



LIFE Project Number  
**LIFE12 NAT/EE/000871**

**FINAL Report**  
**Covering the project activities from 01.07.2013 to 31.12.2018**

Reporting Date  
**28 February 2019**

Restoring the integrity of freshwater habitats in Alam-Pedja Natura 2000 area -  
bringing the River Laeva back to life

**LIFE HAPPYRIVER**

Project Data

<b>Project location</b>	ESTONIA
<b>Project start date:</b>	01.07.2013
<b>Project end date:</b>	31.12.2017 <b>Extension date:</b> 31.12.2018
<b>Total Project duration (in months)</b>	66 months ( including <b>Extension of 12 months</b> )
<b>Total budget</b>	€ 911 529
<b>Total eligible budget</b>	€ 911 529
<b>EU contribution:</b>	€ 455 764
<b>(%) of total costs</b>	50%
<b>(%) of eligible costs</b>	50%

Beneficiary Data

<b>Name Beneficiary</b>	Eesti Loodushoiu Keskus / Wildlife Estonia
<b>Contact person</b>	Mr Einar Kärgerberg
<b>Postal address</b>	Veski 4, 51005 Tartu, Tartumaa
<b>Visit address</b>	Veski 4, 51005 Tartu, Tartumaa
<b>Telephone</b>	+3725 5929 7560
<b>Fax:</b>	+37 2742 2767
<b>E-mail</b>	einar.kargerberg@gmail.com
<b>Project Website</b>	<a href="https://www.loodushoid.ee/">https://www.loodushoid.ee/</a>

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## 2 Executive Summary

The Final report gives an overview of the activities of the LIFE HAPPYRIVER project conducted from July 2013 to December 2018 by the project co-ordinating beneficiary Wildlife Estonia.

The general objective of the Project was restoration of the natural riverbed of the lower course of the River Laeva and completing the restoration of the integrity of freshwater habitats in Alam-Pedja Natura 2000 network area. The main task was to improve the conservation status of valuable habitat types - natural rivers (3260 and alluvial meadows (6450) - serving as key habitats for fish species of EU importance *Leuciscus aspius*, *Cobitis taenia*, *Misgurnus fossilis*.

The Project was implemented in accordance with the Grant Agreement. The Project was started 01.07.2013, all planned activities have been carried out, the goals were achieved and even exceeded. Two amendments were concluded. First, the amount of the river restoration work was increased, additional 3 km river section was added. Secondly, the project was prolonged for one year for the execution of the monitoring activities.

### 2.1 Summary of the chapters of the report

**Chapter 3 – Introduction** of the report describes the overall and specific objectives of the Project together with expected longer-term results, describes the project site and indicates which habitat types and protected species were targeted.

**Chapter 4 – Administrative part** is concentrated to describe and evaluate the management system. The effectiveness of the communication with the Commission and Monitoring team is also illustrated here. The project was implemented by the coordinating beneficiary Eesti Loodushoiu Keskus / Wildlife Estonia (WE). No associated beneficiaries were involved. Project manager and 8 experts of the WE participated in the implementation. General progress of the project was monitored by the steering committee, which assessed the progress of the project at least twice a year. 11 Steering Committee meetings were held during the project time.

Communication with the Commission took place through reporting, Commission and external monitor's project visits once a year and correspondence regarding the issues raised. Totally 5 reports have been submitted and 10 letters received. Two amendments to the project were agreed.

Organigram of the Project is presented on drawing 1 (pg. 10).

**Chapter 5 – Technical part** (subchapters 5.1.1 to 5.1.4) describes the progress of each action of the Project, the activities undertaken and indicates outputs achieved in quantifiable terms. Each task is compared with planned output and time schedule.

**A – actions. Preparatory actions** (subchapter 5.1.1) are successfully completed. Project action plan and timetable was elaborated and evaluated by steering committee once a year. Project action plan is presented on drawing 2 (pg. 16). All activity licenses and permits were issued and necessary coordination with the stakeholders existed. Five licenses were obligatory during the project time.

**C-actions.** Concrete conservation actions are described in subchapter **5.1.2**.

**C1-** Restoration of the River Laeva lower course (habitat type 3260).

Work was started in August 2015 and initially planned 5 km river section was restored in October 2016.

About 1 km upstream from the first section existed another 3 km long partly remained river section in the nature conservation area, what according area management plan was aim to restore. To increase the positive cumulative effect of the Project outcomes on a cost effective way the restoration of an additional river section was negotiated and the amendment to the Grant Agreement was concluded in February 2017. The work was executed as by November 2017.

For sustainable management of the alluvial meadows of the Alam-Pedja area the access road and the bridge over a ditch were reconstructed. The construction of nearly 300 m of the road was executed during winter 2017/2018.

**C2-** Restoration of spawning grounds.

The restoration of 13 hectares of flooded meadows (habitat type 6450) of the River Laeva was executed in March 2017. Bushes and trees were cut, removed and the meadow grinded. The site was cleaned from the outgrowth of the trees and bushes once more before the regular maintenance (cutting, collecting and removal of the grass) will start. The work was carried through in winter 2017/2018 and summer 2018.

**C3-** Reintroduction of *Leuciscus aspius*.

The task to artificially propagate and re-introduce 10 000 one summer old asps proved more complicated than expected. The task was not successful in 2016 because of the bad weather conditions. The goal was reached in 2017 when 10 000 specimen of juvenile fish were collected from the rearing ponds of the fishfarm and inhabited into the Laeva river in October and November. In May 2018 additional 2000 specimen were released into the River Laeva during the celebration of the Natura 2000 day and festive river opening event.

**D-actions.** Monitoring of the impact of the project actions is described in subchapter **5.1.3**.

**D1** Monitoring of the project results.

Monitoring was carried through according the workplan. The Project experts M.Tambets, M. Sepp and A. Trahv carried through ichthyology, hydrology and water quality analyses. The expert of the University of the Life Sciences Henn Timm, hired with short time contract temporarily, handled the monitoring of the invertebrates. The surveys of the aquatic vegetation were carried out in the restored river sections in September 2018. In addition, novel otolith microchemistry study of the asps was conducted to study the habitat preferences and origin of the asps in Emajõgi River system. The monitoring results show positive impacts of the river restoration work for the fish (especially the protected species) and macroinvertebrates populations and habitats quality. A total of 9 monitoring reports were prepared.

**D2** Assessment of the socio-economic impact was carried out by the expert Üllas Ehrich. The results of the study shows the high socio-economical value of the project activities and results.

**F-actions.** Overall project operation (**F1 and F2**) is described under the administrative part (chapter 3).

Actions F3 – F5 are described in subchapter **5.1.4**.

**F3** Project audit. The auditor Rein Ruusalu from PKF Estonia, the member of the global association PKF International, carried out the audit. The audit report and declaration is presented in chapter 6 and annex 8.3.

**F4** After-LIFE Conservation Plan describes how the results of the project will be maintained and the activities started will continue. After-LIFE Conservation Plan was produced as a separate document in English and Estonian language. The plan is provided in Annex 7.2.5.

**F5** Networking with other projects and associations has been very active and fruitful. Project's experts and manager have participated in numerous local (10) and international (6) events. The project has hosted visits of interested persons and organisations to the project area more than 10 times. Contacts with 5 LIFE projects and experts established, 3 international project proposals developed and submitted.

**E-actions. Public awareness and dissemination of results** are described in separate chapter 5.2. The Wildlife Estonia carried out the action. Public awareness and dissemination activities have been diverse and extensive. There has been designed and printed 1 leaflet, 1 information panel and Layman's Report. In newspapers has been published 5 articles, in TV 4 specialised stories and in news 3 times. Very important and popular were the 3 study camps for children and youth (100 children). Project representatives have presented the project on local seminars, conferences and information days 29 times and international seminars and conferences 7 times.

The subchapter 5.3 focusses on the evaluation of the Project implementation. The project was very successful. All planned goals have had achieved and even exceeded. The methodology for execution of the conservation activities was efficient and cost-effective. This made it possible to achieve greater results than planned. Finally, 8 km of natural river was restored instead of initially planned 5 km. In addition, the access to the project site and valuable floodplains of that area was significantly improved because of the road reconstruction work. This will guarantee the continuation and sustainability of the habitats management in large area, necessary for the implementation of the Alam-Pedja nature conservation area management plan.

The subchapter 5.4 analyses the long-term environmental benefits and sustainability of the Project together with indicating possible long-term indicators of the project success.

The methodology and practice of artificial incubation and re-introduction of protected fish asp was improved and the planned tasks completed. In addition, the modern fish monitoring technologies – telemetry and especially the otolith microchemistry fingerprint methodology – were practiced, developed and value added.

The restoration of the river and alluvial meadow were planned and carried through with high quality and the sustainability of the results is high. The diverse, open, flowing river provides habitats for aquatic fauna and connects different habitats from very large area. The restored floodplain is integrated with the regularly maintained meadows and will be managed according the management plan of the Alam-Pedja Natura 2000 network area.

The methodologies and practices are replicable and transferable wherever the similar habitat restoration activities or fish re-introduction and ichthyology studies will be conducted. Most probably, the results of the activities will be presented in scientific article(s) in future.

The 6th chapter explains the background of the financial report and the accounting system, summarises the costs incurred (also costs per action) and includes the auditor's report. The project was implemented according to the budget, initially planned. Overspent Personnel and External assistance costs categories did not exceed the threshold of 10%/€ 30,000 according

the Article 15.2 of the Common Provisions. The overspend in these categories was mainly caused by the increase of the amount of the concrete conservation and monitoring actions and prolongation of the project by 12 months. In addition, the monitoring studies - otolith chemistry and macrophyte studies – were not initially foreseen and intended to be carried out as External assistance.

The project was successfully implemented. The total budget was slightly exceeded: the final fulfilment was 100, 4% and the overspend was € 3807.-.

### 3 Introduction

#### Overall and specific objectives

General objective: Completing the restoration of the integrity of freshwater habitats in Alam-Pedja Natura 2000 network area (SPA/pSCI, EE0080374). The main task was to improve the conservation status of valuable habitat types (natural rivers 3260, alluvial meadows 6450) serving as key habitats for fish species of EU importance (*Leuciscus aspius*, *Cobitis taenia*, *Misgurnus fossilis*).

Specific objectives:

To restore the R. Laeva natural riverbed in Alam-Pedja Natura 2000, to preserve habitats and species of European conservation priority e.g. *Leuciscus aspius*, *Cobitis taenia*, *Misgurnus fossilis*

To restore the alluvial meadow, thus providing important habitats to the valuable fish and birds eg. *Aquila pomarina*, *Crex crex*, *Gallinago media*, *Grus grus*

To create the spawning grounds for asp

To re-introduce the asp to guarantee the populations stability/increase

To promote the public awareness about the conservation of the EU importance habitats and species and the role of the LIFE+ in it

To develop the international co-operation for the river and river-dependent species conservation

To promote the management and preservation of Natura 2000 biotopes in Alam-Pedja Natura 2000 area to guarantee the presence and quality of spawning grounds *Leuciscus aspius*, *Cobitis taenia*, *Misgurnus fossilis*.

#### Main conservation issues targeted

Alam-Pedja Natura 2000 area is rich in valuable habitat types and species listed in the Habitats and Birds directives. The core of this Natura area is the complex of various freshwater ecosystems, which are mostly excellently preserved and maintained. However, there was a serious problem affecting the integrity of the freshwater ecosystems - the River Laeva has been driven away from its natural riverbed at the lower course. The straight Laeva channel was created for amelioration and log transport purposes. The old riverbed (still partly remained) needs to be re-opened and filled with running water again.

The River Emajõgi is connecting the two biggest lakes of Estonia – Lake Peipsi (the fourth largest lake of Europe) and Lake Võrtsjärv. There are diverse and abundant fish communities in the river and its good quality tributaries. There was a missing part in diversity of fish and other species if the contribution from the River Laeva continued to be absent.

The floodplain meadows (Natura Code 6450) are important from a biodiversity aspect and directly providing critical habitat for Annex I Bird Directives species and breeding grounds for Annex II fish species of Habitat Directive (*Cobitis taenia*, *Misgurnus fossilis*). Without management of these semi-natural biotopes, they will revert to shrub lands and eventually forested areas and thus will lose its mosaic structure and habitat value for many dependant bird, fish and bat species as well as threatened and endangered plant species. Unmanaged floodplains generally overgrow with reed, woody vegetation, and other undesirable plant species, and lose their botanical value and diversity as well as the host of associated animal species (eg. *Corncrake* and *Great Snipe*).

## **Expected longer-term results**

The expected results were:

- 5 km of the River Laeva natural riverbed restored, integrity and completeness of the Alam-Pedja Natura 2000 area improved;
- 12 ha of alluvial meadows restored;
- 300 m<sup>2</sup> of spawning grounds created;
- 10 000 specimen of asp (*Leuciscus aspius*) re-introduced;
- Dissemination activities completed;
- Tangible monitoring indicators verified and results introduced, the efficiency of taken practical protection measures assessed.

The project's outcomes exceeded planned goals. The favourable status of riverine habitat 3260 increased by 8 km / 5,6 hectares; the area of maintenanceable floodplains (6450) increased by 13 hectares; the population of *Leuciscus aspius* in R. Laeva established. In long term, the status of the habitats will remain favourable and the population of the asp will be viable. Thus, the project was necessary for executing the objectives what the Alam-Pedja Natura 2000 area was founded for. In addition, restoration of the river Laeva increased the impact of the LIFE Happyfish project implemented during 2009 to 2012 and the use of its outcomes. The implementation of the management plan for the Alam-Pedja Natura 2000 area and action plans for conservation of the protected species will secure the sustainability of the project outcomes.

## **Socio-economic context**

The socio-economic impacts of the project are positive and significant. The LIFE Happyriver project has influence on local society and wider. During the implementation of the concrete conservation actions work and income through external assistance contracts was provided. This will continue also in future. The public interest to the Alam-Pedja area and fishing in particular is great. The results of the studies of the socio-economic impact indicate the high level of public interest and awareness about the river restoration activities. In addition, the willingness to pay for the restoration of the valuable habitats is positive. The restoration of River Laeva has been very valuable project among other things, economically, and restored services have a significant positive impact to human welfare. The potential of the Alam-Pedja Natura 2000 network area to serve the ecosystem services has increased.

## 4 Administrative part

### 4.1 Description of the management system

The coordinating beneficiary of the project was NGO Eesti Loodushoiu Keskus (Wildlife Estonia). Project did not have associated beneficiaries.

The project had three main phases:

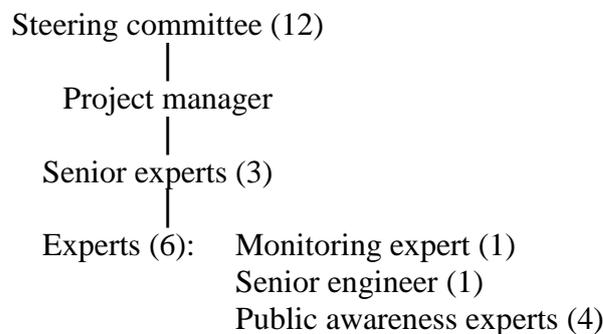
- preparation and planning;
- carrying out specific activities;
- compiling results monitoring and reporting.

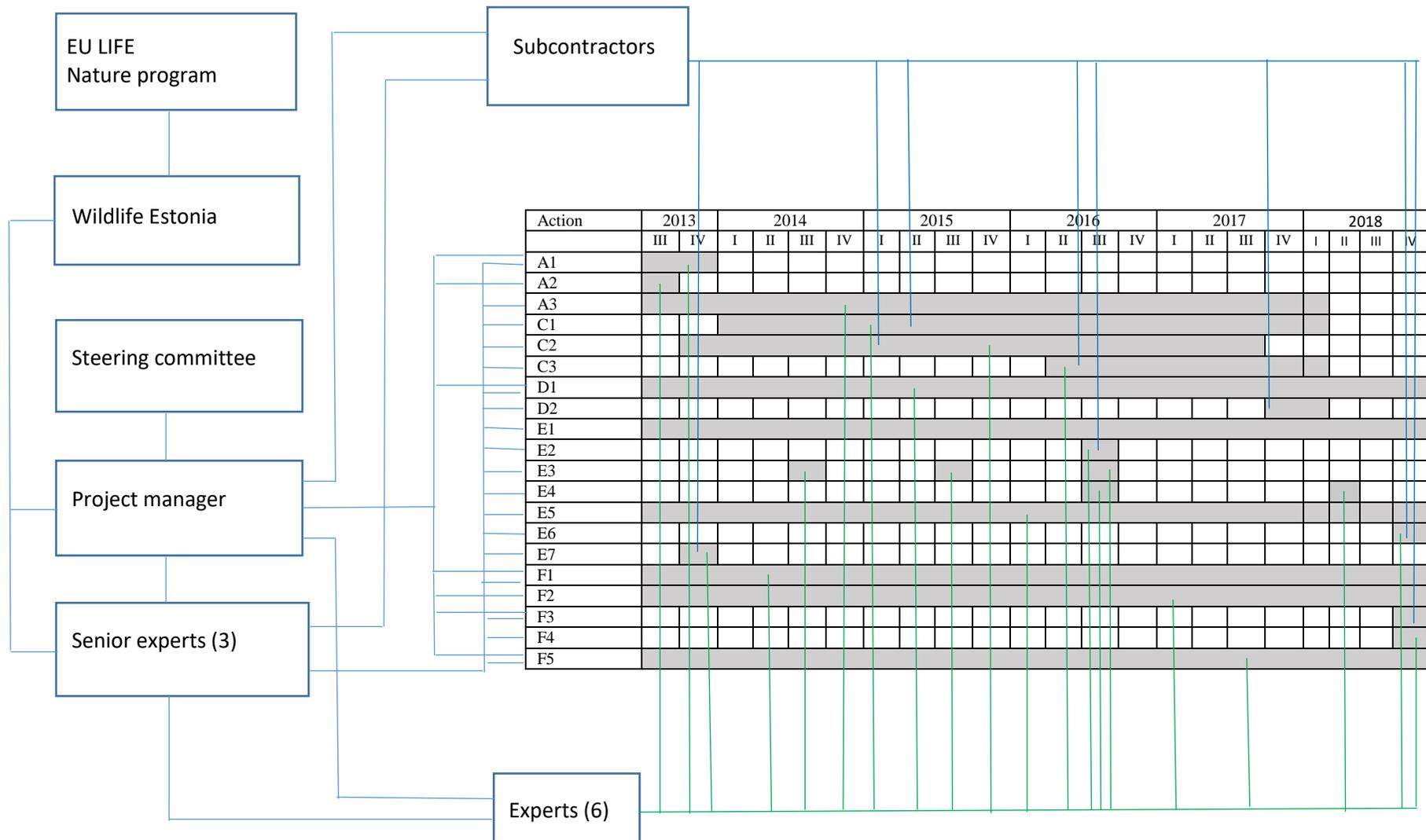
During the preparatory and planning phase, work contracts were concluded with the project manager and experts, a steering committee was established for the overall management of the project, a workplan for the project was developed. The project manager and experts of the Wildlife Estonia obtained the necessary authorisations and approvals for the activities, started dissemination activities, developed a monitoring plan, and acquired the equipment.

