



LIFE Project Number  
< **LIFE14 NAT/EE/000126** >

**Mid-term**  
**Covering the project activities from 01/09/2015<sup>1</sup> to 30/06/2018**

Reporting Date<sup>2</sup>  
< **31/12/2018** >

LIFE PROJECT NAME or Acronym  
< **LIFE Mires Estonia** >

Data Project

<b>Project location:</b>	Estonia, NE and Central Estonia
<b>Project start date:</b>	< 01/09/2015 >
<b>Project end date:</b>	< 31/08/2020 > <b>Extension date:</b> < ND >
<b>Total budget:</b>	€ 2,815,576
<b>EU contribution:</b>	€ 2,100,713
<b>(%) of eligible costs:</b>	74,61

Data Beneficiary

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<sup>1</sup> Project start date

<sup>2</sup> Include the reporting date as foreseen in part C2 of Annex II of the Grant Agreement

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## 2. List of key-words and abbreviations

ARHV – NGO Archaeovision  
DL – deliverable  
ELF – Estonian Fund for Nature  
MoE – Ministry of Environment  
MS – Milestone  
NCA – nature conservation area  
ND – not determined  
Prg – paragraph  
PR – public relation  
PrRI – Progress Report I  
PrRII – Progress Report II  
RMK – State Forest Management Centre  
Tartu Un – University of Tartu  
UAV – unmanned aerial vehicle

### 3. Executive Summary

#### 3.1. General progress

The work conducted so far has led towards achievement of objectives of the project. Main emphasis has been on following:

I Preparatory actions (field surveys on drainage systems, potential cutting areas, archaeology, evaluation of the state of target habitats and species) in order to finalize restoration and technical plans on project areas;

II Monitoring actions to determine conditions before restoration actions;

III Starting restoration actions in cooperation with RMK (forest management actions have been implemented in Soosaare and most part of Palasi in Sirtsu NCA) and implementation of public procurement for closing ditches has been completed in Soosaare, Feodorisoo and Palasi;

IV Public awareness (public meetings for discussion and introduction of restoration actions; wild hiking trips; participation in seminars and conferences; articles in media and professional journals; interviews with local people; involvement of volunteers).

All the work has been supported by smooth project administration and coordination between project partners, steering group and external monitoring team.

Activities so far have supported fulfilment of project objectives. Still, compilation of restoration plans and technical projects took longer time than expected, partly related to changes in project area due to findings in field work, e.g. additional drainage systems which were unknown during application preparation process; additional inventories in extended restoration areas which also delayed outcomes of inventories of target species. Another challenge was the need to get conditions and acceptance for restoration work in different stages of technical planning from different state agencies which took much longer than expected. Also, forest management actions which were expected to start in winter 2016/2017 were delayed due to weather conditions (temperatures above 0°C and rainy) and unsuccessful procurement by RMK. Due to delays with preparation of restoration plans and technical projects, forest management actions in most of the areas could not be started in winter 2017/2018 and were postponed for a year. Therefore, a proposal to extend project period up to 1.5 years will be presented in the beginning of 2019. This is also necessary in order to carry out proper monitoring of restoration actions and providing appropriate guidelines (D1, D2), establishment of LIFE trail (E2), compiling study programs and implementing study days (E3). In addition, there is a risk that weather conditions are unfavorable for restoration work as in 2018/2019 and/or 2019/2020, but extension of project period provides enough time to overcome potential delays.

### 4. Introduction

The main objective of project LIFE Mires Estonia is to secure the most favourable conservation status for wetlands, especially mires and priority habitats protected under EU Habitats Directive - Active raised bogs (7110\*), Bog woodland (91D0\*), and Fennoscandian deciduous swamp woods (9080\*). In addition, project will affect protection and management of other habitats as well as species related to the habitats protected also by EU Habitats Directive and Bird Directive: Natural dystrophic lakes and ponds (3160), transition mires and quaking bogs (7140), Fennoscandian herb-rich forests with *Picea abies* (9050), and Western Taiga (9010\*); birds *Tetrao urogallus* and *Lagopus lagopus*, amphibian *Rana arvalis*, and semi-aquatic invertebrates *Leucorrhinia* dragonflies. Also *Nymphalidae* butterflies are included within target species.

In order to achieve this there is a need to stop degradation of habitats caused by drainage. Within LIFE Mires Estonia regeneration of favourable conditions for development of natural hydrology has been planned in following sites: Alam-Pedja NCA (Soosaare mire), Agusalu

NCA (Feodorisoo mire), Ohepalu, Tudusoo and Sirtsu NCAs, and Lahemaa National Park (Laukasoo mire). Restoration is also aiming for improvement of conditions of several wetland related species with special attention to *T. urogallus*, *L. Lagopus*, *R. arvalis*, *Leucorrhinia* populations, and *Nymphalidae* butterflies. It was estimated that restoration area affects app. 5800 ha of mires of which 3450 ha are Natura 2000 priority habitats (7110\*, 91D0\*, 9080\*, 9010\*), it was expected to close app. 240 km of drainage ditches and restore mire habitats in 50 ha of abandoned peat mining fields located in nature conservation areas.

Also following objectives were set:

I To present project results on national and international scale in order to share, spread and gain knowledge regarding restoration and management of mire habitats.

II To raise public awareness regionally to influence the local inhabitant's attitude towards safeguarding of internationally valuable wetlands, and improve understanding of current nature conservation issues, habitats of EU importance and Natura 2000 network.

III Development of a methodology and guidelines for restoration of degraded mire habitats sites concurrently supporting *T. urogallus*, *R. arvalis*, and *Leucorrhinia* populations.

IV Involvement of volunteers in mire restoration activities.

It is expected that due to project actions there will be significant and sustained improvement of conditions of the EU priority habitats Active raised bog habitats (7110\*; restored area estimated 3409.8 ha (originally 2447.2 ha)), Bog woodland (91D0\*; respectively 700.0 and 567.8 ha), Fennoscandian deciduous swamp woods (9080\*, 296.0 and 159.0 ha), and Western taiga (9010\*; 398.0 and 276.2 ha). In addition, restoration activities aim to improve conditions of Transition mires and quaking bogs (7140), Degraded raised bogs still capable of natural regeneration (7120), Natural dystrophic lakes and ponds (3160), and bird species *T. urogallus*, *L. lagopus*, amphibian *R. arvalis*, and *Leucorrhinia* dragonflies (also protected by EU Habitats and Bird Directives), and *Nymphalidae* butterflies. Restoration area affects app. 7640 ha (originally 5800 ha) mires covering 5024.2 ha (originally 3610.7 ha) of Natura 2000 habitats (including 4803.8 ha of priority habitats). Methodology is under development in order to provide guidelines to reduce potential negative impacts to abovementioned species due to restoration activities, e.g. removal of trees or sudden closure of drainage ditches. Therefore, dynamic spatial planning approach has been partly already elaborated in order to balance the restoration benefits and risks, and eventually ensure that restoration activities create quality habitats for various species. The project is innovative in combining the central concepts of favourable conservation status and precautionary principle.

Project partners involve volunteers into NCA management actions and thus, create better understanding and commitment for nature conservation efforts in Estonia as well elsewhere as there are also foreign participants at volunteer camps. In total 50 volunteer camps for app. 500 participants are planned. Also, a Platform meeting on Volunteers' contribution to N2000 network will be organised in cooperation with EASME, NEEMO, Ministry of Environment of Estonia, and other LIFE projects in Tartu from 19<sup>th</sup> to 21<sup>st</sup> of September 2018. The main goal of the meeting is to share experiences, to discuss lessons learned and to identify steps to take in order to increase the impact of volunteers in nature conservation. Participants will also explore international cooperation possibilities and discuss future networking. One day is dedicated to restoration work in Soosaare restoration area.

Public events are organised in order to introduce restoration activities, study days for schoolchildren and teachers, establishment of LIFE trail – all these actions are expected to approach around 90 000 persons and inform them about Natura 2000 habitats, their values and restoration efforts in Estonia.

Materials made available on project homepage will raise awareness about the value of priority habitats and the need of their conservation and restoration (reach to 20 000 persons). It is expected that the project will make a significant contribution to the further management and restoration of EU priority habitats in Estonia and other EU countries.

## 5. Administrative part

Project manager (Jüri-Ott Salm) has kept a system for smooth change of information between project partners and staff. For that purpose, monthly partner meetings have been arranged, e-mail list is active, and if needed, additional meetings have been held. By June 2018 steering group has had five meetings (protocol of meeting held in 2018 provided at [Annex 1](#), protocols from meetings in 2016 were provided with PrRI and in 2017 in PrRII). Project manager has been available for interviews and inquiries, and provided presentations of the project in different work-shops and conferences. Since December 2017 Jüri-Ott Salm has been employed as part-time project manager (at least 75% of work time) as the number of tasks is reduced in relation to approval of restoration plans and final stage of technical design. The changes have not hampered implementation of the project task (e.g. procurement for conservation actions C1 and C2, approval of technical plans). The situation will be reviewed if actions C1 and C2 (scheduled from July 2018) need more field work and time compared to present status.

Project manager is assisted by ELF's executive committee members in implementation of tenders, contracting experts and tenderers, and other financial and organisational matters.

Project assistants (Kristiina Kübarsepp Sept 2015 to Oct 2015, Aili Saluveer (since Oct 2015) and Liina Järvpõld since May 2018) have been working on digitalisation of field inspection work, maintaining technical documentation, preparation of inquiries and informative letters, agreements, organisation of meetings in ELF's premises, and taking care of the office for the project staff.

Project financial assistants (Heda Kalmus Sept 2015 to Nov 2015 and Kadri Kalmus (since Nov 2015) have been involved in financial planning of the project, controlling expenditure documents and providing financial reports of the project. Doing so, they also provided assurance that project expenditures are in line with LIFE, EU and national provisions. They also have checked financial correctness of associated beneficiaries' financial reports and provided answers for relevant enquiries.

Public relations coordinators – (Kertu Hool, Sept 2015 to Aug 2016 (starting maternity leave) and starting again from April 2018); Tarmo Tüür, since Sept 2016 until January 2017, and Mariliis Haljasorg, since January 2017 to April 2018, Laura Oro replaced Mariliis Haljasorg during her vacation in June to July 2017 and working part time on the project from February), Siim Angerpikk was involved in May and October 2017 in relation to production of study videos) – have updated project web site in cooperation with ARHV. There has been a lot of information exchange with journalists. Articles and press-releases as well as news for social media have been prepared with assistance of PR coordinator. PR coordinator is also responsible for the overview of media coverage and relevant statistics.

ELF's expert Piret Pungas-Kohv is on maternity leave since December 2017 and is expected to be back to work in mid-2019. Still, her tasks related to the project could be fulfilled with prolonged schedule of the project agreement as many of the actions have been completed (e.g. Wikipedia articles; collection of meta-data; provision of input on cultural meta-data for restoration plans; data-base on literature) and she has also implemented some of them during the maternity leave period (e.g. information boards to Seljamäe nature trail, articles).

In ARHV local manager (Kaarel Sikk) has been active and their part of project is coordinated according to project plan.

This is also the case of Tartu Un. Only change has been the replacement of Tartu Un local manager (Riinu Rannap, Sept 2015 to Aug 2016; Voldemar Rannap, since Sept 2016).

There has been fluent exchange of information in means of e-mail communication, meetings and visits to ELF office and project sites with Luule Sinnisov from monitoring agency NEEMO. All needed information for reporting has been delivered and questions raised by both parties have been answered which has led to effective project development.

## 6. Technical part

### 6.1. Technical progress, per Action

#### **Action A1 Compilation or renewal of the restoration plans - Completed**

Foreseen start date: 01.09.2015 Actual start date: 01.09.2015

Foreseen end date: 30.06.2017 Actual end date: 31.12.2017

Name of the deliverable	Deadline	Actions (Status 30/06/2018)
Restoration plans compiled for restoration of hydrology - 3 sites (Ohepalu, Laukasoo, Tudusoo)	01/12/2016	The task was finalized in Dec 2017. Ohepalu (Dec 2017), Laukasoo (Dec 2017) and Tudusoo (Nov 2017) restoration plans were approved by Environmental Board and RMK. Documents provided in PrRII Annex 2.
Updated restoration plans for restoration of hydrology - 3 sites (Soosaare, Agusalu and Sirtsu)	01/12/2016	The task was finalized in Dec 2017. Soosaare (Dec 2016), Sirtsu (Nov 2017) and Agusalu (Dec 2017) restoration plans were approved by Environmental Board and RMK. Documents provided in PrRII Annex 2.
Updated restoration plans for all areas based on results from Actions A2, A3, A4	31/05/2017	Work was finalised in Dec 2017 in the course of compilation of restoration plans which were approved (dates of approvals provided upwards).

