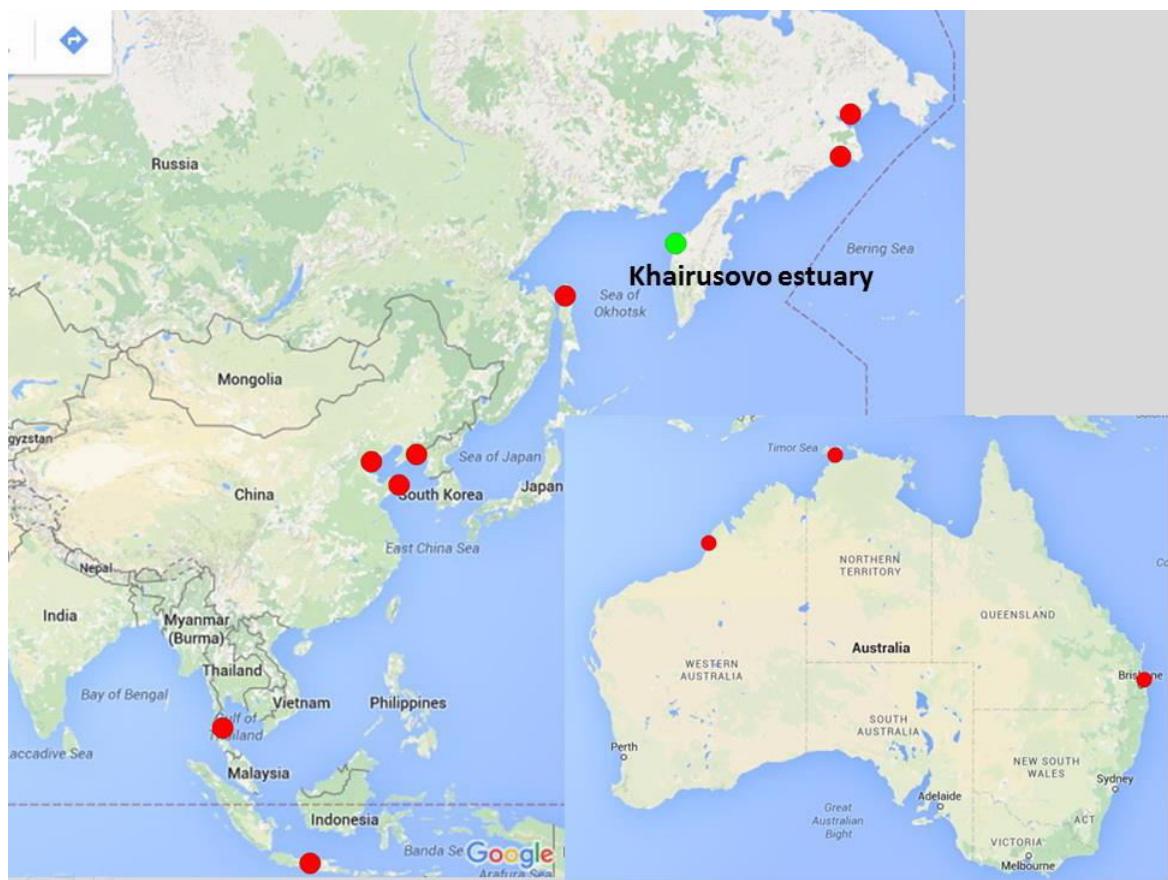


Khairusovo-Belogolovaja estuary (Western Kamchatka) as a key place for waders of the East Asian-Australasian Flyway



Knot re-sightings (red dots) from Khairusovo estuary (green dot)

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OBC report

1) Summary

The study area is situated on the western coast of Kamchatka peninsula (57°N, 156.7°E). In this place two rivers – Khairusova and Belogolovaya forms simultaneous estuary with the largest on the whole western coast of Kamchatka mudflats. Total square of mudflats and sandflats is about 47 sq. km.

During field season 2015 (from 17 July till 12 September) we made large investigation in this area. On the peak of migration we observed up to 26 000 waders of 31 species. At this site we've seen 26 Spoon-billed Sandpipers and up to 200 Far Eastern Curlews. We assume that part of Far Eastern Curlews breed in the study area.

