(Projects funded under the Call 2014 onwards must use this format)

LIFE16 NAT/LT/000701

Final Report

Covering the project activities from 01/09/2017 to 31/03/2022

Reporting Date[1]

29/06/2022

LIFE OSMODERMA

Ecological network for *Osmoderma eremita* and other species dependent on veteran trees

Data Project

Project location:	Lithuania, Latvia
Project start date:	01/09/2017
Project end date:	31/03/2022
Total budget:	€ 1,378,000
EU contribution:	€ 1,033,180
(%) of eligible costs:	74.98 **%**

Data Beneficiary

Name Beneficiary:	Lithuanian Fund for Nature

[1] Include the reporting date as foreseen in part C2 of Annex II of the Grant Agreement

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This table comprises an essential part of the report and should be filled in before submission

Please note that the evaluation of your report may only commence if the package complies with all the elements in this receivability check. The evaluation will be stopped if any obligatory elements are missing.

Package completeness and correctness check	
Obligatory elements	**✓ or N/A**
Technical report	
The correct latest template for the type of project (e.g. traditional) has been followed and all sections have been filled in, in English *In electronic version only*	✓
Index of deliverables with short description annexed, in English *In electronic version only*	✓
Final report: Deliverables not already submitted with the MTR annexed including the Layman's report and after-LIFE plan Deliverables in language(s) other than English include a summary in English *In electronic version only*	✓
Financial report	
The reporting period in the financial report (consolidated financial statement **and** financial statement of each Individual Beneficiary) is the same as in the technical report with the exception of any terminated beneficiary for which the end period should be the date of the termination.	✓
Consolidated Financial Statement with all 5 forms duly filled in and signed and dated *Electronically Q-signed or if paper submission signed and dated originals* and in electronic version (pdfs of signed sheets + full Excel file)*	✓
Financial Statement(s) of the Coordinating Beneficiary, of each Associated Beneficiary and of each affiliate (if involved), with all forms duly filled in (signed and dated). The Financial Statement(s) of Beneficiaries with affiliate(s) include the total cost of each affiliate in 1 line per cost category. *In electronic version (pdfs of signed sheets + full Excel files) + in the case of the Final report the overall summary forms of each beneficiary electronically Q-signed or if paper submission, signed and dated originals**	✓
Amounts, names and other data (e.g. bank account) are correct and consistent with the Grant Agreement / across the different forms (e.g. figures from the individual statements are the same as those reported in the consolidated statement)	✓
Beneficiary's certificate for Durable Goods included (if required, i.e. beneficiaries claiming 100% cost for durable goods) *Electronically Q-signed or if paper submission signed and dated originals* and in electronic version (pdfs of signed sheets)*	✓
Certificate on financial statements (if required, i.e. for beneficiaries with EU contribution ≥750,000 € in the budget) Electronically Q-signed or if paper submission signed original and in electronic version (pdf)	✓
Other checks	

Additional information / clarifications and supporting documents requested in previous letters from the Agency (unless already submitted or not yet due) *In electronic version only*	✓
This table, page 2 of the Mid-term / Final report, is completed - each tick box is filled in *In electronic version only*	✓

**signature by a legal or statutory representative of the beneficiary / affiliate concerned*

1. Table of contents

2. List of key-words and abbreviations

LFN – Lithuanian Fund for Nature
LZG – Lithuanian Zoological Garden
KCM – Kaunas City Municipality
DU – Daugavpils University Nature Studies and Environmental Education Centre
MoE – Ministry of Environment
GA – Grant Agreement
GSM – Global System for Mobile Communications
ETW – European Tree Worker
EAC – European Arboristic Council
ISA – International Society of Arboriculture
PMT – Project Management Team
KPI – Key performance indicators
ES – Ecosystem services
CICES – Common International Classification of Ecosystem Services
CINEA – the European Climate, Infrastructure and Environment Executive Agency (we will use CINEA in this document also when referring to EASME)
EASME – the Executive Agency for Small and Medium-sized Enterprises
SSPA – State Service for Protected Areas
pSCI – proposed Site of Community Importance
O. eremita – *Osmoderma eremita,* the hermit beetle, also as a synonym to *O. barnabita*
SRIS – National Database of Protected Species

3. Executive Summary (maximum 2 pages)

The main goal of the project LIFE OSMODERMA was to create a functional ecological network for the hermit beetle (*Osmoderma eremita*) and other species dependent on the deciduous veteran trees by habitat management in core habitats, development of the steppingstone elements within the network area and re-establishing hermit beetle population in the restored historical habitat of the species. The project aimed on improvement of the conservation status of *O. eremita* by managing its habitats, which are closely related to habitat types: 9020* Fennoscandian hemiboreal natural old broad-leaved deciduous forests, 9070 Fennoscandian wooded pastures, and 9180* Tilio-Acerion forests, and also improving the habitat conditions for the species dependent on deadwood. To implement the intended habitat management activities and ensure long term conservation of the restored habitat sites, the management plans for 2 Natura 2000 sites (Kaunas Oak Forest (LTKAU0020) and the Slope of Neris River by Verkiai (LTVIN0012)) were prepared and legally approved by the Ministry of Environment – exactly as it was planned. To develop the Cross-border Ecological Network for the Species Dependent on Broad-leaved Veteran Trees (one of the key deliverables), large scale research was carried out throughout the Lithuania collecting the samples for genetic analysis and finding out the existing metapopulations of the hermit beetle in Lithuania and Latvia.

To prolong the lives of veteran oaks and other old broad-leaved trees, several approaches were used. The project team has found, described, and documented 1591 veteran broad-leaved trees in the formed ecological network. The agreements for protection and arboristic management were signed with landowners for most valuable of them – in total 643 trees. The internationally certified arborists managed and restored 643 old trees (which is 161 % of what was initially planned) in the core areas and the ecological corridor. The lighting conditions were improved for additional ~90 trees when dispersal corridors for the hermit beetle were created and when the invasive tree species ash-leaved maple (*Acer negundo)* was eradicated in two core areas. The invasive tree eradication was completed in 67.56 ha (563 % of what was initially foreseen). Part of the felled overshadowing trees and pruned branches were left on site to increase the amount of deadwood and help the habitats and saproxylic species to move towards the favourable conservation status. Additional 27 trees were tended either by the removal of concrete from their cavities, the installation of fire prevention equipment or the installation of natural looking covers for the ground cavities to prevent vandalism and to guarantee the microhabitats for nature. To spread the best practice and to create the possibilities for the replication of project activities, the Guidelines for Management of Veteran Trees and Deadwood were developed and distributed to the municipalities and the regional and national parks.

To re-establish the hermit beetle population in the historical habitat of the species in the Slope of Neris River by Verkiai (LTVIN0012), several approaches were used. In order not to harm the wild population of the *O. eremita* by translocating the individuals to the historical habitat, the captive-bred population was started and maintained. The historical habitat was restored by eliminating the invasive tree species and by arboristic management of veteran trees. To play it safer, the captive-bred larvae were released not directly into the cavities of trees, but into artificial habitats (wood mould boxes, not foreseen in the project proposal), where the project team could have better control of the re-introduction process. Additional 4 oak trunks with living larvae of the hermit beetle were transported to the same site from the Strėvininkai Forest (LTKAI0002), where sadly part of the forest, inhabited by the hermit beetle was felled for the timber trade. In total 441 larvae and 80 cocoons were released in the historical habitat, and some were left in captivity for the continuation of the breeding. In the summer of 2021, the first adult beetles were finally seen flying in this historical habitat after more than 16 years

of absence, proving the process of the re-establishment is proceeding successfully. The Methodology of *O. eremita* reintroduction was prepared and shared with more than 100 target groups (zoological gardens with rare species breeding programs, entomological societies, and scientists) of Lithuania and other European countries.

To monitor and evaluate the impact of the project actions, the evaluation of LIFE Performance Indicators, assessment of socio-economic impact, assessment the project's impact on the ecosystem functions and the monitoring of 3 target species were successfully carried out. The smart pheromone traps (50 in total, as planned) were developed to facilitate the monitoring of the secretive hermit beetle. 247 locations in total were monitored and out of those 97 locations have been proven to be inhabited by the hermit beetle, and that is a lot of locations for such a rare species. The proposal for 21 sites to be included in Natura 2000 network or updated was provided to the Ministry of Environment by the project team.

To raise public awareness on importance of veteran trees and share the knowledge about conservation strategies of the species and practical experience on habitat restoration, broad scale of events was held or were participated in by the project's specialists. All the planned dissemination activities with one exception (mentioned below) were carried out. In total, more than 3.1 million engagements were made through different means (mass media, social media, webpage, publications, events, information boards, etc.). The Best Practice Guidelines were written and disseminated to the target groups to facilitate the replication of the project actions.

During the implementation of the project, some deviations and difficulties arose. The finalisation of several actions had to be moved to later dates due to various practical reasons, but all except one were finished in the timeframe of the project. The one exception was the planned opening of the educational trail in Kaunas Oak Forest, which was postponed by the city municipality due to a large-scale park reconstruction in Kaunas Oak Forest, which started later than our project. The implementation of the educational trail was finalized after the end of the project in June 2022. Some problems with meeting the planned timeframe arose due to the unexpectedly time-consuming communication with the state institutions for required permissions and agreements. The development of the smart pheromone traps took longer and costed more than planned, but due to the savings in other budget lines this did not affect the overall budget, and the traps were successfully used for the monitoring as planned. Understory in the area Slope of Neris River by Verkiai was not removed, but condition of *O. eremita* habitat was improved by arboristic tree care. Additional action, training of dogs for *O. eremita* monitoring, was performed. Additional part of the Kaunas Oak Forest was included in the project and additional 51 trees were managed there. The pandemic of COVID-19 made the dissemination activities harder to implement, but all the planned goals were still reached.

During the preparation of nature management plan for the core project area Slope of Neris River by Verkiai, it was concluded that understory should not be removed because a) it is open enough for *O. eremita*, b) more care should be taken to avoid increasing the slope erosion. Therefore, as agreed by CINEA letter on 24/07/2019, the action C2.1. was not implemented in this area. The stability of the habitat was increased by tree arboristic management under action C1.

To summarise, all the planned output and expected results of this project were reached with only a few minor issues, which do not depreciate the noticeable impact of this project to nature conservation.

4. Introduction (maximum 2 pages)

- **Description of background, problems, and objectives (as foreseen in the proposal)**

The main goal of the project was to create a functional ecological network for *Osmoderma eremita* and other species dependent on deciduous veteran trees by habitat management in core habitats for the species, development of steppingstone elements within the network area, and re-establishing hermit beetle populations in restored historical habitats of the species.

Ten main objectives defined were as follows:

1. To develop a cross-border Lithuania–Latvia ecological network plan and distinguish functional ecological network for *O. eremita* and other saproxylic species from Kaunas Oak Forest (LTKAU020) to the Slope of Neris River by Verkiai (LTVIN0012).
2. To prepare the necessary documentation for implementation of practical conservation actions in the area of ecological network and ensure long-term conservation of restored habitat sites.
3. To prepare a methodology for the reintroduction of the Hermit beetle and to restore a viable population of the Hermit beetles in the Slope of Neris River by Verkiai (LTVIN0012).
4. To create favourable conditions for *O. eremita* and other species dependent on veteran trees in the core project areas by management of veteran trees, creation of migratory corridors and eradication of alien species.
5. To create the steppingstones between core project areas by the management of veteran trees, old parks, alleys, wooden pastures, forests of slopes, screes and ravines, and other potential steppingstones or creation of temporary artificial habitats.
6. To monitor and evaluate the impact of the project actions.
7. To improve monitoring techniques and equipment by applying smart technologies and enhanced understanding of ethology in species monitoring.
8. To raise public awareness on the importance of veteran trees for biodiversity conservation, socioeconomic impacts, and ecosystem functions.
9. Share the knowledge about conservation strategies of the species and practical experience on habitat restoration between the experts and ensure transfer and replicability of demonstrative methods developed by the project.
10. Ensure smooth project management.

The project area was chosen according to the concept of an ecological network. Kaunas Oak Forest (LTKAU0020), Dūkštos Oak Forest (LTVIN0007), which was incorporated into the Surroundings of Neris River Loops (LTELE0005) in year 2019 (Annex C1 Map Surroundings of Neris River Loops LT ELE0005) and the Slope of Neris River by Verkiai (LTVIN0012) were chosen as the main core zones. Kauno Marios Regional Park (LTKAU0007), Strėvininkai Forest (LTKAI0002), Vaiguva Forest (LTKAI0004), and other territories between Natura 2000 sites located in the project area composed the ecological corridors.

The umbrella species, targeted by the project, is a priority species listed under the Habitats Directive – hermit beetle (*Osmoderma eremita/barnabita*). In the Project context we use these two species epithets as synonyms, as the taxonomy of the genus *Omoderma* is changing due to new genetic findings. The species is protected under the Habitats Directive Annexes II (as a priority species) and IV. The species is also listed in Annex II of the Bern Convention. In Lithuania, the species is protected since 1989. The project aimed to improve the conservation status of *O. eremita* by managing its habitats, which are closely related to habitat types: 9020* Fennoscandian hemiboreal natural old broad-leaved deciduous forests, 9070 Fennoscandian wooded pastures, and 9180* Tilio-Acerion forests, but also improving the habitat conditions for the species dependent on the fallen deadwood like *Cucujus cinnaberinus*.

