

WHEN THE PATHS OF BIRDS AND PEOPLE CROSS IN THE SKY

Review of results of the Project *Installation of the Bird Protection Measures on the High Voltage Electricity Transmission Grid in Lithuania* (LIFE Birds on Electrogrid) No. LIFE13 BIO/LT/001303, concerning the implementation of bird protection measures on high voltage overhead electricity transmission lines in Lithuania.

Layman's Report

Contents

What links: electricity lines and birds	3
LIFE Birds on Electrogrid Project: goals and objectives	5
Installed protection measures on high voltage wires	6
Electricity pylons for breeding kestrels: human structures assist protected birds	7
Before and after: results of bird monitoring in the high voltage electricity lines	9
Society has to be aware of it	11
Future plans	13
Project Partners	15



Common house martin on electricity wire



Corvids on electricity transmission wires

What links: electricity lines and birds

In numerous countries bird deaths caused by collision with high voltage overhead electricity transmission lines are considered a serious problem and in some areas it is critical due to significant numbers of bird victims. Comprehensive research of the scope of bird deaths in electricity transmission grids have been carried out in the USA and Canada, in Europe research of bird collisions with overhead electricity transmission lines was started in late sixties of the 20th century. The scope of deaths is substantial - over one million of bird deaths in France occur annually, in West Germany within the period of 40 years over 500 dead white storks were found, this figure accounting for a significant share of the breeding population of this bird species in the country. In Lithuania, no research has been conducted until now. However, situations in places with abundance of birds and frequent visits by people, for example like the Nemunas river segment in the city of Kaunas, disclosed urgency of the problem. Along with changing landscapes, developing urbanisation birds also adapted themselves to the changes - white storks perch and Northern ravens nest on pylons of high voltage electricity transmission lines, and later various falcons move into abandoned nests of the latter. Besides, high voltage overhead electricity



Mute swans

transmission lines or pylons are used by numerous birds as supports for perching, hunting and overnight stay. Such close presence is not safe for birds, also people suffer material losses, for example, caused by white storks perching on pylons of overhead electricity lines, as their droppings on the wires trigger electrocution, also leading to bird deaths in most cases. Electricity grid operators are reported line outages involving costs to remove electricity supply disruptions. Various measures are applied to solve the problem - installation of underground electricity lines (cabling) is most effective, however, solution concerning high voltage overhead electricity transmission lines is not possible in every case due to high costs and site peculiarities. Installation of bird flight diverters on overhead electricity lines and implementation of measures hindering landing on pylons are frequently used means to solve conflicting situations with birds. In Lithuania, such measures were introduced in 2014-2018 within the



Western jackdaw

framework of the Project ***Installation of the Bird Protection Measures on the High Voltage Electricity Transmission Grid in Lithuania*** funded by the EU LIFE+ Programme.

LIFE Birds on Electrogrid Project: goals and objectives

In 2014-2018, the Lithuanian Ornithological Society (LOD) together with the Partner LITGRID implemented the Project ***Installation of the Bird Protection Measures on the High Voltage Electricity Transmission Grid in Lithuania*** (LIFE13 BIO/LT/001303) funded by the EU LIFE+ Programme (hereinafter – Project). The Project implementation aimed at the main goals, as follows:

- To improve the conservation status of the migratory, wintering and some breeding bird species, through reduction of the negative impact of high voltage overhead electricity transmission lines on their populations;
- To support reproduction conditions for breeding populations of the common kestrel and other falcon species, through the implementation of special supportive conservation measures.

Seeking for these goals the most important objectives were achieved, as follows:

- The bird mortality rate caused by collisions with high voltage overhead electricity transmission lines was reduced significantly in their staging areas introducing special installations to increase visibility of the electricity lines;
- The white stork mortality rate caused by electrocution was reduced significantly installing special bird protection measures on pylons of high voltage overhead electricity transmission lines;
- In Lithuania, breeding conditions of common kestrels (*Falco tinnunculus*) were improved erecting nest-boxes designed for this species on pylons of high voltage overhead electricity transmission lines;
- Public awareness of the bird mortality problem within the high voltage electricity transmission grid and its possible solutions was raised.



