Final report of project «Conservation of white-headed duck (Oxyura leucocephala) in Barabinskay lowland (Russia)»

For further information:

strizh@mail.tsu.ru

www.strizh.tsu.ru

Contact persons Evgeniy Murzakhanov, Andrey Bazdyrev

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INTRODUCTION

The current work is devoted to the project «Conservation of white-headed duck in Barabinskay lowland (Russia)». Besides, when writing the report, there was used the material, obtained at realization of the project «Finding-out of number and distribution of rare species of birds in south-east part of Western Siberia». Both projects were financed by the Conservation Leadership programme (old name BP Conservation programme). The aim of the project is to contribute to the development of the local work in studying and conservation of white-headed duck in Barabinskaya lowland and Kulunda. The project's tasks are to develop a draft of the National Action plan for conservation of white-headed duck, collect information about white-headed duck biology, assist the development of positive attitude to this bird, raise the ecological awareness of the local population.

The work has been carried out during three years (2006-2008) on the territory of Barabinskaya lowland and Kuludinskaya steppe, which administratively refer to Altai region and Novosibirsk oblast of the Siberian federal district of RF. Besides, there were attracted specialists from 13 regions of RF, where the white-headed duck occurs, for the establishment of the National working group on the white-headed duck conservation in RF.

We used various methods to achieve the goals of the project: monitoring of the white-headed duck number, application of nest-cameras, collection and analysis of hydrobiology samples from ponds, estimation of success of the white-headed duck reproduction on model ponds, botanic description of ponds, literature analysis, creation of GIS-maps, distribution of polygraphic production for ecological education of local population (hunters, fishers, children), meetings with the population, publications in the mass media, meetings and negotiations with the state and public organizations of the region and Russia on the whole.

PART 3 «MATERIAS AND METHODS»

200 wetlands have been studied in Barabinskaya lowland and northern Kulunda (Figure 1). As a result of inventory, 1041 individuals of the white-headed duck have been recorded, 100 individuals in 2006, 240 individuals in 2007, 326 individuals in 2008 and 375 individuals in 2009; 14 nest (1 nest in 2006, 13 nests in 2008-2009) of the white-headed duck, 26 broods of the white-headed duck have been registered. In 2008 there were taken 85 samples of plankton and benthos from 45 ponds of Kulunda and Baraba. Altogether during 2006-09 there were registered 32 broods of the white-headed duck. Total number of young birds in them was 181 birds. Field work in different years was carried out from middle May to 28 – 30 of August.

For studying the WHD nesting, there were selected 5 model wetlands in Karasuk region of the Novosibirsk oblast. These wetlands were visited minimum once a week since the moment of the WHD males lekking and up to raising of young birds on their wings. A 20-fold optics was used when observing birds. The birds were watched both from the bank and when investigating the lakes on the boat. There was carried out the investigation of the WHD reproduction on two wetlands, which included search and description of nests, studying of nesting biology during brooding and regular registration of the number of nestlings in broods till the moment of their raising on the wings. For studying of the nesting biology there were mounted sets of hidden cameras on two nests, which recorded the whole brooding period.

To estimate the food capacity of wetlands, there were collected benthos and plankton samples (during the WHD nesting). The samples were collected not only on wetlands where the WHD was observed, but also on those, that were suitable for its habitat outwardly, but WHD was not noted. The sample collection was realized by a standard method of hydrobiology research (Methodical recommendations …,1984). The cameral treatment was realized by an aquatic biologist – member of the zoology chair of the Tomsk State Pedagogical University – L.V. Luk'yantseva by the standard method of hydrobiology research.