In order to carry out concrete conservation activities, monitoring was started to establish the situation prior to work, procurement was carried out to find subcontractors, subcontracting contracts were concluded, a work contract with senior engineer was signed to monitor and supervise the execution of the restoration and construction work. In order to carry out the asp breeding work, contracts for rental of the ponds and facilities at the fishfarm and work contract with breeding expert were concluded. Dissemination, awareness rising and cooperation activities continued. Temporary contracts with the experts for the conduct of the study camps were signed and three study camps were organised.

At the final stage of the project, following the implementation of the concrete activities, monitoring was carried out to clarify out the results of the project and reports were drawn up. Dissemination, awareness rising and cooperation activities were continued. The work was executed and managed by the project's senior experts and project manager.

The work plan of the project was discussed and updated in the Steering Committee at least once a year.





Drawing 1 Organigramm

General progress of the project was monitored by the steering committee. The steering committee meetings were held regularly twice a year. Eleven meetings have been held: on 04.10.2013 (No 1 Face-to-face at project site), 18.06.2014 (No 2, digital), 15.12.2014 (No 3, digital), 21.05.2015 (No 4 Face-to-face at project site), 04.12.2015 (No 5, digital), 26.05.2016 (No 6 digital) and 03.01.2017 (No 7, digital), 28.04.2017 (No 8, Face-to-face at the project site), 14.12.2017 (No 9, face-to-face in Tallinn). The 10<sup>th</sup> meeting was organised at project site together with the river opening event on 21<sup>st</sup> of May 2018. The progress of the project and results of the evaluation of the Progress Report No 2 from 28<sup>th</sup> of February were discussed. The 11<sup>th</sup> meeting took place in Tallinn on 20<sup>th</sup> of December 2018. Final activities and results of the project were discussed. Steering Committee was pleased with the implementation of the project and its good results.

The minutes of the meetings and lists of participants are presented in Annex 7.1.5 according to the Commission letter 3319085 dated 03.07.2017

Project team included full time Project manager E. Kärgerberg responsible for the every day project running, three part time senior experts M. Tambets, M. Sepp and A. Trahv responsible for the implementation of the Project's technical and ecological aspects, also for the monitoring tasks, part time senior supervising engineer U. Lombots, responsible for the technical supervision of the river restoration and construction work, part time monitoring expert H. Timm responsible for the monitoring of the invertebrates and part time experts L. Saar, M. Grosberg, R. Oetjen and P. Männil, responsible for the organisation of the study camps. Project manager E. Kärgerberg was slightly involved in the monitoring activities, public awareness and dissemination activities, networking and project's web page updating work in the final phase of the project.

Two amendments were made to the project:

- The area of the project river restoration action was enlarged, a second section was added. The Amendment No 1 to the Grant Agreement was signed on 14 March 2016 (EC letter no 1276280, 14 March 2016).
- The duration of the project was extended by 12 months because due to unfavourable natural circumstances, the introduction of the asps could not be carried out at the planned time but 12 months later. Therefore, monitoring of the results of the project would not have been possible and the deadline for the monitoring activities and consequently, the final date of the project was extended until 31.12.2018. The Amendment No 2 to the Grant Agreement was signed on 1 December 2017 (EC letter no 5890965, 01 December 2017).

Changes did not affect the overall project management system and implementation of the project.

## 4.2 Evaluation of the management system

The project management system corresponded to the planning, organising and efficient implementing of project actions. The project management was sufficiently comprehensive and the potential natural, economic and organizational risks were taken into account. The exchange of information was effective and all problems and issues were solved without hampering the achievement of the project work plan and objectives. The cooperation with the Steering Committee has been constructive, as well as with the stakeholders, authorities, municipality and other parties involved in the implementation of the project.

Project team, partners and subcontractors were competent and technically and financially capable of performing project tasks. The implementation of the activities has been high quality and sustainable. Negative results and feedback have not occurred, public interest and reactions to the project has been positive.

**Communication with the Commission and the Monitoring team** has been active. Kaia Treier inspected the Project five times: on 10 December 2013, 23 October 2014, 08.-09 September 2015 together with the European Commission visit, 10 October 2016 and 17<sup>th</sup> November 2017. Luule Sinnisov has been the external monitor from the 1<sup>st</sup> of February 2018. She visited project 22<sup>nd</sup> of October 2018. External monitors have well managed the communication with the LIFE unit regarding the arised project amendment topics and the access road reconstruction and monitoring questions. They have participated in submission of reports in form of commenting the draft of the reports.

The communication with the Commission has taken place on in the form of reporting and answering the questions that needed to be clarified after the Reports submission and monitors visits. The issues concerning the Inception Report (EC letter no 1623555 from 19.05.2014) and external monitor visits on 10 October 2013 (EC letter no 113038 dated 20 January 2014) and 23 October 2014 (EC letter no 3910518 from 24.11.2014) are clarified in the cover letter of the Mid-Term Report, submitted on 31 August 2015.

The questions, concerning the Mid-Term Report, submitted on 31 August 2015 and the results of the EC and external monitor visit on 8-9 September 2015 and 10 October 2016 were presented in the EC letters no 4255339 dated 13 October 2015 and 64170812 from 17 November 2016. The answers are provided in the cover letter for the Progress Report (submitted on 28 February 2017) and Final Report.

The questions, concerning the Progress Report, submitted on 28th February 2017 (PrRep), also the results of the external monitor visit on 17th November 2017, were presented in the EC letters 3319085 from 03.07.2017 and 124731 from 09.01.2018.

The questions concerning the road reconstruction issue was discussed in our letter to European Commission from 20.07.2017 and EC letter 124731 from 09.01.2018.

The issues concerning Progress Report no 2 were presented in EC letter no 2517558, dated 15.05.2018. The results of the monitoring visit on 22.10.2018 are presented in Commission letter 5819225 dated 14.11.2018. The questions are answered in the cover letters and reports and in Final Report.

### **Delivered reports**

Following reports have been submitted to the Commission:

The Inception Report on 31.03.2014. Letter from Commission no 1623555 dated 19.05.2014 answered with MtR subchapter 4.1.1 on 31.08.2015.

The Mid-Term Report with second pre-payment request on 31.08.2015 (our letter dated 31.08.2015). Letter from Commission no 4255339 on 13.10.2015, the issues are answered in cover letter of Progress Report and Final Report.

The Progress Report on 28.02.2017 (our letter dated 28.02.2017). Letter from Commission no 3319005 on 03.07.2017, the questions are answered in cover letter for Progress Report 2 and Final Report.

The Progress Report No 2 on 28.02.2018 (our letter dated 08.03.2017). Letter from Commission no 2517558 on 15.05.2018, the questions are answered in cover letter for Final Report and it's annexes.

## 5 Technical part

### 5.1. Technical progress, per task

Table 1 Overview of the project tasks and status as 31.12.2018

Action	Total	Status	2013	2014	2015	2016	2017	2018	
	Planned	31.12.2018	Actual	Actual	Actual	Actual	Actual	Actual	
<b>A Preparatory actions</b>									
1	Elaboration of detailed project action plan and timetable	5x	6x	x	x	x	x	x	x
2	Formation of project steering committee	01.08.2013	x						
3	Issuing obligatory permits, licenses	5x	6x	x	x	x	x	x	x
	Water usages (C1)	1	1						
	Ichthyology monitoring licence (D1, C3)	1	1						
	Operating on nature reserve (C1, C2)	2	2						
	Reintroduction of asp (C3)	30.09.2016	Issued					x	x
<b>C Concrete conservation actions</b>									
1	Restoration of R. Laeva	5 km	8 km			5	3		
2	Restoration of spawning grounds at the floodplain	12 ha	13 ha		4	6	3		
	Restoration of spawning grounds in river	300 m <sup>2</sup>					300 m <sup>2</sup>		
3	Reintroduction of asp	10000	12000					10000	2000
<b>D Monitoring of the impact of the project actions</b>									
1	Monitoring of the Project results	11 surveys	12	1	3	2	3	3	4
	Monitoring indicators	31.03.2014	x						
2	Assessment of the socio-economic impact	1						1	
<b>E Public awareness and dissemination of the results</b>									
1	Project website	1	Completed	1	Updated	Updated	Updated	Updated	Updated
2	Leaflet on riverine habitats, 700 pcs	31.12.2016	700				700		
3	Study camps	3	Completed		1	1	1		
4	Public site visits	2	Completed				1		1
5	Media								
	Articles in newspapers	3	5	1		1	1	1	1
	TV broadcast	1	8		2		1	1	4
6	Layman's report	1	1						1
7	Notice board, 1 pc	31.12.2013	1	1					
<b>F Overall project operation and monitoring of the project progress</b>									
1	Project management								
	Reports	4	5 <sup>1</sup>		1	1		1	2
2	Steering committee meetings	9	9	1	2	2	2	2	2
3	Audit	1	Completed						1
4	After-LIFE conservation plan	1	Completed						1
5	Networking	5x	6x	x	x	x	x	x	x
	Study tour	1	3				1	1	1

<sup>1</sup> Because of the prolongation of the Project Progress Report n° 2 was issued in February 2018

## DELIVERABLE PRODUCTS OF THE PROJECT

Name of the Deliverable	Action	Deadline	Status 31.12.2018
Project detailed action plan	A1	31.08.2013	Completed, submitted with the IncRp 31.03.2014
Monitoring indicators	D1	31.03.2014	Completed, available at homepage, submitted with the IncRp 31.03.2014
Printed leaflet	E2	31.12.2016	Completed, printed 700 pcs
Monitoring reports	D1	30.11.2018	Completed, reports submitted in Annex 7.2
After-LIFE conservation plan	F4	31.12.2018	Completed 03.12.2018, submitted in Annex 7.2.5
Layman's report	E6	31.12.2018	Completed 28.12.2018, submitted in Annex 7.3.1
Assessment of the socio-economic impact	D2	31.12.2017	Completed 10.01.2018, submitted in Annex 3 for PrRep 2
Audit	F3	28.02.2019	Completed February 2019, submitted in Annex 8

## MILESTONES OF THE PROJECT

Name of the Milestone	Action	Deadline	Status 31.12.2018
Project manager contracted	A1	01.07.2013	Completed
Web page created	E1	31.07.2013	Completed, over 300 visits monthly
LIFE Kick-off meeting	F5	31.07.2013	Completed
Steering group formed	A2	01.08.2013	Completed
Detailed fieldwork plan elaborated	A1	31.08.2013	Plan elaborated, approved by the steering committee
First meeting of steering committee	F2	31.08.2013	Meeting held on 04.10.2013
Contacts with other LIFE+ projects created	F5	31.12.2013	Contacts with 7 projects
First article	E5	31.12.2013	Published 10.12.2013
Notice boards set up	E7	31.12.2013	Completed in December 2013
Detailed design for river restoration	C1	06.01.2014	Completed in preparatory phase
Monitoring indicators	D1	31.03.2014	Completed, submitted with the IncRp on 31.03.2014
First study camp	E3	31.08.2014	First camp organized 28.-30.08.2014
Auditor nominated	F3	31.12.2014	Completed
First annual monitoring carried out	D1	31.12.2014	Completed
Sub-contractor nominated	D2	31.01.2016	Completed
Restoration of the alluvial meadow effected	C2	30.09.2016	Completed in September, 2018
First site visit organized	E4	30.10.2016	Completed, site visit for international expertgroup on 18.05.2016
10000 specimen of <i>Leuciscus aspilus</i> summerlings introduced	C3	30.11.2016	Completed in May 2018, 12000 individuals
Monitoring carried out, results evaluated	D1	30.11.2018	Completed 28.12.2018, report submitted in Annex 7.2.5

5.1.1 A – actions. **Preparatory actions** included the elaboration of the work plan, setting up the project steering committee and obtaining the necessary licences and approvals. Project action plan is presented on drawing 2 (pg. 16). Project action plan and timetable was evaluated by steering committee at least once a year. Part of the preparation was finished before the beginning of the Project. Environmental impact assessment of the river restoration work was carried through and technical design was worked out during the preliminary project “Evaluation of the restoring of the River Laeva”.

## **A1 Elaboration of detailed project action plan and timetable**

Proposed beginning	Actual beginning	End in proposal	Actual end
III quarter 2013	III quarter 2013	III quarter 2013	August 2013

Milestone	Deadline	Status
Action plan elaborated	31 August 2013	Completed, submitted with IncR on 31.03.2014. Updated regularly

The most important stages of the work plan were:

- 1) During the preparatory phase of the project from July 2013 until I quarter 2014:
  - Formation of the Steering Committee and elaboration of the action plan;
  - Preparatory work for the concrete actions. Obtaining licences and permits, meetings with stakeholders were organised and technical designs for river restoration negotiated (C1). Long period with communication and number of meetings with the representatives of the Amelioration Department from the Agricultural Board, State Forest Management Centre and local municipality were organised in 2014 to get the final approval for the river restoration activities. The Information was shared and agreements with the private landowners were made. The agreements were received in November 2014, not in first quarter like was planned. The delay did not result in postponement of the deadlines for the concrete activity C1 and the timely execution of the project;
  - Preparation for the monitoring activities (D1). Working out the work plan and methodology for monitoring. Purchasing of the equipment.
  - Implementation of the dissemination actions (E1, E5, E7) and project management actions (F1, F2 and F5).
  
- 2) During the period of executing the concrete actions I quarter 2014 to I quarter 2018:
  - Implementation of the C actions, selection of the subcontractors, execution of the contracts;
  - Amendments for the additional concrete conservation activities and prolongation of the project duration;
  - Monitoring of the project actions (D1);
  - Dissemination and management actions.
  
- 3) Final stage of the project included mainly the monitoring (D1 and D2) actions, dissemination activities (E1, E4, E5 and E6) and management actions.

Project action plan		2013		2014			2015				2016				2017				2018				
		II I	I V	I	II	II I	I V	I	II	II I	I V	I	II	II I	I V	I	II	II I	I V	I	II	II I	I V
<b>Reports</b>				●					●					●				●					●
A1 Elaboration of detailed action plan and timetable	Planned																						
	Actual	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
A2 Formation of SC	Planned																						
	Actual	■																					
A3 Issuing permits/licenses	Planned <sup>2</sup>																						
	Actual <sup>3</sup>	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
C1 River restoration	Planned <sup>4</sup>																						
	Actual			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
C2 Restoration of spawning grounds	Planned																						
	Actual <sup>5</sup>			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
C3 Reintroduction of asp	Planned																						
	Actual <sup>6</sup>										■	■	■	■	■	■	■	■	■	■	■	■	■
D1 Monitoring	Planned																						
	Actual	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
D2 Assessment of the socio-economic impact	Planned																						
	Actual									■	■	■	■	■	■	■	■	■	■	■	■	■	■
E1 Project website	Planned																						
	Actual	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
E2 Issuing leaflets	Planned																						
	Actual													■	■	■	■	■	■	■	■	■	■
E3 Study camps	Planned																						
	Actual				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
E4 Public site visits	Planned																						
	Actual													■	■	■	■	■	■	■	■	■	■
E5 Media	Planned																						
	Actual	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
E6 Layman's report	Planned																						
	Actual																					■	■
E7 Notice board	Planned																						
	Actual	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
F1 Project management	Planned																						
	Actual	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
F2 Project SC meetings	Planned																						
	Actual	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
F3 Project audit	Planned																						
	Actual																					■	■
F4 After-LIFE Conservation Plan	Planned																						
	Actual																						■
F5 Networking	Planned																						
	Actual	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

<sup>2</sup> Permit for visiting the area was renewed for the 2018.

Special licence for ichthyology surveys were issued annually, at the beginning of the year

Permits for riverbed restoration, forestry work and water usage was issued for the project implementation period

Permit for re-stocking of the asp was issued at the end of 2017, when introduction took place

<sup>3</sup> It was planned to have issued the permits for riverbed restoration by I quarter 2014. Actual time was IV quarter of 2014

<sup>4</sup> Work at the first section was finished in October 2015. Work on second section started in August 2016 and was finished in November 2017. The reconstruction of the bridge and road was finished in February 2018.

<sup>5</sup> The spawning ground restoration was finished in March 2018 because of the unfavourable weather conditions.

<sup>6</sup> The artificial propagation and re-introduction in 2016 was unsuccessful. The action was completed in November, 2017.

