

# Lesser Spotted Eagle *Clanga pomarina* Brehm, 1831 (Aves: Accipitridae) on the Eastern Border of the Present Range in Russia

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**Abstract:** The generalized data allowing to specify the recent distribution of the Lesser Spotted Eagle in the eastern part of the range are presented. The analysis of the publications for different years affirms the eastward expansion of the range since the early 1990s, as well as a significant increase of the occupied area within the limits of the range. Confirmed breeding attempts in Ivanovo Region and Chuvash Republic have evidenced that the recent eastern border of the range is reaching the 47th meridian, much further than considered earlier. The spatial relations and hybridization with the Greater Spotted Eagle are discussed.

**Key words:** breeding range, eastward expansion, hybridization, Lesser Spotted Eagle

## Introduction

The Lesser Spotted Eagle *Clanga pomarina* Brehm, 1831 inhabits mixed and broad-leaved forest sub-zones in the western part of the European Russia, and the North Caucasus (MISCHENKO & MELNIKOVA 2018, VÄLI et al. 2009). The precise eastern border of the species' breeding range in the forest zone has not been sufficiently studied. Separate scattered recent data on this subject are published in some Russian journals and proceedings of regional conferences. They are not available to the foreign readers, therefore the maps of the breeding range in the European publications are incorrect (e.g. information on Lesser Spotted Eagle in the IUCN website). In this paper we generalized and critically analyzed information on the species' distribution in the eastern part of the range. These generalized data have not been published before. Also, we have submitted data on hybridization of Lesser and Greater Spotted Eagle (*Clanga clanga* Pallas, 1811) in the east of the range,

which were published only in Russian (MELNIKOVA et al. 2008).

In the eastern part of the range, within the limits of Central Russia (Upper Volga area), the Lesser Spotted Eagle (LSE) is a rare nesting bird species (MELNIKOVA et al. 2001, 2009), listed in the Red Book of the Russian Federation and the red books of the regions, where breeding was confirmed. It was considered a vagrant until the mid-1990s (GERASIMOV et al. 2000). In the aforementioned region, ornithologists have paid special attention to this raptor since 2000 – after breeding was confirmed in 1999 in the Darvinsky State Nature Reserve in Yaroslavl Region (EGOROVA 2000) and in the Klyazminsky Regional Nature Reserve in Ivanovo Region (MELNIKOVA et al. 2001). The population density of the Lesser Spotted Eagle in the eastern part of the range is very low; hence, hybridization with the rare Greater Spotted Eagle (GSE) is expected.

## Materials and Methods

Lesser Spotted Eagle studies in Ivanovo Region have been conducted since 1999. Annual monitoring is carried out in the Klyazminsky Regional Nature Reserve (IBA EU–RU242; N 56°32'; E 41°46') and in the northern part of Balahninskaya Lowland (IBA EU–RU386; N 56°27'; E 42°04').

Regular surveys, inspections of known nests, identification of nest sites and search for occupied nests were carried out in the valley of mid-stream Lukh (IBA EU–RU243; N 56°44'; E 42°15') and in adjacent peat extraction complexes, in North Meshchera, in the vicinity of the town of Petushki (Vladimir Region) (N 55°51'; E 39°26'), as well as in Crane Homeland cluster of regional nature reserves in the Dibnensky Peatland Area and its surroundings (IBA EU–RU071, north of Moscow Region; N 56°45'; E 37°44'). Additional data on LSE were obtained during faunistic research carried out in most of the districts of Ivanovo Region and in the neighboring areas of Vladimir, Yaroslavl and Kostroma Regions. In 2016–2017, surveys were carried out in the central part of Kostroma Region, in the area of lakes Galichskoe (N 58°25'; E 42°27') and Chukhlomskoye (N 58°52' E 42°47').

For detection of nesting sites and search for nests in known or prospective places of Lesser Spotted Eagle's habitats, we implemented observations from counting points providing good visibility; binoculars and telescopes were used. The observations were conducted both from single points and from 2–3 points simultaneously. In the latter case, the communication between the observers was organized via mobile phones and portable radio stations JJ-connect. The tracking of the LSE started immediately after its detection, in order to trace the delivery of prey to the nest. The approximate location of the nest site was determined observing the landing bird with the prey, setting the direction with the compass and estimating the distance. A point indicating the approximate location of the nest was marked on a map in GPS. After that, the marked site in the forest was carefully searched for nests. This method allowed us to find the nests, which were located at a distance of 3–5 km from the points of observation. Databases of the programs "Birds of Moscow and the Moscow Region", "Atlas of breeding birds of European Russia", "Birds online" and websites of photographers-animalists were analyzed. We contacted the authors of records and photos in cases, when specification of the data was needed.

The estimation of the probability of hybridization between Lesser and Greater Spotted Eagles

was one of the main tasks of this research. In order to identify cases of hybridization, we developed detailed morphological descriptions and implemented measurements and photographing of nestlings, including descriptions of separate attributes, applying the methods described by DOMBROVSKI (2009). For species identification of adult birds the handbook of FORSMAN (1999) was also used.

