Ornis Fennica 69:149-154. 1992

Status and breeding performance of the Osprey *Pandion haliaetus* in northern Byelorussia

Alexey K. Tishechkin & Vladimir V. Ivanovsky

Tishechkin, A. K., Institute of Zoology, Byelorussian Academy of Sciences, ul. F. Skoriny 27, Minsk – 220072, Byelorussia
Ivanovsky, V. V., Regional Society of Hunters and Fishermen, ul. Lenina 26/2, Vitebsk – 210015, Byelorussia

Received 20 May 1991, accepted 9 December 1991

Distributional and breeding data on the Osprey *Pandion haliaetus* were collected in northern Byelorussia during 1976–90. The population size was estimated at 100–120 pairs; proved nesting records from other parts of the country are lacking for the last 8 years. Small pines on peat bogs were used for breeding by 90% of the Ospreys. The main part of the population used natural nest sites; only 7% of the nests were built on artificial platforms. The mean clutch size was 2.82 and the mean size of successful broods was 2.06. The brood size per active nest was 1.59 and per occupied nest 1.29. Addled eggs and fallen nests were the main reasons for reduced productivity. Early clutches produced more young in the successful nests. It seems that the population size has remained stable during recent years.

1. Introduction

The main part of the European Osprey *Pandion haliaetus* population inhabits Fennoscandia and north-eastern parts of the USSR (Cramp & Simmons 1980, Gensbøl 1984). Fennoscandian Ospreys have been studied intensively during the last two decades (Österlöf 1973, Saurola 1980, 1986b, Hop 1989), but data on the Soviet Osprey populations are scarce, and not often easily available outside the USSR (Ivanovsky 1983, Belko 1985, Ganusevich & Mezhnev 1987). Prednieks et al. (1989) have reported on the numbers and distribution of Ospreys in Latvia, and Šablevičius (1988) has provided comprehensive information on a small Osprey population in Lithuania. We present here data on the numbers, distribution, nest sites and productivity in a relatively dense population in northern Byelorussia.

2. Study area and methods

We studied Ospreys in northern Byelorussia, including the Vitebsk region and some northern districts of the Minsk region, in 1976–90. About 85% of the data were collected in 1983–90. Our study area was about 32000 km^2, 30% of the area being covered by forests, mainly coniferous, and about 8% by bogs. The study area contains about 1000 lakes with a total area of ca. 1200 km^2 (Yakushko 1988, Martsinkevich & Klitsunova 1989).