## A2 Formation of the project steering committee

Proposed beginning	Actual beginning	End in proposal	Actual end
III quarter 2013	III quarter 2013	III quarter 2013	July, 2013

Milestone	Deadline	Status 31.12.2018
Steering committee formed	01.08.2013	Completed July, 2013, list submitted IncRp
Meetings of the committee	Twice a year	Eleven meetings held

Important action at the preparatory phase was formation of the Project's Steering Committee. Steering committee was established in order to secure the smooth running of the project and to receive qualified advice, opinions and interests of project partners and stakeholders. Steering committee was formed in a principle that all project stakeholders and interested parties are involved - co-financier Environment Investment Centre, Ministry of the Environment, State Forest Management Centre, Environmental Board, local municipality, management of the Natura 2000 area, University of Tartu and Environment Agency. During the project, some changes took place on the personal level, because the members changed their occupation.

## A3 Issuing obligatory permits, licences

Proposed beginning	Actual beginning	End in proposal	Actual end
III quarter 2013	III quarter 2014	IV quarter 2015	I quarter 2018

Milestone	Deadline	Status 31.12.2018
Water usage permit	01.07.2013	Completed in July 2013
Permit for area visiting	01.07.2013	Completed in January 2014
Permit for ichthyology monitoring	01.07.2013	Completed, updated annually
Permit for river restoration work	31.12.2014	Completed in September 2014
Permit for restoring the alluvial meadow	31.12.2013	Completed in February 2014
Permit for fish re-introduction	31.10.2016	Issued in October 2017

All necessary activity licenses and permits were issued and valid on time.

Environmental Board issued following operational authorisations:

- The permits for visiting and working at the Nature conservation area and organising the public events.
- Water usage permits for river restoration and bridge construction.
- Permits for maintaining of the alluvial meadow and restoring the natural riverbed.
- Permit for stocking of the asps.

Forest Management Centre coordinated the floodplain and river restoration work. The river restoration activities were coordinated also by local municipality, Agricultural Board and landowners.

The licences for the biota monitoring was issued by the Ministry of the Environment.

## 5.1.2 C-actions. Concrete conservation actions

Objective	Planned	Status 31.12.2018	2014	2015	2016	2017	2018
C1 Restored Laeva river, km	5	8		5		3	
C2 Alluvial meadow restoration, ha	12	13	4	6			3
C2 Creation of spawning grounds, m <sup>2</sup>	300	300			300		
C3 Introduction of <i>Leuciscus aspius</i> , spm	10000	12000				10000	2000

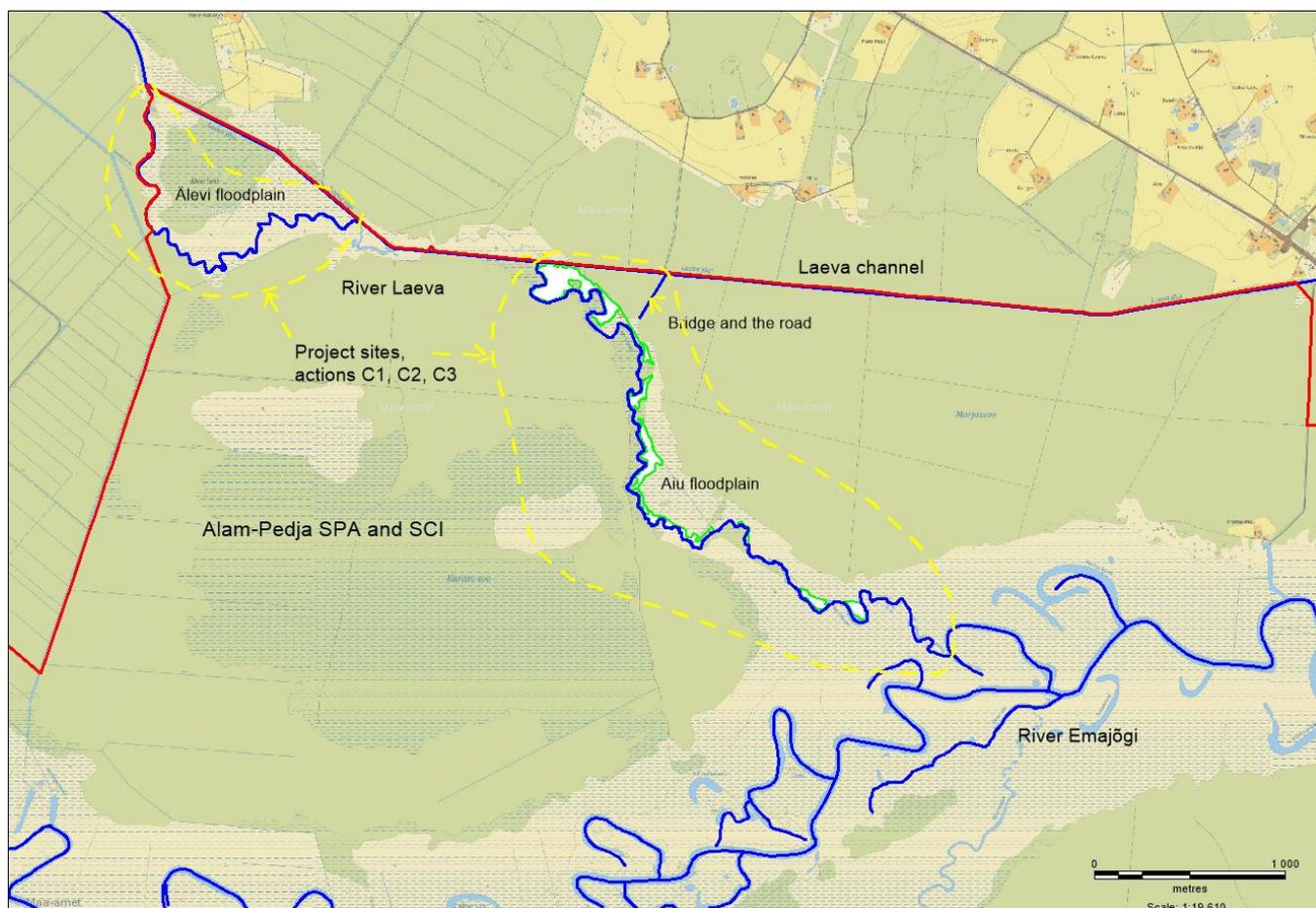


Figure Project area and work sites

During the project time, the following actions have been carried out:

### **C1 Restoration of the River Laeva lower course**

Proposed beginning	Actual beginning	End in proposal	Actual end
I quarter 2014	II quarter 2014	III quarter 2016	I quarter 2018

Milestone	Deadline	Status 31.12.2018
Detailed design ready	06 January 2014	Completed in April 2013
Restoration work effected	31 December 2017	Completed in May 2018

In the lower reaches of the river, the last 5 kilometres of the river, situated on the Aiu floodplain, had been left dry. The water of the river had been diverted into a straight ditch (Laeva channel) that drained into Emajõgi River several kilometres downstream from the natural inflow point. As there was no flowing water in the riverbed, it filled with sediment and vegetation over time, and a series of ponds with stagnant water were formed. A few kilometres upstream of this part

of the river, there was another 3-kilometre-long former winding river, situated on Älevi floodplain, that had been destroyed with trenching.

In order to restore the missing part of the Emajõgi water system and to bring the river that had been rich in fish back to life, the project was initiated with the restoration of the first five-kilometre river section on the Aiu flood meadow. The technical project, environmental impact assessment and permit for the special use of water for the execution of the work had already been organised before the start of the project. During the preparatory phase of the project in 2013 and 2014, the project was approved with the relevant authorities. A public procurement procedure was carried out in January 2015. A contract for carrying out the work was concluded with OÜ Melior-M on 23 March 2015.

The main work of stage I – riverbed digging, construction of water level regulators, construction of a ford – were completed in October 2015. On September 8 and 9, a planned visit by the Commission and an external monitoring group took place, during which the possibility and the need to restore another 3-kilometre-long river section was discussed. In order to significantly increase the area of habitats to be restored during the project and to enhance the results of the project, a decision was taken to increase the project area and to restore another section. The corresponding project supplement and contract amendment was signed in March 2016.

For the preparation of the works, geodetic surveys of the preserved river section and its surroundings were carried out (OÜ Kagu Geodeesia, 15/020, Annex 7.2.5), a technical project was prepared (work of IB Urmas Nugin OÜ töö IB 03/2016, Annex 7.2.5) and the work was approved in the respective agencies.

A public procurement procedure for finding the contractor was held in May 2016, a contract with the winner OÜ Melior-M was concluded in July. The stage II work on Älevi flood meadow commenced in August 2016 and was completed in November 2017.

With two stages of work, the Alam-Pedja Natura 2000 area network of rivers received a total of about 8 kilometres of diverse winding rivers that had been destroyed for a long time due to human activity.

The managed alluvial meadows of Emajõgi River are one of the most representative ones in the whole boreal region of Europe. In the Alam-Pedja Natura 2000 area, some 2,000 hectares of flood meadows are regularly managed, a significant part of which are also located in the downstream area of the restored Laeva River. In order to ensure regular management, it is necessary to ensure that access to the managed areas and the removal of vegetation that is collected during management is as little dependent on weather conditions as possible. However, the condition of the existing access road and the bridge over the Laeva channel had deteriorated to such an extent that they could no longer be used. The need to reconstruct the access path was explained to the Commission and the work was approved in correspondence and during an extra visit (EC letter 124731, 09 Jan 2018). The reconstruction of the bridge and road leading to the Aiu flood meadow was carried out in cooperation with RMK. The joint open public procurement took place in April 2017. RMK reconstructed a section outside the project area and the project restored the part of the road (300 m) within the protected area and the bridge over the Laeva channel. Construction work was completed in May 2018.

### **Complementary actions outside LIFE**

Outside the project area, in the middle reaches of the Laeva River in the Laeva village, a dam was removed from the Laeva River and an artificial rapid was built in 2016 by the local municipality. Opening migratory routes increases the opportunities for fish to move and occupy new habitats. The increase of habitats and the increase of the area will enhance the positive impact of the project on the asp population in the Emajõgi and Laeva rivers.

Reconstruction of the access road in cooperation with RMK was also carried out partly outside of the protected area. RMK was responsible for and funded the construction of an 820 m long road outside the protected area. As a result of the cooperation, the management of representative Emajõgi floodplains is made sustainable.

## C2 Restoration of spawning grounds

Proposed beginning	Actual beginning	End in proposal	Actual end
III quarter 2013	I quarter 2014	III quarter 2016	March, 2018

Milestone	Deadline	Status 31.12.2018
Restoration effected	30.09.2016	Completed in September 2018

The floodplain meadows (Natura Code 6450) are important from a biodiversity aspect and directly providing critical habitat for several Annex I Bird Directives species and breeding grounds for Annex II fish species of Habitat Directive. Without management of these semi-natural biotopes they will revert to shrub lands and eventually forested areas and thus will lose its mosaic structure and habitat value for many dependant fish and bird species as well as threatened and endangered plant species with the disappearance of these flooded meadows. These high value habitats are a main value of the area and the restoration and subsequent management of these areas also are a prime objective of the area.

Action did foresee the restoration of important spawning grounds at the floodplains of River Laeva restored lower course and the river section upstream from the area of the restoration work. Action did foresee also creating of the rapids as spawning ground for asp in streams. There are large meadows located in the area where hay and bushes are cut regularly, but large areas of the destroyed Laeva river meadow, next to these were unmaintained for decades. The restoration of the unmanaged meadow was difficult and labor time-consuming work depending much of the weather conditions. Part of works was done by machinery and part manually and mostly by sub-contractors. Senior technical expert U. Lombots supervised the works from technical aspects and senior nature conservation experts M. Tambets, A. Trahv and M. Sepp supervised the works from nature conservation aspects.

The goal was to finish the work by the third quarter of 2016, but due to the warm winter of 2016 and the rainy summer, the work could not be completed. Work began again in January 2017 with the arrival of major frosts and was completed by April. A total of about 13 hectares of alluvial meadows suitable as spawning grounds were restored.

As the restoration work lasted longer than expected – 4 years – the areas that had been completed earlier started to overgrow with brush. To be able to give the alluvial meadows over for RMK to manage, the meadows have to be freshly managed. In order to bring the restored areas into compliance with the required conditions for the transfer, the first post-restoration management was performed. For this purpose, the freshly grown scrub and vegetation were crushed. The work was subcontracted from OÜ Murukratid in winter 2017/2018. The restored alluvial meadows were handed over to RMK in September 2018.

The creation of spawning grounds for the asp took place during the riverbed restoration works (C1). 300m<sup>2</sup> of spawning grounds have been created.

### C3 Re-introduction of *Leuciscus aspius*

Proposed beginning	Actual beginning	End in proposal	Actual end
IV quarter 2016	II quarter 2016	IV quarter 2016	May 2018

Milestone	Deadline	Status 31.12.2018
10000 specimen of asp introduced	30.11.2017	12 000 individuals stocked

Restocking of asp that had been planned for 2016 failed because natural conditions were unfavourable for reproduction and breeding. The very early spring flood and cold spring were followed by a cold summer with very little precipitation. Therefore, the breeding of 10,000 asp summerlings that had been the aim was not successful, and the action was repeated in 2017. The methodology was renewed and preparations for spring breeder fish fishing and transport were more thorough. An additional agreement was signed with a professional fisherman (OÜ Gustofer, U. Saks, FIE A. Kukin) from the Emajõgi River for catching and tagging breeder fish and for carrying out monitoring. Breeder fish and fish suitable for tagging were obtained using the fisherman's gear (river fyke net) that had to be regularly checked, cleaned and repaired. The transport to the gear and the transport of the caught fish were carried out using the fisherman's means of transport. U. Saks and A. Kukin were present and assisted in all the activities. The work took place in spring and summer of 2016, 2017 and 2018 (fish for tagging).

The reintroduction of asp had been planned for October 2017. The fish were raised in the ponds of the Haaslava fish hatchery and for the summerlings (5 gr, 10 cm) to be caught for reintroduction, the ponds were discharged. Since the outflows of the ponds where juvenile fish are reared in the fish hatchery are connected to the Emajõgi River, and the Emajõgi River's autumn water level was exceptionally high, the release was postponed until November. The reintroduction finally took place between November 16 and 21, and more than 10,000 asp summerlings were released at low densities across both of the restored sections of the Laeva River. As a few thousand asp were kept to overwinter in the pond of the fish hatchery, it was decided to carry out their reintroduction during the opening ceremony of the restored river. The opening ceremony took place on May 21, 2018, when we also celebrated the anniversary of the LIFE program and the Natura 2000 network. In total, more than 12,000 asp summerlings were released into the Laeva River.

#### 5.1.3 D-actions. Monitoring of the impact of the project actions

##### DI Monitoring of the project results

Proposed beginning	Actual beginning	End in proposal	Actual end
III quarter 2013	III quarter 2013	IV quarter 2017	31.12.2018

Milestone	Deadline	Status 31.12.2018
Monitoring indicators verified	31.03.2014	Issued, submitted with Inc Rp 31.03.2014
Final monitoring report	30 November 2017	31 December 2018

The purpose of the monitoring was to collect data before and after the ecosystem restoration work and to compare them. Project team senior experts M. Tambets, M. Sepp and A. Trahv carried out monitoring of the hydrology and the ichthyology. H. Timm performed the monitoring of large invertebrates as a part-time temporary expert. M. Sepp compiled an overview of avifauna. A study on the recovery of river-specific vegetation took place in September 2018 by experts of respective fields. At the end of 2018, researchers from the

University of Tartu conducted the otolith microchemistry study. The reports of the studies are delivered with the previous reports and in Annex 7.2.5 of Final Report (Study of Macrophytes, Aggregated report of monitoring results and Report of the otolith microchemistry study). Reports are available at the project web site [https://www.loodushoid.ee/Restoring the integrity of freshw 350](https://www.loodushoid.ee/Restoring_the_integrity_of_freshw_350).

Regarding the question 4 in letter from Commission no 2517556 dated 15 May 2018, during the monitoring activities was collected various data, which can be included in national databases. For example, the information about the asp migration and catches was provided to the register of endangered and Directive Annex II species of the Environment Agency. The collected data was used also during the preparation of the Asp Conservation Action Plan. In addition, the reports of ichthyological studies are available for the experts and submitted to the Environmental Agency.

Environment Agency is responsible for the collecting and analysing environmental monitoring data. There is also database for hydrological data and information about the water quality (oxygen, temperature, pH, conductivity) of the River Laeva are submitted to the register of the Environment Agency.

The information about the birds monitored at the area is included into a electronic database e-Elurikkus (<https://elurikkus.ee>),

Changes in the **ichthyofauna** condition were continuously monitored by both traditional and telemetric (asp migrations) methods. Regular monitoring of fish fauna and water chemistry shows that because of the work carried out in the lower reaches of the Laeva River:

- the hydrological regime inherent to a natural river has recovered;
- water quality in terms of dissolved oxygen has greatly improved;
- in sections with a missing riverbed, a riverbed characteristic to a natural river and better suited to biota has been created;
- existing riverbed has been straightened with little interference, allowing fish to recolonise the river faster and more extensively;
- the opportunity for fish to carry out year-round migrations has been restored;
- a large number of fish habitats and breeding sites have been restored;
- ichthyofauna characteristic to a natural river has begun to recover;
- new species of fish (including protected species) have been added to the composition of the ichthyofauna of the river;
- fish abundance has significantly increased;
- plant communities characteristic to the river have develop. The condition of river sections that were restored first is either good or very good. Over time, the condition of the newly excavated sections will also improve.

Thus, the results of the river restoration work are very positive and as expected. The recovery continues, flowing water will take a long time to shape the riverbed, that had stood with stagnant water, into a riverbed that more resembles a natural river. The vegetation that will start growing in the excavated area will be a good habitat for different species of fish. It is expected that new fish species will colonise the area and the abundance of fish will increase with the recovery of microhabitats.

