



## **Report on the project**

# **Rewetting in Moscow and Ivanovo regions as a tool for peatlands restoration and support of populations of Greater Spotted Eagle in Central Russia**

### **Main project participants:**

Dr. Alexander Mischenko (coordinator)

Olga Grinchenko (responsible for activity in the nature reserve Crane Homeland)

Dr. Vladimir Melnikov (responsible for the works on rewetting and studies of  
Greater Spotted Eagle in Ivanovo region)

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## **Background**

Northern part of the Moscow region plays important role in preservation biodiversity of all region, that is connected to specificity of landscapes. 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. Over the all previous years, thanks to the support of the Manfred-Hermsen-Stiftung and NABU, in the Crane Homeland and its surroundings 18 dams were built to maintain the hydrological regime, rewetting of drained peatlands, restoration of mire habitats and reduce fire danger. The works spent for 2020, are continuation of the activities on peatland restoration, successfully implemented since 2010.

The drained and cut-away peatland complex Bolshoye Boloto was formed on the peatbog of the same name, and is the largest peat-hag in the Ivanovo region. A mosaic of habitats has formed here: quarries with peat sites between them and abandoned peat fields overgrown with young forest in some places. The area of the complex is about 30 km<sup>2</sup>. Peat extraction in Bolshoye Boloto stopped at the beginning of the XX century and a large area of peat fields was abandoned. On the thrown peat fields with hills of not taken out peat fires regularly occur. During the catastrophic peat fires of 2010, the fire passed through the entire cut-away peatland complex, only the islands on the quarries, far enough from the shore, remained untouched by the fire. After the fires, the forest in the inter-quarry areas, along the banks of quarries and in abandoned peat fields fell out, and tree trunks litter the territory, are a substrate for the spread of new possible fires. Fires stop the natural restoration of the peatland. This area is important as nesting site of GSE and Eagle Owl, listed in the Red Data Book of the Russian Federation. But strong peat fires very negatively influenced on bird fauna. Reduced the numbers of breeding waders: Black-tailed Godwit, Terek Sandpiper, Greenshank and Curlew. The number of nesting ducks including Common Pochard, listed in the IUCN Red List, has decreased also. The pilot rewetting works in Ivanovo region thanks to support of the Manfred-Hermsen-Stiftung were successfully spent on the disturbed peatland in vicinity of Lake Rubskoye in 2015.

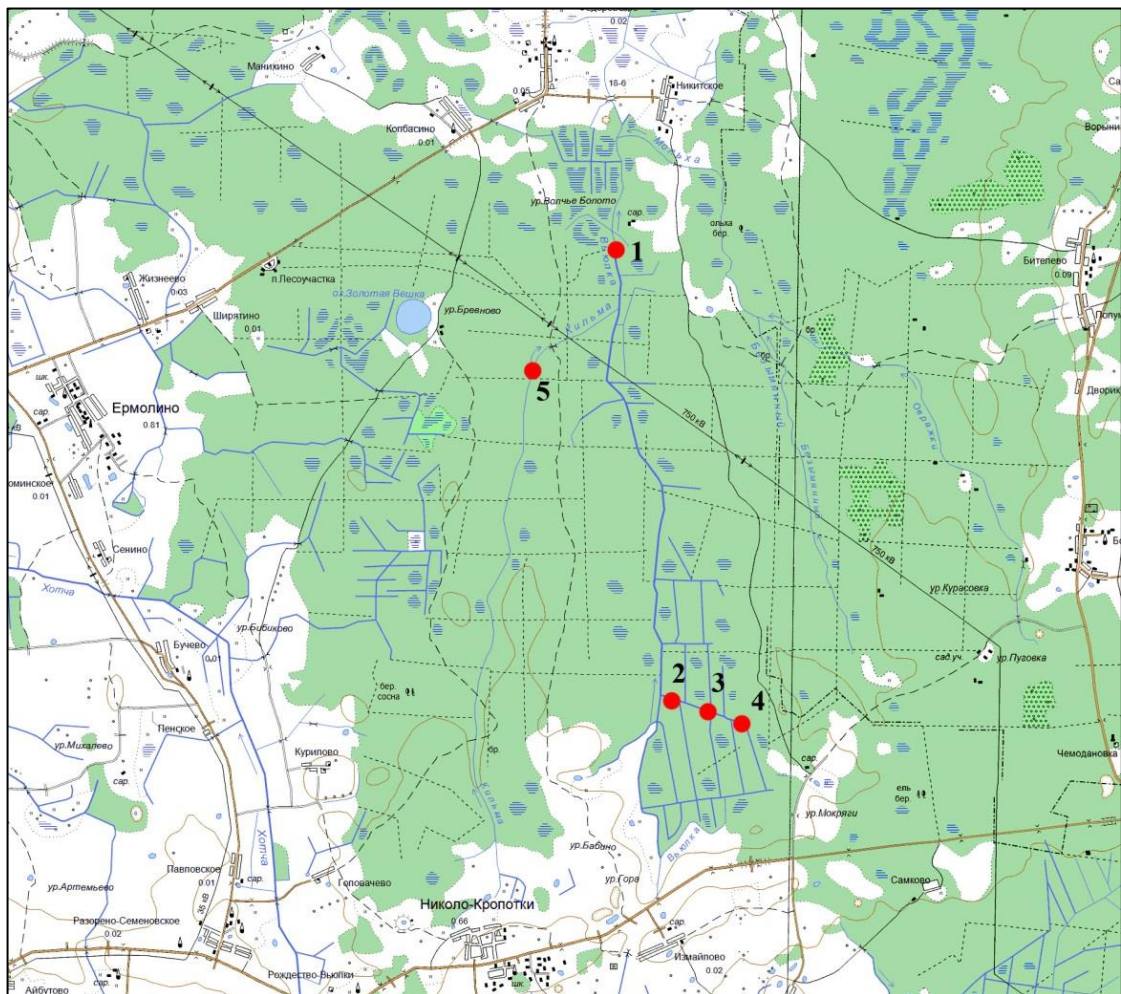
### **1. Rewetting of disturbed peatlands in Dubnensky forest-mire area in the nature reserve Crane Homeland, Moscow region**

