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The current breeding status of Eurasian Spoonbill *Platalea leucorodia* in the Amur River Basin

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Abstract. The article presents up-to-date data on the population of Eurasian Spoonbill in the Amur River Basin in Russia and China. According to the data of 2018-2022, the total number of breeding population is about 550–650 pairs, of which 400-500 pairs are nesting on the territory of China in Xingkaihu National Nature Reserve and Qixinghe National Nature Reserve of Heilongjiang Province, 150 pairs on the territory of Russia in Daursky Nature Biosphere Reserve and Khankaysky Nature Biosphere Reserve.

Keywords: Eurasian Spoonbill, Amur River Basin, Lake Khanka, Khankaysky Nature Biosphere Reserve, Xingkaihu National Nature Reserve, Qixinghe National Nature Reserve

Современное состояние колпицы *Platalea leucorodia* в бассейне реки Амур

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Аннотация. В статье представлены современные данные о состоянии гнездовой популяции колпицы в бассейне реки Амур в России и Китайской Народной Республике. По данным 2018–2022 гг. общая численность гнездящейся популяции составляет около 550–650 пар, из которых 400-500 пар гнездятся на территории Китая в заповедниках Синкайху и Ци Синхэ провинции Хэйлунцзян, 150 пар – на территории России в Даурском природном биосферном заповеднике и Ханкайском природном биосферном заповеднике. Основным очагом распространения колпицы в бассейне реки Амур можно считать Национальный природный заповедник Цисинхэ. Несмотря на специфические гидрологические условия, сложившиеся на озере Ханка в новом столетии, численность гнездящихся здесь колпиц продолжает увеличиваться.

Ключевые слова: Колпица, бассейн реки Амур, озеро Ханка, Ханкайский природный биосферный заповедник, национальный природный заповедник Синкайху, национальный природный заповедник Ци Синхэ

Introduction

Eurasian Spoonbill *Platalea leucorodia* Linnaeus, 1758 inhabit wetlands from North Africa (coasts of Mauritania, Morocco, Algeria) and the Atlantic coast of Europe to England, Germany and Denmark to the north and to Hindustan Peninsula and the Korean Peninsula to the east (Spangenberg 1951; Cramp 1977; del Hoyo et al. 1992; Snow, Perrins 1998). As of 2015, the world population was estimated at about 63-65 thousand individuals (BirdLife International 2019). It includes three subspecies: the West African subspecies *Platalea leucorodia baltaci*, the Red Sea subspecies *P. L. archeri*, and the nominate subspecies *P. L. leucorodia*, which is widely distributed throughout Eurasia.

Within the nominative subspecies, there are four recognized biogeographic populations (Wetlands International 2021), one of which — East Asian — breeds mainly in Northeast Asia, including Russia, Mongolia and China, and winters in Southeast China, South Korea and Japan. It is believed to consist of about 20,000 birds (Xi et al. 2021). These data were obtained when accoun-

ting for wintering birds in China, Japan, and South Korea. In China, about 19,200 Eurasian Spoonbill wintering in the floodplain of the Yangtze River were counted, 200 individuals were recorded in the coastal areas of Jiangsu Province and 100 individuals in other coastal areas of eastern China. There are about 100 wintering individuals in Japan and about 400 individuals in South Korea (Xi et al. 2021).

In Russia, Eurasian Spoonbill is listed in the Red Book and has a second protected status as a species declining in number and/or distribution. In the east of the country, the subspecies are found to nest in the Amur River Basin. According to the latest published data, the number of breeding birds here is estimated at several dozens of pairs (Kharitonov, Korobov 2021). This was also confirmed by observations of the spring flight of Eurasian Spoonbill in the Primorsky Krai, namely, in the valley of the lower reaches of the Razdolnaya River in the vicinity of the city Ussuriysk. This is one of the most powerful flight paths of various groups of East Asian birds. In the spring period of 2003-2007, Eurasian Spoonbill was seen here in very limited numbers and not annually, with a maximum of 32 individuals in 2006 (Glushchenko et al. 2007; Glushchenko, Korobov 2021). The surveys conducted in 2020 and 2021 showed that the number of northward migrating Eurasian Spoonbill increased at least tenfold: from 275 individuals in 2020 to 768 in 2021. At the same time, the records were made before the first days of April and did not cover the final period of migration lasting on the territory of Primorsky Krai until mid-April (Glushchenko, Korobov 2021).

