

IN SEARCH OF THE **VETERAN TREES**

The creation of
an ecological
network for a
thousand and
one species



LAYMAN'S REPORT OF **LIFE OSMODERMA** PROJECT LIFE16 NAT/LT/000701





1. A hermit beetle (*Osmoderma barnabita*) is in particular rare in Lithuania and Europe and most of its life spends in the old, hollow oaks or other broad-leaved trees.

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PROJECT LIFE OSMODERMA:

PROJECT TITLE:

“Ecological network for *Osmoderma eremita* and other species dependent on veteran trees” (LIFE16 NAT/LT/000701)

PROJECT BUDGET: 1 378 000 €

European Commission's Contribution: 1 033 180 €
Ministry of Environment of the Republic of Lithuania: 316 940 €
Beneficiaries' own Contribution: 27 880 €

ASSOCIATED BENEFICIARIES:

LITHUANIA:
Lithuanian Zoological Garden
Kaunas City Municipality

LATVIA:

Daugavpils University, Nature Studies and Environmental Education Centre

COORDINATING BENEFICIARY –

Lithuanian Fund for Nature

PROJECT DURATION:

September 2017 – March 2022

THE PROBLEM AND SOLUTION BY THE PROJECT **LIFE OSMODERMA**

The target species of the project, *Osmoderma eremita*¹, is very rare and protected throughout Europe. The hermit beetle is one of the so-called umbrella species, because measures taken to conserve this species will also favour many other organisms occupying the same habitat. Scientists identify around 1000 species of different organisms that are related to the veteran trees. Therefore, by creating favorable conditions for one species, a thousand more will benefit.

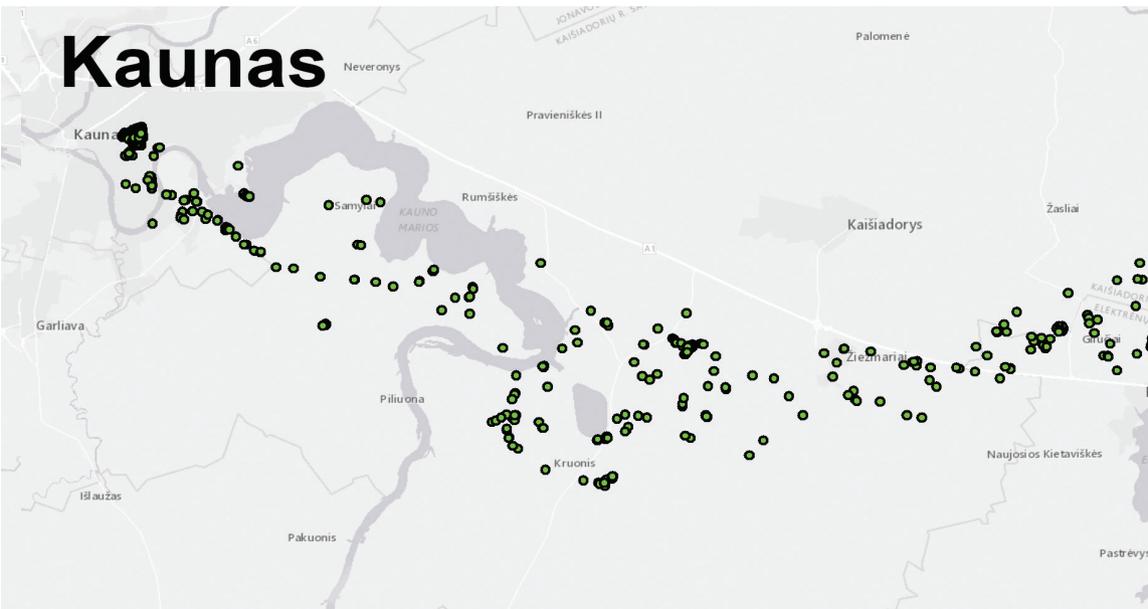
Not only the hermit beetle but also its habitat – veteran broad-leaved trees with cavities are a rare sight in a modern landscape. Having in mind that the hermit beetle can fly only up to two kilometers, finding a mate or a new home for the species is problematic. During the project, concrete conservation actions were implemented to ensure the survival of the target species populations by saving the habitat.

The project LIFE OSMODERMA tackled the species isolation problem by creating an ecological network between Kaunas and Vilnius – two major cities of Lithuania. It was created by improving the habitat conditions for the species: executing tree management works by professional arborists, eradicating invasive species, installing temporary habitats. Restoration of the population of the hermit beetle has been also implemented in one historical place where this beetle was previously discovered. Furthermore, having applied up-to-date technologies, we improved and optimized methods for the monitoring of this beetle by developing a smart pheromone trap.

