LIFE Project Number

LIFE15 NAT/SE/000892

Final Report

Covering the project activities from 07/07/2016[1] to 31/03/2022

Reporting Date[2]+

30/06/2022

LIFE PROJECT NAME or Acronym

ReBorN LIFE

Data Project

Project location:	County of Västerbotten and county of Norrbotten in Sweden
Project start date:	07/07/2016
Project end date:	06/07/2021 **Extension date:** 31/03/2022
Total budget:	€ 13 052 875
EU contribution:	€ 7 829 810
(%) of eligible costs:	60%

Data Beneficiary

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[1] Project start date

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

Package completeness and correctness check	
Obligatory elements	**✓ or N/A**
Technical report	
The correct latest template for the type of project (e.g. traditional) has been followed and all sections have been filled in, in English *In electronic version only*	✓
Index of deliverables with short description annexed, in English *In electronic version only*	✓
Final report: Deliverables not already submitted with the MTR annexed including the Layman's report and after-LIFE plan Deliverables in language(s) other than English include a summary in English *In electronic version only*	✓
Financial report	
The reporting period in the financial report (consolidated financial statement **and** financial statement of each Individual Beneficiary) is the same as in the technical report with the exception of any terminated beneficiary for which the end period should be the date of the termination.	✓
Consolidated Financial Statement with all 5 forms duly filled in and signed and dated *Electronically Q-signed or if paper submission signed and dated originals* and in electronic version (pdfs of signed sheets + full Excel file)*	✓
Financial Statement(s) of the Coordinating Beneficiary, of each Associated Beneficiary and of each affiliate (if involved), with all forms duly filled in (signed and dated). The Financial Statement(s) of Beneficiaries with affiliate(s) include the total cost of each affiliate in 1 line per cost category. *In electronic version (pdfs of signed sheets + full Excel files) + in the case of the Final report the overall summary forms of each beneficiary electronically Q-signed or if paper submission, signed and dated originals**	✓
Amounts, names and other data (e.g. bank account) are correct and consistent with the Grant Agreement / across the different forms (e.g. figures from the individual statements are the same as those reported in the consolidated statement)	✓
Beneficiary's certificate for Durable Goods included (if required, i.e. beneficiaries claiming 100% cost for durable goods) *Electronically Q-signed or if paper submission signed and dated originals* and in electronic version (pdfs of signed sheets)*	✓
Certificate on financial statements (if required, i.e. for beneficiaries with EU contribution ≥750,000 € in the budget) *Electronically Q-signed or if paper submission signed original and in electronic version (pdf)*	✓
Other checks	
Additional information / clarifications and supporting documents requested in previous letters from the Agency (unless already submitted or not yet due) *In electronic version only*	✓
This table, page 2 of the Mid-term / Final report, is completed - each tick box is filled in *In electronic version only*	✓

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

1. Table of contents

2. List of keywords and abbreviations

ReBorN LIFE = Restoration of Boreal Nordic Rivers
CABV = County Administrative Board of Västerbotten
CABN = County Administrative Board of Norrbotten
Gällivare = Municipality of Gällivare
Nordmaling = Municipality of Nordmaling
SFA= Swedish Forest Agency
SwAM = Swedish Agency for Marine and Water Management
EIA= Environmental Impact Assessment
FHC=Former highest-coastline; at ~250 m above sea level

3. Executive Summary

The overall aim of the project is to restore the damage done by the timber floating in six larger water systems in the northern part of Sweden. The effect of the timber floating activities has been the cause of decreasing populations of the targeted species. Through these actions, where restoration has been done, is a potential for lastingly improving and securing the biodiversity in the selected water systems for the targeted species and several associated species. The (favourable) conservation status of the Natura 2000 habitats and species will be improved or maintained.

Our original (as mentioned in the application) main objectives have been to restore 202 km of river stretches to reverse the effects of previous alterations intended to facilitate timber floating and to create 2 300 spawning grounds for salmon and trout.
We have exceeded the main objectives and restored 242.7 kilometres of streams and created 14 169 spawning beds. Read more about the objectives in chapter 4.

Down below are some important actions that have occurred since the beginning of the project.

Action A
We have written the reports ”Pre-project ecological status reference points for each river” and “Biological data compilation on salmon and trout status of rivers within ReBorN-LIFE . Additionally, two reports concerning cultural history are composed “Kulturhistorisk dokumentation av Råneå älv med biflödet Abramsån samt Åby älv” and ”Kulturhistorisk dokumentation av Lögdeälven (chapter 6.1.1).

We have had 7 meetings with landowners and the work plan is completed (chapter 6.1.2).

During February 2017, we established a framework agreement and signed contracts with 20 companies for the excavator contractors and 18 companies for machine foremen. These companies have, since then, been awarded contracts based on the framework agreement as needed (chapter 6.1.4).

We have held 6 courses for all foremen in the project, each in the beginning of the season (June) 2016, 2017, 2018, 2019, 2020 and 2021. 105 different persons have attended (chapter 6.1.5).

Action C

After six field seasons and the end of the project, a total of 242.7 km has been restored in the ReBorN project. It is important to notice that when we restore rivers, we recreate its meandering path from a previous straight channel. Hence, the new river stretch is longer than the stretch in the application. We have also re-open side channels in the rivers, which are counted as river stretch if they assessed as big enough to be called river stretch (chapter 6.1.6).

A total of 14 679 spawning grounds have been created in the ReBorN project. The number of expected spawning grounds was underestimated since we did not know, in detail, the geological condition in the rivers. We found much more gravel suited for spawning grounds than anticipated in most places. However, in some areas all gravel is flushed out due to the strong current in pre restoration state. Then external gravel must be added. Since spawning grounds are the limiting factor in our rivers in the abundance of salmon and trout we have created as many spawning grounds as possible. In the end of the project, in the county of Norrbotten, we discovered that there was a loss of spawning beds. There might be several explanations why this happened. The restoration work has affected the flow patterns in the area in such way that high floods occurring directly after restoration have a big impact on the spawning beds. Material can be flushed away. Some beds were made even if the natural conditions were not ideal. (chapter 6.1.7)

Action D

The status of salmon and sea trout are monitored by annual electrofishing surveys and is carried out in all of Sweden's wild salmon- and sea trout rivers (national salmon monitoring program).

It is difficult to say if the projects actions have had a positive effect on salmon and trout recruitment in the main channels and tributaries of the project rivers. However, river Byskeälven has a positive trend (five-year mean value) for salmon (both juvenile and adult). Since the project started, 0+ salmon have decreased in the main channels of almost all project rivers while >0+ salmon densities instead have increased. The lack of extensive time series for the tributaries makes it hard to conclude any effects of the project's actions on the recruitment.

Parr (a young salmon or trout between the stages of fry and smolt) densities vary between years for natural causes. Factors such as the number of females that spawned the year before and if the conditions in the river were favorable during the summer may also influence recruitment. There are also methodological factors that can affect the outcome of electrofishing surveys, for example water level and water temperature during the time of electrofishing. This have most likely affected the electrofishing results. (chapter 6.1.8)

We have performed electrofishing in project areas Råneälven, Åbyälven, Piteälven, Byskeälven and Lögdeälven to examine the gills on young brown trout and salmon to examine if they act as hosts for the freshwater pearl mussel glochidia larvae.

Most likely due to lack of time after restoration has been done, as biological systems can have a very slow pace of life, the results from the investigation cannot answer the hypothesis that stream restoration would increase the prevalence and intensity.

One unique discovery is that some of the streams in the project in-habited by freshwater pearl mussel utilize Atlantic salmon as the primary fish host. That means that we have the first record of salmon as fish host to the freshwater pearl mussel in Sweden. Interestingly a few streams also had infected trout at the same site as infected salmon was caught and that is even more rare. (chapter 6.1.8)

To ensure that the sites are functional and used by the targeted fish species we have monitored a sample of created spawning sites within the project. The monitoring is showing great results. During 2016-2021 we have monitored 347 spawning sites in both counties. The results show that spawning has occurred on 165 (47, 6 %) sites. (chapter 6.1.9)

Monitoring of restoration impacts on geomorphology and hydraulics has been carried out by the University of Umeå. The monitoring has been carried out in Lögdeälven (four monitoring sites in the mainstream of the river and four on direct tributaries to the mainstem river).
The results show there was a significant increase in channel planform width during restoration. This was also reflected in increased wetted area with new areas. Some sites had large areas of new channel resulting from the opening of side channels as well as widening of the main channel. Changes of water velocity were not significant. Metrics of planform complexity typically increased during restoration. However, these changes were not statistically significant and there was little change in cross section complexity.

Interestingly, channel width and wetted area often decreased within the 2-3 years post restoration, but this was not significant. This suggests that restoration may have oversized channels slightly and they are now adjusting to a more equilibrium size. Flow velocity and standard deviation demonstrated little change post restoration. (chapter 6.1.10)

We have compiled data from the monitoring of otter in the county of Norrbotten. During 2011 to 2013, 828 sites were surveyed to see if there were signs of otter. Of those were 209 monitoring sites within a 20-kilometre radius of ReBorN watercourses. The selected sites have been monitored before the measures have been conducted (2011-2013) and in 2021 we re-visited these sites to do a “after measure” monitoring.
In 2021, we have found traces of otter in 65% of the sites compare to 41% before the measures were done. The otter has increase with 29% in the monitoring sites close to ReBorN project areas whereas the otter has increase with 22% in monitoring sites far from ReBorN project areas. This comparison shows that the otter has increased more in areas close to ReBorN project areas compared to areas further away from the ReBorN sites. We can assume that the measures done in the rivers have benefited the otter by providing more food (fish) and more shelter (natural structures in the streams). (chapter 6.1.11)

We have analysed the data from the drone monitoring (rewetted area). The results show that we have increased the wet area with 19.6 % in total.
(chapter 6.1.12).

The monitoring of Socio-Economic impact shows that the number of sold fishing licenses have increased in the project area Lögdeälven, from approximately 2000 yearly during the period 2015-2018 to >2500 during the last three years (2019-2021). Data is unfortunately lacking for river Råneälven during the last three years.
25 landowners answered the questionnaire sent out by mail and 78 people answered the questionnaire posted on social media (103 in total). The knowledge among the public and

private landowners regarding the nature connected to the project was still very high and had not changed considerably since the last questionnaire sent out in 2017. (chapter 6.1.13)

A consultant company has compiled data and analysed the projects impact on ecosystem functions. The analyse shows that the project has enhanced the conditions for freshwater pearl mussel, Atlantic salmon and Eurasian otter in the project areas.
Today, after the restoration, the average speed of water has decreased leading to increased natural water purification and increased infiltration to the groundwater. The latter is contributing to increased resilience to summer droughts in the surroundings.
Spawning grounds for salmon and trout have been restored. Increasing populations of salmon and trout benefits other species such as various insects and birds, European grayling, Eurasian otter, freshwater pearl mussel and lampreys. The restoration efforts also benefit recreational fishing and outdoor recreation in general.
The freshwater pearl mussel is a species with a long lifespan and so far, it is not possible to see positive trends for the mussel. With the measures taken, there is hope for the return of freshwater pearl mussel. The Eurasian otter has long been threatened by habitat loss. The actions within ReBorN have contributed to suitable habitats, food access and protection by reintroducing boulders and dead wood in the water and on the riverbanks.
The project has built local knowledge and pride among financiers, interests and the public. The re-creation of natural watercourses contributes to a wonderful landscape with a rich wildlife and vibrant waters to experience. (chapter 6.1.14)

We have achieved the KPI targets. An assessment of the KPI is done (chapter 7).

Action E
The communication plan is completed.

We have received a lot of attention in media, in newspapers, television and radio (chapter 6.1.16).

We have produced a folder about the project in both English and Swedish. We have also produced a film about the project in Swedish https://youtu.be/njOnfO0837g and with English subtitles https://youtu.be/WaOhFC4lW7s
Our website is launched, both in English and Swedish (www.rebornlife-eng.org and www.rebornlife.org). We have produced a Layman's report (both in English and Swedish). (chapter 6.1.17)

We have completed four demonstrations sites with information signs, notice boards and additionally wind shields to make it a natural place to meet. However, due to the effects of Covid-19 we have only had a few physical meetings at our demonstration sites. But we have presented the project and performed online tours around all demonstration sites. (chapter 6.1.18)

We have had or attended several meetings, seminars and excursions with the public, landowners, politicians, municipalities, other counties etc (chapter 6.1.19).

In September 2018 we had an exchange of experience with Scotland. In May 2019 we visited LIFE project triple lakes in Jämtland Sweden. (chapter 6.1.20)

In September we had a popular and digital final seminar. Over 200 persons attended. (chapter 6.1.21)

Action F

During the entire project period a work group consisting of people from all partners continuously have Skype meetings. The work group has for three years in a row (2017, 2018, 2019) met in January for two days and discussed the issues more thoroughly. Due to Covid-19 we have not had any physical meetings in 2020 and 2021. We had a last physical meeting with the work group in March of 2022.

We have five different thematic reference groups; the river restoration reference group, the salmon fishing reference group (Lögdeälven), the salmon fishing reference group (Råneälven), the demonstration site reference group and the forestry reference group. These reference groups have regular meetings out in the field (when it its necessary) or by Skype to discuss the topic interests before or during restoration actions. (chapter 6.1.22)

The steering committee meets on a regular basis, mainly by Skype (chapter 6.1.22).

We have had an independent auditor that has verified the financial statement. Nothing out of the ordinary was noted (chapter 6.1.23).

We have written an after-LIFE plan (chapter 6.1.24).

Rivers and streams were used to transport timber from the inland to the coast.
Photo: Sven Hansson/The museum of Västerbotten

4. Introduction

The objectives in the ReBorN project are:
Overall objectives

- Improve the conservation status of habitats and species in the Habitats directive.
- Enhance previously modify streams with the aim of achieving good ecological status according to the Water Framework Directive.

Specific objectives

- To restore approximately 202 km of river stretches to reverse the effects of previous alterations intended to facilitate timber floating. The two Natura 2000 habitats *Fennoscandian natural rivers* 3210 and *Water course of plain to montane levels with Ranunculion fluitantis and Callitricho-Batrachion vegetation* 3260 will be restored with methods that strive to achieve natural conditions. The amount of new, accessible habitats due to the measures will increase.
- To create 2 300 spawning grounds for salmon and trout.
- To create 4 demonstrations sites with examples of best practice methods adjacent to water environment for the forestry industry as well as examples of restoration actions in water courses. Through these demonstration areas the project will also be disseminated to the public.
- Dissemination and knowledge transfer by excursions and seminars to make the public, landowners, contractors, municipalities, consultants and staff from public organisations responsible for water restoration and management aware of the problems but also of the solutions.
- To build an expert network and exchange best practise, knowledge and ideas between countries (Great Britain and Finland) regarding how to re-create the habitats for the targeted species.

We are executing restoration actions in six Natura 2000 sites:

- Torne och Kalix älvsystem SE0820430
- Råneälven SE0820431
- Piteälven SE0820434
- Åbyälven SE0820433
- Byskeälven SE0820432
- Lögdeälven SE0810433

Which habitat types and/or species are targeted:

- Fennoscandian natural rivers 3210
- Watercourses of plain to montane levels levels with Ranunculion fluitantis and Callitricho-Batrachion vegetation 3260
- Freshwater pearl mussel 1029
- Atlantic salmon 1106
- Otter 1355

The main conservation/biodiversity problems and threats of the river stretches concerned by this project are the consequences of two major matters of negative impacts; altered river morphology and flowing regime due to historic timber floating activities and forestry practices.

The targeted rivers are heavily modified by measures taken to enhance large-scale timber floating during the 19th and 20th centuries. Extensive efforts as narrowing and channelizing all water courses, blocking side-channels and by removing boulders and large wood from the main channel were altered to reduce the risk of timber getting jammed. As the natural heterogeneity of the river decreased, general water velocity increased, and gravel sediments were flushed out of the rapids and deposed further downstream. Gravel sediment in rapids compose as the main substrate at spawning sites for fish species such as Atlantic salmon (*Salmo salar*) and brown trout (*Salmo trutta*). It also composes as habitat for freshwater pearl mussel (*Margaritifera margaritifera*), which to a large extent is deteriorated or eliminated in our watercourses. Since the brown trout is the most important host for the glochidiae (larvae) of the freshwater pearl mussel, the latter species suffered not only from a lack of suitable habitats but also from a lack of hosts. Correspondingly, the otter (*Lutra lutra*) is dependent on catching fish in streams in winter when all other parts of the water landscape are covered with ice and is thus negatively affected by diminishing stocks of stream fish.
Other consequences from the altering of the streams are soil erosion and a separation of the river from its surroundings. Whereas a natural river would respond to high flows by expanding into adjacent riparian forests, wetlands and floodplains all along its course, a channelized river rushes through and might cause devastating floods in the lower reaches. According to assessments made by the Bothnian Bay Water District Authority in 2015, almost all the river stretches concerned by this project actions have an ecological status which is less than good (usually moderate). The main reasons are the hydromorphological alterations due to historic log driving in the rivers. The Action Programme of the Bothnian Bay Water District Authority 2016-2021 identify restoration of channelized water courses as a prioritized measure to ensure good ecological status of all water bodies of the district.
All rivers targeted by this project are located in forest landscape and where large-scale commercial forestry is carried through. Ditching, cutting of trees with large and heavy machines which can cause deep tracks in soft ground, and cutting of trees in the riperian zone are all forestry related actions which contribute to a negative impact on stream ecology. However, the forestry companies and the authority SFA are continuously working on minimizing the risk of those actions occurring.

The socio-economic aspect of the project is also important. After the river restoration, the populations of fish will increase and/or be more sustainable. Increasing populations of salmon and trout benefits other species such as various insects and birds, European grayling, Eurasian otter, freshwater pearl mussel and lampreys. The restoration efforts also benefit recreational fishing and outdoor recreation in general. That will attract recreational anglers, increase the sales of fishing licences and will favour the local businesses. Freshwater pearl mussels filtrate water and make it cleaner, which is an ecosystem service that we yet not know the value of.
The abundance of Atlantic salmon in Swedish rivers has been low during the 1970´s and 1980´s. However, a positive trend of the natural Atlantic salmon smolt production (smolt is a young, downstream migrating salmon) has continued to increase.

In Kalixälven salmon are counted in the fishway at the waterfall in Jockfall about 100 km from the river mouth. From 2007 to 2012 the mean annual run was 5500 salmon. In 2013, the run increased to the highest observed when more than 15 000 salmon passed the fishway. The counted runs in 2014–2019 stayed at a lower level (between 5000–10 000 salmon). In 2020, nearly 19 000 were registered in the fish counter.

In 2014–2019, the spawning run in Råneälven has been monitored with an ultra-sound camera (SIMSONAR). The counting site is located about 35 km upstream from the river mouth, and the counts are expected to represent the total run as almost no salmon spawning areas exist downstream. The total counted salmon runs in the period 2014–2019 has varied between 1000–4000 and in 2020 the salmon run was 2461.

In the fishway in Piteälven the counted salmon run in 2020 was 1006 which is half of the run in 2019 when 2089 salmon were recorded. In 2018, the run was 1431, which is the same amount as in 2017.

In 2020, the counted salmon in the fishway at the hydropower station in Åbyälven was 55, which is half of the amount in 2019 when 93 salmon were registered, which is at the same level as the three previous years. In 2018, the hydropower station owner has sent in an application to the environmental court asking for reconstruction of the fishway to achieve a higher passage efficiency. In the two fishways at Fällforsen in Byskeälven, the total counted salmon run increased in 2020 to 6675 registered salmon compared with the three previous years. (ICES WGBAST Report 2021)

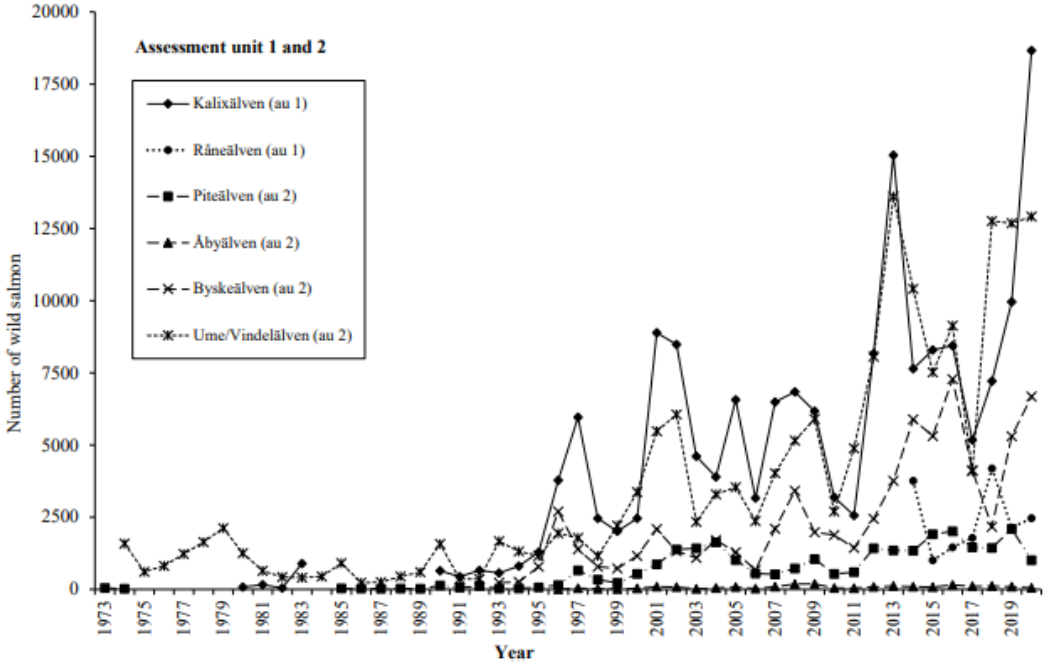


Figure 3.1.1.3. Salmon run in fish ways (ecosounder in Råneälven) in rivers in assessment unit 1 and 2, in 1973-2020.

