



Report on the project

Rewetting in the north of Moscow region as a tool for peatlands restoration and support of populations of Greater Spotted Eagle in Central Russia

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Background

Northern part of the Moscow region plays essential role in preservation of biodiversity of all region, that is connected to specificity of landscapes. Here is located Dubninskaya Lowland - boggy area, the biggest territory of swampy black alder forests in the north of Moscow region, in combination with fens, mesotrophic peatlands and raised bogs. For the protection of nature in this unique area, here was organized the system of nature protected areas «Crane Homeland» and more than 25 smaller local nature reserves (zakazniks) and nature sanctuaries, which are the "cores" of general ecological network of the Moscow region. The problem of restoration of cut-away peatlands in the northern part of Moscow region is very urgent. Rewetted of disturbed peatlands is the base for restoration of peatlands. It can strengthen an ecological network, to support nature protected areas adjoining with them, to create new refuges for rare birds and plants, to raise a landscape mosaic and to arrange conditions for the further development of recreation, both an ecological and traditional orientation: gathering of mushrooms, berries, fishery and hunting. The activities spent in 2019 were continuation of the works on peatland restoration, successfully implemented since 2011 thanks to the support of the Manfred-Hermsen-Stiftung and NABU.

Russian Federation maintains the largest population of Greater Spotted Eagle (GSE). Population of the species in European Russia (west from the Urals) was assessed in 600-800 breeding pairs in 2013. But proceeding decrease of numbers was recorded from 1980, GSE disappeared in some areas and the breeding range becomes fragmentary. Probably deterioration of wintering and stopover conditions are among the main factors negatively influencing on GSE, but we cannot affirm it without precise data about wintering areas and migration routes, which can be available only with GPS-GSM transmitters data. The main breeding habitats of GSE in European Russia are swampy woodlands with domination of black alder, usually located near river floodplains. Large areas of such habitats were destroyed in result of drainage works and timber felling. So habitat management is necessary for support of local breeding groups of GSE in the key areas.

1. Rewetting of disturbed peatlands in Dubnensky forest-mire area in the nature reserve “Crane Homeland”, Moscow region

In accordance with the project plan of 2019, 5 dams were built in the nature reserve “Crane Homeland” and its vicinities: 2 on the rivers Vjulka and Molkha, 2 on the drainage ditches located in the forest, diverting water from the Dubna Mire Complex, and 1 on the river Sulat', where the old dam was washed out as a result of strong flooding in the spring.

Rivers Vjulka and Molkha were transformed into the channels in the 1960s and 1970s to increase the speed of gathering snow water and draining the nearby woods. As a result of drainage works, the forests in the strip of 500-800 m from the riverbeds were drained, although not completely. This greatly worsened the breeding habitats of common cranes *Grus grus*, whose numbers decreased from 10-15 pairs (according to surveys of elderly local people and hunters) to 4 pairs.

As a result of the construction of dams on the rivers Vjulka and Molkha, at least 70 hectares of drained forests were rewetted (Fig. 1). The summer of 2019 was abnormally rainy, so now it is not possible to separate the impact of dams and natural phenomena. Monitoring the water level next year will clarify the area of rewetting.