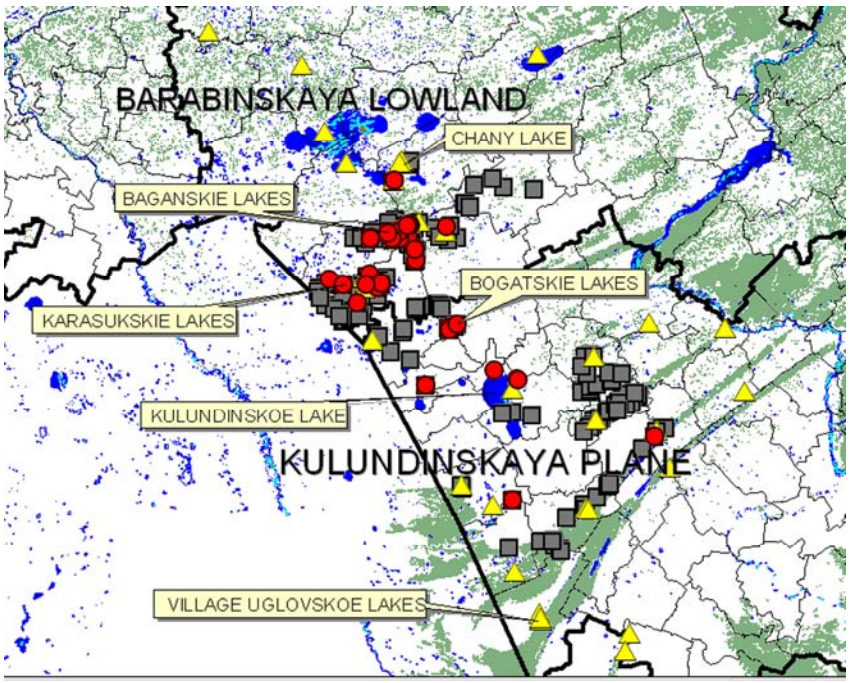

Figure 1 - Distribution White-Headed Duck in a southeast part of Western Siberia

Встреча савки в прошлом на основании литературных данных.

Встречи савки в 2006-2009 г.

Обследованные водоемы в 2006-2009 г.

RESULTS OF PROJECT

Distribution and estimation of the number of the white-headed duck in Barabinskaya lowland and in Kulunda steppe

Currently, 5 key areas of the white-headed duck habitat can be pointed out within the considered region:

1. **Chany Lake:** important birds area (IBA), Ramsar wetlands.
2. **The Baganskaya lakes system:** important birds area (IBA), Ramsar wetlands.
3. **Karasuk lakes system:** Ramsar Shadow List.
4. **Byrlinskay lakes system**: Ramsar Shadow List.
5. **Lakes system about village Uglovskoe**: important birds area (IBA) «Narrow steppe».

Drawing conclusions about the number and distribution of WHD in the region, it can be said that the species was saved on nesting in all of the above mentioned points. That is the WHD areal in the considered region obviously reduced slightly, but its number on these territories reduced sharply from 6 to 10 times. Thus, the modern nesting number of the white-headed duck in South Baraba and North Kulunda can be estimated in 30 – 40 couples minimum (actually 30 – 40 of nesting females), and most likely not more than 10 – 15 couples in South Kulunda. The post-nesting number of the white-headed duck in South Baraba and North Kulunda can be estimated in 350-400 specimens minimum, and, apparently not more than 100 specimens in South Kulunda.So far, it is difficult to say anything accurate about the modern tendency of the white-headed duck number on the territory being considered due to comparatively short period of observations. But most likely seems the stable state on the background of the general low level of number.

Biology of white-headed duck

Habitats

Nesting of the white-headed duck in the region was noticed in one-type places: on salty, saltish and practically sweet lakes with an area of 1 – 200 ha. with sufficient coastal reed-beds and strong quagmires. These lakes are located both in natural landscapes (50%), and in settlements and near them (50%). The average depth in such lakes is 1 – 2 meters. The height of the reed-beds on lakes is 1 – 3 m; the underwater vegetation includes various species of pondgrass, hornwort and various algae swimming in the thickness of water. As a rule the reed-beds are thick and mildly thick.

A very important criterion for the choice of the pond (especially on nesting and moulting) is a food capacity of ponds – the presence of a sufficient biomass of benthos, plankton and underwater plants (figure 2). We observed the white-headed duck in a large number (10 and more specimens) on ponds with the biomass of plankton not less than 40 g/m^3 and biomass of benthos not less than 10 g/m^2. The nesting was noticed on ponds with the plankton biomass not less than 66 g/m^3 and benthos biomass not less than 10 g/m^2. These indices are quite low on majority of lakes in comparison with normal values for the described region, which is sooner a consequence of a long-term arid phase of climate in this region.

