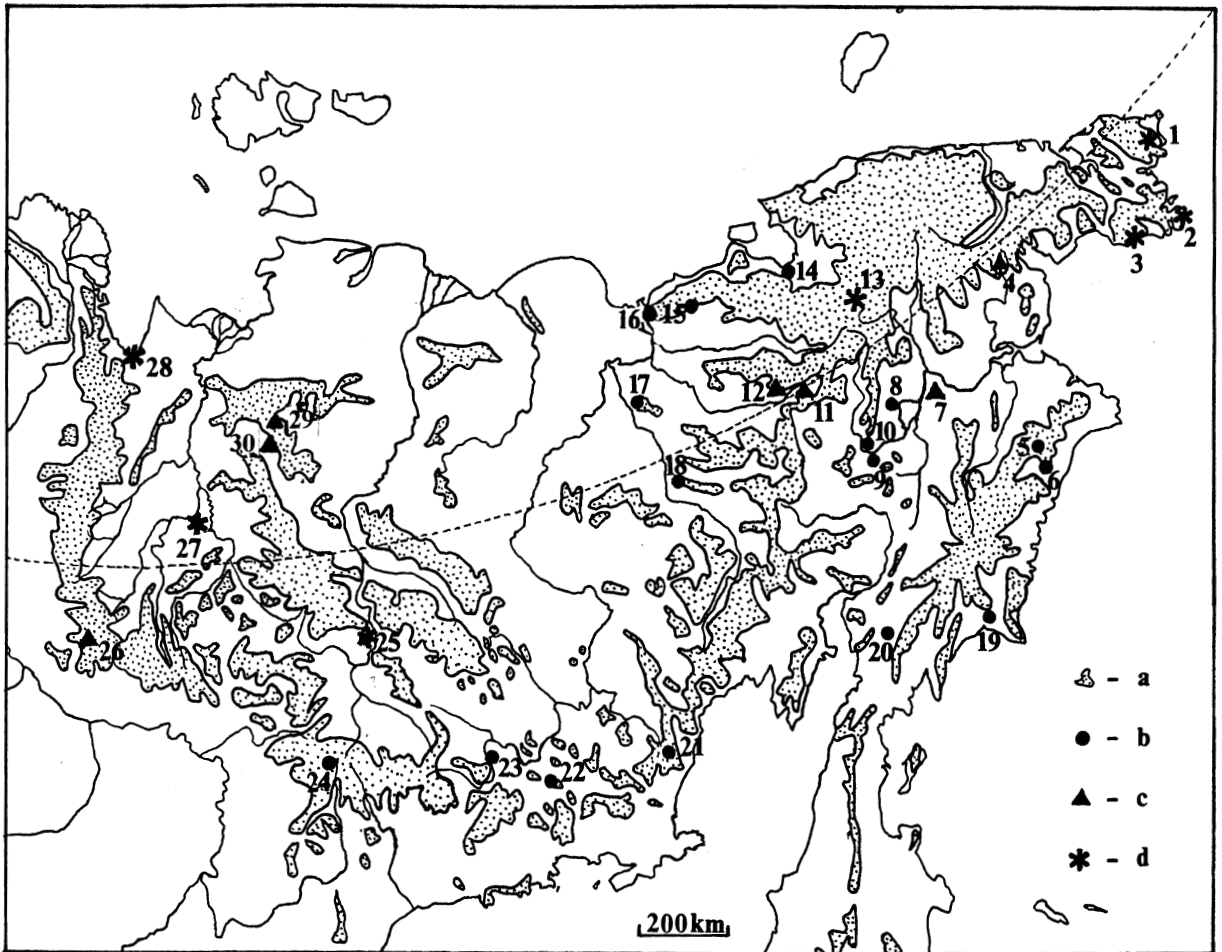


Figure 1 Mountain tundra in East Siberia and the Russian Far East, according to Sochava (1960) and the breeding distribution of the Great Knot. For details and references see Table 1. Key: a, mountain tundra; b, records of nests and/or unfledged chicks; c, localities of highly probable breeding; and d, other records indicating at least close proximity to breeding. Dashed line = Arctic Circle at 66.5°N latitude.

and Figure 1. An additional eight sites showed strong indications of breeding activity, involving observations of adults singing or alarming, probably near broods, and the collection of birds with large brood patches early in the breeding season. A further seven localities, where pairs, or numbers, of adults were observed during the prime incubation period (9–28 June), are possibly within or close to breeding sites. In total, 26 nests with eggs are known, including 13 found in a single area during a special study of the species during 1993–95 (PST unpubl. data). However, observations of chicks are more common because the secretive behaviour of

incubating adults changes to very conspicuous behaviour when chicks are present (Portenko 1933; Flint et al. 1980; PST pers. obs.).

Although a specialised analysis is needed to determine the specific habitat requirements of the species during the breeding season, it is possible, using current knowledge, to provide broad details. Birds occupy plateaux, level mountain tops or broad terraces and avoid mountains with sharp, rocky tops and steep slopes. They can use desert-like stony habitats with clumps of impoverished vegetation at high altitudes (Kistchinski 1968), as well as areas with thick lichen

Table 2 Localities of new Great Knot records within the breeding range.

No.*	Geographic description	Coordinates
9	Upper Anadyr River, c. 5 km SE of the Travka River mouth	64°47'N, 168°58'E
10	Upper Anadyr River, from c. 4 km E of Balaganchik River to 15 km NE of Balaganchik River mouth	64°55'N, 168°35'E
12	Yagel'naya Mountain, Orlovsky range, upper Bolshoj Anyuj River basin	66°50'N, 166°30'E
15	Middle Attykeveem River, tertiary tributary of Malyj Anyuj River	68°55'N, 164°25'E
17	SW part of Kur'insky Kryazh range, sources of tributaries of the Omolon River	67°50'N, 159°30'E
23	Kulu River basin, Kontaktovy Stream, c. 10 km from Kulu settlement	61°50'N, 147°42'E
24	Aldan River basin, source of the Vinto-Khaliya River	62°20'N, 140°20'E
27	Yana River basin, c. 40 km SE of Batagai settlement	67°25'N, 135°30'E
29	Indigirka River basin, Selennyakh Range, near Deputatsky settlement	69°20'N, 139°50'E
30	Indigirka River basin, near Tirekhtyakh settlement	68°50'N, 139°20'E

* See Figure 1 for locations.

cover and scattered depressed larch trees *Larix dahurica* and dwarf pine trees *Pinus pumila* at the upper tree line level (Andreev 1980; PST pers. obs.).

Suitable habitats can be found both north and south of the present known latitudinal limits of the breeding range. Reasons for their lack of use are not known. Kistchinski (1988) considered that the ecological niche of the Great Knot on the northern Chukotski Peninsula is occupied by the congeneric Red Knot *C. canutus*. However, the breeding ranges of both species overlap significantly in northern Far East Siberia (see Dorogoi & Kretchmar 1992 for Red Knot breeding range in the region), thus ruling out niche competition as an explanation in this case.