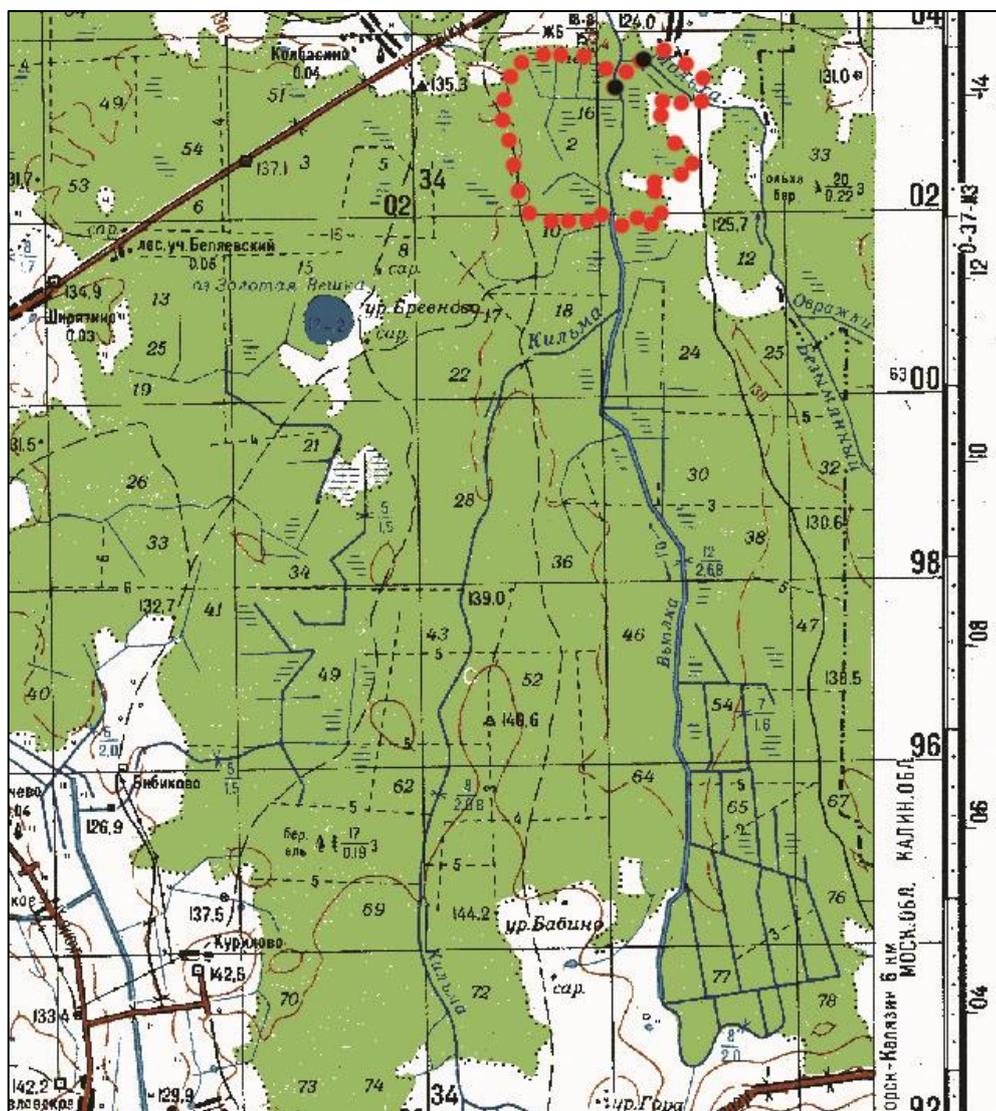


Figure 1. Scheme of location of dams and the territory of rewetting. Symbols: black dots – dams on the rivers Vjulka and Molkha; the area of rewetting is outlined with red dots.

Two dams were built on forest drainage ditches, diverting water from the Dubna bogs (Fig. 2).

As a result of construction of the dam No. 1 and its subsequent work, the water regime of the system of oxbow lakes on the right bank of the Dubna river was supported. The area of the rewetting is not less than 40 hectares. This area is important for nesting of Azure Tit *Cyanistes cyanus* and Greater Spotted Eagle *Clanga clanga*, as well as for three breeding pairs of common cranes. Maintaining a relatively high water level in the vicinity of the oxbow lakes is important to prevent overgrowth of open willow-reed swamps by black-alder forest. If such overgrowth occurs, the feeding habitats of both Azure Tit and Greater Spotted Eagle will greatly decrease.