Main conservation issues targeted: removal of dead and dying trees, reduction in genetic exchange, abandonment of pastoral systems, lack of grazing, lack of regeneration of suitable habitat, species composition change, reduction in dispersal, felling for public safety, removal of roadside trees, invasive non-native species, wrongly directed conservation measures, vandalism, and lack of public awareness.

Arboristic management and restoration of veteran trees were of great importance to the project, and it increased the need for experienced and certified arborists. A predictable and continuous supply of contracts for high-qualified arborists for 4 years encouraged them to raise their qualifications and to seek for international certificates. Active communication during the project has promoted the ideas of arboristic veteran tree management, reintroduction of the hermit beetle, the importance of the deadwood to the institutions and the general public. The experience acquired during the project was presented actively to specific and well-targeted entities that have an interest in replicating the results of the project. Project core areas were in the two biggest cities (Vilnius and Kaunas) therefore the visibility of the project actions was high, reaching more than three million people. Direct communication was also of particular importance and a key in project success - the agreements with landowners were signed for protecting 643 trees that received arboristic management thus ensuring the longevity of the project results.

- **Expected longer term results (as anticipated at the start of the project)**

The main longer-term results anticipated were as follows:

- Ecological network for *O. eremita* and other saproxylic species created between Kaunas and Vilnius.
- Smart pheromone traps for monitoring hermit beetle developed.
- 300-400 veteran and other biologically valuable large dimension trees restored and managed by professional arborists.
- Elimination of alien and invasive species in total 12 ha.
- Creating of dispersal corridors for the Hermit beetles and control of invasive species inside the core zones in total 10 ha.
- At least one viable population of the hermit beetle restored.

Impact of the project actions (16 in total) was monitored, as well as KPI's. Assessment of socio-economic impact and assessment of the project's impact on the 7 ecosystem services were carried out. Replicability and transferability of proposed solutions were ensured by publishing several documents and publications. In addition, the knowledge about conservation strategies of the species and practical experience on habitat restoration was shared between the experts participating in more than 40 conferences and seminars.

5. Administrative part (maximum 1 page)

Project consortium consisted of coordinating beneficiary Lithuanian Fund for Nature (LFN) and three associated beneficiaries: Lithuanian Zoological Garden (LZG), Kaunas City Municipality (KCM), Daugavpils University Nature Studies and Environmental Education Centre (DU).

The partnership agreements were signed with DU on December 2017, with LZG on February 2018 with KCM in February 2018, submitted with Mid-term Report as Annexes F1.1.1, F1.1.2, F1.1.3. The diverse partnership allowed to meet set project goals. For example, LZG had suitable experience and conditions for breeding the *O. eremita* (action C3), KCM was assisting in granting permissions and co-financing nature management activities in Kaunas Oak Forest (actions C1, C2). DU team has competence in scientific project tasks (under actions A1

and E3) and construction of smart pheromone traps (action A4). LFN was responsible for overall project management, objectives, and tasks implementation according to the timeline (and timeline modifications, if necessary), communication with CINEA and NEEMO – ELLE.

The LFN team consisted of international project manager (Dalia Bastyte-Cseh, replaced by Adele Baneliene from July 2021) and six other team members (experts for nature conservation, project specialists, accountant, finance manager), working part or full time. The personnel change in the project team was intense due to the team members going to maternity leave, team members accepting new job offers (and in some cases returning), changing from working full time to part time and vice versa. In total, 15 different people were employed in the project by LFN. Naturally, efficiency of work slowed down in some cases as new project members were joining the team. But at the same time new team members enriched LFN team with new skills and knowledge. The project team cared for fluent experience transfer while personnel changes, therefore the overall project implementation did not suffer too much.

Team of LZG consisted of four members, all working part time: local project manager, two project specialists and educator.

Team of KCM consisted of two project specialists.

Team of DU consisted of four members, all working part time: local project manager, accountant, invertebrate expert, and genetics specialist (the later only in the first half of the project).

Steering committee was formed during the kick-of meeting (as described in section 6.1 under action F1) and was responsible for monitoring and supervision of the Project implementation.

Communication with the Agency and Monitoring Team was smooth and efficient. Yearly missions of the external project monitor were useful to keep track of the project administration rules, project progress and solve various issues related to successful Project Management.

First Progress Report was submitted on 31/10/2018. Initially, the due date for Mid-term report was foreseen on 31/10/2019, but extension was asked and confirmed by CINEA on 7/10/2019, as the previous pre-financing instalment was not used at the foreseen time for the submission of the Mid-term report. Mid-term report was submitted on 31/01/2020, second Progress Report on 28/02/2021.

Amendment N°1 to Grant Agreement (modification of the definition of conditions for natural person, submission of VAT certificate and threshold for submission of certificate on financial statements dated 19/09/2018) proposed by CINEA entered into force on 05/10/2018.

6. Technical part (maximum 25 pages)

6.1. Technical progress, per Action

ACTION A.1: Development of Cross-border Ecological Network for the Species Dependent on Broad-leaved Veteran Trees

Foreseen start date: 2017 IV Actual start date: 2017 IV
Foreseen end date: 2020 IV Actual end date: 2020 IV

Deliverable	Foreseen due date	Revised due date	Completed
Cross-border Ecological Network for Species Dependent on Broad-leaved Veteran Trees	31/12/2019	30/06/2020	30/06/2020
Scientific article about the Cross-border Ecological Network for the Species Dependent on Broad-leaved Veteran Trees prepared	31/12/2020	-	31/12/2020

Name of the Milestone	Foreseen deadline	Revised due date	Completed
Data from the existing national data bases selected, analysed, GIS modelling performed and gaps in the knowledge of *O. eremita* distribution Lithuanian wide defined	01/05/2018	-	01/05/2018
Cross-border Ecological Network for the Species Dependent on Broad-leaved Veteran Trees distinguished	31/12/2019	30/06/2020	30/06/2020
Genetic investigations of separate *O. eremita* populations carried out	30/09/2019	-	30/09/2019

The compiled data from the existing national spatial data bases was analysed, GIS modelling performed and gaps in the knowledge of the *O. eremita* distribution Lithuanian wide defined. After revising all gathered data, final list of 58 locations was made. After summarizing all fieldwork data, 28 locations were indicated as not suitable habitats for *O. eremita*, 30 locations were acknowledged as suitable for pheromone trap investigation. In total 132 samples from 30 locations were obtained. The samples with needed information were transported to project partner DU for genetic investigation. Results showed that genetic drift occurs in *O. eremita* populations in Lithuania and indicate the necessity to connect population to reduce the gene drift effect. A detailed overview in the Annex A1.6 was submitted with the Mid-term report.

For creation of Cross-border Ecological Network (Annex A1. Ecological network LT-LV) compiled data from the existing national (LT and LV) spatial data bases was analysed, matrix of values established, and GIS modelling performed. Result of it – hexagons with a value, that show suitability for *O. eremita*. Using these results, together with gathered genetic data, 3 main scenarios how to connect Latvian *O. eremita* populations with the largest *O. eremita* populations in Central Lithuania were established: East corridor through Anykšiai and Rokiškis regions, Central corridor – through Panevėžys, Pasvalys and Biržai regions and West corridor – through Tauragė, Telšiai and Klaipėda regions.

Online map with the results: https://gis.biology.lv/portal/apps/webappviewer/index.html?id=edc3bdd10921491895cabfc7ac9856cc

Using these results DU and co-authors prepared the scientific article (Annex A1. Scientific Article on Ecological network) „Ecological network for species dependent on ancient broadleaf trees using *Osmoderma barnabita* as a model species – a new approach" which was published in „Insect Conservation and Diversity" (https://onlinelibrary.wiley.com/doi/10.1111/icad.12554).

ACTION A.2: Preparatory work for establishing ecological network between Kaunas Oak Forest, Dūkštos Oak Forest, and the Slope of Neris River by Verkiai

Foreseen start date: 2018 III Actual start date: 2017 IV
Foreseen end date: 2019 II Actual end date: 2021 IV

Deliverable	Foreseen due date	Revised due date	Completed
Action plan for the ecological network	30/06/2019	-	30/06/2019

Action started earlier then it was originally planned. First, data from the existing national spatial data bases was analysed and all identifiable indicators in the data, that might show importance as an *O. eremita* habitat were extracted. Then a grid of hexagons was generated and relative values from those indicators were calculated within each hexagon in Ecological network. From calculated data 3 scenarios were established: A, B and C (Annexes A2.1 and A2.2 submitted with Mid-term report). Scenario A had a priority because it was shortest and there were more hexagons with higher value, which means there was more suitable habitats for *O. eremita*. Open-source mobile application for tree inventory was created and used during the fieldwork.

Field work specialists searched for large veteran trees suitable for *O. eremita* within distance of 1-2 km from each other, that beetle would have a possibility to move within ecological network using steppingstones. Distance of ecological network Scenario A, where large veteran trees were investigated reaches ~110 km. According to the above-mentioned methodology 1591 tree (Please refer to a table 1 under section C1) in total were investigated. 42 veteran trees and 9 younger trees, that were dangerous for infrastructure but had good potential for veteranisation were investigated in the core area the Slope of Neris River by Verkiai. 252 veteran trees investigated in the core area Dūkštos Oak Forest. 707 veteran trees investigated in the core area Kaunas Oak Forest and 581 veteran trees in the ecological corridor (Annex A2 Map Trees in Ecological Network). The table with all inventoried trees is submitted as Annex A2 All Inventoried trees.

For further arboristic inspection 255 high nature value trees were selected in Ecological network, 187 trees in the core area Dūkštos Oak Forest, 51 trees in the core area the Slope of Neris River by Verkiai and 542 trees in the core area Kaunas Oak Forest.

For each tree, which was arboristically managed, an agreement with landowner and / or municipality was signed. By signing the agreement, the owner committed to abstain from cutting the managed tree and to abstain any radical changes at the tree growing site. In total 48 agreements are signed with private landowners, private companies, or non-profit organizations. 6 agreements are signed with municipalities, one agreement is signed with state enterprise, administrating Lithuanian road network. 4 agreements are signed with the State Forest Enterprise.

ACTION A.3: Preparation of management plans and other documentation for Kaunas Oak Forest (LTKAU0020), Dūkštos Oak Forest (LTVIN0007) and the Slope of Neris River by Verkiai (LTVIN0012)

Foreseen start date: 2017 III Actual start date: 2017 III
Foreseen end date: 2018 III Actual end date: 2019 II

Deliverable	Foreseen due date	Revised due data	Completed
Guidelines for management of veteran trees and deadwood.	30/04/2018	30/12/2018	19/10/2018
Management plan for Kaunas Oak Forest (LTKAU0020)	30/09/2018	-	02/04/2019
Management plan for the Slope of Neris River by Verkiai (LTVIN0012)	30/09/2018	-	02/04/2019

Name of the Milestone	Foreseen deadline	Revised due data	Completed
Guidelines for management of veteran trees and deadwood prepared	30/04/2018	30/12/2018	19/10/2018
Management plans for Kaunas Oak Forest (LTKAU0020) and the Slope of Neris River by Verkiai (LTVIN0012) prepared and approved	30/09/2018h	-	02/04/2019

A3.1. Preparation of management plans for Kaunas Oak Forest (LTKAU0020) and the Slope of Neris River by Verkiai (LTVIN0012)

Management plans for Kaunas Oak Forest (in force until 2027) and for the Slope of Neris River by Verkiai (in force until 2028) were prepared by the Project team and officially approved by the Minister of Environment (according to the national legislation system) by orders No. D1-195 and No. D1-191 on 2nd April 2019. There was a minor delay in the preparation and approvement of the management plans, due to the fact, that collecting data about protected species and defining precise management measures took longer than foreseen. However, it did not have a significant impact on other project actions. Management plans were already used for practical nature conservation measures under Project C actions, and they will be further used after the end of the Project by local directorates of the protected areas. Both management plans submitted with Mid-term report as annexes A3.1.1 and A3.1.2.

A3.2. Preparing of guidelines for management of veteran trees and deadwood

The following versions of the guidelines were prepared in 2018: for Kaunas and Verkiai city forests, for Dūkštos Oak Forest and the universal version (also translated to English and Latvian). Submitted with PR and Mid-term reports as annexes A.3.1.2. - A.3.1.2.6. The guidelines for the Project core areas in the protected areas were approved by the respective representatives. The action had a minor delay because of the changes in the project personnel in the years 2018. At the end of the Project, the universal version of the guidelines was updated according to the Project experience and used for further dissemination by LFN.

ACTION A.4: Preparing a methodology for surveying and headstarting of the Hermit Beetle

Foreseen start date: 2017 III Actual start date: 2017 III
Foreseen end date: 2021 IV Actual end date: 2021 IV

Deliverable	Foreseen due date	Revised due date	Completed
Smart pheromone trap for *O. eremita*	31/12/2018	30/12/2020	30/04/2021
Methodology of *O. eremita* reintroduction	31/12/2021	-	01/09/2021

Name of the Milestone	Foreseen deadline	Revised due date	Completed
Initial operation of prototype of a smart pheromone trap	01/06/2018	-	01/06/2018
Final methodology of *O. eremita* reintroduction Prepared	31/12/2021	-	01/09/2021

A4.1. Preparing a methodology for reintroduction of the Hermit beetle

The preparation of the methodology consisted of two stages:

I. The initial methodology was needed to get a permission from the Ministry of Environment for hermit beetle reintroduction in the Slope of Neris River by Verkiai (Action C3). Initial methodology was developed by the Project team and approved by the Ministry of Environment on 22/10/2018. The initial methodology was submitted with Mid-term report as annex A4.1.2 and letter of approval submitted as annex A.4.1.1.