[1] Name of the species *Osmoderma eremita* and *Osmoderma barnabita* are used as synonyms in this text. There are several closely related species in Europe, identified after an extensive genetic research, which form the *O. eremita* complex.

MAIN ACHIEVEMENTS:

- A cross-border Lithuania–Latvia ecological network plan developed
- An ecological network of 106 km length completed in Lithuania
- 1590 old broad-leaved trees inventoried in the ecological network
- 643 trees were maintained by the arborists and protected by signed agreements with the owners
- Invasive tree species eradicated in the territory of 68 hectares
- 6 temporary artificial habitats created in the site “Slope of Neris river by Verkiai”:
2 artificial wood mould boxes and 4 logs with cavities from the donated felled oaks
- A population of the hermit beetles in the site “Slope of Neris river by Verkiai” introduced
- Monitoring techniques improved by developing a smart pheromone trap
- 247 potential locations monitored and this rare beetle found in 97 locations
- 2 management plans for Natura 2000 sites (“Kaunas Oak Forest” (LTKAU0020) and the “Slope of Neris River by Verkiai” (LTVIN0012)) developed
- Methodology of *Osmoderma eremita* monitoring methods updated
- 8 publications prepared (they can be all found here: www.osmoderma.lt/publications)
- Educational trail in Kaunas oak park installed
- 2 scientific articles published
- 136 children educations organized in the Lithuanian Zoological Garden



2. 1590 trees were identified as existing/potential habitats in the ecological network.

ECOLOGICAL NETWORK

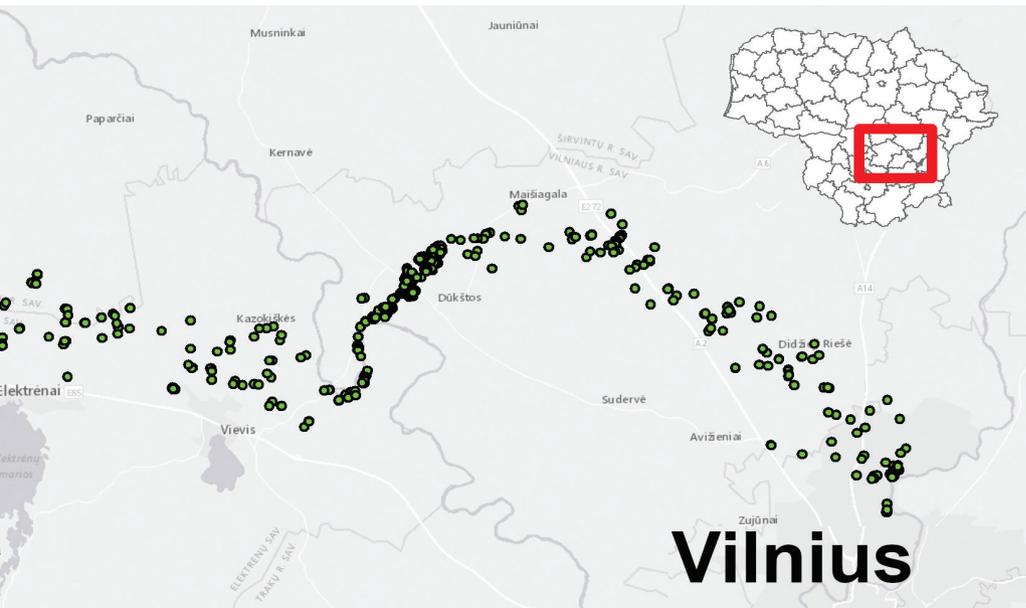
An ecological network was created selecting Natura 2000 sites designated for *Osmoderma barnabita* as the core areas – “Kaunas Oak Forest” (LTKAU0020), “Surroundings of Neris River Loops” (LTELE0005), and the “Slope of Neris River by Verkiai” (LTVIN0012). The isolated patches of habitats were linked by the corridor territories creating an ecological network. Throughout the territory of the ecological network, arboristic measures were applied to restore the vitality and extend the longevity of the veteran trees. Habitat conservation is vital for protecting the target species from extinction. Therefore, inventory, management, and protection of old trees were among the most important activities of this project.

