



Breeding Population of the Great Gray Owl (*Strix nebulosa* Forster) in Belarus:
Summary of Recent Knowledge

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Abstract.—A nearly isolated Great Gray Owl (*Strix nebulosa* Forster) population of 50-100 breeding pairs exists in southwestern and south-central Belarus and northern Ukraine. It exhibits rather high nesting density in particular forest tracts and is separated from populations in northwestern Russia by several hundred kilometers. No reliable data on residency, postbreeding movements and wintering strategies are available. Twig nests are used for nesting almost exclusively; the proportion of other nest sites was ca. 10 per cent. Mean clutch size was 3.4, with 1.3 young produced per breeding attempt. The main adverse factor affecting the population seems to be illegal shooting by local hunters.

The Great Gray Owl (*Strix nebulosa* Forster) inhabits boreal lowland and mountain forests throughout the Holarctic (Bull and Duncan 1993, Mikkola 1983). In Europe, the southern border of its breeding range is poorly known outside Fenno-Scandia, and two recent handbooks give quite different distributional limits within the countries of the former Soviet Union (Cramp 1985, Mikkola 1983). Heimo Mikkola (1983, p. 210), trusting information on breeding Great Gray Owls in east-central Poland in 1966-1971 (Jablonski 1976), recognized that the "Great Gray Owl is much more common in Poland and in the European part of USSR." The most recent available published information on the Great Gray Owl in Belarus (Fedyushin and Dolbik 1967, Nikiforov et al. 1984) is not complete or detailed. Furthermore, the information is not easily available to international audiences as it is in Russian. Using published information and unpublished data collected from the 1980-1990's by ourselves and several of our colleagues (listed in Acknowledgment) this paper describes the status of the Great Gray Owl in Belarus.

DISTRIBUTION AND ABUNDANCE

Breeding of Great Gray Owls in northeastern Belarus, and probably adjacent parts of recent Lithuania in the early 19th century, was first reported by Tyzenhauz (1843). He lived mainly in Postavy, Wilno [Vilnius] Government at that time (now the Vitebsk Region of Belarus) and reported this species to be not very rare and stressed its connection with raised bogs. He did not indicate exact localities, but wrote about "our lands," "our forests" having in mind areas widely adjacent to his own town. The second published record was by Shnitnikov (1913). He described two cases of breeding in 1902-1903; one nest and one brood, and several owl observations near Porechie in the Yaselda River valley north of Pinsk. Using these data, along with the understanding that the habitat was very common and typical for Minsk Region at that time, he concluded that Great Gray Owls were common and that they breed in all "suitable habitats", i.e., "large old forests". No records of Great Gray Owls were reported by German ornithologists working in Belarus during World War I. Zetlitz and Trutzschler (1917) who worked previously in our study area, the upper Shchara River (including Tuhavichi, see below) strangely reported that Ural Owls (*Strix uralensis* Pall.) were not rare in the 1910's; yet they are definitely absent now (own observ., 1990-1996). It seems that the simplest reason for this situation is that they misidentified Great Gray Owls as Ural Owls, but we have had no success

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finding either Ural or Great Gray Owl specimens or other materials in German collections to help solve this anomaly. Two Great Gray Owl nests were found in the Bialowiez Primeval Forest, Polish-Belarusian border in 1929-1930 (Szczerkowski 1930, Tomialojc 1990). The most precise location given for these nests was "east of Bialowiez village", not "Bialowiez Forest" as mentioned in Cramp (1985, p. 563), and it is not clear if these records were in the Polish or Belarusian parts of the forest (Tomialojc 1990). This was the last information on Great Gray Owls breeding in the region until the early 1970's, and the species was considered extremely rare in Belarus in monographs published after World War II (Dolbik and Dorofeev 1978, Fedyushin and Dolbik 1967, Nikiforov et al. 1984). Our review of recent information starts with Demianchik and Gaiduk (1981).

The distribution of Great Gray Owls in Belarus is summarized in figure 1. Short descriptions of the points shown in figure 1 follow.

1. Bialowiez Forest. Since the breeding records of 1929-1930, six breeding season observations of 1953-1996 (Datskevich et al. 1985, Tomialojc 1990).
2. Tuhavichi, Lyahavichi District. This area, as well as areas 3 and 5, is situated around Vygonovskoe Lake. Eleven nests on six territories were found in swamped deciduous forests along the Shchara River floodplain in 1992, 1995, and 1996.
3. Two nests and one brood were reported by Demianchik and Gaiduk (1981) "in the vicinities of Vygonovskoe and Bobrovichskoe Lakes" from 1976-1979.