Figure from ICES WGBAST Report 2021.
[Publication Reports - wgbast 2021_Full report.pdf (ices.dk)]

The number of sea trout spawners recorded by fish counters is low in most larger “salmon rivers” in Sweden. The average number of sea trout counted in River Kalixälven increased somewhat after 2012, to a maximum of above 300. In River Byskeälven, the number increased to almost 300 fish in 2016, followed by a decrease to 50 in 2018 and increase back to 300 in 2020. In contrast, River Piteälven has shown a positive trend that has lasted since the beginning of the century, with over 1800 sea trout spawners recorded in 2020.

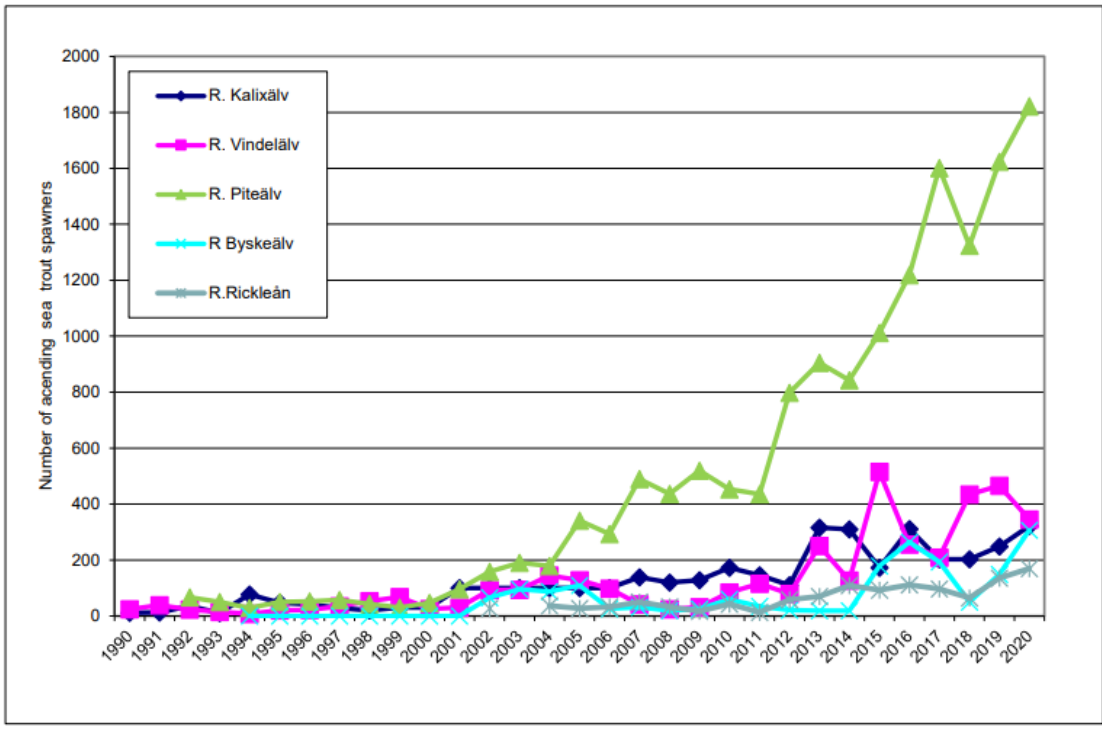


Figure 5.4.1.2. Number of ascending sea trout spawners from fish counters in four Swedish rivers debouching in the Bothnian Bay.

In 2020 we had a record of salmon passing the fish ladders in Jokkfall and Linafallet (river Kalixälven)
https://www.havochvatten.se/arkiv/aktuellt/2020-10-27-fiskevardsprojekt-gav-rekordmanga-laxar.html
In Jokkfall, 18 818 salmons passed in 2020 (compared to the record year of 2013 with 15 029 salmons) and in 2 330 salmon passed in Linafallet (previous all-time high was 1 281).

The expected long-term results of the project ReBorN are that:

- Anthropogenic modified streams in six water systems are restored, which will create more habitats for fish and other aquatic organisms.
- The freshwater pearl mussel will be able to establish new populations in the river systems and the long-term effects on freshwater pearl mussel will strengthen its conservation status. This is a long-term result, and we will not be able to see any of these results within the project time.
- The otter population will increase due to more fish in the systems. This will lead to a more stable population with a higher abundance of the species in the project areas.
- The Atlantic salmon will have access to an extensive number of increased areas for spawning, feeding, breeding and shelter.

These results will favour the species and their conservation status on a long-term basis, as strengthen the status of concerning habitats. Additionally, more natural conditions of the habitats will be achieved concerning structures and functions.

5. Administrative part

The work is done according to the time plan (Gantt chart) in annex 10.1.

The work group has had several Skype meetings and 4 physical meetings during project period. It is valuable to have a continuity of meetings within the work group, as we are dispersed at so many locations in a large geographic area, as well as to know what each partner has on their table. The steering committee consists of one representative from each partner and have had approximately two meetings per year. The reference groups have been valuable discussion partners and has been contacted when needed except for the meetings.

Once a year we have received visits from the project monitors. The contact with the project monitor is highly valuable and the visits have given us a lot of good inputs to the project.

The first amendment to the Grant Agreement was from the European Commission (LIFE15NATSE000892AGA1180701 Letter Amendment no 1) and it did not create any significant changes for the project.
We applied for a second amendment (03/04/2020) from the Grant Agreement and were approved to prolong the project by nine months until 31/3/2022 (Ref.ares(2020)3685455-13/07/2020 Letter of Amendment no 2). We needed to prolong the project duration, mainly because we were behind schedule in action C1. After our final field season (2021), we have reached the projects objectives in action C1.
A third amendment request regarding the substantial budget changes was submitted in September 2021. The amendment was approved in October 2021 (Ref.Ares(2021)6112935-07/10/2021).

Work group and steering committee at our last meeting. Hemavan, March 2022.

6. Technical part

6.1. Technical progress, per Action

6.1.1. Action A.1 Collection of pre-restoration data on habitat characteristics and juvenile fish -the action is completed

Foreseen start date: 07/2016 Actual start date: 05/2017
Foreseen end date: 06/2017 Actual end date: 09/2017

Deliverable A1	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
Pre-project ecological status reference points for each river	07/2016	05/2017	06/2017	09/2017	Completed

Milestone A1	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
Compilation of "pre-data" finalized	07/2016	05/2017	05/2017	09/2017	Completed

The deliverable "pre-project ecological status reference points for each river" is done, see annex 7.2 in progress report from 30/06/2018.

In the first progress report (28/04/2017) we asked to prolong the deadline of the milestone "Compilation of pre-restoration data" until the 30/09/2017 which the commission accepted (ref.ares (2017)3600219-17/07/2017). The report is done "Biological data compilation on salmon and trout status of rivers within ReBorN-LIFE (LIFE15 NAT/SE/000892)" (annex 7.3 in progress report from 30/06/2018). The report is written in both Swedish and English.

The reports are on our website: https://www.rebornlife.org/rapporter.

The report was done by personnel at the CABV.

Over the last few years, the densities of salmon fry have increased in the main stems and in tributaries in all project rivers, while the densities of trout fry have generally been constant or decreased slightly. Although salmon has increased in the tributaries, trout are dominant. The opposite pattern exists in the main stems where the densities of salmon are much higher than the densities of trout.
The number of migratory salmons has increased significantly in the project areas Kalixälven, Piteälven, Åbyälven and Byskeälven during recent years. No increase is seen in the project area Råneälven or Lögdeälven, however, the data quality of these two rivers is uncertain. In Råneälven, counting of migrating fish has only been carried out in 2013-2016, and then with an echosounder and in Lögdeälven, the fish counter is placed high up in the river (about 50

km from the mouth) and hence, does not reflect the entire river's potential. In addition, the fish counter has been subjected to some malfunctions.
Also, the migration of trout has generally increased and resembles the trend of salmon in Kalixälven, Piteälven, Åbyälven and Byskeälven. However, as in the case of salmon, the estimation of migratory trout in Råneälven and Lögdeälven is uncertain.

From report "Biological data compilation on salmon and trout status of rivers within ReBorN-LIFE (LIFE15 NAT/SE/000892)":
Five-year mean value (2012-2016) of densities of salmon and trout fry (fry/100m^2) and number of spawning migrating adult fish. Migration data are from fish counters of VAKI-type, but in River Råneälven in which an echo sounder (Simsonar) has been ised in 2014-2016. The counter in River Lögde was not in use during 2015 and thus, the mean value is from; 2012-2014 and 2016. Electrofishing data from River Piteälven is for 2013-2016 since no survey was conducted in 2012.

River	Salmon 0+	Salmon >0+	Trout 0+	Trout >0+	Migrating salmon (MSW)	Migrating salmon (Total)	Migrating trout (Total)
Kalix main stem	27,0	13,4	0,3	0,3	7777	9513	244
Råne main stem	6,6	4,1	0,0	0,03		2071	32
Pite main stem	7,8	5,3	0,3	0,5	1352	1603	955
Åby main stem	22,6	13,0	0,7	0,7	91	106	94
Byske main stem	31,7	17,3	0,8	0,6	4069	4936	103
Lögde main stem	12,6	5,9	0,5	1,1		308	139
Lögde tributaries	2,4	1,0	26,2	17,0			

MSW= Multi Sea Winter (salmon that spent more than one winter in the ocean).

Electro fishing in River Lögdeälven.
Photo: CABV

An echo sounder

A compiled and structured data set on historic timber floating installations has been done for both CABV and CABN. It exists in the form of ArcMap GIS (Geographical Information System). For more information see shapefile "ReBorN" in the USB flash drive, annex 7.24, progress report from 30/06/2018.
This action was done by personnel from CABV and CABN.

6.1.2. Action A.2 Information to local stakeholders, permits and licenses from landowners - the action is completed

Foreseen start date: 07/2016 Actual start date: 07/2016
Foreseen end date: 06/2020 Actual end date: 06/2020

Deliverable A2	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
Documentation of culture - history for each river	03/2017	03/2017	10/2017	10/2017	Completed

We have chosen to do a more thoroughly report from two of the rivers in the County of Norrbotten, Råne river and Åby river. We have not done this for all rivers in the County of Norrbotten since the timber constructions and remains are similar in all rivers in the county. River Råneälven and river Åbyälven are chosen, in collaboration with the CAB's archeologists.
The results can be read in the report "Kulturhistorisk dokumentation av Råneå älv med biflödet Abramsån samt Åby älv". The report was written by a consultant.
A similar report has been done for Lögde river "Kulturhistorisk dokumentation av Lögdeälven och ett urval vattendrag inom Lögdeälvens avrinningsområde". The report was written by personnel at the CABV. See annex 7.4 and 7.5 in progress report from 30/06/2018.
The reports are available on our website: https://www.rebornlife.org/rapporter

We have all permits from the Environmental court that we need, in total 8 permits.

The permits for Kalixälven, Piteälven, parts of Åbyälven and Byskeälven were issued before the project started by the environmental court.
The permit for Åbyälven within the municipality of Piteå was issued, by the environmental court, in September 2017.
The required permits for project areas Råneälven and Lögdeälven as well as their tributaries are also issued.
All consultation according to the Environmental Code Chapter 11 §12 are done. For more details see annex 10.2 in midterm report from 30/12/2020.

Before any work is started, in the different stretches in the different rivers, all required permits according to Swedish legislation is collected; permit from the environmental court, landowner consent, exemption to drive in terrain (issued by CAB), exemption to work in the shoreline (issued by CAB) and exemption to move freshwater pearl mussel (issued by CAB).

We have had 7 meetings with landowners and the public since the project started.
For river Råneälven we have had three public meetings, one in Niemisel, one in Nattavaara, and one in Mårdsel. For river Lögdeälven we have had four public meetings, one in Norrfors, one in Klöse, one in Åsele and one in Storsjöbäcken. See table below.

The meetings have been well frequented, and we have reached 122 persons in total.

We have also contacted landowners by phone and e-mail to get their consent for the actions.

Meetings with landowners and the public

Where	**Date**	**No of participants**	**Organiser**
Norrfors, project area Lögdeälven	2016-11-15	25	CABV and SFA
Klöse, project area Lögdeälven	2016-11-16	18	CABV and SFA
Niemisel, project area Råneälven	2017-05-09	28	CABN and Gällivare
Nattavaara, project area Råneälven	2017-06-12	11	CABN and Gällivare
Åsele, project area Lögdeälven	2018-04-17	10	CABV
Mårdsel, project area Råneälven	2018-07-05	18	CABN and Gällivare
Storsjöbäcken, project area Lögdeälven	2019-03-28	12	CABV

In 2020 we had an inspection from the CABN in project area Råneälven regarding the permit to drive in terrain and there were no remarks from the supervisory authority.

All partners have participated in this action.

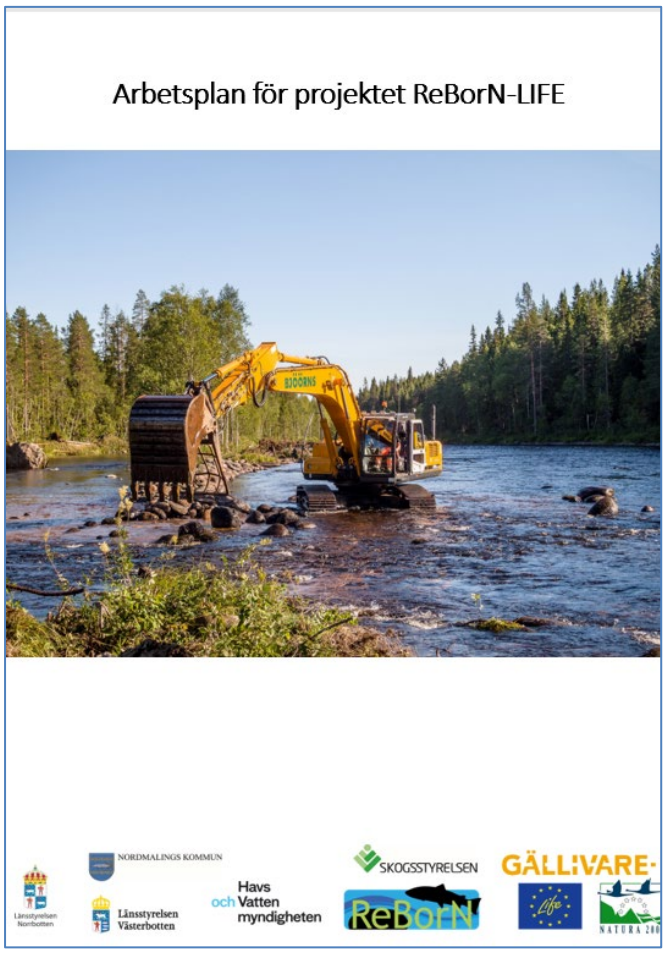
6.1.3. Action A.3 Elaboration of work plans- the action is completed

Foreseen start date: 07/2016 Actual start date: 04/2017
Foreseen end date: 06/2020 Actual end date: 12/2017

Milestone and deliverable A3	Foreseen start date	Actual start date	Foreseen end date	Actual (or anticipated) end date	Status 31/03/2022
Work plan	07/2016	04/2017	06/2017	12/2017	Completed

The work plan is completed (annex 7.6 in progress report from 30/06/2018). When we met our monitor, in October 2017, we asked to prolong the deadline of the deliverable "Finalised Work plan" until the 31/12/2017 which the Commission accepted (ref.ares (2017) 5678196-21/11/2017). The work plan is available on our website: https://www.rebornlife.org/rapporter

All partners have participated in this action.



Front page of work plan for the ReBorN project.

6.1.4. Action A.4 Public procurement- the action is completed

Foreseen start date: 07/2016 Actual start date: 04/2016
Foreseen end date: 06/2021 Actual end date: 06/2021

Milestone A4	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
First contract with excavators signed	04/2016	04/2016	07/2016	07/2016	Completed

At the same time as we asked for an extension of the project, we also requested an extension of this action until 06/2021. In the letter amendment no 2 to grant agreement for project (Ref.ares (2020)3685455-13/07/2020) the Commission accepted the extension of the action A4.

The 29th of December 2016 we established framework agreements for the period 2017-2021 for excavator companies and consultant companies (external machine foremen) for action C1 and C2. During February 2017 contract was send out for signature to 20 companies for the excavator companies and 18 companies for machine foremen. These companies have since then been called up as needed. The contracts were signed by CABV.

Due to the prolongation of the project costs for consumables (e.g. clothes) have been increased (approved by the Commission in the budget change [Amendment no 3] 2021-10-07). As restoration of watercourses is a physically demanding work out in the field and performed during full days, 5 - 6 months per year – the equipment and gear did not last for 5-6 years. We have repaired our equipment as much as we could – but with the prolongation of the project some of the equipment could not be repaired anymore. Additionally, we have had trouble receiving the same persons to hire as foremen and technicians year after year. This implies that many persons we hire each year are new persons to the project, which also demands new sizes in the equipment. We also certify that the equipment purchased for the project and for which the life-expectancy is longer than that of the project, will in the future be used exclusively for nature conservation activities.

This action has been done by all partners.