The available data on altitudinal distribution (Table 1) are insufficient for statistical analysis. However, two trends are clear. The first is that birds closest to the coast inhabit lower altitudes than those further inland. Second, in most cases nesting altitude increases from north to south. Both of these trends are most probably related to the altitudinal distribution of suitable breeding habitats, which are correlated with the cooling effect of the sea and latitudinal climatic differences. It is of note that within the eastern half of the breeding range Great Knot generally nest at altitudes of 300 to 800 m asl (with the exception of site 11, which was at 1000 m asl, Fig. 1), while in the western half of the range they usually nest at 1000 to 1600 m asl (with the exception of site 29 and, possibly, site 30, which are at lower altitudes). These observations agree well with previous comments that Great Knot inhabit mountain

tundra at altitudes varying between 350 and 1700 m asl (Kistchinski 1988). That some breeding records apparently fell outside habitat described as mountain tundra (Fig. 1) was found to be an artefact of the small scale vegetation map used, in which relatively small mountain massifs or tops with mountain tundra were not shown.

The locations of the unpublished records in Table 1 are given in Table 2. These recent records assist in defining the northern and southern limits of the breeding range. However, much still remains to be learnt. In particular, there are no records from the north-eastern limit, on the Chukotski Peninsula, or the central and northern limits of the western half of the breeding range. It can be presumed, on the basis of a few late May (Kapitonov 1962) and June (Labutin et al. 1988; Tomkovich 1988) records from the area close to the Lena Delta, that the enormous Verhoyansky Mountain Range, along the Lena River, is also occupied by breeding Great Knots. It can be safely predicted that the species' breeding range extends over most mountainous areas with mountain tundra habitats shown in Figure 1, in between those already known or presumed breeding sites.

Most human settlements in sparsely inhabited north-eastern Siberia and the northern Far East are situated on the coast and in valleys of large rivers, areas which are rich in natural resources and allow water-based transport. The mountain ridges are of little interest for the majority of the population as they are difficult to walk over and, in most cases, are not directly accessible from

the villages. These factors explain why the mountains are not often visited by the general public and are the areas least explored by ornithologists. In addition, the secretive nature of nesting Great Knots, coupled with their patchy distribution and the general lack of bird studies within the region, accounts for the low number of breeding records for this numerous and widely dispersed wader.

Northward migration

On passage to their breeding grounds, Great Knots first appear on the sea coasts of southern-most Far East Russia (Appendix 1 and Fig. 2). However, considerable disagreement exists between the data of different observers on dates and bird numbers in the region. Apparent anomalies in the data most probably result from

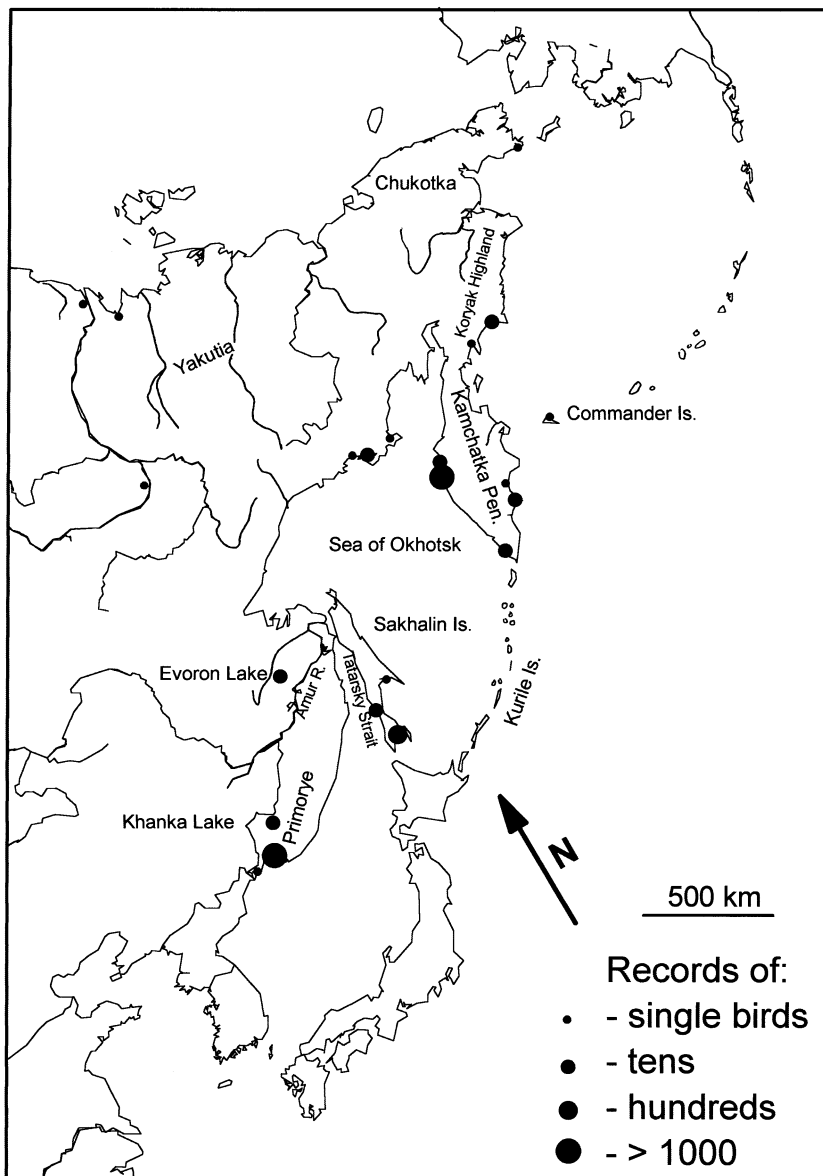


Figure 2 Locations of records and numbers of Great Knots during northward migration.

large year-to-year variations in these characteristics. Omelko (1971) stated that Great Knot numbers varied between nil and abundant over different years. There are no other spring records of Great Knots further north on the mainland coasts of the southern Far East; however, there are two inland lakes where the species has been observed.

On Sakhalin Island, Great Knots have occurred regularly on northward migration only in the south. There are few northern spring records from the Kurile Islands, eastern Kamchatka Peninsula and Commander Islands and, thus, these areas are not on the main migration route.

A different situation occurs on the western coast of the Kamchatka Peninsula, where Great Knots appear regularly in large, but varying numbers. They are known so far from only three localities, but can be expected anywhere on mudflats, at least in the central and northern parts of the peninsula. On the northern coasts of the Sea of Okhotsk, Great Knots have not been recorded in the north-west corner and, in particular, they are absent during May in Tugursky Bay (Pronkevich in press). Close to Magadan they probably appear regularly in small numbers. Possibly the same situation occurs on the coast of the southern Koryak Highland.

No more northern spring coastal records are known. Information on arrival dates on the breeding grounds was only obtained for the first time in 1995 (PT unpubl. data). However, there are several spring inland records within, or close to, the breeding range in Yakutia and Chukotka, which may provide additional indications of the arrival period. There are also records of single Great Knots on 26 May 1977 at St. Paul Island, Bering Sea, and on 28 May 1922 on the Seward Peninsula, Alaska (Kessel & Gibson 1979), which are most probably of birds which have overshot the breeding grounds.