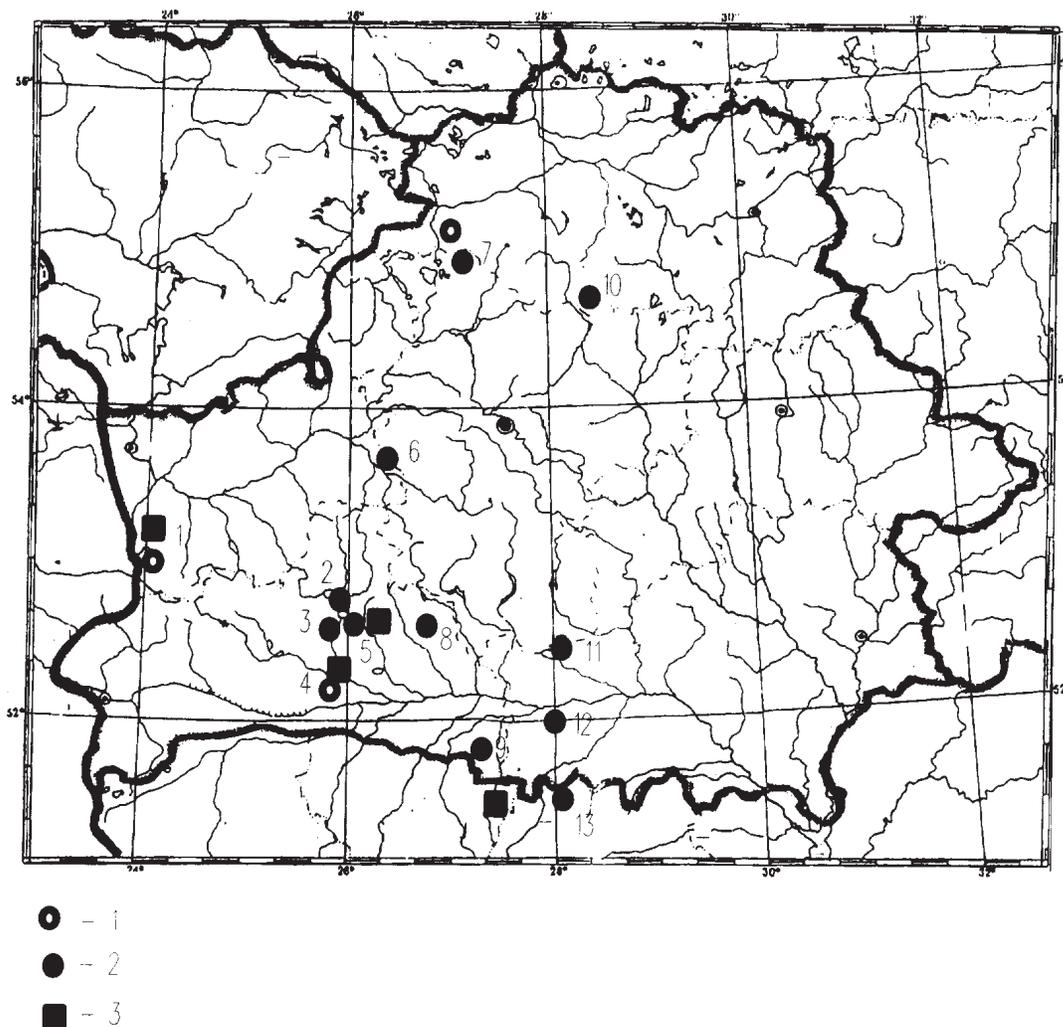


Figure 1.—Breeding distribution of the Great Gray Owl (*Strix nebulosa*) in Belarus. 1 = old (prior to World War II) breeding localities; 2 = recent (since mid-1970's) breeding localities; 3 = probable breeding localities and breeding season observations.