The monitoring of asp was carried out using the best available techniques. Great progress has been made in this regard in the previous years. Recent research and international collaboration between research institutions have created the prerequisites for a new effective method – otolith microchemical analysis – to be implemented in this system of waterbodies.

Microchemical research, the so-called microchemical fingerprinting method, is increasingly being used in modern ichthyology. The method is based on the fact that fish otoliths (or also some part of the skeleton) record the characteristic microchemical trace of the waterbody and that it is possible to identify the habitats of the fish (including the waterbody of origin) throughout the life of the fish. The prerequisite for the application of this method is that the waterbodies to be examined must be distinguishable by microchemical methods. A recent studies of bream on watercourses related to the Emajõgi River and Lake Peipus and Lake Võrtsjärv showed that the traces of different waterbodies are clearly distinguishable and the origin and movements of the fish can be traced. A microchemistry “passport” of the waterbodies in the Emajõgi River system was improved for fish. Inspired by the results, an otolith microchemistry study was also conducted on asp during the LIFE Happyriver project. The aim of the study was to test and develop the method for asp in the River Emajõgi system, study the migration patterns and habitat preferences, describe the waterbodies (restored Laeva River) and assess the performance of the asp re-introductions and the recovery of the restored river as a habitat for asps. What is particularly important in the context of our project – this way it is possible to recognise all the individuals released by our activities. Based on this, we can see the share of the fish in populations that have been introduced by us (including within the framework of LIFE Happyfish). We are able to see the share that fish from the Laeva River, which was restored as part of the project, account for in the ichthyofauna of Emajõgi and of other water bodies, etc. The results of the studies show that the stocking of asp as part of the LIFE projects has been effective. A significant share (16%) of the adult asp living in the Emajõgi system, originate from the Haaslava fish hatchery. 27 % of the young asps, caught from the Laeva River, was inhabited by the project.

In response to the letter from the Commission no 2517558 dated 15 May 2018, question 2, we specify the information on the study as follows:

- 1) to carry through the study of otolith microchemistry the preparatory work includes the communication with the fishermen for collecting the fish samples (project senior experts, continuously, as appropriate), storage of the samples and management of the database (senior experts, continuously, as appropriate), analyzation of the database of the collected fish samples and selection of the relevant samples (senior experts, continuously, as appropriate). The samples had to be defrozened, the pair of otoliths removed from fish heads and delivered for the further analyzes to the Tartu University (senior experts, 5 days).
- 2) the study involved senior experts of the Eesti Loodushoiu Keskus M. Sepp and M. Tambets in the preparatory phase of the study.
- 3) the concrete outcomes are: increased knowledge about practical use of the novel method; increased knowledge and amount of the data about the characteristics of the large system of waterbodies of the East-Estonian basin, including the restored Laeva River; information about the origin of the fish and their migration patterns improved. The Laeva River is valuable for asps in the system and they have already discovered and inhabited the re-opened river. The river provides habitats for different life stages – for spawning, recovery and feeding period.
- 4) the conclusions: method is well suited for ichthyological studies; the introduction of asp into the river system of the River Emajõgi has been effective; the data collected provide additional high-quality information to carry out and assessment of the status of the fish stock.
- 5) the work of the experts of the Eesti Loodushoiu Keskus is covered from the Personnel costs. The work of the experts of the Tartu University is covered from the

External assistance cost for the action D1. University of Tartu performed half of the analyses in Tartu and half in Sweden.

The **macroinvertebrate** community studies were conducted in 2014 (prior the restoration work), 2015 (immediately after the excavation work), 2016 and 2017. The monitoring indicates positive impacts of the river restoration work. The river section was a waterbody with standing water before restoration work. The habitat type natural rivers 3260 was restored and the conditions for the establishing of a typical invertebrate population created. The diversity of the dominant species has increased. Also, the indicators, describing different aspects of the invertebrate status, are presenting the improvement of the status of the restored river.

The recovery of the **plant communities** after the river restoration work was studied in autumn 2018. Macrophyte communities were observed and sampled at eighth river sites. In two sites, the excavation was done 2 years ago, in three sites four years ago, and in the rest of the sites, recent excavations were not done. After excavation in the corresponding sites, there was no vegetation. As the surveys have shown, the formation of macrophyte communities has now yielded some results. The river sites differed in macrophyte dominance. In the two recently excavated sites, the development of vegetation is still at an early stage. Also, in the sites excavated four years ago, the macrophyte communities were not yet fully developed. As expected, the recently excavated sites were in a poor or good state. However, the positive point is that the condition of the river sites excavated four years ago were evaluated much better than those excavated two years ago. This refers to the performance of excavated work in improving river conditions, although the result does not appear immediately after excavation. One would hope that in a few years, the state of the sites that were excavated later would reach at least the status class 'good'.

### **Complementary actions outside LIFE**

The results of the project studies are an input for the future management of the Alam-Pedja Natura 2000 site and the protection and use of several water bodies and species. The management plan for the next period of the Alam-Pedja protected area will take into account the monitoring and research results of the project and the recommendations from the project team. The project team also contributes to shaping the fishing regime in the area. The data gathered on the asp and the expert opinions of the project team are an input to the discussions on the protection of the asp. At the end of 2018, an action plan for the protection of the asp was adopted, prepared by experts of Wildlife Estonia.

Monitoring in the framework of the project has been carried out with the best modern methods and there are plans to publish a few scientific articles on habitat restoration and fish introduction and migration based on the results of the studies. Project Manager Einar Kärgerberg will continue and complete doctoral studies at the University of Tartu.

### **D2 Assessment of the socio-economic impact**

Proposed beginning	Actual beginning	End in proposal	Actual end
I quarter 2016	I quarter 2016	IV quarter 2017	February, 2018

Deliverable	Deadline	Status 28.02.2018
Assessment of the socio-economic impact	31 December 2017	Completed, February 2018

Restoring the natural state of the lower reaches of the Laeva River will create ecosystem services that will have a positive impact on the environment and, thus, on the well-being of individuals. A special study was carried out to measure the economic benefits of restored ecosystem services. Given the fact that ecosystem services are to a large extent nonmarket values, the contingent valuation method was used. This is the most widely used method in the world for the economic valuation of nonmarket values. Focus group interviews were used to find out the importance of different ecosystem services.

To implement the contingent valuation method, a simulated market scenario for restored ecosystem services was developed. In addition to the question of willingness to pay, the questionnaire also included several other questions related to the consumption of ecosystem services. In total, 578 persons were interviewed who are representative of the Estonian population in terms of their sociometric characteristics (gender, age, level of education, income).

The results of the study show that only 5% of respondents prefer for EU funds to be used on land improvement activities, such as river straightening. By contrast, as many as 70% of respondents prefer for natural riverbeds to be restored through EU projects.

Respondents were not satisfied with the amount of knowledge on the status of the waterbody. As many as 80% thought there should be more information.

85% of the respondents had a positive personal willingness to pay for the natural status of the Laeva River to be restored, which is a very good result. The average individual willingness to pay was 25.5 euros, which is about 22 million euros when extrapolated to the residents of Estonia. Thus, according to the results of the study, the economic value of the ecosystem services provided by the lower reaches of Laeva River to Estonian residents is 22 million euros.

Three focus group interviews were used to link the total value of ecosystem services to individual services. Ecosystem values were discussed in the focus groups and afterwards the groups were asked to rank river ecosystem services in order of importance (10 points for the most important, etc.). In the three focus groups, the highest grade was given to “the improvement in fish spawning conditions”, which can be attributed a total willingness to pay of 3.6 million euros. The next ones are “the preservation of traditional flood meadows and fish spawning grounds” with 3.4 million and “the improvement of the status of protected aquatic animals” with 2.8 million. A total of ten ecosystem values were assessed.

In conclusion, it can be said that the restoration of the natural state of the river is economically a very successful project, which brings a significant increase in well-being. The report is included in Annex 3 to the PrRep 2 and is available on the project website [http://www.loodushoid.ee/s2/350\\_2183\\_348\\_Socio-economic\\_impact\\_.pdf](http://www.loodushoid.ee/s2/350_2183_348_Socio-economic_impact_.pdf).

According the question 2 in Commission letter no 124731 dated 09 January 2018 the results of the study showed the public's strong support for the work that was carried out to restore the natural state of rivers and spawning grounds. We have introduced the results of the study to the representatives of the state agencies – Environmental Board, Environment Agency and departments of the Ministry of Environment and Ministry of Rural Affairs. The results of the study show high importance of the awareness rising and dissemination, especially among children and youth. Therefore, the study camps for children and site visits with the students have been important and such kind of activities and cooperation with educational institutions will be significant part of our work in future. The interest of the schools and organisations, providing education in field of nature conservation has been great and the interest in dissemination materials is high. Thus, it is important to continue and increase awareness raising efforts in different environments (fishing forums, TV shows and social media). It is especially

important to consider the use of channels that are suitable for young people. The results of the study will be used to better target future information dissemination actions and when informing various stakeholders.

#### 5.1.4 F-actions. **Project operation and monitoring**

##### **F3 Project audit**

Proposed beginning	Actual beginning	End in proposal	Actual end
IV quarter 2018	January 2019	February 2019	January 2019

Milestone	Deadline	Status 31 December 2018
Project audit	28 February 2019	Completed on 20 February 2019

The Final Report of the project has been audited by the auditor rein Ruusalu from an international audit bureau PKF Estonia. The audit report provides an independent and professional assessment of the financial management of the project. Audit report is a part of the financial report and is annexed to the report (Annex 8.3).

##### **F4 Production of the After-LIFE conservation plan**

Proposed beginning	Actual beginning	End in proposal	Actual end
IV quarter 2018	October 2018	December 2018	31 December 2018

Milestone	Deadline	Status 31 December 2018
After-LIFE conservation plan	31 December 2018	Completed in December 2018, submitted with FinRep

The After-LIFE Conservation Plan is a separate chapter of the Final Report. The Plan is produced by Wildlife Estonia in Estonian and English, both in paper and electronic form. This plan describes how it is planned to continue and to develop the conservation actions and measures initiated by the project after the end of the project and how the longer-term conservation activities of the protected fish species and riverine habitats and flooded meadows will be assured. The report provides information regarding the actions that will be carried out, and when, by whom, and with what sources of finance they will be carried out. The plan is available at the project's homepage [https://www.loodushoid.ee/s2/350\\_2365\\_408\\_LIFE\\_Happyriver\\_After-LIFE\\_conservation\\_plan.pdf](https://www.loodushoid.ee/s2/350_2365_408_LIFE_Happyriver_After-LIFE_conservation_plan.pdf) and in Annex 7.2.5.

##### **F5 Networking with other LIFE and non-LIFE projects**

Proposed beginning	Actual beginning	End in proposal	Actual end
III quarter 2013	III quarter 2013	IV quarter 2017	Continues

Milestone	Deadline	Status 31 December 2018
Contacts with other projects	31 December 2013	Contacts established with 5 LIFE projects

Co-operation with LIFE and other projects dealing with similar topics was developed to share and acquire project results and experiences. We established contacts with several LIFE projects:

LIFE Danube floodplains - Restoration and management of Danube floodplain habitats (LIFE14 NAT/SK/001306);

LIFENaturaSlowinskaPL - Conservation of selected habitats and species in Ostoja Słowińska and Pobrzeże Słowińskie (LIFE13 NAT/PL/000018);

LIFE ConfluPo – Restoring connectivity in Po River basin – opening migratory route for *Acipenser naccarii* and 10 fish species in Annex II (LIFE11 NAT/IT/188);

LIFE ReBorN - Restoration of Boreal Nordic Rivers (LIFE15 NAT/SE/000892 ReBorn).

We discussed the possibilities for practical cooperation and sharing the information and results of activities. The information about workshops and dissemination events was shared. Also, the materials of projects were shared.

We organized a visit to the project area for the representatives of the Polish project Active protection of endangered species and habitats in the Natura 2000 Ostoja Wigierska area (LIFE11 NAT/ PL/000431).

In cooperation with WWF Estonia, a seminar and a field trip to the project area was organised for a group of representatives of nature conservation organisations from Belarus on May 17, 2016 (<http://elfond.ee/tehtud#/projektid/eesti-ja-valgevene-vabauhenduste-koostoo-margalade-kaitset>). The visit to Belarus took place on August 13–18, 2018. We familiarised ourselves with the local conditions, the nature conservation situation and the opportunities for cooperation.

We have participated in training and information days introducing the LIFE program. We have had a very fruitful collaboration with Mikko Tiira from Finland, a LIFE expert with a lot of international experience. The greatest result of the co-operation is the drafting of the LIFE IP project application for the Ministry of the Environment, under the code name LIFE IP CleanEST, which deals with addressing the water management questions at a new, more integrated level, in the Ida-Viru sub-basin in Estonia. The application was successful, and the financing agreement was signed in December 2018.

Cooperation with project WETMAN – Conservation and Management of Freshwater Wetlands in Slovenia (LIFE09 NAT/SI/000374) has led to new contacts with Slovenian conservationists. In partnership with the organisation REVIVO, we are planning joint LIFE and other projects. The first meeting and discussion of project ideas took place during Mr Tambets' visit to Slovenia during 15–20 August 2017. The visit was fruitful. The possibilities of LIFE programme were introduced, contacts with the experts and stakeholders, dealing with the similar nature conservation issues in Slovenia and other countries were created and developed. As a follow-up to the visit and in order to promote further cooperation, we organised a seminar on organising the conservation of protected fish species and habitats and on doing restoration work in Estonia and Europe. The seminar was held on 23–25 May 2018 in Tartu. The aim of the seminar was to present the results of the work of improving the status of waterbodies and ichthyofauna in the framework of LIFE projects, to discuss novel fish fauna monitoring methods, to discuss the possibilities of the LIFE program, and to plan joint projects. The seminar was successful. An international project application called “Building capacity in fish telemetry as a powerful tool for planning and evaluating a cross-border collaboration on three living labs” with the acronym TELEFISH was prepared during the seminar and the following cooperation after the seminar. 12 partners from 9 European countries are involved in the project. Proposal concept note was submitted to EEA and Norway Grants Fund for Regional Cooperation on 28 June 2018. Concept note has passed the technical evaluation and is in the further evaluation process now. Questions regarding the implementation of the Baltic Sea action

plan for the conservation of the sturgeon and the implementation of the sturgeon reintroduction project were also discussed at the seminar.

We participated in the international conference Dam Removal Europe 2018, which took place 24–26 September 2018 in Sweden. The conference was attended by 140 participants from 24 countries. Dam Removal Europe unites organisations, institutions, and individuals involved with improving the status of rivers, organising the removal of dams, and related research and information dissemination. At the seminar, we created numerous contacts with organisations and people working to protect rivers and the aquatic environment. The next Dam Removal Europe seminar will take place on May 22–23, 2019 in Estonia. The seminar is organised by the Environment Agency of Estonia and Dam Removal partnership.

The materials of the networking are provided in Annex 7.3.2.5. according the Commission letter no 4255339 from 13 October 2015.

### **Complementary actions outside LIFE**

Experience from our LIFE projects helped us to prepare the above-mentioned TELEFISH application for the EEA and Norway Grants European-wide call for proposals.

Our positive experience in the implementation of LIFE projects led to cooperation with the Estonian Ministry of the Environment to put together a LIFE integrated project, LIFE IP CleanEST, to solve water management issues at the national level. Two years of cooperation was successful, and in December 2018, a financing agreement was signed between the European Commission and the Ministry of Environment of the Republic of Estonia for implementing a 10-year project. The application was successful due to the extensive involvement of various institutions and organisations and cooperation with various local and international organisations and experts (Mikko Tiira from Finland, experts from the River Trust).

Our cooperation with the international working group involved with the recovery of the Baltic Sea sturgeon has been very fruitful. As a result of the co-operation, it has been possible to continue the preparation of sturgeon reintroduction activities in Estonia. From the point of view of reestablishing sturgeon populations, it is extremely important that as a result of international co-operation, the Baltic Sea countries' joint “Draft HELCOM Action Plan for the protection and recovery of Baltic sturgeon” has been written; 31 October 2018 (<https://portal.helcom.fi/meetings/HOD%2055-2018-577/MeetingDocuments/4-11%20Draft%20HELCOM%20Action%20Plan%20for%20the%20protection%20and%20recovery%20of%20the%20Baltic%20sturgeon.pdf#search=sturgeon>). We continue to plan joint projects to implement the plan.

## 5.2 Dissemination actions

### 5.2.1 Objectives

The project demonstrated the first large scale river restoration work in Estonia. The objective was to disseminate the obtained experiences to a wide audience and to increase the awareness of people on the local and international level. All kinds on information channels and events were used: different media channels, conferences, study camps, seminars and printed materials. The dissemination and awareness increasing work was carried out by Wildlife Estonia.

Table 2 The objectives and the effectiveness of the dissemination

Objective	Task	Result	Success of the implementation
Use of LIFE and Natura 2000 logo	Use logos on basic tools, printed materials, information materials, information boards	According to the contract and what was planned, comments from the Commission's representatives considered	Successfully completed
Installation of an information board	Install an information board at a frequently visited area	Board was put up at Kärevere in December 2013, at a site giving access to Alam-Pedja and the area. In addition, information boards detailing the work being undertaken.	Successfully completed
Project homepage	Create and constantly update the project web site, expected at least 250 visits per month.	Homepage active and updated, over 400 visits per month. Appearance updated in January 2017	Successfully completed
Issuing a leaflet introducing the values of the project and riverine habitats	Design and issue a leaflet in English and Estonian, 700 copies in total.	Leaflet designed, 500 copies printed in Estonian and 200 in English.	Successfully completed
Press releases	At least three articles in national newspapers and produce 1 TV episode	Published/aired*: - articles in national newspapers (circulation 40,000–50,000): 5; - web magazines: 1 review; - longer dedicated TV episodes in national television: 4 times; - in news on national television and commercial stations: 3 times	Completed very successfully, a lot of interest and feedback
Videos and photographs	Produce dissemination videos and photographs	Produced 5 drone videos of the sites before and after restoration work.	Completed successfully.
Children and youth camps	Organise 3 study camps for a total of 100 children and young people	Organised 3 study camps for a 100 children and young people	Successfully completed, feedback very positive
Introducing the project at national seminars	Introduce the project to residents, specialists, and officials	Project was introduced: - at seminars, workshops and information days: 29 times (approx.. 1500 people) - lectures and fieldwork for university students: 2 times (60 students) - Celebrating the anniversary of LIFE and Natura 2000, organised visits to the site four times for local and international nature conservation	Completed very successfully, a lot of interest and positive feedback

		experts, and for local youth (around 150 people in total)	
Introducing the project at international seminars	Introduce the project at international conferences	Project was introduced: - international seminars in Estonia: 4 seminars, over 450 people - conferences abroad: 3 conferences, nearly 450 people.	Completed very successfully, a lot of interest, cooperation links created.