The most numerous species at the stopover was Great Knot. On the peak of migration we counted up to 23 000 individuals. There are no large stopovers of Great Knot to the south on the coast of Kamchatka peninsula except Moroshechnaya river estuary (40 km to south). We assume that from this point Great Knots start their southward migration. Also we observed a lot of individually marked Great Knots. We made 260 observations of 180 individually marked birds. These observations showed us that birds spend up to 1 month in this estuary foraging before long-distance flight to Sakhalin island or Yellow sea. That's why this site is a key site for Great Knot, Bar-tailed Godwit and Far-Eastern Curlew.

We took 260 samples (greed 500 meters) to investigate diet of waders that forage on the mudflats.

The main conclusion of our investigation is that study area is a key place for Great Knot and Bar-tailed Godwit during the southward migration. This is wader stopover of international importance.

2) Introduction (include description of species\habitat and importance of area for birds)

The study area is situated on the western coast of Kamchatka peninsula (57°N, 156.7°E). In this place two rivers – Khairusovo and Belogolovaya forms simultaneous estuary with the largest on the whole western coast of Kamchatka mudflats. Total square of mudflats and sandflats is about 47 sq. km. Large flocks of waders of 31 species use this unique place during southward migration. The maximum counts registered up to 26-28 000 waders in the end of July – in the beginning of August. We assume that this place is very important for migrating waders and at least a part of them accumulate energy stores before long flight to the staging sites on the mudflats of Yellow sea.

We were focused on 5 mostly vulnerable species of the region. Spoon-billed sandpiper (CR), Great Knot (EN), Far-Eastern Curlew (VU), Bar-Tailed (NT) and Black-Tailed (NT) Godwits. All these species are either rare or their number is decreasing for a long time, since middle of 90's.

3) Project objectives

Main objective was to understand how important is study area for 5 target species. Is it just a local stopover or a staging place that is important for forming necessary energy stores before the long flight to the coasts of the Yellow sea.

One of our aims was to explore what is the diet of this 5 target species. What do they eat in this area? We have information about food ration in China and Australia. But we do not know what is the most important source for these 5 wader species on the Western coast of Kamchatka.

The next aim is rather simple – to study the dynamics in number of all species of waders in this aggregation.

Also one of the most important aims is studying of the individually marked birds. Firstly 5 target species.

And the last aim is to count the percentage of the young birds in the flocks. If we will do it, we can understand the breeding success of these species.

4) Methods (Describe activities you carried out)

We used several methods that are well-known for studying large wader stopovers. First of all we had to estimate numbers of different wader species and their dynamics. To answer these questions we used total counts during low tides when birds were feeding. Also we used counts on the high-tide roosts. Different species were more effective to count using different types of counts. For example it is much simpler to count Far Eastern Curlews on the roosting places. But it is impossible to count Spoon-billed Sandpipers there. So we compared these two methods to make representative estimates.

It was very important to find out longevity, duration of the stopover for single individuals. Large proportion of Great Knots were individually marked since 90-s in Australia. During July-August we checked all flocks of Great Knots for individually marked birds.

The last method that we used was SIBES-alike benthos sampling. SIBES is NIOZ (The Netherlands) program that was invented to estimate invertebrate numbers and distribution in Wadden Sea. It includes taking sampling of benthos on mudflats with tube (20 cm diameter, 25 deep). The upper part (5 cm) was sieved apart from other part of sample to separate bivalves. Five centimeters is the length of the Great Knot bill. This species is specialized in feeding on bivalves. When we take sample of 5 cm we can estimate number of bivalves that are accessible for Great Knots. The rest part of sample was sieved too. Bivalves from this part was also fixed in pure alcohol separately from previous part. All other invertebrates from whole sample were fixed in 4% formaldehyde.

Sample greed was 500 meters – the distance between sample points was 500 meters. Totally we took about 260 samples.

Proceeding in the laboratory includes identification of shells and other invertebrates. All shells were measured. During 2016 year we are going to finish proceeding of the samples. Next stage is to dry all invertebrates, weight them and burn them in the stove. Then weight them again and by

the difference between dry weight and ash weight we would calculate energy output of these invertebrates.

5) Results

Our fieldwork lasts from the 17 July till 12 of September. First large counts were made on 19 July. And the peak of summer migration of waders was from the end of July till the beginning of August. On the peak we registered up to 26 000 of waders.

During our field work we observed 31 species of waders (in previous years we observed only 19). We explain this result that this year we had enough time to make wader counts. Previous years we made them during our free time when we worked in expedition that investigated marine mammals there.