4. *Porechie, Pinsk District. Shnitnikov's (1913) study area; a single owl was repeatedly observed hunting in the same location in the floodplain in May 1992.*
5. *Svyatitsa, Lyahavichi District. Six nests on five territories were found in a large wet forest tract interspersed with open meadows and bordered by cultivated land from 1994-1996.*
6. *Kroman Lake, Novogrudok District. A territorial male (1993), a territorial pair (1994), a nest and a territorial male (1995), and no owls (1996) were observed within ca. 10 square km of conifer and mixed forests along Neman River floodplain.*
7. *NE Myadel District. Two nests ca. 5 km apart were found in the spruce forests in 1976 and 1985, no fieldwork has been carried out in this area since. The area falls within the area mentioned by Tyzenhauz (1843).*
8. *Deniskovich, Gantsevichi District. One fledged brood was recorded in 1980 (Dolbik 1985).*
9. *Olmany, Stolin District. Four nests were found on the edge of and in small forested islands within the huge tract of open transition meadows and raised bogs from 1995-1996.*
10. *Velevshchina, Lepel District. Breeding Great Gray Owls were observed in the same nest in a pine bog along a small river floodplain from 1990-1991; "large" owls bred there in 1993, but the species was not recorded. Owls did not use this nest in 1995 or 1996.*
11. *Hvoika, Zhitkovichi District. Two nests were found in 1991; prior to this, birds were observed several times during the breeding season. No fieldwork has been carried out in this area since 1991.*
12. *Pripyatsky Nature Reserve, Zhitkovichi District. Two nests were found in 1980 in habitat similar to that in the Olmany area; fresh feathers were found at two other locations in the Reserve in 1995.*
13. *Polesky Nature Reserve, Zhitomir Region, Ukraine. Three nests were found from 1985-1988 (Yaremchenko and Sheigas 1991; Zhila 1991), two nests from 1995-1996. A territorial male was observed in neighboring Syra Pogonya Reserve (NE Rivne Region) 1988.*

A concentration of breeding records occurs in southwest and south-central Belarus, in the Black Sea-Baltic watershed in the upper

Pripyat River basins and tributaries, Nar ev River, and the upper Neman River. Bialowiez Primeval Forest seems to be the westernmost point of its range in eastern Europe. Despite extensive ornithological research activities only two breeding records were documented in the 1800's in this area. Several confirmed breeding records exist in northern Ukraine; breeding Great Gray Owls are surely absent in the Ukraine outside the northern Polesie Region (Peklo 1994). The southeastern border of its range in Belarus is not clear, but it seems that owls do not breed east of the Pripyat tributaries, Ptich and Ubart.

Considering the known distribution of Great Gray Owls in Europe it seems very surprising that only a few breeding records were noted in northern and central Belarus (only five recent breeding records in two localities in pine, spruce, and conifer-deciduous subtaiga forests of Belarusian Poozerie [northern lake region]). Although there were very few special searches for Great Gray Owls in northern Belarus, its density there seems to be lower than in southwestern and south-central parts of the country. The following arguments support this conclusion.

1. *Great Gray Owls in Belarus use primarily old raptor nests for breeding (see below), and most of the nests were found during the checks of known raptor nests. More twig nests suitable for owls were checked in northern and central Belarus than in the south in the late 1980s and 1990s. But the distribution of active Great Gray Owl nests was the reverse. In 1995 and 1996, the most successful years for our nest searches, 206 raptor and Black Stork (*Ciconia nigra* L.) nests were checked in central and northern Belarus while 54 such nests were checked in southern Belarus. No active Great Gray Owl nests were found outside southern Belarus, where we succeeded in finding 19 nests during these 2 years (Chi-square test, $P < 0.01$).*
2. *Great Gray Owls are extremely rare breeders or are absent in the area to the north, northwest and northeast of the Belarusian border (Leibak et al. 1994, LOB 1996, Malchevsky and Pukinsky 1983, Patrikeev 1991, Zalakevicius 1995); only 11 documented breeding records from the 1800's have been reported in the sources mentioned. Further more, no Great Gray Owl breeding was observed in Estonia, Latvia,*

Lithuania and Poland in 1995-1996, years which seemed to be good for owl breeding in Belarus (A. Avotins, M. Gromadski, E. Lelov, G. Matiukas, M. Strazds, pers. comm.).

It may be concluded that a rather dense breeding Great Gray Owl population exists in southern Belarus and northern Ukraine. This population seems to be separated from the species' range in northern Europe by vast areas with no or only a few scattered breeding pairs. The history and origin of this population, its connection with northern European populations are completely unknown.