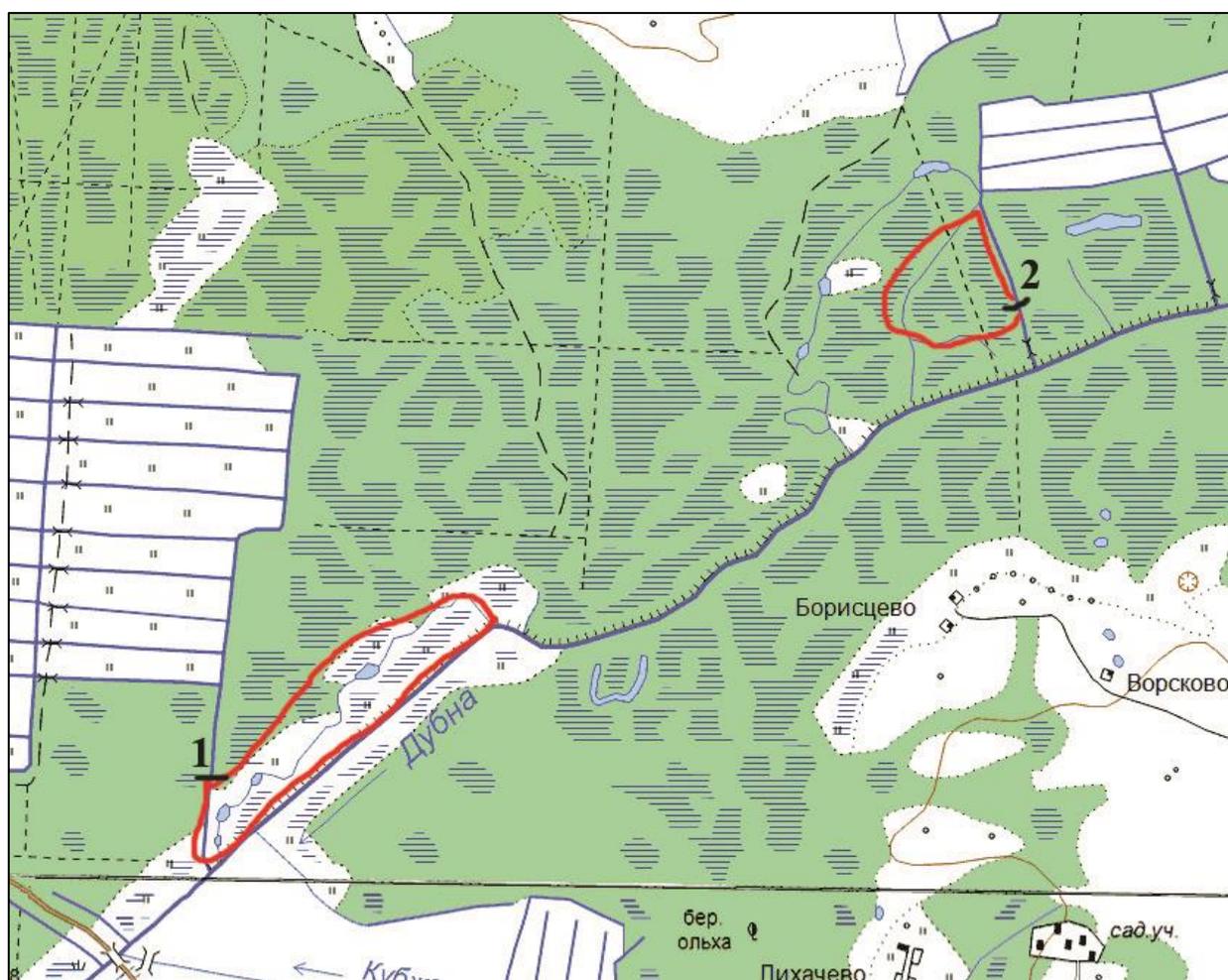


Figure 2. Scheme of location of two dams and the area of rewetting in the valley of the Dubna river. Symbols: black lines under the numbers-dams on the drainage ditches; the area of rewetting is outlined with red lines.