Clothing; waders, shirt etc. + logo prints

The iron horse

Table of procurements

Year	Type of contract	What's procured	No of companies	Name of companies	Forseen (F) / Unforseen (UF) in budget
2016	Public procurement rules	7 excavators for restoration C1 and C2	3	BDX Företagen AB, M Hansén Bil & Maskin AB, Gällivare Frakt AB	F
2016	Public procurement rules	Transport of excavator (C1 and C2)	1	Kaj Johansson Åkeri	F
2016	Framework agreement CABV (Public procurement rules)	Rental cars for foremen and coordinators	1	Avis	F
2017	Framework agreement (Public procurement rules)	Transport of excavators/gravel (C1 and C2)	5	SYDmek i Gällivare AB, Sorsele frakt AB, Torbjörn Sundström Entreprenad AB, M Hansén Bil & Maskin AB, Bilfrakt Bothnia AB	F
2017	Framework agreement (Public procurement rules)	15 excavators for restoration C1 and C2	8	Torbjörn Sundström Entreprenad AB, Norrlands Marktjänst AB, Sorsele frakt AB, Bilfrakt Bothnia AB Skellefteå, Swerock AB, M Hansén Bil & Maskin AB, SYDmek i Gällivare AB, Thed Wilhelmssons Gräv AB	F
2017	Framework agreement (Public procurement rules)	5 foremen for restoration C1 and C2	4	Joakim Nilsson, Fiskmiljö i Nilivaara, V River Services, Svenature AB	F
2017	Public procurement rules	Chainsaw training course action A5 (11 persons)	3	Sv Västerbotten, Svarte Swartling, Kalix Naturbruksgymnasium	F
2017	Public procurement rules	Treefelling and clearing	1	KP Legotjänst	UF
2017	Public procurement rules	Cultural historical values assessment in CABN	1	Laponiatjuottjudus (LAPONIA – world heritage in Swedish Lapland)	UF
2017	Framework agreement CABN (Public procurement rules)	Rental cars for foremen and coordinators	1	X-entus	F

Year	Type of contract	What's procured	No of companies	Name of companies	Forseen (F) / Unforseen (UF) in budget
2017	Framework agreement CABV (Public procurement rules)	Rental cars for foremen, coordinators and service team	1	Avis	F
2017	Public procurement rules	Accommodation for foremen, coordinators and service team	2	Kåbdalis B&B, rental of cottage (private)	F
2017	Framework agreement CABN (Public procurement rules)	Transport of petrol with helicopter	1	Rotor Service Norden AB	UF
2017	Public procurement rules	Clothing; waders, caps, gloves etc. + logo prints	6	Boströms Traktor & Maskin AB, Granngården AB, Flyfish Europe AS, Skog och trädgård AB, XXL, Skog och Trädgård, KL Johansson maskinförsäljning	F
2018	Public procurement rules	Exhibit with Johan Hammar	1	Johan Hammar Tema Natur AB	UF
2018	Framework agreement (Public procurement rules)	20 excavators for restoration C1 and C2	8	Nya Korpilombolo Entreprenad AB, Torbjörn Sundström Entreprenad AB, Swerock AB, Sorsele frakt AB, M Hansén Bil & Maskin AB, VTG Entreprenad AB, Kaj Johansson Åkeri, BDX Företagen AB	F
2018	Framework agreement (Public procurement rules)	1 foreman for restoration C1 and C2	1	Fiskmiljö i Nilivaara	F
2018	Public procurement rules	Chainsaw training course action A5 (15 persons)	4	Utbildning Skog Färna AB, Svarte Swartling, Norra Skogsägarna, Hushållningssällskapet	F
2018	Framework agreement (Public procurement rules)	Transport of excavators	4	VTG Entreprenad AB, Nya Korpilombolo Entreprenad AB, M Hansén Bil & Maskin AB, Swerock AB	F
2018	Public procurement rules	One-wheel loader relocating gravel in Lögdeälven	1	Kaj Johansson Åkeri	UF

Year	Type of contract	What's procured	No of companies	Name of companies	Forseen (F) / Unforseen (UF) in budget
2018	Public procurement rules	Monitoring of the impact on geomorphology and hydraulics action D3	1	Umeå University	F
2018	Public procurement rules	Clothing; waders, caps, gloves etc. + logo prints	5	Flyfish Europe AS, Granngården AB, Naturkompaniet AB, Tryckt Reklam i Sverige AB, Staples Sweden AB	F
2018	Framework agreement CABN (Public procurement rules)	Rental cars for foremen and coordinators	1	X-entus	F
2018	Framework agreement CABV (Public procurement rules)	Rental cars for foremen, coordinators and service team	1	Avis	F
2018	Public procurement rules	Accommodation for foremen, coordinators and service team	6	Kåbdalis B&B, Selholmens Camping, Nattavaara Hembygdsförening, Åsele Camping, Stiftelsen Åselehus, Park hotell	F
2018	Public procurement rules	Temporary bridges in demonstration areas	2	Roger Nilsson, Niemisels Svets & Alltjänst	UF
2019	Framework agreement (Public procurement rules)	23 excavators for restoration C1 and C2	7	VTG Entreprenad AB, Torbjörn Sundström Entreprenad AB, Gällivare Frakt AB, Swerock AB, Nya Korpilombolo Entreprenad AB, M Hansén Bil & Maskin AB, Berggrens schakt AB	F
2019	Framework agreement (Public procurement rules)	4 foremen for restoration C1 and C2	1	Fiskmiljö i Nilivaara	F
2019	Framework agreement (Public procurement rules)	Transport of excavators	2	Swerock AB, VTG Entreprenad AB	F
2019	Public procurement rules	Chainsaw training course action A5 (8 persons)	2	Svarte Swartling, Skogsconsult Nord	F

Year	Type of contract	What's procured	No of companies	Name of companies	Forseen (F) / Unforseen (UF) in budget
2019	Public procurement rules	Monitoring of the impact on geomorphology and hydraulics action D3	1	Umeå University	F
2019	Public procurement rules	Clothing; waders, caps, gloves etc. + logo prints	4	Flyfish Europe AS, Fronta/Umeå Reklam AB, Swesum AB, Micke Lindström, SWEDOL AB	F
2019	Public procurement rules	Give-aways for meetings (chocolate and bandanas)	1	Staples Sweden AB	F
2019	Framework agreement CABN (Public procurement rules)	Rental cars for foremen and coordinators	1	X-entus	F
2019	Framework agreement CABV (Public procurement rules)	Rental cars for foremen, coordinators and service team	2	Avis, Hertz	F
2019	Public procurement rules	Accommodation for foremen, coordinators and service team	8	Hotell Örnvik, Ekorrbo, Folkets hus Lansjärv, Arctic Camp Jokkmokk, Nattavaara Hembygdsförening, Kåbdalis B&B, rental of cottage (private), Stiftelsen Åselehus	F
2019	Public procurement rules	60 communication hearing protectors	1	LTS Telekommunikation AB	F
2020	Framework agreement (Public procurement rules)	16 excavators for restoration C1 and C2	5	VTG Entreprenad AB, Swerock AB, Torbjörn Sundström Entreprenad AB, Berggrens schakt AB, M Hansén Bil & Maskin AB	F
2020	Public procurement rules	1 consultant (spawning bed expert)	1	Fiskmiljö	F
2020	Framework agreement (Public procurement rules)	3 foremen for restorationC1 and C2	1	Fiskmiljö	F
2020	Public procurement rules	Transport of excavators	4	Swerock AB, Berggrens schakt AB, Torbjörn Sundström Entreprenad AB, M Hansén Bil & Maskin i Norrbotten AB	F

Year	Type of contract	What's procured	No of companies	Name of companies	Forseen (F) / Unforseen (UF) in budget
2020	Public procurement rules	Chainsaw training course action A5	1	Skogsconsult Nord	F
2020	Public procurement rules	Dumper truck in Lögde river	1	Swerock	UF
2020	Public procurement rules	Clothing; waders, caps, gloves etc. + logo prints	4	SWEDOL AB, Flyfish Europe AS, Fronta/Umeå Reklam AB, Granngården AB	F
2020	Framework agreement CABN (Public procurement rules)	Rental cars for foremen, coordinators and service team	1	X-entus	F
2020	Framework agreement CABV (Public procurement rules)	Rental cars for foremen, coordinators and service team	2	Hertz, Sixt	F
2020	Public procurement rules	Accommodation for foremen, coordinators and service team	9	Storforsen hotell, hotell Örnvik, Kåbdalis B&B, Murjek Hembygdsförening, Hotell Vuollerim, AirBnB Långträsk, rental of cottage (private), rental of house (private), Stiftelsen Åselehus	F
2020	Public procurement rules	Gravel for spawning beds (C2)	1	Inlandsfrakt	F
2020	Public procurement rules	Iron horse and repair	1	LL Skog och Skötsel	F
2021	Framework agreement (Public procurement rules)	7 excavators for restoration C1 and C2 in Norrbotten	3	Torbjörn Sundström Entreprenad AB, Berggrens schakt AB, M Hansén Bil & Maskin AB	F
2021	Framework agreement (Public procurement rules)	Transport of excavators	3	Torbjörn Sundström Entreprenad AB, Berggrens schakt AB, M Hansén Bil & Maskin AB	F
2021	Public procurement rules	1 smaller mobile excavator and truck in Norrbotten	1	Hansén Bil & Maskin AB	F
2021	(New) framework agreement (Public procurement rules)	6 excavators for restoration C1 and C2 in Västerbotten	3	Maskinring Norrland, Swerock AB, Sjölunds Spår och Mark	F

Year	Type of contract	What's procured	No of companies	Name of companies	Forseen (F) / Unforseen (UF) in budget
2021	(New) framework agreement (Public procurement rules)	Transport of excavators	3	Maskinring Norrland, Swerock AB, Sjölunds Spår och Mark	F
2021	Framework agreement (Public procurement rules)	3 foremen for restoration C1 and C2	1	Fiskmiljö	F
2021	Public procurement rules	Chainsaw training course action A5 (5 persons)	1	Riström, Svarte Swartling	F
2021	Public procurement rules	Clothing; waders, caps, gloves etc. + logo prints	5	SWEDOL AB, Flyfish Europe AS, Fronta/Umeå Reklam AB, Granngården AB, procurator	F
2021	Public procurement rules	Gravel for spawning beds (C2)	1	Inlandsfrakt	F
2021	Framework agreement (Public procurement rules)	Transportation of gravel with helicopter	1	Fjällflygarna Arjeplog	F
2021	Framework agreement CABN (Public procurement rules)	Rental cars for foremen, coordinators and service team	1	X-entus	F
2021	Framework agreement CABV (Public procurement rules)	Rental cars for foremen, coordinators and service team	1	Mabi	F
2021	Public procurement rules	Accommodation for foremen, coordinators and service team	14	Polar hotell, hotell Örnvik, Murjeks hembygdsförening, Quality hotell Luleå, Överkalix Camping, AirBnB Långträsk, AirBnB Fagerheden, rental of apartment (private), Pemobygg, Fredrika Camping, Åsele Camping, Viskabo bygg och fastigheter, rental of house (private), Ansia Camping	F

Year	Type of contract	What's procured	No of companies	Name of companies	Forseen (F) / Unforseen (UF) in budget
2021	Framework agreement CABN (Public procurement rules)	Baseball hats	1	Idépoolen	F
2021	Framework agreement CABV (Public procurement rules)	Bridge in demonstration site Högsåker	1	EÖ Bygg och Anläggning AB	F
2021	Public procurement rules	Consultant "monitoring of the impact on ecosystem functions"	1	Calluna	UF
2021	Public procurement rules	Consultant "Study of freshwater pearl mussel glochidia larvae on salmon and trout in rivers within ReBorN-LIFE"	1	Sportfiskarna	UF

Baseball hat

New bridge at demo site Högåker, project area Lögdeälven.

6.1.5. Action A.5 Training of foremen and excavator operators - the action is completed

Foreseen start date: 07/2016 Actual start date: 07/2016
Foreseen end date: 06/2021 Actual end date: 06/2021

Milestone A5	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
First foremen and excavator operator training course completed	07/2016	07/2016	07/2016	07/2016	Completed

At the same time as we asked for an extension of the project, we also requested an extension of this action until 06/2021. In the letter amendment no 2 to grant agreement for project (Ref.ares (2020)3685455-13/07/2020) the Commission accepted the request.

The first training course for foremen and excavator operators were completed the 31st of July 2016.
We have continued to have courses in the beginning of every field season to ensure that the quality of the work remains high. In 2017 and 2018, we have had two courses together for all foremen. Since there are so many attending the training course, we decided to divide the training and we have had separate courses in each county in 2019, 2020 and 2021.
105 different persons have attended this (excavator operators are not included). The added numbers below are higher since some persons have attended the course more than once.

See table below for number of attendants.

Year (Arranger)	Date	No. attended CABV	No. attended CABN	Consultants (foremen)	No. machine op. attended (date)	External who attended course (municipalities)
2016 (CABV)	July	8			6	
2017 (CABV & CABN)	20 – 22 June	15	8			
2018 (CABV & CABN)	18 – 21 June	27	12	3		11
2019 (CABN)	17 – 20 June		14	5	16 (19 – 20 June)	2
2019 (CABV)	10 – 14 June	21			4 (26 – 27 June)	
2020 (CABN)	15 – 18 June		14	3 (18 June)	11 (18 June)	2
2020 (CABV)	15 – 18 June	20				
2021 (CABN)	23-24 June		21			
2021 (CABV)	14-18 June	21				

This action has been done by personnel at the CABV and the CABN but personnel from the municipality of Gällivare have also participated.

Training of foremen 2017. Learning how to make spawning beds.

Training of foremen 2018. The largest group during the project.

Training of foremen 2019. Looking for freshwater pearl mussels.

Training of foremen 2021. Looking at already done areas in Åbyälven.

6.1.6. Action C1 Restoration of channelised stream sections - the action is completed

Foreseen start date: 07/2016 Actual start date: 07/2016
Foreseen end date: 12/2021 Actual end date: 12/2021

Deliverable C1	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
The first compilation of work done- maps of progress, updated each year to be presented at the project website	01/2017	01/2017	06/2017	06/2017	Completed

Milestone C1	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
100% of the rivers restored	07/2016	07/2016	11/2020	11/2021	Completed
50% of the rivers restored	07/2016	07/2016	11/2018	11/2019	Completed

This action C1 was by far the biggest and most challenging task in the project. The objective was to restore at least 201.9 km length of timber flotation affected watercourses.
In total 242.7 km has been restored in the ReBorN project.

In midterm report from 28/06/2019 we requested for an extension of milestone “50% of the rivers restored” until 11/2019 since we had not reached the milestone due to reasons described in this chapter. After field season 2019 the milestone was reached.

At the same time as we asked for an extension of the project, we also requested an extended end date of milestone “100% of rivers restored” until 11/2021 and an extension of the action until 12/2021. In the letter amendment no 2 to grant agreement for project (Ref.ares (2020)3685455-13/07/2020) the Commission accepted the requests.

In project area Lögdeälven a total of 136.5 km (out of 97.5 km foreseen) has been done, see map 2 in annex 10.2. For sub-areas see table in annex 10.2.
In project area Byskeälven a total of 4.8 km (out of 4.3 km foreseen) has been done, see map 3 in annex 10.2. For sub-areas see table in annex 10.2.
In project area Piteälven 23.1 km (out of 36.9 km foreseen) is done, see map 4 in annex 10.2. For sub-areas see table in annex 10.2.
In project area Åbyälven 24.9 km (out of 16.5 km foreseen) is done, see map 5 in annex 10.2. For sub-areas see table in annex 10.2.
In project area Kalixälven a total of 17.7 (out of 13.3 km foreseen) km is done, see map 6 in annex 10.2. For sub-areas see table in annex 10.2.
In project area Råneälven 35.6 km (out of 33.5 km foreseen) is done, see map 7 in annex 10.2. For sub-areas see table in annex 10.2.

The action has been done by personnel from the CABV, the CABN and the municipality of Gällivare.

We have experienced extreme water levels for some years. In 2017 it was hight water levels the entire field season which made it more difficult to perform our actions (and led to the need for adjustments the forthcoming seasons). In 2018 there was the opposite problem with extremely low water levels which made it difficult to estimate how the restoration work and the structures would look like in normal water levels.
If autumn rainfalls are heavy, it will cause high water levels and problems for the project actions. That happened in 2019 (both counties) and 2020 and 2021 (Västerbotten) which have shortened the field seasons with a couple of weeks for some of the excavators.

We have also had some difficulties getting the requested number of excavators and machine operators, which led to delayed starts in some areas.

Unfortunately, there is a mistake in our application and the sites in project area Råneälven do not add up. We asked to remove some areas and add a few new ones. All areas are within project area Råneälven (same Natura 2000 site as in the application: SE0820431). The length of the restoration (33 kilometers) has not changed, and the measures have been done within the project budget. For more details see annex 7.7 in progress report from 30/06/2018.The alteration was accepted in EASME letter of 30/10/2018.

We were not able not do some of the stretches in project area Piteälven (Vitbäcken) because some of them were difficult to get to with an excavator and we also had to leave other stretches due to culture values. We have also discovered some inaccuracies in the application regarding Vitbäcken. There seems to be more km in the table on page 231 in the application that we have intended to restore. Despite this inaccuracy we have reached our overall objective of 202 km (and exceeded it) since we have added areas in project areas Lögdeälven, Åbyälven, Kalixälven and Råneälven. We have addressed the issue to our monitor (e-mail 2021-02-18). In annex 10.3. we explain in detail the correction of sites in project area Piteälven/Vitbäcken.

The compilation of work done is published on our website www.rebornlife.org for each project area.
Action C1 and C2 are conducted at the same areas so there is only one map for each project area on the website.
On average, we had 17 excavators working each season (2016-2021), fewest being in 2016 (3) and most in 2019 (23).

We have had an inspection regarding the work environment with the CABN and the two different unions (SACO and ST) in Norrbotten in 2020. They visited one foreman/excavator operator team. We got some feed-back about minor changes and we have improved the working conditions according to the suggestions.

One problem we have encountered every year is that machine operators quit during the season. The companies have found replacements, but it often takes a while for new operators to learn how to do the work which set us back in the schedule.

During the same time as the ReBorN project, the County Administrative Board of Norrbotten has done some restoration work in a stream close to project area Byskeälven, Valkenbäcken (which is part of the Piteälven catchment area) and 1 100 metre has been restored. It has been financed by national funds.

Complementary projects

The CABN participate in the project ReArc (Ecological Restoration of Arctic Rivers). It is financed by the Kolarctic Cross Border Cooperation program. The project runs 2019 to 2022. It is a cooperation between Sweden, Finland, Norway and Russia.
The project will lead to increased knowledge in all countries about how to restore river habitats. The main task in the project is habitat restoration of rivers and approximately 200 km will be restored.

The CABN participate in project EMRA (Environmental planning, measures and Actions in Regulated water systems). It is a Swedish-Finnish cross border project financed by Interreg Nord programme. The project aims to perform restoration actions, knowledge exchange about restoration rivers and increase the knowledge about trout and grayling by doing genetic analysis. So far 11,81 km has been restored. The work will continue in 2022.

The CABN participate in project called SALMUS (Salmonid Fish and Freshwater Pearl Mussel- Riverine Ecosystem Services and Biodiversity in the Green Belt of Fennoscandia). Focusing on reaching common methods for evaluation of freshwater pearl mussel and salmonid population status. It is a Kolarctic Cross Border Cooperation project and the knowledge from the ReBorN project will be transmitted to the SALMUS project.

8 migratory barriers (road-water crossings and dams) have been removed in the County of Norrbotten and small tributaries attached to river Kalixälven has opened up within the project "Älvspecifik laxförvaltning". In the same project, 34,6 km of streams has been restored in the same way as in ReBorN and 348 spawning beds have been created. The project has been financed by national funds.
Additionally, about ten migratory barriers have been removed by CABN in smaller projects financed by national funds and the work will continue if we receive more funding.
The forestry companies have replaced culverts that have been migratory barriers. In both counties, Sveaskog and SCA have replaced 5-10 culverts every year during the years 2016-2021.

In 2021, the LIFE project ReVives (Reviving freshwater pearl mussel populations and their habitats, LIFE20 NAT/FI/000611) started. The project has a budget of 9.5 million EUR and the objective is to increase freshwater pearl mussel populations by improving their – and their host fishes' – habitats in Finland, Sweden and Estonia. The project owner is the University of Jyväskylä, Finland and the CABN is a partner in the project. The conservation and restoration actions will be carried out in 14 river systems and the river restorations will totally affect 77 ha and 117 km. To save dying-out freshwater pearl mussel populations, adult mussels will be revived – and juveniles produced – in captivity.
Throughout the project, emphasis will be given in sharing good practises among people working with land use and forestry to help forward freshwater pearl mussel conservation, and in raising the awareness of freshwater pearl mussel importance among public. The project will continue until 2027. The knowledge from the ReBorN project will be transmitted to the ReVives project.

Two fish ladders in river Kalixälven (in Jokkfall and Linafallet) downstreams our project area have been restored by the CABN with financing from national funds (SWaM): https://www.havochvatten.se/arkiv/aktuellt/2020-10-27-fiskevardsprojekt-gav-rekordmanga-laxar.html

In the County of Norrbotten, in an already finished project called “Kustmynnande vattendrag i Bottenviken- metodutveckling och ekologisk restaurering, ett gränsöverskridande svensk-finskt samarbetsprojekt” a fish ladder made of composite was installed in 2018 in the river of Alterälven to facilitate fish to migrate pass a hydropower dam. In a follow-up project called “Innovativt fiskvandringsprojekt för juvenil och lekvandrande fisk i Norrbottens län” the function of the fish ladder is monitored. The project is financed by national funds, and it will end in 2022.

We have received national funds to restore wetlands, mainly by removing diches. This work has been done in both counties. Some of the restored wetlands are within the project rivers catchment areas.

A large water restoration project, TRIWA LIFE, will start in 2023. TRIWA LIFE is a Swedish-Finnish effort to improve the conditions of riverine ecosystems in the whole international catchment area of River Torne NATURA 2000 site, the main rivers are among the largest free-flowing rivers of Europe. The overall aim is to improve conservation status for species and habitats of the Habitats Directive and reach good ecological status according to the Water Frame Directive. 103 hectares of streams will be restored, 399 anthropogenic migration barriers will be removed so more than 3 366 km of tributary river and stream will open up for fish migration.
Additionally, 2 521 hectares of wetland, that was historically ditched for forestry use, will be restored so the water quality and the wetland habitats will be improved.

To raise the level of knowledge among excavator operators, the CABN has started a new project where an education package will be developed and will be applicable for restoration in streams, wetlands and remediation of migratory barriers. One goal is to be able to prioritise machine operators with a course diploma in future procurements. The project is a cooperation between Sweden, Norway and Finland, a Kolarctic project called EXPERT (Excavator Pro Ecological ResToration) and it started in December 2021.

The CABV has conducted restoration work in the river basins of Hörnån, Rickleån, Sävarån, Marsån, Gäddbäcken and Stalonbäcken. Where needed, gravel for spawning beds have been transported to the streams. In Marsån, Gäddbäcken and Stalonbäcken brown trout has been artificially infected with freshwater pearl mussel glochidia larvae. It has been financed by funds.