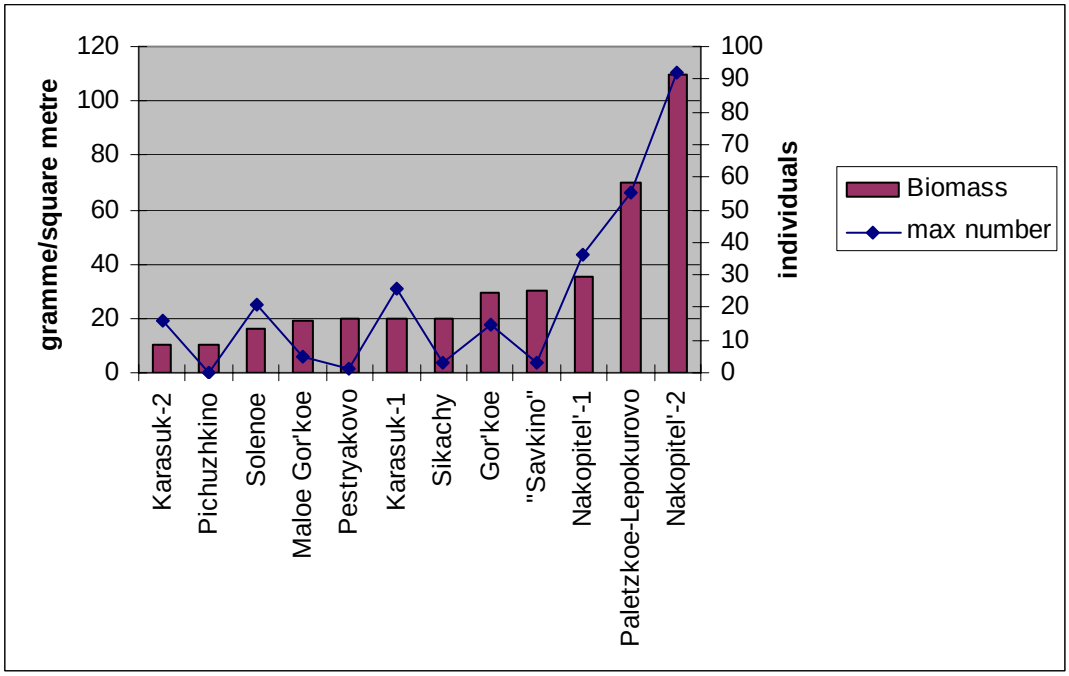

Figure 2 – Dependence of the white-headed duck number on the benthos biomass (r =0,9224).

Apparently, the white-headed duck is quite conservative in the choice of ponds which is also indicated in the paper of Dhamirzoev and other authors (2008). Thus, we repeatedly noticed its nesting and moulting on some ponds, but never on neighboring ponds, which are quite suitable outwardly for habitation. Especially such situation is characteristic of ponds of Kulunda. In majority of cases, such examples can be explained by a small food capacity of most ponds. When on movements and moulting, the white-headed duck keeps to the same places of habitat in the described region. During migrations, the white-headed duck can be met also on-ponds, where the reed-beds are insufficient, or on the river floods, but always in small number.

Reproduction

Nesting. The white-headed duck arranges its nests on reed quagmires along the edge of the main reach or by the small internal reaches, fixing them between the stems of the reed. Unlike the information given by Gordienko and co-authors (1986), who write that 80% of the nests discovered by them were located in colonies of gull birds and black-necked grebes, all the nests that we have found were located separately. Moreover, there were not observed any major colonies of other bird species practically on all ponds where the white-headed duck nesting was registered, only separate couples occurred.

The nesting period is much stretched and can vary in different years by one and more months. In Barabinskaya lowland and North Kulunda there were found nests from 27 May to 10 July in different years. Despite a big extension of reproduction period, the white-headed duck is an unambiguously late-nesting species.

All discovered nests had a similar structure: they were located in 15 – 40 cm from the bed edge, all nests were built of dry stems and reed-bed leaves with a very little grayish fluff. Only in one of the discovered nests, the female slightly covered the laying with the nest material when caring. This nest was found in early June, when the weather was comparatively cold.

Average dimensions of 71 eggs that we measured were 69,6 x 50,93 mm, variation limits of length 62,4 – 74,93 mm, and width 48,3 – 58,4 mm. The average mass of 54 measured eggs was 95,85 g. The weight of females varies from 500 to 890 g. (Dolgushin, 1960), that is, the total weight of the laying is 98 – 170 % of the female weight, and the weight of separate eggs can make to 15 – 20 % of the female weight. According to J.Kear, in captivity the eggs are laid with 1,5-day interval (birds of Central Asia. Volume 1,2007). Thus, at this time, the white-headed duck requires a high concentration of food in the pond in order to put on weight after migration and to lay its big eggs.

The phenomenon of the WHD abandoning its nests, noticed by us during the work on the model wetlands in Karasuk, should be mentioned separately. In 2008-2009 we found 13 nests on these lakes, 4 layings of which were abandoned by a female on the initial stages of brooding. We did not manage to reveal the reasons. In 2009 when discovering such layings, we withdrew the eggs and incubated in the Karasuk biology station. In 2009, thanks to artificial incubation, 8 nestlings hatched from 13 abandoned eggs (2 layings), and currently are kept in the Novosibirsk zoo.

Precocial time. Nesting period is a very prolonged one and can vary for a month or more. In 2008 the first broods of 6 and 8 pipped nestlings were met on June 25 and 28 on the lakes of Karasuk, and another brood of 9 pipped nestlings was met on July 9. The latest occurrence of pipped nestlings was observed on August 3 on the lake in the town Karasuk as well.

The average size of the brood was 5,66 birds (n=32). This value slightly exceeds the average number of the brood (5,5 – 5,6), given by Gordienko and co-authors (1986) for our region and northern Kazakhstan. Also, it is obvious that the "coupled" broods are characteristic of the white-headed duck, that is one bird guides two and more broods. For example, we observed 1 female guiding 9 nestlings on July 19, 2007, at that 2 of them had evidently different sizes in comparison with others. Drobovcev and Koshelev (1980) observed the same phenomenon regarding the white-headed duck.

