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ORIGINAL PAPERS

The Colonial Nesting Sea Birds (Charadriiformes: Laridae) of Peter the Great Bay, Sea of Japan

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Abstract—This paper presents the recent data on the distribution and breeding abundance and distribution of the Mongolian Gull, Slaty-backed Gull, Black-tailed Gull and the Common Tern nesting within Peter the Great Bay of the Sea of Japan. Over the past 30 years, all species of gulls increased their abundance, while the Common Tern has almost ceased to nest on the islands of the bay.

Keywords: colonial sea birds, abundance, distribution, Peter the Great Bay, Sea of Japan, Gulls, Common Tern

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INTRODUCTION

The study of sea birds in Peter the Great Bay of the Sea of Japan was started in the 1960s. Yu.V. Shibaev in his publication of 1987 [9] summarized all available data on the distribution and abundance of sea bird colonies within the boundaries of the bay. For many colonies, these data were no longer updated. For example, the latest data on the number of nesting Black-tailed and Slaty-backed gulls on Stenin Island were from 1970 and 1979 [9], for the Black-tailed gull on Karamzin Island, from 1972 [11–13], and for the Common tern throughout the entire water area of the bay, 1982 [9]. At the same time, judging by some works, including those on the development of the Mongolian gull in the eastern periphery of the Asian continent [10], as well as the cadastre of the main marine ornithological territories [11–13], specialists periodically visited some islands of Peter the Great Bay and conducted stationary ornithological observations on Furugelm Island. Unfortunately, the published information on the abundance and distribution of gulls (with the exception of the Mongolian gull) is extremely scarce and sometimes repeats the information obtained several decades ago. This situation greatly influenced our desire to clarify the current distribution and abundance of gull birds within Peter the Great Bay. Moreover, in 1978, the Far Eastern Marine Biosphere State Nature Reserve was established in the bay; the main scientific studies of the Reserve are inventory and monitoring studies of the animal world. The data we obtained on the distribution of gull colonies and their abundance in the area of the bay, including within the boundaries of the reserve, are important and can be used for subsequent comparisons and conclusions.

MATERIALS AND METHODS

Within Peter the Great Bay (from Cape Ostrovok Falshivy to Cape Povorotny), all colonies and small settlements of gulls were recorded in 2017 and 2018 during a detailed survey of the entire coastline of the bay, including the islands (Fig. 1). In these years, the number of nesting gulls was estimated approximately, without taking into account birds of large colonies. In the periods from May 21 to May 30, 2019 and from May 20 to May 30, 2021, the count survey was performed purposefully.

The abundance of small bird settlements was counted from a motorboat with Olympus 12 × 50 Exps I binoculars and a Panasonic Lumix FZ 50 camera with further office data processing, and also during landings at counting all nests. In large colonies (on the islands of Furugelm, Stenin, Karamzin, Askold, and some others), we performed a count of the number of nesting birds with a Phantom 4 Pro quadrocopter. Photography was carried out from a height of 50–80 m, covering the entire area of the colony. In 2019, photo shooting from a quadrocopter was conducted manually. Photo stitching was performed in Photoshop CS6