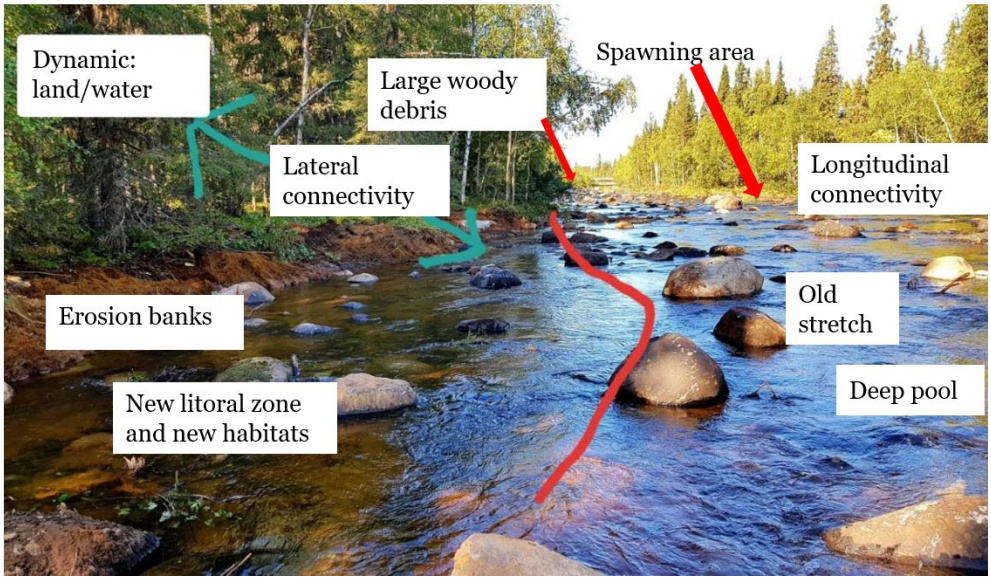
In January 2021, a new LIFE project, Ecostreams (LIFE19 NAT/SE/000333), started with actions in the counties of Västerbotten, Västernorrland and Jämtland. With the experience and knowledge of restoring freshwater ecosystems gathered from ReBorN LIFE – Ecostreams for LIFE will restore 140 kilometres of river stretches in the three counties for Atlantic salmon, freshwater pearl mussel, brown trout, European bullhead and scapania moss. The project will also remediate 221 migration barriers, where 22 are old dams and 199 are undersized/misplaced road culverts. Additionally, reintroduction of the threatened freshwater pearl mussel in scarce areas and adaptive sustainable management plans of fish populations will be implemented.

14 water road crossings and dams, that have been migratory barriers for fish, have been replaced in tributaries. Five of them in river Lögdeälven, two in Gäddbäcken and seven in Rickleån. The project has been financed by national funds.

The SFA is a partner in the Interreg (Botnia-Atlantica) financed project KLIVA (Vattenbalans, ekosystemtjänster och metalltransport i ett klimat i förändring). The use of natural resources effects the aquatic environment, the availability of ecosystem services and the possibility of achieving environmental goals. A climate in change means new challenges for sustainable production and clean water. During the years 2019–2022, the KLIVA project is working with stimulating to climate-adapted measures in agriculture and forestry through to start from a holistic view of water flow and water supply in a catchment area. With a more natural water balance and less pollution from acidic sulphate soils, conditions are created for sustainable production, biodiversity, and healthier water. The project model areas Toby å i Finland and Hertsångerälven in Sweden.

For more details on the work done in actions C1 see annex 10.2.

Excavator moving big boulders in project area Åbyälven.



By re-creating different kinds of habitats, the stream regains the ecological functions that were lost during the timber floating. For example, the dynamic between land and water is re-open. We also create erosion banks so the supply of gravel to spawning beds will continue after the project.

6.1.7. Action C2 Restoration of spawning areas- the action is completed

Foreseen start date: 07/2016 Actual start date: 07/2016
Foreseen end date: 12/2021 Actual end date: 12/2021

Deliverable C2	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
The first compilation of work done- maps of progress, updated each year to be presented at the project website	01/2017	01/2017	06/2017	06/2017	Completed

Milestone C2	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
100% of the spawning sites restored	07/2016	07/2016	11/2020	11/2021	Completed
50% of the spawning sites restored	07/2016	07/2016	11/2018	11/2018	Completed

In total 14 679 (538%) spawning beds (out of the 2 300 foreseen) have been restored in the ReBorN project. The number of expected spawning beds was underestimated since we did not know, in detail, the geological conditions in the rivers. We found much more gravel that suits spawning beds. Since the spawning beds are the limited factor in our rivers in the abundance of salmon and trout we have created as many spawning beds as possible.
In the end of the project, in the county of Norrbotten, we discovered that there was a loss of spawning beds. There might be several explanations why this happened. The restoration work has affected the flow patterns in the area in such way that high floods occurring directly after restoration have a big impact on the spawning beds. Material can be flushed away. Some beds were made even if the natural conditions were not ideal.

At the same time as we asked for an extension of the project, we also requested an extended end date of milestone “100% of spawning sites restored” until 11/2021 (even though we had already reached that milestone) and an extension of the action until 12/2021. In the letter amendment no 2 to grant agreement for project (Ref.ares (2020)3685455-13/07/2020) the Commission accepted the requests.

In project area Lögdeälven 11 800 spawning beds have been done, see map 2 table in annex 10.2.
The work in project area Byskeälven is completed and a total of 66 spawning beds have been done, see map 3 and table in annex 10.2.
In project area Piteälven 449 spawning beds are done, see map 4 and table in annex 10.2.
In project area Åbyälven 641 spawning beds are done, see map 5 and table in annex 10.2.
In project area Kalixälven 740 spawning beds are done, see map 6 and table in annex 10.2.
In project area Råneälven 983 spawning beds are done, see map 7 and table in annex 10.2.

In 2020 and 2021, we transported, in total, 820 000 kg of gravel with helicopter to areas in project area Lögdeälven. The gravel was placed in areas that were restored earlier in the project and where natural gravel was scarce. Our expectation is that anadromous fish will use the spawning beds and also migrate further up streams.

In 2021, we had a small mobile excavator in Norrbotten to adjust spawning beds in areas that had been restored earlier within the project. The excavator was led by a consultant who is the inventor of the Hartijoki method (method for creating spawning beds).
The smaller excavator has visited all project areas in Norrbotten.

In Västerbotten, we have had service teams (hired by the CABV) 2017, 2018, 2019, 2020 and 2021. In Norrbotten we have had service teams (hired by the CABN) 2020 and 2021. Their work tasks have been to cut down trees and prepare for the excavators, picked up and relocated freshwater pearl mussels, manually adjust spawning beds and to transport fuel to excavators.
The service teams have helped the foremen and have made the work more efficient when preparations have been done before the excavators have arrived at the sites.

When the excavators have been in the rivers, our foremen have observed spawning salmon and brown trout in all project areas in sites restored in the project. One interesting observation is that the fish doesn´t seem scared of humans or the excavators. The excavator operator can take a lunch break and during that time salmon will visit the newly made spawning beds.

The action has been done by personnel from the CABV, the CABN and the municipality of Gällivare.

The compilation of work-done is published on our website www.rebornlife.org under the menu “resultat och kartor” (results and maps) for each project area. The website is continuously updated you can see the progress of this action on the website.

For more details on the work done in actions C2 see annex 10.2, 10.4 and 10.5.

The service team is doing the final adjustment on a spawning bed and meanwhile the excavator is doing the preparation work for new spawning beds (project area Råneälven).
Photo: Fiskmiljö

6.1.8. Action D1 Monitoring of stocks of migratory fish and freshwater pearl mussel- the action is completed

Foreseen start date: 07/2016 Actual start date: 03/2017
Foreseen end date: 03/2022 Actual end date: 03/2022

Deliverable D1	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
Chapter on monitoring in Final Layman's report including data report year 5	01/2020	10/2021	03/2020	03/2022	Completed

Milestone D1	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
Data report year 1	08/2016	03/2017	12/2016	05/2018 (electrofishing) and 06/2018 (freshwater pearl mussel)	Completed
Data report year 4	08/2019	08/2021	12/2019	01/2022 (electrofishing) and 01/2022 (freshwater pearl mussel)	Completed

When we met our monitor, in October 2017, we asked to prolong the deadline for the milestone "data report year 1" until the 30/09/2017 which the Commission accepted (ref.ares (2017)5678196-21/11/2017). Unfortunately, due to lack of time, the reports were not done until May and June 2018.

At the same time as we asked for an extension of the project, we also requested an extended end date of the action until 03/2022. In the letter amendment no 2 to grant agreement for project (Ref.ares (2020)3685455-13/07/2020) the Commission accepted the requests.
With the change in timetable, we also postponed the remaining studies in action D1 (both glochidia study and the electrofishing) to 2020 and 2021.

After correspondence with our monitor, who found it reasonable to write one report for the two monitoring years, so we requested to postpone the end date of the second report "Data report year 4" until 03/2022 and add it together with Final report (annex 10.4 and 10.5). The Commission accepted the request (Ref.ares (2021)149984-26/02/2021).

Due to lack of time, we hired a consultant (public procurement) who analysed the data and wrote the report "LIFE ReBorN – Evaluation of prevalence and intensity of glochidia on Salmonidae" (annex 10.5). The cost was about 5, 000 EUR which we can accommodate within our budget. We have used savings in the cost category Personnel and allocated about

5,000 EUR. The amount has been transferred to External assistance (CABN) from Personnel action F1, CABN. The minor change has been discussed with the monitor

Results
A generation cycle for salmon and sea trout is about 5-6 years. Thus, monitoring of the effect of restoration on salmon and trout status within the scope of project ReBorN LIFE cannot be conducted with a high degree of certainty. Follow-up measures, however, continues within the county administrative board's ongoing environmental monitoring program even after the project expires. See more details in the After LIFE plan, annex 10.24.

Data from ongoing national monitoring salmon program
The status of salmon and sea trout are monitored by annual electrofishing surveys and is carried out in all of Sweden's wild salmon- and sea trout rivers (national salmon monitoring program). In some tributaries, for example those in River Lögdeälven system, surveys are conducted as part of the national liming program. Based on data from those monitoring programmes, we have compiled the data and compared with the data from the report in action A1 (annex 7.3 in progress report from 30/06/2018) and presented it in a report (annex 7.8 in progress report from 30/06/2018).
From the dataset of 2020's and 2021's monitoring of salmon and trout densities, the data of ReBorN rivers have been compiled (annex 10.4 in midterm report from 30/12/2020 and annex 10.6).
It is, within the limited time of the project, difficult to measure the effect the projects actions have had any effect on salmon and trout recruitment in the main channels and tributaries of the project rivers. However, river Byskeälven has a positive trend (five-year mean value) for salmon (both juvenile and adult).
Since the project started, 0+ salmon have decreased in the main channels of almost all project rivers while >0+ salmon densities instead have increased. The lack of extensive time series for the tributaries makes it hard to conclude any effects of the project's actions on the recruitment.
Parr (a young salmon or trout between the stages of fry and smolt) densities vary between years for natural causes. Factors such as health and the number of females that spawned the year before influence the yearly recruitment. There are also methodological factors that can affect the outcome of electrofishing surveys, for example water level and water temperature during the time of electrofishing. This have most likely affected the electrofishing results.

The reports were done by personnel at the CABV.

Data on fish migration
Data on fish migration have been compiled and is in the monitoring report for Action D1 (annex 10.6).
Since the start of the ReBorN project, the number of migrating salmon have increased in river Kalixälven and Råneälven while the numbers instead have decreased in river Piteälven, Åbyälven and Byskeälven.
Depending on the location of a fish counter in a river, all or just a part of the total migration is counted. Hence, a large proportion of migrating salmon and trout are spawning below the counter and are therefore not included in the count.

Glochidiae study
The results from the investigation cannot answer the hypothesis that stream restoration would increase the prevalence and intensity. This is due to the lack of data and probably time, both

in sample sizes and time before and after the restorations. However, the data collected, no matter how small the numbers are, can be valuable baseline data to future studies.
The abundance of freshwater pearl mussel in the streams is not large, and that can be one reason why the prevalence and the infection intensity was low.
The investigations have revealed that some of the streams in the project in-habited by freshwater pearl mussel utilize Atlantic salmon as the primary fish host. Together with the first report (annex 7.9 in progress report from 30/06/2018) and the data presented in the latest report (annex 10.7) we have the first record of salmon as fish host to the freshwater pearl mussel in Sweden. Interestingly a few streams also had infected trout at the same site as infected salmon was caught. The phenomenon that both salmon and trout are infected at the same site has only been reported before from a few streams in Scotland. There are investigations from Norway where salmon and trout co-exist together with freshwater pearl mussel but were only one of the fish species have been found with glochidia infection. There should be a genetic difference between freshwater pearl mussel that use salmon as host and freshwater pearl mussel that use trout as host, this may be a useful tool to use in streams where no infected fish was caught.
It is difficult to implement investigations in the field when conditions are not favourable at all time. In these investigations, personnel had to struggle with high floods and days without any catch of infected fish host. These obstacles are hard to get by when resources are limited. Time is probably one of the most important components to consider when evaluating conservation actions and biological effects from such, as biological systems can have a very slow pace of life. Read more about the results in annex 7.9 in progress report from 30/06/2018, annex 10.5 in midterm report from 30/12/2020 and annex 10.7.

The first report from 2018 has been read 208 times from the site www.researchgate.net. That is a site that is a network for scientists and researchers with over 15 million members from all over the world where the members can share, discover and discuss research.

Two sections in the Layman´s report are written regarding action D1. They were written by personnel at CABV.

This action was done by personnel from CABV and CABN.

Looking for glochidia larvae on the gills of young brown trout and salmon, June 2017.

6.1.9. Action D2 Monitoring of number and function of spawning sites- the action is completed

Foreseen start date: 07/2018 Actual start date: 07/2018
Foreseen end date: 03/2022 Actual end date: 03/2022

Deliverable D2	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
Chapter on monitoring in Final Layman's report	01/2020	10/2021	03/2020	03/2022	Completed

Milestone D2	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
First season of spawning ground check completed	08/2018	08/2018	11/2018	11/2018	Completed

At the same time as we asked for an extension of the project, we also requested an extended end date of this action and of the end date for the deliverable until 03/2022. In the letter amendment no 2 to grant agreement for project (Ref.ares (2020)3685455-13/07/2020) the Commission accepted the requests.

One of the objectives in the ReBorN project was to create 2300 spawning sites. By the end of the project more than 14 000 spawning sites have been created. The spawning areas are usually located at the top of a rapid (river neck, where calm water pass over into a rapid).

To ensure that the sites are functional and used by the targeted fish species we have monitored a sample of created spawning sites within the project. During 2016-2021 we have monitored 347 spawning areas in both counties. Traces of spawning activity have been noticed on 165 (47,6 %) sites. The fact that spawning areas were used very soon after they were created indicates that there is a high demand for spawning areas of good quality in the river systems. The result is also depending on the number of fish that is spawning, both stationary fish and fish that goes up into the river for spawning each year (anadromous fish). More mature fish in the river, more signs of activity will be noticed. For more details see annex 10.8.

The monitoring in 2020 and 2021 were not complete due to a couple of different factors. In the County of Västerbotten there where very high water levels in the autumn when the monitoring was taken place which made the monitoring difficult. In the County of Norrbotten in 2020 the winter came early. Snow and cold made the monitoring though, although 31 spawning sites in Vassaraälven were monitored.

This action was done by personnel from CABV, CABN and by consultants.

As discussed during the monitor meeting in November 2020 and via e-mail correspondence, the monitor recommended to submit a final monitoring report on the results (second milestone) from action D2 and submit it with the Final report. This is to show more detailed

information regarding the results from the monitoring, instead of only one chapter in the Layman's report (deliverable). This report is annex 10.6.

Top left picture: spawning bed
Top right picture: In 2020 and 2021 a consultant (Fiskmiljö) did the monitoring in the County of Norrbotten (pictures from project area Kalixälven).
Bottom picture: Brown trout that are spawning

A section in the Layman´s report is written regarding action D2. The section was written by personnel at CABV.

6.1.10. Action D3 Monitoring of the impact on geomorphology and hydraulics- the action is completed

Foreseen start date: 07/2016 Actual start date: 01/2017
Foreseen end date: 03/2022 Actual end date: 03/2022

Deliverable D3	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
Project report on geomorphology and hydraulics	01/2020	10/2021	07/2020	03/2022	Completed

Milestone D3	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
Analyses of geomorphology and hydraulics completed	07/2016	01/2017	02/2020	03/2022	Completed

At the same time as we asked for an extension of the project, we also requested an extended end date of this action and of the end dates for the deliverable and the milestone until 03/2022. In the letter amendment no 2 to grant agreement for project (Ref.ares (2020)3685455-13/07/2020) the Commission accepted the requests.

In progress report from 30/06/2018 we requested a change in the hydrogeomorphic monitoring and conduct all of the pre- and post- restoration measurements within the Lögdeälven project area. This was accepted by the commission (ref.ares(2018)5551311_30102018 from 20/10/2018). For details see annex 7.10 in progress report from 30/06/2018.

To monitor the effect of the restoration actions on channel geometry, flow velocity data has been collected on three occasions: before restoration, 1 year post restoration and either 2- or 3-years post restoration. Since there are more boulders in the streams after the restoration, we expected that the geometry would be more heterogeneous, and the water velocity would decrease while flow heterogeneity was expected to increase. Monitoring of restoration impacts on geomorphology (channel form) and hydraulics was carried out by Umeå University.

The main results of the study are:
1) Restoration was successful in removing the lateral constraints imposed during timber floating. River width increased at all sites and on average the increase was 2 ha/km.
2) Side channels and islands were reconnected and maintained in the two to three years following restoration. These reconnected side channels increase habitat diversity and likely provide important refugia for fish.
3) Geomorphic complexity typically increased during restoration. However, increases in the variability of channel width were minimal, because width was increased by a similar amount along both banks at many sites. Similarly, lateral variability in the location of the deepest part of the channel (thalweg) decreased with restoration. Future restoration should consider increasing complexity in these dimensions.

4) Hydraulics show high variability between sites and no clear differences in flow velocity or turbulence (i.e., variation in velocity) following restoration.
5) Following restoration, rivers continued to adjust morphologically. Across most sites, there was a net decrease in river width (two sites had net increase in channel width and area). During restoration rivers were widened but there was no reduction in depth, meaning that river capacity was probably oversized. Field observations indicated the formation of an inset bankfull channel; this risks reducing connectivity between the river and the floodplain/riparian areas (contrary to aims of restoration) by reducing frequency of overbank flooding.
6) Following restoration, there was a slight decrease in geomorphic complexity. Banks and longitudinal profiles became smoother and channel sediment settled causing grain interlocking, which is common after a series of low to medium flows.
7) Inter-site variability was high and no large (or statistically significant) differences were found between main channel and tributary sites or sites above or below the former highest coastline.
The scientists at the University of Umeå concludes that the ReBorN project has been successful in restoring channels towards their pre-disturbance state by increasing width and geomorphic complexity. Longer term monitoring is required to understand whether these rivers will continue to adjust channel design or settle on a new state. This is especially true in northern Sweden where channel geomorphology does not fit responses found in alluvial channels elsewhere.
This is possibly the first study to consider the morphological response of rivers to restoration in boreal, post glacial landscapes.

The coordination of this action and some of the field work was done by personnel from the CABV.

A section in the Layman´s report is written regarding action D3. The section was written by personnel at CABV.

For more details, see annex 10.9.


Measurements done in action D3. Photo: University of Umeå

6.1.11. Action D4 Monitoring of otter - the action is completed

Foreseen start date: 07/2016 Actual start date: 07/2016
Foreseen end date: 03/2022 Actual end date: 03/2022

Deliverable D4	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
Chapter on monitoring in Final Layman´s Report	01/2020	10/2021	03/2020	03/2022	Completed

Milestone D4	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
Report on otter abundance before restoration	07/2016	10/2018	12/2016	12/2018	Completed

At the same time as we asked for an extension of the project, we also requested an extended end date of this action and of the deliverable until 03/2022. In the letter amendment no 2 to grant agreement for project (Ref.ares (2020)3685455-13/07/2020) the Commission accepted the requests.

In the progress report from 30/06/2018 we asked if we could replace the monitoring of otter droppings with the national and regional monitoring programs for otter. We also asked if we could alter the milestone “otter droppings reference point set after first season” to “Report on otter abundance before restoration” based on our regional and national monitoring data.
This was accepted by the commission (ref.ares(2018)5551311_30102018 from 30/10/2018).

To monitor the status of otter populations, surveys are regularly carried out by the County Administrative Boards. The County Administrative Board of Norrbotten has one of the longest time series of otter monitoring in Sweden. The monitoring of otter in the County of Västerbotten started in 2015 so there is no data before the project in these areas. Therefore, we have used data from Norrbotten to see the change in otter populations for both counties. We have otter in both counties, and we can assume that the change in otter population in Norrbotten correlates with the change in Västerbotten.

