RAPTORS IN THE GORKOVSKY RESERVOIR AREA

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The fauna and population of diurnal raptors (*Falconiformes*) in the Gorkovsky impoundment reservoir area was studied over a multiannual period in 6 permanent sample plots. Registrations include 19 species, of which 13 definitely breed in the area, another 6 are alleged to breed, 1 species is a passage migrant; 6 species are red-listed in the Russian Federation. The population of raptors around the reservoir differs notably from those in flat areas and valleys of small and medium-size rivers of the region.

Key words: diurnal raptors, *Falconiformes*, fauna, population, impoundment reservoir, Upper Volga area.

ХИЩНЫЕ ПТИЦЫ ПОБЕРЕЖИЙ ГОРЬКОВСКОГО ВОДОХРАНИЛИЩА. В. Н. Мельников. *Ивановский государственный университет, Иваново, Россия.*

На основе многолетних стационарных исследований на 6 учетных площадях изучена фауна и население дневных хищных птиц (Falconiformes) побережий Горьковского водохранилища. Отмечено 19 видов, 13 из них достоверно гнездятся, предполагается гнездование еще 6 видов, 1 вид встречается только на пролете; 6 видов занесены в Красную книгу РФ. Население хищных птиц побережий водохранилища в значительной степени отличается от таковых плакорных участков и долин малых и средних рек региона.

Ключевые слова: дневные хищные птицы, соколообразные, Falconiformes, фауна, население, водохранилище, Верхневолжье, Ивановская область.

INTRODUCTION

The Gorkovsky impoundment reservoir was formed in 1955 by building an earthen dam across the Volga River upstream of the town of Gorodets. Three parts differing in the hydrological and ecological conditions are now distinguished within the reservoir: Kostroma pools, mainstem and Yurievets pools or the Yurievets Sea. Lower reaches of rivers Zhelvata and Nodoga, Unzha, Nemda, Mocha and others formed branches of the reservoir, and the mouths of numerous small streams turned into its bays. The fauna and population of raptors in the Kostroma lowland, most of which is now under the Kostroma pools, was studied by A. Kuznetsov (1992). Rare species of raptors along the Unzha branch were studied by S. Bakka and N. Kiseleva (2001). Our studies were done in the reservoir mainstem part, along Yurievets pools, as well as at the Zhelvata–Nodoga and Nemda branches of the reservoir.

MATERIAL AND METHODS

Bird population along the Gorkovsky reservoir mainstem was studied in the 1950s by M. Bubnov (1958, 1968), and in the 1980s by Yu. Gerasimov and S. Buslaev (Gerasimov et al. 2005). Long-term permanent plot studies of raptors in the Krasnogorsky research station in the Zhelvata–Nodoga branch area were started in 1983 by S. Buslaev under the supervision of Prof. S. Helevina. Later on (1986–1988), G. Shatilo and since 1988 the author of the present paper joined the work (Helevina et al. 1992, Buslaev et al. 1991, Mel'nikov 1998).

Abundance was estimated by mapping territories in a sample plot. A total of 6 permanent plots were established: Pljos and Novlyanskoye in the mainstem part, Krasnogorsky along the Zhelvata–Nodoga branch, Yelnat' and Nemda along respective branches, and Obzherikha – on the shore of the reservoir lacustrine part, including a shallow bay and a water-logged area between villages Andronikha and Obzherikha (Andronikha floodplain) (fig. 1). Counts at each area were made during the breeding period for a number of seasons, the only station where the count was made just once (in 1997) being the Nemda branch shore. The combined area of the study plots was 610 km^2, and taking surveys in all study areas into account, counts covered over 2500 km^2.

The population density of common and uncommon species was calculated from the interannual mean number of pairs nesting in the plot rounded off to a whole number, that of rare species from the number of territories detected in several latest years of study. The aim of estimating the density of rare species was not extrapolation, but determination of total values of the population density of all raptors nesting in each plot, correct assessment of dominance, etc. For some raptor species, the abundance, population density and dominance (ratio) are shown in table 1.

Table 1. Raptor population in the research stations surveyed (n – mean interannual abundance rounded-off to whole numbers, pairs; Ni – population density, pairs/100 km², Pi – dominance, %).