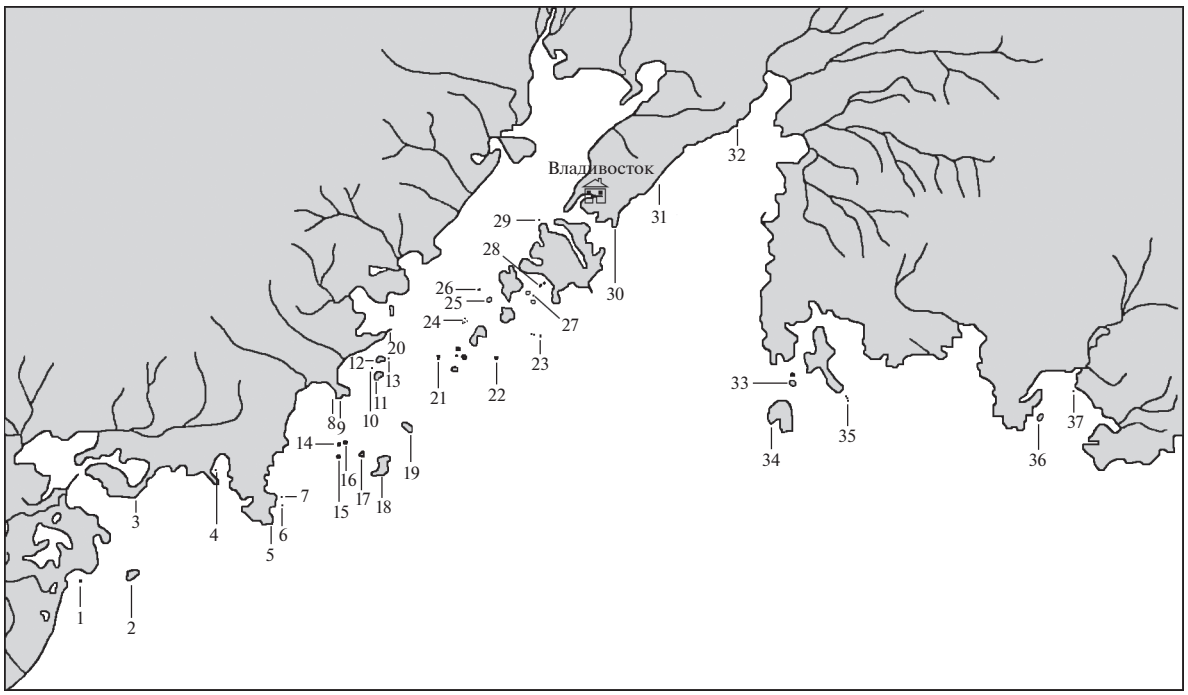

Fig. 1. A schematic map of the localities of count surveys of nesting birds within Peter the Great Bay. (1), Kamni Butakova Islets, (2), Furugelm Island, (3), Degera Cape, (4), Brausera Island, (5), Gamov Cape, (6), Maksimov Island, (7), Astafiev Islands (8), Klerk Island, (9), Klerk Cape, (10), Kolonna Kekur, (11), Sibiryakov Island, (12), Antipenko Island, (13), Ptichiy Island, (14), Hildebrandt Island, (15), Durnovo Island, (16), De-Livron Island, (17), Matveevskaya Gryada, (18), Bolshoi Pelis Island, (19), Stenin Island, (20), Bruce Peninsula, (21), Tsivolko Island, (22), Karamzin Island, (23), Verkhovskogo Islands, (24), Pakhtusov Islands, (25), Kozlov Island, (26), Dva Brata Islands, (27), Malyy Island, (28), Lavrov Island, (29), Ushi Island, (30), Basargin Peninsula, (31), Tri Brata Cape, (32), Vilkov Cape, (33), Kamni Unkovskogo Islets, (34), Askold Island, (35), Pyat' Paltsev Kekurs, (36), Lisiy Island, (37), Stvornyy Island. @Key: Владивосток→Vladivostok

by determining the intersection points in each photo with following counting of birds on their nests. This counting showed that at manual shooting over large areas with a quadrocopter, some fragments of the colony cannot be covered; this makes it difficult to stitch photos and thus it results in underestimation of the number of nesting birds.

In 2021, gull colonies were photographed by a quadrocopter in an offline mode with the use of the Drone Deploy program, which allows one to preset the required flight area and height and to overlap frequency of photographs. This made it possible to film the areas occupied by the gull settlements without missing any sites. The height of photo shooting also ranged from 50 to 80 m, and the overlap area of the photographs was 70%, this approach, although it increased the number of frames, excluded missing of fragments of the colony because of elevation differences on the terrain.

In total, we took and processed 1800 photographs in 2019 and 4450 photographs in 2021. The time interval for photographing the colonies in 2019 and 2021 was chosen as the time when the Black-tailed gull incubated full clutches. Therefore, when counting the number of pairs in the photographs, one pair was taken as a gull sitting on a nest, or as two birds, one of which was incubating the clutch, and the second bird was nearby. Birds that were not incubating in the colony and birds in flocks outside the colony were not taken into account.

RESULTS

Three species of gulls and one species of tern nest on the coast and islands of Peter the Great Bay.

The number of the Mongolian gull *Larus mongolicus* Sushkin, 1925, which breeds only on the islands Furugelm and Verkhovskogo (Bolshoy Verkhovsky), was 133 pairs, according to the data for 2021.