Nest-box and spiral type wire markers



Electricity transmission lines

Installed protection measures on high voltage wires

Seeking to prevent disruptions of high voltage overhead electricity transmission lines due to electrocution caused by birds, measures impeding birds (storks, in particular) to perch on support structures above insulators were implemented. For this purpose, wishbone type bird flight diverters are installed, saucer type casings above insulators supporting wires are erected, thus abundant droppings of large birds causing electrocution are disbursed.

Bird flight diverters installed within the Project period: 11032 units of wishbone type and 7075 units of saucer type.

As in Lithuania installing high voltage electricity transmission lines underground (cabling) is used in exceptional cases only, visibility of existing overhead lines was improved leading to reduction of threats for birds to collide with electricity transmission lines. For this purpose special spirals and pendant type wire markers are used. Spirals are special plastic rods fitted on a wire in compliance with its diameter. A pendant is a rotating reflective device, it is fitted tightly onto a wire with special fastening.

In the Project implementation ***6464 spirals were installed to mark segments of 93,9 km high voltage lines. 2890 pendants were installed to mark segments of 31,2 km high voltage lines.***



Young common kestrels successfully grown up in an artificial nest

Electricity pylons for breeding kestrels: human structures assist protected birds

Within the Project implementation period erection of nest-boxes for kestrels was started in 2015, and by end of 2018 on high voltage electricity transmission pylons 580 nest-boxes for common kestrels were erected. The nest-boxes were erected taking into consideration plans for renovation works in the high voltage electricity transmission lines, within the Project framework from 20 to 120 nest-boxes were erected annually. The first kestrels could occupy and start breeding in newly introduced nest-boxes in 2015. In 2017, in the nests erected on pylons 64 pairs bred their chicks; in 2018 - 87 pairs. Currently, kestrels breeding in nests on pylons account for a big share of the entire population nationally - 150-300 pairs of these birds breed in Lithuania, including 40 percent of them - in the artificial nests. In the Project implementation in total 189 breeding cases of common kestrels in erected nest-boxes were registered. The average number of the young per pair varied from 3,5 to 4,2 in one nest-box, noticeably exceeding the reproduction level of kestrels breeding in natural conditions (in nests of other birds). The highest occupancy rate of nest-boxes by kestrels was in the districts of Klaipėda, Kaunas, Vilnius and Alytus, also the comfortable nest-boxes homed birds turned out of the towns by renovation of apartment blocks. It was noticed that when kestrels occupied a nest-box, next year more nearby nest-boxes became occupied too. Within 4 years kestrels bred over 700 chicks. The share of unoccupied erected nest-boxes accounted for less than 1/3. However, the potential of

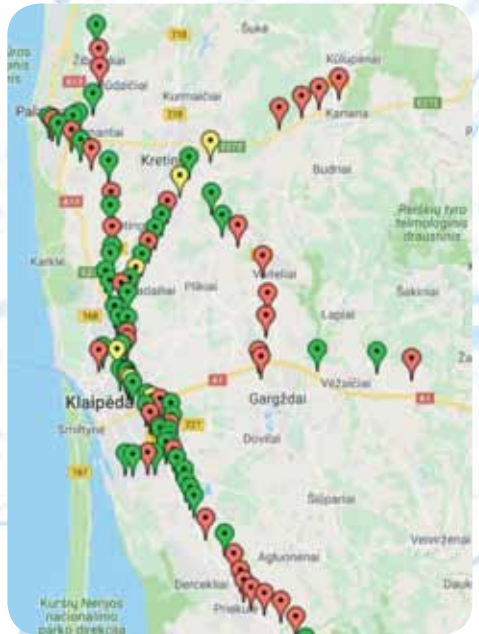
nest-boxes exists for growing population of breeding kestrels. It is expected that beyond accomplishment of the Project implemented by the Lithuanian Ornithological Society the population of common kestrels in Lithuania would further increase as a result of the erected nest-boxes.