The available information on dates is summarised in Table 3 and shows a tendency for passage duration to shorten from south to north primarily due to latitudinal differences in ice and snow conditions (i.e. a shorter snowless period further to the north). Coastal sand and mudflats in the southern Primorye region are the only suitable (ice-free) areas for waders early in the season and it is only here that Great Knots are found in small numbers throughout April and early May. The few early May birds on Sakhalin Island and the Kamchatka Peninsula should be considered as vagrants, with normal passage starting there in the second half of May. The similarity of the main passage dates in different regions is striking and implies that the main migration

Table 3 Dates of northward migration of Great Knots in different regions of the Russian Far East

Region	Range of dates	Period of main migration
Coasts of Primorye	3 April–4 June	20–23 May
Khanka Lake	22–23 May	
Evoron Lake	2nd half of May	
Coasts of Sakhalin Island	9 May–1 June	21–30 May
Inland Sakhalin Island	22–23 May	
Magadan	25 May–1 June	
Kamchatka	7 May–6 June	20–29 May
Coast of Koryak Highland	28 May–5 June	
Breeding range arrival	22 May–early June	22–23 May

across the whole region is occurring over a few days in the last third of May, almost without staging. Such a conclusion is supported by observations of Great Knot concentrations only during unfavourable weather conditions (Gerasimov 1980; Nechaev in press). It is also interesting to note that all records from inland lakes, both on the mainland and Sakhalin Island, coincide with the main passage period.

Non-breeding birds

It is generally believed that large numbers of non-breeding Great Knots spend the northern summer on the coast of the Sea of Okhotsk. This opinion is based on observation of flocks in July (e.g. Middendorf 1853) but some birds have been recorded in June as well (e.g. Shulpin 1936; Lobkov 1986; Kistchinski 1988). Within the breeding range, non-breeders cannot be easily separated from failed breeders or from flocking breeders. Possibly the June Alaskan records (Kessel & Gibson 1979) are of non-breeders.

Some specimens and observations can be either definitely or probably assigned to non-breeders being found outside the breeding range during the incubation period. These are summarised in Figure 3 and Appendix 2. It can be seen that there are only a few such records, which are scattered broadly along the coasts of the region.

During regular May to October 1990 counts of the inter-tidal area of Tugursky Bay (north-western Sea of Okhotsk), Great Knots were completely absent in May and June but started to arrive in large flocks from the north on 3 July (Pronkevich in press). Observations of

tens of birds at the end of June and very early July on the western Kamchatka Peninsula are possibly of Great Knot concentrating after breeding. These data correspond to the first departure dates from breeding grounds (see Table 4 and Appendix 3). Even the flock of five birds seen in Karaga Bay on 26 June might have indi-

cated the start of movement from nearby mountains to the coast.

Thus, July flocks are unlikely to consist of mainly non-breeders, although it is possible that some may be present.

Southward migration

All observations, to date, from the breeding grounds indicate that only one adult takes care of chicks, and in all cases where such birds have been collected they were males (Portenko 1933; Kistchinski 1968, 1980, 1988; Artyukhov 1990). This explains why females (together with non-breeders and failed breeders) depart first, followed by males that have successfully bred and then by young birds (see Appendix 3). The very few adult males still present on the breeding grounds at the very beginning of August were caring for chicks from late egg clutches (PST pers. obs.). Thus, in those cases when ageing was possible, only young birds were recorded within the breeding range in Chukotka and on the Koryak Highland in August. No data about post-breeding movements of Great Knots are available from Yakutia. Few records are known for coastal Koryak Highland, the eastern Kamchatka Peninsula and the Commander Islands on southward passage.

Great Knots are numerous (thousands of birds) on the western side of Kamchatka, based on occasional July counts. According to Gerasimov (Gerasimov et al. 1992; Gerasimov & Gerasimov in press) and Lobkov (1986) these flocks precede the main passage, which occurs in mid-August, but no exact figures exist. Many fewer birds were found close to Magadan on the northern coast of the Sea of Okhotsk, although they are quite common there in suitable places. Contrary to northward migration, Great Knots are rather common on the Kurile Islands on southward passage and even abundant in the north-western corner of the Sea of Okhotsk. Interestingly, a flock has been seen on the treeless peak of Val mountain, north-eastern Sakhalin, showing that some migrating Great Knots maintain an association with habitat resembling their breeding one.

The data from Chaivo Bay, Sakhalin Island, show the increase in numbers during the first two thirds of July. Other large flocks were also recorded during the second ten-day period of July in Dagi and Nabilsky Bays. These records mark the first wave of southward migration. The second wave starts in the first ten-day period of August, when reasonable numbers of adult Great Knots have been found on northern and southern

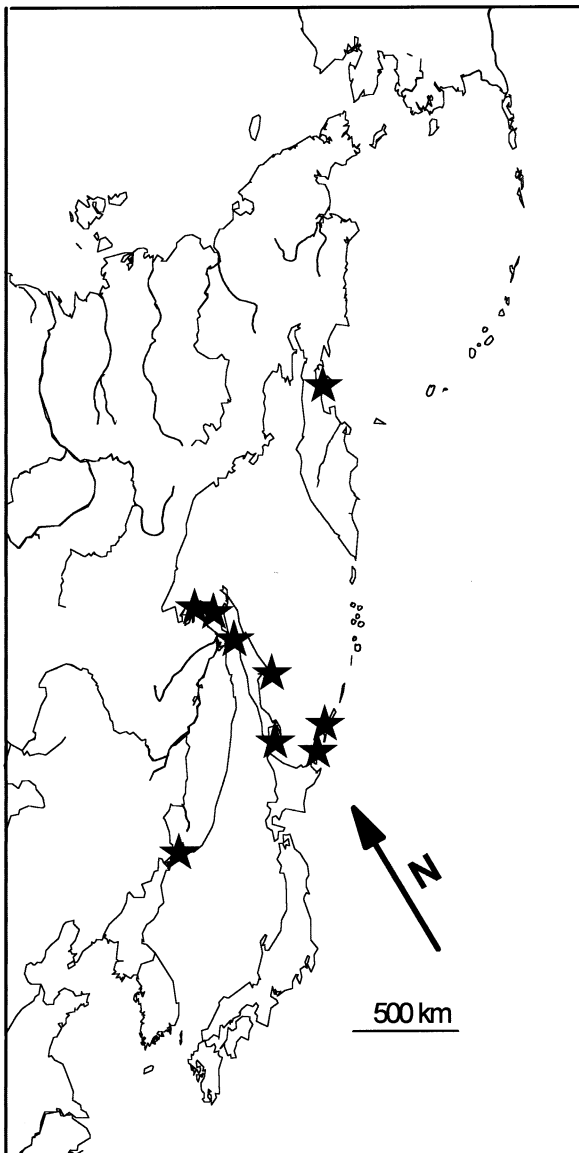


Figure 3 Locations of records of non-breeding Great Knots outside the breeding range during northern summer.