All restoration plans have been approved by Environmental Board and RMK. Public consultation and meetings (10 events) were organised in localities which were considered as closest and accessible for local people and municipality administrations. In Laukasoo there was a need for 3 public meetings as several issues were raised by local community – this led also to outsource additional expert opinion in order to assess potential hydrological impact of restoration to surrounding land areas. The assessment concluded that there would be no substantial impact and therefore original plan was followed. Also, there was consultation with private landowners in Soosaare, Laukasoo, Sirtsu and Ohepalu in order to find out if they would approve changes in water regime on their land. In 2 occasions out of 8 these were approved. PR manager informed local journalists and in most cases the plans were covered in local media. Also social media, village movement, hunters and other potential stakeholders were informed about the meetings and plans.

Action included field inventories in all restoration areas in order to map and evaluate conditions of existing drainage network, evaluation of conditions of these part of habitats where forest management was planned, collection and analyze of data from old maps, orthophotos and existing databases. Compiling plans took longer due to changes in restoration area and gathering

relevant data (also considering input from Action A4). Work was implemented in close cooperation with RMK and Environmental Board.

Action A1 provided most of needed input for A2 and at first phase of the project it was expected that ELF's experts could compile also technical plans by themselves. This led to increased work load of ELF's experts within actions A1 and A2 but external expertise costed less than budgeted and extra work load of ELF experts was covered by that. External experts were needed due to high workload as well as conditions set by legal acts – involvement licensed experts for some of the tasks was precondition.

Suggestions to increase restoration area (compared to area in LIFE agreement), was proposed within PrRII (PrRII Annex 2) and approved by EASME. PrRII Annex 2 included also approved restoration plans.

Reason for delay in fulfillment of actions were related to increase of the area, more detailed description provided in prg. 3.1.

### Action A2 Technical designs and building permits – In Progress

Foreseen start date: 01.06.2016 Actual start date: 01.06.2016

Foreseen end date: 31.12.2019 Anticipated end date: 31.12.2019

Name of the MS	Deadline	Actions (Status 30/06/2018)
External assistants for technical design contracted and work started	31/05/2016	Two external companies contracted: AS Kobras for all areas except Ohepalu (contracts in May and July 2017), OÜ Consultare for Ohepalu (contract in Oct 2017).
Expert and public meetings elaborated	31/03/2018 31/08/2018 <sup>3</sup>	Public meetings for introducing restoration plans implemented for all 6 project areas. Meetings to introduce exact technical designs were organized as following: Feodorisoo in 24/01/2018; Lauaksoo in Palmse 13/04/2018; Tudusoo and Sirtsii 28/05/2018. In Soosaare there was in total 1 meeting on 30/09/2016 and after consultation with local municipalities additional meeting was not necessary. For Ohepalu a meeting will be organized in summer 2018 after approval of technical design by RMK.
1st review of technical design and permits based on monitoring results (Actions D1 and D2)	31/12/2018	Not relevant yet as restoration actions have been delayed.
2nd review of technical design and permits based on monitoring results (Actions D1 and D2)	31/12/2019	Not relevant yet.

<sup>3</sup> in red colour proposals for extension of deadlines provided with current report, these deadlines remain into timeframe of current grant agreement

Name of the DL	Deadline	Actions (Status 30/06/2018)
Technical designs elaborated for all restoration sites and relevant permits provided	31/12/2017 31/09/2018	All technical designs are approved except Ohepalu. Soosaare was approved in July 2017 (provided within PrRII, Annex 2), amendments approved in February 2018; Feodorisoo in February 2018; Laukasoo in April 2018; Tudusoo and Sirtsu in June 2018. Approved technical design provided in <a href="#">Annex 2</a> . Also version of Ohepalu technical design approved by RMK and Ministry of Defence is annexed. Reasons for delay with Ohepalu is provided in prg 6.2.
Reviewed technical designs and permits based on monitoring results (Actions D1 and D2)	31/12/2019	Not relevant yet.

Actions A1 and A2 were implemented simultaneously by ELF experts, also two subcontractors were involved to compile technical projects with additional effort for closing or changing amelioration systems and avoidance negative impacts on infrastructure (mainly forest roads). For biggest share of the work public procurement for contracting experts was carried out. In Feodorisoo, Laukasoo, Sirtsu and Tudusoo areas technical planning was 2-fold: within first phase there was a need to evaluate potential impact on infrastructure and if needed, project mitigation measures. In Laukasoo, extra project was made concerning closing major drainage ditch in order to restore a lake in the center of the mire with substantial positive effect on surrounding 7110\*.

Some field work was carried out already within A1 but there appeared a need for additional checks in certain areas to control existing data or work on special solutions (e.g. access to restoration areas). In two areas there were several landowners – in Laukasoo 8 agreements were made and in Ohepalu 21 - with whom approvals for access over their land was acquired. Due to some denials routes and projects had to be re-planned but positive aspect was that this actually provided better contacts with local communities and participation in public meetings was much more active. This allowed also more explicit discussion on management and protection of Natura 2000 sites. 82 participants took part of 4 meetings where technical plans were introduced, amongst them were local community members, land owners, officials from municipality administration, Environmental Board, RMK, Agricultural Board, and experts from LIFE ME project.

The main reason for delays for approval of technical plans were that there are four different agencies (RMK, Environmental Board, Agricultural Board, local municipality) which provided their conditions and acceptance in different stages of technical planning and they usually have been/are taking the maximum allowed time for this. In Ohepalu the reason for delay was that until March 2018 it was unknown to ELF that additional approvals should be acquired also from the Ministry of Defense which took additional time. Also there were problems to get good quality technical project from OÜ Consultare – the documents were not approved by ELF several times in row. Still, it does not prevent start up or continuation of restoration actions in 2<sup>nd</sup> half of 2018 or beginning of 2019 in all areas.

Personnel costs have been increased due to extra work by ELF expert Marko Kohv by app. 27 000 EUR by June 2018 and some extra (maximum 3000 EUR) will be needed to complete tasks

and make amendments, these could be compensated as costs for external expertise were approximately 65 000 EUR lower (the final sum depends on need if any for amendments).

### Action A3 Archaeological survey of the project sites – In progress

Foreseen start date: 01.09.2015 Actual start date: 01.09.2015  
 Foreseen end date: 30.08.2020 30.08.2021<sup>4</sup> Anticipated end date: 30.08.2021

Name of the MS	Deadline	Actions (Status 30/06/2018)
Field surveys finished in Sirtsu and Alam-Pedja areas	12/2016	Field surveys have been finished in Sirtsu and Alam-Pedja areas, reports were disclosed 05/2017.
Field surveys finished in all restoration areas	12/2017	Field surveys were finished in all restoration areas by 12/2017 and relevant information provided in special reports.
Archaeological field monitoring elaborated in restoration areas and results are provided for public use and environmental awareness activities	07/2020 11/2021	Not relevant yet.

Name of the DL	Deadline	Actions (Status 30/06/2018)
Field surveys (archaeology) special reports delivered for all restoration areas	10/2017	For Sirtsu and Alam-Pedja areas compiled in May 2017, in other areas by 12/2017. Reports were submitted with PrRII Annex 3 and are available on the project website.
Monitoring of the restoration work in order to preserve and determine archaeological values, report on activities provided	03/2020 11/2021	Not relevant yet
Field survey reports, photos, press-releases on archaeology	05/2020 11/2021	Initial field survey reports finished 12/2017. Other points not relevant yet

All field surveys have been completed, monitoring of restoration works will depend on action C1.

To raise awareness of the project, restoration and cultural heritage of mires, people with different background were involved as volunteers during archaeological fieldworks. In addition to archaeology students, members of history and metal detecting club “Kamerad” attended. One field survey was done in cooperation with students of ecotourism from Estonian University of Life Sciences as part of the course teaching Estonian nature.

Because of amount of old roads found in restoration areas during the survey the soilwork monitoring workload will probably grow slightly higher than expected.

To suit the needs of volunteers and archaeologists (who wanted to return home for the nights) the fieldworks were mostly carried out as one day events without need for accommodation.

<sup>4</sup> in blue colour proposals for extension of deadlines provided with assumption that Project period will be extended

Because of that the accommodation costs were significantly smaller and transportation costs higher than expected.

There have also been amendments regarding changes in use of the budget: instead of GPS navigators a metal detector was purchased in order to carry out field work (GPS systems were available from other resources) and this provided valuable results and findings (e.g. new sites of iron melting, an old coins etc). Also it was decided to employ some experts as ‘Personnel’ instead ‘External Assistance’ which provided proper means for field studies. Those changes were consulted with EASME, and evaluated as technically justified and acceptable.

As complementary actions outside LIFE a short article about the fieldwork conducted for the project was published in Estonian popular annual archaeology magazine Tutulus 2016. Also a presentation of the archaeological field works was done on interdisciplinary seminar “Interdisciplinary possibilities for researching past events” (original “*Interdistsiplinaarsed võimalused minevikusündmuste uurimisel*”) in Särghaua in December 2015.

#### Action A4 Evaluation of initial state of target species in the project - Completed

Foreseen start date: 01.09.2015 Actual start date: 01.09.2015

Foreseen end date: 31.03.2017 Actual end date: 22.12.2017

Name of the MS	Deadline	Actions (Status 30/06/2018)
Existing information of species at project areas collected	31/12/2015	Existing information on birds, amphibians, butterflies and dragonflies at project sites was collected in 2015.
Habitat models built and utilized in restoration planning	31/03/2016	Habitat models for brown frogs ( <i>Rana arvalis</i> , <i>R. temporaria</i> ), and dragonflies ( <i>Leucorrhinia spp.</i> ) (provided in PrRI, annex 6) and butterflies ( <i>Nymphalidae spp.</i> ) (provided in PrRII, annex 12) were compiled.
Inventory of species by Tartu Un. and ELF completed	28/02/2017	The inventory of species was conducted in 2016. Additional information on target species was collected in spring and summer 2017. The milestone was reached by 15/08/2017.
Report of this action will be compiled and implications utilized in further restoration planning	31/03/2017	The data collected in the frame of inventories was used for compiling restoration plans. The first version of the report of the action was completed in summer 2017 and it was updated in November and December 2017.

Name of the DL	Deadline	Actions (Status 30/06/2018)
Report of evaluation of the initial state of target species in all 6 project sites	31/03/2017	The first version of the report was completed in summer 2017 and it was updated in November and December 2017. The deliverable completed by 22/12/2017. Report provided in PrPII Annex 11.

The inventory of species was conducted from April to July 2016 in all project sites and additional information on species was collected from April to August 2017. Altogether 17 experts of birds, amphibians and invertebrates as well as some volunteers participated. In 2016,

7 conservation camps (in total 154 participants) were held to determine the presence of *Tetrao urogallus* in project sites (see also action C3 - Conservation work by volunteers).

Habitat models of the project target species were constructed based on existing data and knowledge of different experts. The models were used to select fieldwork locations.

During the inventories the presence and abundance of other species of the same groups (amphibians, dragonflies, butterflies, birds) were also recorded. This will allow to detect changes in the species communities and gain new insight into the effectiveness of mire restoration.

To ensure that it would later be possible to evaluate the effects of the restoration activities objectively and exclude any changes caused by other factors, inventories were carried out both in the prospective restoration areas as well as in reference areas that included a selection of draining-affected and natural, draining-unaffected areas.

Very important objective of action A4 was to determine the essential habitat demands and key areas of the target species. Based on a comprehensive analysis of the collected data, restoration instructions were designed which would optimally balance effectiveness for the target species with minimizing detriment to existing species. These instructions were included in the restoration plans.