During the project implementation, four dams were constructed for rewetting of disturbed peatland area. These dams were built on the river Vjulka and on the drainage

ditches that flow into it (Fig. 1). The river Vjulka was transformed into the channel in 1960s, 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 habitats of several bird and mammal species. All the dams in 2020 were built with the use of bulldozer, as in the previous years.

Dam No. 1 was built at the place where a straightened riverbed passes through a small hill. This dam diverts the water of the Vjulka river into a side drainage ditch and into disturbed peatland to the northwest, through the resulting runoff. As a result of the construction of the dam, the water level in the river increased by 0.9 m, which rewetted the floodplain swamps disturbed by drainage on an area of about 50 hectares.

Dam No. 2 was built at the confluence of the main forest-drainage ditch with the river Vjulka. The dam stopped the flow of the main ditch. As a result, water was retained in a drained area of previously swampy forest with an area of 400 hectares, which is the source of the river Vjulka.



**Figure 1.** Location of the dams in the disturbed peatland along the river Vjulka.

Dam No. 3 was built at the confluence of the secondary drainage ditch with the main ditch from the South. It raised the water level in this ditch by 0.7 m. The flow was redirected to the south towards the sources in the river Vjulka.

Dam No. 4 was built at the confluence of the secondary drainage ditch with the main ditch from the south. The flow was diverted to the south and further west, into a ditch blocked by several beaver dams and having no flow in the river Vjulka.

Dam No. 5 was built last year, but then was partially destroyed by a strong spring flood. In the summer of 2020, the dam was reinforced by adding soil, and tamped with a bulldozer. This dam maintains the water level in the river Kilma for 2 km and the water level in previously drained floodplain swamps, which are 20 to 50 m wide, with the total area about 10 hectares.



Figure 2. The dam on the drained ditch No. 4 in the process of construction.



This swampy forest in the basin of the Vjulka and Kilma rivers is the important habitat for Brown Bear, Lynx, three pairs of Common Crane, one pair of Greater Spotted Eagle and two pairs of Ural Owl – the species listed in the Red Data Book of the Moscow region (Fig. 2, 3 and 4). Photos of rare and very careful mammals were made with the use of trail cameras” Bushnell Trophy Cam” kindly donated by the NABU last year. Flooding this area has improved the protective and feeding conditions for these animals and birds and makes it difficult for people access, thereby reducing disturbance factor.



Figure 3. One from two bears detected by the tracks in Vjulka and Kilma rivers area.



Figure 4. Lynx on the border of area rewetted in 2020.



Figure 5. Ural Owl. Photo by Igor Bartashov.

## **2. Rewetting of disturbed peatlands Bolshoye Boloto, Ivanovo region**

The Bolshoye Boloto has three water flows that worsen the situation, continuing to drain the area and increasing the risk of fires. They are shown in the Fig. 6. For rewetting activities in 2020, it was decided to block the western runoff from drained peatland. This runoff consists of three parallel drainage channels. Two of them flow into the Lake Ponykhar, merging together before the confluence (No. 1). The flow of water through these channels is insignificant, as it is blocked by three beaver dams, and in many places a lot of wood debris has accumulated. The third channel (No. 2), located to the south, flows into the Ponykhar stream, which flows from the lake of the same name. At the beginning of this channel, a branch runs away from it (No. 3), leading to the south and diverting water to a small non-drained site. The main drainage channel below this branch is blocked by the old big beaver dam. It is already covered with soil and woody vegetation has begun to grow on it. Thus, it turns out that the western main channel itself is blocked by a natural dam, but has a branch through which water losses from the cut-away peatland complex is currently occurring. The place where this water enters is excessively waterlogged and does not require water inflow. Closing the channel branch will increase



the water level in the drained area of Bolshoye Boloto, at least in the quarries and in the western peat fields.



