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Use of Breeding Area by Immature Spotted Eagles *Aquila pomarina* and *A. clanga* in Belarus: different strategies

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ABSTRACT

During a 1999-2002 RSPB-funded APB-BirdLife Belarus project, data on the occurrence of immature individuals of both species in the breeding season were collected. 25 immature GSE and 17 immature LSE were observed. Immature GSEs were sighte with the first arriving adults (earliest date – 9 March), spending the entire breeding season in the vicinity of occupied territories in the typical GSE breeding biotopes (large forest-mire complexes), never congregating in groups. In March-early April, solitary birds in juvenile plumage were often seen accompanying an adult in its breeding area (resembling a pair from a distance). But later on, immature birds left the territories occupied by adults. Immature LSEs arrived later than immature GSEs. The earliest date was 15 April, but more than 70% of observations of immature LSEs were made in June-July, when the birds congregated in small groups of 2-5 individuals. They fed on vast drained wetlands used for hay-making. Doubtless, some several hundreds of immature LSEs stay in Belarus during summer. The low observation rate is explained only by the absence of special counts on open agricultural areas. Probably the majority of immature LSEs arrive in Belarus towards the hay-making season (late May-June). This supposition is supported by data on spring migration of two satellite-tracked immature LSEs (Meyburg *et al.* 2001).

On August 14, 2002 in Ivanovo Region (Russia), a LSE in the second plumage was sighted near the north-easternmost recorded point of the species' breeding range (Melnikov *et al.* 2001), demonstrating that imm. LSEs use the entire breeding area and are not limited to Central Europe.

INTRODUCTION

The data on the occurrence of immature Spotted Eagles *Aquila pomarina* and *A. clanga* here presented were collected as a byproduct of counts of breeding pairs. Therefore I cannot claim to provide a comprehensive coverage of the issue. Study of the available literature, as part of the analysis of these data, has not revealed any information on the quantity and behaviour characteristics of immature Greater (GSE) and Lesser Spotted Eagles (LSE) summering in Europe. This lack of information has prompted the present article, since this facet of the population biology of Spotted Eagles is obviously understudied and it is hoped thereby to stimulate interest in the issue.

MATERIAL AND METHODS

During the 1999-2002 RSPB-funded census of GSE and LSE, implemented by APB-BirdLife Belarus, data on the occurrence of immature individuals of both species in the breeding season were collected. Each bird's age was estimated, based on visual observation (using a 20x60 telescope) of the partly juvenile plumage and the pattern of moulting of primaries and secondaries (Forsman 1999). Throughout the period, 25 immature GSEs and 17 LSEs were sighted.

Apart from this, zoological museum collections were also examined in Moscow State University (94 GSEs and 31 LSEs) and Belarusian State University (3 GSEs and 8 LSEs).

RESULTS AND DISCUSSION

Greater Spotted Eagle

Immature GSEs arrive in Belarus with first returning adult birds. The earliest observation of immature GSEs in Olmany Marshes (Southern Belarus, around the border with Ukraine) was recorded on 9 March, 2002. In four cases, these early-arriving second calendar year (2^{nd} cy) immature GSEs were seen together with an adult (supposedly a female, judging by its large size) around its breeding area (Table 1). At a distance, the two looked like a breeding pair. It is difficult to say whether these immature birds were offspring of these particular adults or whether they formed temporary unions. The former assumption is substantiated by the fact that, in two cases, the immature birds spent a night near the nest, with no aggression on the part of the adult bird. The above behaviour was observed only shortly after arrival (March- mid-April). Later on, immature birds were not observed in the areas occupied by the adults. Furthermore, in May-June adult birds started to show explicit aggression toward trespassing immatures.

Table 1. Sightings of immature GSEs in Belarus during breeding season.