The Slaty-backed gull *Larus schistisagus* Stejneger, 1884 forms the largest colonies on the Kamni Unkovskogo Islets, the islands of Verkhovskogo, Tsivolko, and Furugelm (Table 1). The total number of birds breeding within the boundaries of Peter the Great Bay was 793 pairs in 2019 and 777 pair in 2021. Taking into account the birds we recorded in 2017 and 2018 on the islands of Askold, Kozlov, Dva Brata, Brauzer, and others, but not counted in 2019 and 2021, the total number of nesting gulls may reach 800–850 pairs.

According to the data of 2017–2021, the actual abundance of the Black-tailed gull *Larus crassirostris*

Table 1. The abundance of the Slaty-backed gull *Larus schistisagus* (pairs) on the coast and islands of Peter the Great Bay of the Sea of Japan

Locality	Year		
	2017/2018	2019	2021
Stvornyy Island	1/1	0	0
Kamni Unkovskogo Islets	140/214	340	328
Askold Island	?/2	?	?
Kozlov Island	3/?	?	?
Dva Brata Islands	5/?	?	?
Verkhovskogo Islands	82/102	232	224
Karamzin Island	30/?	34	27
Tsivolko Island	15/?	76	82
Bruce Peninsula	3/?	?	?
Ptichy Island	3/?	?	?
Kekur Kolonna	1/?	?	?
Sibiryakova Island	1/?	?	?
Klerk Cape	1/?	?	?
Klerk Island	3/?	?	?
Gamov Cape	1/?	?	?
Maksimov Island	1/?	?	?
Brauzer Island	2/?	?	?
Stenin Island	3/?	6	5
Bolshoi Pelis Island	0	3	3
Matveev Islands Chain	9/?	16	16
Hildebrandt Island	2/?	2	2
De-Livron Island	5/?	9	9
Kamni Butakova Islets	0	1	?
Furugelm Island	–	74	81
Total	–	793	777

Here and in Table 2: "?", the island was not visited this year; "0", the colony was visited, but no nesting birds were observed; "–", the colony was visited without assessing the number.

Vieillot, 1818 was 93 229 pairs. Taking into account the imminently missed nests because the birds left their nests at the moment of counting and birds on nests but hidden by dense vegetation, as well as the birds whose nests were destroyed by the time of our survey, the number of nesting gulls within Peter the Great Bay may be 94500–95500 pairs. The largest colonies of the Black-tailed Gull are located on the islands of Furugelm, Karamzin, and Askold. In addition to the previously known bird nesting sites, we noted nesting of this species on the islands of Stvorny, Tsivolko, Brauzer, and some others (Table 2).

The only colony of the Common tern *Sterna hirundo* Linnaeus, 1758 within the boundaries of Peter the Great Bay was discovered on Brauzer Island. The number of nesting birds varied from six pairs in 2017 to eight pairs in 2018.

DISCUSSION

The Mongolian gull *Larus mongolicus* is a common migrant here, a breeding migrant and, probably, a rare wintering bird in Primorsky Krai. In Peter the Great Bay, breeding of this gull species was first recorded in 2004 on Furugelm Island, when one nest of this gull was found, and 11–12 pairs nested there in the next 2005. In subsequent years, the population dynamics was positive, and in 2012 the number of nesting pairs increased to 72 [10]. In 2019, we counted 124 nests of the Mongolian gull on this island [3] and in 2021, 127 nests.

In 2012, two nests of the Mongolian gull were found on the Verkhovskogo Islands [10], and two nests were found in 2015 on one of the small islets Matveevskaya Gryada [1]. Later, in 2021, six nests were counted on Ostrova Verkhovskogo Islands, while in 2017–2021, nesting of this species on Matveevskaya

Table 2. The number of the Black-tailed gull *Larus crassirostris* (pairs) on the coast and islands of Peter the Great Bay of the Sea of Japan