It should also be noted that the white-headed duck does not avoid a man when selecting a nesting place. Half of 10 broods that we discovered in 2007, accounted for the lakes Karasuk 1 and Karasuk 2, which are located right in the center of the town Karasuk. In 2008, 50% of all mentioned broods were met on these lakes.
The opinion is formed that jennies leave a brood without care at the beginning of August. All broods that we saw in the first half of August, and we saw some broods several times in different days, young birds were not accompanied by jennies in 84% of cases. Jennies did not leave the Lake; however, they keep away from the young ones. Raising of young white-headed ducks on the wings occurs from late August to middle September (Gordienko and other, 1986).

Nidicolous parasitism. A question of nidicolous parasitism in the white-headed ducks is still unclear. In literature there is evidence that the white-headed duck puts eggs to a nest of the pochard *(Aythya ferina)* in the isolated population of the white-headed duck in the Republic of Tuva (the southwestern part of Eastern Siberia), where such two broods were found (Baranov, 1964). In one nest there were 4 eggs of the pochard and 5

eggs of the white-headed duck. In the other nest 5 eggs were of the pochard and the other 5 eggs were of the white-headed duck.

We have a reason to suppose that a similar phenomenon occurs in Barabinskaya lowland and in northern Kulanda correspondingly. For instance, on August 21, 2006 we found a brood of the white-headed duck that was accompanied by a jenny of the pochard *(Aythya ferina)*. When a jenny noticed a potential danger it swam away for a safe distance, and young white-headed ducks followed it in single file as it were their mother.

Success of reproduction. The estimation of the reproduction success was realized on 4 wetlands, located in Karasuk town and its outskirts. It was realized by means of regular visual observations as well as by using hidden video cameras on nests (fig. 3 and 4).

Altogether there were discovered 13 nests of WHD during 2008-2009 on these wetlands, only 5 layings turned successful of them (nestlings hatched), other 4 nests were abandoned by females and 3 nests were destroyed by predators (most likely by Siberian weasel). At that, in one case the predator killed the female as well. Total number of the hatched nestlings from these 5 layings was 29. It should be noted that all these 29 nestlings grew up and successfully raised on their wings. Besides, we monitored the hatched nestlings, the parent nests of which we did not find. During two years of work there were noted 30 such newly hatched nestlings. Almost all of the nestlings successfully raised on their wings. It is difficult to give accurate data, as the broods on the wetlands mixed with each other all the time. Generally, during two years of observations, 84% of the hatched nestlings grew up and successfully raised on their wings. Thus, despite the small size of the sampling, it is seen that the main losses occur in the period of brooding and hatching and are associated with the partial or complete ravage of the brood or a female death. In order to find out the detailed qualitative indices of the reproduction success, additional investigations are required in future.

Figure 3 – One-day nestlings of the white-headed duck in the nest in lake Karasuk 1, 21 Jule 2008, photo by nest-cameras

Figure 4 – Marsh harrier steals the abandoned egg of the white-headed duck in lake Karasuk 1, 22 Jule 2008, photo by nest-cameras

Moult of grown-up birds

Toms moult near the nests on nesting or neighboring water bodies. They get together by 5-50 individuals on deep (1-2 meters) reaches of the steppe lakes and stay away from the banks 23 one by one or in groups together with the pochards, the tufted ducks (Gordienko, Drobovtsev et al., 1986). These authors inform us of the following data about our region: a moulting tom was caught on 11.08.1964, 3 white-headed ducks with wing feathers were caught on August 11 and 20, 1966. The abovementioned authors think that the white-headed ducks moult near the Chany Lake and the Baganskie Lakes in Barabinskaya lowland. Our investigations confirm these conclusions. Thus, during the investigation of Bagana lakes in 2006-2008, there were discovered groups of white-headed ducks which most likely moulted here. Altogether, there were discovered 77 birds during three years on 5 lakes, the largest gatherings were fixed on the Pestrenkoe bog (8 males and 1 female) in 2007 and on the lake without name on the left of the route Paletskoe - Lepokurovo (20 – 30 males out of 49) on 22 July, 2008. Besides, during our work we revealed new, earlier unknown places of moulting of these birds. These lakes are places of waste water discharge of Karasuk town. The water bodies are up to 10 meters deep; areas of reed and macereed (5-20 meters wide) are along the banks. The water bodies are rich in organic matters, thus different algae grow and small crustaceans inhabit there. Altogether during 2007-2008 we noted 206 white-headed ducks on these lakes, 164 of which were males (the ratio of sexes 3,9:1). It should be noted that the number of males in gatherings of birds decreases to the middle August. For example, on 9 July 2008 there were fixed 102 whiteheaded ducks on these lakes (the ratio of sexes 11,8:1), and on August 14 – 88 white-headed ducks (5:1). It can be easily explained by the fact that in July the males that left the females in nests gather for the moulting. But already in August they are joined by unsuccessfully nested females and young birds migrating to the south. The change in the number of the white-headed ducks on places of moulting is shown in figure 11. Besides, young males probably fly to moultings earlier than the adults, as we met only single adult males in a spawning dress by early- middle July, and the young ones – only till late June. From late July all the males acquired the autumn dress, however young males had more black on their heads than the adult males. On the whole, gatherings of the white-headed ducks on the places of moulting begin to appear in early June, and there is a noticeable reduction of its number already by middle-late August due to a gradual movement to the south.