II. The final methodology (Annexes A4 Methodology of *O. eremita* reintroduction EN and LT) was developed according to the experience gathered during the Project action C3, as well as experience gathered during study tour in Latvia (action E2) and communication by email with European experts from institutions as University of Turku (Finland), University of Daugavpils (Latvia), LIFE EREMITA project (Italy), Copenhagen Zoological Garden (Denmark), Nordens Ark (Sweden). The methodology was written in Lithuanian by LZG entomology expert and translated to English. Both versions are available in the project website, were directly distributed to experts working in entomology field (more than 100) and presented in the final project conference.

Optimal conditions for the hermit beetle were investigated using six temperature and humidity loggers (costs approved by CINEA letter of 03/04/2020), which were placed in natural and artificial hermit beetle habitats: two oak cavities in Kaunas Oak Forest, two wooden boxes, one tree cavity and artificial habitat-oak trunk in the Slope of Neris river by Verkiai. A total of 742 days with temperature and humidity parameters were recorded in 6 different locations from 2020-05-07 to 2021-05-19. Temperature and humidity were also monitored in LZG in boxes of mould, where *O. eremita* larvae were bred. Data gathering in natural habitats using loggers was a complex process and needed some adjustments during the project time (as described under 6.2). Despite these problems, valuable and important data have been obtained, for example: temperature and humidity fluctuations were very slow (Annex A4 Loggers data), with temperatures rarely falling below 0 degrees during the monitored winter months. Gathered data was very important for successful breeding of *O. eremita* (Action C3).

A4.2. Development of smart pheromone traps for hermit beetle

The first trap prototype (Annex A4.2.1 submitted with Mid-term report) was developed in the summer 2018. The trap efficiency and accuracy were low due various technical problems, and this slowed down the further development of smart traps. In GA, the due date for development of deliverable smart pheromone trap was foreseen in December 2018. Due to various technical issues the deadline was postponed to 31st December 2019 (letter of CINEA on 04/02/2019). It was postponed one more time until 31.12.2020 for remaining 25 smart traps (letter of CINEA on 23/03/2020). The action was completed until 30/04/2021. The technical details on problems encountered and solutions found while developing smart pheromone traps are described under section 6.2 and Annex A4 Versions of smart pheromone trap. Despite the fact, that the action took longer and costed more than expected (please refer to section 6.2 of this report), the last version of smart trap is very efficient tool to improve the *O. eremita* monitoring.

In total 50 units of last design were made by the beneficiary DU in the summer of 2021. 25 units were used under D1 action in Lithuania (to improve the monitoring efficiency) and the rest was used for *O. eremita* monitoring in Latvia. The smart traps in Latvia were used in the Gauja National Park and in the nature reserve "Lubāna mitrājs", which are one of the key areas for the conservation of the hermit beetle in Latvia. The data was already used for the development of After LIFE Conservation Plan and the preparation of new LIFE Project application upscaling LIFE Osmoderma Project

(Application submitted in November 2021). The data will also be used in the development of nature conservation plans for both specially protected nature territories.

ACTION C.1: Management and restoration of veteran and other valuable large dimension trees

Foreseen start date: 2018 III Actual start date: 2018 I
Foreseen end date: 2021 IV Actual end date: 2021 IV

Name of the Milestone	Foreseen deadline	Revised due date	Completed
50% of trees management implemented	31/12/2019	15/03/2020	15/03/2020
100% of trees management implemented	30/09/2021	30/11/2021	20/12/2021

All veteran tree management was done by AEC (European Arboricultural Council) certified arborists, who had valid ETW (European Tree Worker) certificate and / or ISA (International Society of Arboriculture) and / or VETcert (a certification system developed during VETcert project) issued certificates. An individual management plan was prepared for each tree before starting practical tree management. Main management objective was to increase well-being and prolong life of veteran trees, as current or potential *O. eremita* habitat. The main activities are minor preventive pruning of tree, full scope tree surgery to ensure structural stability and suitability for saproxylic species, reducing tree canopy to the size it can be supported by existing trunk, removal of artificial materials from the cavities, installation of dynamic or static tree bracing systems, soil improvement, removing overshading young trees. Actions were completed by LFN contractors.

Arboristic tree management was implemented for 643 trees (Annex C1 List all managed trees) in Ecological Network (157 in Ecological corridor (Annex C1 managed trees map Ecological corridor) and 486 in 3 Core areas. Out of 643 trees, 7 trees from Ecological corridor were managed by landowners' expenses according to LFN recommendations. Most of the actions were implemented in 3 core areas: 420 trees in Kaunas Oak Forest (Annex C1 managed

trees map Kaunas Oak Forest), 40 trees in the Slope of Neris River by Verkiai (Annex C1 managed trees Slope of Neris River by Verkiai) and 26 trees Dūkštos Oak Forest (Annex C1 managed trees map Dūkštos Oak Forest).

In the Slope of Neris River by Verkiai 9 trees were saved from cutting. These trees grew in 110 kV high voltage power line protection zone. LFN and administration of Pavilniai-Verkiai Regional Park reached the agreement with stakeholders to change decision from cutting down the trees to pruning. For some trees top pruning was so intense that it was considered as veteranisation (Annex C1.3, submitted with Mid-term report).

To reduce vandalism risks for hollow veteran trees, hollows of 24 trees in Kaunas Oak Forest, 2 in Ecological corridor and 1 in Dūkštos Oak Forest were managed by removing concrete and trash, mounting protective railing to block entrance and installation of fire suppression equipment according to the need. Two different fire suppression systems were tested: smoke detectors and fire extinguishing balls. Originally smoke alarm was intended, so 3 smoke detectors were installed in Kaunas Oak Forest (Annex C1 Smoke alarm device). However, as, from time-to-time dust was making false alarms, a more advanced solution, that was not available during preparation of the project, was found – fire extinguishing balls, which stop the fire themselves instead of just giving alarm. (Annex C1 Fire extinguishing ball).

Kaunas City Municipality has also committed to maintain the Project results in the whole area of Kaunas Oak Forest after the project end. The commitment was expressed by an official letter (Annex C1 Kaunas city municipality - commitment to maintain tree management work in Kaunas Oak Forest).

Management of additional 51 trees in Kaunas Oak Forest and other modifications of action C1 are described under the section 6.2 of this report.

Table No. 1 Inventoried and managed trees in Ecological network

Area of Ecological Network	Total number of inventoried trees, girth larger than 3 meters or potential for veteranizing Action (A2)	High nature value trees, selected for arborist inspection Action (A2)	Trees, selected to obtain the agreements and permissions Action (A2)	Managed trees Action (C1)
Ecological corridor	581	255	212	**157**
Core zones:				
Kaunas Oak Forest	707	542	420	**420**
Dūkštos Oak Forest	252	187	29	**26**
The Slope of Neris River by Verkiai	51	51	42	**40**
Total	**1591**	**1035**	**703**	**643**

ACTION C.2: Creating of dispersal corridors for the Hermit beetles and control of invasive species inside the core zones

Foreseen start date: 2018 III Actual start date: 2019 II
Foreseen end date: 2021 IV Actual end date: 2021 IV

Name of the Milestone	Foreseen deadline	Revised due date	Completed
100% of migration corridors for the Hermit beetles inside the core zones implemented	31/03/2020	31/12/2021	20/12/2021
Last stage of invasive and alien species control completed	30/09/2020	30/08/2021	30/08/2021

C2.1 Creation of migration corridors for the Hermit beetles inside the core zones

During the preparation of nature management plan for the core project area Slope of Neris River by Verkiai, it was concluded that understory should not be removed because a) it is open enough for *O. eremita*, b) more care should be taken to avoid increasing the slope erosion. Therefore, as agreed by CINEA letter on 24/07/2019, the action C2.1. was not implemented in this area. The stability of the habitat was increased by tree arboristic management under action C1.

The management of migration corridors (2.5 ha) by felling spruce was necessary in Dūkštos Oak Forest. The action was implemented in winter 2020-2021, starting right after the ground froze. This action was postponed two times: due to the reorganization of Forest Enterprise, and due to unfavourable weather conditions, as described in more details under section 6.2. In total 47,69 solid m^3 of spruce was removed from this site by LFN contractor. (Annex C2 Management of migration corridors in Dūkštos Oak Forest).

After the preparation of the nature management plan in Kaunas Oak Forest, the decision to extend the scope of C2 into this core area was made (agreed by CINEA on 23/03/2020). There was a high need for the removal of undergrow (18 ha) in Kaunas Oak Forest, as most of the veteran trees were growing in an open area till mid of 20^{th} century. In total 751 solid m^3 of undergrowth was removed in this area. The reasons for postponing the finalizing the action are described under section 6.2.

C2.2 Control of invasive species

During the summer of 2019, in Kaunas Oak Forest area of 60.83 ha was thoroughly investigated for ash-leaved maple (*Acer negundo)*, and all individuals (13 trees spread in the whole area) were treated with herbicide injections or removed from the ground. After 1 month from this procedure, the area was investigated again (Annex C2.2.1, submitted with Mid-term report), alive *A. negundo* individuals were located and treated one more time. After 1 more month, the area was investigated the third time, and no more alive *A. negundo* individuals were found. Together with C2.1 actions dead *A. negundo* were fell off and removed from the territory. Thorough checks were repeated in the summer of 2020 and 2021 to eradicate newly sprouted individuals by LFN specialists.

During the summer of 2019, in the Slope of Neris River by Verkiai area of 6.73 ha was thoroughly investigated for *A. negundo,* and all individuals of this invasive species were treated with herbicide injections or completely removed. The second and third investigations were repeated analogous as in Kaunas Oak Forest. Thorough checks were repeated in the summer of 2020 and 2021 to eradicate newly sprouted individuals by LFN specialists.

In total 67.56 ha are free from *A. negundo*. Although the spread of this alien species was spotted, it was necessary to inspect the whole area. The due date for finalizing this action was prolonged mainly due to the need to implement follow up of the action by inspecting new sprout individuals in 2020 and 2021. After the Project this action will be continued by local authorities as specified in the After-LIFE Conservation Plan.

ACTION C.3: Restoring a viable population of the Hermit beetles

Foreseen start date: 2018 III Actual start date: 2017 IV
Foreseen end date: 2021 IV Actual end date: 2020 III

Name of the Milestone	Foreseen deadline	Revised due date	Completed
Results of species monitoring show life signs of the species larvae in the Slope of Neris River by Verkiai	30/09/2021	-	31/07/2020

The agreement of competent authorities for the restoring of viable *O. eremita* populations was submitted with the Project proposal. At the start of the project (autumn 2017) LZG started to prepare laboratory and equipment for captive breeding in LZG, which took place during the whole Project time and is planned to continue after the end of the Project. The breeding was carried out in accordance with the "Methodology of Reintroduction of the Hermit Beetle", which was prepared as part of Action A.4.1. The experience collected during this action was further elaborated in the deliverable "Methodology of *O. eremita* reintroduction" as described under action A.4.1.

During the whole Project, 92 adult beetles were captured in Kaunas Oak Forest and used for the breeding of *O. eremita*. They gave start to approx. 1447 larvae, major part them further developed to *O. eremita* pupae and adult beetles. Part of the larvae and pupae was used for the reintroduction to Natura 2000 site Slope of Neris River by Verkiai. Part of them was kept at the LZG for further growth of the captive population.

For the safe release of captive *O. eremita,* two wooden boxes were constructed (approval for the action by CINEA on 03/04/2020) and placed in the Slope of Neris River by Verkiai in spring 2020. In early summer 2020 160 larvae and in late spring 2021 281 larvae and 80 cocoons were released to the wooden boxes. (See Annex C3 Release of *Osmoderma* to its historical habitat 2021). Permission for the species reintroduction was ensured by Environmental Protection Department under the Ministry of Environment (MoE.)

In year 2019 Project team also arranged a transfer of 4 hollow oak trunks with the larvae of *O. eremita* to the Slope of Neris River by Verkiai, where they have successfully developed. (Picture of trunks submitted as Annex C3.2 with the Mid-term report). These 4 oak trunks were acquired from a clear-cut in Natura 2000 site Strėvininkai forest (LTKAI0002), this action is also described in more details under section 6.2.

The success of the restoring of viable population was proven three times:

1. July 2020: 8 adult *O. eremita* specimens were observed by the Project team crawling on the tree trunks from Strėvininkai forest.
2. July 2021: 1 adult *O. eremita* specimen caught with a smart trap by project monitoring actions D2.

3. July 2021: 2 adult *O. eremita* specimens observed at the wooden boxes.

The continuation of the action will be ensured by LZG, where captive *O. eremita* population will be maintained and released to nature according to the needs.

ACTION D.1: Monitoring & Evaluation of project actions

Foreseen start date: 2017 III Actual start date: 2017 III
Foreseen end date: 2022 I Actual end date: 2022 I

Project progress was constantly monitored using tools as Asana, Google Sheets, Google maps. From the year 2020, due to the COVID-19 outbreak, most of the team worked from home. Skype, Zoom, Teams platforms were used for the regular project team meetings and meetings with other organizations. Location-related actions (A1, A2, C1, C2, D1) were monitored using online map platforms, which are filled in by the employees. The project finance manager constantly updated the project finance papers (invoices, travel accounting) and timesheets to keep track of the costs of each activity and activity category (e. g. travel).