These species were Grey Plover (*Pluvialis squatarola*), Pacific Golden Plover (*Pluvialis fulva*), Common Ringed Plover (*Charadrius hiaticula*), Mongolian Plover (*Charadrius mongolus*), Oystercatcher (*Haematopus ostralegus*), Wood Sandpiper (*Tringa glareola*), Spotted Redshank (*Tringa erythropus*), Marsh Sandpiper (*Tringa stagnatilis*), Common Greenshank (*Tringa nebularia*), Tattler (*Heteroscelus brevipes*), Common Sandpiper (*Actitis hypoleucos*), Terek Sandpiper (*Xenus cinereus*), Red-necked Phalarope (*Phalaropus lobatus*), Turnstone (*Arenaria interpres*), Ruff (*Philomachus pugnax*), Spoon-billed Sandpiper (*Calidris pygmaea*), Red-necked stint (*Calidris ruficollis*), Long-toed stint (*Calidris subminuta*), Temminck's stint (*Calidris temminckii*), Dunlin (*Calidris alpina*), Great Knot (*Calidris tenuirostris*), Knot (*Calidris islandica*), Sanderling (*Calidris alba*), Western Sandpiper (*Calidris mauri*), Broad-billed Sandpiper (*Limnicola falcinellus*), Snipe (*Gallinago gallinago*), Bar-Tailed Godwit (*Limosa limosa*), Black-tailed Godwit (*Limosa limosa*), Long-billed Dowitcher (*Limnodromus scolopaceus*), Whimbrel (*Numenius phaeopus*), Far-Eastern Curlew (*Numenius madagascarensis*). All of them were registered on the Western coast of Kamchatka earlier by other researches (Gerasimov, Gerasimov 2000; Gerasimov et al 1999; Dorochev, Kazansky 2011)

Spoon-billed Sandpiper (*Calidris pygmaea*) is one of the most interesting and rarest species of waders that use East Asian-Australasian Flyway. The totals number population estimates are about 100 breeding pairs or 500 individuals (BirdLife International 2015). This wader is in the IUCN Red List as Critically Endangered species (CR).

In Khairusovo-Belogolovaya estuary was observed totally 26 birds from the 19 June till the 07 September 2015

First bird was observed on 19 June on the mudflats nearby the settlement Ust'Khairusovo. It was adult bird in bright breeding plumage. From this date till the 08 August we observed 6 adult birds. All of them were seen in the flocks of Red-necked Stints and Dunlins.

Adult birds used for feeding the same types of mudflats near the mainland. That were small ponds and puddles on the rather solid loamy or clay mudflats. Juvenile birds used the same type of mudflats. We observed them from the 12 August till the 07 September. As usual birds were met in flocks with Dunlins and Red-necked Stints. Only once we observed one juvenile for very

short time in the flock of Great Knots on 23 August. This bird escaped just in several minutes. Five times we've seen two and three waders simultaneously.

We checked all birds for any individually marks (colored flags, rings) but we found nothing.

Far-Eastern Curlew has status Endangered (EN) in the IUCN Red List. In Khairusovo-Belogolovaya estuary this wader is both migrating and breeding species. We observed Far-Eastern Curlews from the 17 July till the 04 September. The maximum numbers of that species were counted on 27 July (170 birds) and 02 August (200 birds). The most part used this area from the 17 July till the 11 August. Single birds stayed in the estuary till the beginning of September

Far-Eastern Curlews preferred to forage on the most offshore parts of the mudflats. According to the results of our preliminary investigations the most common invertebrates in this area were large polyhaetes (especially lug worms *Arenicola sp.*) and small numbers of shrimps. In these areas it is very difficult to count waders because of very vast square of mudflats. So all counts were made on the roosting places. These roosting places were on the high mudflats between mouths of two rivers and on the islands upper Belogolovaya river.

Great Knot is listed in the IUCN Red List as Endangered species because the population of this species is declining sharply during last 20 years. This wader is the most numerous species on the stopover. The peak of numbers we registered in the end of July-beginning of August. Maximum counts were about 23 000 birds during low tide on the mudflats on 20 July. In the beginning of the observation we saw only adult birds. First young birds were seen on the 27 July. When we arrived to study area and started our investigation there we registered the peak of numbers of Great Knot. We made consultations with local people and found out that first large flocks (more than 1000) arrive to study area from the wintering grounds in the beginning of July.