Map of the nest-boxes for common kestrels placed during the Project (occupied nests are marked in green, empty ones in red)



Young common kestrels in a nest-box



Distribution of nest-boxes in Klaipėda region



Northern hawk-owl, a winter guest from the north, on electricity wires

Before and after: results of bird monitoring in the high voltage electricity lines

During the Project implementation period throughout the year beneath high voltage electricity wires 852 km were monitored walking on foot, including 320 km beneath the lines without installation of visual measures and 521 km beneath the lines with visual measures installed in the Project implementation.

The most important results of the monitoring of bird deaths:

- **254** bird victims (112 mute swans in the Nemunas river in Kaunas in winter, 142 birds of different species monitoring other high voltage electricity lines) were found caused by collision with the wires;
- According to the experts, in Lithuania, the annual toll of up to **45** thousand bird deaths caused by collisions with the voltage electricity lines occurs;



Dead white stork



Dead European golden plover

- The annual toll of **11,1** bird deaths per 1 km of the high voltage overhead electricity lines without installation of visibility increasing measures occurs;
- The annual toll of up to **3,6** bird deaths per 1 km of the high voltage overhead electricity lines with installation of visibility increasing measures occurs;
- Beneath the lines with installation of visibility increasing measures introduced in the Project implementation the rate of bird deaths reduced in different months from **1,2** to **4** times, compared to the lines the visibility of which had not been improved;
- Calculation showed, that having implemented protection measures **1.374** bird deaths yearly are avoided in the high voltage overhead electricity lines extending 123 km.



White-tailed eagle

Society has to be aware of it

Society involvement in the installation of bird protection measures on high voltage electricity transmission grids may contain various aspects – first of all providing information of bird victims found beneath electricity transmission lines and detecting unidentified segments posing threats to birds, the latter being of particular importance for implementation of special protection measures.

In the Project implementation the Lithuanian Ornithological Society seeking to draw attention to threats caused by electricity transmission lines contributed efforts to the public awareness activities: 18 info stands were erected next to the lines that used to cause major threats, and now fitted with visibility increasing measures – we often do not think that changed landscape makes an impact on migrating birds, flocks of which make their way for wintering places following the same routes.

A wide information campaign was conducted: a short film about installation of bird protection measures on high voltage overhead electricity transmission lines was broadcasted on the national TV, 600 DVD copies of the film were distributed to various stakeholders. Progress of



Electricity transmission line with installed bird protection measures

the Project and information regarding threats for birds caused by electrical wires was widely provided in articles of the national and regional mass-media, several publications about birds were produced.

Considerable public interest was shown in live broadcast in the course of several years of the “multi-chick” family of kestrels from their nest-box installed on the roof of Klaipėda University buildings. In 2018, this pair of kestrels succeeded to bring up their 6 youngs, while in other places - in the average 3 youngs per pair. Kestrels contribute directly to sustainable agriculture - they feed mainly on murids, a pair of kestrels exterminate about 350 of them annually, thus supporting farmers.

The Lithuanian Ornithological Society organised an international workshop *Birds’ protection practices on electricity grids* aiming at presentation of the results at the national level and sharing of international experience in the reduction of bird mortality in electricity grids. In the event ornithologists working in various institutions, operators of electricity grids, producers of bird protection devices from Portugal, Bulgaria, Belgium, Germany, Sweden, Belarus and other European countries shared their experience.

The main communication channel providing detailed information about the implemented activities is website www.birds-electrogrid.lt, here one can find Project publications, monitoring reports - all that was produced within 4,5 years of the Project. Beyond completion of the Project the website will be updated with additional relevant information as some activities will be continued.