Date	*Number of birds observed*	*Age of birds*	*Notes*
9.03.02	1	2nd cy	Accompanying an adult female near the nest
12.03.02	2	2nd – 3rd cy	Migrating
27.03.02	1	2nd cy	
1.04.00	1	2nd cy	Near the nest of GSE
1.04.01	1	2nd cy	Accompanying an adult female near the nest
10.04.01	1	2nd cy	Accompanying an adult female near the nest
10.04.01	1	2nd –4th cy	Migrating
11.04.01	1	3rd –4th cy	
12.04.03	1	2nd cy	Accompanying an adult female near the nest
20.04.99	1	2nd cy	
20.04.00	1	2nd cy	
21.04.00	1	2nd – 3rd cy	
24.04.00	1	2nd cy	
19.05.99	1	2nd cy	
25.06.02	1	2nd – 3rd cy	
25.06.02	1	3rd –4th cy	
27.06.02	3	2nd – 3rd cy	2 birds feeding together on a hayfield
5.07.01	1	3rd –4th cy	
15.07.00	1	2nd cy	
15.07.02	1	3rd –4th cy	
15.07.01	1	3rd –4th cy	
16.07.99	1	2nd cy	

Throughout the entire breeding season immature GSEs were normally observed near the areas occupied by adult birds in the species' typical habitats (vast forest wetlands, river floodplains), rarely assembling in groups. In a single case, two immature GSEs were hunting together in a hayfield like a LSE. The highest number of observations of immature GSEs was registered in the areas of high breeding density (Central Polesie in Southern Belarus). The average occurrence ratio for immature GSEs in Belarus was one bird per 5-6 breeding pairs. Thus some 25-40 immature GSEs are estimated to be present in Belarus during the breeding season.

Out of the 94 GSEs sampled in the museum of Moscow State University, 12 turned out to be immature birds of 2-4 cy, collected across the entire breeding range stretching from Europe to the Far East (Table 3).

In neighbouring Poland, isolated non-breeding GSEs (usually immature) have been sporadically recorded across the country (Tomialojc 1990). The earliest recorded date of immature GSEs in the Polish Belovezhskaya Pushcha was March 2, 1985 (Pugacewicz 1996). A winter encounter with an immature GSE in Poland was recorded on January 13, 1979 (Tomialojc 1990).

Lesser Spotted Eagle

Immature LSEs arrive in Belarus much later than immature GSEs. Over 70% of all sightings were made in June-July (Table 2). Three observations of immature LSEs in April obviously defy the general pattern. And the earliest record of an immature LSE was on April 15, 2000 in Dikoe mire, adjacent to the National Park Belovezhskaya Pushcha, in the breeding area of a mixed pair (*Aquila pomarina x clanga*). This bird could have been the pair's previous year's offspring. In 2000, the pair raised a hybrid chick whose phenotype was that of a typical LSE (Dombrovski 2002).

In June-July immature birds were normally observed in vast agricultural areas during or directly after hay-cutting. This time of year usually sees small groups (2-5) of young and adult birds feeding peacefully side by side. At times, these hay areas are located far from forest tracts, corroborating the supposition that these groups are formed by non-breeding birds. An estimated several hundreds of immature LSEs are present in Belarus in summer. The low observation rate indicated in Table 2 can be explained by the absence of special counts on open agricultural areas during this time of year. Probably the majority of immature LSEs arrive in Belarus toward the hay-making season (late May-June). This supposition is supported by data on the spring migration of two satellite-tracked immature LSEs caught in Namibia in February 1994, one of which returned to Hungary on June 26 and the other to Ukraine on May 30 (Meyburg *et al.*, 2001).

Table 2. Sightings of immature LSEs in Belarus during the breeding season.