From the year 2019, annual *O. eremita* monitoring was performed by LIFE Osmoderma Team during the summer months. Every year, 20 locations outside the core areas were selected and monitored using conventional and smart pheromone traps. In year 2019, out of 21 randomly selected locations of the ecological corridor, in the 12 locations *O. eremita* presence was confirmed. In the summer of the year 2020, out of 20 localities monitored, 10 locations with *O. eremita* were confirmed. Finally, during monitoring in 2021, all the 20 localities in the ecological corridor were monitored using smart pheromone traps (developed implementing action A4), and the beetle was caught in 16 of them. (Annex D2.1. Maps with the sites and results from *O. eremita* monitoring).

The monitoring results demonstrate that the location of the ecological corridor was well-chosen, and in a long-term it also demonstrates the positive effect of the arboristic tree management (action C1) implemented in the ecological corridor for the *O. eremita* population.

Monitoring was taking place in the core areas as well. Many beetles were caught every year in Kaunas Oak Forest and Dūkštos Oak Forests. Some of the beetles caught in Kaunas Oak Forest were used for breeding in captivity (Action C3). In the year 2021 an adult beetle has been captured on the Slope of Neris River by Verkiai where the reintroduction of the species is implemented (as described under C3).

The results of the monitoring were uploaded to the National Database of Protected Species (SRIS) yearly. Monitoring of *O. eremita* will be further performed by SSPA.

ACTION D.2: Monitoring of the LIFE Performance Indicators

Foreseen start date: 2017 III Actual start date: 2017 III
Foreseen end date: 2022 I Actual end date: 2022 I

Habitats: Project actions improved the status of the habitat 9180* Tilio-Acerion Forest of slopes, screes, and ravines due to the increased dead wood volume after arboristic tree management. Areas of habitats improved: Kaunas Oak Forest: 7.85 ha, Slope of Neris River by Verkiai: 13.09 ha, Dūkštos Oak Forest: 9,13 ha. In total in core areas: 30.07 ha. (Annex D.2 Maps of improved habitats 9180)

Wildlife species: three threatened species: beetles *O. eremita*, *Cucujus cinnaberinus* and polypore fungi *Fistulina hepatica* were monitored in year 2019, 2020 and 2021. In total, 91 sites were monitored for *Cucujus cinnaberinus* (noticed at 2 sites) and *Fistulina hepatica* (noticed at 2 sites). Monitoring of *O. eremita* is described in detail under Action D1. Due to the different species seasonal activities, the monitoring of *O. eremita* took place in summer months, while other two species were monitored in autumn / winter.

Alien species: alien tree species *Acer negundo* is eradicated in 60.83 ha in Kaunas Oak Forest and 6.73 ha in the Slope of Neris River by Verkiai (67.56 ha in total). Concentration of invasive species was low in major parts of the territories and high in specific parts of these territories, therefore it was possible to clear bigger area as planned for the same effort. The whole area was checked for seedlings following years after the main work implemented and new seedlings were eradicated.

Employment: Arborists surveys, completed and described under Action D3, showed that arboristic companies increased the number of employees during the time of the Project. The need of high-qualified arborists also increased: at the end of the Project, there are 10 Lithuanian ETW certified arborists (to compare to 1 at the beginning of the Project).

Replication / transfer and behavioural change: 23 replication and behavioural change actions in the fields of species monitoring, veteran trees management, communication, etc were reached. They are further described under the section "Replicability, transferability, cooperation"

Communication, dissemination, awareness raising (including website): LIFE OSMODERMA website had 9,765 page visits (6,727 unique visitors). Facebook posts about the project in LFN Facebook profile have reached more than 257,000 people in total. Popular web portals shared articles about the project at least 101 times, various project activities were presented on TV 18 times. In total, 316,3027 engagements were made through different means.

ACTION D.3: Assessment of socio-economic impact

Foreseen start date: 2018 III Actual start date: 2018 I
Foreseen end date: 2021 IV Actual end date: 2021 IV

A sociological survey was conducted three times during the project using the same online questionnaire: in the years 2018, 2020, and 2021. In total, 800 visitors of Kaunas oak forest, Verkiai manor park and Dūkštos Oak Forest filled in an online survey consisting of 9 questions that was disseminated using social media.

The results showed that the statement "Old trees threaten the visitors of the park/forest" received fewer supporters every year. Also, people are increasingly (fully) agreeing with the following statements "To protect people from the threat posed by the old trees, old trees should be managed by the high-level professionals" and "To preserve animals living in old trees (birds, mammals, insects), old trees should be managed by high-level professionals". It is evident, that the importance of arboristic tree management is increasing in the eyes of the public and visitors perceive old trees managed during the project as posing less risk.

To assess the economic impact of the project, arborist companies were surveyed twice during the project: in 2019 (inquired about the initial situation of the project in 2017) and 2020. The survey of 2017 showed that arborist companies employed on average 1,5-3 arborists (in full-time equivalents) in 2017. Whereas in 2020 companies increased the number of employees to 3-4 arborists (in full-time equivalents). A change in the type of work carried out by the arborist companies is also evident. More trees are being managed by the arborists than felled (the percentage share of managed trees from all the tree work contracts has increased from 5%-46% in 2017 to 43%-62% in 2020). The arborist companies have indicated an increase in inquiries on arboristic certificates from customers in the private and public sectors. In 2017 only one arborist had the "European tree worker" certificate, whereas in 2021 there were already 10 certified arborists in Lithuania.

ACTION D.4: Assessment the project‘s impact on the ecosystem functions

Foreseen start date: 2018 III Actual start date: 2018 II
Foreseen end date: 2021 IV Actual end date: 2022 I

Seven ecosystem services (ES), according to The Common International Classification of Ecosystem Services (CICES) were chosen to assess. For the ES assessment we mainly focused on Natura 2000 sites. Project actions had positive effects for ecosystem conditions and trends. Here we provide summary of results of every ecosystem service assessed. Main findings with some adaptations required for KPI webtool are also provided in the online KPI data base.

Regulation & maintenance services:

1. Maintaining nursery populations and habitats (Including gene pool protection) in Slope of Neris River by Verkiai.

The conditions of 30.07 ha of habitat 9180* Tilio-Acerion forests of slopes, screes and ravines in all Project core areas improved due to increased volume of dead wood. Restoration of one new hermit beetle population in Slope of Neris River by Verkiai (species historical habitat) has been successfully implemented. Ecosystem trend for populations and habitats is improving.

2. Mass stabilisation and control of erosion rates in Kaunas Oak Forest and Kaunas Lagoon

Universal Soil Loss Equation (USLE) and data from European Soil Data Centre (ESDAC) was used for erosion protection modelling. Change in runoff is supposed to be the most important factor regarding habitat management activities. On average 12.3 kg per 1 year less soil loss occurred due to the tree management activities. Values for only Kaunas Lagoon were submitted in the KPI data base. Ecosystem trend is some improvement.

3. Pest control (including invasive species) in Kaunas Oak Forest and the Slope of Neris River by Verkiai.

Eradication of invasive tree species - ash-leaved maple, improved habitat condition in Kaunas Oak Forest and the Slope of Neris River by Verkiai. In total 67.56 ha area has been managed and spread of invasive tree species stopped. Values for only Kaunas Oak Forest were submitted in the KPI data base. Ecosystem trend is overall stable.

4. Hydrological cycle and water flow maintenance in Kaunas Oak Forest, Vaiguva and Strėvininkai forests.

The volume of litres of water intercepted by trees was estimated using tool i-Tree Design v.6.0 and v.7.0. It was estimated that 340 oaks in Kaunas Oak Forest, Vaiguva and Strėvininkai forests will change their condition from poor to excellent due the arboristic care. The difference of intercepted rainfall water in coming 99 years between poor and excellent condition oak is 2901 litres. As for 340 trees, it makes 986 340 l (986 t) of intercepted water difference in 99 years. Values for only Vaiguva Forest were submitted in the KPI data base. Ecosystem trend is some improvement.

Cultural services:

The impact of three cultural ES in Kaunas and Dūkštos Oak Forests and Slope of Neris River by Verkiai was assessed, using the data gathered under action D3:

- Characteristics of living systems that enable aesthetic experiences;
- Characteristics of living systems that enable education;
- Characteristics or features of living systems that have heritage or cultural value.

Cultural services have no territorial impact on project sites, which could be measured and expressed in hectares. Therefore, the impact was evaluated in percentage of opinion change expressed in questionnaires. For example, opinion changes were visible to the statement “In order to protect animals (birds, mammals, insects), related to old trees, trees must be managed by professional arboristic care” and “In order to ensure human safety trees have to be managed

by professional arboristic care". In Kaunas Oak Forest, the proportion of respondents, (totally) agreeing to these statements increased by 7%. Values for only Dūkštos Oak Forest were submitted in the KPI data base. Ecosystem trend is some improvement.

ACTION E.1: Dissemination and Communication

Foreseen start date: 2017 III Actual start date: 2017 III
Foreseen end date: 2022 I Actual end date: 2022 I

Deliverable	Foreseen due date	Revised due date	Completed
A webpage created	01/02/2018	-	16/10/2017
A leaflet about the project prepared	01/03/2018	-	25/01/2018
Layman's report published	31/10/2021	-	28/02/2022

Name of the Milestone	Foreseen deadline	Revised due date	Completed
Opening of the nature educational trail	30/09/2020	30/09/2021	Completed in June 2022

E1.1. Educational trail in Kaunas Oak Forest and Informational boards in areas of the ecological network:

E1.1.1. Educational trail in Kaunas Oak Forest.

The milestone of the Action E1 is "Opening of the nature educational trail". It is a trail of 2 km length and 22 information boards. Part of the boards are adapted for visually impaired visitors by applying a transparent layer with information in braille on top of the board with a visual text. Parts for children and English-speaking visitors are also included. Initial due date for the trail was foreseen on 30/09/2020, it was postponed to 30/09/2021, as implementation of KCM Project "Reconstruction of other engineering structures in Kaunas Oak Forest" was delayed. It was agreed, that LFN is responsible for information and design of the 22 informational boards for the educational trail and the rest will be implemented by KCM. The boards were printed out before the end of the Project and were ready for installation (Annex E1 Information boards Kaunas Oak Forest Educational Trail). Before the end of the Project KCM has signed a commitment to finalize the nature trail until 1st of August 2022 (on own costs) (Annex E1 KCM commitment to finish the implementation of educational trail).The installation of the boards in Kaunas Oak Forest took place in June 2022, at the end of the "Reconstruction of other engineering structures in Kaunas Oak Forest" (see also Annex Kaunas Oak Forest Educational Trail and section 6.2). The Action is completed.

E1.1.2. Informational boards in Verkiai park, Dūkštos Oak Forest, and project areas of the ecological network.

Three informational boards are installed introducing the hermit beetle and its habitat to the visitors of LZG, Dūkštos Oak Forest and the Slope of Neris River by Verkiai. Initially, 5 informational boards were foreseen in the GA, but it was changed (as approved by CINEA letter of 04/02/2019) to 3 informational boards and 30 smaller temporal informational signs. Temporal informational signs were used to inform people about arboristic work and were placed by the trees before and during their management was implemented (Annex C1.4. submitted with Mid-term report). Further 5 temporal informational boards describing the main arboristic measures for veteran tree management were used in Kaunas Oak Forest while implementing arboristic tree management. Additionally, 40 small-diameter signs were produced to inform park visitors about the importance of the deadwood and were mounted directly on the dead trees/logs in the Project core areas (Annex E1 Informational signs on

deadwood). 5 more informational boards on the importance of the deadwood (Annex E1 Informational boards on the importance of the deadwood) were installed in the site Slope of Neris river by Verkiai by the artificial habitats created in the logs with cavities from the felled oaks. At the end of the Project, 230 small metallic plates (Annex E1 Metallic plates on managed trees) were attached on managed trees in order to increase the visibility and conservation of managed trees (as approved by CINEA via e-mail communication on 18/01/2022).

E1.2. Development of the Dissemination Pack (including website, brochures, Layman's Report, project video, events):

1. 4 mass events organized (one event in 2018, two in 2019, and one in 2021) with around 300 participants. Planned target – 400 people were not reached due to Covid-19 outbreak.
2. Website (https://www.osmoderma.lt) of the project was created at the beginning of the project. Since then, more than 10 000 visits have been recorded by 6,727 unique visitors. Planned target – 10,000 visitors – was not reached, but it is complemented by active communication through social media.
3. Despite the pandemic situation, LZG has organized 136 educations, reaching more than 3,900 people, the majority of them being schoolchildren. Educators led excursions, lectures and created educational videos.
4. 500 copies in Lithuanian and 200 copies in English of the leaflet published and distributed to the relevant target groups. 100 copies in Lithuanian and 100 copies in English of the Layman's report are printed out (Annex E1 Layman's report). The Pdf file is available on the project site. A Project roll-up was produced.
5. 82 articles were posted on the project's website in the news section (planned target – 20 articles) exceeding 3,600 views.
6. 99 posts on LFN Facebook page reached more than 257,000 persons.
7. Project partners DU, LZG and KCM added a description of the project and a link to the project's website as a constant section of the website.
8. 10 short films were created. The total views on all platforms exceeded 61,000. An animated cartoon was translated by a Latvian arborist company into LV language (all the rights reserved to the project) and shared with the Latvian public as well.
9. 300 T-shirts, 500 cloth bags and 500 posters, and 200 mugs were produced. All were distributed during project-related events to the members of the project's target groups.

101 articles in different web portals were published reaching an audience of more than 69, 000 people. 18 broadcasts on national radio and television programmes were made having audiences of 2,824,000 viewers. (Annex E1 Results of the Dissemination and Communication Actions).