Local densities of Great Gray Owls in Belarus may be very high. In the Tuhavichi study area, few nests were found in 1995 during a survey of a ca. 10 square km forest tract; six nests were found there in 1996. A similar local density was recorded in the Svyatitsa study area in 1995. Four nests in Olmany area were recorded from 1995-1996 while randomly checking 19 raptor and Black Stork nests. Taking into consideration this recent distribution of breeding owls, the area of suitable habitat, and our density data, we estimated the Great Gray Owl breeding population in Belarus to be 50-100 pairs. These figures may be an underestimate and we did not try to estimate the Ukrainian part of the population.

SITE TENACITY AND NEST SITES

There are few data on the territoriality and nest-site tenacity of Great Gray Owls in Belarus. Beginning in the 1995 field season, we monitored the use of known territories in some of our study areas. In total, 70 per cent of territories located in 1995 were used in 1996 (N = 10). In Tuhavichi, all four nests were re-used in 1996 (two new nests were also found within 1.5 km of known nests) as well as one nest in Zhitomir Region, but only 40 per cent in Svyatitsa from 1995-1996. Other isolated breeding localities (Kroman, Myadel and Velevshchina, see above) exhibited some stability, at least for 2-3 years.

We know almost nothing about the wintering ecology of Great Gray Owls. Winter observations are regularly reported (at least one or two each winter by local hunters) in the northern and northeastern parts of the Vitebsk Region,

far from known breeding localities. There is a high probability that these are wandering birds from northern Russia. Very few winter observations on breeding grounds were recorded. Birds (exact number not reported) were shot in December 1956 and February 1960 in Bialowiez Forest (Datskevich et al. 1985). We observed owls four times in Svyatitsa and Tuhavichi from 1993-1996 near nest-sites 1.2-1.5 months prior to breeding, as early as February 18.

We hypothesize that Great Gray Owls in Belarus, at least in the south, hold long-term territories and are probably resident. In this respect, they more closely resemble some Swedish and American mountain populations rather than typical Fenno-Scandian ones (Bull and Duncan 1993, Mikkola 1983). Breeding owls in Belarus use a wide variety of forest habitats for breeding, from upland dry coniferous to swampy alder, birch forests, and pine bogs. About two-thirds of known nests were situated in wet deciduous forests, but this distribution seems to be biased due to predominance of this forest type in the most intensively studied Svyatitsa and Tuhavichi areas. Nests were always situated close to open habitats, mainly natural meadows, and two were found in several ha. forest islands within large mire tracts.

More than 85 per cent of all nests were in large twig nests (table 1), built by raptors, mainly Common Buzzard (*Buteo buteo* L.), Black Storks, and Common Ravens (*Corvus corax* L.). A ground nest was situated near the trunk bases of a group of trees in swampy alder forest. An exact description of beehive nests was not reported (Yaremchenko and Sheigas 1991), but they seem to be similar to stump nests, as local people in Polessie use thick logs

Table 1.—Nest sites used by Great Gray Owls (*Strix nebulosa*) in Belarus.

Nest sites	N	Percent (%)
Twig nests of (summary)	25	86
<i>medium-sized raptors</i>	22	75.5
<i>Black Storks</i>	2	7
<i>Common Ravens</i>	1	3.5
Stumps	1	3.5
Hives (bee)	2	7
Ground	1	3.5
Total	29	100



for hive preparation and put these hives in a vertical position on the trees 3-6 m above the ground, often in remote forest areas (unpubl. data). The proportion of stump nests in Belarus (10.5 per cent including hive nests) contradicts the hypothesis of Mikkola (1983) on the increased use of this nest-site type toward the southern part of the Great Gray Owl's range, but which was supported by Finnish and American data (Franklin 1988). Some underestimate of less conspicuous stump nests is possible, but it probably does not significantly affect nest-site use (table 1).

BREEDING PERFORMANCE

Clutch initiation dates for Belarusian Great Gray Owls ranged from 30 March to 31 April (table 2). Weather conditions of winter 1995-1996 were steadily cold with thick snow cover

Table 2.—Breeding phenology of Great Gray Owls (*Strix nebulosa*) in Belarus.