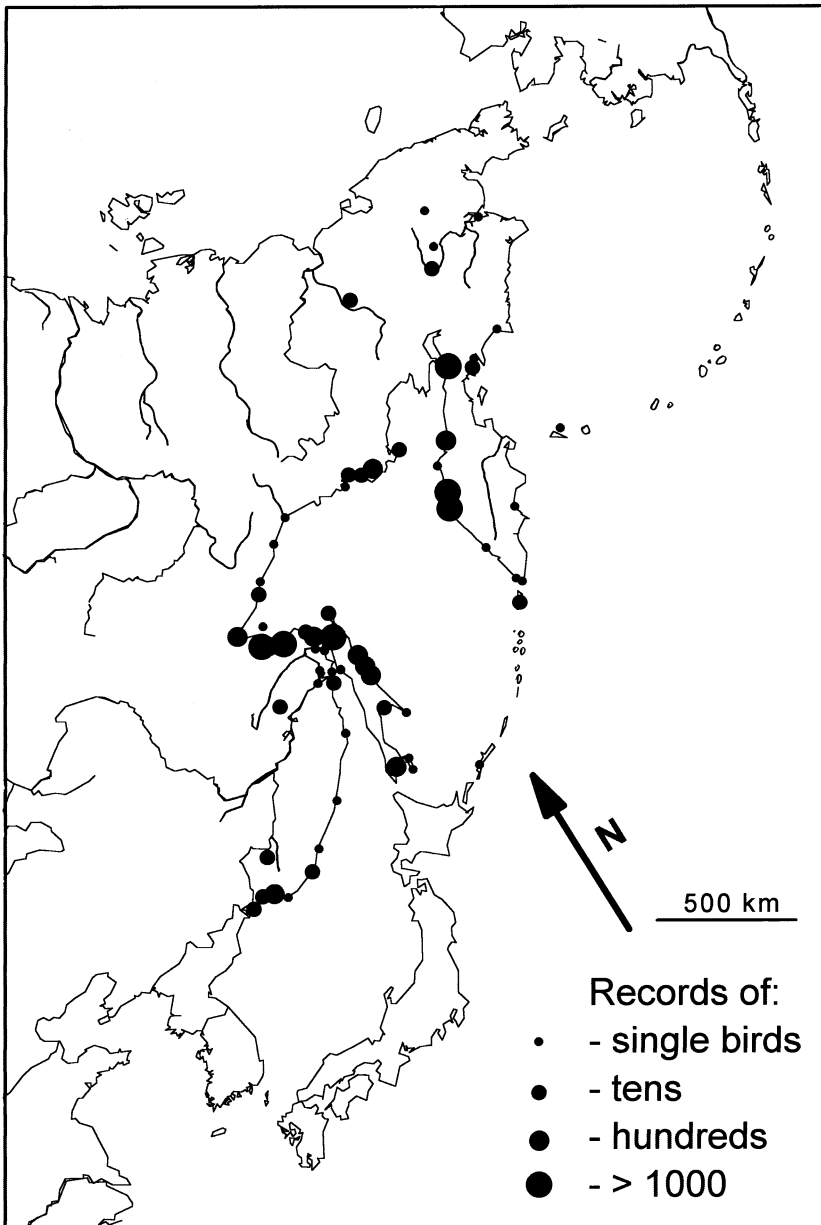


Figure 4 Locations of records and numbers of Great Knots during southward migration.

Sakhalin Island. Peak migration of juveniles was in the second half of August, with the largest numbers in Lososei and Nabilsky Bays, but no counts were carried out in September.

The Primorye region of the southern Russian Far East is much better explored than other areas and Great

Knots have been recorded from many coastal sites (Fig. 4). However, data given in most publications are very limited and are in agreement with those presented in Appendix 3. The low proportion of adults among museum specimens and the observations of Glushchenko and Nechaev indicate that few adults occur on

coastal Primorye. There are several inland records from the lower Amur River area and Khanka Lake from the same regions as on northward migration. It appears that adults are more common on Khanka Lake than on the coastal areas of Primorye.

It is to be expected that the timing of adult male and female migration will be different, on average, because of the earlier departure of females from the breeding grounds. It is only possible to check this hypothesis from sexed specimens. Unfortunately, there are too few on southward passage from the Russian Far East to allow this to be done with any confidence. Six females and four males collected in the northern half of the Sea of Okhotsk show no difference in dates, all being taken from 18–27 July. In the southern part of the Russian Far East, only one adult female has been collected (2 August) and nine males (24 July–24 August). However, it is interesting that all eight specimens from Khanka Lake are males, suggesting that mainly males migrate via the lake in late July and August. These are the only data which could be construed as supporting the earlier passage of females, probably in early and mid-July. However, it is possible that the habitat at Khanka Lake is unsuitable before late July for use by earlier migrating females.

Data on the timing of southward migration are given in Table 4. The duration of return passage is much longer than on northward migration and lasts for

approximately two months in northern areas and about three and one half months in southern areas of the Far East. Unfortunately, the data are insufficient to show whether there are any timing differences between the migrations of the sexes, but available counts from Tugursky Bay and the western Kamchatka Peninsula show that the initial wave of adult migration occurs in the first half of July, which is probably the same wave as on Sakhalin Island in mid-July. It can be hypothesised that non-breeders, failed breeders and successful females, which leave the breeding grounds first, form this wave. Later in the season, large numbers of adults are present in the second half of July on the western Kamchatka Peninsula and during the same period, plus the first ten days of August, in more southerly areas, e.g. Sakhalin Island, Khanka Lake and coastal Primorye. Also, large numbers have been recorded in Tugursky Bay during the first half of August, probably forming part of the same adult wave. This second wave probably consists largely of males.

Low adult numbers in Primorye, especially during the first wave, indicate that most overfly this region. It can be hypothesised that birds in the initial wave are normally in the best position to fatten in the Sea of Okhotsk and, as a result, have less need to stop further south in the Far East. On the other hand, young birds have less experience and are, thus, the most common age group visiting the Primorye.

Table 4 Dates of southward migration of adult and juvenile Great Knots in different regions of the Russian Far East.

Region	Adults		Juveniles	
	Range of dates	Period(s) of main migration	Range of dates	Period(s) of main migration
Breeding range	F c. 27 June–12 July	Very early July	24 July–21 August	24 July–1 August
(successful breeders)	M 22 July–2 August	22–29 July	& 14–19 August	
Coast of Koryak Highland	5 July			
Kamchatka and Commander Islands	29 June–29 August	c. 10 & 19–24 July	29 July–4 September	Mid-August
Northern coast of Sea of Okhotsk	12 July–15 August		3 August–early September	Mid- and late August
Western coast of Sea of Okhotsk	From 3 July	1st half July, August	10 August–early September	27 August
Tatarsky Strait	28 July		21 August–9 September.	
Sakhalin Island	11 July–23 August	13–20 July, 9–10 August	3 August–2 November	11 August–6 September
Kurile Islands			4 August–12 September	
Khanka Lake	18 July–24 August	22 July–10 August	18 August–14 September	24–27 August
Coasts of Primorye	14 July–28 August		2 August–29 October	11 August–5 September

F = female; M = male.

Most broods disappear from at least the northern part of the breeding range before August, but there are several late records for mid-August, especially in the Koryak Highland. The main juvenile passage occurs in mid-August on the Kamchatka Peninsula and other northern areas of the Sea of Okhotsk. It is not known where young birds spend the two weeks, or so, after they leave the northern breeding grounds. It is possible that most juveniles stay either in a mountain area and form the last wave leaving the breeding grounds, or in the unexplored Penzhina Gulf, north-eastern Sea of Okhotsk. Most juveniles pass through the southern region, Sakhalin Island and Primorye, in the second half of August. Young birds can migrate quickly. The first juvenile was collected on south-western Kamchatka Peninsula on 29 July and they appear in southern areas during early August, indicating that they can cover a distance of at least 3000 km in about ten days. In all northern areas, young were recorded up to early September, while in southern regions they can normally be found up to late September and, in very small numbers, into October.

