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Notes on the Breeding Biology of Spotted Eagles *Aquila clanga* and *A.pomarina* in Byelorussia

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These notes summarize data on the breeding of Spotted Eagles *A. clanga* and *A. pomarina* in Byelorussia. In all, five active nests of the Greater Spotted Eagle and 48 of the Lesser Spotted Eagle were observed during 1981-91. I wish to thank my colleagues Vasily Grichik, Michael Nikiforov and Gennady Puzankevich, who provided some valuable information.

During the last decade breeding of the Greater Spotted Eagle was recorded only in the Vitebsk region. Two nests, one on birch and one on alder, were found in Shumilino district, and eagles bred here altogether five times, until both nest trees fell down. One was situated in swampy birch forest and the other in swampy alder forest. Both were built in a bifurcation of the trunk; their heights above ground were 8m and 10m, their diameters 80 cm and 100 cm, and their depth 100 cm and 150 cm respectively. Both territories included large tracts of open bogs and swamps.

Lesser Spotted Eagles used different, often humid, forest types, for breeding, avoiding only pine forests. Among 48 nests, 35% were situated in mixed deciduous forest, 29% in mixed deciduous-conifer stands, 17% in spruce forests, 15% in alder forests and 4% in birch forests. The mean nesting density calculated for the study area in the Shumilino district of Vitebsk region (total 120 km^2) was 2.3 pairs per 100 km^2 of forested area. 37% of nests were built on spruce, 30% on alder, 23% on birch and the remaining 10% on aspen and oak. About 60% of nests were used at least twice. Nests were built mainly at the base of a large branch near the trunk (67%), the remainder being placed in a bifureation of the trunk itself. Nest height above the ground averaged 14.5m (limits 8-22 m), nest diameter 1 m (0.8-1.4), nest depth 0.7 m (0.6-0.9 m). Both species decorated the nest cup with fresh small sprigs of spruce, alder or birch. Lesser Spotted Eagles often had alternative nests on their territories, sometimes up to three, the mean number of nests per territory was 1.5.

Spring arrival of the Greater Spotted Eagle was recorded once, on March 12, 1984. Lesser Spotted Eagles returned from their winter grounds somewhat later, between March 27 and April 14 according to the course of a particular spring.

I recorded the following data on the reproduction of the Greater Spotted Eagle. Clutches in an advanced stage of incubation were observed on May 24, 1987, May 25, 1986 and June 20, 1983. Apparently, the last was a replacement clutch. Nests with chicks were inspected on June 17, 1984 and June 24, 1981; nests containing young

about to fly on July 17, 1985 and July 20, 1986.

There were 1-2 eggs in completed clutches, the mean being 1.83 (n=6). Mean egg size of Greater Spotted was 65.8 x 52 mm (limits 64.7-67.5 x 49.2 53.1). A mean of 1.5 eggs hatched in successful nests, mean brood size being 1.25 large young per successful nest and 1.00 per occupied nest (n=4 and 5 respectively). One-fourth of successful broods contained two fledglings.

Lesser Spotted Eagles started egg-laying between May 2 and 7. Completed clutches contained 1-2 eggs, the mean being 1.86 (n=22). Mean egg size was 63.2 x 50.9 (limits 58.2-66.9 x 47.5-53.2, n=24). The eggs were smaller than those of the Greater Spotted Eagle but differences were significant only for length (t=3.10, P 0.01 and t=1.33, P 0.05, df=29). Hatching occurred between May 28 and June 13, mean date June 6, with a mean of 1.57 young per successful nest (n=14); 17% of eggs failed to hatch. Young Lesser Spotted Eagles left their nests between July 23 and August 16, mean date August 6. Mean brood size was 1.03 young per successful nest and 0.76 large young per active nest (n=29 and 39 respectively). All authors who have studied the Lesser Spotted Eagle (e.g. Golodushko 1958, Meyburg 1970, Baumgart 1980, Bergmanis *et al.* 1989) have insisted that this species never reared more than one fledgling. I recorded one case of the rearing of two young by a pair of Lesser Spotted Eagles in Shumilino district. (of Vitebsk region).

The last visit to this nest was on July 26, 1991, when I ringed two full-grown eaglets. I supposed that the older eaglet was a male and the other a female, which may be one possible reason for the survival of both young birds. The eaglets tended to maintain a constant distance between them in the nest, about 0.5m, and it was very difficult to place them side by side for taking a photograph.

Young Lesser Spotted Eagles left their nests with relatively poor ability to fly and sometimes became the victims of carnivores and humans. About 75% of breeding attempts were successful. Young eagles stayed on their natal territories for about a month after fledging and were often seen soaring with their parents over their home ranges. From mid-September one may sometimes see loose groups of 6-9 Lesser Spotted Eagles, made up of neighbouring broods, flying over their hunting grounds such as open swamps, river flood-lands and cultivated fields. They start the autumn migration at the end of September.

In order to record the prey selection of both species, I collected surplus, just delivered and partly eaten prey during nest visits. In all, 160 animals taken by Lesser Spotted and 50 taken by Greater Spotted Eagles were collected (see Table 1). The staple food of the lesser Spotted were frogs *Rana temporaria* and *R. terrestris* (39% and 17.5% respectively). The commonest prey of the Greater Spotted was the Water Vole, which comprised 19% of the diet.

Five young Greater Spotted and 29 young Lesser Spotted Eagles were ringed during the study. I had only one recovery: a Greater Spotted Eagle ringed in June 1984 in Shumilino district was killed on April 20, 1986, 50 km from St. Petersburg.

Table 1. Diets of Greater and Lesser Spotted Eagles in northern Byelorussia, 1981-91.

Prey types	*A. clanga*	*A.pomarina*
	%	%
Mammals	53.8	29.1
Birds	17.4	5.6
Reptiles	7.7	3.3
Amphibians	21.1	62.0
	n=50	n=160

According to Malchevsky and Pukinsky (1983), only the Greater Spotted Eagle breeds near St. Petersburg.

As regards differences in the biology of Lesser Spotted and Greater Spotted Eagles, the breeding cycle of the latter (from egg-laying to fledging) is about 10 days shorter than that of the Lesser Spotted. Successful broods of two young are regularly observed in the Greater Spotted and only an exception in the Lesser Spotted (above-cited authors and own observation). The breeding spectra of these species are quite different, the Greater Spotted specializing mainly on small mammals and the Lesser Spotted on amphibians. In the study area the Lesser Spotted Eagle is a relatively common species, typical for moist mixed and deciduous forests, whereas the Greater Spotted is a very rare species at the western limit of its range. It is evident to me that both these eagles are separate species, and observed differences in sympatric populations reflect this status.

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