

Spring Migrations of the Siberian Crane (*Grus leucogeranus*) in Yakutia

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Abstract—The white crane is a common migrating bird of the Aldan Plateau, with 100 to 200 individuals being visually recorded each season (up to 5% of population). The active passage is observed from May 14–15 to May 25–28, especially in the first days. The main part of the cranes migrating in spring takes north-north-east direction.

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The basic winter stay of the east population of the white crane known since 1984 is situated in the lake system Poyang in the basin of the middle course of the Yangtze River in the southeast of China (29°N and 116°E) [1]. In winter of 1994 the young and adult cranes ringed in 1990–1993 in Indigirka tundra in the northeast of Yakutia (71° N and 148° E) were found for the first time, including two adult birds marked with tracking tags that they had lost [2]. Thus, the flyway of the white crane is about 6500 km long.

The migration over the territory of Yakutia takes more than a month regardless of the season [3]. As analysis of the results of satellite tracking of the autumn passage shows, the shortest distance between the nesting places of the crane and the boundary of Yakutia and Amur oblast and Khabarovsk krai makes up about 1950 and 1490 km, respectively. The flying speed being 50–60 km/h, the cranes cover this distance in 9–13 days, 84–89% of which they spend at the stopover points [4].

During migration the cranes are found all over Yakutia, but the main routes of their flyway in the northeast follow the valleys of large rivers: Yana, Indigirka, Alazeya, Kolyma (up to the point where the river takes a sharp turn to the east, 65°N). In the mountain system of the Upper Yana the regular places of the stopover points are located in the valleys of the rivers Moma, Dulgalakh, Bytantai, Adycha, Tumara and in the upper course of the Indigirka [3, 5–19]. Southward from the Upper Yana the front of bird passage occupies primarily the eastern part of the Lena–Aldan interfluvium. The basins of the rivers Amga and Aldan are the most important places of the crane's stopovers. The duration and formation of the aggregations differ, especially during autumn migration.

In spring the earliest appearance of the crane on the territory of Russia is recorded in the basin of the Zeya

and in Primorskii krai: the first occurrence is dated by March 25, the mass occurrence, April 4–24, the last, May [9, 20–23]. In Transbaikalia and on the adjacent territories the birds appear later, from May 10, in June and even in July [15, 24–28]. It is probable that the immature individuals were recorded there, since in autumn the cranes fly here early, August 18–28 [29], which is not typical of the birds that have bred [3].

According to literature, in Yakutia the spring passage of the white crane covers the period from the first days of May (the middle course of the Aldan, May 3, 1987, the lower course of the Vilyui, May 5, 1988, the Tuostakh River in the middle course of the Yana, May 7, 1989) to early June (the lower course of the Berelekh River in the basin of the lower course of the Indigirka, June 11, 1989). In autumn, the majority of the birds pass over the territory of Yakutia in September. October 6, on the Adycha River in the middle course of the Yana, and October 7, on the Amga River [3] are the latest dates when the cranes were seen in 1988. The white cranes arrive to tundra in the second half of May: the vicinity of the Berelyakh Village, May 20, 1960, May 19, 1961, May 20, 1962, May 25, 1963 [3], when tundra is still under snow. The arrival period ends in late May or, rarely, in early June [3].

No special ground investigation of the seasonal migrations of the white crane has ever been conducted. The documented data on the white crane passage are relatively scarce and do not give a full picture of the migration beyond the breeding places. The dates of the arrival of the birds to the nesting places have been unknown. The 2004–2005 studies of the white crane passage through the Central Yakutia determine the dates and character of its seasonal migration, as well as show that the water-bog lands serve as the stopover and aggregation points.

Number of individuals in the flocks of white crane during spring passage near the mouth of the Nuotara River

Year	May							
	14	15	16	17	19	24	25	28
2004	–	24	2+14	2	–	40	–	2
2005	2+21+11+7	37	21+34+10	–	11	–	12	–

MATERIAL AND METHODS

The spring migration of the white crane was primarily observed on the ways of the intensive passage in the valley of the middle course of the Aldan (the Nuotara mouth) on the territory of the Republican Resource Reserve (RRR) “Kyupskii” (Ust'-Maiskii ulus) and in the nesting area in the Indigirka tundra on the left bank of the Berelekh River in the zone of absolute seasonal rest 'Elon' of the “Kytalyk” Reserve (Allaikhovskii ulus).