Locality	Year			
	1967–1986	2017/2018	2019	2021
Stvornyy Island	0	140/340	?	474
Lisiy Island	≤100	0	0	0
Askold Island	0	0	8764	19531
Kamni Unkovskogo Islets	1500–2000	0	0	0
Pyat' Paltsev Kekurs	≤1000	0	0	0
Tri Brata Cape	0	70/?	68	0
Vilkov Cape	0	60/?	131	0
Basargin Peninsula	0	1895/–	3582	1163
Ushi Island	0	10/12	?	?
Verkhovskogo Islands	100	15/0	0	0
Dva Brata Islands	0	2/7	?	?
Karamzin Island	4500–10000	9868/?	13675	13655
Tsivolko Island	0	15/?	12	9
Bruce Peninsula	0	30/0	?	?
Antipenko Island	684	0	0	0
Stenin Island	2500	–	6064	8593
Bolshoy Pelis Island	1	0	0	0
Matveevskaya Gryada Islets	15–30	0	0	0
Hildebrandt Island	5–20	0	0	0
Durnovo Island	0	1/0	0	0
De-Livron Island	43–70	0	0	0
Brauzer Island	0	540/547	1083	1147
Furugelm Island	22500–42500	–	37310	48657
Total	32948–59005	–	70689	93229

Designations as in Table 1.

Gryada islets (Matveev Island, two nameless isles, three emersed rocks, and several kekurs) was not recorded at all.

The Slaty-backed gull *Larus schistisagus* is a rare nesting but common nomadic and wintering species in the Sea of Japan. In Peter the Great Bay, breeding of the species was first recorded on Karamzin Island in 1967 [5]. Visiting the island on May 5, 2011, Glushchenko et al., recorded 18–20 territorial birds [2]. By 2016, the total abundance of the species for Karamzin and Verkhovskogo Islands was 75–80 pairs [11]. Moreover, one to three pairs of the Slaty-backed gulls nested in 1979 on Stenin and Bolshoi Pelis islands [9], while in 1993 and later, 20–22 nests of this species were found on Furugelm Island [8, 13, 15].

We conducted the count survey of the Slaty-backed gull nesting on Furugelm Island on May 23, 2019 and on May 24, 2021. A total of 74 and 81 nests, respectively, were recorded. Moreover, large colonies of this species were recorded on the Kamni Unkovskogo Islets and Ostrova Verkhovskogo Islands, where, according to the results of counts carried out in 2017 and 2018 from a motor boat and during hiking routes, fewer nesting birds were found than from quadrocopter photos in 2019 and 2021 (Table 1).

We recorded small settlements of the Slaty-backed gulls on the islands Karamzin, Tsivolko, and Matveevskaya Gryada. Single pairs and small groups of these birds usually nest near colonies of the Temminck's cormorant *Phalacrocorax capillatus* and the Pelagic cormorant *Phalacrocorax pelagicus* on the islands of Askold, Kozlov, Bolshoi Pelis, Hildebrandt, Stenin, and De-Livron, on the Klerk and Gamov capes, on the rocks of Butakova, and others (Table 1).

On Tsivolko Island, the greatest number of breeding Slaty-backed gulls (82 pairs) was recorded in 2021 (Table 1). At the same time, against the background of an increase in the abundance of this species, a decrease was recorded in the number of nesting pairs of the black-tailed gulls (Table 2). Most probably, this

decrease in abundance resulted from destruction of nests of Black-tailed gulls by Slaty-backed gulls, as well as from hunting on adult gulls by the Peregrine falcon nesting on this island.

The Black-tailed Gull *Larus crassirostris* is an abundant breeding species in Primorsky Krai. According to N.M. Litvinenko and Yu.V. Shibaev, the number of gulls on the islands of Peter the Great Bay is more than 50000 pairs [7, 9], while the largest colony located on Furugelm Island varied in abundance in different years – from 20000–22500 pairs in 1972 [6] to 42500 pairs in 1983 [14]. The latest information about the number of gulls breeding here dates back to 1993, when 73 440 individuals, i.e., 36720 pairs, were recorded [8]. However, Yu.V. Shibaev indicated in his publication of 2016 that, according to his unpublished information, the number of gulls in the colony significantly decreased (probably by 2016) compared to 1993 [13].

According to our data obtained with the use of a quadrocopter, at least 37 310 pairs nested on Furugelm Island in 2019. However, this number is underestimated due to the imperfect methods and the omission of several fragments of the colony. During the recount in 2021, 48657 nests were recorded (Table 2), which, taking into account the error, may indicate the nesting of 49000–49500 pairs.