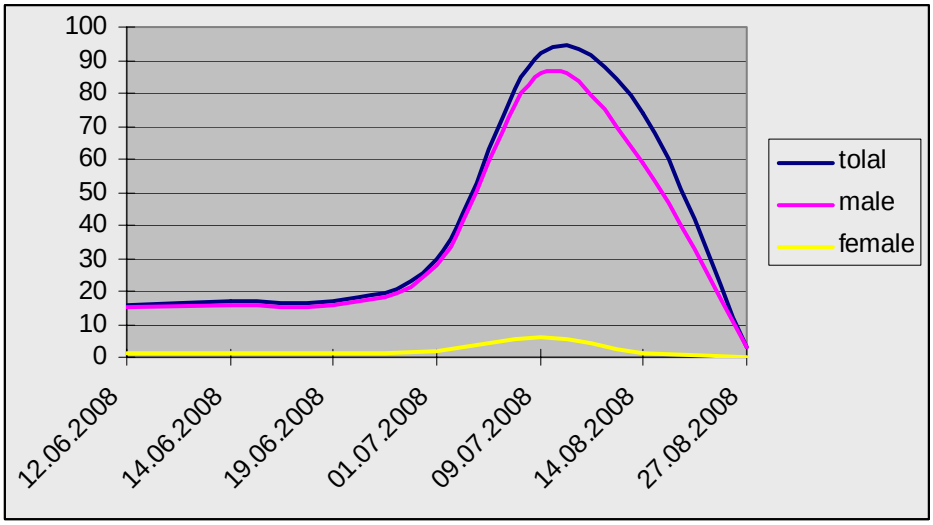

Figure 5 - The change of the absolute number of the white-headed duck on lake Nakopitel-2 (place of moult of grown-up birds) in June- August 2008.

Threats and limiting factors

In general, as a result of our work a group of factors and threats for population of the white-headed duck in Baraba and Kulunda can be singled out. It should be emphasized that the degree of influence of threats revealed by us is described only for the south of western Siberia. For other regions of Russia and Kazakhstan this degree can sufficiently vary, however the threats themselves will most likely be the same. For example, for our region, we do not think that the factor of disturbance of birds has any sufficient influence on birds. However, in other regions the situation may be directly opposite.

Feed reserves in lakes. The most important factor for the white-headed duck, as we already indicated, in our opinion is the volume of feed in lakes, which in its turn depends on the water level in the lakes. In the recent years, an arid phase of the hydrological cycle of lakes occurs in the described region – many lakes reduced in area. Especially strong changes refer to the lakes which are weakly connected with river systems and closed lakes. The influence of the change of hydrochemical conditions of the lake on the quality of places of habitat (feed capacity, nesting places etc.) in the considered region are described in detail in the monograph of Krivenko V.G. (1991). Our observations can serve as an example: there was a vast reduction of the area of two lakes, where the white-headed duck used to nest (Krotovo and Kusgan lakes) – up to 10 couples in the 1960th. Thus, for example, in 2008, the Kusgan lake completely dried up and Krotovo lake became very shallow. Currently the white-headed duck is not observed on these lakes.

Illegal hunting. The white-headed duck is prohibited for shooting by legislation on the whole territory of Russia and Kazakhstan. However, at the moment, this ban does not bring any sufficient results in practice. For example, we do not know a single case of punishment of hunters for shooting the white-headed duck for the recent years, though there is no doubt that the shooting takes place. Low level of awareness and culture of most hunters and inspectors themselves who check the hunters, are the main reasons for inactivity of the legislative ban for the shooting of the white-headed duck in practice. On the other hand, thanks to its way of life and behavior (night migration, late arrival, early flying away, frequent dive etc.) the white-headed duck can get into shooting only accidentally. In 1950-60th in the delta of the river Ili (Kazakhstan), the white-headed duck made 3,3 – 4,3 % in the prey of hunters (Birds of central Asia, volume 1, 2007). In the Petropavlovsk region, the part of the white-headed duck in the prey of hunters was 0,1 – 0,4 % in the 1960-70th. (Gordienko, Drobovcev and other, 1986). We did not register the shooting of the white-headed duck, though in Karasuk biology station there was kept a male of the white-headed duck that was caught as a wounded bird in 2004.