The otter’s main diet is fish, so when fish stocks increase the otter population is favoured. When water courses are restored, many rapids are re-created. The otters need open water during the winter, so they can search for food. Slower running waters freezes to ice during the winter, but the rapids have open water where the otters can search for food. Additionally, by creating more natural structures of boulders and woody debris in and close to streams, more favourable habitats for otter are created for shelter etc.

To see if the measures done in ReBorN have had a positive effect on the otter population, we have selected sites that are included in the regional monitoring programme for otter and that are within 20 km from ReBorN project areas.
The otter has a territory of 30-50 km. There are 209 monitoring sites within the range of 20 km from a ReBorN project area.

The selected sites have been monitored before the measures have been conducted (2011-2013) and during 2021 we have re-visited these sites to do a “after measure” monitoring. We decided to re-visit all of the selected sites and not follow the monitoring time schedule for each site since we would not have had all the data at the end of the project.

In 2021, we have found traces of otter in 65% of the sites compare to 41% before the measures were done. On all monitoring sites in the county the otter has increase from 37% to 49 % during this period.

The otter has increase with 29% in the monitoring sites close to ReBorN project areas whereas the otter has increase with 22% in monitoring sites far from ReBorN project areas.

This comparison shows that the otter has increased more in areas close to ReBorN project areas compared to areas further away from the ReBorN sites (see table below). We can assume that the measures done in the rivers have benefited the otter by providing more food (fish) and more shelter (natural structures in the streams).

As discussed during the monitor meeting in November 2020 and via e-mail correspondence, the monitor recommended to submit a final monitoring report on the results (second milestone) from action D4 and submit it with the Final report. This is to show more detailed information regarding the results from the monitoring, instead of only one chapter in the Layman’s report (deliverable). The report is annex 10.10.

The report was written by personnel from CABN.

	ReBorN	**River Kalixälven**
Number of sites	206	86
Percentage of sites with otter 2012	41 %	31 %
Percentage of sites with otter 2021	65 %	45 %
Percentage of sites where otter has been added between 2012 and 2021	29 %	22 %

A section in the Layman´s report is written regarding action D4. The section was written by personnel at CABV.

Photo: Mostphotos

6.1.12. Action D5 Monitoring of rewetted area - the action is completed

Foreseen start date: 07/2016 Actual start date: 06/2017
Foreseen end date: 03/2022 Actual end date: 03/2022

Deliverable D5	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
Chapter on monitoring in Final Layman´s Report	01/2020	10/2021	03/2020	03/2022	Completed

Milestone D5	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
First two seasons of measuring rewetted area completed	07/2016	06/2017	12/2017	06/2019	Completed

At the same time as we asked for an extension of the project, we also requested an extended end date of this action and of the deliverable until 03/2022. In the letter amendment no 2 to grant agreement for project (Ref.ares (2020)3685455-13/07/2020) the Commission accepted the requests.

When we met our monitor, in October 2017, we asked if we can replace the measuring with laser with drones to get more accurate data (for more details see annex 7.1 in progress report from 30/06/2018) which the commission accepted (ref.ares(2018)5551311_30102018from 30/10/2018).

In progress report 30/06/2018 we requested to postpone the milestone “first two seasons of measuring rewetted areas completed” to 12/2018 which was accepted by the commission (ref.ares(2018)5551311_30102018).

We have measured the areas with drones 2016-2021. We have been a bit delayed by all the different permits that are required for the usage of drones (see chapter 6.2).

In total, we have increased the wet area with 19.6% or 78.6 ha.
In the county of Norrbotten, the data from all years shows that we have increased the wet area with 21%. For more results, see annex 10.11. The wet area in project area Lögdeälven (county of Västerbotten) has increased with 18 % (annex 10.12).

Drone surveys are depending on natural circumstances as wind, rain, shading and water levels to get accurate results. This makes it time consuming and combined with no-go flight zones (military or civil air zones) and new overall regulations for flights out of sight makes it impossible sometimes.
Measurement without high resolution drone pictures can give a lower degree of accuracy.
Restoration measures in large river systems provide extensive response in increased ha/km because the width of the riparian zone is often proportional to river width.
In some of the sites in there are no new footage available. The estimations in those sites have been done in manually or with orthophotos.

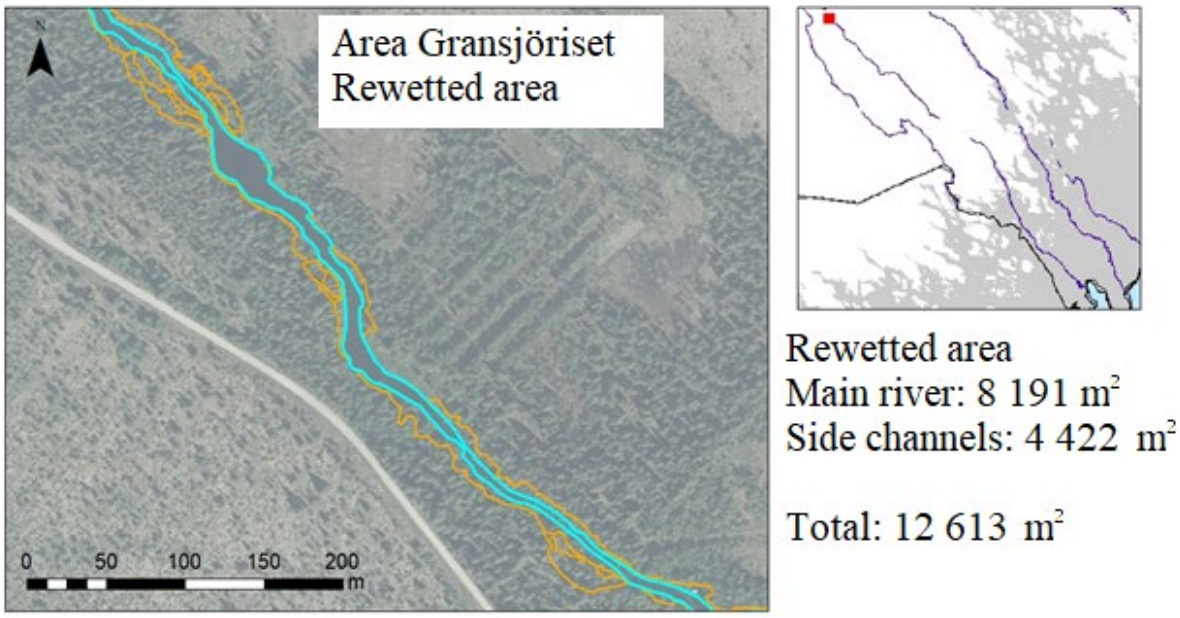
In the northern part of Sweden there is a very short timeframe when the conditions are optimal, the yearly variation is between 1-3 weeks after the spring flood decreases and before there is a dense vegetation cover. Monitoring is more suitable for large systems than smaller because of the vegetation cover.

Some areas that have been restored shows no extra gained rewetted area. However, the habitat is still very much improved in terms of variation, natural structure and function. Other areas have 3-4 times larger area after the restoration.

Some parts of the side channels were already “wet” but closed or partially closed off from the natural waterflow before restoration. It is important to keep in mind that the real gain of “functional” area therefore is a lot larger than the numbers shown above.

The measurements and the reports were done by personnel from the CABV and the CABN.

A section in the Layman´s report is written regarding action D5. The section was written by personnel at CABV.



Rewetted area (yellow) and channelized river (cyan) in Lögdån Gransjöriset. Project area Lögdeälven.
An example of regained area with both widened channel and re-opened side channels.

6.1.13. Action D6 Monitoring of socio-economic impact - the action is completed

Foreseen start date: 07/2016 Actual start date: 06/2017
Foreseen end date: 03/2022 Actual end date: 03/2022

Deliverable D6	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
Report on results of landowner enquires	01/2020	01/2022	07/2020	03/2022	Completed

Milestone D6	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
Initial enquire sent out to households	07/2016	06/2017	05/2017	12/2017	Completed
Second enquire sent out to households	08/2019	09/2021	01/2020	01/2021	Completed

At the same time as we asked for an extension of the project, we also requested an extended end date of this action and of the deliverable until 03/2022. In the letter amendment no 2 to grant agreement for project (Ref.ares (2020)3685455-13/07/2020) the Commission accepted the requests.

When we met our monitor in October 2017, we asked to prolong the end date for the milestone “Initial enquire sent out to households” until the 31/12/2017 which the commission accepted (ref.ares (2017)5678196-21/11/2017).

The second enquire was sent out in January 2021.

The first questionnaire was sent out to households along the rivers. We have used paper questionnaires, but the public could also answer online, see annex 7.12 in progress report from 30/06/2018.
We have extended the study to not just include landowners, but also to the public. We have especially targeted people who are fishing in the rivers and have distributed the questionnaire to Fishing Conservation Associations. To reach as many people as possible we have the questionnaire on the CABs’ Facebook pages.

In 2017, 62 people started answering the questionnaire. Some choose to only answer a few of the questions while other answered all of them. The answering frequency varies between 31-62.
Answers from the second questionnaire sent out in 2021 did not differ particularly from the first. The answers showed that the knowledge about the project was high in both 2017 and 2021. The majority were positive towards the restoration actions and their contribution to the rural development within the project areas. Most believed that the project would lead to more fishing licenses being sold and they were also prepared to pay more for the fishing licenses if the salmon stocks became larger. Most of the people answering the questionnaire did not think that forestry is negatively affected by the restoration, although some did.

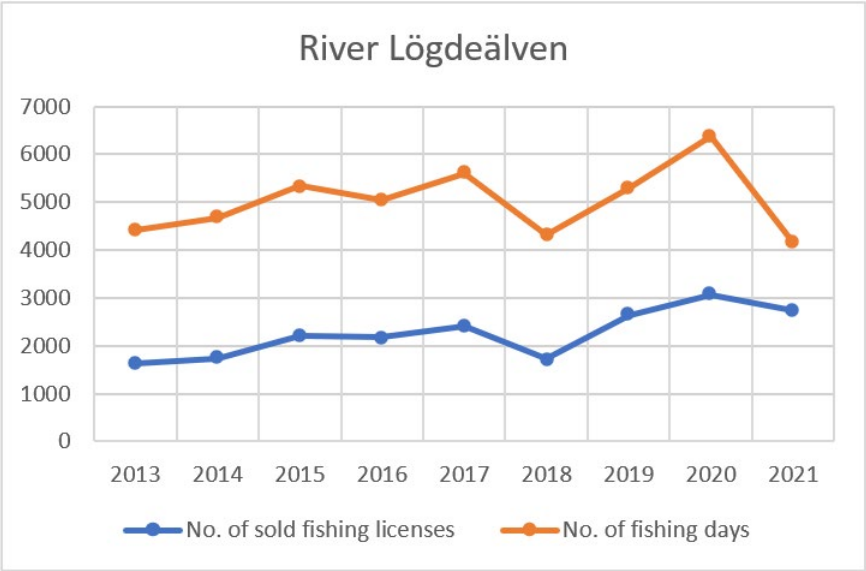
The number of sold fishing licenses was considered a proxy of action success and we expected the number of sold fishing licenses to increase as the restoration project progressed. Sold fishing licenses in project area Lögdeälven has been approximately 2000 yearly during the period 2013-2018, with a slight decrease in 2018. During the last three years of the project (2019-2021), the number of sold fishing licenses have increased to >2500 sold licenses per year.
It is hard to say if the increase in number of sold fishing licenses in river Lögdeälven is a result of the project actions or not. The project actions (for example the creation of spawning sites) might have led to an increasing number of migratory fish in the river. It could also be that the project has increased the awareness regarding fish and fishing opportunities throughout information dissemination. The pandemic may also have contributed to the increase seen during the last years. As the opportunity to travel have has been limited due to Covid-19, people have instead started to explore local outdoor activities such as fishing.
We also expect that the project would improve the knowledge and awareness of good forestry restoration practices among private landowners as well as the public.

In river Råneälven, data is unfortunately lacking for river Råneälven during the last three years. For the years 2015 to 2018, approximately 200 fishing licenses have been sold yearly between with the same decrease in sale in 2018 as was shown in river Lögdeälven. The decrease can be explained by the warm summer of 2018 when people chose not to fish. When the water temperature gets higher the fish is more likely to be harmed or die from the catch and release process.

See annex 10.13 for details.

The questionnaires and the reports were done by personnel from the CABV and the CABN.

A chapter in the Layman´s report is written regarding action D6. The chapter was written by personnel at CABV.



Number of sold fishing licenses and number of fishing days in river Lögdeälven between 2013-2021.

6.1.14. Action D7 Monitoring of the impact on ecosystem functions - the action is completed

Foreseen start date: 01/2020 Actual start date: 01/2021
Foreseen end date: 03/2022 Actual end date: 03/2022

Deliverable D7	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual or anticipated) end date**	**Status 31/03/2022**
Summary report project effect on ecosystem functions aimed at professionals within the field of expertise	01/2020	01/2021	12/2020	03/2022	Completed
Layman's report on project effect on ecosystem functions	01/2020	07/2021	12/2020	03/2022	Completed

At the same time as we asked for an extension of the project, we also requested an extended end date of this action and of the deliverables until 03/2022. In the letter amendment no 2 to grant agreement for project (Ref.ares (2020)3685455-13/07/2020) the Commission accepted the requests.

At the monitor meeting in November 2020, we discussed if we, instead of having personnel from the CABV and the CABN to do the analyse, we might hire an external consultant. The Commission accepted the request (Ref.ares (2021)149984-26/02/2021).

In 2021, the consultant company Calluna compiled data and analysed the projects impact on ecosystem functions.

Guided by the natural conditions in the rivers' surroundings, the ReBorN project has restored watercourses using both excavators and manual labor to enhance the conditions for freshwater pearl mussel, Atlantic salmon and otter in Västerbotten and Norrbotten in the north of Sweden. Restoration of natural habitats have benefited both biodiversity and people, by increasing delivery of ecosystem services. Some of these ecosystem services are natural water purification, water regulation/delay, habitat for biodiversity, climate regulation, outdoor recreation and support for the cultural heritage and reindeer husbandry.

Today the average speed of water has decreased leading to increased natural water purification and increased infiltration to the groundwater. The latter is contributing to increased resilience to summer droughts in the surroundings.

Spawning grounds for Salmon and trout have been restored. Increasing populations of salmon and trout benefits other species such as various insects and birds, European grayling, Eurasian otter, freshwater pearl mussel and lampreys. The restoration efforts also benefit recreational fishing and outdoor recreation in general.

The LIFE project ReBorN builds local knowledge and pride among financiers, interests and the public. The re-creation of natural watercourses contributes to a wonderful landscape with a rich wildlife and vibrant waters to experience.

For more details, see annex 10.14a (the report) and annex 10.14b (summery).

The coordination of the report was done by personal at CABV.

A section in the Layman´s report is written regarding action D7. The section was written by personnel at CABV.

Report about ecosystem functions

6.1.15. Action D8 Management of the indicator performance table - the action is completed

Foreseen start date: 07/2017 Actual start date: 07/2017
Foreseen end date: 03/2022 Actual end date: 03/2022

Milestone D8	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
Report on State-of-play at the end of the project period at project level	01/2020	10/2021	12/2020	03/2022	Completed

At the same time as we asked for an extension of the project, we also requested an extended end date of this action and of the milestone until 03/2022. In the letter amendment no 2 to grant agreement for project (Ref.ares (2020)3685455-13/07/2020) the Commission accepted the requests.

In January 2018 and in the beginning of 2022, we filled in the KPI database. For more details see annex 10.9 in midterm report from 30/12/2020, annex 10.15 and chapter 7.

The reports have been done by personnel from the CABN.

6.1.16. Action E1 Communication plan - general communication- the action is completed

Foreseen start date: 11/2016 Actual start date: 07/2016
Foreseen end date: 03/2022 Actual end date: 03/2022

Deliverable E1	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
Communication plan completed	11/2016	01/2017	03/2017	12/2017	Completed

At the same time as we asked for an extension of the project, we also requested an extended end date of this action. In the letter amendment no 2 to grant agreement for project (Ref.ares (2020)3685455-13/07/2020) the Commission accepted the request.

When we met our monitor, in October 2017, we asked to prolong the deadline for the deliverable "Communication plan completed" until the 31/12/2017 which the commission accepted (ref.ares (2017)5678196-21/11/2017).

The communication plan is completed (annex 7.13 in progress report from 30/06/2018). The communication plan is available on our website: https://www.rebornlife.org/rapporter and it was done by personnel from CABV.

A logotype for the project is designed.

We have had a lot of attention from media, reportage, interviews and newspaper articles. Personnel from CABV, CABN, SwAM, the municipalities of Nordmaling and Piteå have been interviewed.

Before each field season, we have had press releases about the project and our planned measures. They have been well received and we have been contacted almost every summer by local media and it has resulted in 26 articles in total. We have had 9 radio features in local and national radio about the measures, targeted species and the multi-media show with Johan Hammar.

We were interviewed in the trade magazine "Trucking", and they did a 4 pages reportage about ReBorN. Since there has been a challenge getting excavator operators it was valuable to have a reportage in a magazine that targets persons who work with machines.

During the pandemic, the number of articles etc. decreased and we did not actively invite media.

For more details see annex 10.16.

Media type	Number of features
Articles	26
Radio feature	9
TV feature	1
Reportage (more than article)	2

Front page of the magazine “Trucking”.

A co-worker (foreman) on the front page in the regional newspaper Norrbottens Kuriren.

The Swedish King, Carl XVI Gustaf, visited the County of Västerbotten and took a closer look at the freshwater pearl mussels in Lögdeälven.

6.1.17. Action E2 Notice boards, website, Layman's report etc.- the action is completed

Foreseen start date: 07/2016 Actual start date: 11/2016
Foreseen end date: 03/2022 Actual end date: 03/2022

Deliverable E2	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
Folder	02/2017	02/2017	10/2017	10/2017	Completed
Film	07/2019	07/2019	05/2020	05/2020	Completed
Website	08/2016	08/2016	12/2016	12/2016	Completed, it has been updated every second month
Notice boards	06/2017	06/2017	10/2017	10/2020	Completed
Layman´s report	07/2018	10/2021	10/2018	03/2022	Completed

Milestone E2	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
Project website up and running	08/2016	08/2016	12/2016	12/2016	Completed, it has been updated every other month

At the same time as we asked for an extension of the project, we also requested an extended end date of the deliverable “Layman´s report” and an extended end date of this action until 03/2022. In the letter amendment no 2 to grant agreement for project (Ref.ares (2020)3685455-13/07/2020) the Commission accepted the requests.

Our first folder is done, see annex 7.15 in progress report 30/06/2018. It is both in Swedish (2500 copies have been printed) and in English (400 copies have been printed).
It is on our website: https://www.rebornlife.org/rapporter
The folder was done by personnel at the CABV.

In midterm report from 28/06/2019 we asked if we could replace the two last folders with a film. This was approved by the Commission (Ref. Ares(2019)6556657 - 23/10/2019).
The film is available on our website, it has been published on out two Facebook pages and it is and on YouTube https://youtu.be/njOnfO0837g
With English subtitles https://youtu.be/WaOhFC4lW7s
The film has been produced by CABV.

A website has been produced and it is updated every other month. The website contains information about the project, Natura 2000 and LIFE, our project areas etc. It is both in English (https://www.rebornlife-eng.org) and Swedish (www.rebornlife.org). The website

was produced by personnel at the CABV, and it is updated by personnel from the CABV and CABN. It will be available to the public five years after the project has ended.

We have produced 45 notice boards and placed them on strategical places along the project areas and in the city halls of concerned municipalities (annex 10.42).
In midterm report from 28/06/2019 we asked if we could prolong this action until 10/2020. This was accepted by the Commission (Ref. Ares(2019)6556657 - 23/10/2019).
The content and the layout of the notice boards were done by personnel from CABV and CABN.

Four different beach flags and four roll-ups have been produced (see progress report from 28/04/2017). The content and the layout of the notice boards were done by personnel from CABV.