Large colonies of the black-tailed gull were also found on the Karamzin and Stenin Islands (Table 2). According to the census data, about 10000 pairs nested on Karamzin Island in 1967, 7000 pairs in 1968 [5], 4500 pairs in 1970, 5500 pairs in 1972 [6, 9], and 5600 pairs, according to other data of Shibaev [11]. We surveyed Karamzin Island on May 31, 2017, May 26, 2019, and May 28, 2021. In 2017, the island was photographed along the entire perimeter, this survey, due to the configuration of the island and the high quality of the photographs, made it possible to count gulls almost throughout the entire colony. Count surveys for the number of nesting birds with the use of photo shooting from a quadrocopter showed a slightly higher number of gull pairs in 2019 and 2021 (Table 2) compared to the data of 2017–2018.

The number of Black-tailed gulls on Stenin Island was in 1967–1968 several tens of pairs [5], according to the data of surveys2500 pairs in 1970 [9]. According to our observations carried out in 2019 and 2021, the area occupied by the colony and the total number of nesting birds significantly increased (Table 2).

On Brauzer Island, the number of breeding Black-tailed gulls in 2017 and 2018 were counted during hiking routes through the entire colony. In 2019 and 2021, the number of gulls was determined using a quadrocopter. The cyclone of 2020 destroyed wild rose thickets on the island, this had a favorable effect on the number of individuals breeding there in 2021 (Table 2).

According to the census of 1986, 1500 to 2000 pairs of Black-tailed gulls nested on the stones of Kamni Unkovskogo Islets [9]. During the visits in 2017–2021, nesting of the Black-tailed gull was not observed, but a colony of Slaty-backed gulls was registered.

Earlier, nesting of the Black-tailed gull was observed in Ussuriysky Bay, on Lisiy Island, and on the Pyat Paltsev kekurs [9]. During the period of our surveys, the species was not recorded in this territory; however, some colonies were found on the islands of Stvorny and Askold, capes Tri Brata and Vilkov, and on the Basargin Peninsula. On Askold Island, we recorded two colonies with a total number of almost 20000 pairs (Table 2). One of the colonies located in Naezdnik Bay contained at least 17000 pairs in 2021. In 2021, the species did not nest on capes Tri Brata and Vilkov, and a decrease in the abundance of this species was determined for Basargin Peninsula. It was established that gulls build nests only in hard-to-reach areas, not using a significant areas of the available space, which is associated with an increased disturbance factor or direct destruction of nests by dogs, cats and foxes, and due also to collection of eggs by people.

On Verkhovskogo Islands, where a colony of 100 pairs of Black-tailed gulls was observed in 1985–1986 [9], we found just single nesting birds (15 pairs) and only in 2017. Visiting these islands in 2018, 2019, and 2021, we found no nests of the Black-tailed gulls (Table 2), but revealed the appearance of several pairs of the Mongolian gull. In addition, we encountered in 2017 only one nesting pair of the Black-tailed gull on Durnovo Island. At our surveys in 2017–2021, we revealed that some colonies noted in 1982 on Antipenko Island had disappeared, as well as those recorded in 1973 and 1979 on Hildebrandt Island, and those recorded in 1972–1983 on De-Livron Island [9]. We recorded small numbers of nesting birds on the islands of Ushi, Tsivolko, and Dva Brata and on Bruce Peninsula (Table 2).

The Common Tern *(Sterna hirundo)* is a common, locally breeding migratory bird species in Primorsky Krai. According to information of Yu.N. Nazarov, in the 1950s a number of pairs inhabited the islands of Peter the Great Bay, e.g. Ushi Island [9]. In the 1960s, this species was observed nesting on the islands of Tsivolko (about 10 pairs), Malyy (about 20 pairs), Lavrov (about 50 pairs), and Stenin, as well as on kekurs located between the islands of Matveev and Bolshoy Pelis (21 pairs) and on an unnamed islet at Antipenko Island [5]. In the 1970s, several birds nested on a separate kekur off Verkhovskogo Islands, on a rock at Pakhtusova Islands (20 pairs), on kekurs near the Astafiev Islands (20 pairs) and Hildebrandt Island (1 pair) [9]. In the period, the Common tern no longer nested on Stenin Island and on kekurs located between islands of Matveev and Bolshoi Pelis. In 1980s, the total number of the birds in the surveyed area was about 300 pairs; the largest settlements, located on Malyy Island and on rocks near Antipenko Island, included 141 and 123 pairs, respectively. In

addition to the known settlements, some terns occurred in these years on the Dva Brata Islands and on a kekur near Degera Cape (Krabbe Peninsula) [9].