Migration routes and key areas

The northward migration of Great Knots (Fig. 2) is very similar to that of the Spoon-billed Sandpiper *Eurynorhynchus pygmeus* (Tomkovich 1992). The main passage takes place along a rather narrow corridor across southern Primorye, southern Sakhalin Island and western Kamchatka Peninsula. The highest and most regular numbers occur at the Moroshechnaya River mouth, Kamchatka Peninsula, but even here they do not remain long. The data imply that most birds cross the Russian Far East to the breeding grounds without stopping, probably having originated at a refuelling site somewhere in China or on the Korean Peninsula. The bays near Vladivostok and on southern Sakhalin Island and, especially, the Moroshechnaya River estuary are emergency staging sites needed when adverse conditions are met, such as bad weather and strong winds. This explains why the year-to-year variation in numbers near Vladivostok is so great.

A few other localities are visited by Great Knots on northward passage, but these are not on the main route outlined above and numbers are small. The identified main route is to the eastern part of the breeding range and it is not known how birds breeding in the west of the range get there. They can either migrate inland from the staging sites outside Russia directly to the mountain

breeding habitats or follow the main route to north-western Kamchatka Peninsula and then head westwards. The former suggestion seems unlikely because there are virtually no records west of the lowlands between Vladivostok and the north-western corner of the Sea of Okhotsk. The latter possibility seems more likely but there are no data to confirm it.

The data presented here do not support the common view that large flocks of non-breeding Great Knots occur on the coastline of the Sea of Okhotsk. The early southward migration, which commences from late June (or early July), was the basis of this opinion. Nevertheless, small numbers of non-breeders (largest flock of five) do spend June on the Far East coast (Fig. 3), although the total number of non-breeders is unlikely to exceed a few hundred.

The post-breeding distribution in the Russian Far East (Fig. 4) only partly repeats that of northward migration. Large numbers use the extensive mudflats of western and north-western Kamchatka Peninsula. In contrast to northward migration, high numbers occur in several bays of the north-western part of the Sea of Okhotsk. Other quite large concentrations occur in the bays to the north of the Amur River mouth and on northern Sakhalin Island. The only other sites where hundreds of Great Knot stop are more southerly: southern Sakhalin Island and in Ussuri Bay, Primorye. The low numbers of adult Great Knot in Primorye means that most of them overfly this region on southward migration. This implies that the mudflats in the western and eastern parts of the Sea of Okhotsk are the most important refuelling areas for adults preparing for further long non-stop migration. Most of the north coast of the Sea of Okhotsk is steep and is much less suitable for waders than the north-western and eastern bays and estuaries. In support of this, all recoveries of Great Knots banded in Australia are from the areas where largest numbers occur (Lowe 1989; Dettman 1993).

From the available data, it seems that juveniles occur over a wider range of sites than adults, and can more often be found in the southern part of the Far East. However, in these peripheral areas they are never found in the same numbers as at the main stopover sites. It is interesting that, contrary to the broader dispersal at coastal sites, juveniles do not use a wider range of inland sites. Great Knots show a very strong preference for coastal areas outside the breeding season; inland records are mainly from places over which they are crossing between coastal sites.

The results confirm the conclusion of Kistchinski

(1980, 1988) concerning the striking differences, especially on southward passage, in the use of the coasts of the Bering Sea and Sea of Okhotsk by migrating Great Knots. They are rare visitors to the former and abundant inhabitants of the latter. The dissimilarity is probably due to differences in habitats, tidal amplitudes and food productivity. Kistchinski (1988) emphasised that Great Knots feeding on the Bering Sea coast on northward migration were not using the inter-tidal zone, but were in gravel habitat just above sea level. This observation confirms the suggestion that Beringean tidal flats are unsuitable for Great Knot.

Unfortunately, no data exist on the staging duration of individual birds, nor on their food requirements and weight gains, in order to determine the importance of the individual stopover sites.

Conservation

The breeding habitats of the Great Knot are not within areas of intensive human activity. Only the mining industry and herds of domestic reindeer are liable to have any influence on the breeding population. As a result, the species would appear to be currently secure from human interference.

No special conservation measures exist for Great Knots in Russia. As a numerous species it is sometimes attractive to hunters. Recently, several recoveries of Australian bands have been from shot birds. In the mid-1970s, when cartridges were cheap, hand-made wader decoys of Great Knots, and other species, were used to attract birds on Sakhalin Island (Voronov 1980). However, there is no coastal wader hunting tradition in Russia, although woodcock and snipe are hunted inland.

For effective conservation of Great Knots, and other species with similar requirements, it is necessary to protect their main and emergency staging sites. The most important of these are several bays in the north-western Sea of Okhotsk (primarily the Tugursky, Ulbansky and Konstantina Bays), the Moroshechnaya River estuary and coastal areas near the Rekinniki and Kuivivayam Rivers on the western Kamchatka Peninsula, and probably other mudflats of north-western Kamchatka Peninsula. These wetlands are of undoubted international importance, not only for Great Knots but also for a number of other wader species (Tomkovich 1992; Gerasimov & Gerasimov in press; Lobkov in press; Pronkevich in press). To a lesser extent, several bays in northern Sakhalin Island and Lososei Bay, southern Sakhalin Island, as well as tidal flats close to

Vladivostok, are of importance for Great Knots. Among these important sites, only the Moroshechnaya River estuary is protected as a temporary ornithological sanctuary. It was declared as a Ramsar site in 1994. Khanka Lake, which is another wetland listed under the Ramsar Convention in the Russian Far East, supports a few Great Knots.

The construction of a tidal power station in Konstantina Bay, in the north-western part of the Sea of Okhotsk, was under consideration several years ago. This project, which would greatly affect inter-tidal fauna (including the local breeding population of Nordmann's Greenshank *Tringa guttifer*), did not proceed due to lack of finance but could be reinstated at any time. Contamination of the inter-tidal areas of the Sea of Okhotsk, near northern Sakhalin Island, with oil and disturbance from off-road vehicles, tourists and hunters are among other factors that could influence the distribution and conservation status of coastal waders, including the Great Knot (Zykov 1995; Nechaev in press).

Acknowledgements

Much appreciated unpublished breeding data was supplied by A.I. Artyukhov, G.T.H. de Roos, V.V. Kontorschikov, V.G. Krivosheev, S.I. Mochalov, E.E. Syroechkovski, Jr. and A.A. Nazarenko. Valuable unpublished migration information was made available by V.G. Babenko, I.V. Dorogoi, Yu.N. Glushchenko, A.Ya. Kondratiev, N.B. Konyukhov and, especially, V.A. Nechaev, who also supplied data from publications difficult to obtain. My thanks, also, to L.V. Firsova and L.S. Stepanyan for consultations and the museum curators R. Prys-Jones, V.M. Loscot, V.T. Butiev, V.A. Nechaev, N.N. Stcherbak, and V.Yu. Rummyantsev for access to their collections. I thank E.G. Lappo for help in finding a suitable map for Figure 1. My personal observations in the Upper Anadyr River in 1993–95 were possible due to a grant from the Australian Nature Conservation Agency and logistical support from Mark Barter and Gerard Boere. The field assistance of V.G. Krivosheev, D.A. Shitikov, D.E. Te and M.N. Demytyev was invaluable. Thanks to Mark Barter and Jeff Campbell for revision of my English in the manuscript and, especially, to Mark Barter for his invaluable advice, as well as word processing of the text and preparation of the figures. Peter Dann and Clive Minton made helpful comments as referees.