#### Action C1 Restoration of hydrological regime – In progress

Foreseen start date: 01.04.2016

Actual start date: 01.12.2016

Foreseen end date: 30/08/2020 15/12/2021

Anticipated end date: 15/12/2021

Name of the MS	Deadline	Actions (Status 30/06/2018)
Restoration of hydrological regime completed in abandoned peat mining areas (130 ha)	30/09/2017 31/02/2019	Forest management in Sirts/Palasi and in Soosaare project areas is mostly completed by RMK, procurement for closing ditches in these areas has been implemented by ELF. Work in Palasi starts in July 2018 (deadline Sept 2018) and in Soosaare in Aug 2018 (deadline March 2019)
Restoration of hydrological regime completed in 2400 ha (50% of total restoration area)	30/09/2018 28/02/2020	Procurement for closing ditches has been implemented for Feodorisoo by ELF (deadline March 2019); acquiring environmental permits and procurement for forest management actions for all areas is in process by RMK; procurement for closing ditches in all the remaining areas scheduled to autumn 2018, schedule of closing ditches depends on forest management actions
Restoration of hydrological regime completed in all project areas (in total 5800 ha)	30/09/2019 30/10/2021	Not relevant yet
Additional work (if needed and based on inspection and monitoring) completed	30/06/2020 15/12/2021	Not relevant yet

Name of the DL	Deadline	Actions (Status 30/06/2018)
Restoration of hydrological regime completed in all project areas (in total 5800 ha)	30/06/2020 30/11/2021	Action started in autumn 2016 with tree removal in Soosaare project area, and in Sirtsii/Palasi mining area in autumn 2017. Status of the work above.

Restoration actions are based on approved restoration plans and technical plans. In Tudusoo special building permit (In Estonian: *Ehitusluba*) is required for certain tasks. For forest management RMK needs also special environmental permit (In Estonian: *Metsateatis*). Next task is implementation of procurement for forest management actions (app. 650 ha) by RMK and for closing ditches by ELF (with exemption described below). Procurement includes meetings with company representatives at restoration sites in order to ascertain that companies get sufficient overview of the work which should be carried out. When a procurement contract has been made, agreements with landowners whose land will be used for access should be revised to guarantee conditions similar to pre-work time, e.g. conditions for roads should be assessed and if there is a need, repair work should be done. ELF and RMK make regular inspections in order to advise workmen and ensure high quality for the work. The warranty for work for dams is 2 years. During the inspection ELF will fill in the info about finished tasks in GIS database which enables to control if the work is in accordance with technical design and provides data needed to accept payment requests by the company.

First phase of restoration is forest management in order to provide routes for machinery and conditions for improving habitats. In most areas forest management is organized and financed by RMK, except Feodorisoo and partly in Ohepalu and Lauaksoo. In latter two the reason is that forest management in certain areas is intended only for establishment of routes for machinery and better solution is that company closing ditches will make the work themselves. The work is weather dependent – too wet conditions could lead to temporal discontinuation as soil is too soft for machinery (the case in Soosaare in winter 2016/2017); too dry and warm conditions could stop work because of high fire risk. If tasks could not be implemented within one season before restrictions for work in NCA, these could be started again only when restrictions are ended. Also there is a risk that procurement will not be successful as appeared in 2016.

Forest management actions started in Soosaare in autumn 2016 and in Palasi in autumn 2017. In 2018 closing ditches is planned in three areas: Sirtsii/Palasi (96,8 ha), Soosaare (167,3 ha) and Feodorisoo (597 ha), in total 861,1 ha. Applying for environmental permits and procurement for forest management actions for all other areas (Laukasoo, Tudusoo, Sirtsii, Ohepalu) are currently processed by RMK; procurement for closing ditches in abovementioned areas is scheduled to autumn 2018. Exact schedule depends on outcome of forest management actions.

**Action C2 Restoration of former peat extraction areas by *Sphagnum* mosses – Not started**

Foreseen start date: 01.01.2017      Actual start date: 01.05.2018  
Foreseen end date: 31.08.2019      Anticipated end date: 30.11.2019

Name of the MS	Deadline	Actions (Status 30/06/2018)
Areas are levelled and dams established in order ensure favorable conditions for	31/12/2018	Restoration plan and technical project for the Sirtsii/Palasi area approved by authorities. Forest cutting by RMK started

<i>Sphagnum</i> seeding and natural regeneration		in Oct 2017 enabling to start this action in July 2018. Procurement for closing ditches finished and contract signed with a company Metropol Group OÜ, deadline 30 <sup>th</sup> Sept 2018.
Restoration of vegetation in abandoned peat-extraction sites with <i>Sphagnum</i> mosses	30/11/2019	Procurement for <i>Sphagnum</i> seeding expected to be finalized in July, deadline 30 <sup>th</sup> Nov 2018.

Name of the DL	Deadline	Actions (Status 30/06/2018)
Restoration of hydrological conditions in abandoned peat extraction fields in order to provide favorable conditions for mire regeneration and seeding <i>Sphagnum</i> mosses	30/11/2019	Restoration plan completed and technical project in process. Tree removal has started.

Within A1 and A2 it has been concluded that concrete actions for *Sphagnum* seeding is needed in Sirts/Palasi. Also, it has been clarified that field preparation should be better done in summer in order to avoid frozen surface for building peat dams. After that the area will be ready for *Sphagnum* reintroduction which could be done in autumn (in application it was stated that suitable work time is summer). It was expected to finalize this action in 2017 but due to unsuccessful procurement (no offers were provided) for tree removal by RMK in 2016 activities were delayed. In autumn 2017 tree removal started and it is expected to finish with *Sphagnum* seeding in autumn 2018. The work is weather dependent and if precipitation rate will be high then work could be postponed until next year. In order to achieve good outcome for *Sphagnum* seeding expert Edgar Karofeld experienced on this field was recruited with following tasks: provision of detailed methodology, finding donor sites Provided in [Annex 3](#), consulting implementing company and quality control of the work. Costs related to Edgar Karofeld are covered under action A2.

### Action C3 Conservation work by volunteers – In progress

Foreseen start date: 01.07.2016

Actual start date: 01.01.2016

Foreseen end date: 31.12.2019 [30.11.2021](#)

Anticipated end date: [30.11.2021](#)

Name of the DL	Deadline	Actions (Status 30/06/2018)
Implementation of conservation camps (50 events)	31/12/2019 <a href="#">30/11/2021</a>	There have been held 9 conservation camps. In total 171 participants.
Name of the MS	Deadline	Actions (Status 30/06/2018)
Implementation of conservation camps (15 events)	12/2017	7 camps with 154 participants, reported in PrRI
Implementation of conservation camps (20 events)	12/2018 <a href="#">12/2020</a>	2 camps with 17 participants, reported in PrRII

Implementation of conservation camps (15 events)	12/2019 11/2021	
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9 camps have been successfully implemented and there is great interest by participants to get involved in further work. In 2016 camps were organized to help to determine the presence of *T. urogallus* in all project sites except Soosaare, in 2017 peat dams were established in Soosaare. There has been good media coverage of the work and the project (e.g. in TV program “Osoon”, daily newspapers, radio etc.). Still, the number of camps by 2017 was expected to be 15 but it was less due to delays in A2 and C1 actions.

In summer 2018 there are plans to implement at least 7 camps. 4 of these are related to implementation of Platform meeting on Volunteers’ contribution to N2000 network in Tartu, 19.–21. September 2018. Participants will be taken for a day to Soosaare to build peat dams. Also costs for organising the meeting will be partly covered from C3 action considering the time and number of participants attending restoration work.

In 2019 there is a plan for 10 conservation camps.

Chainsaw trainings are replaced with first aid trainings (1<sup>st</sup> was held in April 2018 – 20 participants) and 2<sup>nd</sup> is planned in 2019) as a need to involve volunteers in forest management actions is small compared to initial plans. First aid is priority to guarantee safety of participants during the camps. Safety is important while implementing conservation work with volunteers in remote areas where potential for accidents (e.g. bite by adder) exist and skills for immediate action could be needed. Group management trainings are planned for 2019 and 2020. Also, as there is less actions related to tree removal it was proposed to replace purchase of chainsaws with accommodation costs for volunteers (Other costs) as prices have been higher than initially planned. EASME has been informed and positive evaluation for these has been received.

#### Action D1 Hydrological, botanical monitoring and remote sensing – In progress

Foreseen start date: 01.09.2015

Actual start date: 01.09.2015

Foreseen end date: 30.08.2020 31.12.2021

Anticipated end date: 31.12.2021

Name of the MS	Deadline	Actions (Status 30/06/2018)
Monitoring actions started to evaluate the conditions of project sites before restoration work, all sites	30/04/2016	Monitoring actions have been carried on from the beginning of the project, in 1 <sup>st</sup> phase equipment was purchased (50 piezometers, 2 barometers, downloading port from OÜ Est-Doma; 1 drone from Nordic Digital OÜ; parts and equipment for 1 <sup>st</sup> and 2 <sup>nd</sup> drone; consumables for establishment of monitoring plots, e.g. piezometer wells).
Monitoring report evaluating the conditions before restoration work	30/06/2017	Completed in Dec 2017 (provided in PrR II Annex 13). Laukasoo data will be included in next monitoring report.
Monitoring report evaluating 1st phase of restoration	22/12/2018	Not relevant yet
Monitoring report evaluating 2nd phase of restoration	22/12/2019	Not relevant yet
Final monitoring report	31/05/2020	Not relevant yet

Name of the DL	Deadline	Actions (Status 30/06/2018)
Monitoring to evaluate conditions and success before and after restoration work, relevant reports provided	31/08/2020 31.12.2021	1 <sup>st</sup> drone working, 2 <sup>nd</sup> drone completed and in testing phase. Monitoring established and ongoing in all project areas, including plant cover, vegetation survey and hydrology.

Hydrological monitoring points were established by November 2017. Baseline data, including plant cover data, drone videos and photos have been collected by June 2018.

Hydrological monitoring should document change of the water levels due to restoration activities. The monitoring network was configured according of the concrete restoration activities and concerns of the local population. Final monitoring network has 53 monitoring points (including 2 hand-measurement points), current situation in the project sites is now documented. Hydrological monitoring network is integrated with plant cover monitoring, that is done both from the ground and UAV.

Plant cover (see [Annex 4](#) for more details) monitoring is done in 49 plots in total, most of them (35) have two overlapping levels. Central 1x1 m plot is for detailed, species level survey; it is surrounded by 10x10 m plot where plant cover is described by 1x1 m squares at the class level. Larger plot is ground reference for UAV based plant cover mapping; therefore they were not present outside of the UAV survey areas (14 cases). Baseline plant cover monitoring from the ground is describing situation before the restoration activities; it was finalized by July 2018.

UAV's are used both for videos and photos. All project sites are covered with UAV photos/videos by July 2018. Total flight mileage is approx. 450 km, the flight paths were crossing restoration areas and UAV's was mostly filming during entire flight. Same flight paths will be filmed again after the restoration activities. Acquired videos will be edited to side-by-side videos that show the sites "before and after" project, producing easily understandable and visually striking material. All "before" videos were acquired by July 2018, except Ohepalu, that is planned for July 2018. Soosaare and Palasi sites were also flown over second time in spring 2018 after the forest management.

UAV photos for orthophoto generation and following plant cover classification is tested in the Soosaare site before and after forest cutting. Sphagnum mosses that are key species for bog restoration, can be photographed only after the forest manipulation. Monitoring sites (2 in Laukasoo, Feodorisoo, Palasi, Soosaare) with sparse (< 30%) treecover or after the forest removal were photographed by July 2018. One Ohepalu monitoring site will be photographed from UAV during July 2018. Ohepalu flights were delayed by very windy conditions during spring and summer 2018 and numerous military aerial drills close to the monitoring sites that prevented use of airspace during few calm days.

Additional testing was done with Landsat satellite imagery in order to document changing of forest cover of project sites from 1986 till present. This approach provides possibly to document changes in landscape in the future after completion of large scale restoration works in 2019-2021.

Relevant information is provided in [Annex 4](#). Next monitoring report will be delivered by the end of 2018 as advised by EASME in reply for PrRII in April 2018. In PrR II it was proposed to shift deadlines to the end of the year in order to provide monitoring reports simultaneously with progress reports.