## Results

For the first time in Ivanovo Region the nesting of LSE was recorded in the territory of Klyazminsky regional nature reserve (No. 1 in Fig. 1). The inhabited nest with one nestling was found near lake Berezovets on 3 July 1999. On 16 June 2000, two downy nestlings were recorded in this nest, and on 13 July – only one fledgling.

On 14 July 2000, in vicinity of lake Zavokhranets, the second nest of LSE with one nestling was found, located on a lateral branch of a pine, at 1,5 m from the tree-trunk. The abundance of the species in the regional reserve grew further: two pairs were recorded in 2000 and 2001, and three pairs in 2002 (MELNIKOV 2005). From one to three LSE pairs were recorded there in each of the following years. It is interesting that nesting sites of the two species of spotted eagles were located at a distance of 3–5 km from each other. The foraging grounds of adjacent pairs overlapped, but the two species used different nesting sites. This pattern of nesting sites location of the two spotted eagle species in the Klyazminsky Regional Nature Reserve is still preserved today.

In June 2002, the territorial pair of LSE was observed in the flood plain of river Lukh, in the vicinity of lake Shadrino (No. 2 in Fig. 1), in an area of rather high nesting density of GSE (8 pairs/100km<sup>2</sup>, see MELNIKOV 2005). In August 2007, the LSE nest and the pair of eagles with one fledgling were recorded in vicinity of the village of Degtyariovo in the surroundings of the city of Ivanovo (MELNIKOV 2017, No. 3 in Fig. 1).

One nest known earlier on a pine in the Northern Meshchera (the vicinities of the town of Petushki, Vladimir Region, (No. 4 in Fig. 1)) was surveyed in 2005. The nest was occupied by LSE. One almost completely fledged nestling was found in the nest. A breeding group of LSEs estimated at four pairs was found in 2015 in another area, located in the north of Vladimir Region (ROMANOV et al. 2017, No. 5 in Fig. 1).

In 2005, in the Crane Homeland cluster of local nature reserves (the north of Moscow Region, No.