As a result of construction of the dam Number 2, the site near oxbow lake of the Dubna river was rewetted, where in previous years two nests of greater spotted eagles were found (Fig. 3). Later, these nests were not occupied, destroyed, and the birds did not restore them. Creation of favorable feeding habitats for the Greater Spotted Eagle as a result of flooding increases the

likelihood of these rare predators returning to breeding sites. It is also important to prevent overgrowth of open reed swamps, serving as a feeding place for the eagle, by black-alder and birch forest.



Figure 3. Excursion of volunteers specializing in restoration of hydrological regime of disturbed peatlands. The location of the dam is indicated by the red arrow. The area rewetted as a result of the dam construction is visible. November 23, 2019.

On the Sulat' river was repaired the dam, washed during the passage of the high spring flood. The backwater created by the dam raised the groundwater level by at least 700 hectares. The flow of the river was redirected into a nearby lowland, but then a new channel was formed, and the water level in the surrounding area decreased slightly. Nevertheless, the formation of the meander of the river will begin of the natural processes of peatland restoration, prerequisites for which were not previously. Meandering of the channel slows the runoff of the river and delays the output of flood waters (Fig. 4).



Figure 4. Changing the riverbed of the Sulat' river, the formation of a meander. November 23, 2019.

After the erection of the dams, there and on backwaters were recorded flocks of grey herons *Ardea cinerea*, several wader species and black kites *Milvus migrans*. The dams are used as paths to the watering place by wild boars. As a result of flooding, the water level in the peatlands rose. In August this year they were constantly used by common cranes for roosting. In past years, the cranes have not used these places for roosting, preferring meadows with drainage ditches. This was quite dangerous, because the cranes were more accessible to predators and poachers on the meadows.

Figure 5 shows all dams in the nature reserve "Crane Homeland" and its surroundings (Taldom and Sergiev Posad municipal districts of the Moscow region), as well as dams planned for construction in 2020. Over the previous years, thanks to the support of the Manfred-Hermesen-Stiftung and NABU, 18 dams were built there to maintain the hydrological regime, rewetting of drained peatlands, restoration of mire habitats and reduce fire danger. 7 from them are built in the Dubna mare massif, and 11 in the forest-mire area Kilma – Vyulka.