## 5.2.2 Dissemination: overview per activity

### **E1 Project website**

Proposed beginning	Actual beginning	End in proposal	Actual end
III quarter 2013	III quarter 2013	IV quarter 2017	Will continue

Milestone	Deadline/Amount	Status 28 December 2018
Webpage created and updated	31 July 2013	Updated, will continue
Visits per month	250	300 – 400 visits per month

The information gathered by experts during the project and compiled reports are reflected on the website. Video and photo materials from the project area have also been uploaded to the website. A new design was created for the website in February 2017. Between 2013 and 2017, the website had an average of 310 visits per month. In 2017, the collection of site visit data was interrupted due to the redesign of the website; this was restored in early 2018. In 2018, there were 5247 visits to the website, thus averaging 437 visits per month. The statistics from 2018 are given in Annex 7.3.2.5.

### **E2 Issuing of leaflets**

Proposed beginning	Actual beginning	End in proposal	Actual end
III quarter 2015	III quarter 2015	I quarter 2016	January 2017

Milestone	Amount	Deadline	Status 31 December 2018
Leaflet issued	700	31 December 2016	Issued

The leaflet (700 copies in Estonian and 200 in English) has been printed and distributed to the Environmental Board, RMK, Palupõhja Nature School and also distributed on Environmental Education Information Days and various seminars, conferences and information dissemination events. The printed leaflet is presented in Annex 4 to the Progress Report of 28 February 2017 and on the website [http://www.loodushoid.ee/Ulevaade\\_346](http://www.loodushoid.ee/Ulevaade_346).

### **E3 Study camps focusing on Natura 2000 values of Estonian rivers**

Proposed beginning	Actual beginning	End in proposal	Actual end
III quarter 2014	IV quarter 2014	III quarter 2016	July 2016

Milestone	Amount	Deadline	Status 28/02/2018
Study camps	3	31 August 2016	Three study camps organised

In the years 2014, 2015 and 2016, 3 successful and educational camps were organised for a total of 100 children and young people. Study camp materials are presented in Annex 7 to the Progress Report of 28 February 2017.

#### **E4 Public site visits at the Laeva River**

Proposed beginning	Actual beginning	End in proposal	Actual end
III quarter 2016		III quarter 2018	October 2018

Milestone	Amount	Deadline	Status 31 December 2018
Public site visits	2	30 September 2018	3 site visits organised

The first visit took place on May 18, 2016, when, in cooperation with the Environmental Board, we introduced the project actions and the area to be restored to a Finnish environmental protection group (about 40 visitors in total). The second site visit was held on May 21, 2018, in connection with the formal opening event of the Laeva River, and the anniversary of LIFE and Natura 2000 (over 50 people in total). We also organised a third site visit on October 6, 2018 for 22 members of the Tartu Students' Nature Conservation Association.

#### **E5 Introduction of Habitats Directive Annex II fish species and valuable habitats in media (radio, TV, papers), seminars and international conferences**

Information dissemination actions of the project aimed at the local and international public, experts, and policy makers have been diverse, comprehensive and massive. Interest for the project in Estonia has been large, as shown by the results of the socio-economic impact study conducted. The project was also submitted to the Environmental Action of 2018 competition organised by the Ministry of the Environment. The project has also attracted international interest. In 2014, the project and LIFE Platform meeting organised by ELLE-Geie were among the most read LIFE news stories. Stories have been published in the most widely distributed nationwide newspapers and in the most popular TV shows and news programs.

##### **Newspapers**

In newspaper **Postimees** (printed about 50 000 daily) have been published four stories; one on **10.12.2013** (copy submitted with the Inc Rp

<http://www.tartupostimees.ee/2626472/happyriver-annab-joele-oige-lop> ) on **25.08.2015** (copy in MidT Rep [https://tartu.postimees.ee/3304635/lompide-reast-tekib-vastu-talve-ilus-vana-jogi?\\_ga=2.226706846.2043077616.1547472548-1726413153.1526038393](https://tartu.postimees.ee/3304635/lompide-reast-tekib-vastu-talve-ilus-vana-jogi?_ga=2.226706846.2043077616.1547472548-1726413153.1526038393) ),

**09.05.2016** (copy with PrRep <http://pluss.postimees.ee/3686179/kui-kiiresti-ujub-latikas-taitsa-kiiresti> ) and **22.11.2017** (copy with PrRep 2

<https://tartu.postimees.ee/4318083/havimisohus-olnud-tougja-populatsioon-hakkas-teadlaste-abil-kosuma> ).

National weekly **Maaleht** (printed 41 900) **22.05.2018** (copy in Annex...

<http://maaleht.delfi.ee/news/keskkond/uudised/fotod-ja-video-tartumaal-suwendati-ning-puhastati-ummistunud-laeva-joe-alamjooks?id=82182159>).

##### **Ministry of Environment press news**

22.05.2018 <https://www.envir.ee/et/uudised/tartumaal-avati-terveks-tehtud-laeva-joe-loik>

31.01.2019 <https://www.envir.ee/et/uudised/suurel-keskkonnagala-kuulutati-valja-2018-aasta-koige-keskkonnasobralikum-tegu-ja-ettevete>

## TV

Osoon 19.05.2014

<https://arhiiv.err.ee/guid/20140516164559901000300112290E2BA238B440000002508B0000D0F060790>

Osoon 20.10.2014

<https://arhiiv.err.ee/guid/20141017152504601000300112290E2BA238B440000004144B0000D0F031856>

Osoon 16.05.2016

<https://arhiiv.err.ee/guid/20160515025222101000300112290E2BA238B440000000792B0000D0F180851>

Osoon 27.11.2017

<https://arhiiv.err.ee/guid/20171124150305501000300112290E2BA238B440000004680B0000D0F043127>

AK 21.05.2018 from 18:59

<https://arhiiv.err.ee/guid/20180522151124501000300112290E2BA238B440000002912B0000D0F014531>

Kanal2 Reporter 21.05.2018 from 12:25

<https://kanal2.postimees.ee/pluss/video/?id=89187>

TV3 Seitsmesed uudised from 12:55 <https://uudised.tv3.ee/eesti/uudis/2018/05/21/eriline-projekt-5-kilomeetri-pikkune-joeloik-aratati-taas-ellu>

Postimees Reporter 21.05.2018 [https://reporter.postimees.ee/4492046/reporter-laeva-jogi-joudis-koju?\\_ga=2.134906482.2043077616.1547472548-1726413153.1526038393](https://reporter.postimees.ee/4492046/reporter-laeva-jogi-joudis-koju?_ga=2.134906482.2043077616.1547472548-1726413153.1526038393)

## Local seminars and information days

25.07.2013 local people, representatives of the local municipality and environmental organisations. We introduced the results of the LIFE Happyfish project and the goals and activities of the LIFE happyriver project. The expectations and possibilities for the cooperation was discussed.

We have participated on a series of the Nature education seminars, which were organized by the Environmental Board in 6 regions in Estonia in October - November 2013. The seminars were targeted for the specialized audience - the teachers of the educational institutions and experts of the nature conservation and consulting organisations. The total number of visitors was close to 800 and the feedback to the presentations about our project was very positive.

The Natura 2000 day 2015 was celebrated on the field trip to the Project area with the members of the Students nature conservation society on 21.05.2015.

Presentations about the activities of the LIFE projects on the area were made on various meetings and information days:

- celebration of the 20th anniversary of Alam-Pedja Nature conservation area on 10<sup>th</sup> of October 2014;

- Tartu Nature Festival 2016 on 01.07.2016 (<http://loodusfestival.ee/programm>);
- Public information day "Who is living in Alam-Pedja?" 21.03.2017. <https://www.keskkonnaharidus.ee/infopaeva-kes-elab-alam-pedja-sees-tartus/>

The Environmental Board organized series of the Nature education seminars also in September – October 2017. We participated in 11 seminars together with educational institutions, municipalities and tourism organisations in 11 county centers.

Two information days took place in 2018:

- Summer seminar of the Estonian Ornithological Society on 30.06.2018 about river restoration and fish communities in LIFE Happyfish and LIFE Happyriver projects;
- In the contest of the Lake Peipsi Festival, we presented to interested parties the status of rivers and fish in the Emajõgi River system and LIFE projects that have been carried out to improve their status. This seminar took place on 4<sup>th</sup> of July.

Very important is to participate in the work of the Alam-Pedja Cooperation Council. The Council is a voluntary association of organisations and private individuals to share the information and discuss issues related to the development and activities of the Alam-Pedja Natura 2000 network area. <https://tartu.postimees.ee/3457153/alam-pedja-looduskaitseala-tegevusi-hakkab-suunama-koostookogu>

### **International seminars and conferences**

Very successful was the LIFE platform meeting addressed to the riverine species and habitats held in Tartu on 10-12th of September 2014. The article about the meeting gathered large public attention as the most read **LIFEnews** story in 2014: <http://ec.europa.eu/environment/life/news/newsarchive2015/january/index.htm#top5>  
**LIFE news sept 2014:** <http://ec.europa.eu/environment/life/features/2014/rivers2.htm>  
**LIFEnews Platform meeting:** <http://ec.europa.eu/environment/life/features/2014/rivers1.htm>

Wide audience of nature conservation and environmental experts were informed at the international conference **Wetland Day 2016** in Tartu on 02 February 2016 (<http://elfond.ee/uudised/rahvusvaheline-konverents-toob-kokku-ideed-margalade-kasutusest-ja-tulevikust>).

The **Natura 2000 and LIFE day 2016** was celebrated on the field trip to the Project area with the group of representatives of organisations from Belorussia on 17 May 2016 organised by the WWF Estonia (<http://elfond.ee/tehtud#/projektid/eesti-ja-valgevene-vabuhenduste-koostoo-margalade-kaitse>) and group of nature conservation experts from Estonia and Nordic countries organized in co-operation with Environmental Board on 18 May 2016.

Project was introduced on international conference "**Towards the best practice of river restoration and maintenance**" on 20.-23. September 2016 in Krakow, Poland. Unfortunately, we could not make an oral presentation, as the conference was big with nearly 200 participants and the number of presentations was limited. ([http://www.iop.krakow.pl/files/137/first\\_circular.pdf](http://www.iop.krakow.pl/files/137/first_circular.pdf)).

The **Natura 2000 and LIFE day 2017** was celebrated and project presented on a seminar organised by the Ministry of Environment on 13<sup>th</sup> of June in Tallinn (<http://life.envir.ee/25-aastat-loodusdirektiivi-ja-life-programmi>).

Oral presentation about LIFE projects were made on international conferences:

- final seminar of **LIFE URBANCOWS** in Pärnu, Estonia on 13.-14.09.2016;
- **“Conservation and Management of Wetland Habitats”** Riga, Latvia, July 11-12, 2017. The conference was also a study tour for wetland conservation practitioners. <http://www.mitraji.lv/conference-on-conservation-and-management-of-wetland-habitats-july-11-12-2017/?lang=en>

Wide audience of nature conservation and environmental experts, also decisionmakers and officials were informed about the LIFE projects at the international conference **Wetland Day 2018** in Tartu on 02 February 2018. <https://soo.elfond.ee/konverents-2018/>

We participated in the **Dam Removal Europe 2018** conference on 24th to 2th of September 2018 in Hudiksvall, Sweden (<https://damremoval.eu/sweden/>). 24 countries over the world and 140 participants took part in the conference. Estonia had time for only one presentation and the presentation about the dam removal activities in Estonia was made by the representative of the University of the Life Sciences of Estonia. The progress and achievements of Estonia gathered great attention and our activities including. The next Dam Removal Europe meeting will take place in Estonia on 22-23 May 2019 (<https://damremoval.eu/dam-removal-europe-international-seminar-estonia/>). The event will be organised by the Environment Agency and Ministry of Environment of Estonia and Dam Removal Partnership.

## **E6 Composing a Layman’s Report**

Proposed beginning	Actual beginning	End in proposal	Actual end
IV quarter 2017	IV quarter 2018	31 December 2018	December 2018

Milestone	Deadline	Status 31 December 2018
Layman’s report issued	31 December 2018	Completed on 31 December 2018. Printed in 200 pcs.

The Layman’s Report was prepared, designed and printed in December 2018. The report provides an overview of the project objectives, actions and results. The report has 20 pages, contains photos and maps of project sites and LIFE, Natura 2000 and co-financer’s logos. Reference to the project and LIFE programme support is included also. The printed number of the A5 format report is 200: 100 in estonian and 100 in english. Report is available at project’s web page [https://www.loodushoid.ee/ Restoring the integrity of freshw 350](https://www.loodushoid.ee/Restoring_the_integrity_of_freshw_350) and in annex 7.3 of the Final Report. Report is designed and printed by Foliaalis OÜ.

## **E7 Information boards**

Proposed beginning	Actual beginning	End in proposal	Actual end
IV quarter 2013	IV quarter 2013	IV quarter 2013	December 2013

Milestone	Amount	Deadline	Status 31 December 2018
Notice board erected	1	31 December 2013	Completed in December 2013

Notice board about the project and nature values of the Alam-Pedja Natura 2000 area is erected at Kärevere, closest place to the Project site often visited by the people (reported with the Inception report 31.03.2014). In addition, the information panel about of the river restoration work were erected on roads to the work sites.

## 5.3 Evaluation of Project Implementation

### 5.3.1 Methodology

The first main goal of the project was to restore the natural streambed of the river in the lower reaches of the Laeva River and its connections with the Emajõgi River (C1). For this purpose, sediments that had deposited and accumulated in the historical streambed during the digging of the channel and over time were removed by digging. The sediments were deposited on the left bank of the river and were planned uniformly. If necessary, gullies were left on the alluvial meadow for the spring flood. In order to ensure an even distribution of the water between the original channel and the restored river, bottom barrage were constructed to the bottom of the canal and at the source of the reopened river. The excavation work was carried out based on detailed technical projects, which had been approved by all relevant bodies. The projects identified the location, profile and the depth of the streambed, the locations of the sections to be cleaned, the structures, materials and locations of the barrages/rapids and fords to be erected. The reconstruction of the road and bridge leading to the alluvial meadow was carried out in cooperation with the State Forest Management Center that commissioned the technical project. An agreement was signed with an engineer with appropriate qualifications and competencies to supervise all construction work. Excavation and construction contractors were picked as a result of open public procurement procedures. The work was of high quality, and it was carried out on time at the cost agreed in the public procurement.

The second main objective was to restore alluvial meadow spawning grounds suitable for fish (C2) and to prepare them for regular management. To do this, the trees and shrubs that had grown on the alluvial meadow were removed. Larger trees were transported away, scrub was either burned or crushed and stumps were grinded. Since work was carried out over several years depending on the weather conditions, thin scrub managed to start growing again on the cleared alluvial meadow and had to be removed. As a result of the works, the alluvial meadow has been prepared for regular management detailed in the management plan for the Alam-Pedja Nature Reserve.

The methodology for carrying out the C1 and C2 activities was appropriate and took into account the natural and environmental circumstances. All preparatory steps for performing the work – approvals, environmental impact assessment, technical designs and public procurements – were carried out in a timely and high quality manner. The aim of the public procurement was to find entrepreneurs with sufficient experience and good technical readiness for execution of the work in difficult conditions. The management and monitoring of the restoration work was effective. The planning and implementation of the activities were efficient and the possibility of carrying out more concrete conservation work than initially planned has high importance. The implementation of additional works significantly increased the positive impact of the project on the status of the habitats, species and the achievements of the objectives of the Alam-Pedja Natura 2000 network area. The work was carried through on a cost-effective way and the sustainability of the results will be secured. The re-opened river acquires the characteristics of the natural river again and the flowing water keeps the river open and the quality of the water will be good. The management of the restored alluvial meadows and spawning grounds is included in the area management plans.

The third major objective of the project was to strengthen the asp population in the Emajõgi system and in the restored Laeva River (C3). Experience of artificially breeding asps had already been gained during the LIFE Happyfish project in cooperation with the Haaslava fish

hatchery. However, the success of artificial breeding depends to a large extent on natural conditions and, unfortunately, in 2016 the rearing of 10,000 individuals, which had been planned, failed. So the action had to be continued in 2017 when it was successful. In the autumn of 2017, 10,000 summerlings were released into the Laeva River and 2000 more were released in the spring of 2018. Mainly the methodology met the goals. The changes that were made were as follows: a higher number of breeding fish was ensured, cooperation with professional fishermen improved, the incubation temperature range was extended and the number of incubation units increased. The rearing of juvenile fish in ponds is a cost-effective and ecologically appropriate method.