At the beginning of the project, the project team has faced a considerable mistrust of the public to all the work related to tree management. The ill-practice of the municipalities and private owners that were felling old trees instead of arboristically managing them has met a wide resistance in the public through the active groups on social media. Therefore, an active communication campaign was implemented during the project years, thoroughly presenting the best practices. Even dogs, trained to search *O. eremita* larvae according to the smell under action E2 - helped to reach the attention of a wide audience as well. Currently, we are considered as ambassadors of the veteran trees in Lithuania.

ACTION E.2: Networking and knowledge exchange

Foreseen start date: 2017 III Actual start date: 2017 III
Foreseen end date: 2021 IV Actual end date: 2021 IV

Name of the Milestone	Foreseen deadline	Revised due date	Completed
Project kick-off meeting organized	15/10/2017	-	12/10/2017
Workshop on habitat management organized	01/06/2018	-	11/05/2018

E 2.1. Project kick-off meeting. The kick-off meeting was organized on the 12th of October 2017 in the Direction of Pavilniai-Verkiai Regional Park, in Vilnius. 30 participants participated in the meeting, representing organisations of project partners and other stakeholders.

E2.2. Workshop on habitat management. The conference and workshop "Veteran Trees in the Open Landscapes" was organized in 2018 May 10-11. 83 participants from various organizations and institutions participated in the event.

E.2.3. Study tours. In 2018 April 10-12 a trip to Latvia was organized to gain knowledge on molecular biology research of *O. eremita* during LIFE+ project EREMITA MEADOWS and management of the habitats. 5-day study tour to southwestern Sweden was held on 10-14th June 2019. 11 participants gained experience on saproxylic species and broadleaved trees habitats, mainly from the Life project "Bridging the gap". Photos from the study tours are in the Projects' website. It was planned 4 study tours in total. 2 of them were cancelled as the breeding of the beetle was discontinued in the foreseen locations and the needed information was gathered via email.

E.2.4. Networking with the other projects. It was implemented by inviting representatives from other projects and by participating in various networking events (in Lithuania, Estonia, Denmark, Italy). In year 2018, a workshop in Lithuania with an expert of the LIFE project MIPP "Monitoring of insects with public participation" LIFE11 NAT/IT/000252 was implemented and Project team learned to train dogs for *O. eremita* search, which aimed to improve the monitoring of the species. Also, experience on working with landowners in *O. eremita* habitats, habitat restoration and keeping of *O. eremita* larvae *ex situ* was shared. As this activity was not foreseen in GA, an additional permission was granted by CINEA on 12th September 2017. In total, the project team has exchanged the experience in 44 events.

ACTION E.3: Replication and transferability

Foreseen start date: 2020 I Actual start date: 2017 IV
Foreseen end date: 2022 I Actual end date: 2022 I

Deliverable	Foreseen due date	Revised due date	Completed
Methodology of *O. eremita* monitoring methods	01/08/2021	-	07/02/2022
Best practice guidelines	01/09/2021	-	11/10/2021
Scientific article about *O. eremita* monitoring methods	31/10/2021	-	31/12/2021
Analysis of how the proposed methods might be applied in other contexts	31/12/2021	-	04/01/2022

Name of the Milestone	Foreseen deadline	Revised due date	Completed
Final conference organized	31/10/2021	-	07/10/2021

E.3.1. Workshop on importance and management of deadwood. Due to pandemic, an international webinar "Deadwood in Urban Areas" was held instead of the workshop on 22nd of September 2020. Its length was shortened to half a day, but instead of 20 participants (as was planned) 119 persons participated.
E.3.2. Best Practice Guidelines. The publication prepared and published both online and printed (200 copies) format in Lithuanian, Latvian and English (Annex E3 Best Practice Guidelines).
E3.3. Improvement of monitoring methods of the Hermit beetle. Scientific article about *O. eremita* monitoring was prepared by DU with partners and published it in the Baltic Journal of Coleopterology Volume 22 No. 2 (2021) (Annex E3 Scientific article about *O. eremita* monitoring methods). The Lithuanian monitoring methodology was updated based on the experience of the project and disseminated to the relevant institutions and organizations (Annex Methodology of *O. eremita* monitoring methods)
E.3.4 Final project conference. A hybrid event "From a Beetle to an Oak" was organized on 6-7th October. It was possible to attend in person or participate online. 12 speakers made presentations, a keynote speech was delivered by the vice-minister of the Ministry of Environment. There were also 2 excursions: in Kaunas Oak Forest and Pavilniai-Verkiai Regional Park. (Annex E3 Programme of the final conference). In total, 40 attendees participated in person and 65 joined online.
How the proposed methods of the project might be applied in other contexts was discussed and a document "Replication and transferability analysis" was produced after the conference and published on the project's website (Annex E3 Analysis of how the proposed methods might be applied in other contexts).

The experience acquired during the project was presented actively to specific and well-targeted entities that have an interest in replicating the results of the project during various events (refer to Replicability, transferability, cooperation part). The project team has contributed to the preparation of the description of the "Criteria for good conservation status for the species and its habitat at the local level" together with the Methodological-Analytical Centre of the State Service for Protected Areas. Manual on the Usage and Construction of the Wood Mould Boxes was published on the project's website as well to share the practical knowledge gained in developing the temporal habitat for the species.

ACTION F.1: Project management and After-LIFE Conservation Plan

Foreseen start date: 2017 III Actual start date: 2017 III
Foreseen end date: 2022 I Actual end date: 2022 I

Deliverable	Foreseen due date	Revised due date	Completed
After LIFE Conservation Plan	31/10/2021	-	28/02/2022

Name of the Milestone	Foreseen deadline	Revised due date	Completed
International project manager appointed	30/09/2017	-	30/08/2017

F 1.1. Project management

The Project was coordinated by the Steering Committee (SC) and Project Management Team (PMT), the later described under section Administrative part.

Composition of the SC: Chairman - Algirdas Klimavičius, deputy director of Nature Conservation and Forests Department (MoE). Members: Radeta Savickiene, Head of Nature

Conservation Department (KCM); Aurimas Didžiokas, Director (LZG) - from April 2021 replaced by new LZG director Gintarė Stankevičė; Uldis Valainis, chairman of the board (DU); Giedrius Švitra - an expert of entomology, Lithuanian Entomological Society and State Service for Protected Areas under the Ministry of Environment. Secretary: Danas Augutis, Nature Conservation expert (LFN), from September 2018 replaced by finance manager/project specialist Indrė Čeidaitė (LFN), from April 2021 replaced by project specialist Gustina Vaicekauskienė (LFN).

Five Steering Committee meetings were held: 12th October 2017, 21st September 2018, 22nd October 2019, 27th April 2021, 25th January 2022. Two last meetings were held online due to the Covid-19 restrictions. During the meetings, the project progress was assessed, challenges discussed, and solutions offered, improvement ideas generated, and successes celebrated.

F 1.2. After-LIFE conservation plan

During 2022 January-February an After-LIFE conservation plan was prepared as a separate document (Annexes F1 After LIFE conservation plan (EN), (LT), (LV). It sets out how the project results will be maintained and how the dissemination and communication of the results will be continued after the end of the project. This plan was prepared by LFN in collaboration with other project partners.

ACTION F.2: Compiling the information to complete the indicator tables

Foreseen start date: 2017 III	Actual start date: 2017 III
Foreseen end date: 2022 I	Actual end date: 2022 I

The compilation of Projects Key performance indicators (KPI) consisted of several stages during the Project time. First, the LIFE KPI excel file was submitted at the Project Proposal Stage. It consisted of eight indicators under three objectives:

1. Improved Nature, Species and Biodiversity
2. Economic Performance, Market Uptake, Replication
3. Communication, dissemination, awareness rising.

For each indicator, the values at the start, end of the Project and 5 years after the Project were evaluated.

Second, the project team was informed about a new LIFE Programme Key Performance Indicators online database on 11th December 2017 by a letter from CINEA. The first set of the data was included in the KPI online data base in the period from December 2017 to February 2018. The LIFE KPI excel file served as the basis for filling the online KPI data base. In addition, the data was further developed and adapted according to the data types asked to provide, as online data base is more comprehensive when compared to the initial KPI excel table.

Later, data for further filling and finalizing the KPI values was gathered mainly under actions A1, A2, D1, D3 and D4. The KPI progress was reported at the Mid-term report stage (31st January 2020). At the end of the project, the final actual situation and KPI values were evaluated and online KPI data base finalised. The list of indicators and values is given in the section 7. Key Project-level Indicators.

6.2. Main deviations, problems and corrective actions implemented

Action A.1 Budget allocation: To buy necessary materials for performing genetical research it was needed 7,937.78 EUR less than it was expected at the beginning of the project. This part of money was rearranged for development of smart pheromone traps (position "Prototype").

Action A.2 Prolonged deadline for getting permissions: deadline for action A2 was extended until 01/11/2021, because agreements with the landowners had to be signed until the Project C actions had been ongoing, as it is not efficient to implement management action with a long gap of time after signing an agreement with a landowner. Therefore,

Action A4.1 The use of temperature and humidity loggers in natural hermit beetle habitats is a complex process, which requires specific equipment and tree climbing skills. The first set of loggers was used in year 2020, but after frequent technical issues (early discharge, problems with data transfer from logger to the computer) it was exchanged by the producer due to the manufacturing defects. Second set of loggers was working successfully, and useful data for was gathered.

Action A.4.2 Creation of smart pheromone traps: as mentioned under section 6.1, the development of smart pheromone traps took longer and costed more than expected in GA (26,086.52 EUR in total, Annex Breakdown of costs for smart pheromone traps.) 4 versions of smart traps were created to have an efficient final version. Main differences and improvements (as reduced weight and size, ability to receive data from remote monitoring sites, reduced power consumption and longer battery life) between 4 versions are explained in Annex A4.2 Versions of smart pheromone trap. |The final version of smart pheromone trap met the requirements for efficient use in the field and was successfully used by the Project Team.

Action C.1.

Process of getting permissions and agreements: we did not plan in the GA that getting agreements and permissions for tree management from the state institutions will be more time and energy consuming (and less predictive outcome wise), than implementing the actual tree care. At first the state institutions declined permissions for tree management, underground felling, or possibility to preserve valuable trees. Only persistent actions from project team lead to positive results obtaining necessary permissions and agreements. Due to same reasons for delayed C2 actions in Kaunas Oak Forest, large part of C1 actions in this area was also postponed and completed in year 2021.

Additional managed trees in Kaunas Oak Forest: as mentioned in the GA and in the Mid-term report, the core area Natura 2000 Kaunas Oak Forest was divided into two parts to avoid double financing: the area where implementation of LIFE Osmoderma actions was planned, and the area where *O. eremita* species action plan was prepared and planned to be implemented by local authorities (map was submitted as Annex C1.5 in the Mid-term report). However, the intentions of competent authority about the implementation of the species action plan have changed during the years of Project implementation. In year 2021 State Service for Protected Areas under Lithuanian Ministry of Environment confirmed that there are no financial resources for the implementation of the species action plan in Kaunas Oak Forest. Because of the high importance of this adjacent territory, with the agreement with CINEA on 29/07/2021 project actions were completed implementing LIFE Osmoderma project (51 trees from 420 in Kaunas Oak Forest). All removal of undergrowth in Kaunas Oak Forest was made by KCM contractor during action C2 and saved significant part of the budged, that was allocated for arboristic management for more trees than first planned. The costs for 51 veteran tree arboristic management consisted of 20,398.18 EUR (which makes 399.96 EUR on average per one tree). The foreseen costs in Project Mid-term report (28/02/2021) was anticipated to be up to 25,000 EUR.

Additional protection measures for 5 trees (as confirmed by CINEA via e-mail communication on 04/11/2020), were implemented. For trees KAUM005 and KAUM006 tree protective shields were installed, and soil was mulched. Mulching and aeration were also implemented for trees KAUM014 and VLNR041. For tree VLNR041 platform was installed to protect tree roots from soil compression by passing people (Annex C1 Platform for root protection). Action was completed by LFN contractor. Unfortunately for tree KAUM014 Lithuanian State Forest Service did not allow fencing veteran tree motivating that it would violate Lithuanian Forest Law about free public access to forests, even when Ministry of Environment explained otherwise. Therefore, the fencing was not implemented.

Change of the name and territory of Natura2000 site Dūkštos Oak Forest (LTVIN0007). In the second half of the project Dūkštos Oak Forest was (LTVIN0007) was incorporated into new Natura 200 site Surroundings of Neris River Loops (LTELE0005). This extended territory includes 13 managed trees from the Ecological corridor. Together with former Dūkštos Oak Forest where 26 trees were managed, in Surroundings of Neris River Loops 39 trees in total were managed.

Action C.2

Migration corridor management in Dūkštos Oak Forest: permission for the felling of spruce trees in Dūkštos Oak Forest was obtained in winter 2019 and renewed in January 2020 and in January 2021. It was defined in the permit, that felling work is allowed only in winter, after ground freezes as this allows to remove the felled timber without damaging the soil. This reduced the time, available to implement the work. Reorganization of 42 Lithuanian State Forestry Enterprises (Vilnius Forest Enterprise split into Trakai and Nemenčinė subdivisions) was implemented in 2019. Due to the complicated reorganization, there was no contractors, who could legally work in Forest Enterprise Nemenčinė subdivision in year 2019. In winter 2020-2021 the action was successfully implemented.