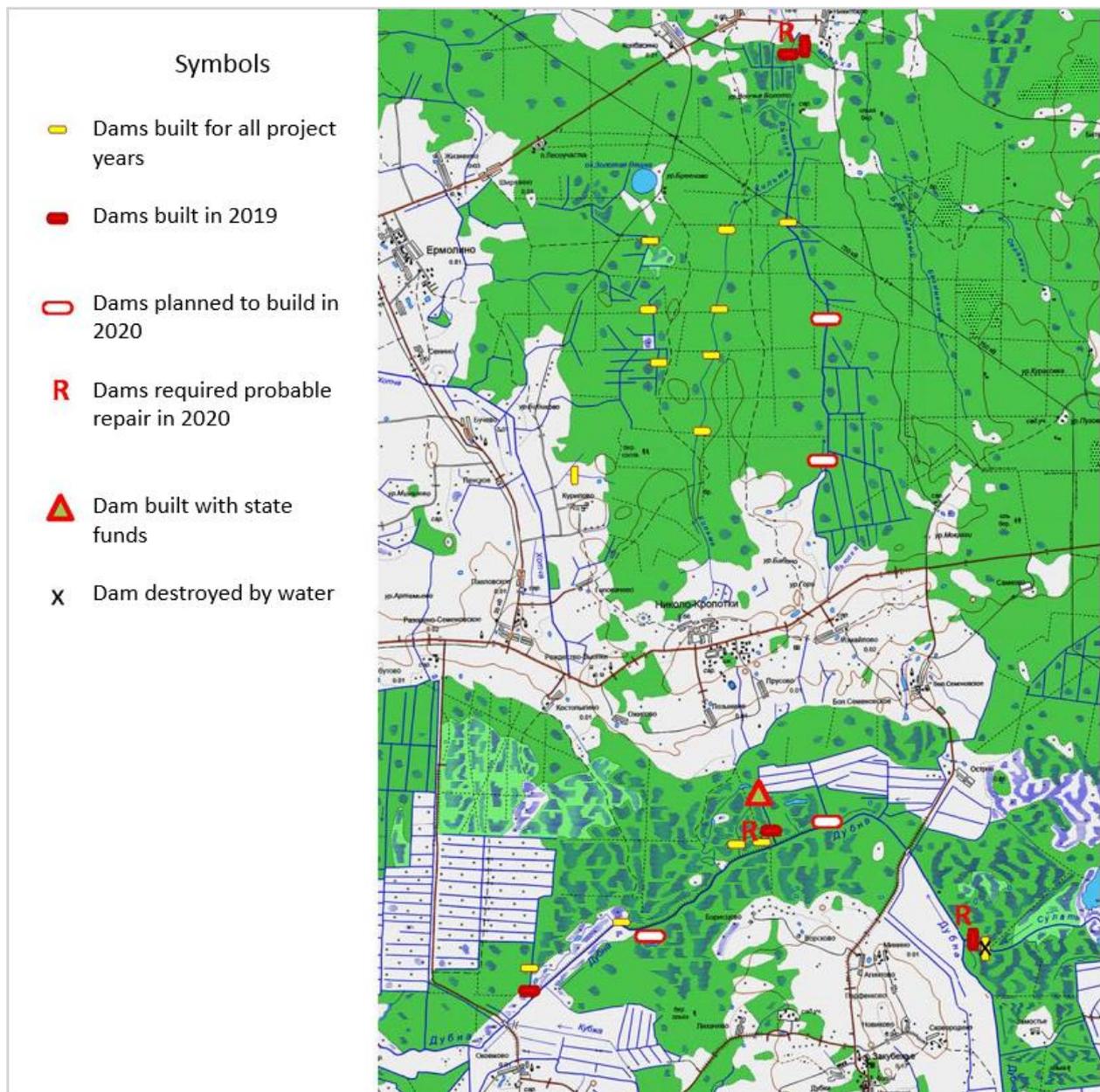


Figure 5. Location of dams for rewetting in the nature reserve “Crane Homeland” and surroundings.

2. Tagging of Greater Spotted Eagles with GPS-GSM transmitters and tracking their migration routes

Study of the Greater Spotted Eagle (GSE) is carrying out in three areas of the Central Russia from the end of 1990s. All areas are local nature reserves: “Crane Homeland” (Moscow region), “Klyazminsky” (Ivanovo region) and “Klyazminsko-Lukhsky” (Vladimir region). In all these areas in 2019, by the teams of ornithologist and volunteers, were spent special searches of GSE nests convenient for tagging of eaglets. Four nests were chosen for tagging: two in Moscow region, one in Ivanovo region and one in Vladimir region (Fig. 6).