The increase in the number of breeding Eurasian Spoonbill of the eastern group is also evidenced by the discovery of two nests with clutches in reed thickets of Lake Stepnoe (Republic of Buryatia) on 13 June 2020 (Badmaeva et al. 2020). Previously, the Eurasian Spoonbill was considered a regular vagrant species here (Dorzhiev, Badmaeva 2016). In the 2010s, the flights of Eurasian Spoonbill across Buryatia became more frequent, which is associated with a sharp increase in the numbers of Spoonbill in Mongolia: from several hundreds to 3-5 thousand individuals in the Ubsunur Lakes Basin (Archimaeva-Ozerskaya, Zabelin 2010; Archimaeva 2019).

The numbers of Eurasian Spoonbill on wintering territories in China and their flights have increased, however, up-to-date information on the number of nesting birds in East Asia, specifically in the basin of Amur, is not available. Scattered information about the number of nesting birds ranges from several dozens to several hundreds (Lincov 2000; Li 2016; Korobov 2021;. Thus, the aim of this work was to establish the actual number of birds nesting in the Amur River Basin.

Materials and methods

In Russia, investigations were carried out from 2018 to 2022 in Primorsky Krai, on the coast of Lake Khanka. From 10 to 30 May 2018, the southern and eastern coasts of Lake Khanka were surveyed on a motor boat to identify breeding sites of Eurasian Spoonbill. As a result, two Spoonbill colonies were found: one at the mouth of the Ilistaya River (44°33'N, 132°29'E) and the other at the mouth of the Gnilaya River (44°56'N, 132°46'E). These colonies were surveyed on a small rowboat on 10 and 22 May. In 2019, a quadcopter Phantom 4 Pro was used to count the number of nesting birds. Heron colonies, including Spoonbill, were photographed from a height of 60 meters on 14–15 May at the mouth of the Ilistaya River and on 18 June at the mouth of the Gnilaya River (Fig. 1). The resulting photographs were merged manually in Photoshop CS6 by determining the intersection points in each photo and then counting the birds in the nests. In 2020, Heron colonies, in which Spoonbill also nested, were photographed by a quadrocopter on 13 May at the mouth of the Ilistaya River and on 15 and 29 May at the mouth of the Gnilaya River. That year, we used the Drone Deploy program, which allows to pre-set the flight area, height, and frequency of overlapping photographs for an autonomous operation of the quadrocopter. This made it possible to photograph sites of the coast occupied by Heron colonies without missing a single section. The photographing height was also 60 meters, and the overlap-

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Fig. 1. A fragment of a colony of Herons (Grey Heron, Black-crowned Night Heron) at the mouth of the Ilistaya River with the nests of Eurasian Spoonbill, 15 May 2019

Рис. 1. Фрагмент колонии цапель (серая цапля, кваква) в устье р. Илистой с гнездами колпицы, 15 мая 2019 г.

ping area of the photo was 70%, which, despite an increase in the number of photos, eliminated the gaps in colony fragments and facilitated the manual merger of photos. Besides the quadcopter, the colonies were surveyed using a small boat to measure nests and eggs. In 2021 and 2022, we visited Spoonbill colonies on 16 and 19 May and 28–29 April, respectively. In the last two years, we only took into account the presence of Spoonbill in nests, without taking into account the number of nesting pairs. All the works were done by one person.

In China, the work was carried out by the employees of Qixinghe National Nature Reserve and Xingkaihu National Nature Reserve in the period from 2016 to 2022. The nesting area in Qixinghe National Nature Reserve (46°43′N, 132°09′E) was observed from a fixed bird count (tower), and the number of nests was counted using walking routes. In Xingkaihu National Nature reserve (45°19′25"N, 132°56′30"E), the number of Spoonbill nests was counted using a small rowboat (Fig. 2).

Results

Russian sector, Lake Khanka. As a result of a full investigation of the coastal area of Lake Khanka in 2018, we found two colonies of Eurasian Spoonbill in flooded shrubs. They were part of polyspecies colonies of Herons (Gray Heron *Ardea cinerea* Linnaeus, 1758, Great Egret *Ardea alba* (Linnaeus, 1758), Purple Heron *Ardea purpurea* Linnaeus, 1766). Altogether 36 nests with eggs were taken into account, 21 of which were located in the mouth of the Ilistaya River and 15 in the mouth of the Gnilaya River (Fig. 3, points 3-4).

