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## PUBLISHER'S TRANSLATION INTO ENGLISH

**Litvinenko N.M., Shibaev Yu.V.*** Breeding of the Little Egret *Egretta garzetta* (Linnaeus, 1766) in Extreme Southwest Primorye (Furugelm Island) // *Far East. J.Orn. 5*: 61—67.

### SUMMARY

We provide information on the initial stage of colonization of the Primorsky Territory (in the southern Russian Far East) by Little egret *Egretta garzetta (Linnaeus, 1766)*. About 35 years have passed since the first detection of the species in the region and first documented nesting. The article also provides information on the current status of the species here, its biology, breeding success and threats.

***The referred figures and tables are in the original article in Russian, pp. 61—67***

Little egret *Egretta garzetta*, being a recent invader, is a rare nesting species on the south of the Russian Far East. It hadn't been mentioned in generalizing studies of Shulpin (1936), Vorob'jov (1954) and Panov (1973). Neither this egret had been revealed during surveys conducted in 1963-68 on the islands of the Peter the Great Bay (Labzyuk et al., 1971). First registrations of this species in Primorye happened in the beginning of the 70's: May 3, 1970, mouth of the river Shmidtovka, De-Friz Peninsula (Omel'ko, Omel'ko, 1981); September, 1974, Olginsky District (Labzyuk, 1981); 1974, Terneysky District (Elsukov, 2013). All these observations were made on the coastal areas. Apparently, birds-"invaders" came deeper into the mainland a bit later. Thus, first observations on the lake Khanka are dated August 17, 1976 and May 15, 1977 (Glushhenko et al., 1992).

In the following years birds were being registered on the same and new sites of Primorsky krai much more regularly, but, again, mostly in the coastal zone. Data on the long-term zoological studies, conducted by S.V. Elsukov (2013) in the coastal zone of the north-east Primorye, from Plastun settlement to Zolotoy cape, is quite representative. From the 1974 to 2007 author registered little egrets 216 times. However, A.G. Velizhanin observed this bird in the central part of the Sea of Japan (Jamato bank) yet in 1963. During April 15 – 23, 3 singles, 1 pair and a flock of 3 birds were registered (proved with photos). Moreover, three birds landed on the ship at night. "Herons flew westward from Japan" (Velizhanin, 1981). Obviously, it was migratory birds, flew towards south of Primorye or northern part of North Korea.

Thereby first appearances of the little egret on the territory of the southern Prymorye should be dated by early 60-ies of XX century. Distribution pattern of all observations is quite lopsided. Most of them are located close to coastal area of Primorsky krai (Nazarov, 2004; Elsukov, 2013; Shokhrin, 2005; our observations, etc.), and they are still very few away from the seaside. Thus, during five-year survey (2003-2007) of waterfowl spring migration near Ussuriysk only two observations of single little egret were registered (Gluschenko et al., 2007). This comparison is not that rigorous, nevertheless, it evidence that pervasion into the region is going through the coastal area. In spring birds are flying towards the seaside and along it.

### MATERIAL AND METHODS

Authors have collected data for a several years (1990-2015) on extreme southwest of Primorsky krai. More often these observations were made occasionally in frames of the long-term monitoring

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of colonial seabirds on the Furugelm island and periodic surveys of coastal wetlands of the Peter the Great Bay. Despite this, overall duration of such observations made it possible to characterize the situation in general. Scarcely could it be made within short and even targeted study.

**What Was Prior the First Evidence of Nesting on Extreme Southwest of Primorsky Krai.** In 1996 we managed to track the status of little egret from the end of March till the second half of October (Table 1). Data was collected accidentally with the performance of other tasks. It was a mix of stationary observations after birds' migration through the wetlands near Khasan settlement, walking excursions and examinations of surrounding area by car.

There were no species observation from March 27 to April 10. First bird was recorded on the Narva river only on April 25. Thereafter herons were observed relatively regularly. Usually it was singles or small groups of feeding or resting birds. The ones, who could be seen distinctly, were identified mostly as adults and rarer - as subadults. The largest groups consisted of 6-8 individuals. Surroundings of Khasan settlement became the main area of successful observations. Particularly, on the outskirt of the settlement, on the lake birds have been seen from mid-May to mid-August. This quiet and food abundant place attracted different species of herons. For example, on July 18 and 19 we recorded six species presented simultaneously: Chinese pond heron *Ardeola bacchus,* cattle heron *Bubulcus ibis,* great egret *Egretta alba,* intermediate egret *E. intermedia,* little egret *E. garzetta,* grey heron *Ardea cinerea* (Litvinenko & Shibaev, 1999). During the day herons fed actively and rested, and after a sunset flew towards the border river Tumen, apparently, to overnight on the one of the islands.