Period	Clutches started	
	N	Percent (%)
March 20-30	3	14
April 1-9	5	23
April 10-19	8	36
April 20-31	6	27
Total	22	100

which began to thaw only in early April. Snow cover may be important for the onset of breeding in Belarus as in western North America (Franklin 1988). In 1996, three of seven clutches were started mid-April and four in late April. Clutch size (table 3) in Belarus is somewhat smaller than in Fenno-Scandia, reflecting a well-known trend of increased clutches in the northernmost areas (Mikkola 1983). Mean breeding success was 1.34 ± 1.34 fledglings/active nest ($n = 16$), six nests failed to produce any fledglings (table 4). Brood reduction was documented for three of 12 nests; in total, five nestlings died. One case of possible bigyny was recorded in Tuhavichi in 1996. Two nests attended by two females were found 250 m apart, one in a raptor nest used successfully in 1995 and another on the ground (no suitable twig nests were available within 500 m). Three young fledged from the first nest, and only one was raised in the other. In the presumably, secondary nest, egg laying occurred ca. 10 days later than in the first, and at least one nestling died.

Unfortunately, the second nest was found only in late May, a period when males were never seen near the nests. Thick leaf cover caused additional difficulties during our observations and so we failed to record the exact number of males near these two nests.

Table 3.—Reproductive output of Great Gray Owls (*Strix nebulosa*) in Belarus.

Clutch/brood size	Clutches		Broods	
	N	Percent (%)	N	Percent (%)
1	-	-	3	25
2	5	22	4	33
3	7	30	4	33
4	8	35	1	9
5	3	13	-	-
Mean \pm SD (N)	3.39 ± 1.05 (23)		2.25 ± 0.97 (12)	

Table 4.—Reasons of nest failures and mortality of Great Gray Owls (*Strix nebulosa*) in Belarus.

Failure/mortality reason	Nest failures, N	Birds died, N
Eggs fallen down	1	-
Adults/birds killed by man	2	8 (includes 4 adults and 2 juveniles)
Birds killed by Eagle Owl	-	1 (a juvenile)
Nest abandoned/bird found dead (reasons unknown)	4	3 (includes 1 adult and 1 juvenile)

CONSERVATION ISSUES

The lack of information on the status of Great Gray Owls in the 1960's and 1970's was the reason this species was considered among the most rare and endangered in Belarus (Dolbik and Dorofeev 1978). It currently has the highest national legal conservation status (Dorofeev 1993). Considering potential threats, one can see that its situation is not so bad. There are many forest and mire tracts within the core of the species' range which are not seriously affected by economic activities. Tens of square kilometers of such habitat exists in Ivatsevichi, Lelchitsy, Lyahavichi, Luninets, Stolin and Zhitkavichi Districts. Further more, most of the known dense Great Gray Owl populations inhabit nature reserves (Bialowiez Forest, Polessky in Ukraine, Pripyatsky, Telehansky [around Vygonovskoe Lake]) which conserve habitats. Several hundreds of square kilometers of mires and adjacent forests in Olmany have no human population and were used for 30 years as military grounds; plans to create a protected area there are in preparation. Great Gray Owls often share territories with two of their potential predators, the Eagle Owl (*Bubo bubo* L.) and the Goshawk (*Accipiter gentilis* L.) (Mikkola 1983). It seems, however, that predation does not affect their populations seriously. The proportion of Great Gray Owls in the diet of the Eagle Owl (table 4) is less than 0.3 percent (unpubl. data), and this predator is rare in Belarus (Fedyushin and Dolbik 1967, Dorofeev 1993). No owls were recorded as prey of Goshawks in Belarus (Golodushko 1965, Ivanovsky and Umanskaya 1981, unpubl. data).

It seems that illegal shooting by local hunters is the most adverse factor affecting Great Gray Owl populations in Belarus. Mortality counts in table 4 are minimal values known to us from the last 30 years and include killing for scientific collections (four birds). The fearless behavior of Great Gray Owls towards humans may provoke non-educated hunters and makes these birds easy targets. It is impossible to estimate the real importance of this factor, but two positive aspects have to be stressed. First, remote and often swampy forests used by owls for breeding are not regularly visited by humans, at least in spring. During 2 years we did not see people or their tracks closer than 300 m to 15 nests, although some dry trails 300-400 m apart were used rather regularly. Second, the idea of persecution of birds of prey has

become less popular in Belarus recently along with an increasing conservation approach.

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