Creating dispersal corridors in Kaunas Oak Forest: In Kaunas Oak Forest C2 actions were postponed due to bureaucracy compiling Nature management plan actions into forestry project and delayed issue of felling permit by local authorities. The action in this area later was completed in two stages depending on the degree of overshadowing: in one stage where veteran trees were less overshaded and in two stages where veteran trees were strongly overshaded. This was necessary to avoid causing stress of too much intense insolation for veteran trees. Work was implemented by KCM subcontractor as beneficiary's own contribution and total cost was 25,897.60 EUR.

Action C.3

Strėvininkai Forest (LTKAI0002) case: During the field work Project team noticed that a valuable part of the forest is marked for cutting, despite the fact, that it is designated for the protection of *O. eremita* and another beetle species *Cucujus cinnaberinus*. Project team contacted the owner and explained the threats to the nature conservation and agreed that he will leave the trees with hollows not cut. However, after a week, the area was clear cut and only 1 hollow oak tree was left. LFN informed responsible institutions and authorities and according to explanation of State Forest Service, the cutting permit included the condition to save hollowed trees as wildlife habitat, but it was not properly fulfilled in practice. A meeting on "Strėvininkai forest clear-cut" was organized by LFN together with MoE and was held on 25th April 2019. LFN formulated 7 suggestions for improvements to the current forest management system, which could solve problem of forest management in Natura 2000 areas, designated for species directly dependent on the old trees (The minutes of the meeting were submitted as annex C.3.3 with Mid-term report)

Action E1

Educational trail in Kaunas Oak Forest is a final part of the project "Reconstruction of other engineering structures in Kaunas Oak Forest" (2019), implemented by KCM. The

reconstruction of the engineering structures in Kaunas Oak Forest by KCM took longer than anticipated, due to delayed tender procedure and technical pauses of work during the winter season. KCM has signed commitment to finalize the nature trail until 1st of August 2022 (i.e. already after the end of the Project LIFE Osmoderma) on own costs. (Annex E1 KCM commitment to finish the implementation of educational trail). The educational trail was finalized in June 2022 (i.e. after the end of the LIFE Osmoderma Project).

Impact of Covid-19 on Project Implementation

Covid-19 restrictions had impact on several Project actions, main of them are listed below:

- Number of educational activities in LZG decreased in year 2020 and 2021, compared to year 2018 and 2019. Part of the educational activities was converted into online.
- Workshop "Deadwood in Urban Areas" in 2020 was organized as a webinar.
- Final conference "From a Beetle to an Oak" in 2021 was organized as a hybrid event.
- Arborists from Latvia were in quarantine in Lithuania for two weeks before being able to finalize arboristic work in Kaunas Oak Forest in spring 2021.
- Study tours in 2020 and 2021 were cancelled. Despite the restriction to travel, networking took place via e-mails and online meetings.
- Steering Committee meetings in 2021 and 2022 were hold online.
- Work from office was replaced by work from home by a big part of the Project team.

6.3.Evaluation of Project Implementation

Objectives and results by Project action foreseen in the revised proposal	**Achievements and Evaluation**
A1, A2 **Objectives:** 1. To develop cross-border Lithuania – Latvia ecological network plan and distinguish functional ecological network for *O. eremita* and other saproxylic species from Kaunas Oak Forest (LTKAU020) to the Slope of Neris River by Verkiai (LTVIN0012). **Expected results:** 1.Cross-border Lithuanian – Latvian ecological network plan created. 2. Ecological network for *O. eremita* and other saproxylic species distinguished between Kaunas and Vilnius	Foreseen objective and results are fully achieved. > Although it was challenging to collect enough data for genetic investigation of *O. eremita* (136 DNA samples were isolated, 134 samples were suitable for analysis), the results enhanced ecological network from Lithuania to Latvia and contributed to the successful reintroduction in the Slope of Neris River by Verkiai. > "Google street view" was used to identify potential steppingstone trees near roads. This method saved significant amount of time, fuel, and carbon footprint. > A very detailed inventory (1591 trees investigated) was necessary for further tree management work, as only the most valuable trees were chosen for further actions. > The face-to-face communication with landowners (private persons as well as state institutions) regarding tree protection was the most effective way to proceed with signing required agreements.
A3 **Objectives:** 2. To prepare necessary documentation for implementation of practical conservation actions in the area of ecological network and ensure long term conservation of restored habitat sites. **Expected results:** 1.Management plans and for Kaunas Oak Forest (LTKAU0020) and the Slope of Neris River by Verkiai (LTVIN0012) prepared;	The objective and results are fully achieved. > Two management plans for Natura 2000 sites will serve for further nature management activities after the end of the Project. > A meeting for stakeholders before preparing and publishing guidelines was organized and was helpful to get to know the stakeholders needs, doubts and usual practices regarding the veteran tree and dead wood management.

2.Guidelines of veteran tree and deadwood management for 3 Natura 2000 sites prepared.	
A4, C3 **Objectives:** 3. To prepare a methodology for reintroduction of the Hermit beetle and to restore a viable population of the Hermit beetles in the Slope of Neris River by Verkiai (LTVIN0012). **Expected results:** 1. Methodology for reintroduction of the hermit beetle prepared; 2. Smart pheromone traps for hermit beetle developed. 3. At least one viable population of the Hermit beetles restored.	The objective and results are fully achieved. > Despite the prolonged term and increased price (as described under 6.2) the prototype of smart pheromone trap was successfully used in the field work. > Main strength of final methodology is a focus on practical experience. After direct distribution by e-mails, it was warmly welcomed by target audience. > Knowledge exchange with the Swedish project LIFE Bridging the Gap was important for the restoration of population, as the wooden boxes were constructed according to their experience. > It was possible to create and maintain strong hermit beetle population in LZG mainly due to the daily accurate and careful supervision by the project team. > 4 oak trunks from Strėvininkai forest (not foreseen in GA) contributed as additional habitat to the successful restoration.
C1, C2 **Objectives:** 4. To create favourable conditions for *O. eremita* and other species dependent on veteran trees in core project areas by management of veteran trees. 5. To create the steppingstones between core project areas by management of veteran trees, old parks, alleys, wooden pastures, forests of slopes, screes and ravines and other potential steppingstones or creation of temporary artificial habitats. **Expected results:** 1. 300 - 400 veteran and other biologically valuable large dimension trees restored and managed by professional arborists. 2. Creating of dispersal corridors for the Hermit beetles inside the core zones in total 10 ha; 3. Elimination of alien and invasive species in total 12 ha;	The objective and results are fully achieved. > 643 veteran trees were managed (161% of foreseen results). This activity was implemented not only in a high quantity but good quality as well, as all contractors were required to have a certificate issued by EAC (European Arboristic Council), ISA (International Society of Arboriculture) or VetCert. > Hollows management of 27 trees preventing vandalism were implemented by LFN specialists (not subcontracting), because work was unique and not tested before in Lithuanian conditions and work by LFN team was cost-efficient (5,827.14 EUR). > Kaunas Oak Forest veteran tree management maps created by Project team won 2019 A. Kapočiūnas environmental award for the best maps, showing conservation problems (Annex C1.2 submitted with Mid-term report). > Dispersal corridors created in 20.5 ha. > Eradication of alien species was performed in a bigger area (67.56 ha) than planned. Work was done for the same time and money as planned in GA. The success of eradication was mainly due to the former experience of the project team in this field. The work required yearly investigation and follow-up during the Project years and the continuation will be ensured as described in After LIFE conservation Plan.
D1, D2, D3, D4	The objective and results are fully achieved.

Objectives: 6. To monitor and evaluate the impact of the project actions. **Expected results:** **1.** Impact of the project actions monitored – 16 actions in total. 2. Monitoring of the LIFE Performance Indicators – 5 indicators monitored. 3. Assessment of socio-economic impact – assessment of direct or indirect employment growth and raising the profile of the area; 4. Assessment the project's impact on the ecosystem functions – 7 ecosystem services assessed;	> Monitoring of polypore fungi *Fistulina hepatica* was more complicated than foreseen in GA due to the drought in Lithuania, but LFN team implemented the monitoring and increased knowledge on various fungi on trees during the fieldwork, and a workshop with professional mycologist. > 608 % of area planned in GA was eradicated from alien tree species. > Distribution of the sociological survey via mass media (using LFN and Project friends' channels) allowed to reach a high number (800) of respondents. > ESTIMAP tool for the assessment of the ecosystem, services, which was foreseen in GA, was not used after a detailed analysis of its features. Therefore, more suitable tools and sources were chosen: European Soil Data Centre and online tool I-Tree Design version v.6 and v.7, together with data gathered under actions D1-D3.
E1 **Objectives:** 8. To raise public awareness on importance of veteran trees for biodiversity conservation, socioeconomic impacts and ecosystem functions **Expected results:** 1. Educational trail built; 2. 5 informational boards erected; 3. Webpage created; 4. 4 mass events organized; 5.40 groups of schoolchildren taught about the importance of old and even dead trees, the threats arising, conservation methods and all complex of species, which use veteran trees as a habitat; 6. 40 tables on deadwood trunks in the places often visited by the general public will be left; 7. 500 copies in Lithuanian and 200 copies in English of leaflet about the project will be published; 8. 200 copies in Lithuanian and English of Layman's report will be published; 9. 300 T-shirts, 500 cloth bags, 200 mugs and 500 posters with problematics of the project will be produced; 10. 10 broadcasts in mass media will be made.	The objective and nearly all the expected results achieved. > The expected results that were exceeded: 8 informational boards installed, and 35 temporal informational signs and boards were used; 136 educations were organized by LZG; 18 broadcasts in mass media were made. > The expected results that were met: 3, 4, 6, 7, 8, 9. > The expected result that is postponed to a later date: Educational trail in Kaunas Oak Forest was finalized in June 2022 (i.e. after the end of the Project.), as specified under section 6.2. >After the discussions with the KCM, the pedestrian counting solution was considered redundant and was omitted from the educational trail. > Information boards in Kaunas Oak Forest have parts for visually impaired people. The creation and production of these parts required in-depth understanding about needs of visually impaired people and will be one of few examples of educational trails, adjusted to visually impaired people.
E2 **Objectives:** 9. Share the knowledge about conservation strategies of the species and practical experience on habitat restoration between the experts and ensure transfer and replicability of demonstrative methods developed by the project. **Expected results:** 1. 3 meetings for networking with other projects organised;	The objective and results are fully achieved. > The experience exchanged in 44 events - by inviting representatives of other projects and by participating in various networking events nationally and internationally. > In the kick-off meeting, 30 people participated. > 83 participants attended the workshop. > 2 study tours (to Latvia and Sweden) were organized instead of 4 because of the Covid-19 outbreak. It was complemented by active participation in the networking events.

2. Project kick-off meeting organized with up to 15 participants; 3. Workshop on habitat management organized with up to 30 participants; 4. 4 study tours organized.	
E3	The objectives and results are fully achieved. > Due to the pandemic, an international webinar on deadwood in the urban areas was held instead of the workshop with 119 participants. > 2 scientific articles about *O. eremita* monitoring prepared by DU, the Lithuanian monitoring methodology was updated based on the experience of the project. > Final project conference with 12 speakers making presentations and 40 attendees participating in person and 65 joining online organized. > Document "Replication and transferability analysis" on how the proposed methods of the project might be applied in other contexts was published on the project's website.
Objectives: 7. To improve monitoring techniques and equipment by applying smart technologies and enhanced understanding of ethology in the species monitoring; 9. Share the knowledge about conservation strategies of the species and practical experience on habitat restoration between the experts and ensure transfer and replicability of demonstrative methods developed by the project. **Expected results:** 1. Workshop on importance and management of deadwood organized with up to 30 participants; 2. 250 in English, 250 in Lithuanian, 250 in Latvian of Best practice Guidelines published; 3. Monitoring methods of *O. eremita* improved; 4. Final project conference for up to 50 participants organized; 5. Analysis of how the proposed methods might be applied in other context prepared.	
F1	The objective and results are fully achieved. > The smooth project management was ensured by strong attention to planning, good communication inside the project team and by cooperation of all project partners. > Activities defined in After LIFE communication plan includes contribution by all project partners.
Objectives: 10. Ensure smooth project management. **Expected results:** After LIFE Conservation Plan prepared.	

6.4. Analysis of benefits

1. Environmental benefits

a. Direct / quantitative environmental benefits:

Project performed habitat restoration works in five Natura 2000 territories designated for *O. eremita* of 649,352 m^2 size. Other project territories (outside Natura 2000) where habitat improvement measures were implemented cover a territory of 158,256 m^2 in size. The numbers

calculated reflect only the number of trees managed – 643 (action C1) and their crown / root protection zone. It accurately reflects the area with the improved habitat that is critically important to the species survival.

Regarding policy implications, management plans for two of Natura 2000 territories - Kaunas Oak Forest and Slope of Neris River by Verkiai – were prepared and approved by the competent authorities. 21 new sites for Natura 2000 network meeting the qualifications for proposed sites of Community Importance (pSCI) were proposed to the MoE. 3 new Natura 2000 sites were established, follow-up of the action is planned for 2024 as described in the After-LIFE Conservation Plan. Compensation mechanism for owners having veteran and other valuable trees growing in the forest, agricultural land and/or Natura 2000 sites could be further developed according to the Project experience with the private landowners and included in the EU agri-environment and forest policies. Development of compensation mechanism is also foreseen in a new LIFE project proposal, which was submitted in the call 2021.

Invasive tree species A. negundo is eradicated in the area of 67.56 ha.

b. Qualitative environmental benefits:

The status of *O. eremita* in Lithuania is U1 "Unfavourable-inadequate" with deteriorating conservation trend, based on range, habitat, and prospects criteria. The main project activities aimed at improving the conservation status of the species and its habitat, but the time span of 5 years (or less) is too short to establish a trend. Only first signs of improvement are evident in restoration of the population (C3), an increase of deadwood for the saproxylic beetles (C1, C2), and boosted vitality of the managed trees (C1).