**Action D2 Monitoring of the effects of project actions at target species – In Progress**

Foreseen start date: 01.01.2017

Actual start date: 06.03.2017

Foreseen end date: 30.08.2020 **30.11.2021**Anticipated end date: **30.11.2021**

Name of the MS	Deadline	Actions (Status 30/06/2018)
1st version of guidelines prepared for restoration work	31/12/2017	Relevant information collected under action A4. The first version of guidelines has been written and the work is ongoing.
Monitoring reports I (Tartu Un. and ELF)	31/12/2018	In spring 2018 monitoring of amphibians was conducted in Soosaare and Palasi and the monitoring of <i>T. urogallus</i> in Soosaare.
Monitoring reports II (Tartu Un. and ELF)	31/12/2019	Not relevant yet.
Monitoring reports III (Tartu Un. and ELF)	31/05/2020	Not relevant yet.
Final monitoring reports (Tartu Un. and ELF)	31/05/2020 <b>31/10/2021</b>	Not relevant yet.
Final version of guidelines prepared for restoration work	31/05/2020 <b>30/11/2021</b>	Not relevant yet.

The restoration started in two project sites, Soosaare and Palasi. In both sites the monitoring of amphibians was carried on in spring 2018. It showed that the amphibians already used for breeding the water bodies which are sun-exposed after cutting of trees. The monitoring of *T. urogallus* was carried out in Soosaare (Palasi is not suitable for this species) but no findings were recorded (there were no lekking sites on areas which are under restoration before either). The monitoring of butterflies and dragonflies was not carried out because the changes are too small yet to have any influence for these species groups.

Name of the DL	Deadline	Actions (Status 30/06/2018)
Guidelines for restoration activities to establish favorable conditions for target species	31/05/2020 <b>30/11/2021</b>	Relevant information collected under action A4. The first version of guidelines has been written. The amendments depend on the progress of restoration activities and corresponding monitoring of species.
Monitoring reports evaluating the effects of restoration work on target species	31/05/2020 <b>31/10/2021</b>	Not relevant yet.

**Action E1 Networking with other LIFE and NON-LIFE projects related to wetlands – In Progress**

Foreseen start date: 01.09.2015

Actual start date: 01.09.2015

Foreseen end date: 30.08.2020 [30.11.2021](#)

Anticipated end date: [30.11.2021](#)

Name of the DL	Deadline	Actions (Status 30/06/2018)
Study-tours implemented (2x).	31/12/2016	Study tour to Finland 12.-16. Sept 2016, to Sweden 9.-14. Oct 2016. Relevant reports (PrR I Annex 4) provided at project web-site at <a href="https://soo.elfond.ee/projektist/aruanded/">https://soo.elfond.ee/projektist/aruanded/</a>
Conferences organized (3x).	01/05/2020	1 <sup>st</sup> conference was held on 27 <sup>th</sup> July 2016 in Laukasoo to mark International Bog Day (20 participants), 2 <sup>nd</sup> on 2 <sup>nd</sup> Feb 2018 in Tartu to celebrate International Wetland's Day (183 participants).
Participation at conferences (5x).	01/05/2020	<ol style="list-style-type: none"> <li>1. 3.-5. Nov 2015 - „<a href="#">LIFE to Ad(d)mire</a>“ final seminar in Sweden, poster presentation by M. Kohv;</li> <li>2. Feb 2016 – International Wetland Day, Tartu, presentations by P. Pungas-Kohv and J.-O. Salm;</li> <li>3. 8.-10. Apr 2016 – training on cultural heritage in Lahemaa NP (Estonia) by P-Pungas-Kohv, no presentation;</li> <li>4. 28.-29. June 2016 „Small Unmanned Aerial Systems for Environmental Research“ and visit to <a href="#">Moor LIFE 2020</a>, UK, presentaton by M. Kohv;</li> <li>5. 9.-11. June 2016 “Text as a clue on Landscape” (Estonia), presentation by P. Pungas-Kohv;</li> <li>6. 5.-9. Sept 2016 PECSRL (Austria), presentation by P. Pungas-Kohv;</li> <li>7. 4.-6. Oct 2016 <a href="#">Cumbria Bog LIFE</a>, UK), presentations by P. Pungas-Kohv and M. Kohv.</li> <li>8. 10.-12. May 2017, LIFE Platform meeting on Ecosystem Services, Tallinn; July 17 Riga (LIFE13 NAT/LV/000578) J.-O. Salm, P. Pungas-Kohv and M. Kohv (ELF) poster and oral presentation;</li> <li>9. Sept 17 Poland (LIFE11 NAT/PL/428) U. Sellis, E. Pass (Un Tartu) poster presentation.</li> <li>10. Feb 18, International Wetland's Day, U. Sellis, M. Kohv, P. Pungas-Kohv, E. Sepp</li> </ol> <p>In total: 10 events (details provided in <a href="#">Annex 5</a>, conferences in 2015 to 2016 reported in PrRI and in 2017 in PrRII)</p>
Opening events of case-study areas are carried out (5x).	31/05/2020 <a href="#">30/10/2021</a>	Not relevant yet.
Final event of the project is organized (1x).	15/06/2020 <a href="#">30/11/2021</a>	Not relevant yet.

Number of conferences participated is bigger than planned in project agreement due to possibilities and interest. Also there are enough financial resources planned for that action and

costs have been lower than expected. In study tour there were participants from Ministry of Environment, State Forest Management Centre, Environmental Board, University of Tartu and ELF which allowed to share knowledge from LIFE projects (Boreal Peatland Life - Restoring the Natura 2000 network of Boreal Peatland Ecosystems LIFE08 NAT/FIN/000596; LIFEPEATLANDUSE - Quantification and valuation of ecosystem services to optimize sustainable re-use for low-productive drained peatlands“ LIFE12 ENV/FI/000150; [LIFE to Ad\(d\)mire - Restoring drained and overgrowing wetlands](#) LIFE08 NAT/S/000268) and initiate further information exchange. Also journalists were involved and information spread to wider audience. In Estonia another LIFE funded project on mire restoration started (LIFE15 CCM/DE/000138) and cooperation has been initialized, e.g. organizing together the conference in 2018. In addition, ELF has hosted other LIFE projects: LIFE13 NAT/PL/024 and LIFE11 NAT/PL/423 in Ohepalu project area and Lahemaa National Park in August 2017. List of conferences and other events listed in [Annex 5](#).

Conference on 2<sup>nd</sup> Feb 2018 was also broadcasted on television of Tartu University and it is possible to see videos of presentations online. So far the site has had over 1000 visits and presentations have been watched more than 6300 times.

### Action E2 Elaboration of project information boards and establishment of LIFE trail with notice boards - In Progress

Foreseen start date: 01.09.2015

Actual start date: 01.09.2015

Foreseen end date: 30.06.2018 [30.11.2020](#)

Anticipated end date: [30.11.2020](#)

Name of the MS	Deadline	Actions (Status 30/06/2018)
LIFE-trail technical project completed	31/01/2016	Completed in October 2016.
Texts for information boards in 6 project areas are compiled and edited	22/12/2017	Information boards were ready by December 2017 (provided in PrRII Annex 4). Texts for information boards depended on outcomes of restoration plans (A1) which were completed in Nov 2017.
Life trail is completed and opening event is carried out	15/06/2018 <a href="#">30/11/2020</a>	Action is postponed as restoration actions (C1) should be completed before establishment of the trail.

Name of the DL	Deadline	Actions (Status 30/06/2018)
LIFE-trail with wheelchair access (ca 700 m) - information boards (10 for trail + 6 for project case study areas), photos, study materials (E3), interviews, articles (E3) are delivered.	15/06/2018 <a href="#">30/11/2020</a>	<ol style="list-style-type: none"> <li>1. Technical Project of LIFE trail completed but renovation of the trail will start after completion of restoration actions; general themes are worked out for Tudu LIFE-trail. Project provided in PrRI Annex 5.</li> <li>2. 13 information boards for Seljamäe hiking trail are completed (Annex 6).</li> </ol> General information boards for all project areas were ready in Dec 2017. To avoid potential misunderstanding by local people and tourists, setting up information boards was postponed, until ending public consultation. Thus, in

		Soosaare it was set up in Jan 2017, in all other areas except Ohepalu in July 2018. In Ohepalu it is planned in autumn 2018.
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Before the activities related to LIFE-trail building can start, restoration work should be implemented at the area. Restoration plans and technical plans for that purpose have been approved and preparation for C1 action are in process. Also a new parking area was proposed to establish in Tudusoo restoration plan. It will offer better result for restoring process of transitional mire which is currently drained by a ditch established to serve present road and parking area. Additionally, the new parking area will be more suitable for car transport as well as for buses. New toilets will be established in the parking area and LIFE trail will be extended 243 meters in total.

New parking area will increase costs for the trail 87 765 euros at least. Costs for that are planned under C1 action, as new parking area is related to restoration of transitional mire and closing one drainage ditch which leads presently water out of the ecosystem. Based on calculations for C1, there should be sufficient funding available. Final cost will be known after public procurement. It is expected that work on Tudu LIFE-trail will start earliest in winter 2018/2019 and will be finished in autumn 2019.

### Action E3 Study materials and days about mires – In progress

Foreseen start date: 01.09.2015

Actual start date: 01.09.2015

Foreseen end date: 30.08.2020 **30.12.2021**

Anticipated end date: **30.12.2021**

Name of the DL	Deadline	Actions (Status 30/06/2018)
6 Wikipedia articles and 10 study videos about LIFE-project case study areas and mires in general are carried out.	01/04/2017	Study videos were released in September 2017 (9 instead of 10 but one video is more than 10 minutes long, covering material for two films) (Provided in PrR II Annex 15). Guidance material for film use in schools provided at project web-site. Wikipedia articles (PrR II Annex 16) were published in Jan 2016 and are updated continuously. Materials and links provided at project web-site.
Study-program and worksheet (3 levels of difficulty; in 3 languages; usable by smart-phone, by tablet or as a print-out) for LIFE-trail.	01/04/2017 <b>30/11/2019</b>	During the preparation of information boards for Tudu and Seljamäe, study-programs and worksheets are also in the stage of preparation. The final version will be available by completion of LIFE-trail in 2019, when it will also be tested before sharing it with the stakeholders. In addition, material about dragonflies is released (PrR II Annex 5).
Leaflet (1000 pcs) published and ready for distribution	31/03/2018	500 pcs released in 2016, another updated 500 pcs in Nov 2017 (PrR II Annex 6). As costs were lower it is proposed to release extra 500 in 2019 if there will be necessary finances still available for that. Leaflets include annual calendars and therefore their layout is adjusted each time.