**Figure 6.** Scheme of the western part of the drained peatland Bolshoye Boloto.

1-3 – numbers of drainage channels,  constructed artificial dam,  dams of beavers.

The mentioned branch was blocked at the point where it departs from the main drainage channel. The dam with the possibility of runoff excess water was made in accordance with the recommendations of Sainov *et al.* 2013. The dam was built by installing bags of synthetic material filled with sand in the channel. Sand was extracted on site, being removed from the shaft of the channel's ground embankment at its highest point. In this case, taking the sand will not affect the waterproofing properties of the embankment shaft. Sand was loaded into bags manually, using a shovels. At the filled bags, the neck was knotted with a double cord. Carrying bags from the place of loading to the channel and the installation was done manually, because this place is not accessible for bulldozer and excavator. In total, 108 bags of 50 kg of sand were laid, i.e. more than 5 tons. A small watercourse was made in the old beaver dam on the main channel to drain excess water (Fig. 7 and 8).

As a result of spent work, we expect an increase in the water level in the surrounded peat quarries and an increase in the moisture content of the peat fields of the western sector of disturbed peatland, especially during the low-water period. This will create more



favorable habitat conditions for waterfowl and near-water birds (Common Pochard, Greenshank, Curlew, Black-tailed Godwit, Terek Sandpiper etc.) and for predatory birds: Greater Spotted Eagle and Eagle Owl.



Figures 7 and 8. Two stages of the construction of dam in the branch of drainage channel in disturbed peatland Bolshoye Boloto.



## **2. Monitoring of Greater Spotted Eagle and tracking migration routes of the birds tagged in 2019**

In 2020 was continued monitoring of Greater Spotted Eagle (GSE) in two areas, important for this species: in nature reserves: “Crane Homeland” (Moscow region, Taldom district) and “Klyazminsky” (Ivanovo region). In all these areas, by the teams of ornithologist and volunteers in April – July were spent special searches of GSE breeding sites and nests convenient for tagging of eaglets next year. In Taldom district, 10 nests and artificial nesting platforms were checked, and 2 new nests were found, that were not previously known.

Ten years researches in Taldom allow to do some conclusions.

1. The well-being of the GSE breeding population is largely due to the rewetting of black alder forests by damming drainage ditches, as well as relatively stable seasonal water levels in the floodplain of the Dubna river.

2. As a result of reduced visits to rewetted areas by hunters, the factor of disturbance for GSE decreases at the beginning of the breeding season in April – early May (the critical period in nesting that determines its success).

3. Rewetting of disturbed peatlands in floodplains and river valleys can create prerequisites for increasing the number of great spotted eagle in the northern part of Moscow region and adjacent areas, as well as a number of other rare bird species associated with wetlands.