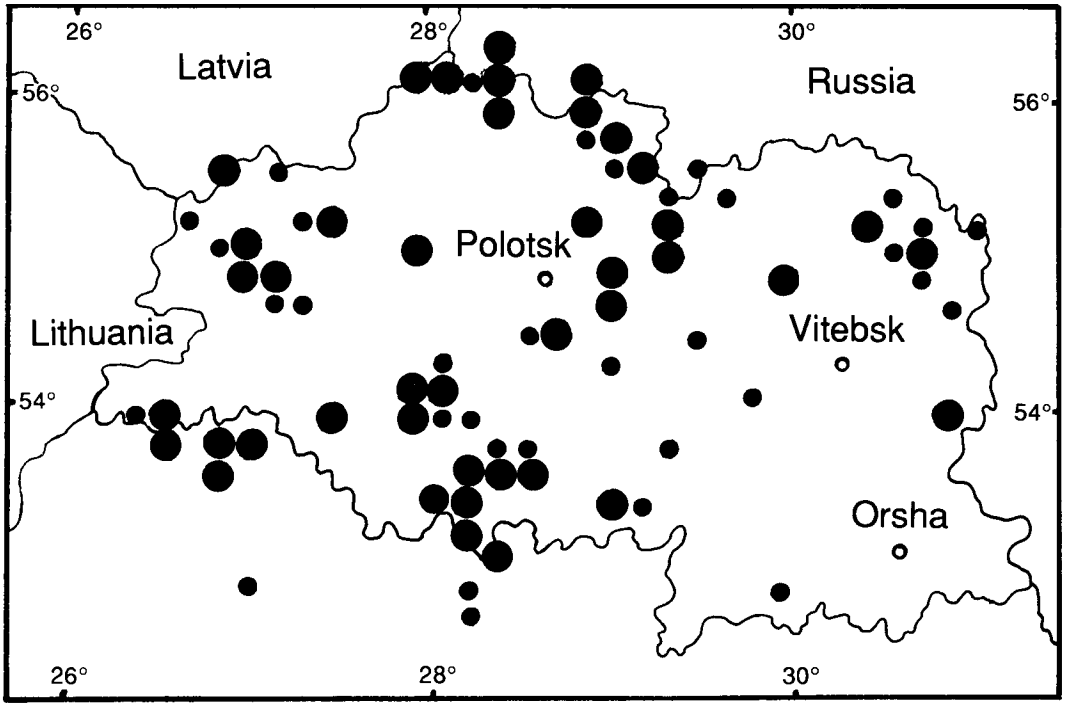

Fig. 1. Vitebsk region and neigbouring areas. Large dots indicate proved breeding of the Ospreys, small dots – probable breeding.

According to research activities, the study area may be subdivided as follows. First, an intensively studied area comprising the Berezinky Biosphere Reserve (BBR) and its surroundings (about 950 km^2), where A. K. T. conducted total counts and collected the main part of the data on productivity and breeding success in 1987–90. Second, six areas (in total about 1200 km^2) in different districts of the Vitebsk region, where V. V. I. checked most of the nests at least twice during the breeding seasons 1981–90. Finally, the rest of the area, where mainly V. V. I. checked known nests once or twice per a year, chiefly for banding young birds, and searched for new nests.

We did not have a wide network of voluntary co-workers as, for example, in Finland during the so-called Project Pandion (cf. Saurola 1984). Only 10–15 persons among forest and game managers provided us with some information, mainly on the occurrence of Ospreys on particular ponds and sometimes nest sites. In the course of the annual field work schedule we searched for Osprey nests on one or two new forest or bog tracks and checked known nests and new nests detected by V. V. I. during aerial counts of ungulates in late winter.

For each nest visited, we recorded the nesting habitat, nest tree species and condition and height above the ground. All nests were classed as occupied, active or successful according to Postupalsky (1974). We climbed every visited nest tree to record clutch or brood size and to document nestling mortality. Laying dates were determined according to the age of the young calculated from measurements of body parts (Häkkinen 1977, Poole 1982, own obs.). Sometimes we used direct observations of egg-laying or hatching. We used 37 days as the length of the incubation period (Cramp & Simmons 1980).

3. Results

3.1. Distribution and numbers

In the course of the study, we found 101 active Osprey nests. Fig. 1 illustrates the Osprey distri-

bution in 1985–90, when 68 nests were found in 43 (7% of the total in the study area) 10 × 10 UTM squares. The maximum annual number of nests per 10 × 10 square was five (BBR in 1988). During 98 visits to known territories, we established that 81% of the pairs used their old nest trees. Breeding in the same nest tree for 3–5 years was common; in one nest, found in 1980, Ospreys bred every year until 1989, when it was checked for the last time. We suppose that most of the territories were occupied every year.

Total counts were conducted in two relatively large areas. In 1988–90, the breeding density in BBR and its surroundings (a protected area where local concentrations of nests were observed) was 1.25–1.70 occupied nests/100 km^2. In the Myadel district (about 1950 km^2, 1985–89) the breeding density was 0.25–0.40 active nests/100 km^2 (V. V. Grichik, pers. comm.). According to the distribution of the nests, the breeding density and coverage of the study area, we estimated the total size of the breeding Osprey population in northern Byelorussia at 100–120 pairs.

3.2. Nest sites

Byelorussian Ospreys bred mainly (75% of nests, n = 101) in sparse stands of pine *Pinus sylvestris* on peat bogs. An additional 18% of the nests were on small (less than 1 ha) "islands" of forest in peat bogs. Thus, about 90% of the population used bogs for reproduction. The mean distance from the nearest feeding lake or river was 1. 65 ± 0.17 (mean ± SE, n = 77), the range being from null (nest tree at lake shore) to 4.5 km. Only 30% of the nests were situated closer than 1 km to the nearest feeding pond. The nests were built mainly on pines (94%, n = 101), sometimes on alders *Alnus glutinosa* and power poles (3 and 2 nests, respectively), and one nest was on birch *Betula pubescens*. Twenty-seven per cent of the nests were built on dead trees. Only 7% of the pairs used artificial nest platforms. The nest height varied between 4.8 and 32 m, the mean being 12.1 ± 0. 81 m.

Table 1. Productivity of the Osprey in northern Byelorussia in 1976–90.