Meta-data collected for preparing informative and study materials.	01/01/2019 01/03/2020	Collection of meta-data about all project areas, incl. 17 interviews, total duration 25 h). Survey of <i>ca</i> 100 publications from the area of fictional literature (+ several lyrics, doc-films etc.). Based on the material a database of Estonian fictional literature is updated on project web-page. Collected information from online databases, of cultural heritage is presented in project web-page. Collected material is also presented in restoration plans, 10 presentations given (see E1, A1). The work with collecting the meta-data is continuously under attention but deadline is postponed due to experts' maternity leave.
Teacher training (2x) with program prepared and carried out; content, photos, study materials about restoration areas.	01/10/2019 30/11/2021	Not relevant yet. Postponed due to changed deadline for restoration work and establishment of LIFE trail.
Fairy-tale book (1000 pcs)	28/02/2020 01/06/2020	Not relevant yet. Deadline is postponed due to experts' maternity leave.
Articles (5x) are published; LIFE-project is introduced in Estonian media, including national TV and radio.	31/03/2020 31/12/2021	<ol style="list-style-type: none"> <li>1. NG I article is published in Feb 2016 (PrR I Annex 8);</li> <li>2. An article in <i>Eesti Loodus</i> published in August 2016 (special number related with mires) (PrR I Annex 8);</li> <li>3. an article in <i>Akadeemia</i> was published in Dec 2016 and won the first price for 2016 (PrR II Annex 7);</li> <li>4. IV „Mires as landscapes: Their role in Estonian fiction and national identity“, <i>Landscape Research</i> (1.1) <i>submitted in May, 2017, accepted in Dec, 2017.</i></li> <li>5. An article „Mõne Alutaguse soo mured ja rõõmud“ <i>Compendium of Alutaguse, submitted in May, 2018</i></li> <li>6. Remm, L., Vaikre, M., Rannap, R., &amp; Kohv, M. (2018). Amphibians in drained forest landscapes: Conservation opportunities for commercial forests and protected sites. <i>Forest Ecology and Management</i>, 428, 87-92.</li> </ol> <p>All other media-appearance related with the project please find in <a href="#">Annex 7</a>.</p>
Wild hiking trips (20x during the project) in project areas	31/05/2020	10 trips implemented to Soosaare, Sirtsu, Tudusoo and Laukasoo restoration areas (List of events and number of participants provided in <a href="#">Annex 5</a> ). Also celebration of 25 years of the LIFE programme, the Habitats Directive and Natura 2000 was organised

		within these events in 2017 - information about the topic was introduced to participants on 21 <sup>st</sup> of May and press release was published.
Study-days for 64 classes/groups in LIFE-trail.	15/06/2020	Not relevant yet.
Name of the MS	Deadline	Actions (Status 30/06/2018)
Study material is ready for LIFE-trail; Wikipedia articles are ready, study-movies are ready	01/04/2017 30/11/2019	Wikipedia articles and study-movies provided, study material for LIFE-trail in preparation.
Meta-data collected at least from the half of project areas	31/12/2017	Meta-data collected for all project areas but more information will be collected during the whole course of the project
10 Wild hiking trips in LIFE project case study areas are carried out	31/05/2018	10 trips implemented by May 2018
32 Study days for children are implemented	01/10/2018 30/04/2020	Deadline postponed due to maternity leave of Piret Pungas-Kohv and delay in renovation of LIFE trail.
3 articles are published	31/10/2018	Completed in Dec 2016.
Draft of texts for fairy-tale book is ready	28/02/2019 28/02/2020	Not relevant yet.

The content of collected data has been presented to public in several ways: in restoration plans, data base on project web site, relevant articles and presentations (see also E1). An article in Akadeemia “Kui soine on eesti ilukirjandus?” (*How boggy is Estonian literature?*) by P. Pungas-Kohv won the golden laureate prize which is great acknowledgement for the work.

Cost of videos were higher than planned but these are also longer than initially planned. Also, videos had very good media coverage and feedback from different auditoriums (e.g. teachers). In addition, publishing house “Avita” has used videos in their web based learning material for geography for schools. Permission was granted with criteria that videos should be presented in whole length and information about the project and funding should be provided and this has been agreed with EASME. The videos will be used also in exposition presenting wetlands in Endla nature reserve (managed by Environmental Board) in Endla visitors’ centre in 2<sup>nd</sup> half of 2018 or in 2019.

#### Action E4 Project web-page – In progress

Foreseen start date: 01.09.2015

Actual start date: 01.09.2015

Foreseen end date: 30.08.2020 31.12.2021

Anticipated end date: 31.12.2021

Name of the DL	Deadline	Actions (Status 30/11/2017)
Continuous up-dating of the web-page	31/08/2020 31/12/2021	Web-page located at soo.elfond.ee is available from January 2016 and is updated continuously.

Project webpage has proven to be a key platform for collection and distribution of all public information related to the project. Number of unique site visitors from the start of the project

web site in January 2016 to 30<sup>th</sup> of June 2018 was 12,221 with total number of page views of 44,132. The visitors flow has had a stable increase with peaks during public events (e.g. conference and events connected to World Wetlands day in 2016, 2017 and 2018, release of study videos in September 2017). The main social media platform for directing people to the webpage has been ELF's Facebook page (<https://www.facebook.com/Eestimaa.Looduse.Fond>), over 20% of the users are referred from Facebook. Facebook traffic has brought about over 6,500 page views to the project webpage. Questions and answers for section *frequently asked questions* are compiled and updated by whole project team as an extra material for informative purposes. The material was initially presented on web-page in Dec 2016 (<https://soo.elfond.ee/kkk/>, in Estonian). The interest in the extra material has also increased with almost 1700 unique page views and over 2,200 pageviews.

The average time a person spends on the project website is relatively high – 2 minutes. That has been a constant during the project and shows that people take time to get acquainted with the information on the webpage.

Complementary source of online traffic is ELF's Facebook page and occasionally the reach of the Facebook posts' substitute the communicative functions of the webpage. Social media reach on the posts relating to the project is currently 206,620.

Another complimentary web traffic source has been Wikipedia articles. The articles have had 3,441 pageviews so far.

All together the reach of online commutations (Webpage, Facebook, Wikipedia) is estimated at 254,193 pageviews.

Web visitor's statistics provided in Annex 7.

#### Action E5 Layman' report – Not started

Foreseen start date: 01.01.2020

Actual start date: ND

Foreseen end date: 30.08.2020 [30.11.2021](#)

Anticipated end date: [30.11.2021](#)

Name of the DL	Deadline	Actions (Status 30/06/2018)
Layman Report	30/06/2020 <a href="#">30/11/2021</a>	Not relevant yet.

#### Action F1 Project administration and coordination – In progress

Foreseen start date: 01.09.2015 Actual start date: 01.09.2015

Foreseen end date: 30.08.2020 [31.12.2021](#)

Anticipated end date: [31.12.2021](#)

Name of the DL	Deadline	Actions (Status 30/06/2018)
Public tenders for Actions A2, C1, C2, E1, E2, E3, F1, F2 completed	30/06/2020 <a href="#">31/12/2021</a>	Implemented tenders: minibus and insurance (Action F1); office equipment (3 laptops E3, F1), MapInfo software (F1), piezometers (D1), smartphones and tablets (E3,F1), snowshoes (20pc)(E3), article in National Geographic (E3), drone (D1), headphones and microphone for field excursions (E3), external experts (A2), ditch closing in Soosaaare, Feodorsisoo and Palasi/Sitrsi (C1), different consumables.

Milestones	Deadline	Actions (Status 30/06/2018)
Project is coordinated according to the project plan and budget, reports provided and approved	31/08/2020 31/12/2021	Actions are implemented according to Project plan and budget. Deviations indicated in prg 6.2. do not cause harm for restoration targets concerning implementation of concrete conservation actions (C1, C2, C3). PrRI and PrRII approved and mid-term report prepared.
Project reports delivered and approved by the contracting authority	31/08/2020 31/12/2021	PrRI was completed in Dec 2016 and approved. PrRI completed in Dec 2017 and approved in April 2018.
Steering group meetings organised and project actions approved	31/08/2020 31/12/2021	18.12.2015 I meeting; 7.06.2016 II meeting; 15.02.2017 III meeting; 29.08.2017 IV meeting; 1.02.2018 V meeting. Actions and plans approved (Protocol of meeting V provided in <a href="#">Annex 1</a> , others have been provided in other PrRs).
Report on mire's ecosystem services and assessment of benefits of carbon sequestration by restoration activities	31/12/2019 31/12/2020	Consultation with officials working with national assessment plan – decision to wait until methodology is approved (expected in 2019).

Project manager (Jüri-Ott Salm) recruited from the start of the project. Responsible for overall project performance, relevant control and monitoring done *via* direct meetings with experts responsible for different actions or partner meetings. Coordination of restoration actions and information exchange between RMK, Environmental Board, Agricultural Board, local municipalities, landowners, other stakeholders. Organisation and participation at meetings with relevant stakeholders, public meetings to introduce restoration plans. Implementation of project management meetings on monthly bases, relevant protocols available.

#### Action F2 Final audit of project activities – In progress

Foreseen start date: 30.08.2018

Actual start date: 9.04.2018

Foreseen end date: 30.10.2020 30.03.2022

Anticipated end date: 3/2022

Name of the DL	Deadline	Actions (Status 30/06/2018)
Project audit	21/08/2020 30/03/2022	Not relevant yet

Milestones	Deadline	Actions (Status 30/06/2018)
Contracting auditing company	12/2018	Procurement implemented, contract in process
Auditing report	08/2020 03/2022	

**Action F3 Elaboration of After-LIFE conservation plan – Not started**

Foreseen start date: 01.01.2020

Actual start date: ND

Foreseen end date: 30.08.2020 **30.11.2021**Anticipated end date: **30.11.2021**

Name of the DL	Deadline	Actions (Status 30/06/2018)
Elaboration of After-LIFE plan	21/08/2020 <b>30/11/2021</b>	Not relevant yet

Milestones	Deadline	Actions (Status 30/06/2018)
Initiation of compilation of After-LIFE plan	12/2018 <b>01/2021</b>	

The topic has been discussed in most public meetings as often questions have been raised who will be responsible of different tasks (e.g. monitoring, LIFE-trail maintenance) after completion of the project.

## 6.2. Main deviations, problems and corrective actions implemented

Although actions A1 and A2 have been implemented simultaneously by ELF experts, there was still a need to recruit contractors to compile technical projects. Although in PrRI it was stated that ELF experts could manage most of these tasks themselves, external experts were also needed due to high workload as well as conditions by legal acts to involve licensed experts for some of the tasks – closing or changing amelioration systems and avoiding negative impacts on infrastructure (mainly forest roads). Still, external expertise cost less than budgeted and extra work load of ELF experts has been covered by that. Currently final approvals for restoration actions have been granted to all restoration areas except Ohepalu. The reason for delay in Ohepalu was that it was unknown to ELF that additional approvals should be acquired from the Ministry of Defense which took additional time. There were also problems to get good quality technical project from external expert Consultare OÜ – the documents were not approved by ELF several times in row. Still, it does not prevent start up or continuation of restoration actions in 2<sup>nd</sup> half of 2018 or beginning of 2019 in all areas. RMK has been quick and is ready for applying environmental permits for forest management which usually takes 30 days, and in organization of procurements. There is high likelihood that forest management could be finalized by spring 2019 in most of areas if weather conditions allow work in restoration areas. ELF is preparing procurements for closing ditches in order to allow start of the work after NCA restrictions will end by August 2019.

Due to the shift of deadlines of C actions also part of monitoring actions (D1 and D2) have been planned later, so that these enable to follow potential changes in due time after completion of restoration tasks.

In the course of compilation of restoration plans, following suggestions to increase restoration area (compared to area in LIFE agreement), were proposed within PrRII and approved by EASME: Agusalu NCA – 2.9 ha Natura habitats; Ohepalu NCA 487.9 ha, Sirtsu NCA 519.0 ha, Tudusoo NCA 467.8 ha. In Laukasoo restoration area the final size of restoration area has been decreased due to restrictions by private landowners as well as management of habitats (there is no intention for management of habitats (3260, 6450) at Laukasoo riverside) – therefore total area of restored Natura habitats is 133 ha less. In all project areas, total area of restored wetlands

other than Natura 2000 habitats is expected to be 1432.51 ha bigger than initially planned. Information provided in Annex 8.

Based on first procurements for C1 and C2 actions it has been clarified that there is no potential to increase restoration area even further as costs are close to limits of the current budget. Within technical projects cost estimation for restoration work was given which has left some buffer. Also, within technical planning there has appeared proposals to implement certain actions in relation to restoration which were not foreseen in initial phase of the project: I a need to prolong LIFE trail and establish new parking area with toilets (estimated budget in total 87 765 EUR) in Tudusoo NCA; II prevention of potential negative effects on public forest roads in Sirtsu NCA (estimated budget in total 48 783 EUR which includes renovation of ditches aside of forest roads, renovation of culverts, renovation of ditches which allow water to flow away from the roads in order to prevent flooding the roads); III prevention of potential negative effects on public forest roads and establishment of new ditches in order to allow drainage in managed forests outside NCA after closure of drainage within Tudusoo NCA (estimated budget in total 40 633 EUR); IV restoration of former peat extraction area in Palasi/Sirtsu NCA and planting *Sphagnum* mosses and establishment of wooden trails for monitoring success of the action (estimated budget in total 97 740 EUR divided between action C1 and C2, the latter includes 20 000 EUR for seeding *Sphagnum* mosses and 25 000 EUR for levelling the area); V establishment of extensive peat dam in order to restore lake system and improve hydrological system in Laukasoo (38 873 EUR). These have been discussed within partner meetings, meetings with stakeholders and approved also by the steering group. Within the mid-term we apply for approval of these specific costs under action C1, External assistance. In the course of completing technical design cost estimation was given for all work and it remains in limits of abovementioned budget line. However, if results from public procurements indicate that there prices are substantially higher, then adjustments should be made.