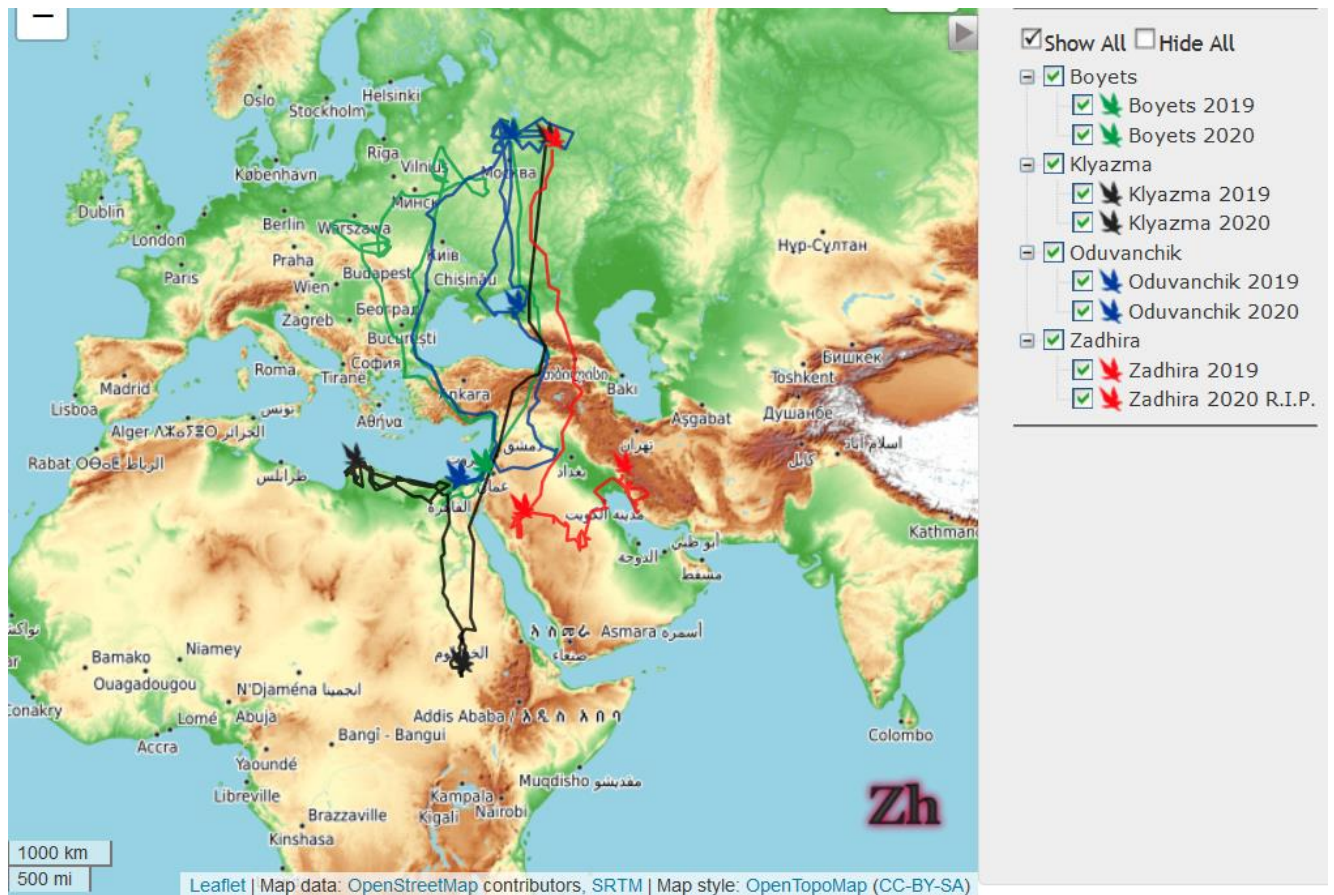
We were unable to tag new spotted eagles with transmitters in 2020, as it was not possible to get transmitters from Germany due to the pandemic. We plan to receive additional transmitters and continue tagging and tracking in 2021.

Tracking four Greater Spotted Eagles tagged with the GPS-GSM transmitters last year yielded interesting results. The migration routes of these birds and their summer movements are represented in the Figure 9. The names of birds tagged in the Taldom district are Oduvanchik (Dandelion) and Boyets (Fighter). The GSE tagged in Ivanovo region was named Klyazma, and in Vladimir region – Zadhira (Rooster).

In contrast to the GSEs of the more western populations: Polish, Baltic, and Belarusian, some of which winter in southern Europe (Väli et al., 2018; Dombrovski *et al.*, 2018), all four of our young birds migrated to wintering grounds located in the Middle East and Sudan.

We found that both birds marked in the Taldom region (Oduvanchik and Boyets) had a circular migration route: the autumn migration route ran along the Eastern coast of

the Black Sea, and the spring migration route passed through the Bosphorus and Dardanelles Straits, and then to the west of the Black Sea coast. The eagle named Klyazma did not make a spring migration to Europe, but limited itself to flying from the Southern Sudan to the province of Cyrenaica in Libya.



**Figure 9.** Map of the migration routes and summer movements of four tagged Greater Spotted Eagles. The names of the birds are at the top right.

The areas of long stops of young GSEs during summer vagrancies were confined to the territories occupied by extensive agricultural lands in the Bezhetsky district of the Tver region and the Orsha district of Belarus.

In addition to the extensive agricultural lands, the GSE named Oduvanchik made a 9-day delay on a large urban waste landfill in vicinity of the city Tver. A special feature of such landfills is the concentration of corvids and gulls and the abundance of rodents, which makes them attractive for feeding birds of prey.

We found that the mortality rate in young GSEs is high (50%). Unfortunately, the birds tagged in the Vladimir and Ivanovo regions have died. Zadhira died on power line wires in Iran on March 21, at the beginning of the spring migration. Klyazma died on October 20 in Libya, the reasons for his death are unknown.



Of course, the results obtained are preliminary and need to be supplemented with data that we expect to receive in the following years, both by continuing to track birds tagged in 2019, and as a result of tagging other great spotted eagles with GPS-GSM trackers. But even this preliminary data contributes to some extent to a better understanding of the biology of the species and its conservation.

## References

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