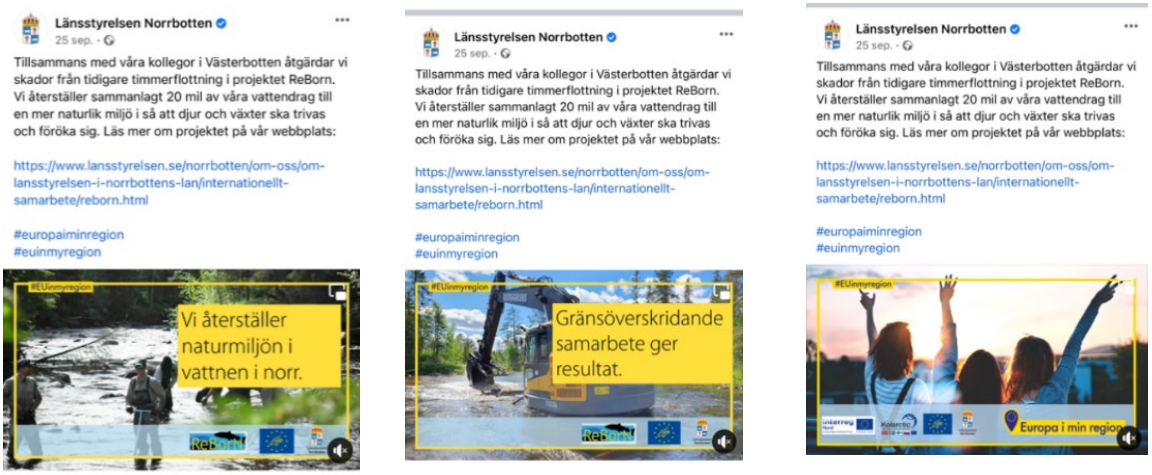
Instead of having a Facebook page for the project we use existing Facebook pages which have a lot of followers. They are “Vatten i Norr” (1 736 followers) and “Fiske och vattenvård i Västerbotten” (2 718 followers). Information about the project is continuously posted on both Facebook pages by personnel from CABV and CABN. We have posted 210 posts about ReBorN.

In 2018 films about green infrastructure were produced by the Swedish Environmental Agency. The project manager Vallin and ReBorN starred in one of the films:
https://www.youtube.com/watch?v=RaOB4isFdek

In July 2018 the production company “Off the Fence” filmed the project on behalf of National Geographic. It aired in March 2020 (on Swedish television).
The programme was broadcasted during 2020 on WWF, France 5, Redbull/Servus TV, SVT and finally the National Geographic channel where a potential 165 million people could watch the programme.

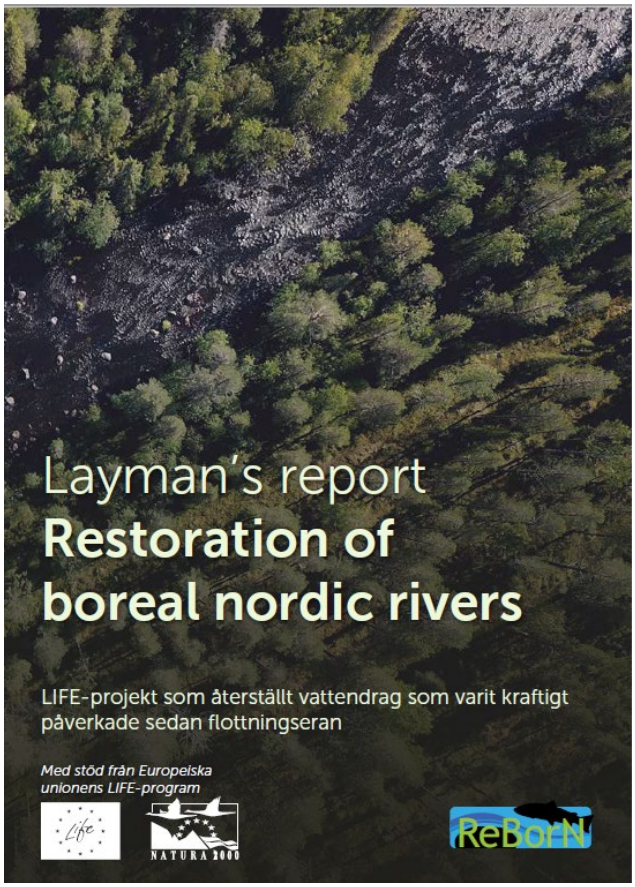

The coordinator is interviewed by the team from “Off the Fence”

In September 2021 the CABN had a campaign on social media on how we participate and contribute to the cooperation between different countries (Europa i min region/ EU in my region). ReBorN was one of the examples.



ReBorN on the CABN's Facebook page.

The Layman´s report is done, see annex 10.17 (both a Swedish and an English version). The reports are on our website: https://www.rebornlife.org/rapporter (in Swedish) and REPORTS AND FOLDERS | reborn (rebornlife.org) (in English).
The report was written by personnel at CABV, CABN and SFA.



Front page of the Layman´s report.

6.1.18. Action E3 Forestry "best practice" and project actions demonstration areas – the action is completed

Foreseen start date: 07/2016 Actual start date: 10/2016
Foreseen end date: 03/2022 Actual end date: 03/2022

Deliverable E3	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
Chapter in Layman´s report	06/2018	10/2021	10/2018	03/2022	Completed

Milestone E3	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
All demo areas are constructed, signs, info, boards, parking spaces, wind shields, paths, show cases etc.	07/2016	07/2017	10/2017	10/2018	Completed

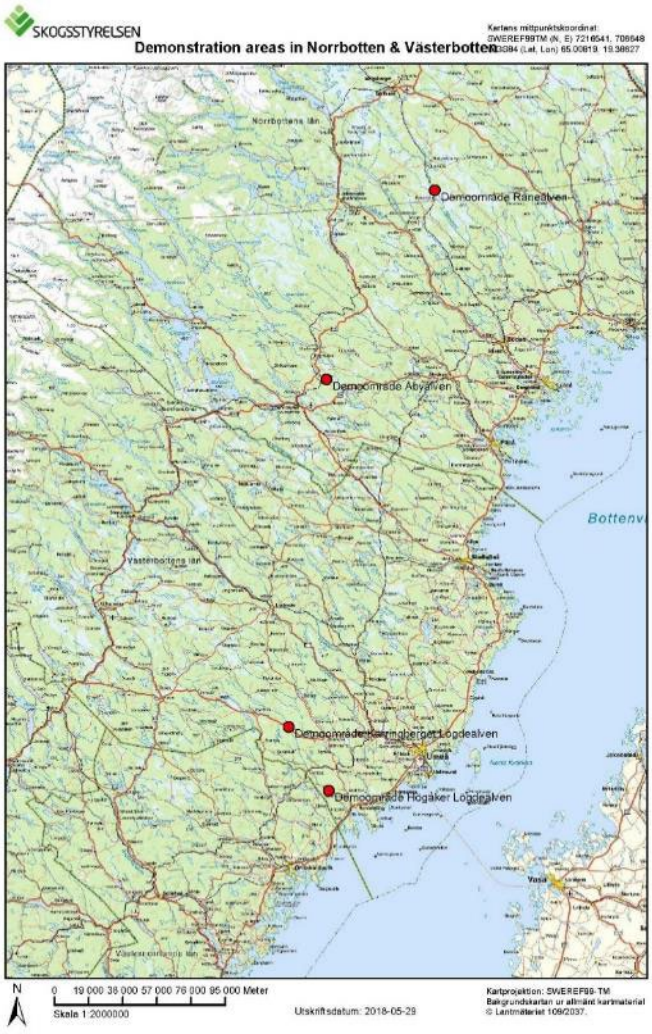
At the same time as we asked for an extension of the project, we also requested an extended end date of the deliverable and of this action until 03/2022. In the letter amendment no 2 to grant agreement for project (Ref.ares (2020)3685455-13/07/2020) the Commission accepted the requests.

In ares (2017)1816422-05/04/2017 a new deadline (10/2018) for the demonstrations sites was approved.

The demonstration sites are:

- Lomontisuando (Kaipa), close to the village Polcirkeln (project area Råneälven)
- Guorpak, close to the village Auktsjaur (project area Åbyälven)
- Högåker (project area Lögdeälven)
- Kärringberget, (project area Lögdelälven)

For locations, see map below.



Locations of the demonstration sites.

At the demonstration sites there are benches, temporary stream crossings etc. as well as signs with information about the project and about best-practice forestry methods.
We have, in total, put up 61 information boards on the demonstration sites, 9 big and 52 smaller ones.

Temporary crossing of wetland in demonstration site Lomontisuando, project area Råneälven.

Wind shields and benches at demonstration site Kärringberget, project area Lögdeälven.

New bridge at demonstration site Högsåker, project area Lögdeälven.

We have built a suspension bridge across the River Lögdeälven at demonstration site Högsåker. This bridge connects an already existing hiking trail to an existing fishing trail and a small car road, and it has made the area more accessible and attractive for hikers, anglers and the general public.
The bridge was not in the original plan but was approved by the Commission in the budget change (Amendment no 3) 2021-10-07. In amendment no 3 we calculated that the bridge would cost 50 000 EUR (20 000 EUR Infrastructure and 30 000 EUR External Assistance). The actual cost for the bridge was 60,000 EUR and the distribution on the cost categories was slightly different (10 000 EUR Infrastructure and 50 000 EUR External Assistance). The cost and distribution on cost categories has changed due to more extensive work with the foundations of the bridge. We can accommodate the increased cost within our budget.

We have done a 360 viewing of all demonstration sites (https://www.rebornlife-eng.org/demonstration-areas). It enables people to visit the sites online, if you, for example have a disability and cannot visit the sites in real life.

The notice boards for the demonstration sites are done, see annex 10.12 in midterm report from 28/06/2019.

We have arranged 46 meetings, seminars and exhibits and we have reach 1 282 persons in action E3. Even before the demonstration sites were done, we have informed the public and landowners about the project and about “best practice” forestry methods regarding riparian buffer zones, temporary creek crossings etc. Even if the meetings were held at other places than the demonstrations sites, we have pictures and films that shows good and bad examples. See annex 10.18 for details.

In the letter from the Commission (ref.ares (2017)5678196-21/11/2017) the new number of meetings were accepted by the commission. 30 meetings will be held in action E.3 (5-10 persons each, 225 in total). We have reached our objectives by far even though the planned excursions in 2020 and 2021 got cancelled due to Covid-19.

The CABV and SFA participate in the integrated LIFE project Grip on LIFE (Using functional water and wetland ecosystems and their services as a model for improving GReen infrastructure and Implementing PAF in Sweden) (LIFE16IPE SE009 GRIP) together with other counties. The project runs 2018 to 2023. One of the actions in the project is to disseminate knowledge on best practice in forestry nearby to streams- much like we do in ReBorN. In Grip on LIFE, 60 demonstration sites will be built to spread knowledge and awareness of best forest practices among the forestry stakeholders, aid them in implementing protocols in how to protect water habitats in close proximity to harvesting sites. The project's objective is also to have seminars, excursions and meetings with landowners.
The project has done a compilation which is an update of the code of practice for aquatic restoration presented by two governmental agencies in 2008 –" Ecological restoration of running waters". The present version has been broadened and now also covers urban environments, climate change, ecological flows and re-meandering.
Fysisk restaurering av akvatiska miljöer (skogsstyrelsen.se)

In January 2021, a new LIFE project, Ecostreams, has started with actions in the counties of Västerbotten, Västernorrland and Jämtland and the CABV is a partner in the project. In line with ReBorN, demonstration areas with information of forestry consideration to aquatic environment will be created in all three counties.

The newly started LIFE project ReVives, where the CABN is a partner, will use the already existing demonstration sites, made in ReBorN, for excursions.

The SFA is a partner in the Kolactic project IMPRESS. The project addresses the need to combine economic activities in timber industry and long-term values associated with forest ecosystems, such as preservation of biodiversity and carbon storage. Climate changes is an important part of the project. The SFA will produce a climate resilience plan with focus on forest management in the northern part of Sweden, which hopefully can apply on the whole North Calotte.

A section in the Layman´s report is written regarding action D7. The section was written by personnel at SFA.

The action has been done by personnel from the SFA, CABN and CABV.

6.1.19. Action E4 Project coordinated seminars, workshops, conferences, field trips and public meetings – the action is completed

Foreseen start date: 07/2016 Actual start date: 09/2016
Foreseen end date: 03/2022 Actual end date: 03/2022

At the same time as we asked for an extension of the project, we also requested an extended end date of this action until 03/2022. In the letter amendment no 2 to grant agreement for project (Ref.ares (2020)3685455-13/07/2020) the Commission accepted the request.

We have arranged and attended several conferences, meetings and excursions to gain more knowledge and to inform the public, municipalities, water councils, politicians, students etc. about the project.

We have arranged 12 excursions, see tables below.

Project area	**Date**	**No of participants**	**Participants/Organisations represented**
Lögdeälven	2017-08-23	35	CABV and CAB of Östergötland
Råneälven	2017-08-31	24	The water councils of the Bothnian Bay and CABN
Åbyälven	2017-09-26	9	The water council of Åby/Byske/Kågeälvar and CABN
Piteälven	2020-09-09	24	Pupils from a school in Jokkmokk and CABN
Piteälven	2020-09-10	24	Pupils from a school in Jokkmokk and CABN
Råneälven	2020-09-29	10	Students from Luleå University of Technology and CABN
Piteälven	2021-07-12	2	Artists from London and CABN
Byskeälven	2021-08-31	8	The municipality of Skellefteå, the Local fishing conservation association and CABV.
Lögdeälven	2021-09-20	4	The municipality of Skellefteå, and CABV.
Åbyälven	2021-09-23	5	Employees from Luleå Travel and CABN
Åbyälven	2021-09-28	13	Students from Luleå University of Technology and CABN
Åbyälven	2021-10-13-2021-10-14	12	Students from Kiruna Fishing School, Malmfältens folkhögskola and CABN

Summary of excursions

Project area	No of excursions	No of participants
Råneälven	2	34
Piteälven	3	50
Åbyälven	4	39
Byskeälven	1	8
Lögdeälven	2	39

We got the opportunity to co-arrange, together with Studiefrämjandet (a study association for adult education) a multimedia exhibit with photographer Johan Hammar. We replaced the excursions 2018 and instead of one excursion in each county we had the exhibit in 7 different cities (Gällivare, Kalix, Luleå, Älvsbyn, Umeå, Skellefteå and Nordmaling). For more details see annex 10.13 in midterm report from 30/12/2020.

On two occasions (2018 and 2019), we have arranged the very popular "Laxens dag" (Day of the Salmon) in Hyngselböle (project area Lögdeälven). The events were co-arranged with the local fishing conservation association. The days were advertised in local media and were open to the public. 300 persons participated in total.

Our kick-off took place in Umeå in in January 2017 and all partners participated. At the same time, we had an evening seminar which was well attended. The goal of 75 participants was reached by far, and we had 120 visitors at the seminar. The large number of visitors was due to our key speaker Martin Falklind, who is a well-known journalist and fishing enthusiast. During the evening seminar, we also had a presentation about the project. See agenda and invitation in annex 13 in progress report from 28/04/2017.

Many of our public excursions are frequented by senior citizens so we decided not to have any in 2020 and 2021, due to Covid -19. Instead, we have arranged five excursions with younger participants (pupils and students). See table above.

Especially successful events were the two excursions we had with a school from Jokkmokk (ages 10-11) on the 9th and 10th of September 2020. We co-arranged the excursion with the Kolarctic project ReArc and a total of 48 pupils attended. The pupils learn about benthic fauna, fish population (they got to see electrofishing), freshwater pearl mussels and restoration work (excavator at work). We made a film about the excursions that was posted on CABNs social media as well as on the Facebook page "Vatten i Norr". In English: Field trip to Vitbäcken - YouTube and in Swedish: Skolutflykt till Vitbäcken - YouTube

We also had two smaller excursions. One was in July 2021 in project area Piteälven (Vitbäcken) with artists from "Cooking sections", from London, UK. They contacted the CABN to get materials and information for their new exhibit, Cooking Sections/Undamming Rivers (read more about the exhibit: Cooking Sections / Undamming Rivers - Bonniers Konsthall) that will take place in August to October 2022 at Bonniers Konsthall in Stockholm. Cooking Sections is using site-responsive installation, performance and video, they explore the overlapping boundaries between art, architecture, ecology and geopolitics. info - Cooking Sections (cooking-sections.com)
Another small excursion was employees/guides from Luleå Travel in September 2021. They wanted to visit some restored areas so they can go back with tourists.

Guides from Luleå Travel are visiting project area Åbyälven in September 2021.

Students from Luleå University of Technology in project area Åbyälven. September 2021.

Students from Kiruna Fishing School, project area Åbyälven, October 2021.
Photo: Jonas Pålsson

We have arranged and/or attended 64 meetings, seminars, conferences, exhibits and excursions and we have reach 6 996 persons in action E4. See annex 10.19 for details.

In the letter from the Commission (ref.ares (2017)5678196-21/11/2017) the new number of meetings were accepted by the commission.

The new objectives are:

- 30 meetings etc., 5-10 persons per meeting, 225 in total in action E.3
- 30 meetings etc., 25 persons per meeting, 750 persons in total in action E.4
- 30 meetings etc., 15 persons per meeting, 450 persons in total in actions E.3 and E.4 combined

The total objective was 90 meetings etc. with approximately 1 425 persons.
The reason why some meetings were organised by both the SFA and the CABs was that these events had a need for forestry-related information (E3) and restoration/biology-related information (E4). For list of meetings where E3 and E4 was done combine see annex 10.20.
In action E3/E4 we have organized and/or attended 12 meetings, conferences and excursions and reached 1 379 persons.

We have in total, E3 and E4 and E3/E4 combined had 121 meetings for 9 640 persons. A fewer than stated for the combined E3/E4 but we have exceeded the number in both E3 and E4, so our objectives are reached.

The CABN participates in three Kolarctic projects, ReArc, SALMUS and EXPERT. These projects will arrange excursions, seminars etc., much like the dissemination work done in ReBorN. Also, the CABN participates in project EMRA in which there also will be meetings etc.

The newly started LIFE projects ReVives and Ecostreams will arrange excursions and meetings, similar to ReBorN.

Personnel from all partners have participated in this action.

School excursion with pupils, ages 10-11 in September 2020. Left picture: looking for freshwater pearl mussels. Right picture: a foreman is showing work of the excavator.

6.1.20. Action E5 Networking – the action is completed

Foreseen start date: 01/2017 Actual start date: 01/2017
Foreseen end date: 03/2022 Actual end date: 12/2021

At the same time as we asked for an extension of the project, we also requested an extended end date of this action until 03/2022. In the letter amendment no 2 to grant agreement for project (Ref.ares (2020)3685455-13/07/2020) the Commission accepted the request.

The project manager and the financial manager attended the kick-off meeting in Brussels the 6th of October 2016.

The deputy project manager attended the final seminar for UC4LIFE (UC for LIFE, brains and mussels) in October 2016. She held a presentation about ReBorN at the conference.

The exchange of experience with organisations that are working with similar questions in Scotland took place in September 2018. A group of 21 persons attended the trip (17 on the project budget, the rest travelled on other budgets). We visited the Scottish Forestry Commission, the Cromarty Fishery trust and the British LIFE project "pearls in peril". We gave a presentation of ReBorN, and we got to listen to interesting presentations and got the opportunity to see some of their work on several field trips. It was a well-planned trip, and the presentations and excursions were very interesting. Both countries learned a lot from each other. More details in annex 10.17 in midterm report from 28/06/2019.

We have attended several international conferences in Russia, Luxemburg, France and Germany where we have presented ReBorN:

- In September 2017, the deputy project manager attended the conference "Salmonids: Biology, Conservation and Restoration" in Petrozavodsk, Karelia, Russia and held a presentation about the project.
- In November 2018, the deputy project manager attended the international seminar "Monitoring and restoration of freshwater (mussel) habitats in Clervaux, Luxembourg and held at presentation about the project.
- In November 2019, the deputy project manager attended the conference "Conservation of freshwater bivalves and restoration of upstream catchment habitat" (organizer Haute-Dronne LIFE13/NAT/FR/000506) in Perigueux, France and held a presentation about the project.
- In November 2019, the deputy project manager attended the conference "Restoration in pearl mussel habitat, breeding and food sources" in Hof, Germany and held a presentation about the project.

Every year, Swedish Agency for Marine and Water Management arrange water days, "Havs- och vattenforum". 2019 the event take place the 4-5th of June. The deputy project manager presented the project at the seminar.

We visited the LIFE project "triple lakes" when they held their final seminar in May 2019. There were many interesting presentations the first day. Day two was an excursion day where we visited some of the Triple Lakes project sites (more details in annex 10.16 in midterm report from 30/12/2020).

In February of 2020 there was a meeting in Luleå with the ministers for the environment from the Barents region, Norway, Finland, Sweden and Russia. The deputy project manager held a presentation about ReBorN at the meeting and received a lot of questions from the ministers and their experts.

The deputy project manager attended a webinar on UN Biodiversity Convention's Voluntary Commitments and the Barents Region in November 2021 arranged by the Barents Euro-Arctic Council: United Nations Voluntary Biodiversity… - Barents Euro-Arctic Council (barents-council.org)
The webinar was arranged as part of Finland's Biodiversity Initiative, which aims to support the goals of the United Nations Convention on Biological Diversity (CBD) by encouraging stakeholders to pursue voluntary biodiversity commitments, with a particular focus on freshwater ecosystems.
The goal of the webinar was to link regional and local activities with global work on biodiversity. The webinar also showcased projects and activities that have taken part in the Barents Biodiversity Initiative where the deputy project manager shared the results of the ReBorN project.