Based on the results of the surveys of the islands and the coast of Peter the Great Bay that we conducted since 2017, Common Tern nesting was recorded only on Brauzer Island [4], occupied by a colony of Black-tailed Gulls. The terns occupied a small-pebble coast of the island, where the Black-tailed Gull did not nest. The numbers of breeding pairs of the Common Tern in 2017, 2018, 2019, and 2021 were 6, 8, 7, and 7 pairs, respectively.

Thus, as a result of the surveys carried out in 2017, 2018, 2019 and 2021, we obtained the original data on the abundance of nesting gulls and common terns on the islands and coasts of Peter the Great Bay after a 30-year break in seabird research. We managed to find an approach to counting gulls in large colonies; the method allows one to count nesting birds with high accuracy. Even small colonies of gulls situated on rocky islands and kekurs, where the number of birds cannot be reliably determined from a boat or at landings ashore, can be surveyed with the use of a quadrocopter, which, as our practice has shown, makes it possible to count almost all gulls and is not a negative factor for the birds. Our data differ from the information presented in the literature and will serve as a good basis for further monitoring.

A slight increase in abundance was noted for the Mongolian Gull on Furugelm Island. Moreover, the species has established its colonies on the Verkhovskogo Islands and may later start nesting on the Kamni Unkovskogo rocks, which are presently occupied by a colony of the Slaty-backed gull. Its population on the islands of Peter the Great Bay at the end of the last century was no more than 30 pairs, while, according to fragmentary information of the last decade, this population was about 100 pairs and, according to our estimates, about 800 pairs. In the meanwhile, both significant monospecies colonies were noted on the Unkovskogo rocks, the islands of Tsivolko and Verkhovskogo, and mixed settlements with the Black-tailed and Mongolian gulls were recorded on the islands of Furugelm and Karamzin. In addition, individual pairs or small groups of Slaty-backed gulls have been found nesting throughout the water area of Peter the Great Bay near the colonies of the Temminck's cormorant *Phalacrocorax capillatus* and the Pelagic cormorant *Phalacrocorax pelagicus*. The abundance of Black-tailed gulls, estimated as 48000–54000 pairs at the end of the 20th century was, according to the results of our surveys, 94500–95500 pairs in 2021. In addition to the largest colony on Furugelm Island, whose abundance has increased by more than 10000 pairs since the last count, numerous new colonies have been noted in the water area of Peter the Great Bay on the islands of Askold and Brauzer, and on Basargin Peninsula. The breeding population of the Common Tern was estimated as almost 300 pairs in the 1980s; this decreased to six to eight pairs, and only on Brauzer Island.

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COMPLIANCE WITH ETHICAL STANDARDS

Conflict of interests. The authors declare that they have no conflict of interest.

Statement on the welfare of animals. All applicable international, national, and/or institutional guidelines for the care and use of animals were followed.