Fig. 2. Observation and accounting of Eurasian Spoonbill nests in China: *1–2* — Qixinghe National Nature Reserve; *3* — Xingkaihu National Nature Reserve

Рис. 2. Наблюдение и учет гнезд колпицы в Китае: *1–2* — заповедник Ци Синхэ; *3* — заповедник Синкайху

Repeat visits to these places in 2019 and 2020 showed that the size of this group was obviously growing and reached up to 120 nesting pairs by 2020. At the same time, the group of birds that had been nesting in the mouth of the Ilistaya River had probably joined the colony in the mouth of the Gnilaya River forming one big colony. In 2021 and 2022, Spoonbill nested only at the mouth of the Gnilaya River.

In polyspecies colonies, Spoonbill usually tend to form monospecies groups, with nests often located nearby, directly on the boundary of open water areas or completely surrounded by a shallow body of water with sparse herbage.

Over the course of the study, we inspected 119 nests with chicks found in 61 of them and eggs in the remaining ones. The nests were mostly built from dry reed stalks and, to a lesser degree, tree branches and cattail stalks; the nests were lined with finer plant material, namely, dry parts of various moisture-loving plants and small feathers of Spoonbill.

Nest sizes (n = 11, mm): outside diameter 550-980 (average 727); inside diameter 220–320 (average 266); nest thickness 130–300 (average 228), depth 40-135 (average 72). Complete clutches (n = 58) contained from 2 to 5 eggs; an average of 3.38 eggs per clutch. Egg sizes (n = 110, mm): length 59.4–75.6 (average 67.02); diameter 42.3–48.9 (average 45.36). Weight of fresh and poorly incubated eggs (n=103, g) was 62.5–86.6 (average 73.45). The inspected Spoonbill nests contained from one to four chicks with on average (n = 61) 2.6 chicks per nest.

Chinese sector. A small colony of Spoonbill was noticed at the cleaning lake Yanuhuatan at Xingkaihu National Nature Reserve, 14 June 2019 (Fig. 3, point 5). The visual inspection of the colony allowed to identify five residential

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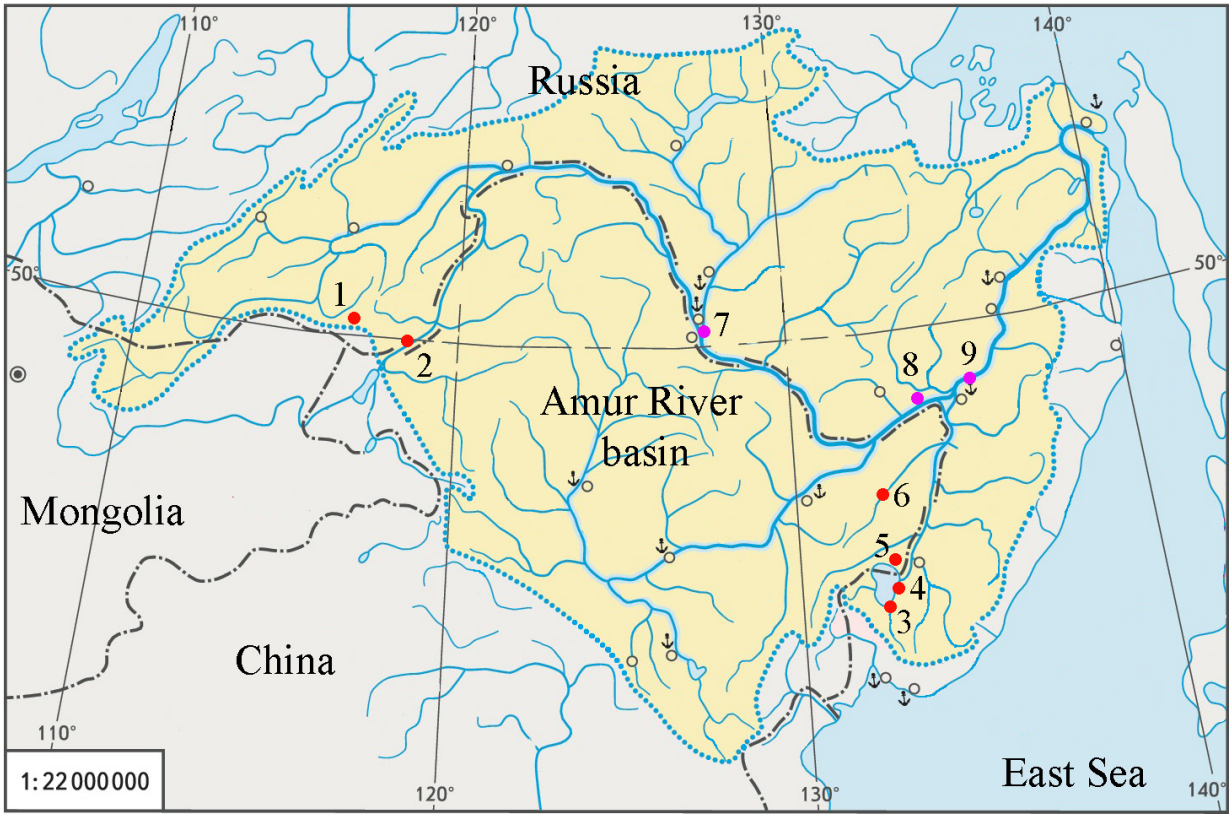