We have attended national and Scandinavian LIFE platform meetings. For the list of all meeting in action E5 see annex 10.21.

Our networking plan is in annex 7.1 in progress report 30/06/2018.

The national platform meeting, that was supposed to take place in the spring of 2020 was cancelled due to Covid-19.

Personnel from all partners have participated in this action.

The deputy project manager is talking on the conference "Conservation of freshwater bivalves and restoration of upstream catchment habitat" in Perigueux, France.

6.1.21. Action E6 Final seminar – the action is completed

Foreseen start date: 01/2021 Actual start date: 04/2021
Foreseen end date: 03/2022 Actual end date: 03/2022

Milestone E6	Foreseen start date	Actual start date	Foreseen end date	Actual (or anticipated) end date	Status 31/03/2022
Final seminar completed	02/2020	04/2021	02/2021	03/2022	Completed

At the same time as we asked for an extension of the project, we also requested an extended end date of this action until 03/2022. In the letter amendment no 2 to grant agreement for project (Ref.ares (2020)3685455-13/07/2020) the Commission accepted the request.

The seminar has been arranged by personnel from the SwAM and all partners have participated.

The original plan was to have a physical final seminar and invite people to one of our project areas but due to Covid-19 we had to change our plan. Instead, we arranged a digital seminar the 15th of September 2021. We hired a production company (Red Carpet Media) to arrange the technical parts of the seminar with a studio and live streaming from two project areas (Åbyälven and Lögdeälven). 212 persons attended the seminar, and it was possible to see it 4 weeks after it took place. Since it was digital there were people from 66 different places in Sweden that participated. For more details, see annex 10.22.
Since the ReBorN crew could not meet up at the seminar, we decided to have one final physical meeting at the end of the project. Luckily the Covid-19 restrictions in Sweden were eased in the beginning of 2022 and we were able to meet up in March 2022 in Hemavan.

ReBorN digital final seminar in September 2021. Top picture: the invitation to the seminar.
Left picture: Head of unit, Department of enivironmental assessment, CABV was the host at the seminar.
Right picture: Panel discussion with representatives from the project partners.

6.1.22. Action F1 Project management – the action is completed

Foreseen start date: 07/2016 Actual start date: 07/2016
Foreseen end date: 03/2022 Actual end date: 03/2022

Deliverable F1	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
Established steering committee	08/2016	08/2016	08/2016	08/2016	Completed
Established reference group	10/2016	09/2016	02/2017	09/2016	Completed

Milestone F1	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual (or anticipated) end date**	**Status 31/03/2022**
First steering committee meeting	11/2016	09/2016	11/2016	09/2016	Completed
First reference group meeting	02/2017	10/2016	04/2017	10/2016	Completed

At the same time as we asked for an extension of the project, we also requested an extended end date of this action until 03/2022. In the letter amendment no 2 to grant agreement for project (Ref.ares (2020)3685455-13/07/2020) the Commission accepted the request.

The last two reports have changed end dates:

Type of report	**Deadline**
Progress report	28/04/2017
Progress report	30/06/2018
Midterm report	28/06/2019
Midterm report	**30/12/2020**
Final report	**30/06/2022**

The steering committee consists of representatives from all partners. The steering committee is continuously updated on the progress of the project and the committee decides the changes concerning time, cost and activities in the project.
The steering committee have, in total, had 11 Skype meetings, and two physical meetings.

When	Where	No of participants
2016-09-09	Umeå	19
2017-04-07	Skype meeting	9
2017-10-25	Skellefteå	10
2018-02-20	Skype meeting	12
2018-05-29	Skype meeting	9
2018-11-22	Skype meeting	12
2019-04-12	Skype meeting	10
2019-11-20	Skype meeting	9
2020-05-13	Skype meeting	11
2020-10-13 (extra meeting about bridge in demo site)	Skype meeting	7
2020-11-17	Skype meeting	11
2021-02-18	Skype meeting	14
2021-03-02	Skype meeting	10

In ares (2017)3600219-17/07/2017 it was approved to postpone the deliverable "Establish reference group" from the 27th of February 2017 to the 30th of September 2017.

Instead of having one reference group, we have decided to have smaller groups that are focused on specific topics. We have had five different reference groups: a group for river restoration, a group for the demo areas, a forestry group, a salmon fishing group (Lögdeälven) and a salmon fishing group (Råneälven).

The reference group "laxfiskegruppen", salmon fishing group is established for the project area of Lögdeälven. The group have had 10 meetings/excursions since the start. For more details see annex 7.19 in progress report from 30/06/2018.

2019 we started a new reference group for fishermen in river Råneälven. During 2019 and 2020 we have had continuous contact with them (excursions and phone).
The rapid Muorkaforsen is the best spot for fishing salmon in river Råneälven. We wanted to have a good dialogue with fishermen before we started the restoration in the rapid, so we have been in in contact with the local fishing conservation association. Those "meetings" have been taking place during the entire field seasons with our coordinators and our foremen, and unfortunately, we don´t have any documentation (dates, number of participants etc.).

We have seen in both salmon reference groups that the number of participants is decreasing with time. It seems like as the work continues, the fishermen trust us, and they don't have to "checkup" on us as much as in the beginning of the project.

We have had one meeting/excursion with the reference group "river restoration group", for more details see annex 7.20 in progress report from 30/06/2018.

We have had one meeting with the demonstration site reference group, for more details see annex 7.21 in progress report from 30/06/2018.

We have had one meeting with the forestry reference group.

Reference group	**When**	**Where**	**No of participants**
Salmon fishing	2016-10-01	Project area Lögdeälven	15
Salmon fishing	2017-09-06	Project area Lögdeälven	8
River restoration	2017-09-26/27	Project area Lögdeälven	17
Demonstration site	2018-01-26	Högsåker	11
Salmon fishing	2018-04-25	Umeå	22
Salmon fishing	2018-06-20	Project area Lögdeälven	4
Salmon fishing	2018-08-14	Project area Lögdeälven	16
Forestry group	2019-01-08	Umeå	11
Salmon fishing	2019-04-24	Umeå	17
Salmon fishing	2019-05-28	Project area Lögdeälven	7
Salmon fishing	2019-06-08	Project area Lögdeälven	5
Salmon fishing	2019-09-02	Project area Lögdeälven	7
Salmon fishing	2020-04-22	Umeå	3

The project managers had a short lunch meeting with our monitor the 6th of September 2016 in Umeå. The monitor was visiting another LIFE project (Remibar).

We had another visit by our monitor the 29th of November 2016 in Umeå. All partners in the project participated.

Our new monitor visited us the 10-11th of October 2017 in the county of Västerbotten. She also visited us the 28-29th of August 2018 in the county of Norrbotten.

The 17-18th of September 2019 we had a visit from our new monitor and our project advisor in Umeå.

Due to Covid-19, we had a digital meeting with our monitor the 4th of November 2020.

The 19-20 of October 2021 we had a visit from the monitor.

The project has shifted the project coordinators at the CABV. The work as a project manager is demanding and the estimation of the time needed to manage the project was inaccurate. We previously requested to increase time for project managing up to 150%, and it was approved in Ref. Ares(2019)6556657 - 23/10/2019.

We have Skype meetings every third week with our work group, which contains project managers and project coordinators from all partners.
The group has met in the beginning of each year for a couple of days to discuss the work that has been done and how to improve the work for the upcoming season. The first meeting was in Umeå the 18-19th of January 2017.
The second meeting was in Luleå the 17-18th of February 2018 (program see annex 7.18 in progress report from 30/06/2018).
The third meeting was in Gällivare the 22-24th of January 2019.
The meetings 2020 and 2021 were cancelled due to Covid-19.
Since the ReBorN crew could not meet up at the final seminar, we decided to have one final physical meeting at the end of the project. Luckily the Covid-19 restrictions in Sweden were eased in the beginning of 2022 and we were able to meet up in March 2022 in Hemavan.

The meetings have been very important to keep the group updated on the activities in the project. Additionally, the people involved in the project got to know each other. We are scattered both geographically and on different workplaces so to get together once a year built up the team spirit.

In March 2022 the work group and the steering committee met for three days to summarize the project, compile experiences (good and bad) from the project and to try to predict the future.

We have used a SharePoint that is available to all project partners where we keep all documents.

The project manager and the coordinator are showing the monitor an old stone wall built by during the timber floating to steer the waterflow. August 2018.

6.1.23. Action F2 Final audit – the action is completed

Foreseen start date: 04/2021 Actual start date: 10/2021
Foreseen end date: 03/2022 Actual end date: 03/2022

At the same time as we asked for an extension of the project, we also requested an extended end date of this action until 03/2022. In the letter amendment no 2 to grant agreement for project (Ref.ares (2020)3685455-13/07/2020) the Commission accepted the request.

We have appointed an auditor for the project. The auditor is internal auditor of County Administrative Board of Stockholm, and he has extensive experience of auditing Swedish LIFE+ projects. He is independent from both the Coordinating Beneficiary and the Associated Beneficiary as he is employed by an organization, County Administrative Board of Stockholm (legal reg. no 202100-2247), not involved or dependent in the project or in its beneficiaries.
He visited the CABV the 4th of April to the 6th of April 2022.
He has provided a Certificate on financial statement for Coordinating Beneficiary County Administrative Board of Västerbotten (legal reg. no 202100-2460) and the Associated Beneficiary County Administrative Board of Norrbotten (legal reg. no 202100-2478) annex 10.23.

6.1.24. Action F3 After-LIFE conservation plan – the action is completed

Foreseen start date: 04/2021 Actual start date: 07/2021
Foreseen end date: 03/2022 Actual end date: 03/2021

Deliverable F3	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual or anticipated) end date**	**Status 31/03/2022**
Chapter on after-LIFE plan in final report	01/2021	10/2021	05/2021	03/2022	Completed

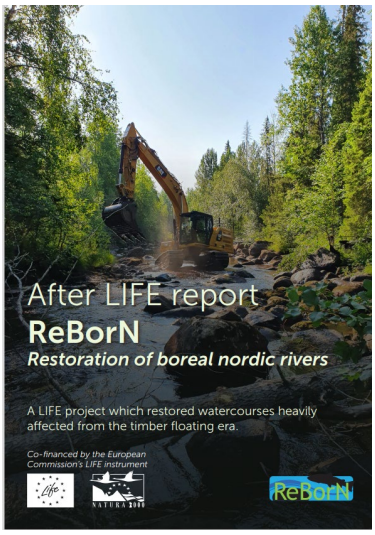
Milestone F3	**Foreseen start date**	**Actual start date**	**Foreseen end date**	**Actual or anticipated) end date**	**Status 31/03/2022**
After-LIFE plan completed	01/2021	10/2021	05/2021	03/2022	Completed

At the same time as we asked for an extension of the project, we also requested extended end dates of the deliverable “Chapter on after-LIFE plan in final report” and milestone “After-LIFE plan completed” and of this action until 03/2022. In the letter amendment no 2 to grant agreement for project (Ref.ares (2020)3685455-13/07/2020) the Commission accepted the requests.

The After-LIFE plan is completed, see annex 10.24.

The report has been done by personnel from the CABN.

A section in the Layman´s report is written regarding action F3. The section was written by personnel at CABN.



Front page of the AFTER LIFE plan for the ReBorN project.

6.2. Main deviations, problems and corrective actions implemented

We have been a bit behind in the schedule for several reasons. In 2018 we did not get the number of excavators we wanted; the entrepreneurs did not deliver the number of excavators stated in the agreement. Additionally, some excavators were delivered with the wrong type of spoon. To avoid we added a clause in the contract that says that the entrepreneur must pay a fine if they do not deliver an excavator on time or with the wrong spoon, they must pay a certain percentage of contracted sum.
We also had to do some adjustments of action C1, usually after one or a couple of spring floods. The need for adjustments depended on the conditions during the year when the restoration was done. For example, high water levels made it more difficult to do the restoration thoroughly when it was both hard to see how permanent our actions were and hard to dig down the rocks and boulders in the riverbed. But even with perfect conditions, a spring flood can alter the stream and it have been necessary to adjust restored stretches a few years after the restoration has been done.
Other reasons for why were behind in the schedule were the extreme water levels we have experienced for a couple of years. In 2017 it was hight water levels the entire field season which made it more difficult to perform our actions (and led to the need for adjustments the forthcoming seasons). In 2018 there was the opposite problem with extremely low water levels which made it difficult to estimate how the restoration work and the structures would look like in normal water levels.
At the end of the field season, the water level does not drop as fast as during the summer. This is due to more frequent rainfalls in the autumn and the fact that the surrounding trees does not absorb as much water (the growth season is over). If autumn rainfalls are heavy, it will cause high water levels – and hence, problems for the project actions. That happened both in 2019 (both counties) and 2020 and 2021 (Västerbotten) which have shortened the field seasons with a couple of weeks.
Since the project was extended, another field season (2021) was added, which made it possible for us to achieve the objectives.

Another problem we have struggle with was the excavator operators, we often received unexperienced operators and it took a couple of weeks for them to learn and understand the task. We had a requirement in the procurement that an operator need at least 2 months of experience of working with an excavator but that was not specified to river restoration. If we had required experience from restoration work in water, we would have had problem to receive the number of machines and operators that we needed. Unfortunately, the ReBorN project started about the same time as new mines and new wind farms were established in northern Sweden which led to a competition for excavator operators with private companies. It often takes 2-4 weeks for a new excavator operator to learn how to do the restoration work. To raise the level of knowledge among operators, the CABN has started a new project where an education package will be developed and will be applicable for restoration in streams, wetlands and remediation of migratory barriers. One goal is to be able to prioritise machine operators with a course diploma in future procurements. The project is a cooperation between Sweden, Norway and Finland, a Kolarctic project called EXPERT (Excavator Pro Ecological ResToration) and it started in December 2021.

Additionally, other problems with operators quitted have occurred in ReBorN. It often happened in the beginning of the season as they didn't really comprehend or received the right information of what kind of work they signed up for. It can be difficult for some persons to be out in the forest without mobile phone coverage, a lot of mosquitoes etc. In future

projects, we need to have a better dialogue with the entrepreneurs so they can inform their personal about the working conditions.

Gladly, more freshwater pearl mussel than expected was found in project area Råneälven. In total, we picked up over 5 000 mussels in that area to prepare for the excavators. Some stretches had to many mussels, and it would take too much effort to pick up all so we have not restored those. It is approximately 1,4 km.
Unfortunately, there was a mistake in our application and the sites in project area Råneälven did not add up. We asked to remove some areas and add a few new ones. The length of the restoration was not changed, and the restoration was done within the project budget.
We have removed some stretches in project area Piteälven (Vitbäcken) because some are difficult to get to with an excavator and we had to leave other stretches due to culture values. We have added some stretches in the other project areas so the length will not be affected.

We have adjusted the method for measuring of rewetted areas (D5). Instead of using a combination of laser and drones as methods to measure the increase of rewetted areas; we have only used drones to gather data. A previous problem occurred with the filing of footage material on our servers. According to Swedish law, we needed to apply for "Dissipation permit" via another authority called Lantmäteriet before disseminating any geographic information, which included pictures taken by drones. Hence, we could not file pictures on our "Media servers" open for all County Board staff as it is interpreted as dissemination of information. We have solved this by creating specific ReBorN folders which only the work group have had access to, and we have applied, and received dissemination permits.

Our dissemination actions (action E) have not proceeded as plan due to covid-19. All meetings and conferences have been cancelled or postponed so we have not performed many of the E actions since March 2020. Many of our public excursions were frequently visited by senior citizens and therefore we chose not to arrange any.
However, we have been able to have excursions for pupils (ages 10-11) and students from the Luleå University of Technology (see chapter 6.1.19).

We have done a budget change (amendment no 3), for more details see chapter 8.1.

6.3. Evaluation of Project Implementation

6.3.1. Methodology

Historically, when the rivers were modified to facilitate timber floating, rocks and boulders were relocated from the water up to the shorelines, which narrowed the stream up to one-fifth of its original width. The river shoreline has since then been covered by the rocks and boulders (originating from the riverbed), which have formed an unnatural protection stopping erosion between terrestrial and aquatic environments. The pristine river meandering path was straightened (channelized), and most of its side channels were closed. When we performed the restoration and re-opened side channels the rivers have returned to a more natural state. This implied wider watercourses and an increased quantity of water habitat where numerous flora- and fauna species thrive. One of the consequences from the lack of natural erosion between terrestrial and aquatic environments is the absence of dead wood (large wooden debris) in the system. During the restoration, the foremen and excavators have pushed down big trees in the streams. This action starts an erosion process, where more trees gradually will fall into the stream, filtering substrate and creating new habitat for smaller fish and invertebrates. The restoration has aimed to improve and recreate damaged or destroyed aquatic habitats. Mainly, the river substrate has been relocated from the shorelines composes of big boulders and large amount of rocks and gravel, and we have primarily used excavators to restore the rivers, which is a long time developed best-practice method. It was required that the excavators were equipped with a custom designed spoon (designed in earlier restoration work), with the ability to clasp rocks, boulders and to stratify gravel. The desired measure of 80 mm between bars and gaps on the spoon gives the ability to sift for gravel- suitable for spawning sites.

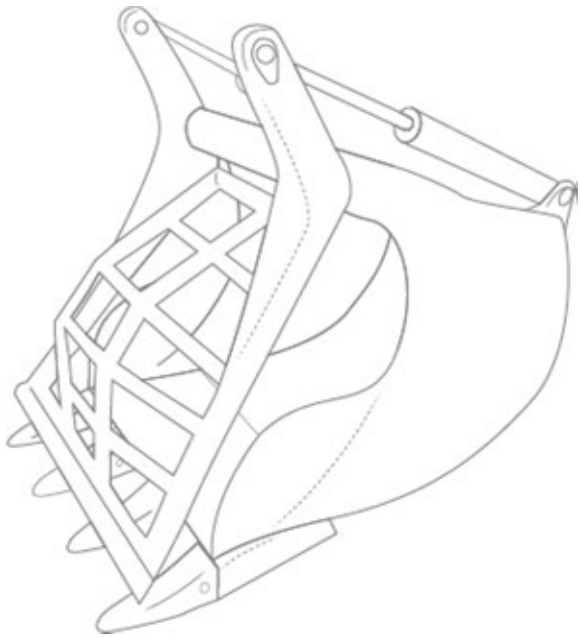


Illustration of custom designed excavator spoon. The maximum width between bars and gaps is 80 mm.

The most common way of restoring a river stretch, is to start upstream and work downstream along with the current. The excavator extends its arm out from the water, almost into the forest, to reach all of the material that belongs to the riverbed. It clasps the rocks and

positions it wherever the foreman decides. Before any excavator starts digging, the foreman together with a coordinator, plan and design how the restoration work will take place. Together they create a goal of what the stream section will look like and what structures it shall have when the restoration work is completed.

The spawning grounds are usually (both naturally and when we restore) located at the top of a rapid (river neck, where calm water bursts into a rapid), and that is where we aimed to relocate the gravel substrate. To assure the created spawning areas are stable and have a secured supply of gravel for years to come, we arranged blocks upstream the spawning sites that creates riffles which silt for more gravel. Additionally, we created areas where natural erosion will provide the spawning grounds with new gravel.

Simultaneously, habitats for juvenile fish as well as for bigger fish were created by making the stream bed heterogenous, in terms of depth, width and substrate size- and type. Bigger fish prefer big, deep pools and smaller, younger fish are located shallow, closer to shore where they can hide from predators. Additional species also benefits by heterogenous riverbed, like the benthic fauna, where they can find suitable habitat to maintain.

The final touch of the spawning grounds was performed manually with custom made tools. The method used is a special technique called *Hartijoki*, developed in the northern parts of Norrbotten. Today, it is a well-known (best practice) method to perform the recreation of spawning beds, all over Sweden. One of our contracted consultants has developed the method and tools over the years and we have been fortunate to have had him within the ReBorN project. The consultant has participated at the education session (introduction week) with our foremen as well as worked as a foreman himself in the project.

<u>Successes</u>
• Low water levels during 2018 made it easier to perform high quality restoration actions.
• The long field season in 2018 made it possible to restore longer and more stretches than expected.
• Additionally, we establish contact with local excavator companies, create job opportunities and eventually, the drivers will be more experienced to drive in water which is good for future projects.

We would not have been done with even a small fraction of Action C1 if it wasn't for the excavators.

<u>Failures</u>
• It has been hard to find desired number of contractors for excavators. The field season was the actual time when we could be productive, allocate more and more meters of restored stretches so the time has been precious. If we were able to get all contractors from day one – we would probably have reached the 50% milestone during 2018.
The solution was to postpone the 50% milestones.