Fishing. The intense fishing apparently has a negative influence on the white-headed duck. Regular visits of fishers to the lakes and continuous stay there strengthens the disturbance factor on the one hand, and the

white-headed duck being a diving duck can become entangled in fixed nets made of various synthetical materials on the other hand. Generally, fishing with nets is a more dangerous threat for the white-headed duck in our opinion than hunting.

Disturbance factor. According to our observations, the white-headed duck is not very timid in relation to people. Thus, in 2007 – 2008 half of the encountered broods and a sufficient part of adult birds were met on lakes in the town Karasuk. But, on the other hand, when a nest is visited by a man, the female of the white-headed duck leaves the nest beforehand as a rule and does not return for a while. When the cameras for observation of the nests were installed, the females did not perch on the laying during 2 – 4 hours. Thus, the disturbance factor can have a sufficient influence namely on nesting females when visiting a nest or being close to it.

Natural enemies. By our observations and according to literature data, adult birds and nestlings do not have a lot of enemies. Adult white-headed ducks and nestlings (even 2 – 3- day) can perfectly dive and in case of danger quickly hide in water bushes. During three years of observations, we have never noticed any manifestations of aggressive intentions in relation to the white-headed duck from the side of other species of vertebrates, though predation is quite possible from part of ravens, gulls and marsh harrier in relation to ducklings strayed from the brood. Predators have much greater threat for the white-headed duck nests. Thus, three nests out of 13 under our observations were destroyed and in one case the female was killed in the nest. Also, there was noted a devastation of a nest by a water-rat (Gordienko, Drobovcev and other, 1986).

As a separate point we consider a question about negative impacts on the white-headed duck in wintering places. For birds, nesting in Western Siberia, one of the main wintering places are the lakes of the state Punjab in northern Pakistan (Birds of central Asia, volume 1, 2007). According to data of the 1980-90th, the conditions for habitation became sufficiently worse (poaching hunting, disturbance, occupation of lakes by tilapia, drying etc.) which considerably reflected on the number of wintering specimens, which reduced by several times (Perennou, 1993; Shirazi, 1993; BirdLife from Birds of Middle Asia. V.1, 2007). However, unfortunately, a question of wintering places of specific populations of the white-headed duck and ways of migration to them is not cleared up so far. The settlement of this task would allow a more accurate estimation of the influence of wintering conditions on thenumber of the white-headed duck.

Education work with hunters and fishers

In the framework of the project there were carried out polls among local hunters and fishers in order to find out the awareness level of the target group about the white-headed duck. Altogether there were questioned 184 people in different years. Comparing the results, we noted a positive tendency: the recognizability of the white-headed duck increased from 3 % in 2006 to 13 % in 2008, more than 90% of those who recognized know that the white-headed duck is a rare species and that hunting for it is banned. The growth of the level of the white-headed duck recognizibility is connected with an active educating activity of the project team among the local population. Thus, an actual level of the target group awareness was found out. In 2008, our team prepared a booklet «White-headed Duck in Siberia», where it was said about the environmental status of this species, given coloured pictures of the white-headed duck (male, female, young), indicated the main distinctions from other ducks, some peculiarities of biology (time of arrival, flying away, nesting) and given a map of the white-headed duck distribution. Altogether there were printed 3000 copies of the booklet. In 2008, there were conducted meetings with local fishers and hunters. The meetings took place in local departments of the community «Hunters and fishers». There was shown a presentation «White-headed Duck in Siberia», covering the main information about the appearance, way of life and distribution of the white-headed duck. Local people could freely ask questions interesting to them. Totally there were 22 meetings (not less than 2000 participants), and each participant was presented a booklet «White-headed Duck in Siberia». Besides, part of booklets was left in the administration, so that those who could not be present on our presentations received such a booklet as well.

Education work with local schoolboys

In 2009 there was prepared a model of the Red List of Russia for children. It was based on the Red List of Russia, reduced in volume and simplified in the form of statement. Besides the appearance and distribution of each species, the Red List was supplemented with some interesting facts from life of separate species.

When elaborating it, there were attracted specialists-teachers from the Tomsk State Pedagogical University, who helped to find the best variant of stating the information. As a result there was created a small (95 pages), colourful and captivating edition, which was printed (300 copies) and an electronic version on discs (1000 copies). After production of the printed and electron version of the Red List, it was distributed among 18 schools. Each school received several copies of a printed version and 20-25 discs with an electron one. The residuary part will be distributed among the residuary schools in the course of the project continuation.