Fig. 3. A map of the distribution of Eurasian Spoonbill in the Amur River Basin: points *1–2* — Zabaykalsky Krai: *1* — Torey Lakes; *2* — Argun River; points *3–4* — Primorsky Krai: *3* — mouth of the Ilistaya River; *4* — mouth of the Gnilaya River; points *5-6* — the territory China: *5* — Xingkaihu National Nature Reserve; 6 — Qixinghe National Nature Reserve; point *7* — Amur Krai, surroundings of the city of Blagoveshchensk; point *8* — Jewish Autonomous Oblast, Lake Zabelovskoe; point *9* — Khabarovsk Krai, surroundings of the village Malyshevo. Red color — places of current Spoonbill nesting, purple color —possible nesting places of Spoonbill or places where Spoonbill used to nest

Рис. 3. Карта распространения колпицы в бассейне Амура: точки *1–2* — Забайкальский край: *1* — Торейские озера; *2* — р. Аргунь; точки *3–4* — Приморский край: *3* — устье р. Илистой; *4* — устье р. Гнилая; точки *5-6* — территория Китая: *5* — национальный заповедник Синкайху; *6* — национальный заповедник Ци Синхэ; точка *7* — Амурская область, окрестности г. Благовещенска; точка *8* — Еврейская АО, озеро Забеловское; точка *9* — Хабаровский край, окрестности поселка Малышево. Красный цвет — места текущего гнездования колпицы, фиолетовый цвет — возможные места гнездования колпицы или места, где раньше гнездилась колпица

nest with 13 chicks. In addition, the colony had another 25 immature individuals.

The number of nesting birds in Qixinghe National Nature Reserve (Fig. 3, point 6) was determined annually. About 140 breeding pairs were counted here in 2016, 40 pairs in 2017, 65 pairs in 2018, 80 pairs in 2019, and 150 pairs in 2020. In 2021 and 2022, the number of breeding Spoonbill reached 400-500 pairs.

Discussion

In the Amur River Basin, the Eurasian Spoonbill nests both in Russia and in China. In the Russian sector of the Amur River Basin, Eurasian Spoonbill is common in summer in the Amur and Jewish Autonomous Regions as well as in Primorsky, Zabaykalsky, and Khabarovsk Krais. In China, Eurasian Spoonbill inhabits the Amur River Basin in

the National Nature Reserves Xingkaihu and Qixinghe in the Heilongjiang Province.

Russian sector of the Amur River Basin. In the Zabaykalsky Region, the Eurasian Spoonbill is numerically insignificant and mainly inhabits the Torey Lakes and the waterlogged bottomland of the Argun River (Fig. 3, points 1–2). Its numbers here vary significantly: in the 1986-1987 flocks numbering hundreds of individuals were noted, in the 1990s the number of birds decreased and showed yet another increase in 2000-2001 (Goroshko 2009; 2012). Now, this area is inhabited by no more than 20 pairs (Kharitonov, Korobov 2021).