In the Aldan valley the observation point was located on Lake Tyobyuryuen in 1 km from the Tumul Village. The Aldan valley widens to 9 km near the Nuotara mouth. The largest part of the valley is occupied by the forbs meadows with the willow and birch combined with oxbow and cave-in lakes. The elevated areas sometimes feature small spots of pine-larch forests. The numerous lakes and floodplain meadows create favorable conditions for the short stopovers of the birds of the water-bog complex.

The arrival of the white crane to the nesting area was observed primarily on one of the spots of the “Indigirka” point of the species increased density [1] in the vicinity of Lake Dzhyukarskoe (36 km northward from the Chokurdakh Village) 5 km long and 2 km wide. The lake shore is occupied by *Carex* stans and green moss tundra covering up to 60%, alternating with hillocks. Observations were conducted at the southern station from May 7 to 30, 2004, and April 21 to June 2, 2005, and at the northern station, from May 23 to June 21, 2004, and May 21 to June 21, 2005.

The migration was observed day and night using the binoculars “Berkut” (10×) and telescope BAUSCH & LOMB (60×) with a tripod. The used optics helped to watch the course of migration within a strip up to 10 km wide (5 km to both sides from the station). The following parameters were recorded: time, number of observed individuals, height and direction of their flight, as well as weather and climate conditions (air temperature, cloudiness, precipitation, etc.).

RESULTS AND DISCUSSION

In 2004, from May 15 to 28, in the mouth of Nuotara in the Aldan valley 84 cranes were recorded on the passage (see Table). The local people state that they saw the first birds (flock of 10 individuals) in this area as early as on April 28. The basic direction of migration is north-north-east. The birds were observed in daytime, from 10 a.m. to 9 p.m. The spring of the year was late, the snow cover melted by 50% only by May 10–11. The

ice on the Aldan broke on May 17, the water stood high from May 19 to the mid-June.

Analysis of meteorological data in the nesting area for the spring of 2004 showed a wide range of temperatures: the mean daily temperature in early May was -13.3°C , but it grew sharply in mid-May. The snow began to melt intensively from May 12, the warm weather lasted until May 22 (day temperature from 2 to -3°C , night temperature from -3°C to -8°C). On the night of May 23 the weather took sharp turn to the worse. By the end of May the mean daily temperature was -3°C . From May 31, the weather improved a little, but in the evening of June 1 a snow storm began and stopped on June 3. During the storm the nesting areas of the majority of bird species were covered with snow, the night temperature lowered up to -8°C . This year the first white cranes appeared on June 4 near Lake Dzhyukarskoe, three cranes made several circles and flew east to the Berelekh River (Elon'). In the evening of June 5 four cranes flew north to Lake Oiuttar Kyuellere.

In 2004 and 2005 the times of the crane passage in the middle course of the Aldan are similar. From May 14 to 25, 2005, 166 birds were recorded. In the first day in addition to the couple of cranes in “Samakh” near the mouth of Nuotara around 8 p.m. three groups of birds were recorded (21, 11, and 7 individuals). The birds flew at a height of 200–300 m north-north-eastward. The interval between recordings of these groups was about 2–3 min. Each group was within visual contact with the flock in front of it.

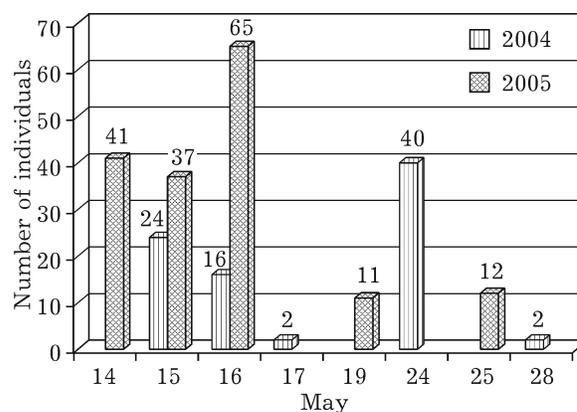


Fig. 1. Dynamics of the seasonal passages of white crane near the mouth of the Nuotara River (valley of the middle course of the Aldan).