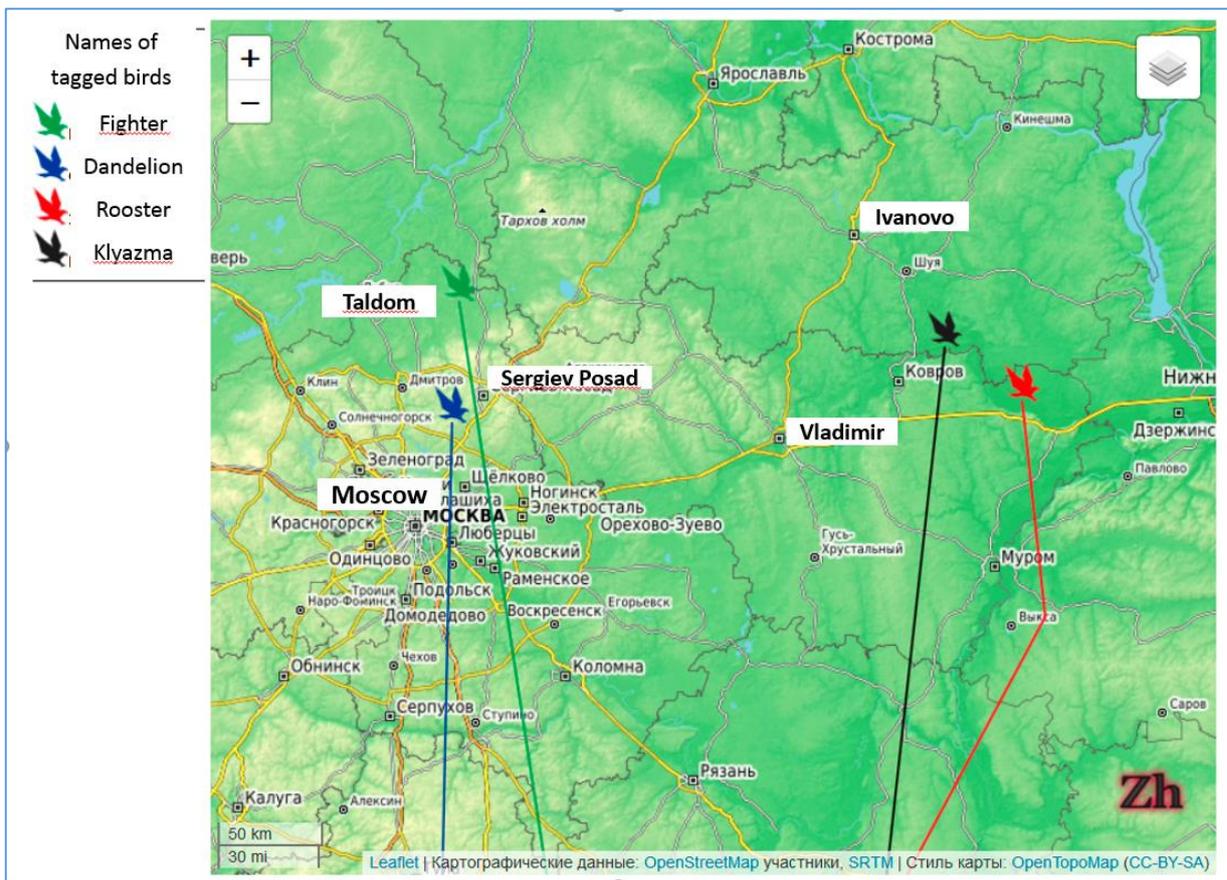


Figure 6. Location of nests where the eaglets were tagged, and the names assigned to these birds.

Tagging of the fledged chicks was carried out a few days before departure from the nest, on the last week of July. Chicks were taken from the nests and gently lowered to the ground in a bag. Measurements and tagging were carried out on the ground, after which the chicks were returned to the nest. Their parents immediately continued to feed them. Before the tagging, we carefully measured the eaglets and checked their external features to prevent accidental tagging of chicks of not very rare Lesser Spotted Eagle *Clanga pomarina* or interspecific hybrids. For the species identification we used the methodology of Valery Dombrovski (2009). The results of measurements of the beak and tarsus and features of coloring of primary flight feathers and tail feathers showed that all eaglets were certainly chicks of GSE (Fig 7).

Tagging of young GSEs was spent by the GPS-GSM transmitters produced by the Polish firm “Aquila” (Fig. 8) and paid by NABU. Direct assistance in fixing transmitters on birds was provided by Mikhail Korepov (in Moscow region) and Rinur Bekmansurov (in Ivanovo and Vladimir regions), who have extensive experience in marking Imperial Eagles *Aquila heliaca* by transmitters of the same firm. After tagging, the special computer program was installed, to remotely track the movements of the tagged birds. Data transmission is carried out through the mobile communication system of the Russian operator MegaFon.



Figure 7. Details of coloring of primary flight feathers and tail feathers have been described and photographed.