High voltage electricity transmission lines

Future plans

One of the most successful results is that for the first time in Lithuania data revealing the scope of bird deaths nationally was collected, also the so called “hot spots” were identified, i.e. the sites where particularly high numbers of bird deaths occur, also assessment of efficiency of protection measures was carried out; and as bird observations in the high voltage electricity transmission grid prior to the Project implementation had been fragmented the data collected during these observations did not allow to make overall conclusions concerning scopes of bird mortality caused by collisions with wires of high voltage electricity transmission lines. The Lithuanian Ornithological Society and LITGRID will continue the cooperation beyond the Project. According to the existing practice when high voltage electricity transmission lines are renovated or new ones built if the procedures require to prepare Environmental Impact Assessment ornithologists are invited to render assistance in identifying the most dangerous segments of the electricity lines for birds. When Lithuania joins the common European electricity transmission network, the impact of high voltage electricity transmission lines on birds will be carried out, and the most threatening lines will be marked with visibility increasing measures. LITGRID foresees to implement bird protection measures for replaced pylons (200 units annually), i.e. wishbone type bird flight diverters impeding birds (storks) to perch on support structures above insulators, also saucer type casings of a bigger diameter above insulators will be erected.



We care about birds' safety

The main Beneficiary of the Project the Lithuanian Ornithologist Society will produce at least 20 nest-boxes for kestrels in the next 5 years. LITGRID will erect them on pylons of high voltage electricity lines to replace damaged or unfit ones for further use nest-boxes.

The Lithuanian Ornithologist Society will continue information dissemination activities: mass-media will be informed about the implemented measures, the website will be maintained and upgraded with news about activities of the Project Partners. Information concerning bird victims beneath the high voltage electricity lines will be collected on a voluntary basis (involving members of the LOD), and the collected data will enable to identify lines posing threats and facilitate installation of visibility increasing measures on the wires.



Geese landing to the fields

Project Partners



The Lithuanian Ornithological Society (LOD), a non-governmental organisation, uniting Lithuanian people concerned with wildlife protection, who take care of and watch birds and their environment, engage in its preservation and public ecological education, also take civic part in policy making for protection of environment and biodiversity. Since 1994, the LOD represents in our country BirdLife International, a global partnership of over 100 conservation organisations, seeking to conserve birds and their habitats. We believe joint efforts, enthusiasm of the Society members, knowledge and experience will facilitate more efficient protection of birds and the entire wildlife around us, and its status will improve. The LOD is registered with an association status. It is the largest environmental membership-based organisation in the country. Any citizen paying the membership fee may become its member. The Society unites people of various interests: professional researchers, bird watchers, naturalists, farmers, foresters, teachers, schoolchildren, students and others who care for the nature of Lithuania. Join us and become a LOD member! It does not matter that you have just started to take interest in birds, to learn an interesting world of theirs, join the like-minded and support protection of birds and their living environment. Anyone who loves birds and wildlife, does not feel unconcerned about their future may become a LOD member.

We can achieve more together!

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LITGRID is the only Lithuanian high voltage electricity transmission operator. The company manages the Lithuanian high voltage electricity transmission network and is responsible for its development. The principle function of the operator is to ensure efficient and reliable operation of the Lithuanian power system taking care of integrity and compatibility of the national electricity system, and management of the transmission network and connecting facilities with other electricity systems, development of their exploitation and coordinated development. The Lithuanian 400-330-110 kV voltage electricity transmission grid includes 236 substations and 7029 km electricity transmission lines. It provides electricity transmission services to users of the high voltage electricity transmission grid ensuring equal conditions to join the transmission network and use it. Besides, it organises connection to the transmission network by users, distributors and producers' facilities, carries out and supervises accounting activities of the power energy of the transmission network. LITGRID is responsible for reliable work of the Lithuanian electricity system transmission network, connecting lines and other electricity facilities. Also, it provides complementary services to ensure safe work of adequate quality of the electricity grid: plans and coordinates topology of the electricity transmission network, eliminates disruptions and emergencies, pays attention to their prevention. Each year LITGRID plans development of the national electricity transmission network, renovates its facilities – high voltage electricity transmission lines, substations, produces new high voltage overhead and cable electricity lines. The company has been implementing the national strategic goal - to reorganise the power system towards synchronised work with the European continental network.

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