Clutch/brood size	Clutches		Broods	
	n	%	n	%
1	–	–	15	25
2	13	19.5	26	43
3	53	79	20	32
4	1	1.5	–	–

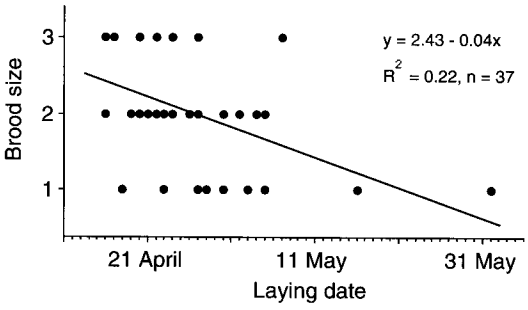

Fig. 2. Relationship between brood size and laying date in 37 successful Osprey nests.

3.3. Start of breeding and clutch size

Breeding began in mid-April (the earliest laying date was 16 April) and extended over 6 weeks. In 50% of the nests, the first egg was laid between 16 and 25 April, in 90% between 16 April and 5 May. The median laying date was 25 April, and it varied very little: 26, 27 and 23 April in 1988–90 respectively (n = 8–13).

The clutch size varied from 2 to 4 eggs (Table 1), and the mean was 2.82 ± 0.06. The annual variation of the mean clutch size was small and non-significant (Kruskall-Wallis test, P > 0.1). In 1987–90, the means varied between 2.73 and 2.90 eggs (n = 9–16).

3.4. Brood size and breeding success

The brood size varied between 1 and 3 young (Table 1) and the mean was 2.06 ± 0.10. In 1986–90 the annual means fluctuated between 1.83 and 2.28 young/successful nest (n = 8–18).

These differences were not significant (Kruskall-Wallis test, $P > 0.1$).

About 75% of the verified nesting attempts were successful, and the mean number of young/active nest was 1.59 ± 0.13 ($n = 80$). The annual variation in this index was greater than in the number of young/successful nest, and in 1987–90 the index varied between 1.10 and 1.86, the variation being significant (Kruskal-Wallis test, $H = 21.31$, $df = 3$, $P < 0.001$, $n = 64$). The number of young/occupied nest in BBR and the surroundings was 1.29 ± 0.22 ($n = 34$, pooled data from 1988–89).

Early clutches produced large broods (Fig. 2). The mean laying dates in successful nests with 1, 2 and 3 young were 8 May ± 4.7 days, 25 April ± 1.5 days and 22 April ± 1.6 days, respectively ($n = 10$, 15 and 12). The differences between the first and the two other values were significant (Kruskall-Wallis test, $H = 8.25$, $df = 2$, $0.01 < P < 0.05$, $n = 37$).

The egg losses were about three times as great as the mortality of the young and were the main reason for reduced productivity (Table 2). The most common cause of failure was the fall of the nest from the tree during heavy rain and strong wind. Productivity was also considerably lowered by addled eggs (see Table 3). Golden Eagles *Aquila chrysaetos,* Eagle Owls *Bubo bubo* and Pine Martens *Martes martes* each took one Osprey brood. The Eagle Owl probably also killed the young in one further brood, but this instance was not included in Table 3, because there was some doubt, and we did not know the exact number of young killed.

Table 2. Nesting mortality of the Osprey in northern Byelorussia in 1981–90.

	Eggs		Young	
	n	%	n	%
Number of nests observed	57	100	40	100
Eggs laid/young hatched in these nests	159	100	98	100
Number of eggs/young fainling to hatch/fledge	56	35	13	13
Number of complete clutch/brood failures	12	21	5	12
Number of eggs/young in failed nests	30	19	9	9

Table 3. Causes of nesting mortality of the Osprey in northern Byelorussia in 1981–90.

	Number of eggs lost		Number of young lost	
	n	%	n	%
Addled eggs/dead young	16	29	1	8
Fallen nests	22	39	4	31
Predation	–	–	5	38.5
Clutch desertion	4	7	–	–
Reason unknown	13	23	1	8
Rolling/fall from the nest/cup nest	1	2	2	15.5
Total	56	100	13	100

4. Discussion

Until the end of the 1970s, the Osprey was considered an extremely rare and endangered species in Byelorussia. Less than 10 nests were recorded (Fedyushin & Dolbik 1967, Dolbik & Dorofeev 1978). It now seems that this situation reflected a low level of searching activity rather than a real situation. A special project for censusing large raptors in the north of the country in the late 1970s (Dorofeev & Ivanovsky 1982) soon revealed that the Osprey is not so rare here (cf. Ivanovsky 1983), and the data presented in this paper allow us to consider it a relatively common species in some parts of northern Byelorussia.