### 5.3.2. Achievement of the project objectives

Task	Foreseen in the revised proposal	Achieved	Evaluation
Restoration of the natural riverbed	5 km	8 km	Implemented successfully
Restoration of the floodplain and spawning grounds	12 ha	13 ha	Implemented successfully
Reintroduction of asps	10000 individuals	12000 individuals	Implemented successfully

Main objectives of the project – improving the integrity and the status of riverine habitats in the Alam-Pedja Natura 2000 network, and strengthening the population of the fish fauna, including a protected species, the asp – were met and exceeded. In the reopened river, the processes of natural riverine habitat regeneration and formation began. The waterbodies with stagnant water that had been created as a result of human activity, and which were unsuitable for organisms in the winter and sometimes in the summer during oxygen poor periods, were once again transformed into a river with flowing water. The reopened migratory routes and created habitats offer fish the opportunity to reach and populate suitable habitats. By restoring the lower reaches of the Laeva River, the potential of the Alam-Pedja protected area, an area that is important for the preservation of the ichthyofauna of the Peipsi–Vörtsjärve waterbodies (both protected and industrial species), was significantly increased.

### 5.3.3. Emergence of the results

The results of the project immediately show the difference that exists in places where previously there was no streambed but now is a river with running water. Living and migration conditions of fish have improved. The reopened riverbeds with flowing water are acquiring characteristic features of watercourses. The species composition of the ichthyofauna has increased significantly; 11 species of fish have been added, including the asp, spined loach, and European bullhead, which are all protected species that had previously not even been observed in the preserved river sections.

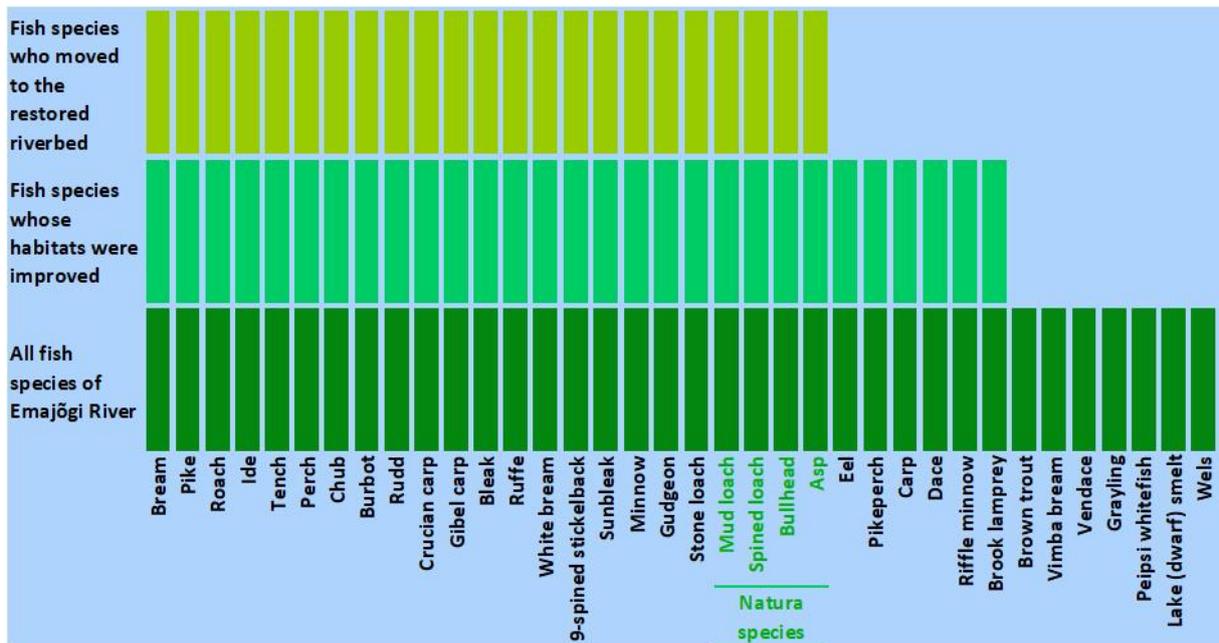


Figure Fish species before and after restoration

A total of 23 species of fish were caught during fishing surveys. These include several species characteristic to watercourses (e.g., spined loach, gudgeon, common chub), including species that are very sensitive to water oxygen concentrations (e.g., European bullhead, Eurasian minnow). The addition of these species to the ichthyofauna of the restored river suggests that the previously destroyed riverbed is becoming a normal fish-rich natural river. The appearance of different age groups is important for the protection of asp and for the stocking effort to be considered successful.

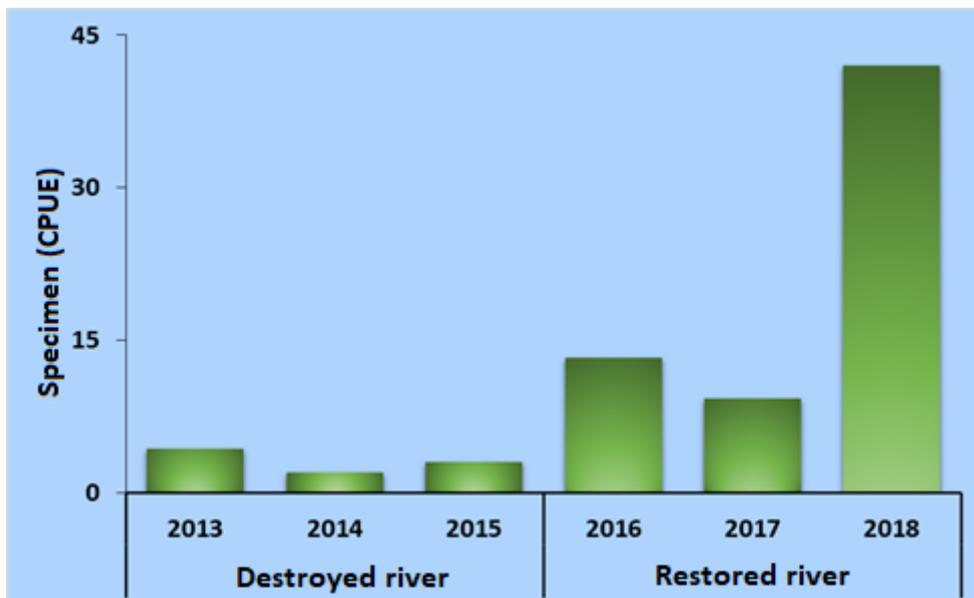


Figure Number of the individuals in the control catches per night in the period before and after the restoration. CPUE (catch per unit effort) is methodology indicating the changes in fish abundance (number of individuals or number of species) using the results of standardised scientific monitoring methods (control catches with standardised equipments and time units)

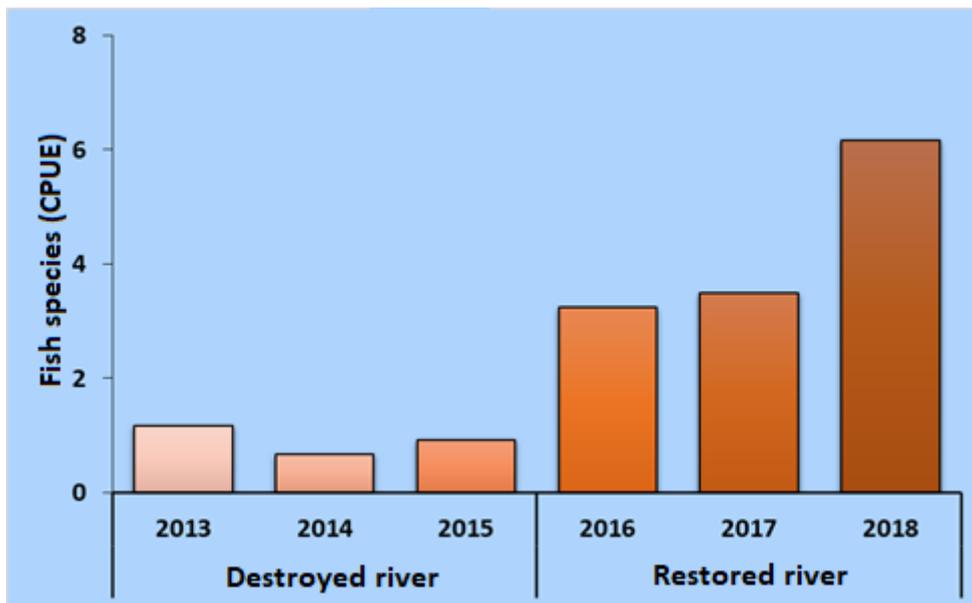


Figure The number of fish species in the period before and after the restoration in control catches per night

An important change compared to the time before restoration is that flowing water has been restored, and there is a significant increase in water oxygen concentration, which has become also much more stable. That is important for biota. The increase is especially evident during the winter, which is the most difficult period.



Figure The average oxygen concentration of the natural lower reaches of the Laeva River in the winter before and after the river was restored. On the y-axis, the oxygen concentration in yellow marks the concentration that only species with low requirements can survive in (e.g., European weatherfish, tench, crucian carp), blue indicates the concentrations required by most species (including asp, spined loach), and green indicates the concentrations that are also acceptable for species that are very sensitive to water oxygen conditions (e.g., European bullhead, European minnow).

In order to evaluate the impact of the work on ecosystem recovery, aquatic and semi-aquatic macroflora (macrophytes) were also studied. Based on flora, the state of the stretch of the river

that was opened in the first stage is either good or very good. In the section that was restored later, the condition is either poor or good, but too little time has passed from digging, and the river is also expected to achieve good or very good condition in these sections.

Restoration of alluvial meadows has resulted in a significant increase in the integrity and area of alluvial meadows under management. Areas suitable for spawning have also been created for fish that spawn in flowing water.

#### 5.3.4. Effectiveness of the dissemination

Dissemination of information to the public has been extensive and effective.

The actions have been covered in nationwide newspapers with the largest circulation, such as Postimees and Maaleht. Project has been introduced several times in most popular TV programs like Osoon on national TV and prime time news on national and commercial TV channels. Stories about the LIFE Platform meeting concentrating on riverine habitats and species organised in Tartu gathered great attention.

The number of people visiting the website is higher than planned – more than 400 visits per month. A great deal of attention was paid to interested groups involved with environmental education and with visiting and using the nature. During the project, active cooperation existed with the Environmental Board in holding environmental education conferences and information days. In total, approximately 1000 educators and people from the field took part in the 20 specific events that were held all over Estonia during the project. Several thematic seminars and project site visits were also organised for both local people and international experts. The project was introduced to policy and decision-makers at round tables held at the Ministry of the Environment once a year in presence of highest level of ministry officials and experts (and also representatives of other nature conservation organisations) and regularly presented in the project steering group that consisted of senior management representatives from different sectors. The socio-economic impact assessment revealed that people are highly interested and aware of river restoration and fish stock sustainability.

The project and its activities were so popular that the restoration of the Laeva River and asp re-introduction were submitted to an Best Environmental Act contest organised by the Ministry of Environment. The project gained great recognition – it was elected as Best of the best Environmental Act 2018!

### 5.4 Analysis of long-term benefits

#### 5.4.1 Environmental benefits

The nature conservation actions carried out during the project (restoration of the natural river, management of alluvial meadows and restoration of spawning grounds, improvement of fish migration conditions, fish reintroduction), in addition to ensuring the favourable status of protected fish species and habitat types, help to preserve the wider economical potential of fishing in the Emajõgi river basin district and lakes Peipus and Võrtsjärv. The results of the project are a good example of the positive impact that compliance with the principles of the Habitats Directive and the creation of Natura 2000 sites has on the preservation of biodiversity and species diversity. In accordance with the principles of the Habitats Directive, the protection

of biodiversity and the conservation of species is ensured by the protection of different habitat types. The knowledge and experiences gained during the implementation of the project also help with planning the following actions for the protection of the rivers and the aquatic life in Alam-Pedja and the whole of Estonia; it can also be used in neighbouring countries.

In Estonia, national river basin management plans have been established for the implementation of the Water Framework Directive, one of the objectives of which is the restoration of the *good* chemical and ecological status of natural rivers, the first priority being protected rivers, including rivers defined as Natura habitats.

Ensuring that ichthyofauna is in a good state is also important for many other protected animal species. In addition to fish, many species associated with waterbodies listed in Annex II to the Habitats Directive are present in the Alam-Pedja Nature Reserve. The large otter population of the Alam-Pedja Nature Reserve feeds in waterbodies. The pond bat (*Myotis dasycneme*), a species listed in Annex II to the Habitats Directive, and whose population in the area is one of the largest in Europe, feeds on invertebrates that spend part of their life-cycle in water (for example, caddis flies).

The fish-richness of waterbodies also ensures a food source for birds feeding on fish. It is of particular importance to white-tailed eagles (*Haliaeetus albicilla*), a species listed in Annex I to the Birds Directive, for whom fish in oxbow lakes are an easy prey during the spawning period, and thus these fish constitute an important source of nutrition for the rearing of their chicks. Grey herons (*Ardea cinerea*) and great egrets (*Ardea alba*) also commonly feed at oxbow lakes.

### **Influence of restoration of the lower course of Laeva River on protected fish species**

Based on data collected during fieldwork we can say that several protected fish species have been re-inhabiting the river since its restoration. Spined loach (*Cobitis taenia*), for example, is successfully resettling the restored river channel. The creation of flowing water habitats and the improvement of water quality, especially in terms of its rise in oxygen content, has been determinative in the spined loach's resettlement of the habitats. Suitable spawning grounds have been and are being created.

In addition to sandy stretches of river, new sections of river with rocky bottoms have also been created as a result of the restoration activities, which are favourable and essential habitats for the **Bullhead** (*Cottus gobio*). Data from field studies show that bullhead has started to re-inhabit the rocky-bottomed stretches of the river. Similarly to the spined loach, the bullhead was absent from the destroyed part of the river before restoration activities began.

The creation of oxygen-rich flowing water and the removal of migration obstacles were the essential preconditions for the resettling of the river by **Asp** (*Leuciscus aspius*). Data from telemetric studies and fish catches indicate that since the restoration work was done, the lower course of the restored stretch of Laeva River, before it flows into the Emajõgi River has great importance for Asp as a wintering ground, and also as a resting and rejuvenation area after the spawning period. Telemetric data collected during the project period also indicate that asp return to the same spawning sites as they previously used. Study has shown that the asps' "chance of missing" their spawning site is small. Otolith microchemistry study indicate that the restored river is suitable for various agegroups and different river sections are occupied by the asps according their age and seasonal needs.

Of protected fish species, the Weatherfish (*Misgurnus fossilis*) was best able to survive in the previously damaged stretches of river. The weatherfish has several unique biological adaptations - such as the ability to absorb oxygen not only through their gills, but through their intestines and skin as well, which help it to survive in very inhospitable conditions. These adaptations, however, may not be enough during winters when the water body is frozen over and cut off to oxygen for long periods. The weatherfish is then unable to ingest oxygen from the air at the water surface. Monitoring catches from the period before the river restoration activities revealed that in winters with harsh conditions even the weatherfish interrupted their wintering and moved away because of the low oxygen levels. The restoration of the river channel created conditions normal to a natural river in which oxygen is not depleted in winter. Wintering conditions have thus improved for all fish species, including the weatherfish. Death of fish from oxygen depletion during harsh winters is no longer probable.

Ensuring the good status of the habitats of the species mentioned in the Habitats Directive also ensures the survival of viable populations of “regular” species that are not protected.

**Alluvial meadows and grasslands** cover about one tenth of the protected area. The Alam-Pedja special area of conservation contains alluvial meadows (habitat type 6450) that are one of the most representative ones in Estonia and the whole boreal region of Europe.

Bird species, such as corn crake and great snipe, that are endangered in the world, are nesting and feeding in the restored alluvial meadows. In Alam-Pedja, the abundance of several bird species (Eurasian wigeon, white-tailed eagle, whimbrel, great snipe) associated with oxbow lakes and alluvial meadows reaches at least 5% of Estonia's overall population.

61 species of breeding birds have been observed on Alam-Pedja's alluvial meadows, the most numerous of which are the sedge warbler and the reed bunting. Thanks to sustainable management, the breeding birds of the alluvial meadows are of great conservation value. In the spring, a large number of waterfowls use the alluvial meadows of Alam-Pedja as stopover sites; their numbers on the alluvial meadows of River Emajõgi can reach 10,000 individuals.

The spawning grounds on alluvial meadows that were restored with the help of the Happyriver project, are part of the alluvial meadow habitats of the Alam-Pedja protected area, which are in the protected area's list of regularly managed alluvial meadows. Reconstruction of a road that provides access to areas to be managed will provide greater opportunities for planning management and ensuring its sustainability.

In the course of the project, 12,000 asps were released into the Laeva River during the project; this provides the necessary impulse for a strong natural population to establish. Removing barriers limiting fish migration and the management of alluvial meadow habitats will also ensure the conservation of other protected fish species. Studies of asp migrations confirm that they carry out long migrations between different waterbodies and different parts of waterbodies. Thus, barriers limiting fish migration are one of the most important risk factors for the conservation of aquatic biota and natural fish populations. This criterion is considered in the assessment of the ecological status of waterbodies based on the evaluation criteria of the Water Framework Directive.

The aim of the Natura 2000 network is to maintain or, where necessary, restore the favourable status of species and habitats threatened all over Europe. An important part of this is the planning and implementation of management activities. For this purpose, the “Management Plan of the Alam-Pedja Natura 2000 Site for the Period 2016–2025” has been compiled based on the Nature Conservation Act; project experts and results of studies also provided an input to it.

National conservation action plans affect the status of protected fish species in the project area. The action plan for the protection of the asp was approved by Decree No. 1-1/18/284 of October 11, 2018 of the Director General of the Environmental Board. Action plans for the protection of the spined loach, European weatherfish and European bullhead are underway. The action plan for the protection of the asp was drawn up by Wildlife Estonia and it takes into account the results of LIFE Happyfish and LIFE Happyriver actions and studies. In the Emajõgi system, the status of the asp population has improved. The results of our studies show that the reintroduction of the asp has been successful, in addition, as a result of habitat restoration and the opening of migration routes, the number of potential habitats has increased; asps have also colonised these. Surveys conducted among professional and recreational fishermen also confirm that the number of asps has increased. However, as in addition to the Emajõgi system, there are still river basins in Estonia, where the status of the asp is not known or is not strong enough, the amendment of the protection regime requires thorough discussion and detailed consideration.