In the Amur Region, Eurasian Spoonbill is an extremely rare but regularly migratory species. It is likely that it used to be a nesting species, too. By the survey data of the first quarter of the 20th century, Spoonbill nested in the lower reaches of the Zea River in the suburbs of Blagoveshchensk (the number of pairs is unknown) (Shul'pin 1936). In 1953 and 1955 they were also spotted near the Volkovo Village (Fig. 3, point 7) (Barancheev 1955; 1959). In the 2000s, the nesting on the territory of the region has not been confirmed, though migratory birds are occasionally recorded with an increase in sightings and bird numbers (Antonov, Parilov 2009; Dugintsov 2019; 2020; Sasin 2021).

Eurasian Spoonbill is a rare migratory species for the Jewish Autonomous Region. Its non-annual nesting is possible, but not confirmed on paper. In 2001 and 2008, both single individuals and flocks of up to 40 individuals were recorded at Lake Zabelovskoe (Fig. 3, point 8) (Averin et al. 2012; Averin 2014).

In the Khabarovsk Krai, only one single nest was found in the end of May 1965 in the vicinity of the Malyshevo Village (Fig. 3, point 9) (Roslyakov 1981). As of the 2000s, the number of species is not clear, though in recent years, the frequency of their sightings has increased. Thus, two individuals were seen 18 May 2011 in the mixed colony of Gray Heron and Great Cormorant *Phalacrocorax carbo* (Linnaeus, 1758) in the vicinity of Khabarovsk (Pronkevich et al. 2011). At the left bank of the Amur River, 7 km up the Emoron River, 5 May 2017, a group of six individuals was recorded; 27 April 2018, four birds were observed at the same place (Pronkevich 2019).

In the late 19th century, Eurasian Spoonbill was not a rarity in the basin of Lake Khanka (Primorsky Krai). It mostly inhabited the downstream and the middle reaches of the Ilistaya River (Przhevalsky 1870). Judging by the survey data, even in 1915-1916 the bird was common for this area, however, by 1921 the number decreased and in 1926 Spoonbill was not detected at all despite the inspection of its former breeding grounds (Shul'pin 1936). In the next 50 years, there was no information on nesting of Spoonbill on Lake Khanka, though the birds were occasionally recorded (Vorob'ev 1954; Panov 1956). In the last quarter of the 20th century (1976, 1978 and 1980), ten pairs of Eurasian Spoonbill nested in colonies of Herons in reed thickets among lacustrine-boggy lands in the north-east of the Prikhankaiskaya Lowland (Glushchenko 1981). Later it was occasionally recorded in different districts of southern and eastern parts of the Prikhankaiskaya Lowland (Glushchenko et al. 1995) with no signs of breeding detected, however.

In the beginning of the 21st century, Eurasian Spoonbill was mostly seen at the Prikhankaiskaya Lowland during the migration. At the same time, the presence of a small number of migrating birds in this period in the lower reach of the Razdolnaya River (Glushchenko et al. 2006) and several recorded cases of their presence at Lake Khanka gives hope for the recovery of groups of Eurasian Spoonbill that used to nest here previously. These assumptions were confirmed in 2011 when 4-5 July a territorial group of ten individuals of different age was found. The group stayed in a multispecies colony of Herons in the delta of the Ilistaya River, the search, however, did not reveal any nests (Glushchenko et al. 2011).

In 2012, the same territory was inspected for Spoonbill, but they were not found. However, in a reed thicket a few kilometers away from the previous place of meeting about ten pairs were found to be nesting (Korobov et al. 2013).

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From 2013 to 2018, the coastal area of Lake Khanka was not surveyed. Our accounting of the number of nesting Spoonbill in 2018–2022 showed a significant increase in the number of birds, reaching 120 pairs in one colony at the mouth of the Gnilaya River.

Judging by our observations, Eurasian Spoonbill is attracted by a high level of water in Lake Khanka. However, since 2000, water levels have been continuously rising: in August 2015 the water level exceeded an average monthly historical maximum (Bortin, Gorchakov 2016), and in August 2019 it rose again by no less than 0.5 m. Autumn storms and winter ice destroy significant parts of reed thickets, including those in the mouth of the Ilistaya River (Fig. 4). For this reason, in 2020 the colony of Spoonbill moved north from the mouth of the Ilistaya River to the mouth of the Gnilaya River.