Our methods did not allow us to establish any current trends in the number of breeding pairs. During 1987–90, the breeding density was stable in an intensively studied plot, the major part of which is protected (BBR). The creation of some new territories near fish-ponds in some districts of the region (Braslav, Postavy, Chashniki) in the late 1970s and recolonization of the Naroch Lake group (Myadel district), where Ospreys had been absent for a few decades (V. V. Grichik, pers. comm.), may even indicate some increase of the Osprey population during the last 15–20 years. A similar conclusion was reached in neighbouring Latvia (Prednieks et al. 1989)

Testing possible trends in population dynamics on the basis of productivity and post-fledging survival (Henny & Wight 1969) involves considerable assumptions, because there are no data on the survival of Byelorussian Ospreys. It seems acceptable to use Finnish data (Saurola 1984), because the Ospreys from Finland and Byelorussia probably have similiar passage ways and wintering grounds (cf. Cramp & Simmons 1980). Survival estimates of 50–60% for the first year and 78–82% for the next years were given by Saurola (1984) for 1958–78. The actual values for Byelorussia may even be higher, due to the shorter journey to the wintering grounds for Byelorussian Ospreys and to reduced persecution of raptors on passage in the USSR during recent years (Saurola 1986a). Thus, the observed productivity (1.59 young/active nest) was markedly greater than would be needed for maintaining a stable population in North America (cf. Henny & Wight 1969).

As regards other regions of Byelorussia, during the last two decades there have been only one proved breeding record (Kirovsk district, Mogilev region, 1980) and some observations of hunting birds during the breeding season on fish ponds in eastern parts of the Brest and western parts of the Gomel regions (A. V. Kozulin, pers. comm.). We believe that intensification of research activities will reveal some breeding pairs here, it is questionable whether their numbers are more than 20–30.

The productivity and nesting success of Byelorussian Ospreys are similar to those observed in large and stable Fennoscandian populations (Odsjö & Sondell 1976, Saurola 1986b). Our data on between-year variation in the breeding success are limited, but we can note that reproduction was unsucceessful in only one of the four last years. In 1987 about 50% of the observed nests failed, 43% due to a fall from the nest tree.

Erection of artificial nest platforms may improve the population status of Ospreys both by providing nest sites, which are often scarce, and by increasing nesting success by preventing possible nest crashes (Rhodes 1972, Postupalsky 1978, Saurola 1984, Scott & Houston 1985). In our study area only 7% of the recorded nestings took place on artificial platforms. It is probable that building of artificial nests may result in increasing the numbers and nesting success of Ospreys in Byelorussia.

Acknowledgements. V. V. Grichik, A. V. Kozulin, and M. E. Nikiforov provided us with useful information. Frequent help in the field was given by E. E. Makeenok, V. S. Martynenko, G. P. Petko, I. I. Semashko, A. E. Vintchevsky. Comments on an early draft of the manuscript were made by E. Korpimäki, H. Pietiäinen and P. Saurola. We express our sincere thanks to these colleagues.

Selostus: **Valkovenäjän sääkset**

Sääksipopulaation levinneisyyttä ja lisääntymistä tutkittiin Valkovenäjällä vuosina 1976–90. Pääosa 100–120 parista pesi luonnonpesissä, 90% pienissä suomännyissä. Vain 7% pesistä oli keino-

pesissä, voimajohtopylväissä tms. Keskimääräinen pesyekoko oli 2.82 ja onnistuneissa pesissä oli keskimäärin 2.06 poikasta. Kuoriutumattomuus ja pesän sortuminen olivat tavallisimmat lisääntymisen epäonnistumisen syyt. Aikaiset pesät olivat tuottoisimpia. Populaation koko on pysynyt vakaana viime vuosina.

References

Belko, N. G. (Белко, Н. Г.) 1985: [The Osprey in the Darvinsky reserve]. (In Russian) — In: Galushin, V. M. & Krever, V. G. (Галушин, В. М. & Кревер, В. Г.) (eds.), Raptors and owls in nature reserves of Russian SFSR: 116–130. Cent. Res. Lab. of Glavokhota, Moscow.

Cramp, S. & Simmons, K. E. L. (eds.) 1980: The birds of the Western Palearctic II. — Oxford Univ. Press, Oxford. 695 pp.

Dolbik, M. S. & Dorofeev, A. M. (Долбик, М. С. & Дорофеев, А. М.) 1978: [Rare and endangered birds of' Byelorussia.] (In Russian) — Uradzhay Press, Minsk. 199 pp.