Date	*Number of birds observed*	*Age of birds*	*Notes*
15.04.00	1	2nd	Near the nest of mixed pair (*A.pomarina* x *A.clanga*)
19.04.01	1	2nd –3rd cy	Migrating
20.04.01	1	2nd –3rd cy	Migrating
8.06.99	1	2nd –3rd cy	
22.06.99	1	2nd	
24.06.01	3	2nd –3rd cy	In a group of 5 LSEs feeding together in a hayfield
25.06.02	2	2nd –3rd cy	Feeding together in a hayfield
1.07.00	1	2nd –3rd cy	In a scattered group of 10 LSEs feeding in a vast hayfield
13.07.01	1	2nd –3rd cy	
14.07.01	1	3rd cy	
15.07.01	1	2nd –3rd cy	
19.07.00	1	2nd –3rd cy	
24.07.00	2	2nd –3rd cy	Feeding together in a pasture

The above data challenge an account of the arrival of juvenile LSEs (younger than 4 years) in early spring (March) at breeding sites in South Bohemia (Czech Republic) (Mrlik 1998). Since adult LSEs of the South Bohemia population usually arrive very early (exceptionally the beginning of March and mid-March (Mrlik 1998)), the species in the above case could have been misidentified. Information on immature LSEs in the countries neighbouring Belarus is very scarce. A young LSE, ringed on 30 August 1956 in Lithuania, was collected on 10 July 1957 in Eastern Belarus near Orsha (R. Patapavicius, pers.comm). A 2nd cy LSE was observed by the author on August 14 2002 in the Ivanovo region of Russia (some 200km east of Moscow) near the north-easternmost recorded point of the species' breeding range (Melnikov *et al.* 2001). The bird was hunting around a cereal field.

Out of the 31 LSEs sampled in the museum of Moscow State University, 5 proved to be immature birds, collected within the breeding range, including the Moscow region of Russia (Table 3). Out of 8 LSEs in the museum of the Belarusian State University, two turned out to be immature (Table 3).

The above data indicate that in summer immature LSEs are spread across the entire breeding area of the species and not limited to Central Europe.

Interestingly, all immature LSEs in museum collections are males, though the limited size of the sample range precludes any conclusions from being drawn.

Table 3. Immature Spotted Eagles in museum collections of Moscow and Minsk

□	*Date collected*	*Species*	*Sex*	*Age*	*Origin*
Moscow State University					
R-37222	1.05.1904	*A.clanga*	male	2nd	Orlov province,
R-96529	14.05.1970	-	male	2nd	Khabarovsk Krai,
R-30361	25.05.1904	-	male	3rd –4th cy	Simbirsk province,
R-52720	29.05.1940	-	male	2nd	Western Siberia,
R-30366	4.06.1904	-	female	2nd –3rd cy	Simbirsk province,
R-48344	8.06.1935	-	male	2nd	Transbaikalie,
R-55563	26.07.1911	-	?	2nd	Western Siberia,
R-75561	26.07.1934	-	male	3rd –4th cy	Bashkiria, Russia
R-41491	9.08.1921	-	male	2nd –3rd cy	Voronezh dstr.,
R-41483	11.08.1921	-	female	2nd –3rd cy	Voronezh dstr.,
R-30364	19.08.1907	-	male	2nd –3rd cy	Simbirsk province,
R-30373	22.08.1908	-	?	2nd –3rd cy	Western Siberia,
R-76126	9.05.1951	*A.pomarina*	male	2nd –3rd cy	Belovezhskaya
R-37201	24.05.1916	-	male	3rd –4th cy	Transcaucasia
R-37191	21.06.1913	-	male	2nd	Moscow region,
R-88254	12.08.1957	-	male	2nd –3rd cy	Kabardin-Balkar
R-8115	12.08.1906	-	male	2nd	Belovezhskaya
Belarusian State University					
	4.06.1925	*A.pomarina*	male	2nd –3rd cy	Belarus
	16.07.1926	-	male	3rd –4th cy	Berezinsky Reserve,

Thus immature GSEs and LSEs differ in terms of time of arrival in their breeding areas, social behaviour and habitat preference. The sex distribution of immature LSEs and GSEs summering in middle latitudes might also show some discrepancy, but this assumption can only be substantiated through continued study of museum collections of the two species.

It is possible that some of the birds in partially juvenile plumage have had breeding experience, as proved for the GSE in Poland (Meyburg *et al.,* 1997).

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