Research station	Pljos			Novlyanskoye			Krasnogorie			Yelnat'			Nemda			Obzherikha		
Area	80 km²			100 km²			250 km²			70 km²			40 km²			70 km²		
No of seasons	2			7			7			2			1			4		
	n	Ni	Pi	n	Ni	Pi	n	Ni	Pi	n	Ni	Pi	n	Ni	Pi	n	Ni	Pi
Osprey	+			+			2	0.8	2.9	+			2	5.0	14.3	2	2.9	7.4
Honey Buzzard	2	2.5	7.4	1	1.0	3.6	4	1.6	5.8	1	1.4	4.2	-			1	1.4	3.7
Black Kite	5	6.3	18.5	8	8.0	28.6	7	2.8	10.1	5	7.1	20.8	3	7.5	21.4	4	5.7	14.8
Hen Harrier	1	1.3	3.7	2	2.0	7.1	2	0.8	2.9	-			-			-		
Montagu's Harrier	2	2.5	7.4	1	1.0	3.6	3	1.2	4.3	4	5.7	16.7	-			2	2.9	7.4
Marsh Harrier	-			-			-	-		-			-			8	11.4	29.6
Goshawk	3	3.8	11.1	2	2.0	7.1	4	1.6	5.8	1	1.4	4.2	1	2.5	7.1	1	1.4	3.7
Sparrowhawk	4	5.0	14.8	3	3.0	10.7	6	2.4	8.7	3	4.3	12.5	2	5.0	14.3	1	1.4	3.7
Common Buzzard	7	8.8	25.9	9	9.0	32.1	31	12.4	44.9	6	8.6	25.0	5	12.5	35.7	5	7.1	18.5
Short-toed Eagle	-			-			2	0.8	2.9	-			-			-		
Booted Eagle	-			-			-			-			-			+		
Golden Eagle	-			-			-			+			-			-		
Spotted Eagle	-			-			-			-			-			+		
White-tailed Sea Eagle	-			-			1	0.4	1.4	+			1	2.5	7.1	-		
Peregrine Falcon	-			-			-			-			-			+		
Hobby	1	1.3	3.7	-			2	0.8	2.9	1	1.4	4.2	-			1	1.4	3.7
Merlin	-			-			1	0.4	1.4	-			-			-		
Kestrel	2	2.5	7.4	2	2.0	7.1	4	1.6	5.8	3	4.3	12.5	-			2	2.9	7.4
Total	27	33.8	100.0	28	28.0	100.0	69	27.6	100.0	24	34.3	100.0	14	35.0	100.0	27	38.6	100.0

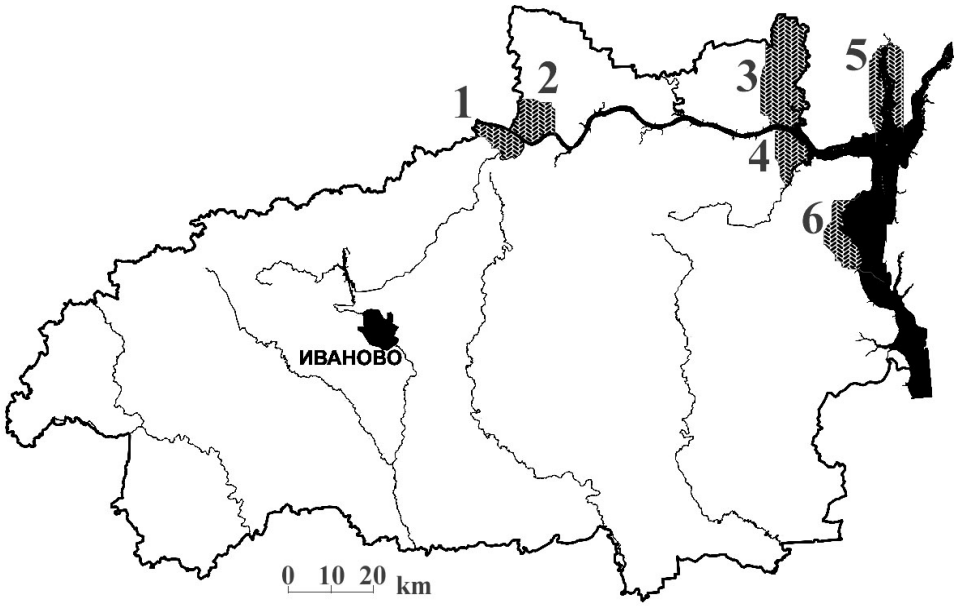

Figure 1. Research plots surveyed: 1 – Pljos, 2 – Novlyanskoye, 3 – Krasnogorie, 4 – Yelnat', 5 – Nemda, 6 – Obzherikha.