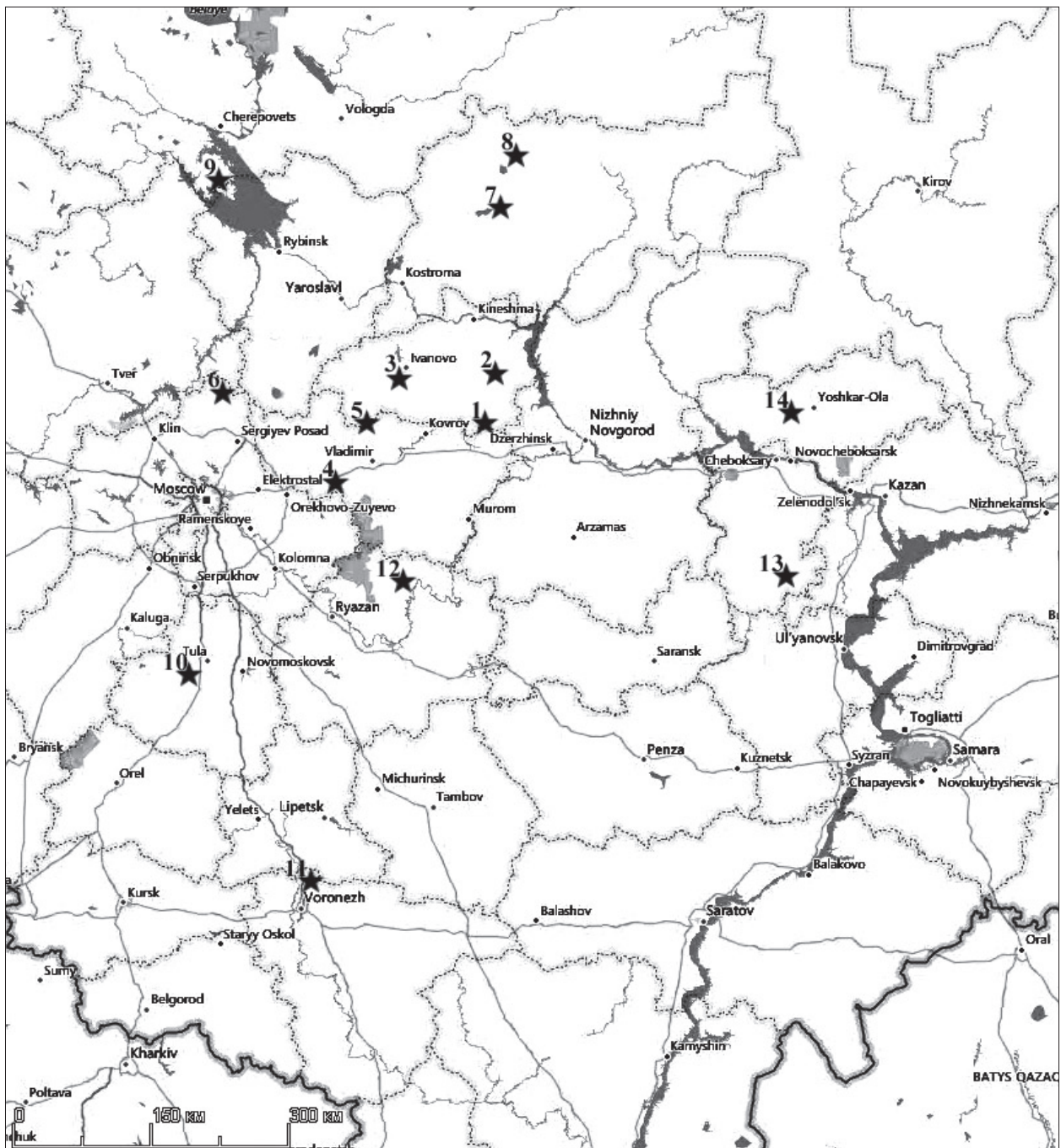


Fig. 1. Breeding localities of Lesser Spotted Eagle on the eastern border of the present range in Russia

6 in Fig. 1), nesting sites of 8 pairs of GSE and 3 pairs of LSE were identified, and 8 occupied nests of spotted eagles were found. One nestling was found in each nest. Two of the nestlings were determined as LSEs and six as GSEs (MELNIKOV et al. 2008). Two to four pairs were assumed to be breeding there in the following years (GRINCHENKO et al. 2008, KONTORSHCHIKOV et al. 2014).

In June-July 2016 and 2017, in the vicinities of lakes Galichskoe and Chukhlomskoye in Kostroma Region (No. 7 and 8 in Fig. 1), nesting sites with

four pairs of eagles were recorded. According to the external features, two of the pairs were LSE, one pair – GSE, and one pair with a poorly flying fledgling was hybrid. The male in this pair was identified as LSE, and the female was identified as GSE.

The 22 known LSE nests were located on the following tree species: 7 on spruce, 5 on oak, 5 on birch, 2 on pine, 2 on aspen and 1 on maple.

In 2005, in Vladimir and Moscow Regions, 9 fledged nestlings from nine nests were recorded, with one nestling in each nest. According to the field

identification of adult birds, in 3 of the pairs the parents were assumed to be LSEs, and in 6 pairs – GSEs. As a result of the analysis of measurements, plumage characteristics and a complex of morphological attributes of the nestlings, 2 of the 3 nestlings of the assumed LSE parents had features of both species and were probably hybrids, and only one – a typical LSE. Of all 6 nestlings of the assumed GSE parents, 2 had attributes of both species and were probably hybrids, and only one was obviously a LSE nestling. The detailed data on the morphology of these birds were presented in MELNIKOV et al. (2008). These results testify to the unreliability of field identification of adult birds and the necessity of a thorough examination and description of fledglings.

## Discussion

A significant increase of the occupied breeding area in the eastern part of the range and some eastward expansion of the range was recorded in the 1990s. Breeding of the species was confirmed in the north of Moscow Region (Crane Homeland, No. 6), in Yaroslavl (Darvinsky State Reserve, No. 9), Tula (Tulskiye Zaseki State Reserve, No. 10) and Ivanovo (Klyazminsky local reserve) Regions. In the first decade of the 21st century the breeding was confirmed in Vladimir and Voronezh (No. 11 in Fig. 1) Regions (EGOROVA 2000, 2008, GRINCHENKO et al. 2008, SAPELNIKOV et al. 2008).

The areas occupied by LSE have become wider in the mentioned regions in the first two decades of the 21st century; the species was found in Kostroma Region and probably nests in Ryazan Region (Okskiy State Reserve, No. 12 in Fig. 1) (KHLEBOSOLOV 2008).

The latest obtained data confirm the continued eastward expansion of the Lesser Spotted Eagle's range in European Russia. In May-June 2018, a territorial pair was observed in the national park Chavash Varmane in Chuvash Republic (N 54°50'; E 46°59', No. 13 in Fig. 1). On 24 and 25 July, the pair with two flying juveniles was recorded in that place (GLUSHENKOV in press). It is the easternmost point with confirmed breeding of LSE nowadays, located ca. 300 km east of the floodplain of the Lух River in Ivanovo Region, where the easternmost breeding place was known before. A pair of LSE was observed on 14 May 2018 in Bolshaya Kokshaga State Reserve in Republic of Mariy-El (N 56°34'; E 47°18'). On 9 July 2018, an adult bird was recorded in the same place (Gennady Bogdanov, unpublished report). This site with possible breeding is located slightly east of Chavash Varmane. Therefore, the

current eastern border of the LSE range is reaching the 47th meridian.

New observations confirm our earlier finding: the nesting areas of LSEs are spatially related to the nesting areas of GSEs on the eastern border of the range of the first species. But for all that, habitat segregation was recorded: GSE breeds in swampy black alder woodlands, while LSE prefers drier mixed forests. Hybridization between the two species of spotted eagles is a usual phenomenon in the eastern periphery of the range. This is a serious problem to the Greater Spotted Eagle, a particularly rare predatory species suffering a considerable decline in numbers. Thus, features like distribution, ecology and hybridization of the LSE in the eastern part of the range require further research.

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