By implementing the project, the ability of the Alam-Pedja Natura 2000 site to provide ecological, non-financial services has been significantly strengthened. River restoration and the improvement of spawning conditions has improved the state of ichthyofauna, which is important for Estonian recreational fishermen, 15% of whom fish on Emajõgi River. A well-functioning system of alluvial meadows and rivers is a hydrological buffer in the event when the Emajõgi River floods and mitigates water level fluctuations in areas downstream. Hay from Emajõgi River's alluvial meadows has been used as animal feed for centuries, and other economic applications are still being sought. The experience of acoustic telemetry and otolith microchemistry used in the monitoring of the asp enables these innovative methods to be applied when studying other protected fish species.

As thanks to the project, the state of fish stocks improves in one of Estonia's most important inland waterbodies – Lake Peipus, the project will also have an impact on national fisheries policy as well as on foreign fisheries policy. Lake Peipus is a transboundary waterbody with the Russian Federation and fishing in Lake Peipus is organised through international agreements. By ensuring the good condition of Alam-Pedja waterbodies, the significance of the region in the regeneration of fish resources in Lake Peipus is maintained and increased. The project's actions in restoring alluvial meadows and fish stocks also support the implementation of the Estonian Rural Development Plan.

#### 5.4.2 Long-term benefits and sustainability

Issues of long-term sustainability and continuation of the actions carried out in the project areas are described separately in the After-LIFE Conservation plan, which can be found on the project website and in the Annex 7.2.5 to the report.

Since the condition of Alam-Pedja waterbodies has a significant impact on the state of the ichthyofauna in a very large area, what is taking place in the nature reserve also has a great socio-economic impact in addition to the ecological impact. The results of the project will help preserve the economic potential of fishing in the Emajõgi river basin district and lakes Peipus and Võrtsjärv, thereby benefiting both professional and recreational fishermen. While the number of professional fishermen has remained relatively stable, Emajõgi River has become more and more popular among recreational fishermen. According to the surveys, during some periods, 150 to 200 people fish on Emajõgi River each day, and fish catches are also significant,

reaching hundreds of tons per year. Actions that support the growth of fish stocks, which ensure the sustainability of the natural environment and the industries dependent on fish stocks, are crucial. Spending time and doing hobbies in the nature will increase demand for services and products that accompany and support it, increasing the market for people and businesses providing the service.

The social impact of the project is high. People's awareness has increased, the presence of representative habitats and their visiting possibilities have increased, which will improve the overall image of the regions and the satisfaction of the local population and visitors. Cooperation between different authorities, local governments and experts has improved. All this has a positive impact on the economy as well.

In the course of the project, infrastructure necessary for carrying out future management work was reconstructed in cooperation with the State Forest Management Centre, an organisation responsible for carrying out conservation actions on state lands. The former access road and bridge over the Laeva channel had deteriorated so much that using them was impossible and environmentally damaging. The project prepared by RMK was jointly implemented. The LIFE Happyriver project reconstructed the road section within the protected area and the bridge. Infrastructure that is in good condition ensures economic activity and the preservation of habitat diversity as well as sustainable management. The implemented project will also influence the local economy in the future. It will create a few job positions and provide work and salary as habitat maintenance must be carried out. Equipment acquired during the project will increase the capacity of Wildlife Estonia to provide and implement habitat restoration and maintenance activities in the Alam-Pedja Natura site and in protected areas elsewhere in Estonia.

### 5.4.3 Replicability, demonstration, transferability, cooperation

The project was an important step in enhancing the integrity, representativeness and integration of the Alam-Pedja Natura 2000 site. Due to extensive communication, the project was very well known. The good results of the project and the fact that traditional methods and innovative methods were combined, ensured great interest and positive feedback from experts, professionals, decision makers, officials, residents and nature lovers as well as children and young people. The project provided several inputs to the processes affecting the development of the Alam-Pedja Natura 2000 site (preparation of the management plan, initiatives of the Alam-Pedja Partnership). In the course of the project, various organisations, agencies, individuals and interest groups cooperated.

The project has demonstrated the first large scale natural river restoration work in Estonia. The monitoring result indicate the large positive impact on biota and ecosystem. As the original riverbed was largely preserved, the restoration work was executed with little physical intervention and reasonable costs. The addition of high quality natural river to the large River Emajõgi system has significant ecological impact. As on the rehabilitated River Laeva, upstreams from the project area, was removed a dam by local municipality, the positive impacts and cost efficiency has even larger cumulative effect.

Forest and wetland management practices were used for restoring floodplain meadows in difficult conditions. Good cooperation between parties and efficient work management provided the best result possible. The experience obtained will be used in planning, designing and implementing similar actions on the local and international levels. Information about the

project activities and results will be widely spread also after the end of the project. All efforts were and will be presented through different media channels, conferences, seminars and printed media.

The experience and knowledge acquired during the research and studies is a valuable source of information for preparing similar scientific and nature conservation activities.

#### 5.4.4 Best Practice lessons

The project used the best practices for restoring riverine habitats and alluvial meadows in Estonian nature protection areas. The river restoration work was executed combining the best practices of excavation work with ecological and ichthyological knowledge. The shape of the riverbed was created considering the local natural conditions and potential habitat variations. The process of restoring flooded plains and spawning areas has several stages that are carried out over several years.

In addition, the best practice ex-situ protection measure in the field of reintroduction of protected fish species (*Leuciscus aspius*) was used and developed. The artificial breeding of asp and rearing the species until an age that is mature enough for reintroduction has been practiced on a couple of occasions, but still, natural conditions were so bad that in the first spring, breeding wasn't completely successful. The lessons learned were taken into account, the methodology was improved, and the set goals were achieved using new knowledge.

The best practice of biotelemetry was used to monitor the results of the work undertaken to reintroduce asps. Experience with the implementation of biotelemetry from previous projects was also relevant and applicable to studying fish migration in this project. In total, 50 fish were tagged, and their movements monitored. The data collected can be used to make generalisations about the habits and habitat preferences of asps. It is expected that a scientific article will be written based on the collected data.

Stakeholders with different goals and interests were involved and necessary decisions were made and approvals were obtained. The best practices and knowledge of various national authorities – the Amelioration Board, Forest Management Centre and Environmental Board – were combined to achieve the best possible environmental result. Great support from local people and the municipality was gained.

An international network between the experts in different fields and different countries has been established, knowledge and practical experiences gained from projects in different countries dealing with freshwater habitats and species has been combined.

#### 5.4.5 Innovation and demonstration value

The project demonstrates a number of exemplary and innovative actions and applications.

The project demonstrated the first large scale river restoration work in Estonia. The experience obtained will be used in planning and designing similar actions on the local and international level. The project launched an intensive public awareness campaign which targeted different interested parties. The information was and will be widely spread also in the future, as this area is very popular for various nature observing and fishing activities – hiking and river trips,

professional and recreational fishing, bird watching. Alam-Pedja Natura 2000 area is one of the protected areas that constantly receives a lot of public and professional attention and interest. In the monitoring of project results, we have used the most novel research methods. Asp migrations and the effectiveness of its introduction were studied using biotelemetry and otolith microchemical fingerprinting.

Using **biotelemetry** (acoustic telemetry in the course of the project) in addition to the traditional Carlin-type tags, is still a relatively new and innovative fish behaviour monitoring method in Estonia. For conducting biotelemetry studies, technical, ecological and physiological knowledge acquired in the framework of international cooperation and work was applied. The project design and execution were exemplary, the data and experience gained are valuable both in Estonia and elsewhere in Europe.

**Otoliths**, also called statoconium, are located in the inner ear of fish. They record the chemical composition characteristic to the water body, which is why they can be used to determine the age of the fish and to understand the patterns of movement and origin. From otoliths, we clearly recognise the fish that we incubated and grew in our fish hatchery. The results of the studies have indicated that the stocking of asp as part of LIFE projects has been effective. A significant share of the asp living in the Emajõgi system, including fish caught from the restored Laeva River, originate from the Haaslava fish hatchery.

The experience and information, gathered during the monitoring activities, has a great demonstration value. Based on studies carried out in the course of the project, some scientific articles are planned to be published.

#### 5.4.6 Long term indicators of the project success

The project can be considered a success if:

- the status of the Laeva River in the Alam-Pedja Natura area continues to be good;
- the area of regularly maintained flooded meadows remains at present level;
- the status of protected fish species has improved and remains good;
- the conservation plan of the Alam-Pedja area includes activities for carrying out maintenance work on the alluvial meadows;
- socio-economic value persists – the willingness of people to contribute financially to the good status of the waterbodies remains;
- the ability of the site to provide ecosystem services will not be reduced.

The main objectives of the project were to improve the status of habitats and protected fish species in the Alam-Pedja Natura 2000 site. The objectives were met, and the positive effects are expected to be long lasting.

#### **Alluvial meadows and rivers**

##### *Environmental conditions*

Alluvial meadows that are in good condition experience floods, the water regime has not been ruined – the river is not straightened, the shores are not dammed and there is no drainage (with strong effect) on the alluvial meadow. The chemical parameters of water are also good.

Watercourses, oxbow lakes and spawning grounds are not separated from the main riverbed; waterbodies of the alluvial meadows are free from scrub and reeds and mowed close to ground. Alluvial landscape is in a natural state – (micro)relief is unchanged; there are no or few shrubs in the area. Alluvial soils are unfertilised, not ploughed. Poor condition of an alluvial meadow is indicated by the lack of continuous connection with the river during fish spawning, as well as by the spawning grounds being covered in scrub and reeds. The deterioration in the quality of alluvial meadows is caused by the decomposition of chopped hay. Overgrazing can also be problematic as there is a danger of nitrogen pollution and oxygen deficit. The poor condition of alluvial meadows in terms of ichthyofauna is often caused by the destroyed hydromorphological regime of the rivers – there are no physically suitable spawning grounds, and the hydrological regime (especially due to the shortened retention period of high water) is no longer suitable for the successful spawning of many fish species.

### *Ichthyofauna*

One of the main indicators of the work being successful is the state of the fish fauna of the Laeva River, especially of the protected species. River restoration created habitats for 29 species of fish; protected species include the European weatherfish (*Misgurnus fossilis*), spined loach (*Cobitis taenia*), European bullhead (*Cottus gobio*), and asp (*Leuciscus aspius*). Changes in the status will be monitored in the future according to the national monitoring plan. Several parameters will be monitored, including species abundance as the main indicator. An indicator of the success of asp reintroduction is the improvement of the status of the species, which manifests itself in increased abundance and that the higher abundance is also maintained in the future.

Alluvial meadows and waterbodies that are in good condition are characterised by characteristic species-rich ichthyofauna and that fish are regularly spawning on the alluvial meadow and in the spawning grounds in the rivers. The survival of juvenile fish is high; fish move freely between the river and the spawning grounds.

### *Vegetation*

Alluvial meadows that are in good condition do not have shrubs (low occurrence), have dense sward / shoot density and diverse plant communities. The meadow is regularly managed, and hay is harvested. Hay is cut low enough; a layer of dead hay is absent.

The indicators of alluvial meadows that are in poor condition are turfs, higher vegetation compared to the managed area, thinner sward / shoot density, as well as higher thickness and density of the layer of dead hay. Bad condition is indicated by patches of monodominant plant species, especially dominating meadowsweet.

River macrophytes are considered to include aquatic and semi-aquatic plants, and taxonomically, this group of biota includes both macroalgae, mosses and flowering plants. Macrophytes are one of the primary producers in aquatic ecosystems, and they use the nutrient salts in both water and sediments, binding them into biomass and thus extending the residence time of the nutrient salts in the waterbody. Macrophytes have close links with many other groups of organisms: competition for light and nutrient salts with phytoplankton and periphyton, providing shelter and habitats for zooplankton, benthic fauna and fish. The vegetation is influenced by water flow, but some taxa can influence the flow of water themselves and thereby the sediment movement in the riverbed. Vegetation stabilises sediment and promotes sedimentation of both organic matter and nutrient salts. Condition is estimated according to the methodology outlined in “Assessment of the ecological status of rivers using vegetation of the banks: preparation of methodological guidelines for sampling and analysis, specification of class boundaries”. The following indicators are used: species composition,

number of taxa, dominants, cover by different taxa (%), total cover, or sum of cover by registered taxa (%).

#### *Avifauna*

A managed alluvial meadow is characterised by the presence of species associated with treeless flood meadows, in particular sandpipers, as well as Anatidae (northern shoveler and northern pintail); less sensitive to the deterioration in the condition of alluvial meadows are Gruiformes (spotted crane, corn crane). Also, the presence of leks suitable for the great snipe generally indicates that the alluvial meadow is in good condition, although lekking has been seen in bushy areas as well.

#### *Insects*

The existence of suitable conditions on the alluvial meadow is shown by the diversity of the imagoes of aquatic species that are present. Species-rich entomofauna is primarily associated with the presence of diverse conditions in the alluvial meadow – this can mean both natural structural mosaic due to varied relief, vegetation and landscape elements, but may also be associated with variations in management conditions (shorter and higher vegetation, bare and more bushy areas). The value of alluvial meadows is increased for all biota groups by the presence of protected species.

River status is assessed using a standard sampling method (five pond net (area of 0,25 m<sup>2</sup>) samples and a qualitative search at each location) and evaluation indices (taxon richness T, Shannon's diversity index H, average taxon sensitivity ASPT, organic pollution estimator DSFI, and richness of sensitive taxa EPT). The MESH index developed in Estonia, which expresses the combined characteristics of the streambed and the flow velocity through taxa of large invertebrates, is used as assisting information. An aggregate assessment of the status was given at each location based on all indices. The results of the status assessments were compared with the corresponding reference values.

## 6 Financial part

### 6.1 Summary of Costs Incurred

Standardised Excel based Financial Report workbook is included in Annex 8 in electronic form. The overview of the Project costs from the start to the end date is presented in Table 3.

Table 3 Project costs 01.07.2013 - 31.12.2018

<b>PROJECT COSTS INCURRED from the start date to 31.12.2018</b>			
Cost category	Budget according to the grant agreement	Costs incurred within the project duration	%
1. Personnel	354780	384457	108,4
2. Travel	62810	36760	58,5
3. External assistance	322200	329497	102,3
4. Durables: total <u>non-depreciated</u> cost			
- Infrastructure sub-tot.	0	0	0
- Equipment sub-tot.	50950	48243	94,7
- Prototypes sub-tot.	0	0	0
5. Consumables	30957	30619	98,9
6. Other costs	30200	26128	86,5
7. Overheads	59632	59632	100
<b>TOTAL</b>	<b>911529</b>	<b>915336</b>	<b>100,4</b>

The costs correspond to the project application, Grant Agreement, Common Provisions and the Amendments. The issues raised have been coordinated with representatives of the European Commission and the external monitoring team in project reports, during visits and direct contacts. Overspent Personnel and External assistance costs categories do not exceed the threshold of 10%/€ 30,000 according the Article 15.2 of the Common Provisions.

As regards **Personnel** costs, the over-spending of the budget by € 29 677.- is due to the Project's amendments and the increase in the amount of the concrete conservation actions (C1 and C2) and prolongation of the Project duration (C3 and D1).

The amount of the river restoration work was nearly doubled – in addition to the initially planned 5 km section was restored second 3 km long section. The reconstruction of the access road and a bridge were executed also during the years 2017-2018. The restoration of the alluvial meadow/spawning grounds (C2) took also more time than expected. The weather conditions during the Project implementation years (2014-2017) were very unstable (warm winters, rainy summers) and the execution of the work was interrupted several times. The work was implemented and coordinated by the Project's experts Meelis Tambets, Meelis Sepp, Andrus Trahv and Urmas Lombiots.

The adverse weather conditions were also the cause for the failure of the asp incubation and re-introduction on the first year (2016). Therefore, the action was repeated and successfully conducted in 2017. The action was carried through by the M. Tambets, M. Sepp, A. Trahv and temporary expert Riina Kalda.

The Project was extended by 12 month to carry out the monitoring of the Project results (D1). Project experts M. Tambets, M. Sepp and A. Trahv participated in the execution of the monitoring of the ichthyology and hydrology studies. Due to the complexity and the large amount of the work, the Project manager E. Kärgerberg participated in a monitoring activities, mainly in ichthyology and telemetry studies. In addition, E. Kärgerberg sometimes assisted in the collecting and analysing of the hydrology data. Nevertheless, because there were fewer managerial tasks at the end of the project, the project manager's work time was reduced to 80% since June 2018. In addition, the contract of employment with the A. Trahv was terminated since November 2018, because the tasks were completed.

The labour costs of the project staff per day are generally in line with the project application.

**Travel** costs meet the conditions of Common Provisions, Grant Agreement, national and internal regulations. The main cost of transport is the cost of fuel for field work (site inspections, monitoring activities, work planning, coordinating and inspection, meetings with experts and cooperation partners, dissemination activities) by project experts M. Tambets (MT), M. Sepp (MS), A. Trahv (AT), as well as temporary experts H. Timm (HT) and U. Lombiots (UL). Also, project manager Einar Kärgerberg used project's car for Project management purposes. The costs of Travel for Project needs were clearly separated from other Travel costs of beneficiary. The Project's car was exclusively used only for the LIFE Happyriver Project tasks. The fuel for the project's needs was bought using unique cards and the invoices were specially issued and marked with the project's reference. While the Project car was busy, other transport vehicles of the beneficiary were used. The fuel for Happyriver work purposes was bought with special Happyriver card in that case also and the trips were separated on the logbook. The samples of the logbooks, asked in the Commission letter no 4255339 dated 13.10.2015, are presented in the annex 7.2.5. The fuel for the field works and boat trips was bought also with the project's fuel card and separated on the invoices of the fuel supplier.