It is unknown, did the little egrets try to nest. Unfortunately, at that time we didn't study this question specially. However, some facts allow to suppose nesting: long stay at a local area; presence of suitable and relatively safe sites (islands on the border river, overgrown with willow); presence and active usage of feeding habitats.

**Period of Seasonal Stay of Little Egret in the Study Area.** Spring observations of birds on extreme southwest of Primorsky krai mostly fall on the second half of April – early May. The earliest one happened on April 16 (Table 2)[1].

However, we didn't met little egrets at all from April 9 to 24 in spring 2009 during examination of the coastal zone of South Primorye, on the area from Sivuch'ja cove to Shkotovo settlement. In autumn birds sometimes stay till mid-September (Table 2). But in 2009, from August 28 to September 21, they weren't registered on the whole area from Tumen river to Vostok Bay (Fig. 1). This data not strictly but outline the frames of little egret's period of stay in the region during the season.

**Reproduction.** The first nesting on the Furugelm island, judging by indirect signs, took place in the season of 1998. Previously this species wasn't recorded for the island, although it was observed occasionally on the nearby seashore area: a single heron on April 29, 1996, 2 specimens on 14 and one on 16 of July, 1997. Veraciously breeding pairs were registered in the following years: 2000 (1) 2003 (3) 2004 (1) 2005 (3) 2009 (3) 2010 (1) 2014 (3) 2015 (2). In parenthesis the number of discovered nests or broods is given. During unspecified years birds on the island were observed, but nesting could be omitted, since the species was not the object of special attention.[2] The size of the nesting colony in these years, apparently, amounts to several pairs.

**Nests, Clutches, Broods.** While nesting in conditions of Furugelm island little egret gravitate to another species of small herons – Chinese egret (*Egretta eulophotes*). Little egrets tried to place their nests within the colonies of this species. Both herons choose elder shrubs (*Sambucus latipinna*) for nesting. Dense plantings are the most appealing for this purpose, like groups of shrubs on the slopes, faced to the open sea. Space under the canopy and branching peculiarities of the shrub, with its 2 meters average height, turned to be very convenient for moving and nesting of these relatively small birds. However, in comparison with

1) Earlier observations are known: March 22, 2003, northeastern Primorye (Elsukov, 2013); April 2, 1997 and April 10, 2002 – in Petrov cove (Lazovsky Nature Reserve) (Shokhrin, 2005).

2) At the beginning of the breeding season, the birds were kept very secretive.

Chinese egret, little egret tends to nest in more open spaces. Several nests were built on the ground near bases of dead bushes of elder or southernwood.

During the last five years we began to meet single nests, aside from the colonies of Chinese egret; they were located openly on the beach among stones or near large rocks of ravines close to the seashore. Sometimes nests were protected from the sides and sometimes built absolutely open on the plane of the stone block. Such nests were definitely less protected and perished more often. Nesting among more numerous Chinese egret plays a significant role for species protection under such natural conditions.

Two nests were measured: #1 was 40 cm in diameter, 15 cm high, with an inner depression of 12-14 cm (depression was slightly formed); #2 was 45x60 cm wide, 22 cm high, with an inner depression of 26 cm. Nests with the initial laying were found only twice: on June 6, 2014 (1 egg, beginning of hatching) and on July 15, 2015 (the same state). Generally, nests with clutches and downy chicks were met from the end of May till the end of July (Table 3).

The size of clutch (according to the data from different years): three, four and five eggs; each type was met twice. The size of broods (according to the data from different years): four cases with two juveniles, five cases with tree juveniles. Nest success (according to 16 nests from different years): successful – eight (feathered juveniles, almost all are flying); unsuccessful – four (nests perished); unknown result – four nests. Perished nests were at the stage of clutch or with downy chicks (Table 4).

Fledglings were observed on the island mainly during August. The earliest record of flying juvenile – 1st of August, the latest – 16th of September (in 2005). On the 18th of September brood wasn't found on its usual place despite thorough search. Obviously, juveniles were guided to the mainland (Table 2). When the parents are absent, juveniles of both species show interest towards territories, adjoined to the nest. Water, water table are especially appealing. Next to the colony is shore edge, surf and puddles in deepening of the stone slabs with fresh or desalted water. Chicks begin to show the hunting instinct. Juveniles of both species actively explore puddles, often full of mosquito larvae. Besides this, large crustaceans *Ligia cinerascens* are common near puddles and between the stones.