Figure 8. Fixation of the transmitter on the back of eaglelet.

It was revealed that until the beginning of the third decade of September, young GSEs moved within the nesting area. Migrations in the southern direction began in the third decade of

September. We found that migration routes and the timing of autumn migration of the tagged GSEs are a little bit different.

The first bird (named “Dandelion”, tagged 24 July in Sergiev-Posad district of Moscow region) flew through the Crimea, the Black Sea coast of the Caucasus, rounded the Black Sea, then through the east of Turkey and Iraq. His last location was found in Egypt, to the north-east from Cairo, 16 December. The second (named “Fighter”, tagged 25 July in Taldom district of Moscow region) flew through the Stavropol territory, flew over the Caucasus Ridge, rounded the Black Sea, then through the east of Turkey, then moved in Egypt to the south from Cairo, and then turned to the north and reached Israel along the coast of Mediterranean Sea. His last location was found in Israel, 21 December. This unusual ring route in Egypt and Israel is shown in the Figure 9.

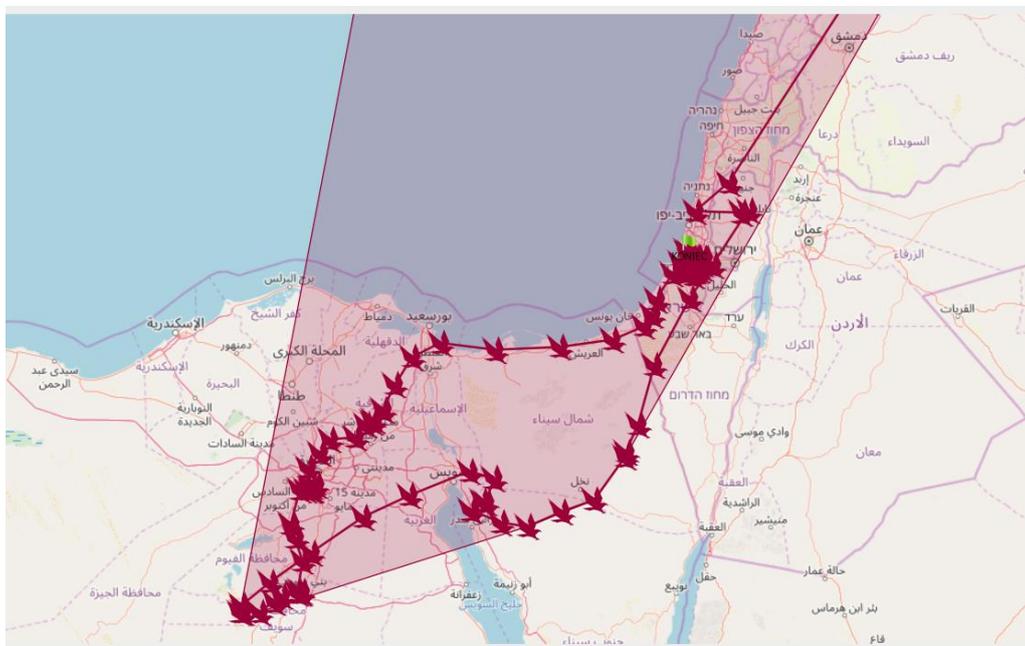


Figure 9. Ring route of the eagle named “Fighter” in Egypt and Israel. Small green flag – last location on 21 December 2019.

The third eagle (named “Klyazma”, tagged 23 July in “Klyazminsky” nature reserve, Ivanovo region) migrated to the south, moved through Caucasus, Georgia, Turkey and Egypt. He moved south the furthest, his transmitter sent the last sms 18 December from the border of Sudan and South Sudan. The fourth GSE (named “Rooster”, tagged 28 July in Klyazminsko-Lukhsky” nature reserve, Vladimir region) migrated to the south more eastward of the other three birds, through the east of Georgia and Turkey. His last location was found on the west of Saudian Arabia, 21 December. Migration routes of all four GSEs are shown in the Figure 10.