The category of Travel costs also includes the costs of visiting local and international conferences and study visits.

The costs are lower than estimated because of the good planning and coordination of the fieldwork and area visits. In addition, the prices of the fuel did not rise as much as expected.

**External assistance** costs exceed the planned project budget by 2,3%/€ 7297.-. The overexpenditure is mainly due to the implementation of larger amount of concrete conservation actions (C1, C3) and monitoring activities (D1). The novel method – study of otolith microchemistry – was used to study the migration of asps and the success of the asp re-introduction. The survey was carried through additionally. The analyses were conducted and data analyzed by the experts of the University of Tartu. The price of the initially unplanned and subcontracted microchemistry study was € 5000.-. The botanical survey of the results and recovery of the macrophyte communities after the river restoration work was conducted also by the experts outside of the beneficiary's staff (OÜ Thymallus, € 1980.-). The reports of the studies are provided in Annex 7.2.5. Small amount of the unpredicted external assistance costs is caused because of the transfer of the bus rental costs for the organisation of the study camps

and seminars from Travel costs to the External assistance (Commission letter no 4255339 dated 13.10.2015) and also room and equipment rental services from Other costs.

In the Commission letter no 4255339 dated 13.10.2015 was a question about the cost of „Geodetic measurement“, not foreseen in the budget. The study was necessary to assess the feasibility of the idea about the restoration of the additional 3 km river section and preparation of the planned activity. The preliminary calculations of the amount of the work and the costs and the negotiations with the stakeholders were based on the measurements. The sum of the outsourced survey was € 1090.-.

The costs of acquiring **Durable goods** are in line with the project proposal. The list of tools and equipment for the restoration of the spawning grounds (alluvial meadows) included a bush cutter and a chainsaw. In many cases it is not possible to remove or to burn the bushes and branches, cut from the area, at the nature conservation area. Therefore, the industrial wood chipper was purchased for the execution of the restoration and maintenance of the alluvial meadows on an efficient and cost-effective way and for the execution of the monitoring activities. The wood chipper is a part of a set of tools for a special amphibian tool carrier Truxor, meant for restoration work on wetlands and fragile environments. The complete set of professional machinery provides efficient and versatile operation. The main machine and major set of tools was purchased with the public procurement procedure from a manufacturer in Sweden during other project. The manual tools and the wood chipper were used during the preparation of the conservation work – cleaning the area for site visits with the engineers and planning process experts. The former Laeva River (channel) bank was cleaned during the preparation of the work according the conditions of the Amelioration Board. The project staff M. Tambets, M. Sepp and A. Trahv did the work. In addition, the machinery and the tools will be used for the maintenance of the re-opened streams and oxbow lakes at the Alam-Pedja area and other nature conservation areas in future.

Additionally, computers with the necessary software (C and D1), a devices for hydrological and water quality measurements (D1), a boat engine (C and D1), and a 4-wheel car (all project activities) were purchased for implementation of the fieldwork and Project management. Purchases of the equipment were carried out in accordance with the rules of public procurement and Common Provisions.

Acquired Durable goods are necessary for the day-to-day activities of the Eesti Loodushoiu Keskus after the end of the project and are registered in the corresponding register of the accounting system. The equipments are labeled with the required LIFE logos.

The costs of the **Consumables** are in accordance with the planned budget and the cost description. The set of winter wheels for the project's car, not mentioned in a proposal, was purchased at the beginning of the Project. The wheels were necessary for the safe and secure use of the car when working also off-road during all seasons and weather conditions.

The expenditure of the **Other** costs are smaller than initially planned. Significant part of the costs were foreseen for the insurance and maintenance of the project's equipment and transport vehicles. In a proposal were mentioned the boat and car, but other equipment like monitoring tools, telemetry and photo equipment and computers need regular maintenance and repair also.

The Other costs category includes maintenance costs of equipment used for the project's purposes. The fieldwork equipment for measuring of the water quality (pH, conductivity, oxygen, temperature) needed regular calibration. In addition, the probes for the equipment must

be changed every year or after being broken during the fieldwork. All issues of malfunctioning were resolved as warranty.

Computer maintenance was needed as regular and unexpected IT service to ensure the stable and problem-less work. In addition, the changes with the internet and web-page space provider have caused the need for the computer maintenance by the experts. Experts make updating of the specialized software (MapInfo for GIS purposes, VUE for biotelemetry). The telemetry receivers components needed upgrading and replacement in a factory. Chainsaw and bushcutter need minimally regular annual maintenance. Therefore, the relevant costs were covered from this category. Technical issues were always handled with the warranty regulation.

Maintenance of the camera was needed for the camera, purchased in 2009 for the LIFE HAPPYFISH Project and which is still used in Projects purposes.

Cost of organisation of the LIFE platform meeting on 10.-12.09.2014, international seminar for on 23.-25.05.2018 and river opening event on 21.05.2018 were not foreseen in the proposal. The catering costs of these events are covered under Other costs. Also, travel and accommodation costs of foreign participants of the seminar in May 2018 are covered. The organising issues are discussed with the Commission (Commission letter 2517558, 15.05.2018) and explained in Final report chapter 5.1.4 (Action F5).

There was planned to participate and to do a presentation about our project at the LIFE Saramugo conference in Portugal, University of Evora. It was planned that Meelis Tambets will visit the conference, we prepared the presentation (abstract provided in Annex 7.3.2.5) and paid the conference fee € 80.-. Unfortunately, the visit to the conference had to be cancelled due to unexpected and unavoidable circumstances. M. Tambets was occupied with the preparation of the LIFE IP project submission together with the Ministry of Environment. The proposal was at a stage that required immediate presence in Estonia.

The **purchase** of the services, equipment and construction work was organised according the rules of the Common Provisions and Public Procurement Act. Most of the tendering processes were carried out in a public Estonian Procurement Register as an Open or Simple procedures. Contracts with smaller value of money were selected as a result of a comparative quotes from potential service providers.

**Overheads** account for 7% of the direct costs of the project and meet the Common Provisions.

## 6.2 Accounting system

Project accounting was organized in accordance with the Common Provisions, internal accounting rules of Eesti Loodushoiu Keskus and the Estonian Accounting Act and Good Practice. The bookkeeping was organized as an External assistance. An analytical accounting system was set up, project's costs were separated and marked in the accounting system as project-based object HAPPYRIVER. In addition, a special bank account EE63 2200 2210 2991 2068 for project's bank transfers, was opened in order to have a clear overview and control over the costs. The project manager used the standard Excel based Financial Report template to register and take into account the cost of the project.

Cost validation was carried out in two stages: initially the documents were checked by the project manager, who forwarded them for the subsequent control and approval to the member of the board of the Eesti Loodushoiu Keskus. After checking and adding the relevant project references and registering the costs in the Financial Report database, the documents were forwarded to the accountant. Accountant included the documents into the accounting system and effected the bank transfers.

There was used two options for adding the Project references to the invoices and expense documents:

- the reference number of the project LIFE12 NAT/EE/000871 Happyriver was added to the invoice by the issuer, or
- the Document was stamped with a special stamp, imprint bearing both the reference number and the acronym. The corresponding stamp was included on the cost documents by the project manager during the initial inspection of the document.

A standard time sheets were used to register working time of project members. The calculation is carried out per hour, the monthly report was submitted to the project manager within the first five days of the following month. The member of the board of the Eesti Loodushoiu Keskus – Meelis Tambets, approved the project manager’s working time sheets.

### 6.3 Auditor's report/declaration

The final report is audited by an internationally recognized independent auditor Rein Ruusalu, (licence no 261) from the auditing bureau PKF Estonia, Pärnu mnt 141, Tallinn, register no 10178029. The audit report is included in Annex 8.

The short conclusion of the audit was, that: “On the basis of the financial control, in accordance with the programme described above, we consider that we have obtained reasonable assurance that the financial report of project no LIFE12 NAT/EE/000871 with the title LIFE HAPPYRIVER - Restoring the integrity of freshwater habitats in Alam-Pedja Natura 2000 area-bringing the River Laeva back to life, start date 01.07.2013, end date 31.12.2018, gives a true and fair view of the expenses, income and investments incurred/made by Eesti Loodushoiu Keskus / Wildlife Estonia in connection with the abovementioned project within the time limit laid down by the Commission and in accordance with the LIFE+ Programme Common Provisions, the national legislation and accounting rules.”

## 6.4 Summary of costs per action

Action no.	Short name of action	1. Personnel	2. Travel and subsistence	3. External assistance	4.b Equipment	6. Consumables	7. Other costs	TOTAL
A1	Elaboration of detailed project action plan and timetable	2731	0	0	0	0	0	2731
A2	Formation of project steering committee	0	0	0	0	0	0	0
A3	Issuing obligatory permits, licenses	1806	0	0	0	0	0	1806
C1	Restoration of the River Laeva lower course	68929	4977	259591	1887	1408	0	336792
C2	Restoration of spawning grounds	17031	2860	15948	7066	0	52	42957
C3	Reintroduction of <i>Leuciscus aspius</i>	33598	2525	6420	3420	1143	0	47105
D1	Monitoring of the project results	89628	15833	6980	7420	24669	8881	153411
D2	Assessment of the socio-economic impact	0	0	4500	0	0	0	4500
E1	Project website	599	0	746			67	1412
E2	Issuing of leaflets related to the targeted riverine Natura 2000 habitats and fish species	652	0	850	0	0	0	1502
E3	Study camps focusing on Natura 2000 values of Estonian rivers	3876	0	4332	0	1231	0	9438
E4	Public site visits at the Laeva River	545	0	0	0	0	380	925
E5	Introduction of Habitats Directive Annex II fish species and valuable habitats in media (radio, TV, papers), seminars and international conferences	13327	2228	1503	0	1177	3556	21791
E6	Composing a Layman`s report	1362	0	2828	0	0	0	4190
E7	Notice boards	760	0	600	0	13	0	1360
F1	Project management	144609	8127	19800	28450	992	9801	211780
F2	Project steering committee	1586	0	0	0	0	785	2371
F3	Project audit	0	0	5400	0	0	0	5400
F4	Production of After-LIFE Conservation Plan	0	0	0	0	0	0	0
F5	Networking with other LIFE and non-LIFE projects	3419	210	0	0	0	2604	6233
Over-head								59632
	<b>TOTAL</b>	<b>384457</b>	<b>36760</b>	<b>329497</b>	<b>48243</b>	<b>30619</b>	<b>26127</b>	<b>915336</b>

The costs of implementation of actions C1-C3 and D1 are higher than that indicated in the application budget. This is mainly caused by the increase of the personnel cost for execution of the additional and unexpected tasks by the Project experts during the prolonged Project time. Anyhow, the increase of the budget of the C-actions is not significant 2%. The budget of monitoring action (D1) is increased by 10% / € 14 581.- also because of the personnel costs and

additional External assistance costs. The microchemistry studies in amount € 5000.- were subcontracted by the scientists of University of Tartu. Also, the botanical survey was conducted by the experts of OÜ Thymallus in sum € 1980.-. Therefore, the costs for activity D1 include subcontracting costs, not described in the project application, which also results in the overrun of the budgets for this activity.

Project dissemination activities (E) were carried out at 25%/€ 13931.- lower costs than originally planned. The biggest savings came from organisation of the study camps (E3) and introduction the Project in media and conferences (E5). Small (nearly € 1300.-) saving was achieved in organising of the activity E4 (Public site visits). There were organised three visits instead proposed two, but one of those was organised in a cooperation with Environmental Board and therefore the costs were lower than planned. Despite budget austerity, the dissemination was diverse and extensive, carried through on very professional and efficient way. Very wide public was reached – children, youth, students, enthusiasts, professional fishermen and recreational anglers, officials, experts and decision makers. In addition, the project took part in a contest on a Best environmental action of a year 2018 and was very successful. The river restoration and asp re-stocking activities was selected as a Best of the best Environmental act of the year in Estonia!

Total project management costs were smaller than planned by 2,7% / € 6107.- mainly because of the savings in Project management (F1) and steering committee work (F2). The activities were implemented in an efficient and professional way; all goals were achieved and even exceeded.

The workload of the Project manager was adjusted during the last year of the project. The first half of the year has been very busy with the completion of several actions (C1, C2) and intensive continuation of important activities (D1, E5, F1, F2, F4, F5). Since July, the workload decreased by 20% and the employment contract was amended accordingly. The concrete conservation actions were implemented. Continued monitoring activities, introduction of the Project results and participation in dissemination events and meetings, networking with other projects, organising the site visits, preparation and production of the reports, preparation for the final report and auditing. The detailed monthly account of the working time is registered in the standard time registration system.

In addition, the employment contracts of experts were corrected depending the number of tasks and workload. Work of A. Trahv for LIFE Happyriver Project was finished in October 2018.

## 7 Annexes

### 7.1 Administrative annexes

#### 7.1.1 Annexes submitted with **Inception Report**

Lisa 1 Detailne tööplaan / Detailed action plan

Lisa 7 Juhtkomitee koosoleku protokoll / Minutes of the steering committee meeting

#### 7.1.2 Annexes submitted with **Final Report**

1 Minutes of the Steering Committee meetings (EC letter 3319085 dated 03.07.2017 clause 6)

### 7.2 Technical annexes

#### 7.2.1 Annexes submitted with **Mid-Term Report**

Lisa 1 / Annex 1 Planeeritav jõe taastamise ala / Map of the planned conservation actions

Lisa 5 / Annex 5 Öppelaagrite materjalid / Study camp materials

#### 7.2.2 Annexes submitted with **Progress Report**

Annex 1 Monitoring report, ichthyology and water quality, 2016

Annex 2 Monitoring report, invertebrates 2016

#### 7.2.3 Annexes submitted with **Progress Report no 2**

Annex 1 Monitoring report, ichthyology 2017

Annex 2 Monitoring report, invertebrates 2017

Annex 3 Report of the assessment of the socio-economic impact

#### 7.2.4 Annexes submitted with **Final report**

1 Geodetic measurements “Kagu Geodeesia, 15T020” (EC letter no 4255339 dated 13 October 2015 clause 10)

2 Technical design of river restoration “IB Urnas Nugin IB 03/2016”

3 After-LIFE Conservation Plan

4 Copies of the logbook (EC letter no 4255339 dated 13 October 2015 clause 8)

5 Floodplain restoration materials (EC letters no 2517558, dated 15.05.2018 clause 1 and letter 5819225 dated 14.11.2018 clause 1). Photos are provided in electronic form.

6 Aggregated monitoring report

7 Report of the study of Macrophytes

8 Report of the study of the otolith microchemistry study

9 Otolith microchemistry method

10 Bio-telemetry method

### 7.3 Dissemination annexes

#### 7.3.1 Layman's report

#### 7.3.2 Other dissemination annexes

##### 7.3.2.1 Annexes submitted with **Inception Report**

Lisa 2 Projekti indikaatorite tabelid / Outputs indicator tables

Lisa 3 Ajalehe artiklite koopiad / The copies of newspaper articles

Lisa 5 Kodulehe külastusstatistika / The statistics of the visits of the web site

Lisa 6 Projekti infotahvel / Notice board

#### 7.3.2.2 Annexes submitted with **Mid-Term Report**

Lisa 2 / Annex 2 Kodulehe külastusstatistika / The statistics of the visits of the web site

Lisa 3 / Annex 3 Ajaleht / Newspaper Postimees 25.08.2015

Lisa 4 / Annex 4 Informatsioonitahvel / Site panel

Lisa 6 / Annex 6 Fotod ja videod / Photos and videos will be submitted on electronic media

#### 7.3.2.3 Annexes submitted with **Progress Report**

Annex 4 Leaflet

Annex 3 Home-page statistics

Annex 5 Newspaper Postimees 09.05.2016

Annex 7 Study camp materials, 2016

Annex 6 Site panels at the construction sites

Annex 8 Corrected Information panel

Annex 9 Project's car

#### 7.3.2.4 Annexes submitted with **Progress Report no 2**

Annex 4 Home-page statistics

Annex 5 Newspaper Postimees 22.11.2017

Annex 6 Fotod / Photos

Annex 7 Kaart / Map

#### 7.3.2.5 Annexes submitted with Final report

1 Copies of newspaper articles

2 Photos and videos in electronic format

3 Materials on the international conferences abroad

4 Materials on the international conferences in Estonia

5 Networking materials (EC letter 124731 from 09.01.2018 clause 5 and EC letter no 2517558, dated 15.05.2018 clause 9 and 10).

6 Web page statistics

7 Photo of the car's logo

8 Presentation in electronic format

9 Materials of seminars in Estonia

### 7.4 Final table of indicators

## 8 Financial report and annexes

### 8.1 Financial Annexes submitted with **Inception Report**

**Lisa 4** Maksu- ja Tolliameti käibemaksu õiend / The VAT certificate

### 8.2 Financial Annexes submitted with **Mid-Term Report**

Lisa 7 / Annex 7 Standard Payment Request

Lisa 8 / Annex 8 Certificate for Nature Projects

Lisa 9 / Annex 9 Financial statement of the individual beneficiary. Annex 9 will be submitted on electronic media.

Lisa 10 / Annex 10 Eelarve täitmise tegevuste lõikes 31.08.2015 / Costs per action 31.08.2015 will be submitted on electronic media.

Lisa 11 / Annex 11 Cover letter

### 8.3 Financial Annexes submitted with **Final Report**

- 1 Audit report
- 2 Standard statement of expenditure
- 3 Standard payment request
- 4 Beneficiary's Certificate
- 5 Standard statement of expenditure in electronic format
- 6 Table costs per action
- 7 VAT declaration
- 8 Print-out of the cost account from the accounting system (EC letter no 5819225, 14.11.2018 clause 7).
- 9 M. Tambets travel documents (EC letter 124731 from 09.01.2018 clause 7).
- 10 Payment receipt of the audit