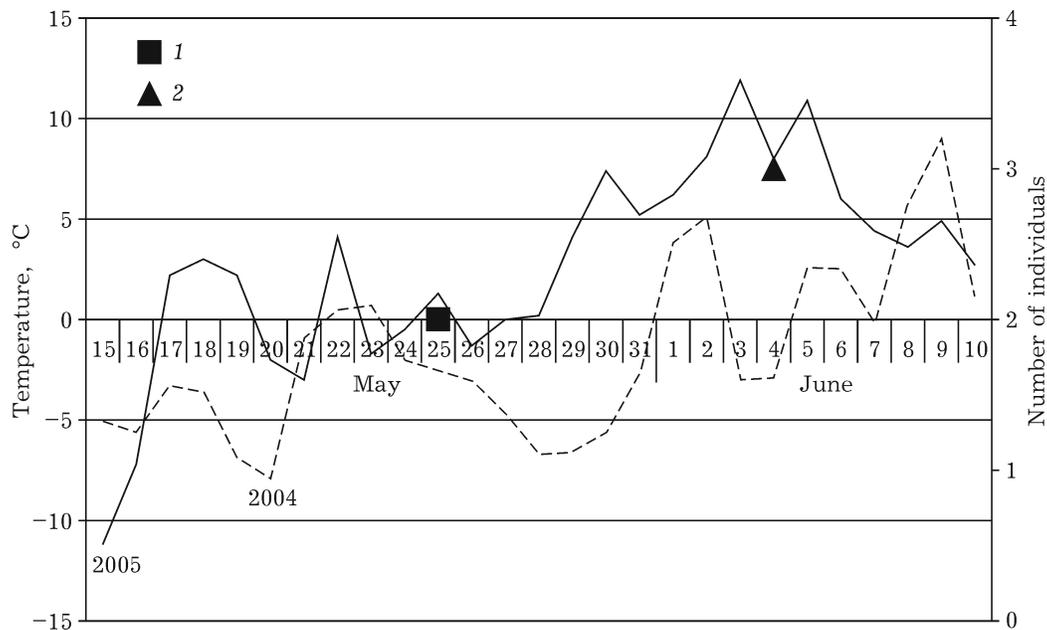


Fig. 2. Dependence of the time of arrival of white crane to the nesting areas on the mean daily air temperature. Time of appearance and number of the first arrived birds: 1, in 2005; 2, in 2004.

According to the poll data, on May 15 a flock of 37 birds flew, on May 16, three flocks of 21, 34, and 10 cranes. The flock of 10 birds made circles at a great height (more than 1 km) over Lake Tyobyuryuen and later continued its flight north-north-eastward. A group of 11 birds was recorded on May 19. The birds flew at a height about 300 m northeastward. One white crane of this flock flew somewhat lower and behind the main group. The last record of the white cranes was made on May 25: 12 birds made circles at a height of 100 m over Lake Tyobyuryuen, then ascended to a height of 1 km and began hovering and lowering in the direction of the mouth of Nuotara (to the height of 150–200 m). This year, the passage of the cranes at the station took place in the afternoon, from 1 to 8 p.m.

In 2005, the spring in the region began ten days earlier than in 2004. By the end of April the snow melted completely, the daytime temperature increased to 10°C. The first rain happened on April 24, whereas in 2004, on May 9. The ice on the Aldan broke on May 8, the water level was low, and, unlike in 2004, the valley was not flooded. By May 16, almost all lakes in the valley were completely clear of ice.

In 2005, the first cranes appeared in the nesting areas on May 25, the couple of the birds being recorded on the shore of Lake Krugloe. Due to bad weather on May 25–28 and strong wind with snow the couple was likely to migrate and appeared here again on May 29. On May 30 another couple was found on the shore of Lake Dzhyukagirskoe. On June 8, four young cranes were recorded not far from the station. The earlier arrival of the white cranes this year is due to the favorable spring conditions. The temperature began rising in the

early May and never dropped. No snow storm usual for this season happened, either. On May 29 the snow began melting quickly: in the morning the temperature in shadow was 10°C. The snow cover disappeared completely on June 2.

Thus, by the results of two spring recordings, the white crane belongs to the common passing birds of the Aldan plateau, with 100 to 200 individuals being visually recorded per season (up to 5% of population). The active passage is recorded on May 14–15 to May 25–28, especially in the first days (Fig. 1). The main body of the white cranes migrating in spring flies north-north-eastward. The birds usually fly from 10 a.m. to 9 p.m. at a relatively low height (up to 300 m). No clear dependence of the date and character of migration on the weather conditions is revealed. Although the year 2004 was characterized by late and cold spring, late snow melting, and the spring of 2005 featured warm quiet weather and early snow melting, the birds flew in the similar time, and the average duration of the basic part of migration was about 15 days. In the nesting areas the dependence of the time of arrival of the birds on the character of spring is clearly seen, the time coinciding with the mean daily temperatures becoming above 0°C (Fig. 2).

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