There were 11 threats for *O. eremita*, defined in Form B2d of the GA. Project activities had the following positive effect on them:

• Removal of dead and dying trees. Deadwood was left on the site after arboristic activities (C1) and undergrowth clearing (C2), where possible, to increased dead wood amount. In total, 798.69 solid cubic meters of trees were felled while clearing undergrowth around veteran trees and left on the site. Awareness on the importance of deadwood was increased due to the communication activities.

• Reduction of genetic exchange. Scientific information was collected and the gaps in the ecological network were identified (A1) ensuring the possibility to plan species conservation measures on a national and regional scale. An ecological network of 106 km in length was created between the biggest populations of *O. eremita* in Lithuania. A population was started to be reintroduced in its restored historic habitat (C3).

• Abandonment of pastoral systems, lack of grazing and reduction of dispersal. Existing and potential habitats of *O. eremita* were improved by clearing undergrowth around veteran trees and creating dispersal corridors (C1, C2). It was followed by an information dissemination campaign.

• Lack of regeneration of suitable habitat. 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.

• Species composition change (succession) and invasive non-native species. Alien species Acer negundo is eradicated (C2) in 67.56 ha in two Natura 2000 sites.

• Felling for public safety, removal of roadside trees. Longevity and safety of old trees are increased by implementing arboristic tree management during C1 activities. In total, 643 trees were managed by certified arborists, a considerable part of them growing in urban sites. A compromise of ensuring public safety and protecting natural values was successfully found while implementing the Project.

• Wrongly directed conservation measures and vandalism. After removing the concrete from previously mismanaged trees, 27 veteran trees with large cavities at the ground level in Kaunas Oak Forest received additional management. Protection from vandalism in Kaunas Oak Forest was ensured - fire prevention equipment was installed, and cavities were covered with parts from the trunks of the dead trees.

• Lack of public awareness. Information disseminated about the project actions has reached more than 3,163,000 persons. Interest from the public about tree management and nature conservation at large was felt during all the project years. It was met by active communication in social media, events, publications, video films etc. (please refer to the Technical part 6.1 of this report).

2. Economic benefits

Innovative equipment - Smart pheromone traps (action A.4.2.), developed and used during the project enabled the Project team to reduce traveling and extra fuel costs to a minimum. Traps can be used on a broad scale of insect species and can be adopted by different non-governmental and state institutions or business entities (e. g. working in pest control). SSPA has already expressed its interest in using smart traps for annual monitoring. The Project aimed at popularizing the arboristic culture of tree management and increasing their qualification. During the project, the number of internationally certified arborists increased from 1 to 10.

3. Social benefits

Arboristic tree management has increased the safety of visitors in the urban areas (lower risk of old branches breakages during strong wind). The general awareness of the value of veteran trees, arboristic tree management, and deadwood importance is increased due to the communication efforts.

4. Replicability, transferability, cooperation

The project's likelihood of replication is high. Its replication is policy-dependant. Several replication, transfer and cooperation actions already took place or actions were taken to encourage it (please refer to the Annex 6.4 List of replication activities.)

5. Best Practice lessons:

- Qualification of the arborists tendered was an area of special attention. Arborists working with veteran trees were required to have certificates of EAC (European Arboricultural Council), ISA (The International Society of Arboriculture), or VETcert. As arborist companies have indicated (Action D.3), the requirement to have an international certificate is spreading to other entities (e.g. municipalities) as well. The change in the number of certified arborists in Lithuania (2017 only one arborist had the ETW certificate, in 2021 already 10) was largely caused by the tender requirements during the Project.
- The successful breeding of hermit beetles in captivity by LZG (Action C.3) and releasing individuals of the hermit beetle to restored historical habitats has made a solid foundation for the population of the species to be restored. The publications „Methodology for Rearing and Breeding the Hermit Beetle" and a Manual on the Usage and Construction of the Wood Mould Boxes is describing the know-how gathered during the Project and provides information for the replication.
- Smart pheromone traps (action A.4.2.), successfully used for monitoring the target species in Latvia and Lithuania, enabled us to reduce the unnecessary traveling and extra fuel costs to a minimum. In addition, all the O. eremita beetles were released alive and well in just

a few hours after they were caught with minimal disturbance. Several non-governmental and state institutions have expressed their interest in using the technology for other species as well.

- Proactive communication with the private tree owners proved to be beneficial to the project – most of the owners have agreed to sign tree protection agreements. This made it possible to implement individual management plans for the veteran trees in the private land. The lesson learned could be further replicated in developing a one-off compensation mechanism targeted at veteran trees growing in the private land situated at the Natura 2000 sites.
- Temporal information boards and signs (action E.1.1.) have proved to be highly effective while working in well-visited urban sites. The boards and signs were used while implementing arboristic tree management to inform people about the work planned. This let to reduce the misinterpretations of the work done and saved arborist's time answering questions of the passers-by. Small-diameter signs informing park visitors about the importance of the deadwood and mounted directly on the dead trees/logs in the urbanized project territories was another successful communication measure. Often, park managers are perceived as inactive if deadwood is left on site, the signs helped to show that it was done intentionally and provided basic information about the importance of the deadwood to the public.
- Finally, a new approach to protecting the veteran trees from vandalism in the urban areas was taken. Often trees with cavities suffer from vandals – the trees are set on fire, rubbish is thrown in the cavities, etc. To prevent this, the trees were equipped with smoke detectors and fire extinguisher balls. The cavities were covered with parts from the trunks of the dead trees while installing a wooden supporting construction. Often it was needed to remove man-made inclusions of stonework and concrete first, as it can damage a hollow tree.

6. Innovation and demonstration value

- The Project demonstrated the practical process of the establishment of the first functional ecological network for species dependent on veteran trees. It has demonstrated the phases of both precise planning and implementation of practical actions like preparation of necessary documentation, habitat management in core habitats for the target species, development of steppingstone elements within the network area, involvement of stakeholders.
- The Project has demonstrated the importance of involvement of landowners and that in most cases it is possible to reach the agreements with them for the protection of valuable trees. The landowners of every inventoried tree that needed arboristic care were found using the data from State Enterprise Centre of Registers. Each landowner was contacted personally, in most cases – visiting them on site and elaborating on why that tree is worth saving.
- The project has also demonstrated how to re-establish a rare insect species in its historical habitat. This action was innovative in Lithuania. The successful captive breeding of the target species gives high potential for the use of this methodology in other countries. The artificial habitats (wooden mould boxes) have proved to be suitable for Lithuanian climate and a good example as a tool for the re-establishment of the saproxylic species.
- The monitoring techniques for *O. eremita* were improved by constructing and using of innovative equipment – smart pheromone traps, equipped with microcamera and internet connection. These smart traps can be used in a broad scale of insect species, that are lured by pheromones.
- Large scale veteran tree management actions raised the awareness in such conservation measures among the specialists and public. It was demonstrated that veteran trees are not the burden, but the value of urban territories. The Project showed that young tree felling can be a nature management tool if carried out in order to protect veteran trees, when done in a proper way and strongly based on scientific evidence and experience of certified experts.

7. Policy implications

Regional legislation. Requirement for arborists to have an international certificate is spreading to public procurements (eg. Kaunas City Municipality). The Project experience has demonstrated that tender requirements motivated arborists to increase their qualification. We see a potential of this simple measure to be further introduced to the national legislation of Green public procurement. The data gathered during the inventory of the valuable trees (A2) was shared with municipalities (Kaunas City, Kaunas District, Elektrėnai, Vilnius City). They have updated or even created (e.g., Elektrėnai Municipality) a register of valuable trees of the municipality according to the data received.

National legislation. Management plans for two of Natura 2000 territories - Kaunas Oak Forest and Slope of Neris River by Verkiai were prepared by the Project. They will ensure long term conservation of the restored habitats. The State Forest Enterprise updated the forest management plan for Dūkštos Oak Forest according to the measures implemented during this project. Proactive communication with the private tree owners made it possible to implement individual management plans for the veteran trees in the private land. The MoE has consulted the Project team if it could be further replicated in developing a one-off compensation mechanism targeted at veteran trees growing in the private land situated at the Natura 2000 sites and in protecting solitary trees in the agricultural land. Furthermore, SSPA adapted methodology of the *O. eremita* habitat evaluation for its "Criteria for good conservation status for the species and its habitat at the local level". The Methodology of *O. eremita* monitoring methods was updated too based on the Project's experience and will be used by the experts in the field nationwide. Project experts are actively participating in the "National Forest Agreement" (divisions "Forest Ecology and Biodiversity" and "Landscape of Protected Areas") organised by the MoE.

European legislation. Project Team proposed 21 new sites, meeting the qualifications as pSCI for the hermit beetle. MoE established 3 new sites according to Project proposal. The follow-up of the proposal made to the MoE regarding the expansion of Natura 2000 network is foreseen as part of After LIFE Conservation Plan. Team Member participated in consultation sessions with MoE regarding the updated National Prioritised Action Framework for 2021-2027.

7. Key Project-level Indicators

The initial KPI values were defined during the Project proposal stage and further elaborated during the Project. Action F2 "Compiling the information to complete the indicator tables" was foreseen, implemented, and described in this report under section 6.1. KPI online database is submitted for verification. Further, the comparison with the targets set and reached during the project is given.

Indicator	Foreseen impact	Results
Areas progressing towards improvement or restoration or in a favourable conservation status	30 ha of habitat 9180* Tilio-Acerion Forest of slopes, screes, and ravines	31 ha in Natura 2000 sites progressing towards the improvement due to practical nature management project actions.
Number of threatened species in improved or secured status	300 populated trees by *Osmoderma eremita, Cucujus cinnaberinus,* and *Fistulina hepatica*	During project monitoring activities *O. eremita* adult beetles were caught in 97 sites. Therefore, at least 97 trees are populated. Most probably in parks, tree alleys and forests more trees are

		inhabited, but the exact number of inhabited trees is difficult to evaluate. 4 sites (at least 4 trees) inhabited by *Cucujus cinnaberinus* and *Fistulina hepatica.* Especially *C. cinnaberinus* need time to establish as its larvae requires rotten tree bark. Therefore, the further rise of the species population is estimated in the Project areas after the end of the Project. In the historical habitat the Slope of Neris River by Verkiai the population was restored. It is estimated that at least 8 trees and semi-natural habitats are inhabited. At least 12 trees are proven as inhabited with *O. eremita* according to the larvae excrements. The initial situation was estimated as 100 populated trees. Due to the project activities, the status of species in those trees is secured. The total number of trees, inhabited by one of the given species is evaluated as at least 221 trees and further rise to more than 300 trees is foreseen mainly due to the improved habitat conditions.
Reduction of invasive alien species	12 ha of invasive trees species *Acer negundo* eradicated	60.83 ha in Kaunas Oak Forest and 6.73 ha in the Slope of Neris River by Verkiai (67.56 ha in total)
Jobs created	7 Full time equivalent for arborists having European Tree Worker (ETW) certificate	The need of high qualified arborists has increased. At the end of the Project, there are 10 Lithuanian ETW certified arborists (compared to 1 arborist at the start of the Project).
Numbers of replication	15 replications	23 replications reached as described under section 6.4. Analysis of benefits.
Number of individuals reached	500,000 individuals	3,163,027 engagements made of the Project communication.
Website visits	10,000	10,000 visits have been recorded by 6 727 unique visitors. Posts in FB have reached 257,000 persons.
Number of entities/individuals changing behaviour	5 entities /100,000 individuals	At least 22 entities (private for profit, public bodies, NGO's) changing the behaviour.

8. Comments on the financial report

Main extraordinary costs not foreseen in the budget:

No.	Action	Cost item	Amount in EUR with VAT	Approved by CINEA
1.	A4	Temperature and humidity loggers (6 units)	333.96 EUR	E-mail on 03/04/2020
2.	C1	Additionally managed trees (51) in Kaunas Oak Forest	20,398.18 EUR	Letter on 29/07/2021
3.	C1	Additional protection measures for 4 veteran trees (KAUM005, KAUM006, KAUM014, VLNR041)	19,024.64 EUR	Email on 04/11/2020
4.	C3	Wooden boxes (2 units)	550.00 EUR	E-mail on 03/04/2020
5.	C1	Used car for project use VW Passat JDD726 (Annex 8. Comparison of the price for renting and purchasing a car)	9,650.00 EUR	Letter on 30/07/2020
6.	C1	Additional outdoor fieldwork clothing	897.01 EUR	Letter on 30/07/2020
7.	C1	Binoculars (3 items)	607.00 EUR	Letter on 30/07/2020
8.	E1	Portable information boards about tree arboristic management actions (30)	144.00 EUR	E-mail on 20/11/2018
9.	E1	Metallic plates on managed trees and special nails	1,556.68 EUR	E-mail on 18/01/2022
10.	E2	Training of Osmo-dogs for *O. eremita* larvae monitoring	2,942.42 EUR	E-mail on 12/092017

All main extraordinary costs were approved by CINEA either by e-mail or official letter as indicated in the table above. The reasoning and need of additional cost No. 1-4 and 8-10 are described under relevant project action description in the section 6.1 in this report. Reasoning and need of the costs No. 5-7 are described in the Annex 6.4 Comparison of the price for renting and purchasing a car.