Dorofeev, A. M. & Ivanovsky, V. V. (Дорофеев, А. М. & Ивановский, В. В.) 1982: Rare species of birds of prey in the Vitebsk region. (In Russian with English summary) — Ornithologia 17:135–136.

Fedyushin, A. V. & Dolbik, M. S. (Федюшин, А. В. & Долбик, М. С.) 1967: [Birds of Byelorussia.] (In Russian) — Nauka i Tekhnika Press, Minsk. 519 pp.

Ganusevich, S. A. & Mezhnev, A. P. (Ганусевич, С. А. & Межнев, А. П.) 1987: [The Osprey and the White-tailed Eagle in the inner parts of the Kola Peninsula.] (In Russian) — In: Nazarov A. A. (Назаров А. А.) (ed.), Biological basis of protection and reproduction of game resources: 139–151. Cent. Res. Lab. of Glavokhota, Moscow.

Gensbøl, B. 1984: Røvfuglene i Europa, Nordafrika og Mellemosten. — GAD, Kobenhavn. 384 pp.

Häkkinen, I. 1977: Food catch of the Osprey Pandion haliaetus during the breeding season. — Ornis Fennica 54:166–169.

Henny, C. J. & Wight, H. M. 1969: An endangered Osprey population: estimates of mortality and production. — Auk 86:188–198.

Hop, H. 1989: Fiskeørn i Aust-Agder, Sør-Norge, hekkebestand og reproduksjon 1980–88. — Fauna 42:1–12.

Ivanovsky, V. V. (Ивановский, В. В.) 1983: [Osprey in Byelorussian Poozerie.] (In Russian) — In: Flint, V. N. (ed.), Conservation of raptors. Proc. I Conf. on ecology and protection of birds of prey: 118–120. Nauka Press, Moscow.

Martsinkevich, G. I. & Klitsunova, N. K. (Марцинкевич, Г. И & Клицунова, Н. К.) (eds.)1989: [Landscapes of Byelorussia]. (In Russian) — Minsk Univ. Press, Minsk. 238 pp.

Odsjö, T. & Sondell, J. 1976: Reproductive success of Ospreys (Pandion haliaetus) in southern and central Sweden, 1971–73. — Ornis Scand. 7:71–84.

Österlöf, S. 1973: Fiskgjusen Pandion haliaetus i Sverige 1971. — Vår Fågelvärld 32:100–106.

Poole, A. 1982: Brood reduction in temperate and subtropical Ospreys. — Oecologia 53:111–119.

Postupalsky, S. 1974: Raptor reproductive success: some problem, with methods, criteria and terminology. — In: Hammerström, F.N., Harrell, B. E. & Olendorff, R. R. (eds.), Management of Raptors: 21–31. — Univ. Wisconsin Press, Madison, Milwaukee & London.

— 1978: Artificial nesting platforms for Ospreys and Bald Eagles. — In: Temple, S. A. (ed.), Endangered birds: management techniques for preservation of threatened species: 35–46. Univ. Wisconsin Press, Madison, Wi.

Prednieks, J., Strazds, M., Strazds, A. & Petrinš, A. 1989: Latvian breeding bird atlas 1980–84. — Zinatne Press, Riga. 351 pp.

Rhodes, L. I. 1972: Success of Osprey nest structures at Martin National Wildlife Refuge. — J. Wildl. Manage. 36:1296–1299.

Šablevičius, B. 1988: Erelis žuvininkas. — Mokslas Press, Vilnius. 111 pp.

Saurola, P. 1983. Finnish project Pandion. — Acta Ornithol. 17:161–168.

— 1984: Population dynamics of the Osprey in Finland during 1971–80. — In: Bird, D. M (ed.), Biology and management of Bald Eagles and Ospreys: 201–206. Harpell Press, St. Anne de Bellevue, Que.

— 1986a: Bird ringing in Finland: status and guide lines. — Ring 22:1–18.

— 1986b: Viisitoista vuotta Suomen sääksikannan seurantaa. — Lintumies 21:67–80.

Scott, F. & Houston, C. S. 1985: Success of Osprey nest platforms near Loon Lake, Saskatchewan. — Blue Jay 43:248–252.

Yakushko, O. F. (Якушко, О. Ф.) (ed.) 1988: [Lakes of Byelorussia.] (In Russian) — Uradzhay Press, Minsk. 214 pp.