Besides wader counts we were focused on searching and reading individual marks that has some part of Great Knots. Within East Asian-Australasian Flyway there are two different schemes of mark

First scheme uses engraved flags. It is using for marking birds in Australia and China. The second one use different combinations of one flag and 4 color rings. Also there is a scheme of ringing all birds within EAAF. Different countries used different colored flags or combinations of colored flags. But these flags have not individual codes and if you read that flag than you can find out in what country this bird was ringed. Totally we observed engraved and naked flags from 11 ringing sights (see picture 1).



Picture 1 Great Knot resights (red dots) from Khairusovo estuary (green dot)

We spent a lot of time looking for individually marked birds. From the 24 July till the 05 August we made 260 observations of 180 individually marked birds. Most part of them was marked on northwest coast of Australia. Proceeding this data we can directly confirm that birds that use Khairusovo-Belogolovaya estuary than have stopovers in many countries. We were lucky and found even one bird that was marked as a chick in Chukotka.

Using data from individually marked birds we can make estimations of the stopover duration for the single birds. We have 61 birds that we observed two or more times. This data are presented in table Great Knot Sheet "Stopover duration". So here we can confirm, that almost a half of birds (30 from 61) spend in this area 6 days or more. Actually our data is not completely full because we arrived to the stopover site on the peak of the number. And we were observing stopover when it was declining. Next summer we are planning to arrive earlier to observe and record forming of migration stopover.

Duration of the stopover	Number of individuals	Average time
2-5 days	31	3,3
6-10 days	21	7,7
>11 days	9	15,1

But even our data confirm the assumption we've made before the expedition that at the study area is situated one of the largest and most important stopovers of rare waders on the western coast of the Kamchatka peninsula.

The third large part of our work was sampling mudflats to clear up species, number and density of the intervertebrates. This is very important part of work because it takes us a key for understanding foraging strategy of different species of waders. We used method that was produced in the Royal Netherlands Institute for Sea Research for studying waders stopovers in Wadden Sea (NIOZ). Later the same method was used for the similar investigations in Mauritania, Australia, Alaska and China.

Now we are processing these samples. All bivalves samples are now processed but samples of other invertebrates (that essentially includes different species of worms) are proceeding during April. We are planning that this part of our work would be finished at the beginning of May.

6) Recommendations

Our investigations are preliminary for study area. But even using our data for only one year of field investigations we can confirm that in study area is situated one of the largest (or maybe the largest) wader stopover on the Western coast of Kamchatka during southward migration.

There are no any special protected areas in study area. We recommend to start process of forming special protected area in estuary of rivers Khairusova-Belogolovaya.

Also we are going to continue our investigations in summer 2016. This year we are shifting field season from the end of July to the end of June to watch the forming of wader stopover. The main activities are the same – counts, reading individually marked birds, taking samples. Also we are going to study breeding population of Far Eastern Curlews.

The results of our investigations were presented on the next meetings

1. Annual International Wader Study Group conference in Iceland (3-5 October 2015, Asbru, Iceland)
2. 10th conference of Russian Working Group on Waders (3-5 February Ivanovo, Russia)
3. The Tenth Meeting of the joint Committee on the environmental cooperation between the Government of the Republic of Korea and the Government of the Russian Federation (4-5 February 2016, Seoul)
4. Presentation on the CAFF meeting in Ministry of Natural Resources and Environment of the Russian Federation (January 2016)
5. Presentation in the Moscow Zoological Museum of the Moscow State University (November 2015)

According to the Minutes of the Tenth Meeting of the Joint Committee on the Environmental Cooperation between the Government of the Republic of Korea and the Government of the Russian Federation both sides agreed to adopt “Study on Waders Population Status, Population Dynamics, Threats and Necessary Protections Measures in the Largest Wader Stopover Site on the Western Coast of Kamchatka and Major Habitats for Waders in Korea” as a new cooperative project.

7) References and appendices

Gerasimov, Yu N., Gerasimov N. N. 2000. "The importance of the Moroshechnaya river estuary as a staging site for shorebirds." *Stilt* 36, 20-25.

Gerasimov, Y., Artukhin, Y., Gerasimov, N., & Lobkov, E. (1999). Status of shorebirds in Kamchatka, Russia. *Stilt*, 34, 31-34.

Dorofeev, D.S. & Kazansky, F.V. 2013. Post-breeding stopover sites of waders in the estuaries of the Khairusovo, Belogolovaya and Moroshechnaya rivers, western Kamchatka Peninsula, Russia, 2010–2012. *Wader Study Group Bull.* 120(2): 119-123.

BirdLife International. 2015. The IUCN Red List of Threatened Species 2015