Reason for shifting costs related to LIFE trail prolongation and establishment of a new parking area is related to fulfillment of restoration work (C1) at the area. In process of restoration planning in Tudusoo it was proposed to establish a new parking area in order to allow restoration of transitional mire and as existing parking area is in improper state for car transport as well as not big enough for buses, also establish toilets to the parking area and extend LIFE trail 243 meters. It would increase costs for the trail at least double, by 87 765 EUR. Still, based on calculations for C1, there should be sufficient funding available for that. As costs are related to restoration of mire then these are planned under C1 action. Final cost will be known after public procurement. It is expected that work on study trail can be started earliest in winter 2018/2019 and finalized in autumn 2019. Also study programs and events could be implemented later due to reasons provided above.

Due to reasons given above several deadlines for milestones and deliverables (see in prg. 6.1) have been extended and hereby we ask for acceptance by EASME. In this respect, extension of project period up to the end of 2021 will be applied in the beginning of 2019 when all procurement will be made and there is an overview of the outcome of forest management activities in coming winter and restoration actions in Sirtsu/Palasi, Soosaare and Feodorisoo.

In order to enable to fulfill the tasks with prolonged time schedule there will be changes in contracts with experts and other staff. In certain case the share of working time for the project have been or will be reduced, e.g. public relation coordinator, project coordinator, project financial officer, experts working on A4, D2. All changes have been or will be made in a way that all tasks could be completed.

Also, in relation to use of drones we apply for adding budget line under D1, Other costs for insurance costs for drones used within project activities as there is high risk for losing them in action and medium risk for damage for a third party. Cost for 1-year long insurance is approximately 1400 EUR, in total for 4 years 5600 EUR.

### 6.3. Evaluation of Project Implementation

As a methodology LIFE Mires Estonia applies the best practice in the conservation of mire habitats as the project experts together with partners (RMK, Environmental Board, Ministry of Environmental) have participated (in forms of study tours, expert meetings, conferences, seminars, other informal knowhow exchange) in wetland studies and restoration activities in a number of countries, like Latvia, Estonia, Finland, Sweden, UK, Poland (Action E1). These corporate visits have been valuable in understanding and planning of restoration actions in Estonia and learn from failures and success from other projects. Also, these activities have increased cost-efficiency of LIFE-ME actions as well as actions in other similar projects – e.g. we learned that usage of timber in construction of dams may lead to extensive repair work as these may not act properly in longer time-span and drainage system may remain active, use of drones is cheaper than sending out experts.

Therefore, the project has not only adapted but also further developed the good practice in mire habitats restoration of Estonia, especially targeting to following NATURA 2000 priority habitats: Active raised bogs (7110\*), Bog woodland (91D0\*), and Fennoscandian deciduous swamp woods (9080\*). In order to evaluate the impact and success of restoration activities monitoring program has been elaborated and different methodologies are used (hydrological and remote sensing, and species related methodologies). In addition, restoration activities target conservation of other species affected by drainage like bird species *T. urogallus* and *L. lagopus*, *Rana arvalis*, *Leucorrhinia* dragonflies and butterflies Nymphalidae. In this respect, adaptive management practice is elaborated and implemented as far as present knowhow and field data are available. Collection of species' data allowed immediately to plan actions respectfully and enabling to avoid need for changes in restoration work afterwards which could be expensive as well. Also, during the restoration of habitats the best practice of other projects, including LIFE Nature and LIFE+ projects (e.g. LIFE08 NAT/S/000268; LIFE08 NAT/FIN/000596), has been evaluated and the best solutions for the concrete project sites situation found (e.g. Finnish approach in infilling ditches which was introduced by Metsähallitus in Estonia and which lead to amendments in technical design of the restoration work; avoidance of use of plastic and wood in dam construction; use of drones for monitoring).

The project experts share the results of mire conservation and restoration by involving local society and stakeholders in the conservation and management activities as well as explain the need for the mire habitats conservation and restoration. Within the project public meetings for local communities have been organised, articles published in media, volunteers involved in actual restoration activities, special learning events for teachers and schoolchildren will be organised, and LIFE trail will be built on restoration area. Public meetings with locals helped to find suitable solutions or overcome misunderstandings which could lead to apparent changes in technical planning, so increasing cost-efficiency of the project.

Also, meta data from the cultural side of mire has been collected and distributed in order to provide more various ways for experiencing mires. This is additional layer next to rather well known information about natural side of mire – information is "refreshed" with cultural "layer" which makes relations to these habitats far more interesting.

In order to bring more attention to values of mire habitats as well as to provide protection for cultural values, archaeological survey was conducted at project sites and collected information was combined into public and learning materials. In Sirtsu area there was one major finding – iron processing site from Medieval or Iron age. Otherwise, the findings were not very high importance and real effect has been lower than expected. Also, archaeological findings were not attractive to bring media attention. Still, the work was needed to ensure that restoration work complies with Heritage Conservation Act (in Estonian: *Muinsuskaitse seadus*) and avoid potential conflicts between cultural values and restoration efforts.

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Action	Foreseen in the revised proposal	Achieved	Evaluation
<p>A1 Compilation or renewal of the restoration plans for project sites.</p> <p>A2 Technical designs and building permits for project sites.</p> <p>A4 Evaluation of initial state of target species in the project sites.</p> <p>C1 Restoration of hydrological regime according to the technical designs.</p> <p>C2 Restoration of abandoned peat mining areas and seeding of <i>Sphagnum</i> species to enhance regeneration of mire habitats</p> <p>E1 Networking with other LIFE and NON-LIFE projects related to wetlands</p> <p>F1 Project administration</p>	<p>Objectives:</p> <p>To stop degradation of habitats caused by drainage and regenerate favourable conditions for development of natural hydrology;</p> <p>To secure the most favourable conservation status for wetlands;</p> <p>Present project results on national and international scale in order to share, spread and gain knowledge regarding restoration and management of mire habitats</p> <p>Expected results:</p> <p>Significant and sustained improvement of conditions of the EU (priority) habitats and protected species; significant contribution to the further management and restoration of EU priority habitats in Estonia and other EU countries.</p>	<p>Information exchange between experts in order to learn from others planning restoration;</p> <p>Restoration plans and technical design completed except Ohpalu area; Restoration actions started in 2 areas covering 264.1 ha;</p>	<p>As restoration is in starting phase it is early to say if applied approaches are successful and will lead to expected results. Still, based on lessons learned from other projects, results from field work and analyses of collected data allows to presume that conditions of habitats and species will be improved in Estonia but also elsewhere as knowledge and experiences are already shared among communities working with mire protection.</p>
<p>A4</p> <p>C1</p> <p>C3 Conservation work by volunteers</p> <p>D1 D2 F1</p>	<p>Objectives: To secure the most favourable conservation status for <i>T. urogallus</i> and <i>L. lagopus</i>, amphibian <i>R. arvalis</i>, and semi-aquatic invertebrates <i>Leucorrhinia</i> dragonflies and improvement of conditions of these species</p> <p>Expected results:</p> <p>Conditions sustained for <i>T. urogallus</i>, <i>L. lagopus</i>, amphibian <i>R. arvalis</i>, and <i>Leucorrhinia</i> dragonflies' populations. Methodology developed to reduce potential negative impacts to these species due to restoration activities, e.g. removal of trees or sudden closure of drainage ditches.</p>	<p>Initial state of target species in the project sites evaluated; restoration plans and actions started based on requirements provided by experts; monitoring started in order to evaluate effects of restoration and provide relevant methodology; networking with experts – experience sharing and gathering information</p>	<p>As restoration is in starting phase it is early to say if applied approaches are successful and will lead to expected results. Still, based on lessons learned from other projects, results from field work and analyses of collected data allows to presume that conditions for species will be improved.</p>
<p>A1; A2</p>	<p>Objectives:</p>	<p>Reports from different actions, restoration plans and technical</p>	<p>The size of media audience reach at this point is 8 098 795 people,</p>

<p>A3 Archaeological survey of the project sites in order to map and secure conservation of cultural values of the area</p> <p>A4</p> <p>C3 Conservation work by volunteers that is giving the opportunity for wider public to get involved in active nature restoration work and helps to implement restoration work in areas where more manpower is needed.</p> <p>D1 Hydrological, botanical monitoring and remote sensing for quantification the effects of implemented restoration measures.</p> <p>D2 Monitoring of the effects of project actions on target species.</p> <p>E1</p> <p>E2 Elaboration of project information boards and establishment of LIFE trail with notice boards</p> <p>E3 Study and information materials about mires and their restoration, learning visits for school children and teachers</p> <p>E4 Project web-site</p> <p>F1</p>	<p>Raising public awareness regionally to influence the local inhabitant's attitude towards safeguarding of internationally valuable wetlands, and improve understanding of current nature conservation issues, habitats of EU importance and Natura 2000 network.</p> <p>Expected results: Materials made available at project homepage will raise awareness about the value of priority habitats and the need of their conservation and restoration. 20 000 persons reached.</p>	<p>design, learning materials, database of cultural artefacts provided at project web site, Wikipedia articles published. Activities of the project have gained high media attentions and journalists have taken part of several actions (e.g. volunteer work, study tour, public meetings). When communicating with people there is often feedback that topic has been heard or seen in media and there is increasing awareness and support for the actions. Still, NIMBY effect applies when restoration actions could impact private property.</p>	<p>and the project has had 160 media coverages including online, radio, TV media stories. Also there has been international media coverage via National Geographic Magazine that adds the estimated scope of 22 000 000 people world-wide.</p> <p>Social media reach on Facebook has been 206,620. Study videos have been watched 9,505 times on YouTube.</p> <p>As project is half on a way it is considered success.</p>
<p>C3 Conservation work by volunteers that is giving the opportunity for wider public to get involved in active nature restoration work and helps to implement restoration work in areas where more manpower is needed.</p> <p>F1</p>	<p>Objectives: Involvement of volunteers to mire restoration activities; Raising public awareness regionally to influence the local inhabitant's attitude towards safeguarding of internationally valuable wetlands, and improve understanding of current nature conservation issues, habitats of EU importance and Natura 2000 network.</p> <p>Expected results:</p>	<p>9 events for 171 participants organised. In addition to volunteers input and involvement it also created media attention and restoration efforts got much bigger audience than just participating volunteers.</p>	<p>Although the number of camps is lower than planned within milestones there is still time to involve additional 319 persons in further activities of the project. The work has been done both on national and international scale as many volunteers come from abroad.</p>

	Involvement of volunteers into management actions and thus, creating better understanding and commitment for nature conservation efforts in Estonia (50 volunteer camps, app. 500 participants)		
All actions with special attention on E2 and E3	<p>Objectives: Raising public awareness regionally to influence the local inhabitant's attitude towards safeguarding of internationally valuable wetlands, and improve understanding of current nature conservation issues, habitats of EU importance and Natura 2000 network.</p> <p>Expected results: Public events to introduce restoration activities, study days for schoolchildren and teachers, establishment of LIFE trail are expected to inform around 90 000 persons about Natura 2000 habitats, their values and restoration efforts in Estonia.</p>	Preparations for LIFE trail implemented, public events organised, media has covered actions and events	<p>Involved participants at public events, expert meetings, conferences 2608 persons.</p> <p>Media auditorium nationally has been 8 098 795 people, extra international media coverage estimated at 22 000 000 people.</p>

Indication of project results which have been immediately visible and which results will only become apparent after a certain time period

Improvement of conditions of the EU priority habitats will be achieved after closing drainage system which affect water regime on approximately 7640 ha. Results of restoration work on landscape will be visible, especially where forest management actions have taken place. Drone videos will be made in order to provide best visualisation in this respect. Still, improvement of conditions and apparent changes of habitats and species will be seen in few years after completion of restoration work but it could take decades in most affected areas, especially areas with remaining high forest stand. In spring 2018 when management actions in Soosaare had been implemented there were already positive signs of appearance of some target species of the project in some parts of restoration area – *R. arvalis*. Species data has been provided for EELIS (Estonian Nature Information System) which is basic information source for management of NCAs and making decisions regarding protection needs of species.