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Appendix 1 Details of northward migration of Great Knots in Russia and their arrival at the breeding grounds.

Primorye region (coastal areas)

1. On De-Vries Peninsula, near Vladivostok, from 1 May to 4 June (starts mostly from 13–18 May), during 1947–1969. The largest numbers (up to 1000) were recorded in the second half of May, particularly during 20–23 May (Omelko 1971).
2. On the extensive coastline of Great Peter's Bay, migration occurred from 23 April–18 May in 1972–1986. Great Knots are among the most numerous waders, comprising 16.5% of the total present (Glushchenko 1988). However, the species has been recorded only three times, with the largest flocks (300 and 1500) on 18 May 1984 (Yu.N. Glushchenko pers. comm.).
3. In Ussuri Bay, part of Great Peter's Bay, recorded between 3 April–1 June in 1984–1993, with most records in late April. Small numbers (largest flock of 18) (V.A. Nechaev pers. comm.).
4. Dates of several other spring records from different sites in the region are 18–23 May (Vorobiev 1954; GFMU).

Inland southern Far East

5. At Khanka Lake, records on 22 and 23 May in two of eight years of migration studies from 1973–1978 and 1980–1981, when a total of 25 birds were seen with a maximum of 15 on one day (Yu.N. Glushchenko pers. comm.).
6. At Evoron Lake, found only in the second half of May in 1986 and 1988, when 91 and five Great Knots were counted, respectively (Pronkevich in press).

Sakhalin Island

7. At Ainskoe Lake on 22 and 23 May 1978, with flocks of 16-20 birds (Nechaev 1991).
8. In Lososei Bay, part of Aniva Bay, from 9–30 May in three seasons, with most records occurring between 21–30 May, when up to 100 of birds were counted on 3 km of coastal sandy mudflat (Nechaev 1991; in press). However, no birds were seen there during regular counts in May 1995 (V.B. Zykov pers. comm.).
9. In Terpeniya Bay from 23 May to 1 June 1977; flocks of 6-18 birds (Nechaev 1991).

Kurile islands

10. On the Kurile islands, one bird without exact date and place (BMNH).
11. On Kunashir Island, one bird on 30 May 1982 (Nechaev & Kurenkov 1986). See also Appendix 2.

Commander islands

12. On Bering Island, one female collected on 30 May 1881 (ZIR).

Kamchatka Peninsula (east coast)

13. Rare on eastern coast, in flocks of 4-6 birds. Earliest record on 7 May 1972 in Zhupanovo (Lobkov 1986).
14. At the Vakhil' River Mouth (53°15'N), during daily migration counts, 364 Great Knots were recorded from 20–22 May 1991 (no observations on later dates); while only six birds were seen there before 22 May in 1992. Majority (283) was counted on 20 May 1991 (Gerasimov et al. 1995).

Kamchatka Peninsula (west coast)

15. At the Opala River Mouth (52°00'N), 43 passing Great Knots were counted in total on 21 and 24 May 1994, during daily observations up to 25 May (Gerasimov & Kalyagina 1995).
16. Moroshechnaya River estuary (56°50'N), arrival occurred on 15 to 18 May during different years in 1970s and 1980s; migration lasts up to at least 2 June. During peak migration, which takes place between 21–29 May, up to c. 12 000-15 000 Great Knots have been found roosting, and the total number of passage birds was estimated at 35 000-40 000 (Gerasimov 1980; Gerasimov et al. 1992; Gerasimov & Gerasimov in press).
17. Near Ust'-Khairuzovo (57°10'N) on 6 June 1989, 30 birds in a flock (Gerasimov et al. 1992).

Northern coast of the Sea of Okhotsk

18. In Gertner Bay and at Yamsk, near Magadan, three specimens were collected from 25 May–1 June in 1938 and 1947 (Kistchinski 1968; ZIR; ZMMU).
19. In the Ola River Delta, appears in spring in small numbers (A.Ya. Kondratiev pers. comm.). Records of three birds on 26 May and c. 50 on 28 May 1995 (Dorogoi in press).

Koryak highland (north-east from Kamchatka Peninsula)

20. Near Korf, on 3 June 1976, two birds (Firsova & Levada 1982). Comment: The published record of 39 Great Knots in Gek Inlet, Korf Bay, on 5 June 1976 (Firsova & Levada 1982) is a misprint and should be 5 July (L.V. Firsova pers. comm.).
21. Near Apuka on 28 May–5 June, generally in groups of two, but on one occasion eight birds (Kistchinski 1980, 1988).

Sakha Republic (Yakutia)

22. Near Yakutsk, one collected on 25 May 1896 (Vorobiev 1963; ZIR).
23. Near Tiksi, close to the Lena Delta, on 30 May 1957, a single male (Kapitonov 1962; ZIR).
24. At Tit-Ary Island, lower Lena River, on 1 June 1974, one male (Perfiliev in Labutin et al. 1988).

Chukotka Autonomous Area

25. At the Omolon River, close to the Oloichan tributary mouth,

Appendix 1 Continued

- lower Kolyma River basin, a flock of five seen on 3 June 1973 (Kretchmar et al. 1978).
26. On Terpukhoi Mountain, upper Anadyr River, on 25 May 1932, one of four birds was collected (Portenko 1933).
27. On the Shchuchy Mountain range, in the upper Anadyr River area, eight locally breeding individually colour-marked males arrived on 22–26 May 1995. Females appeared in pairs with these and other males on 23–29 May. Records of wandering birds on later dates in 1994 and 1995 might indicate the presence of few later arriving individuals. No flocks were seen before the start of incubation (PT unpubl. data).
28. In the middle Anadyr Valley, records on 24 May 1985 and on 27 May 1979 (Kretchmar et al. 1991).
29. At Sireniki, southern Chukotski Peninsula, two and four birds were seen on 1 and 2 June 1988, respectively (N.B. Konyukhov pers. comm.).

Appendix 2 Northern summer records of Great Knots in Russia, which can be assigned to non-breeders outside the breeding range (see Fig. 3).

Primorye region

1. In the Abrek inlet, close to Vladivostok, one bird was collected on 18 June last century (Shulpin 1936).
2. In Ussuri Bay, part of Great Peter's Bay, a flock of three birds was observed on 17 June 1993 (V.A. Nechaev pers. comm.).

Sakhalin Island

3. On the Tatarsky Strait coast, between the Tyk and Viakhtu Rivers, a female was collected on 23 June 1952 (GFMU).
4. At Terpenia Cape, on 1 July 1981, one bird was observed (Nechaev 1991).
5. Aniva Bay is the recovery site of a band on 3 June 1994 from a first-year Great Knot, marked as a downy chick on 8 July 1993 (Moscow Ringing Centre). It might be a non-breeder staying in the Sea of Okhotsk.