1590 trees
identified as existing/
potential habitats

643 trees
arboristically maintained

643 trees
protected by signed
agreements with the owners

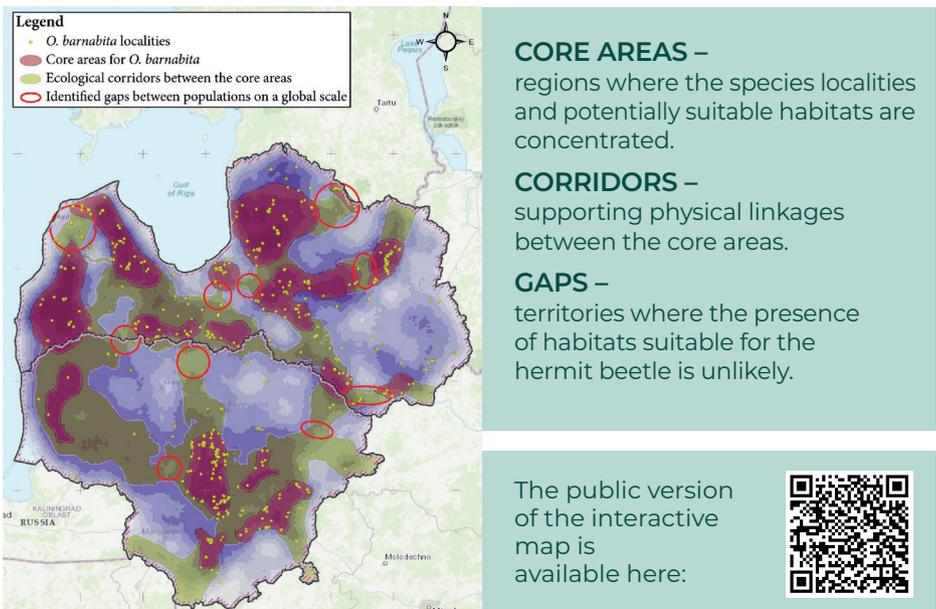
68 ha
of invasive tree
species eradicated



CROSS-BORDER ECOLOGICAL NETWORK FOR THE SPECIES

This ecological network is part of the international Lithuanian–Latvian ecological network in which fragmentation of the populations of the hermit beetle has been identified. An interactive map has been created, which cartographically depicts all identified potentially suitable habitats of *O. barnabita*.

Such an instrument will facilitate the planning of species protection and habitat management measures in specific areas, thus ensuring the possibility to plan species conservation measures on an international scale.



3. Basic elements of developed Ecological network - core areas, corridors and gaps.

EACH OWNER, SIGNING THE TREE PROTECTION AGREEMENT, HAS COMMITTED THE FOLLOWING:

- To abstain from cutting the managed tree.
- To abstain from such radical changes of the growing site as piling up with soil, stones, waste etc., which would result in worsening the growing conditions of a tree.
- To avoid stacking of things, building structures, dumping waste, ploughing and using mineral fertilizers or intensive grazing in the root protection area of a managed tree.

ARBORISTIC TREE MANAGEMENT

During the project, each of the 1590 inventoried trees was assessed individually. It was revealed that nearly 700 trees required arboristic management seeking to restore their viability or prolong longevity. For example, crown reduction, mulching under the tree crown projection, removal of the concrete from the hollows, bringing more light to a selected veteran tree by removing young overshadowing surrounding trees. Many of the veteran trees grow in the city parks, roadsides, therefore, professional tree management is also important in assuring safety for people.

ARBORISTICAL CERTIFICATES:



Maintenance of veteran trees requires experience and excellent skills. Improper work can damage the tree. Qualification of the specialists was an area of special attention during the project – arborists working with veteran trees were subject to the requirement to have international arborist certificates.

4. A dried branch, shortened by the arborist will ensure safety for people while leaving some of the dead branch intact for the species as well.

Photo by SIA "Labie Koki"

For each veteran tree, an individual management plan was developed. For it to be implemented, the private or state owners of a tree were contacted and, if agreed, a tree protection agreement was signed and a management plan was implemented. Not all tree owners undertook to protect a tree, however, the majority of the owners responded positively to the message that a tree growing on their land after arboristic management works will become safer for people and a longer tree life will be ensured.

5. Objects, stacked in the root protection area of a tree may worsen its growing conditions by decreasing the oxygen and water intake by the roots.



DEADWOOD IS NOT DEAD

Deadwood is a high-value nature resource because it is a source of food for many species of animals, fungi, lichen, and bacteria, at the same time it is a growth media, nesting, and hiding site for both invertebrates and vertebrates. Deadwood is also very important for mitigating climate change. While using carbon dioxide for photosynthesis, trees “lock” it in their trunks. Fallen trees return carbon dioxide and nutrients back to the forest very slowly, where they are used by other organisms.

For the reasons mentioned above and seeking to enrich the biodiversity in the

project areas (including cities), we were striving to leave all the wood derived from the arboristic management works on the site, close to the maintained trees. While leaving deadwood in the urban green areas, it is important to ensure the safety of people, diversity and aesthetic aspects of the wood, and proper communication about the actions of the managers of the territories. Therefore, during the project, informational boards and signs of several sizes were installed for public information in the city forests, and several events were held to promote the topic events were held to promote the topic.