8.1. Summary of Costs Incurred

PROJECT COSTS INCURRED				
	Cost category	Budget according to the grant agreement in €*	Costs incurred within the reporting period in €	%**
1.	Personnel	630,300.00	588,287.76	93.62
2.	Travel and subsistence	98,280.00	51,173.22	53.55
3.	External assistance	442,020.00	349,457.34	79.04
4.	Durables goods: total non-depreciated cost	-	-	-
	- Infrastructure sub-tot.	26,000.00	0.00	0.00
	- Equipment sub-tot.	24,100.00	31,026.24	128.74
	- Prototype sub-tot.	10,000.00	18,917.70	189.80
5.	Consumables	22,070.00	19,378.18	87.80
6.	Other costs	36,100.00	31,868.71	88.28
7.	Overheads	89,130.00	76,239,87	85.79
	TOTAL	**1,378,000.00**	**1,166,349.02**	**84.64**

*) If the Agency has officially approved a budget modification through an amendment, indicate the breakdown of the revised budget. Otherwise this should be the budget in the original grant agreement.
**) Calculate the percentages by budget lines: e.g. the % of the budgeted personnel costs that were actually incurred

- Travel and subsistence costs were lower than foreseen in the GA mainly due to the travel and meeting in person restrictions related to Covid-19, which took place from I quarter of 2020 to the end of the Project.
- Prototype costs were higher than foreseen in GA mainly due to the fact, that 4 versions of the smart trap were needed to create the final smart trap prototype version. The improvements are described in more details under Project action A4 in the sections 6.1 and 6.2 of this report.
- The budget shift between the different budget categories is 1% (well within 20%, as required by Financial and administrative guidelines).

8.2. Accounting system

The accounting system in LFN is based on special project number and project acronym (342239 -LIFE16NAT/LT/000701), used in internal book keeping and marking every financial

document. All costs related to this project are registered under this account. LFN has separate bank account for this project.

According to the internal order of the LFN, financial documents (i.e. invoices, contracts) up to 2,000 EUR are approved and assigned to the project by the project manager, if the amount exceeds 2,000 EUR, the financial document is approved by the project manager and signed by LFN director.

Project staff working time is calculated by filling in a time-sheet. There is no electronic timing system. At the beginning of each month, employees are provided with a monthly timesheet, employee records the hours worked each day. Each employee records monthly time and submits filled timesheet to the project manager. The project manager and the financial manager checks the information provided in a timesheet. After verification, the financial manager submits them to the accountant for the calculation and payment of salaries.

The supplier's invoice or other payment document is always required to include the project number and the acronym of the project. In situations where the invoices are of very low value or due to unforeseen circumstances, the supplier could not provide the project number, the project manager stamps the document and assigns it to the project costs.

All associated Beneficiaries have separate accountancy of the costs of implementation of Associated Beneficiary for project actions. All Associated Beneficiaries have separate bank accounts for this project only.

Each Associated Beneficiaries is required to keep all financial documents in a separate accountant book. In Kaunas City Municipality all operations within the project is named LIFE OSMODERMA, separate accountant code in the accounting system is 241110348. Lithuanian Zoological Garden - accountant code in the accounting system is „ES_AUKSVAB“. Daugavpils University Nature Studies and Environmental Education Centre accountant code in the accounting system is 6317. Each financial document required to have project number and an acronym so that can be classified as project costs. Financial documents are assigned to the project costs by the local project manager.

Travel. LFN based on Guidelines for applicants 2014. LIFE Nature and Biodiversity, prepared the internal director's order just for LIFE OSMODERMA project („Dėl LIFE Osmoderma projekto automobilių kuro ir automobilių eksploatacijos“ No. LGF-17-22, date 12/12/2017) for reimbursement for car use and travel cost. According this internal director's order No. LGF-17-22 travel costs are reimbursement by car use in kilometres (organisations own cars or cars with car use agreement) for project activities, cost are estimated at 0.25 EUR/km. The law of per-diem changed in July 2018, increasing per-diem for one day travel in Lithuania from 2.85 EUR to 15.00 EUR. Since it was predicted, that with a lot of fieldwork planned in the Project increased per-diem might be the cause for the exceeded budget for the travel foreseen in GA, it was decided to reduce the per-diem by 50 % in accordance with applicable laws. According to resolution’s „Dėl dienpinigių ir kitų tarnybinių komandiruočių išlaidų apmokėjimo“(newest version was implemented on 01/07/2018) paragraph 9 “By collective agreement or contract of employment per-diem can be decreased no less than 50 %”. All project employees agreed on decreased per-diem by 50 % for the travel in Lithuania by contracts of employment from 01/09/2018. Full amount of per-diem (100%) was returned starting from 01/11/2021

Project partners in Lithuania: LZG and KCM carry out all travel calculation and reimbursement by updated The Labor Code and by main two resolutions “Dėl komandiruočių sąnaudų atskaitymo iš pajamų tvarkos patvirtinimo”, “Dėl dienpinigių ir kitų tarnybinių komandiruočių išlaidų apmokėjimo” and all documentation is carry out by internal rules. At DU inner regulations on calculation and reimbursement of travel costs have not been developed. Travel costs are compensated according to existing legislative regulation. The

lending contracts for use of private cars of project staff for Project needs are signed. The lending contracts include only covering the fuel costs by fuel purchased documents (receipts) with limits set up in technical documentation of cars.

PROCUREMENTS. In LFN all procurements are carried out in accordance by resolution of the Minister of Environment "Dėl ūkio subjektų, kurie nėra perkančiosios organizacijos pagal lietuvos respublikos viešųjų pirkimų įstatymą, pirkimų vykdymo ir priežiūros tvarkos aprašo patvirtinimo".

Project partners LZG and the KCM carry out all procurements in accordance by law "Viešųjų pirkimu įstatymu" as well as the updated procedure for procurement "Mažos vertės pirkimų tvarkos aprašu".

At DU inner regulations on performance of procurements have not been developed, it is also not foreseen by legislation of the Republic of Latvia regulating work of non-governmental organizations. For definition of potential suppliers of goods or service for DU the price quotation has been organised with at least three potential subcontractors or suppliers of goods and the principle of best value for money is taken into consideration. All procurements are carrying out by actual version of the Financial and Administrative Guidelines.

VAT. LFN is a VAT payer, but LFN cannot recover VAT in LIFE projects. LFN send an enquiry (Annex FIN_7.1.1 submitted with Mid-term report) for the TAX Inspectorate whether VAT can be recovered in LIFE projects by Lithuanian juridical bodies, which do implement LIFE projects. The enquiry asked about all LIFE projects, run by LFN and its partners. Tax inspectorate of Lithuania issued a certificate Np. (32.39-PVM E) (Annex FIN_7.1.2 submitted with Mid-term report) which confirms that LFN as well as other Lithuanian juridical bodies cannot recover VAT because LIFE projects are not used for their commercial activities.

8.3. Partnership arrangements (if relevant)

All financial obligations were settled in partnership agreements signed by both parties. In case of unforeseen circumstances, for example if project the partner requests to change the payment schedule, both parties could sign amendment of the partnership agreement. The partnership agreements ascertain that the partners record all project costs separately from other beneficiary costs. All costs incurred in relation to the project activities are recorded by each beneficiary in the form of financial tables / reports and submitted to the coordinating beneficiary within the deadlines set out in the partnership agreements. The financial statements. Filled by beneficiaries, were checked by the coordinating beneficiary. Consolidated cost statement was prepared by coordinating beneficiary after partners submit completed financial reports.

8.4. Certificate on the financial statement

Audit company UAB „Auditėja" has performed audit.
UAB "Auditėja"
Registration number: 135480859
Šiaurės pr. 8A, LT-49155 Kaunas, Lithuania

8.5. Estimation of person-days used per action

Action type	Budgeted person-days	Estimated % of person-days spent
All projects when applicable Action A: Preparatory actions	1,530	83% (1,280 days)
NAT projects Action C – Concrete conservation actions	2,150	77% (1,664 days)
NAT and CLIMA projects Action D: Monitoring and impact assessment	520	73 % (377 days)
NAT and CLIMA projects Action E: Communication and Dissemination of results	1,180	102 % (1,207 days)
NAT and CLIMA projects Action F: Project management (and progress)	1,350	115 % (1,546 days)
TOTAL	**6,730**	**90 % (6,074 days)**

List of Project deliverables submitted with Progress Report 2018 / Mid-Term Report / Final Report and Annexes, submitted with the Final report

Name of the Annex	Submitted with
A1 **Deliverable** Ecological network LT-LV	Final report
A1 **Deliverable** Scientific article on Ecological Network	Final report
A2.15 **Deliverable** Action plan for the ecological network Action A2	Mid-term report
A2 Map Trees in Ecological Network	Final report
A2 All Inventoried trees	Final report
A.3.1.1. **Deliverable** Management plan of Kaunas Oak Forest (Order of the Minister of Environment, Confirmative and Justifying parts of the plan	Mid-term report
A.3.1.2. **Deliverable** Management plan of Neris Slope by Verkiai (Order of the Minister of Environment, Confirmative and Justifying parts of the plan;	Mid-term report
A3.2.1 **Deliverable** - Guidelines for management of veteran trees and deadwood, Neries upės šlaitas ties Verkiais	Progress Report 2018
A3.2.2 **Deliverable** - Guidelines for management of veteran trees and deadwood, Dūkštų oak forest;	Progress Report 2018
A3.2.4. **Deliverable -** Guidelines for management of veteran trees and deadwood, Kaunas oak forest;	Progress Report 2018
A3.2.5 **Deliverable** Guidelines for management of veteran trees and deadwood, English version;	Mid-term report
A3.2.6 **Deliverable** -Guidelines for management of veteran trees and deadwood, Latvian version;	Mid-term report
A4.1.2. **Deliverable** - Methodology for reintroduction of the hermit beetle	Mid-term report
A4 Loggers data	Final report
A4 **Deliverable** Methodology of *O. eremita* reintroduction EN	Final report
A4 **Deliverable** Methodology of *O. eremita* reintroduction LT	Final report
A4 Versions of smart pheromone trap	Final report
C1 List - all managed trees	Final report
C1 managed trees map Ecological corridor	Final report
C1 managed trees map Kaunas Oak Forest	Final report
C1 managed trees map Slope of Neris River by Verkiai	Final report
C1 managed trees map Dūkštos Oak Forest	Final report
C1 Smoke alarm device	Final report
C1 Fire extinguishing ball	Final report
C1 Kaunas City Municipality - commitment to maintain tree management work in Kaunas Oak Forest	Final report
C1 Platform for root protection	Final report
C1 Map Surroundings of Neris River Loops (LTELE0005)	Final report
C2 Management of migration corridors in Dūkštos Oak Forest	Final report
C3 Release of *Osmoderma* to its historical habitat 2021	Final report
D2 Maps of improved habitats 9180	Final report
D2 Maps with the sites and results from *O. eremita* monitoring	Final report
E1 Kaunas Oak Forest Educational Trail	Final report
E1 Information boards Kaunas Oak Forest Educational Trail	Final report
E1 KCM commitment to finish the implementation of educational trail	Final report
E1 Informational boards on the importance of the deadwood	Final report

E1 Informational signs on deadwood	Final report
E1 Metallic plates on managed trees	Final report
E1 **Deliverable** Layman's report	Final report
E1 Results of the Dissemination and Communication Actions	Final report
E3 **Deliverable** Best Practice Guidelines	Final report
E3 **Deliverable** Methodology of *O. eremita* monitoring methods	Final report
E3 **Deliverable** Scientific article about *O. eremita* monitoring methods	Final report
E3 **Deliverable** Analysis of how the proposed methods might be applied in other contexts	Final report
E3 Programme of the final conference	Final report
E1.2.6. **Deliverable -** Leaflet in Lithuanian;	Progress Report 2018
E1.2.7. **Deliverable -** Leaflet in English;	Progress Report 2018
F1 **Deliverable** After LIFE conservation plan [EN]	Final report
F1 **Deliverable** After LIFE conservation plan [LT]	Final report
F1 **Deliverable** After LIFE conservation plan [LV]	Final report
6.2 Breakdown of costs for the smart pheromone traps	Final report
6.4 Comparison of the price for renting and purchasing a car	Final report
8. List of replication activities	Final report

List of Project financial annexes, submitted with the Final report

Name of the Annex	File type
Financial report LIFE Osmoderma CONSOLIDATED final	Exel
Financial report LIFE Osmoderma CONSOLIDATED final - payment request	Signed, PDF
Financial report LIFE Osmoderma CONSOLIDATED final - costs summary	Signed, PDF
Financial report LIFE Osmoderma CONSOLIDATED final - income summary	Signed, PDF
Financial report LIFE Osmoderma CONSOLIDATED final - consolidated FS	Signed, PDF
Financial report LIFE Osmoderma CONSOLIDATED final – funds distribution	Signed, PDF
Financial report LIFE Osmoderma LFN final	Exel
Financial report LIFE Osmoderma LFN final - individual cost statement	Signed, PDF
Financial report LIFE Osmoderma LFN final - certificate	Signed, PDF
Financial report LIFE Osmoderma DU final	Exel
Financial report LIFE Osmoderma DU final – individual cost statement	Signed, Asice
Financial report LIFE Osmoderma DU final - certificate	Signed, Asice
Financial report LIFE Osmoderma KMS final	Exel
Financial report LIFE Osmoderma KMS final – individual cost statement	Signed, PDF
Financial report LIFE Osmoderma LZG final	Exel
Financial report LIFE Osmoderma LZG final - individual cost statement	Signed, PDF
Financial report LIFE Osmoderma LZG final - certificate	Signed, PDF