Work with local mass media

During the project execution the team prepared and printed 3 articles in the local mass media. The first publication «Preservation of the white-headed duck in Novosibirsk oblast» was issued in the newspaper «Karasuk vestnik» in June of 2008. In the article it was told about the environmental status of the white-headed duck, importance of its preservation, its modern state in this region, the measures required for preservation and about the planned events, stated in the present project. The next publication "The white-headed duck – is a rare species of Altai region" was printed in the newspaper "Kulunda" in July, 2008. In this article it was also told about the status of the white-headed duck, importance of its preservation, its modern state in this region, measures required for preservation and about the planned events, stated in the present project. The third publication was issued in the newspaper «Karasuk vestnik» in November, 2008. Besides, there were prepared 2 speeches on radio.

Establishment of the national working group on the white-headed duck conservation in Russia

Though the project did not state a task of establishing the national working group, nevertheless we initiated this work and it received the approval of the Russian partner BirdLife International of the Russian Bird Conservation Union (RBCU). The establishment of the working group is a very important step on the path to the white-headed duck conservation in Russia.

The representatives of 14 subjects of the Russian Federation where the white-headed duck occurs entered this group. Today the working group includes 16 people who are the members of the social environmental organizations, reserves, national parks and scientific institutions, representatives of local population. The activity of the working group is based currently on the International Single Species Action Plan for the Conservation of the White-headed Duck (AEWA, 2006). But now the working group is occupied with the development of the National working plan of actions on the white-headed duck conservation in Russia.

BASIC RESULTS AND DISCUSSION

According to the literature data of the 70-80th of the 20th century, the total number of the white-headed duck in Baraba was estimated in 195 couples of birds (Gordienko, Drobovtsev, 1986; Danilov, Mikhantiev, 1976; Gordienko, Drobovtsev et al, 1986; Ivanov, 1974). In South Kulunda the white-headed duck has apparently never been common, and there are not many places of its being and nesting; currently only single couples are observed (figure 2). The investigations we carried out in 2006-2008 confirm the white-headed duck nesting practically on all lakes that were indicated in the literature, and some new places have been revealed.

All these new places are within the borders of the species areal in Baraba and Kulunda. Altogether we fixed the stay of the white-headed duck on 24 lakes. It nests on 11 of them. Today 5 key areas of the white-headed duck habitation in Baraba and Kulunda can be singled out. By the current moment, we estimate the nesting number of the white-headed duck in this region in 40-55 pairs of birds. We made such a low estimation at quite big number of the white-headed duck (only in 2008 - 326 specimens) reasoning from a major domination of males in local population (on average the ratio of the females and males is 1:6). Though, it is not inconceivable that all the nesting places of the species in Baraba and Kulunda are not discovered yet and the actual number of nesting birds here is much higher. Nevertheless, we can speak about minimum fourfold reduction of the white-headed duck number on lakes of Baraba and Kulunda. So far, it is difficult to say any-

thing accurate about the modern tendency of the whiteheaded duck number on the territory being considered due to comparatively short period of observations. But most likely seems the stable state on the background of the general low level of number.

Despite the program «Inventory Important bird areas in Russia» that have been realized for several years by RBCU, additional works on finding out the nesting and post-nesting number of the white-headed duck on the territory of all other regions of Russia are required. It will allow a more accurate estimation of the modern number of the Russian population of the white-headed duck.

As a result of the project realization, we obtained some interesting results and factors influencing the species distribution Firstly, a preliminary conclusion can be made about the main limiting factors, which do not allow the white-headed duck to increase its number. A very important criterion for the choice of the pond (especially on nesting and moulting) is a food capacity of ponds – the presence of a sufficient biomass of benthos, plankton and underwater plants (figure3). We observed the white-headed duck in a large number (10 and more specimens) on ponds with the biomass of plankton not less than 40 g/m^3 and biomass of benthos not less than 10 g/m^2. The correlation coefficient between the white-headed duck number and benthos biomass makes 0,9224. Apparently, the white-headed duck is very conservative in the choice of ponds, especially when nesting, which is also indicated in papers of Dhamirzoev and other authors (2008) and other authors (Torres and other, 1986; Green and other, 1999; Panayotopoulou & Green, 2000; Sánchez and other, 2000). Thus, we repeatedly mentioned that the white-headed duck nests and sheds on some ponds, but was never seen on neighboring ponds, that were outwardly quite suitable for it. Thus, the biomass of the forage (in the first turn of benthos) is one of the main limiting factors for the white-headed duck.