Kurile islands

6. On Kunashir Island, a male in incomplete breeding plumage was collected on 30 May 1982. It was considered a first year

bird on the basis of plumage (Nechaev & Kurenkov 1986; V.A. Nechaev pers. comm.).

7. On Iturup Island, a single bird in similar plumage to site 6, above, was seen on 29 June 1991 (Nechaev & Fujimaki 1994; V.A. Nechaev pers. comm.).

Kamchatka Peninsula

8. In Karaga Bay, the Bering Sea, a flock of five birds was seen on 26 June 1979 (Lobkov 1986).
9. At the Tigil' River Mouth, north-eastern Sea of Okhotsk, 60–80 Great Knots were found from 29 June–2 July 1983 (Lobkov 1986).

Coast north from the Amur River mouth

10. In Ekaterina Bay, four single birds were counted from 24–30 June 1981 (V.G. Babenko pers. comm.).
11. In Schastia Bay, and to the north over a distance of 30 km, one female was collected on 26 June, and four single birds and a flock of four were observed on 25 and 26 June 1986 (V.G. Babenko pers. comm.; ZMMU).

Appendix 3 Details of departure from the breeding grounds and southward migration of Great Knots in Russia.

Chukotka Autonomous Area

1. In the lower Omolon River area, the lower Kolyma Basin, Andreev (1980) considers that some birds leave in late June and early July and have disappeared completely in early August. This conclusion is based on the occasional observations of N.E. Dokuchaev, who recorded flocks of 16 and eight on 29 June 1974 and 3 July 1972 respectively, and collected the last lone young bird on 1 August 1972.
2. On the Shchuchy Mountain range, the upper Anadyr River, flocks of non-breeders, failed breeders and females, known individually by colour-marking, left the breeding ground in large numbers on 27 June 1994 and on 1 July 1993 and 1995, soon after the eggs hatched. The latest female was recorded in the area on 12 July. Males that had successfully bred started moving southwards from 22–25 July, young birds from 24–26 July in 1993–95. Most adults and young disappeared from the study area before 29 July–1 August in these years. In general, adult males migrated several days before young Great Knots but in some families they migrated together (PT unpubl. data).
3. On the middle Anadyr River, flocks were recorded on 13 and 14 August 1985 and two birds on 16 September 1979 (Kretchmar et al. 1991). Comment: The observation on the latter date is extremely doubtful and probably is the result of misidentification.
4. Near the mouth of the Anadyr River, a young bird was collected on 14 August 1901 (ZMMU).
5. On the eastern Chukotski Peninsula, two flying birds were observed on 20 August 1976 (Tomkovich & Sorokin 1983) but the observation is not reliable.

Koryak Highland (north-east from Kamchatka)

6. Near Apuka, flocks of 10–12 birds were found on a mountain plateau on 30 July–19 August 1959 and a single bird on 21 August 1959 (Kistchinski 1980).
7. Near Tilichiki, two of four fully grown young Great Knots were collected by L.A. Portenko in mountain tundra on 16 August 1957 (Kistchinski 1980; ZIR).
8. In the Gek Inlet, a flock of 39 birds was recorded on 5 July 1976 (Kistchinski 1980; Firsova & Levada 1982; L.V. Firsova pers. comm.).

Commander islands

9. On Copper Island, one young bird was collected on 14 August 1954 (ZMMU).

Kamchatka Peninsula (east coast)

10. In the Kronotski Nature Reserve, one juvenile was collected on 30 August 1984 (IBPR) and the last observation was made on 4 September 1975 (Lobkov 1986).

Kamchatka Peninsula (west coast)

11. At the mouths of the Rekinniki and Kuivivayam Rivers, Great

Knots prevailed among 15 000 waders counted during the second half of July and in August 1991 (Lobkov in press).

12. At the Tigil' River Mouth, north-eastern Sea of Okhotsk, 60–80 Great Knots were found on 29 June–2 July 1983, 200 on 15 July 1983 (Lobkov 1986).
13. At the mouths of the Khairuzova and Belogolovaya Rivers, at least 4500 birds were present on 19–24 July 1983. The numbers were largest in mid- and the last one-third of August (Lobkov 1986).
14. In Ust'-Khairuzovo, an adult bird with an Australian band was recovered on 29 August 1983 (Lowe 1989). This is the latest date for adults on Kamchatka.
15. In the Moroshechnaya River estuary, almost 7000 Great Knot were counted on 10 July 1984, and at least 1000 adults on 24 July 1989. These large July flocks precede the main passage, which occurs in August (Gerasimov et al. 1992; Gerasimov & Gerasimov in press).
16. At the mouths of the Kikhchik and Belogolovaya Rivers, two adults have been collected in August (no exact dates given) (ZMMU; IBPR). Three juvenile specimens, from different localities, are dated 14 and 19 August (Bergman 1935 according to V.A. Nechaev pers. comm.; ZMMU; IBPR). Another from Kambal'ny Bay, dated 29 July 1967, is the earliest date for a juvenile (GFMU).

Northern coast of the Sea of Okhotsk

17. In Babushkin Bay, young birds appeared on 3 August 1964 and were observed in flocks of 4–15 birds on 8–18 August 1964, when both adults and young were present with the adult:young ratio being 1:20. An adult male was collected on 15 August (Kistchinski 1968, 1988).
18. In the Ola River lagoon, the Great Knot is one of the commonest wader species. Flocks of tens to 200–300 young birds were regularly observed in late August 1994 and 1995 (Dorogoi in press).
19. In Gertner Bay, near Magadan, tens of Great Knots can be observed in August and early September (I.V. Dorogoi pers. comm.).
20. On Talan Island, west of Magadan, during several years of study, a flock of six birds appeared on 12 July 1987 and up to 10 young birds were present in mid-August 1988. The species is common at the same time in Taiskaya Gulf, on the nearby mainland (Kondratyev et al. 1992).
21. In Okhotsk, an adult male specimen, without exact date, was collected in 1884 (ZIR). Young birds were collected on 19 August 1930 at the Yana River mouth (ZIR) and on 29 August 1910 at the Ul'ya River mouth (ZMMU).

North-western coast of the Sea of Okhotsk

22. Near Ayan, small numbers were recorded from the second ten-day period of August (1961) onwards (Vtorov 1963). Two specimens collected on 15 August were juveniles (GFMU; MPU).

Appendix 3 Continued.