6. A small-diameter sign informing park visitors about the multiple positive effects to the environment created by the deadwood.

BREEDING AND REINTRODUCTION OF *O. EREMITA*



DURING SPRING
OF THE YEAR
2020 AND 2021

**441 LARVAE AND
80 COCOONS
RELEASED**

**2 WOOD MOULD
BOXES (ARTIFICIAL
CAVITIES) CREATED**

7. Project team by one of the wood mould boxes constructed during the project.

Seeking to increase the number of hermit beetles, the Lithuanian zoological garden has successfully started *O. eremita* breeding in captivity. A permanent captive population can be used for continued translocation or reintroduction of the species to suitable habitats without harming the natural population.

As a first step of the reintroduction, the habitat conditions in the Natura 2000 site the "Slope of Neris River by Verkiai" were improved by performing nature management activities. Later on, bred larvae and cocoons of the hermit beetle were released into wooden mould boxes situated on the site.

In 2021, the first adult beetles have been noticed in the wood mould boxes and

around them. And also in the summer of 2021, after more than ten years of fruitless effort, an adult beetle has been finally captured by a pheromone trap on the slope of Neris river by Verkiai. This shows that breeding and relocation were implemented successfully and it is highly probable that the population of the hermit beetle in the Natura 2000 site the "Slope of Neris River by Verkiai" will be successfully restored.

Special wood mould boxes designed for the release of the hermit beetles to nature mimic an ecosystem of the natural cavity. They can be inhabited by different saproxylic insects, as well as by birds and bats. During the project, we have encouraged other projects and different organizations to adapt this model of a temporal habitat and use it for their needs.

DEVELOPMENT OF SMART PHEROMONE TRAPS

To evaluate if improved habitat conditions have a positive impact on the population of the hermit beetle, the project team has implemented monitoring using smart pheromone traps developed during the project. Monitoring was done during the summertime when the adult beetles are actively looking for a mate. Traps with pheromones attracting the mating beetles were hung on the trees that received arboristic management in the project territory. If using conventional traps, they must



be checked every day to prevent caught beetles from dying. Whereas smart pheromone traps, developed during the project, have a minicamera installed and pictures are sent to the database every 2 hours via the internet. The photos at the database are constantly checked by the project team members and only in case of a successful catch a trip is taken to release the beetle.

This very fast response time after a successful catch of a beetle reduced the unnecessary traveling and extra fuel costs to a minimum. In addition, all the hermit beetles were released alive and well in just a few hours after they were caught with minimal disturbance.

The smart pheromone traps were successfully used for monitoring the target species in Latvia and Lithuania. Several non-governmental and state institutions have expressed their interest in using the technology for other species as well.

8. The smart pheromone traps made life of the project team and the hermit beetle easy.



- **247 potential locations** monitored and the species found in **97 locations**
- Pictures are sent to the database **every 2 hours**
- The pheromone, which attracts female beetles, smells like **peach blossoms**

FIND OUT MORE



10 VIDEOS

about arboristic veteran tree management, smart pheromone traps, hermit beetles, or giant trees

RECORDS

of the organized conferences on deadwood in the urban areas, conservation activities of the veteran trees in other countries

THEY CAN BE ALL FOUND HERE:

<https://www.youtube.com/c/Lietuvosgamtosfondas>

PUBLICATIONS ON TREES AND BEETLES:

- Best Practice Guidelines on the Creation of Ecological Network for *Osmoderma eremita* and Other Species Dependent on Veteran Trees (LT, LV, EN)
- Methodology for Rearing and Breeding the Hermit Beetle (*Osmoderma barnabita*) (LT, EN)
- Maintenance and Management Guidelines for Veteran Trees and Deadwood (LT, LV, EN)
- Cross-Border Ecological Network for The Species Dependent on Broad-Leaved Ancient And Veteran Trees (EN)
- Replication and Transferability Analysis of the Project (EN)
- Updated Monitoring Methodology of the Hermit Beetle (*Osmoderma barnabita* Motschulsky, 1845) (LT)
- Manual on the Usage and Construction of the Wood Mould Boxes (LT)

THEY CAN BE ALL FOUND ON THE PROJECT'S WEBSITE: www.osmoderma.lt/publications



PICTURES

from the organized public events and study visits

CAN BE SEEN HERE:

<https://www.osmoderma.lt/gallery>

SPOTTED AN OLD TREE*?

Contact us and we'll put the tree on a map to increase its protection: osmoderma@glis.it



*Please send coordinates and photos of broad-leaved trees at least 2,5 m in diameter of the tree trunk