For reasons given, we venture to make some assumptions. The white-headed duck is one of the most late arriving and late nesting species of our fauna. From our point of view, it is caused by the fact, that nesting requires a large biomass of forage, and there is no such in early spring. The average mass of one egg of the white-headed duck is 96,7 gramm. The weight of the females varies from 500 to 890 gramm. (Dolgushin, 1960), that is, the general weight of the laying is 98 – 170 % of the female weight, and the weight of separate eggs can make up to 15 – 20 % of the female weight. According to J.Kear (Birds of central Asia, volume 1, 2007), when kept in captivity, the eggs are laid with the interval of 1, 5 days. Thus, the white-headed duck needs a large concentration of food on the pond during this time, in order to put on weight for laying big eggs.

In its turn, the biomass of forage on ponds of the steppe and forest-steppe areas of central Asia and Russia depends on the level of water in the lakes – habitats of the white-headed duck. Currently, in steppe and semidesert areas of Central Asia and Russia, an arid phase of the climate cycle began, which is especially apparent in the Asian part. For example, during the last 70 years, there have been stable tendencies towards strengthening of aridity of the climate and lowering of water content of rivers and drying of lakes (Anopchenko, 2009).

Thus, we consider the biomass of the forage in ponds (which depends on the water level in its turn) as the main factor, because of which the white-headed duck can not increase its number. Especially, since its nesting is quite successful and the majority of the pipped nestlings live up to the autumn migration. A reasonable question arises, what are the reasons for the anomalously large sizes of the white-headed duck eggs. The white-headed duck is an ancient and relic species, and, probably the way of its evolution developed not by the way of “quantity”, but by the way of “quality”. It is known for sure that the average number of eggs in a nest of the white-headed duck is lower than that in nests of other ducks and makes 5-6 eggs (Gordienko and other, 1986; Ryabicev, 2001). Due to a big mass of the egg, the nestlings appear more adult and strong, white-headed ducks have lower death of nestlings than other ducks have. Most likely, the white-headed duck developed by the way of raising the survival rate of nestlings which explains the big mass of its eggs. For example, according to unpublished data of V.A. Shilo (Karasuk biology station) the hatched nestlings of WHD can loose up to 1/27,5% of their mass without lethal outcome, which is not observed at other species of ducks.

Thus, currently it is expedient to continue works on obtainment of additional actual material about the influence of biomass of feed in lakes on distribution and number of the whiteheaded duck. Besides, more profound and extensive works are required to estimate the success of the white-headed duck reproduction. The main thing is to obtain vaster quantitative data on the percentage of destruction of the white-headed duck nests

and survival rate of nestlings. It will allow a more accurate understanding of the reasons of a low nesting number of the white-headed duck within its whole areal of distribution.

Secondly, there was prepared a GIS-project in the framework of the project, which combines the information about the number and distribution of the white-headed duck in South-East of Western Siberia during the last 50 years. In this relation it is required to create a web-resource combining all completeness of the available information about the world population of the whiteheaded duck. Currently, the ecological center "Strizh" prepares such resource, but only about populations of the species in Russia and Kazakhstan.

Thirdly, as a result of the project, there was prepared a project of the National plan of action on the white-headed duck conservation in RF (based on International Single Species Action plan for the conservation of white-headed duck, AEWA). The specialists of public and state organizations from 13 regions of Russia take part in this work. This work received approval from the Russian partner of the BirdLife International – Russian bird conservation union. As a result in the near future such a plan should be prepared by joint efforts and coordinated in the very broad range, not only with professional ornithologists but also with the state and public environmental bodies.

Fourthly, there was carried out the information campaign among local hunters, fishers and schoolchildren. The result was a positive tendency: recognizability of the white-headed duck by hunters increased from 3 % in 2006 and reached 13 % in 2008. There were conducted 22 meetings with hunters with the general coverage not less than 2000 people. In work with schoolchildren there were covered 18 local schools. The project team published 3 articles in local newspapers and issued 2 radio reports.

We consider the continuation of further works on ecological education and enlightenment very relevant in all regions of habitation of this species. In our opinion a priority target group is schoolchildren as the most susceptible part of society. Adult people with already stable outlook not easily come under influence of new information. To minimize the influence of the fishing and hunting on the white-headed duck, a more dense work with the state control bodies is required: regional subdivisions of the federal agency on fishing and bodies of the RF subjects, controlling the hunting. With the former, a more qualitative control on lakes (places of the whiteheaded duck habitat) should be achieved for the fact of illegal fishing with nets. With the latter, relevant is the work on education of filed inspectors, realizing control, for them to recognize the white-headed duck in field conditions and understand the importance of preservation of this species. Undoubtedly, understanding the Russian specific character, it is extremely difficult to achieve such situation. Therefore, the activity on work with the lake users may turn more efficient. According to the Russian legislation, the greatest part of lakes now is at disposal of users keeping household, who received the right of use of the *fauna* of the lakes for 49 years. It is necessary to reveal such users and carry out the explanatory work and if possible achieve limitation of hunting on the lakes where the white-headed duck is observed.

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