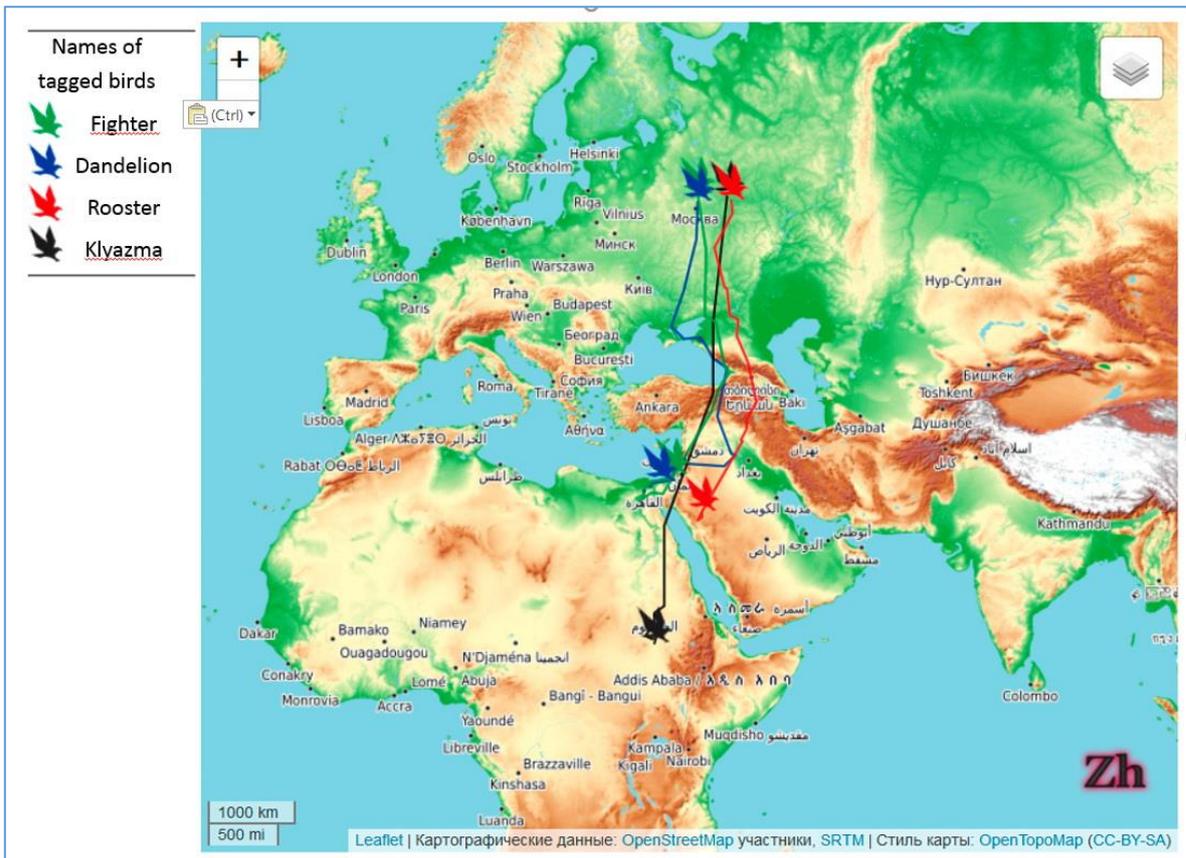


Figure 10. Migration routes of the four tagged young Greater Spotted Eagles in the autumn 2019.

Further tracking of the GSEs tagged with GPS-GSM transmitters will allow to assess the potential threats in different seasons and will contribute to the development of measures aimed at reducing the impact of negative factors in key stopover sites and wintering areas.

References

Dombrovski V.C. 2009. About species identification of Lesser and Greater Spotted Eagles and their hybrids in the field conditions. *Raptor Conservation*, 15: 97-110 (in Russian).