Involvement of volunteers is best visible due to concrete actions as well as coverage in social media and by journalists. This applies also for other actions, e.g. conference in 2018 is still visible on UTTV site (online TV channel of the University of Tartu) and has been visited over 6300 times.

Materials, e.g. reports from archaeological studies have been made available on project web site. Also there is online data-base on mire related literature, films, articles, old sayings and stories related to project sites. Gallery and interactive map about restoration areas is provided. Articles in Wikipedia are available.

Description of the results of the replication efforts

There have been initial negotiations and planning for application of restoration activities and funds (e.g. EEA Grants) in mire areas outside of LIFE Mires Estonia project area. Still, so far no project proposal has been provided for potential donors. Still, experts from ELF and University of Tartu have been involved in restoration work initiated by RMK and knowledge gained within LIFE Mires Estonia is provided in these occasions.

For Estonians, mires are nowadays important both socio-economically and culturally. This understanding supports to discover literature, poems, proverbs, tales etc. that are related with mires. These findings truly help us to interpret the project areas and achieve ecological aims in more effective way. Thus, this knowledge has been taken into account in conservation actions and/or used in materials created during our project. We may say that this is rather unique, as most often nature conservation activities do not include cultural heritage aspect.

Indication of the effectiveness of the dissemination activities and comment on any major drawbacks. Website.

Public events, continuing media-work and production of study materials (e.g. videos) have been a great dissemination tool and used effectively throughout the project.

The public interest in the project is well documented by vast media coverage (national media audience of over 8 million people), public events and organised educational activities. Project's actions and events have been popular and increased the traffic on the project's webpage and related online communication channels. Many public events are planned on the second half of the project and there is anticipation and public communication opportunities for even greater coverage by traditional and social media and an increase in online traffic on the web site. Also

the number of new users of the web page has constantly risen, that shows more people are engaged in the projects' events and interested in the activities.

Because of a change in people's online behaviour that is more focused on social media platforms, the project team uses social media platforms (e.g. Facebook, YouTube) to add to the web page traffic and thereby effectively communicate the project to wider audience and adapt to the needs of the audience.

The main media type in Estonian media outlet has been expectantly online media (35%), but because of constant media work the print media impressions are even higher (39%). That also shows the effects of the teams' efforts in public communication, as it is more difficult to guarantee media coverage on the printed media.

The one major international media channel used is National Geographic Magazine that has audience of 22 000 000 viewers per month. That indicates that media reach has been over 30 000 000 viewers world-wide.

Media statistics and web page visitors' statistics provided in [Annex 7](#).

### Policy impact

**Support for implementation of legislation and policies.** Actions of LIFE Mires Estonia support fulfilment and implementation of Community policy and legislation on nature and biodiversity, in particular Habitats Directive. Also, targeting objectives of Estonian Nature Conservation Strategy (ENCS) until 2020 and prioritized action framework (PAF) for Natura 2000: to improve or maintain the status of the habitats and species, to avoid harmful activities, to improve the status of habitats by either passive conservation or active restoration. Expected outcomes are defined as following: the status of habitats and species is maintained or improved, the water regime is restored, the quality of the habitats for target species is improved. Strategic priorities in relation to climate change mitigation and adaptations are determined within ENCS: degraded mires are restored (9900 ha) and degraded wet forest habitats are restored (2000 ha) by year 2020. PAFs determines also: the infrastructure for visitors in Natura 2000 sites is in place, information about nature values available, involvement of volunteers in nature conservation is more effective. In this respect following project actions apply: establishment of LIFE trail, raising public awareness through different activities, and implementing conservation camps and LIFE Platform meeting on Volunteers' contribution on Natura 2000 management. LIFE Mires Estonia support fulfilment of management plans and protection rules of NCAs covered with the project, and management plans for *T. urogallus*, Brown frogs, and *Leucorrhinia* dragonflies.

**Policy developments.** LIFE Mires Estonia is included in Estonian Action Plan of Protected Mires 2016–2023 (in Estonian: *Kaitstavate soode tegevuskava*) approved by the Minister of Environment. Action Plan is aiming to improve and sustain biodiversity and ecosystem services of mires and restore habitats. Priority sites for restoration have been selected and LIFE ME restoration areas are amongst them. Amongst other funding sources, LIFE program has been determined.

**EU added value** of LIFE Mires Estonia and its actions is provided as following:

I Application of the best practice in the conservation of mire habitats through participation (in forms of study tours, expert meetings, conferences, seminars, other informal knowhow exchange) in wetland studies and restoration activities in a number of countries, like Latvia, Estonia, Finland and Sweden.

II Adaption and further development of good practice in mire habitats restoration, and habitat restoration for related species of Estonia. In order to evaluate the impact and success of restoration activities monitoring program has been elaborated and different methodologies used. Adaptive management practice has been elaborated and implemented as far as present knowhow and field data are available. During the restoration of habitats the best practice of other (LIFE) projects, has been evaluated and the best solutions for the concrete project sites situation found.

III Sharing the results of mire conservation and restoration by involving local society and stakeholders in the conservation and management activities as well as explaining the need for the mire habitats conservation and restoration in means of learning events for teachers and schoolchildren, establishment of LIFE, public meetings for local communities, articles published in media, volunteers' involvement.

IV. Combining cultural values into discussion regarding protection and restoration of mire habitats and using this also in public and learning materials.

V It is planned that experiences obtained in the project will be applicable regionally, nationally and internationally in EU priority habitats restoration – relevant guidelines regarding restoration activities and establishment of favourable conditions for EU priority habitats and related species will be published and distributed. It will be best practice demonstration in Estonia that could be put into practice in other EU countries.

**Relation to climate.** Mire and bog habitats in favourable status sequester carbon dioxide and subsequently accumulate carbon. Destruction of these habitats and alteration of peatlands due to human activities has led to the changing role (source *versus* sink) of peatlands in respect to greenhouse gas emissions, their share in greenhouse effect, and global warming potential. Peat mineralization is strongly related to temperatures and warming climate could increase the emissions from drained areas. The aim of this project is to secure and restore the carbon sequestration and accumulation capacity of mire and forest habitats in all project areas as well as support conservation measures elsewhere. Therefore, potential emissions of CO<sub>2</sub>, caused by drainage and peat mineralization, will be eliminated or minimized. Still, it is a long term result as it could take decades before severely degraded peatlands restart to accumulate carbon.

## 6.4. Analysis of benefits

### Environmental benefits

As restoration work is in starting phase it is too early to provide any trends or info about elimination of threats. Still, main positive deviation has been the increase of affected (project) area from 5800 to 7640 ha. Continuation of activities after the end of the project will be implemented in accordance with Estonian Action Plan of Protected Mires 2016–2023 and management plans of NCAs and species. Main funding will come from state budget and EU funds.

### Economic benefits

Although project area has been increased it has been estimated that existing budget is sufficient to achieve original objectives on much larger area.

Number of full time equivalent (FTE) jobs created, status 30.06.2018 as 5,5: 4 in ELF and 1,5 in University of Tartu. ARHV temporally has no employment contract in relation to LIFE ME

as field works in order to map pre-restoration conditions and findings have been completed and field works in relation to action C1 are scheduled for 2019. For action C1 there are instructions for potential findings and if any signs will be found, expert of archaeology will be temporally contracted.

### Social benefits

Main benefit is that ecosystem services of certain areas are sustained, restored or improved, therefore providing inhabitants of Estonia with cleaner and healthier environment.

Project actions involve large variety of companies as external expertise has been acquired for technical design of restoration activities, inventories, design and editing of informative materials, forest management and activities related to closing drainage systems. Therefore positive socio-economic impact for development of bioeconomy as more understanding and involvement is created due to restoration of vulnerable ecosystems. Also, providing funds has supported economic development on classical terms as more funds have been directed for Estonian economy.

Conservation camps are open to people from all nationalities, therefore ethnic integration has been supported. Participation at these camps has allowed people to spend time in healthy environment and gain knowledge of natures' ecosystem services.

In East-Estonia where local population is mainly Russian speaking, public meetings, restoration plans, and information boards were translated into Russian in order to allow local people to understand reasoning behind nature conservation in Estonia, restoration efforts and provide their comments and thoughts.

One of the aspects of mires, which is still tradition and also provides income for some people, is berry picking. Restoration of mire habitats provides these possibilities.

In relation to tourism well preserved nature is well acknowledged by the sector. Thus, restoration work supports tourism sector bringing people to Estonian nature. Also, providing information boards in English adds value for tourists to get acquainted with Estonian nature.

### Replicability, transferability, cooperation

Knowledge and experience on mire restoration techniques and relevance to target species is exchanged between experts on national and international scale enabling transferability of gained knowhow and use of best practice both within the project but also when planning actions in other sites than LIFE ME project.

Unmanned aerial vehicles (UAV-s) were used extensively for surveying and monitoring of the project sites. This required extensive testing and methodological development because available workflows were clearly not sufficient for the task. UAV based surveys are very well suited for ecosystem restoration monitoring and monitoring of invasive plant species.

Developed methodology is also transferable to other, including commercial fields like precision agriculture and forestry. The use of UAV's is certainly increasing in the nearby future as new, smarter, cheaper and more powerful UAV's are entering the market. Therefore, we expect high likelihood replication, this is mainly market driven as UAV based surveys are much cheaper per hectare compared to traditional survey methods. They are also good eye-catchers for media and educational programs.

## Best Practice lessons

Provided under methodology

## Innovation and demonstration value

UAV based environmental monitoring is innovative approach and has already caught interest of various state agencies (KAUR, RMK) and private companies in Estonia. Development of UAV and surveying methodology would not have been possible without LIFE funding, LIFE project also provided reliable ground-truth surveys that are essential for testing UAV based results. There is high likelihood that future restoration projects (including LIFE projects) will include UAV surveys to their arsenal and our work gives them baseline methodology how to integrate UAV in to the overall projects.

## 7. Key Project-level Indicators

Changes in project area (indicator 1.5) has increased from 5800 to 7640 ha. In relation to that, areal figures under 2.3.3 Hydrological alteration, 7.1. Ecosystems, 7.3 Natural and semi-natural habitats also increase.

## 8. Comments on the financial report

### 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	946150	506736,47	54
2. Travel and subsistence	103775	36264,96	35
3. External assistance	1273412	97034,22	8
4. Durables goods: total <u>non-depreciated</u> cost			
- <i>Infrastructure sub-tot.</i>	71040	1474,4	2
- <i>Equipment sub-tot.</i>	109250	40157	37
- <i>Prototype sub-tot.</i>			
5. Consumables	16550	57586,95	348
6. Other costs	119910	27948,91	23
7. Overheads	175489	42538	24
<b>TOTAL</b>	<b>2815576</b>	<b>809740,91</b>	<b>29</b>

\*) If the EASME 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

Based on organisations' internal accounting policies (*in Estonian: Raamatupidamise siseeeskiri*) the registration limit for durable goods/equipment in University of Tartu is 5000 euros and in ELF 2000 euros. Because of these accounting rules several items (laptops, drones, photo cameras, piezometers, iPads, smartphone, tablet computer, headphones and microphone for field excursions; GPSs, metal detector) had to be shifted to Consumables although these were budgeted under Durable goods/Equipment. Therefore the costs of Consumables are higher than in original budget. The shift was confirmed in the EASME letter of PrRI. This does not apply to ARHV as based on their accounting policy the registration limit for durable goods/equipment is 639 EUR.

Costs related to minibus purchased by ELF in the course of the project are reported under Travel (fuel costs), car accessories and spare parts under Other costs, and repairs under External Assistance as confirmed in EASME letter of PrRI.

Costs related to meetings organized for public consultation are reported under Other costs, action F1. These were initially not planned in the project but were necessary in order to pay rent for the rooms, provide snacks for participants, and buy space for public announcements in media. These costs are covered by ELF from travel and other costs for study tours (E1) as these were smaller than planned. In principle agreed in EASME letter of PrRI.

Costs for external assistance and infrastructure are low as closure of ditches has just started and no major costs have occurred so far, also establishment of LIFE trail is depending on the latter. These diversifications were not planned in project agreement. Information was presented in PrRI and PrRII, and EASME provided feedback on these issues.