Juveniles of little egret avoid the surf, while, in opposite, the young of Chinese egret feel themselves quite comfortable there, at least in the absence of strong swell. Young E. garzetta, staying near puddle and pecking something from time to time is a common sight. Wherein it doesn't avoid stone deepenings and voids if they have puddles. In one of such "wells" 0.7 m deep and with the water at the bottom juvenile E. garzetta stayed for a long time with retracted neck, once in a while pecking something. It looked a bit unusual. Durable absence of parents (for 7 hours, single measurement) should encourage hunting activity of juveniles.

**Feeding Habitats and Feeding Behavior.** In our conditions, however, as in the other parts of the area – it is a various types of shallow water. During non-breeding period – shallows in the mouths of small rivers, small lakes with a fresh water. Sometimes – lake shore edge, overgrown with herbs, shallow brackish lagoons, shallows of the closed bays. It could be wet meadow, circumfused by rains. During nesting period parents fly for food mostly to the shallow lagoons, located in 10-15 km from the island, or to the closed shallow bays in the mouths of small rivers (~30 km). In both cases it is a brackish water.

The manner of feeding is vigorous. Thus on the fresh lake near Khasan settlement little egret "fed intensively, snatching fish every 1.5-2 minutes. Wherein she ran unpredictably, "rowed" the bottom, rarer died away". This extremely contrasted with the behavior of the large herons, great egret and grey heron, located not so far (N.M. Litvinenko, field diaries). Little egret willingly feed together with Chinese egret on the salty lagoons. In August, 2005 we counted twice the rate of these two species in mutual clusters. For the first case it was 5 to 31, in the second – 6 to 44. Almost the same dominance of Chinese egret was observed on the Furugelm island.

**Patterns of Aggressive Behavior.** In cases, when the nests of Little egret and Chinese egret are located close to each other, conflicts between neighbors could occur. In two similar occasions Little egret dominated. She walked around through the dead stems of southernwood, with the rampant egrets.

Another case happened near the nest with downy chicks, which was located openly on the stone boulder. The juvenile of grey heron was standing nearby. Adult female was between him and the nest, with the rampant decorating feathers. She also turned slowly first one then the other side, demonstrating herself, without a step (unfortunately, the final remains unknown).

### Stages of Little Egret Invasion on the Territory of Southern Primorye (Schematically)

1. Registration of migratory birds, flying towards the mainland, in the open Sea of Japan (Jamato bank) in spring of 1963 (Velizhanin, 1981).
2. First registration of the species in the Southern Primorye, spring of 1970 (Omel'ko, Omel'ko, 1981).
3. Becoming frequent observations in Southern Primorye in the early 70-ies of XX century.
4. First proved nesting in the region – the summer of 1998, Furugelm island.
5. Stable nesting (species introduction) on the island – the beginning of 2000s.
6. Beginning of nesting on the mainland of the Southern Primorye (Khanka lake) – 2001 (Gluschenko et al., 2003).

The nearest territories, where the species is nesting, are Korean peninsula and Japanese islands (Kushlan & Hancock, 2005). The invasion into our region is likely to originate from the both directions. Birds could also came from the eastern proveniences of China. Invasion was happened with the spring migration, and at first time other species of storks could guided little egret. Curious detail: A.G. Velizhanin (1981) noted that one of the observed from the sea little egrets "flew together with three bitterns *Botaurus stellaris* L." It took around 35 years from the first observations of the species till the first nesting. Anthropogenic pressure could be the cause which "extrude" the birds from their main area.

Nesting of the little egret on the Furugelm island (and Khanka lake) is a logical result of invasive attempts. Now this sites form the northern border of species' reproduction on the east part of the continent. The process of invasion is likely to continue.

**Threats.** Situation on the island is quite safe – it is the part of Far East Marine Reserve. But nearest feeding sites on the mainland are not protected, so this can be the real threat for the insular colony of little egret, as well as for black-faced spoonbill and Chinese egret. The most valuable for maintaining these species are coastal lagoons on the area from Golubiny Utjos mt. till Fal'shivy Ostrov cape. The problem of its protection voiced repeatedly, but still remains unsolved. It is the part of much more general task – conservation of the whole Tumangan wetland (Litvinenko, 1982; Litvinenko & Shibaev, 1996; Shibaev & Litvinenko, 2007; 1994; etc.).

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