The future of the Khanka colonies of Eurasian Spoonbill (Russian sector) may take two directions. With rising levels of water in the lake, reed thickets will invariably decrease under the influence of storms in autumn and ice in winter. In this case, the eastern coast of the lake will pose a threat of extinction not only to the colonies of Spoonbill, but also other colonial waterbirds of the wetland complex, such as Intermediate Egret *A. intermedia* (Wagler, 1829), Little Egret *Egretta garzetta* (Linnaeus, 1766), Black-crowned Night Heron *Nycticorax nycticorax* (Linnaeus, 1758), etc. If the water level in Lake Khanka remains within the current boundaries or falls slightly, we can expect a significant increase in the number of colony-nesting birds, including Spoonbill.

Chinese sector of the Amur River Basin. In 2019, five nesting pairs of Eurasian Spoonbill were recorded in Xingkaihu National Nature Reserve.

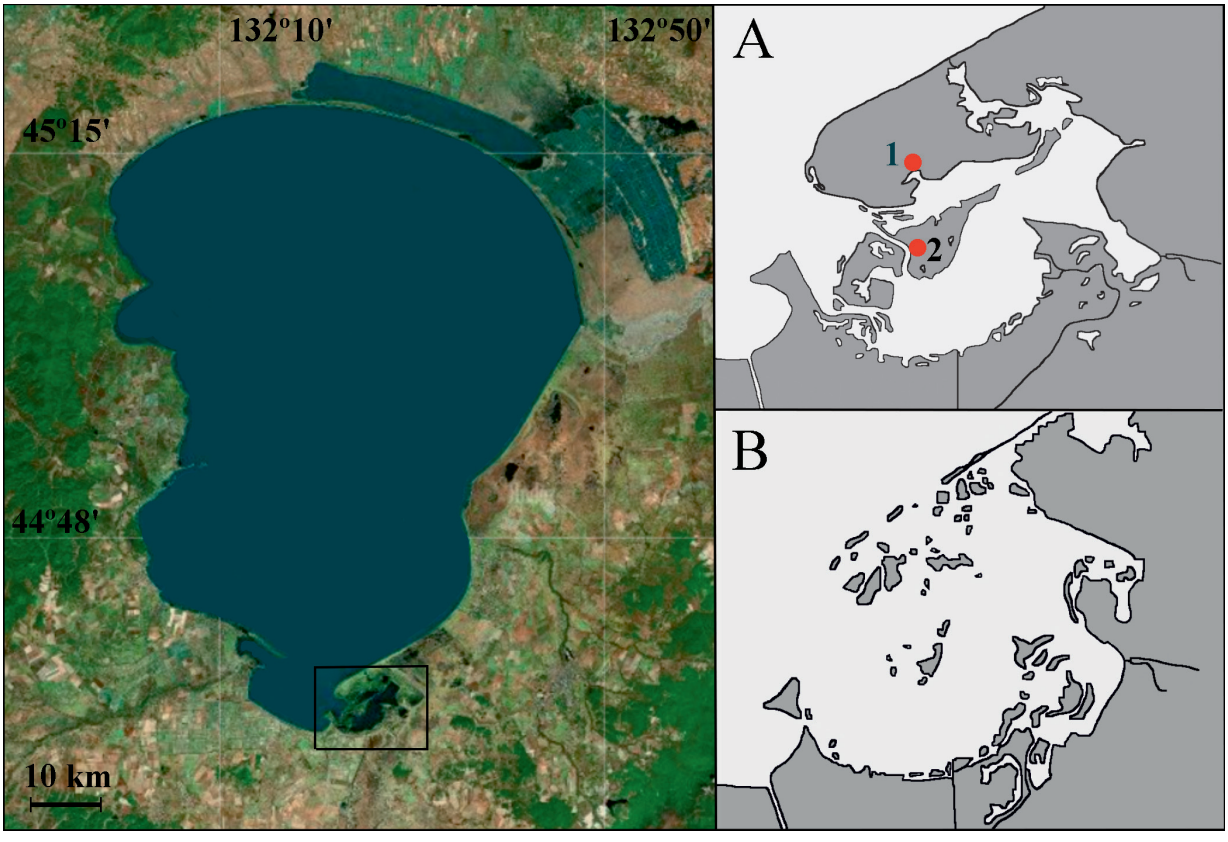

Fig. 4. A fragment of the coastline of Lake Khanka, namely the mouth of the Ilistaya River: *A* — 2015; *B* — 2020; *1* — location of the colony of Eurasian Spoonbill in 2018; *2* — location of the colony of Eurasian Spoonbill in 2019

Рис. 4. Фрагмент береговой линии оз. Ханка, а именно устья р. Илистой: *А* — 2015 г.; *Б* — 2020 г.; *1* — местонахождение колонии колпицы в 2018 г.; *2* — местонахождение колонии колпицы в 2019 г.