REFERENCES

1. Glushchenko, Yu.N. and Korobov, D.V., New data for the study of the avifauna of the Far East Marine Reserve, in *Biota i sreda zapovednikov Dal'nego Vostoka* (Biodiversity and Environment of Far East Reserves), 2015, no. 5, pp. 22–45.
2. Glushchenko, Yu.N., Nechaev, V.A., and Red'kin, Ya.A., *Ptitsy Primorskogo kraya: kratkii faunisticheskii obzor* (Birds of Primorsky Krai: A Brief Faunistic Overview), Moscow: KMK, 2016.
3. Glushchenko, Yu.N., Tiunov, I.M., Korobov, D.V., et al., Nesting birds of Primorsky Krai: Mongolian gull *Larus mongolicus, Russ. Ornitol. Zh.*, 2022, vol. 31, no. 2190, pp. 2299–2325.
4. Glushchenko, Yu.N., Korobov, D.V., Tiunov, I.M., et al., Nesting birds of Primorsky Krai: European tern *Sterna hirundo, Russ. Ornitol. Zh.*, 2022, vol. 31, no. 2148, pp. 87–100.
5. Labzyuk, V.I., Nazarov, Yu.N., and Nechaev, V.A., Birds of islands of the northwestern part of Peter the Great Bay, in *Ornitologicheskie issledovaniya na yuge Dal'nego Vostoka* (Ornithological Studies in the South of the Far East), Vladivostok: Dal'nevost. Nauchn. Tsentr Akad. Nauk SSSR, 1971, pp. 52–78.
6. Litvinenko, N.M., *Chernokhvostaya chayka Larus crassirostris Vieill. Rasprostranenie, biologiya, epidemiologicheskoe znachenie* (The Black-Tailed Gull *Larus crassirostris* Vieill. Distribution, Biology, Epidemiological Significance), Moscow: Nauka, 1980.
7. Litvinenko, N.M. and Shibaev, Yu.V., Colonial birds in Peter the Great Bay, in *Okhrana prirody na Dal'nem Vostoke* (Nature Protection in the Far East), Vladivostok: Dal'nevost. Nauchn. Tsentr Akad. Nauk SSSR, 1976, pp. 181–183.
8. Litvinenko, N.M. and Shibaev, Yu.V., Importance of the lower reaches of the Tumangan River for bird diversity (Materials for organization of national park and additional Ramsar site), in *Ptitsy presnykh vod i morskikh poberezhii yuga Dal'nego Vostoka Rossii i ikh okhrana* (Birds of Fresh Waters and Seacoasts of the Southern Far East of Russia and Their Protection), Vladivostok: Dal'nauka, 1996, pp. 49–75.

9. Shibaev, Yu.V., The inventory of colonies and monitoring of some bird species in Peter the Great Bay (Sea of Japan), in *Rasprostranenie i biologiya morskikh ptits Dal'nego Vostoka* (Distribution and Biology of Marine Birds of the Russian Far East), Vladivostok: Dal'nevost. Otd. Akad. Nauk SSSR, 1987, pp. 43–59.

10. Shibaev, Yu.V., Expansion of "Mongolian gull" *Larus* (*Smithsonianus*) *mongolicus* Sushkin, 1925 to the eastern periphery of the Asian Continent, *Far East. J. Ornithol.*, 2014, no. 4, pp. 3–19.

11. Shibaev, Yu.V., Verkhovskogo and Karamzin Islands, in *Morskie klyuchevye ornitologicheskie territorii Dal'nego Vostoka Rossii* (Marine Key Ornithological Territories of the Russian Far East), Artyukhin, Yu.B., Ed., Moscow: Ross. O–vo. Sokhraneniya Izuch. Ptits, 2016, pp. 118–119.

12. Shibaev, Yu.V., The Rimsky-Korsakov Archipelago, in *Morskie klyuchevye ornitologicheskie territorii Dal'nego Vostoka Rossii* (Marine Key Ornithological Territories of the Russian Far East), Artyukhin, Yu.B., Ed., Moscow: Ross. O–vo. Sokhraneniya Izuch. Ptits, 2016, pp. 120–121.

13. Shibaev, Yu.V., Furugelm Island and the Tumen River Delta, in *Morskie klyuchevye ornitologicheskie territorrii Dal'nego Vostoka Rossii* (Marine Key Ornithological Areas of the Russian Far East), Artyukhin, Yu.B., Ed., Moscow: Ross. O–vo. Sokhraneniya Izuch. Ptits, 2016, pp. 122–124.

14. Litvinenko, N.M. and Shibaev, Yu.V., Status and conservation of the seabirds nesting in southeast USSR, in *Seabirds Status and Conservations*, Cambridge: Int. Counc. Bird Preserv., 1991, no. 11, pp. 175–204.

15. Litvinenko, N.M. and Shibaev, Yu.V., Birds of the wetland "Tumangan" (Biodiversity and problems of protection), in *Sostoyaniye prirodnoi sredy i bioty yugo-zapadnoi chasti zaliva Petra Velikogo i del'ty reki Tyumen'* (The State of Environment and Biota of the Southwestern Part of Peter the Great Bay and the Tumen River Delta), Vladivostok: Dal'nauka, 2001, vol. 2, pp. 5–19.

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SPELL: OK