RESULTS

Osprey (Pandion haliaetus)*. Very rare breeder (asterisk = red-listed).

M. Bubnov (1957) observed transient Ospreys only. In 1991, S. Buslaev detected an occupied Osprey nest in the downstream of River Unzha, proving the species to breed in the area (Gerasimov et al. 2000). At present, 2–3 Osprey pairs nest on the Unzha branch shore annually (Bakka & Kiseleva 2001).

We observed Osprey during the breeding period in all 6 plots, and found nest areas in three plots. Regular Osprey records were reported from the downstream of River Nodoga in 1991–1993. In 1997, 2 territorial Osprey pairs were registered from the area, with a brood of 2 nestlings known for one of them. Survey of the Nemda branch shore in May 1997 revealed 2 territorial pairs. In 2003–2005, two pairs of Ospreys were regularly seen hunting over the lacustrine part of the reservoir. The birds carried their prey to the mixed forest on the primary shore over 4 km away from the water edge, and ate prey themselves on the top of circular concrete power line posts.

Honey Buzzard (Pernis apivorus). Uncommon breeder.

Registered in our studies from all plots except for River Nemda area. Counts there, however, were made in the first half of May – before the birds arrived. The population density in different plots is relatively even (1–2.5 pairs/100 km^2), and corresponds to the regional average of 1.5 pairs/100 km^2 (Mel'nikov 1999). High Honey Buzzard abundance was sometimes observed locally. E.g., during 2003 surveys of the wider stretch at the mouth of River Nodoga, 4 territories of the Honey Buzzards were observed from one point.

Black Kite (Milvus migrans). Common breeder.

Occupies quite densely forested sections of the shore and branches of the reservoir. Black Kite nests in such areas are 1–2 km apart, arranged in "chains" along the shore. All territories were situated right on the shore, and known nests were 20 to 100 metres away from the water edge. The species clearly avoids nesting further away from the shore. In all plots surveyed, the Black Kite is subdominant among raptors, displacing the more common Common Buzzard from the littoral shore to the primary shore. Variations in the population density estimates – from 3 to 8 pairs/100 km^2 for different plots – are due to differences in the proportion of shoreline areas in the sampling plots. The density of the Black Kite population along Gorkovsky reservoir is notably lower than in the Klyazma river floodplain (Mel'nikov 1999).

Hen Harrier (Circus cyaneus). Rare breeder.

All known Hen Harrier nest areas are situated in cut-over sites regenerated to different degrees in forests on primary shore rather than immediately along the reservoir.

Montagu's Harrier (Circus pygarus). Uncommon breeder.

In the early years of studies the species was rarer than the Hen Harrier. By present time, it has grown adapted to living in vast ruderal vegetation stands in abandoned farms, mineral fertilizer storehouses, etc. It is the number and area of such anthropogenic habitats where colony-type settlements can form that predetermined the present-day distribution. Individual pairs occupy moist areas with high swards, as observed in the Andronikha floodplain.

Marsh Harrier (Circus aeruginosus). Uncommon breeder.

A Marsh Harrier settlement was observed only from an extensive (over 3 km^2) reed and shrub stand in a floating bog in a shallow-water bay in the Andronikha floodplain. At least 8 Marsh Harrier pairs were observed nesting there simultaneously.

Goshawk (Accipiter gentilis). Uncommon breeder.

The Goshawk population is distributed quite evenly throughout the region, densities never being high. Its density did not increase along the reservoir shore either.

Sparrowhawk (Accipiter nisus). Uncommon breeder.

Slightly more abundant than the Goshawk. Settles eagerly in tree-grown gullies and gorges, which are numerous along the mainstem part of the reservoir. In some plots, the abundance may be underestimated due to the species' secretive lifestyle.

Common Buzzard (Buteo buteo). Common breeder.