Compared to original budget, employees costs under C3 for Conservation Camp Manager Siim Kuresoo were higher in 2017 due to his salary level and position in ELF (member of executive committee). Costs for assistants and public relation coordinators were occasionally lower due to their salary level and work experience.

Compared to the allowed flexibility of the 20% limit, costs between budget categories have been shifted 4%.

## 8.2. Accounting system

The accounting systems of all beneficiaries enable to separate project expenses from other expenses. This is done using unique codes, which are associated with corresponding expenses (invoices, expense receipts etc) when registering expenses in the organisations' accounting. All beneficiaries adopted project-based cost accounting from the beginning of the project.

### **ELF**

All the project cost documents include a clear reference to the project – invoices the name of the project and project number as follows: „Soode kaitse ja taastamine“ (Conservation and Restoration of Mire Habitats, LIFE Mires Estonia; projekti nr: LIFE14 NAT/EE/000126) as well as project stamp with project acronym. Other cost documents (statements of expenditures and travel expense receipts) are marked with project stamp. In addition, indication to action of the cost is added.

Invoices are accepted when the name and number of the project are marked on it. After receiving of the invoice, it is checked if there are the correct requisites and the reference to the LIFE project, as well as if it is in accordance with the project budget. Thereafter the invoice is marked with project stamp, signed by the project manager and approved by Member of

Executive Committee. Only after that it is delivered to the accountancy and the payment is carried out.

All the project entries in the ledger have a separate object identifier that allows to see the project income and expenses. The LIFE project object identifier in accounting system in ELF is LIFE-ME.

Employees fill timesheets on daily basis, filling manually an Excel-based reporting sheet. Both LIFE template timesheet and ELF's own are in use. Timesheets record both the time spent on given project and total working hours of employee. Timesheets are checked and approved by the project manager and Co-Chairman of Executive Committee during the first week of the following month as salaries are being paid by 8<sup>th</sup> day of the month. In years 2015, 2016, 2017 project manager Jüri-Ott Salm did not fill timesheets because of fixed percentage of working time in the project, but started filling timesheets since December 2017 because of involvement in other project by different funder.

All the LIFE project staff members have agreements for the duration of LIFE project.

The original project documentation is kept at the accounting department.

Each year a yearly project budget is prepared and approved to follow the project expenses.

### **University of Tartu**

Unique codes identifying the project costs in the accounting systems of beneficiary are in use. The code MLOOM15126 was used in 2015, and the code MLTOM15126 is used from 1 January 2016.

### Cost approving procedures

Invoices and expense receipts (here and after cost document) are submitted to the project manager, who is checking their accuracy and conformity with project requirements (incl references to the project - number and acronym). The project manager entering cost document in the internal document system and accepting it. In this system there is a separate field for project code and it is obligatory to fill it. After that the project accountant is submitting the cost document for payment.

Working trip order before the trip and report (incl financial report and cost documents) after the trip are both approved by the director of the Institute of Ecology and Earth Sciences (institute forms a part of the University of Tartu) and by the project manager. The system is electrical and it has also the obligatory field for project code. In addition the explanation of the trip consist project number and acronym.

If it is not possible to add to the cost document project references the special project stamp is used. This is usually the case of gasoline bills and bus/train tickets.

### Time recording system

The project employees are using manually completed LIFE template time-sheets. Project manager is controlling and approving the time-sheets before the signing. The time-sheets of the employees are signed by the employee and the project manager during the first week of the following month. Project manager's time-sheets are signed by the head of department. Project

manager did not fill timesheets until Dec 2017 as till then he was full-time employed for LIFE project.

### **Arheovisioon MTÜ**

Unique codes identifying the project costs in the accounting systems of beneficiary are in use. The code LIFE ELF was used in 2015–2016 and the code LIFE,Sooprojekt is used from 1st January 2017.

All the project cost documents include a clear reference to the project – invoices the acronym of the project and project number as follows: LIFE Mires Estonia; LIFE14 NAT/EE/000126 as well as project stamp with project acronym. If it is not possible to add to the cost document project references the special project stamp is used (statements of expenditures and travel expenses).

After receiving of the invoice, it is checked if there are the correct requisites and the reference to the LIFE project, as well as if it is in accordance with the project budget. Thereafter the invoice is marked with project stamp, signed by the Member of Executive Committee. Only after that it is delivered to the accountancy and the payment is carried out.

The project employees are using manually completed LIFE template time-sheets. Project manager is controlling and approving the time-sheets before the signing. The time-sheets of the employees are submitted by the employee during the first week of the following month.

### **8.3. Partnership arrangements**

Partner agreements were signed in Oct 2015 (provided in PrRI, Annex 10). ARHV and Tartu Un have received first payment in Oct 2015 based on partnership agreement.

Each partner fills the Individual Cost Statement based on accounting log and original cost documents.

Financial reports are provided to ELF twice a year and accompanied with copies of original documents. Costs are checked by ELF before consolidating costs for reporting.

### **8.4. Certificate on the financial statement**

Details of approved auditor: Enn Leppik, assistant Heddi Jallai

Organisation: Audiitorbüro ELSS AS

Registration number: 10213441

Address: [Vanemuise Street 21A, Tartu 51014](#)

## 8.5. Estimation of person-days used per action

Action type	Budgeted person-days	Estimated % of person-days spent
Action A: Preparatory actions	930	85,1
Action C – Concrete conservation actions	310	16,0
Action D: Monitoring and impact assessment	2072	11,3
Action E: Communication and Dissemination of results	1493	46,6
Action F: Project management (and progress)	2710	45,8
<b>TOTAL</b>	7515	40,1

### Envisaged progress until next report

It is expected that RMK will initialize forest management actions in all project areas except Soosaare (completed) and Feodorisoo (task will be completed parallel to ditch closing coordinated by ELF). For Sirtsi, Tudusoo, Laukasoo and Ohepalu restoration areas public procurement for restoration actions will be implemented in autumn 2018 but concrete actions depend on progress of forest management and weather conditions. Procurement for LIFE trail will also be organized in autumn 2018. If conditions are suitable then C actions will start in July in Palasi/Sirtsi, and in August in Soosaare and Feodorisoo. It is planned to start forest management actions in other areas in autumn 2018 or winter 2018/2019. Building of LIFE trail is possible earliest in autumn 2019 but it depends on success of restoration actions.

Monitoring actions, including archaeological work, will take place in all areas with special attention to these sites where restoration actions will be completed. Also monitoring reports will be completed as well as methodology related to target species will be further developed.

Study materials will be developed for LIFE trail but their final edition depends on timeframe of establishment of the trail as tests should be carried out on completed trail.

Volunteer camps will be organized in order to support restoration actions (destinations in 2018 will be Soosaare, Feodorisoo and Tudusoo). LIFE Platform meeting on volunteers' involvement will be organized in September 2018.

Main tasks for F1 actions are provision of reports, public procurement for C1 and E2 actions; and preparation application for extension of the projects' deadline.

LIFE Mires Estonia EE000126

Year	2015		2016				2017				2018				2019				Envisaged progress until the next Progress Report due by 31/12/2019			
Quarter ACTION	III	IV	I	II	III	IV	PrRI	I	II	III	IV	PrRII	I	II	III	IV	I	II		III	IV	
A1 actual	x	x	x	x	x	x	Progress Report 1	x	x	x	x	Progress Report 2	Mid-term Report									Completed
A1 proposed	x	x	x	x	x	x		x	x	x	x											
A2 actual				x	x	x	Progress Report 1	x	x	x	x	Progress Report 2	Mid-term Report									Apply for approval of Ohepalu technical design; if needed, amendments to existing plans
A2 proposed				x	x	x		x	x	x	x						x	x	x	x	x	
A3 actual	x	x	x	x	x	x	Progress Report 1	x	x	x	x	Progress Report 2	Mid-term Report									Field monitoring implemented in restoration sites and if there will be any findings certain actions proposed
A3 proposed	x	x	x	x	x	x		x	x	x	x						x	x	x	x	x	
A4 actual	x	x	x	x	x	x	Progress Report 1	x	x	x	x	Progress Report 2	Mid-term Report									Completed
A4 proposed	x	x	x	x	x	x		x	x	x	x											
C1 actual						x	Progress Report 1	x	x	x	x	Progress Report 2	Mid-term Report									Actions completed in Feodorisoo, Sirtsii/Palasi and Soossare, contracts for other areas and readiness to start after forest management actions
C1 proposed				x	x	x		x	x	x	x						x	x	x	x	x	
C2 actual							Progress Report 1					Progress Report 2	Mid-term Report									Action completed in Sirtsii/Palasi area
C2 proposed								x	x	x	x						x	x	x	x	x	
C3 actual				x	x	x	Progress Report 1	x	x	x	x	Progress Report 2	Mid-term Report									Implementation of volunteer camps and LIFE Platform meeting, first aid training
C3 proposed					x	x		x	x	x	x						x	x	x	x	x	
D1 actual	x	x	x	x	x	x	Progress Report 1	x	x	x	x	Progress Report 2	Mid-term Report									Monitoring ongoing, reports provided
D1 proposed	x	x	x	x	x	x		x	x	x	x						x	x	x	x	x	

D2 actual	x x x x x x	x x x x	x	x x x x x	
D2 proposed		x x x x	x	x x x x x	Monitoring ongoing, reports provided; development of guidelines
E1 actual	x x x x x x	x x x x	x		
E1 proposed	x x x x x x	x x x x	x	x x x x x	Networking with projects similar to LIFE ME, providing presentations at different events
E2 actual	x x x x x x	x x x x	x		
E2 proposed	x x x x x x	x x x x	x	x x x x x	Procurement for establishment of LIFE trail, provision of information boards in restoration areas
E3 actual	x x x x x x	x x x x	x		
E3 proposed	x x x x x x	x x x x	x	x x x x x	Development of study program for LIFE Trail; collection of meta-data
E4 actual	x x x x x x	x x x x	x		
E4 proposed	x x x x x x	x x x x	x	x x x x x	Providing web-site with up-dated information
E5 actual					
E5 proposed					
F1 actual	x x x x x x	x x x x	x		
F1 proposed	x x x x x x	x x x x	x	x x x x x	Provision of reports, public procurement for C1 and E2 actions; coordination of project activities, preparation application for extensio n of the projects' deadline
F2 actual			x		
F2 proposed			x		Contract established with auditing company
F3 actual	x x x x x x	x x x x	x	x x x x x	
F3 proposed	x x x x x x	x x x x	x	x x x x x	

## ANNEXES

### List of deliverables with short description

2. Approved technical designs for restoration sites Sirtsu (including separate plan for Palasi abandoned mining site), Tudusoo, Feodorisoo, and Laukasoo, and Ohepalu which is in approval process. Design includes introduction to project activities, description of the site (hydrology, target species, habitats), planned activities (forest management, closure of drainage system) with detailed drawings, time-schedule and expected costs, results of public consultation and approvals by relevant authorities, protocols from public meetings. *(in Estonian, in order to open documents these should be downloaded first to computer)*
6. Design of 13 information boards for Seljamäe hiking trail *(in Estonian with short translations into English and Russian)*

### List of other documentation, including Financial Annexes

1. Protocol and signature list of steering group meeting No V. Protocol includes approval of costs related to costs for insurance of drones, Tudusoo new parking area, prevention of potential negative effects on public forest roads and establishment of new ditches, restoration of former peat extraction area in Palasi/Sirtsu NCA and planting *Sphagnum* mosses and establishment of wooden trails for monitoring, establishment of extensive peat dam in order to restore lake system and improve hydrological system in Laukasoo. In addition, there were presentation but this is not provided within this report. *(in Estonian)*
3. Detailed methodology and instructions for donor sites for *Sphagnum* seeding. *(In Estonian)*
4. Methodology of monitoring actions: monitoring vegetation and using UAVs and satellite data. *(in Estonian, summary provided in English)*
5. List of conferences and other events, number of persons involved given. *(in Estonian)*
7. Media-appearance related with the project and Web visitor's statistics.
8. Comparison of areal changes of project/restoration area based on Natura 2000 habitats in Project Agreement and after completion of technical design
9. Consolidated Financial Statement
10. Financial Statement of the Individual Beneficiary for each partner
11. Beneficiary's Certificate for Nature and Biodiversity Projects