In the summer of 2008, 48 birds were recorded in flooded reeds in the delta of the Naolihe River, Qixinghe National Nature Reserve (Fig. 3, point 6). By 2011, the number of Spoonbill in the breeding area increased to 500 and the number of actually counted nests to 170 (Cui 2017). By 2016, the number of reproducing birds reached 140 pairs. According to further observations, the number of Spoonbill recorded in the breeding period decreased by several times. By 2021-2022, however, the number increased again and amounted to 400-500 of breeding pairs.

To sum up, now, the total number of Spoonbill population nesting in the Amur River Basin is about 550-650 pairs. Interestingly, according to the data of the late 18th-early 19th century (Przhevalsky 1870; Shul'pin 1936), the colonies of Eurasian Spoonbill at the bank of the Russian sector of Lake Khanka were found not only in reed thickets but also in flooded willows. Today, all the known colonies of Spoonbill in the Amur River Basin are found exclusively in reed thickets.

Today, all the known colonies, both in the Russian (Khankaisky and Daursky Reserves) and the Chinese sectors (Xingkaihu and Qixinghe National Nature Reserves), are located in protected areas. This significantly reduces but does not completely remove the anxiety factor which is undoubtedly important for Spoonbill, a species sensitive to it (Glushchenko 1981).

The increase in the number of birds nesting in the Amur River Basin and, accordingly, the number of birds migrating from wintering grounds in the floodplain of the Yangtze River through the Korean Peninsula and further along the sea coast increases the chances of possible nesting of Black-faced Spoonbill *Platalea minor* Temminck et Schlegel, 1849 in reed thickets of the Amur River Basin. This species is close to Eurasian Spoonbill and belongs to the category of exclusively coastal seabirds. It breeds on the shores of the Yellow Sea on Korean and Liaodong Peninsulas and on Furugelma Island in Russia, that is, on the migration routes of Eurasian Spoonbill. The flocks of Eurasian Spoonbill flying to the north in spring can attract Black-faced Spoonbill to a joint migration to the places located further than their breeding sites. Single Black-faced Spoonbills were noticed in the groups of Eurasian Spoonbills in the inner districts of Primorsky Krai 26 April 2011 in the upper part of the Amur Bay; 30 March 2020 in the Ussuriysk District in the valley of the Razdolnaya River; 4 June 2011 and 24 July 2012 in the southern part of Lake Khanka at the mouth of the Ilistaya River on the boundary of the Heron colony (Korobov et al. 2012; Glushchenko et al. 2020). Moreover, in the summer of 2020, in the mouth of the Gnilaya River, in a colony of Eurasian Spoonbill, a case of successful reproduction of a Black-faced Spoonbill with a partner that has morphological signs of both Black-faced Spoonbill and Eurasian Spoonbill was noted (Tiunov 2021).

According to the data from GPS-GSM trackers, the place of spring observation at the territory of the Primorsky Krai in the Razdolnaya River valley is located not only on the way of Khanka's nesting group birds, but also on the way of those nesting in the Amur River Basin to the north of Lake Khanka (including the Chinese sector) (Xi et al. 2021). Thus, the accounting of Eurasian Spoonbill migrating through this terrain will allow to track the dynamics of the number of Eurasian Spoonbill nesting in the Amur River Basin (excluding the western breeding site in the Zabaykalsky Krai).

Conclusion

It is safe to assume that the major part of Eurasian Spoonbill population in the Amur River Basin concentrates in Qixinghe National Nature Reserve. The decline in the number of Spoonbill in Qixinghe after 2016 could be a consequence of movement of some birds to the Russian sector of Khanka's coast and the formation of colonies in the mouths of Ilistaya and Gnilaya Rivers noticed by us in 2018. The increase in the number of Spoonbill reproductive groups in Qixinghe National Nature Reserve after 2017 could be the beginning of bird nesting in Xingkaihu National

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Nature Reserve, located to the south, on the migration way to the breeding sites. In general, despite the specific hydrological conditions that have formed on Lake Khanka in the 21st century, the number of birds nesting here continues to increase.

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