23. At the Uda River mouth, all five Great Knots collected by Middendorff (1853), from large flocks on 18 and 19 July 1884, were adults in breeding plumage (ZIR) but, based on the presence of large brood patches, only one female had bred that year.
24. In the southern part of Tugursky Bay, Great Knot arrived from the north in large flocks from 3 July (1990) onwards. According to regular counts along the inter-tidal region in that year 2670 and 747 birds/10 km were present during the first and second halves of July, respectively; 2242 and 3135 during the first and second halves of August; and 305 during the first half of September. In particular, on 28 August almost 10 000 Great Knot were counted over a 20 km length (Pronkevich in press).
25. In Konstantina Bay, 250 Great Knots were counted on 3 August 1990 over a 5 km distance (Pronkevich in press).
26. In the southern part of Ulbansky Bay, large numbers were recorded between 4 and 15 August (Pronkevich in press).
27. In Schastia Bay, north of the Amur River mouth, small numbers were seen during the last week of July 1985 and the third week of August 1984 (a total of 55 and 50 birds, respectively), but on 27 July 1986 a flock of c. 1000 birds feeding on a small islet was found (V.G. Babenko pers. comm.).
29. At the mouth of the Aldoma River, at Bolshoi Shantar Island, at Chkalov Island and Vlasievo in Schastia Bay, only juveniles were collected in different years from 10–27 August (ZMMU; ZIR; IZU).
- Sakhalin Island**
30. In Kuegda Bay, Shmidt Peninsula, 16 adults, in a flock of 20 birds, were recorded on 16 August 1976 (Nechaev 1991; pers. comm.).
31. In Pomr' Bay, 10-20 young were present on 24–31 August 1976 (Nechaev 1991).
32. On Golovacheva Cape, Sakhalinsky Bay, 15-20 Great Knot were present on 1–3 August 1979. First juvenile birds were recorded on 3 August (Nechaev 1991; pers. comm.).
33. In Baikal Bay, a flock of c. 1500 roosting Great Knots (90% adults) was recorded on 10 August 1979 (V.A. Nechaev pers. comm.).
34. On the treeless top of Val Mountain (352 m asl), a flock of 18 adults was seen on 9 August 1975 (Nechaev 1991; pers. comm.).
35. In Chaivo Bay, only two adult birds were found on 11 July 1975, a flock of 40 on 15 July and about 100 on 18 July 1976. During 18–31 August 1975, 5-10 young were present (Nechaev 1991; pers. comm.).
36. In Dagi Bay, c. 300 birds were found in a flock on 13 July 1976 (Nechaev 1991).
37. In Nabilsky Bay, 300-350 birds were counted on 19 July 1986, c. 100 on 20 July 1984, and c. 300 on 27 August 1977 (Nechaev 1991).
38. In Terpeniya Bay, an adult male was collected on 6 September 1926 (Yamashina 1928 according to V.A. Nechaev pers. comm.). Comment: It has not been possible to check age in this doubtful late adult record.
39. In Lososei Bay, part of Aniva Bay, 20 adults were counted on 8 August 1980, but c. 200 were seen on the next day. About 100 young were present on 18–19 August 1980 and 40-50 on 21–22 August 1978 (Nechaev 1991; pers. comm.).
40. On the Busse Lake, 5 birds were found in late October and 2 November 1978, being the latest records for the island (Kurenkov in Nechaev 1991).
41. Near Aniva, one unsexed adult was collected on 23 August 1947 (ZIR) being the latest checked documented record for adults. Fourteen of 25 dated specimens of juveniles from Sakhalin Island (ZMMU; GFMU; ZIR; IBPR; MPU) were collected during the period 11–24 August, and nine from 30 August–6 September. These data probably outline the main passage of young birds.
- Kurile islands**
42. On Paramushir Island, an adult female and male were collected on 24 August and 4 September 1928, respectively, and 11 young ('immatures') from 4 August–4 September (Yamashina 1929 according to V.A. Nechaev pers. comm.). Comment: Both dates for adults look extremely late (especially for the north Kuriles) and, therefore, a little doubtful, but it has not been possible to check the specimens.
43. On Paramushir Island, one bird was collected on 5 September 1929 (Bergman 1935 according to V.A. Nechaev pers. comm.).
44. On Iturup Island a young bird was collected on 12 September 1956 (ZMMU).
- Inland southern Far East**
45. Near Sofijskoe, on the lower Amur River, young birds were seen on 10 August 1958 (Nechaev 1991; pers. comm.).
46. Near Mariinsk, on the lower Amur River, a young bird was collected on 30 August 1855 (Buturlin 1905; ZIR).
47. At Evoron Lake, 25 birds were counted in the first half of August 1988 (Pronkevich in press).
48. On Khanka Lake, during 1972–1983, adults were recorded from 18 July–24 August and juveniles from 18 August–14 September. Adult passage was most intensive from 22 July–10 August, when up to 45 birds/day and flocks up to 40 were seen. The largest numbers of young birds (87 and 240, in flocks up to 30), were recorded on 24 and 27 August 1972, respectively (Polivanova & Glustchenko 1975; Glustchenko 1990; pers. comm.).

Appendix 3 Continued.

Tatarsky Strait

49. In the Taba Inlet, two juvenile birds were collected on 9 September 1928 (Shulpin 1936; ZIR).
50. In De-Kastri Bay, young Great Knot have been recorded in flocks of six and ten on 21 August 1956 (V.A. Nechaev pers. comm.)
51. At Vanino, several flocks of 2-5 birds (probably adults) were seen on 28 July 1977 (V.G. Babenko pers. comm.).

Primorye region (coastal areas)

52. In Olga Bay, the species is most common from 2–27 August 1975 (Labzyuk 1979).
53. Near Vladivostok, in 1947–1969, autumn migration started from 19 July (1956), but in some years only from 2–13 August, and lasts until 21 September (1947) (Omelko 1971).
54. In Great Peter's Bay, in 1972–1986, adults were observed from 16 July (1974) to 22 August (1976) and young birds from 11 August (1981) to 6 October (1975). The largest number of adults, 29 birds, was counted on 3 August 1976, with the total number of adults comprising only 12% of the grand total of Great Knots for the whole period. The greatest numbers of juveniles were recorded between 11 August and 5 September, in flocks of up to 60 birds and up to 114 birds per day (on 5 September 1973) (Glushchenko 1988; pers. comm.).
55. In Ussuri Bay, part of Great Peter's Bay, irregular counts in 1984–1993 found adult Great Knots mainly in July, from 14 July (1993) to 31 July (1992) with the largest flock (20) being recorded on 21 July (1992). Two more adults were seen among juveniles on 28 August 1993. Passage of young birds, which are more numerous, occurred from 5 August (1993) to 29 October (1991). This age group is most common (tens/km) from 12–31 August and probably also in early September, when count data are not available. The largest number (c. 100/km) were seen on 29 August 1993. Single birds were observed twice in October (V.A. Nechaev pers. comm.).
56. In Amur Bay, part of Great Peter's Bay, four juvenile specimens were taken on 11–14 August 1894 (BMNH). Comment: These specimens were incorrectly considered as being collected at the Amur River mouth (Sharp 1896), also referred to in Shulpin (1936). The labels of the specimens state 'Amur Bai, E Siberia', which is part of Great Peter's Bay, **not** the Amur River mouth.
57. At the Mongugai River mouth, the species was observed from 26 August–1 September 1961 (Panov 1973).
58. Among 54 museum specimens taken on southward passage in the Region (ZMMU; ZIR; IBPR; MPU; IZU; BMNH) only two adult birds were present (one undated), showing how rare adults are on the Primorye coast in mid- and late northern summer. Two juveniles collected on 2 August 1975 in Olga Bay are the earliest records for this age in the Region. Most birds (23 out of 54) were collected between 12–17 August, probably during peak passage.