The most abundant raptor species in the region, dominating in all plots surveyed along Gorkovsky reservoir shores. The density of the Buzzard population along the reservoir, however, is somewhat lower than in the Ivanovo region on average, and significantly lower than in other agricultural districts (Mel'nikov 1999). This fact can be explained by competition for territory with the Black Kite, which is relatively common on the reservoir shore and forces the Buzzard out to dry flatlands. We have observed that the Buzzard pairs nesting closest to the shoreline regularly conflict with the Black Kites entering their breeding territory.

Rough-legged Buzzard (Buteo lagopus). Common passage migrant.

Short-toed Eagle (Circaetus gallicus)*. Very rare presumed breeder.

S. Buslaev reported a Short-toed Eagle in the Krasnogorie plot on 12 June 1982. We observed a Shot-toed Eagle there on 5 August 1999. During observations from watch-sites through a spotting scope in July 2003 and August 2004 we regularly saw Short-toed Eagles in two permanent plots.

Booted Eagle (Hieraaetus pennatus). Very rare presumed breeder.

A light-morph Booted Eagle was sighted in the Andronikha floodplain in the mid-1980s by Alexei

Mishustin (personal communication). In June and July 2003 and 2004, we made a few records of a dark-morph Booted Eagle there.

***Golden Eagle (Aquila chrysaetos)*.** Very rare presumed breeder.

M. Toropov observed (personal communication) a brood of eagles with two young west of the town of Yurievets in late July – early August 2005. He thought the birds were Spotted Eagles, but owing to a detailed description of the young, with a characteristic white transverse strip on the tail and white spots on the wings, they were identified as Golden Eagles. The birds had probably arrived from the left hand bank of Volga, where a large forest area is situated starting 3–5 km away from the reservoir.

***Spotted Eagle (Aquila clanga)*.** Very rare breeder.

In the 2003–2005 breeding season, the species was a few times detected in the Andronikha floodplain. In June 2004, an old nest was found on a black alder tree.

***White-tailed Sea Eagle (Haliaeetus albicilla)*.** Very rare presumed breeder.

Breeding of 2–3 Sea Eagle pairs is known from the Unzha branch of the Gorkovsky reservoir (Bakka & Kiseleva 2001). We regularly registered the White-tailed Sea Eagle on the downstream of River Nodoga. In May 1997, an adult White-tailed Sea Eagle was a few times seen on the Nemda branch shore. A. Kuznetsov (1990) observed White-tailed Sea Eagle nesting near the mouth of River Nemda.

***Peregrine Falcon (Falco peregrinus)*.** Very rare presumed breeder.

The Peregrine was twice registered in the Obzherikha plot – on 19 June 2003 over a bay of the reservoir and on 11 July 2004 in a transitional mire in the central part of the Andronikha floodplain.

Hobby (Falco subbuteo). Rare breeder.

The density of the Hobby population along the Gorkovsky reservoir is notably lower than along medium-size rivers Klyazma, Lukh, and Teza, and corresponds to the Ivanovo region average (Mel'nikov 1999). Breeding took place in old Raven Corvus corax and Hooded Crow *C. corone* nests, namely those in the Krasnogorsky village outskirts.

Merlin (Falco columbarius). Very rare presumed breeder.

Registered on 1 July 1992 from downstream of River Zhelvata.

Kestrel (Falco tinnunculus). Uncommon breeder.

Late in the 20th century a significant overall decline in Kestrel abundance was recorded in the region. The species registrations in the study area became much fewer in this period. Lately, the number of contacts and known breeding occasions has increased somewhat.

DISCUSSION

Studies have shown that the fauna of diurnal raptors along Gorkovsky reservoir includes 19 species, of which 13 definitely breed in the area, another 6 are alleged to breed, 1 species is a passage migrant. Six species are red-listed in the Russian Federation (marked with an asterisk in the text). All plots surveyed are important bird areas. The fauna and population of raptors in the reserve shore area differ notably from those in drainage divide areas and valleys of small and medium-size rivers (Mel'nikov 1999, Mel'nikov et al. 2002). All three parts of the Gorkovsky reservoir (Kostroma pools, mainstem and Yurievets sea) and its branches are of special value for the conservation of rare species of raptors, including those listed in the Red Data Book of Russia.

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