• Issues with some of the contractors, did not show up on time etc.
The solution was to write more clear guidelines in the calls for tender, and to give sanctions when the guidelines were violated / not met.

• High water levels 2017. We were still able to continue the restoration work, yet some of the sites were not sufficiently restored.

Solution was to adjust some of the sites during 2018.

• An error in the application regarding the sites in project area Råneälven.
The solution has been to adjust the area.

• An error in the application regarding the sites in Vitbäcken (project area Piteälven).
The solution has been to adjust the area.

• Conflicts with landowners/anglers. Lögde river is a well-known salmon sportfishing river. Some of the anglers and/or landowners have fished their particular spot for many years and see the restoration work as a threat. There have been some issues with negative posts on social media, where pictures of our work in progress are disseminated as the final result and threatful notes have been put on the excavators (2018).
We have solved this problem by:
- Contacted and engaged in dialogue with the specific persons in question. Where both we and the persons were satisfied after the meetings.
- We have created a salmon fishing reference group – a group of experienced salmon anglers, FMU's and landowners. During meetings and excursions, we have discussed and visited the upcoming restoration stretches of the season and gain knowledge of which structures we can strengthen (for instance, salmon holding pools).
- We have had a proactive way of handing out information in advance of our plans for stretches to be restored. In this way, persons with objections could contact us to discuss the structures of the stretch - before any work took place, instead of afterwards when the "harm was done".
- Personnel at the CABV have been offered to take courses in MI, Motivational interviewing and how to meet people during conflicts.

• Foremen and excavator operators noted after 2019s field season trouble to communicate with each other. Both shouting and listening over the plangent river. It was not only time consuming for the foremen, but also an important question of safety to walk back and forward to the excavator on rocky streambed, sometimes in heavy current and climb up the machine to the operator (who have to stop the machine).
The solution was to (after consultation with the Project Monitor) buy in communication equipment. More specifically: hearing protectors with the ability to communicate, connected two by two. We saw a better result from the restoration work with less machine stops, it saved a lot of time, the foreman and the operator communicated more effectively with less misunderstandings and most importantly – without having the foreman close to the potentially dangerous excavator.

In conclusion, the overall restoration (Action C1-2) methodology is appropriate and over time it was adjusted with further improvements.

As the project proceed, we made some changes in the methodology regarding actions D3-5.

For action D3 (*monitoring of the impact on geomorphology and hydraulics*) we changed the location of the monitoring sites and we conducted all of the pre- and post- restoration measurements solitary within the Lögdeälven project area instead of doing it in both Lögdeälven and Råneälven project areas. By conducting the entire study within one catchment, we eliminated sources of natural variation and we were able to more accurately

pinpoint and evaluate the effects of restoration. Consequently, the evaluation has been less biased.

Regarding action D4 (*monitoring of otter*) we have replaced our independent monitoring of otter droppings with the ongoing national and regional monitoring programs for otter. We have chosen to do this because the data is more accurate and correct. The CABN have monitored otter for a long time and has a lot of data close or within the ReBorN project areas. The monitoring of otter of CABV started 2015, so we do not (unfortunately) have any "before data" from Västerbotten as we have in the county of Norrbotten. Therefor we have chosen to only work with the large dataset from Norrbotten to identify changes in otter population. Otter is present in both counties, and we can assume that changes in otter abundance in Norrbotten correlates with changes in Västerbotten. We have not use 'after' data from Västerbotten since we do not have any 'before' data to compare it with. The monitoring was performed by specialists on the CABN and covered vast areas all over the county. Monitoring is carried out annually where each location is monitored once in six years. The selected sites have been monitored before the measures have been conducted (2011-2013) and during 2021 we re-visited these sites to do a "after measure" monitoring. The monitoring will continue after the project has ended.

We have slightly modified the methodology for action D5 (*monitoring of rewetted areas*), and instead of using a combination of laser (by hand) and drones (documentation) to measure the increase of rewetted areas; we decided to only use drones to gather data. We have estimated the increase in rewetted areas by comparing before and after drone data. The estimations and calculations were done in in software GIS (geographic information system).

E actions have been affected by the Covid-19 pandemic and the consequences of it are considered to be as a major drawback. The majority of the planned meetings and excursions in 2020 - 2022 have been cancelled.
The solution was to arrange the meetings online by Skype. For instance, the final seminar was completely digital. Another solution was that instead of arranging public meetings we arranged a few excursions with school pupils and students as it was regarded as safe according to the Public Health Authority. We often get senior citizens who participate at the public meetings we normally arrange and that was something we wanted to avoid as they are in risk category.

6.3.2. Results achieved against the objectives and expected results

Overall objectives

Action	Foreseen in the revised proposal	Achieved	Evaluation
C1 and C2	Objectives: Improve the conservation status of habitats and species in the Habitats directive. Expected results: The conservation status in the project areas for targeted species and habitats will be favourable.	242.7 km of habitat is restored. 14 679 spawning grounds are created.	The assessment of conservation status of habitats and species was reported to European Commission 2019. Since the end of the project there has not been another assessment and the next one is not to be expected until 2025. Although we have done large-scale restoration in the ReBorN project the overall national status for the habitats and species in the boreal region will most likely stay unchanged except for otter which might improve the status at the next assessment 2025. The conservation status for the habitats and species in the targeted rivers will improve but since the conservation status of these habitats and species are inadequate and unfavourable in many other water systems in the boreal region in Sweden the national overall assessment will remain unchanged.
C1 and C2	Objectives: Enhance previously modify streams with the aim of achieving good ecological status according to the Water Framework Directive. Expected results: The hydromorphological status of the water bodies within the project areas will be good or excellent.	242.7 km of habitat is restored. 14 679 spawning grounds are created.	The measures that have been done before 2018 are taken into account when it comes to the classifications of the water bodies. The measures that have been done 2019-2021 will be considered in the classification in the next water management cycle (2022-2027). 16 water bodies had their hydromorphological parameters improved by the actions in the ReBorN project. In cycle 4 the status of more water bodies will be improved due to the measures done in ReBorN.

Action	Foreseen in the revised proposal	Achieved	Evaluation
C1 and C2	Objectives: To restore approximately 202 km of river stretches to reverse the effects of previous alterations intended to facilitate timber floating. Expected results: The conservation status in the project areas for targeted species and habitats will be favourable. The amount of new, accessible habitats due to the measures will increase.	242.7 km of habitat is restored.	The assessment of conservation status of habitats and species was reported to European Commission 2019. Since the end of the project there has not been another assessment and the next one is not to be expected until 2025. Although we have done large-scale restoration in the ReBorN project the overall national status for the habitats and species in the boreal region will most likely stay unchanged except for otter which might improve the status at the next assessment 2025. The conservation status for the habitats and species in the targeted rivers will improve but since the conservation status of these habitats and species are inadequate and unfavourable in many other water systems in the boreal region in Sweden the overall assessment will remain unchanged. The amount of new, accessible habitats has increased with 19.6% in total.
C1 and C2	Objectives: To create 2 300 spawning grounds for salmon and trout. Expected results: 2 300 spawning	14 679 spawning grounds are created.	47.6 % of the monitored spawning grounds have been use for fish reproduction.

Action	Foreseen in the revised proposal	Achieved	Evaluation
E3	Objectives: To create 4 demonstrations sites with examples of best practice methods adjacent to water environment for the forestry industry as well as examples of restoration actions in water courses. Expected results: 4 demonstration sites	4 demonstrations sites are created.	The rivers are negatively influenced by former ditch draining and certain current forestry practices, which is why the project included information to forestry stakeholders on the plugging of ditches and on how "best practice" methods can minimize the harm. Even before the demonstration sites were done, we have informed the public and landowners about the project and about "best practice" forestry methods regarding riparian buffer zones, temporary creek crossings, plugging ditches etc. Even if the meetings were held at other places than the demonstrations sites, we have shown pictures and films with good and bad examples.
E3 and E4	Objectives: Dissemination and knowledge transfer by excursions and seminars to make the public, landowners, contractors, municipalities, consultants and staff from public organisations responsible for water restoration and management aware of the problems but also of the solutions. Expected results: 90 meetings and excursions with 1 945 participants.	We have attended/ arranged 121 meetings, seminars, conferences and excursions.	9 640 persons have participated at the meetings, seminars, conferences and excursions.

Action	Foreseen in the revised proposal	Achieved	Evaluation
E5	Objectives: To build an expert network and exchange best practise, knowledge and ideas between countries (Great Britain and Finland) regarding how to re-create the habitats for the targeted species. Expected results: An expert network and exchange best practise, knowledge and ideas between Sweden, Great Britain and Finland.	We have travelled to Scotland and visited e.g., LIFE project "Pearls in Peril" and to Jämtland (Sweden) and visited LIFE project "triple lakes". We have visited several international conferences.	We have learned more about the work in other countries and gotten to know people who work with similar issues.

Our goal was to reach the overall objectives: to improve the conservation status of habitats and species as defined in the Habitats Directive and to enhance previously modified bodies of water with the aim of achieving good ecological status, in accordance with the Water Framework Directive.

Habitats Directive

The assessment of conservation status of habitats and species was reported to European Commission 2013 and 2019. The assessments are based on data from national and regional monitoring programmes, monitoring of protected areas, reports and scientific publications, as well as information gathered from a variety of experts and citizen science projects. Since the end of the project there has not been another assessment and the next is not to be expected until 2025.

The status for Fennoscandian natural rivers (3210) and Water course of plain to modane levels with Ranunculion fluitantis and Callitricho-Batrachion vegetation (3260) have been assessed as inadequate in the boreal region of Sweden both 2013 and 2019. The trends for both habitats are negative, the habitats are exposed to several different environmental impacts such as migration barriers (dams and road water crossings), damage done by the timber floating, eutrophication, forestry, land use etc.

Although we have done large-scale restoration in the ReBorN project the overall national status for the habitats in the boreal region will most likely stay unchanged. The conservation status in the targeted rivers will improve but since the conservation status are inadequate in many other water systems with the same habitats in the boreal region in Sweden the overall

assessment will remain inadequate. Hopefully, the restoration measures will slow the negative trend for the habitats.

The conservation status for otter (*Lutra lutra*, 1355) has been assessed unfavourable both in 2013 and 2019. Impact of toxins is still a problem, and many otters die in traffic. However, the trend for otters is positive, partly due to lower levels of environmental toxins and building of wildlife passages. We predict that the status 2025 for otter will improve to inadequate.

The conservation status for Atlantic salmon (*Salmo salar*, 1106) has been assessed inadequate both in 2013 and 2019. The trend for salmon populations is positive. However, it may take a certain time to see the effects of the increased habitats in terms of more spawning fish in the systems. The life cycle of salmon is complicated and in the northern part of the Baltic Sea, it varies between 3-5 years until a salmon parr becomes a smolt and migrates out to the sea and then additionally 1-4 years until it returns from the sea to spawn in the same river where it was born. We predict that the status will be unchanged.

The conservation status for freshwater pearl mussel (*Margaritifera margaritifera*, 1029) has been assessed as unfavourable both in 2013 and 2019. We predict that the unfavourable status of freshwater pearl mussels will be unchanged since more threats are added due to climate change. Experts predict that annual rainfall will increase significantly in Sweden due to the changes in climate, along with dramatic storm events and flooding. For example, large floods have been shown to adversely affect mussels, and although these stochastic events were historically rare, they may now be occurring more often as a result of climate change. Severe droughts have also been more common due to climate change. Streams with mussels can temporarily be drained of water which will kill the mussels. Populations may also be affected by a number of other factors, including predicted changes in temperature, sea level, habitat availability, parasites, host fish stocks and human activity.
In the 2019 assessment, the trend for freshwater pearl mussel population was negative and if there is a positive effect from habitat restoration, it will take some time to see the possible resulting increase in numbers of freshwater pearl mussels in the system. As the life cycle of a mussel is complicated it can take up to 10 – 15 years before we can see any results and new mussels.

Although we have done large-scale restoration in the ReBorN project the national overall status for the species in the boreal region will most likely stay unchanged for Atlantic salmon and freshwater pearl mussel. The conservation status for salmon and freshwater pearl mussel in the targeted rivers will improve but since the conservation status of these species are inadequate and unfavourable in many other water systems in the boreal region in Sweden the overall assessment will remain unchanged.
The trend for the conservation status for otter is positive and there might be an improvement of the status 2025.

Water Framework Directive
The restoration of natural habitat from the impact of timber floating has been identified as a priority on both a national and a regional scale. The Water Authorities are regional agencies responsible for coordinating the efforts and compile management plans. In the plans, the hydro-morphological damage is still recognized as one of the main reasons why the Bothnian Bay and Bothnian Sea Water Districts have not yet reached good or excellent status in all water bodies.

Each water body's ecological status is assessed by a number of parameters (i.e., connectivity, acidification, hydromorphology, biology etc.). The status varies from high to bad. The Directive aims for 'good status' in all water bodies.

In 2016 the project ReBorN started. During the project time (2016-2022) some of the water bodies have been reassessed when the hydromorphological status has changed due to the measures done in the project.
In total, 44 water bodies have been restored in the ReBorN project. In the water districts of the Bothnian Bay and the Bothnian Sea, the classification of the parameters of hydromorphology was done in May of 2019. Restoration work done after (2019-2021) has not been taken into account in the classification in cycle 3.
16 water bodies had their hydromorphological parameters improved by the actions in the ReBorN project. However, even when the restoration has been a part of the assessment a reclassification is not guaranteed, six of those did not improve their ecological status since there were other parameters that were worse than good. Sometimes the hydromorphological status does not change and that can also be the cause that some water bodies do not change status. For instance, the restore stretch can be too short. Since the biological parameters are the ones that are most important when the water bodies are classified, and it takes time for the ecosystems to respond to measures, it can take a while before there are positive results. Another factor is that new guidelines were developed during the classification in cycle 3 which resulted in changes in the classification, to worse or better, even if the water body has not change at all. In cycle 4 the status of more water bodies will be improved due to the measures done in ReBorN.

6.3.3. Results immediately visible and delayed results

There are many results that are immediate or visible after a certain time in the effects of the project actions.

Regarding the A actions, the preparatory ones, we see immediate results when we hire a number of consultants or own staff as foremen, when we enquire a certain number of excavators in procurement and so on. As well with the training of foremen. If we would not have educated them, their work would be, not only dangerous but also with low quality.

The C actions, the motor in the project, result in both immediate visible (actual restored meters and number and function of recreated spawning beds), but also a long-term improvement and in better conservation status and hydromorphological status. In total, 44 water bodies have been restored in the project. In the water districts of the Bothnian Bay and the Bothnian Sea, the classification of the parameters of hydromorphology was done in May of 2019. Restoration work done after (2019-2021) has not been taken into account in the classification in cycle 3. 16 water bodies had their hydromorphological parameters improved by the actions in the project. However, even when the restoration has been a part of the assessment a reclassification is not guaranteed, six of those did not improve their ecological status since there were still other parameters that were worse than good (annex 10.25).
We also see immediate results from the rewetted areas, after monitoring with drones and estimating the rewetted areas with GIS, we have gained new water habitat with 19.6 %, which is an immediate result. However, it may take a certain time to see the effects of the increased habitats in terms of more spawning fish in the systems. The life cycle of salmon is complicated and in the northern part of the Baltic Sea, it varies between 3-5 years until a

salmon parr becomes a smolt and migrates out to the sea and then additionally 1-4 years until it returns from the sea to spawn in the same river where it was born. It is the same situation with freshwater pearl mussels but even longer time than with fish. It can take up to 10 years before we can see any results and new mussels.

When it comes to the E actions, we can see immediate results on our webpages and Facebook sites in terms of site visits, interactions views and shares. As well with the visitors to our public meetings, excursions, seminars and conferences.

6.3.4. Amendments and the effects of results

The first amendment to the Grant Agreement was from the European Commission (LIFE15NATSE000892AGA1180701 Letter Amendment no 1) and it did not create any significant changes for the project.

Due to delays because of problems with delivery of excavators, extreme high and low water levels etc. we could not keep up with the set time schedule. We applied for a second amendment (03/04/2020) from the Grant Agreement and were approved to prolong the project by nine months until 31/3/2022 (Ref.ares(2020)3685455-13/07/2020 Letter of Amendment no 2). After our final field season (2021), we have reached the projects objectives in action C1. The amendment was also important so we could retrieve necessary data in the monitoring actions, as many of these unfortunately started later than originally planned.

A third amendment request regarding the substantial budget changes was submitted in September 2021. The amendment was approved in October 2021 (Ref.Ares(2021)6112935-07/10/2021).

6.3.5. The results of the replication efforts

The knowledge gained from the ReBorN project has been and will be used in other similar projects such as the LIFE projects Ecostreams, ReVives and TRIWA, see chapter 6.3.7 for more details.
Additionally, we have participated in the making of a new national manual for river restoration, produced by SwAM. The manual was done and released for the public 2021.
To raise the level of knowledge among excavator operators, the CABN has started a new project where an education package will be developed and will be applicable for restoration in streams, wetlands and remediation of migratory barriers. One goal is to be able to prioritise machine operators with a course diploma in future procurements. The project is a cooperation between Sweden, Norway and Finland, a Kolarctic project called EXPERT (Excavator Pro Ecological ResToration) and it started in December 2021.

Within the project, 105 foremen and coordinators (employees, consultants and personnel from municipalities) have been trained. These people will remain a useful resource for future restoration projects.

6.3.6. Effectiveness of dissemination activities

We have arranged and attended several meetings, conferences and excursions. One of the most successful arrangements was the multimedia travelling exhibition together with photographer Johan Hammar. At every exhibition (Gällivare, Älvsbyn, Luleå, Älvsbyn, Skellefteå, Umeå and Nordmaling) we presented the ReBorN project and distributed the project folder (annex 7.15 in progress report 30/06/2018). See table below for attendants at each exhibition and gender distribution.

Date and place for each exhibition with number of attendants and gender distribution.

Date of exhibition	Municipality	No attended	Women	Men
2018-02-13	Kalix	39	20	19
2018-02-14	Luleå	68	23	45
2018-02-15	Älvsbyn	12	6	6
2018-02-24	Skellefteå	75		
2018-02-25	Umeå	120	70	50
2018-02-27	Nordmaling	15	14	1
		Total: 329		

In February 2019 the project got invited to arrange an open exhibition about the project at Umeå City Library – *Väven* in Västerbotten county. A lot of folders, rollups were put out in the exhibition area and a TV-screen showing a rolling slideshow with pictures and movies of the project were positioned in the entrance of Umeå City library for one week in February 2019. We do not know exactly how many visitors the project had but received feedback from the organizer that our exhibition was the most attractive they ever had. The exhibition was cost-effective because we did not need to be in place, and it was free to participate.

The project has received a lot of attention in media (annex 10.16) and have a great reach of public via Facebook pages "*Vatten i Norr*" and "*Fiske och vattenvård i Västerbotten*" with 1736 respectively 2 718 followers, continuously following the project progress. Information about the project current topics and its status has continuously been posted on both Facebook pages. In total from the project start, we have published 127 respectively 83 posts about ReBorN on our Facebook-pages "*Fiske- och vattenvård i Västerbotten*" and "*Vatten i Norr*".

During 2018, films about green infrastructure (GI) were produced by the Swedish Environmental Protection Agency (SEPA). The project manager and the ReBorN project was featured in one of the films. The film has 1912 views on our Facebook page "Fiske- och vattenvård i Västerbotten" and 1408 views on SEPAs YouTube channel.

During July 2018 the production team "Off the Fence" documented the ReBorN project on behalf of National Geographic and Swedish television. ReBorN is part of one episode in a 6-part series. It broadcasted in March 2020 (on Swedish television). The programme was also broadcasted on WWF, France 5, Redbull/Servus TV and finally the National Geographic channel where a potential 165 million people could watch the programme.
The episode is also available on the Swedish national channel 1 (Swedish public service television company) with the widest range of programming of all TV companies in Sweden (SVT).

The CABN and ReBorN participated, both in 2020 and 2021, in a seven-day campaign called "*My Europe*" which was arranged by EU to enhance local and regional projects which the EU finances. The campaign consisted of Instagram and Facebook posts on CANB´s social media platforms where the different projects had one day each.

We have produced a project film instead of the second and third folder about the project and published it in June 2020. It got widespread and have 11 195 views so far. The film was much more effective when it comes to dissemination than folders. The decision to make a film instead of producing folders was also very well timed - due to Covid-19 we have not been able to arrange any meetings and hand out any folders. A movie can be watched by anyone from anywhere.

Overall, the project is affected by the Covid-19 pandemic and the consequences of it and can be witnessed as a major drawback. Many of the planned meetings and excursions 2020-2022 have been cancelled, however some of the meetings have been arranged online by Skype. For instance, the final seminar was done online. Even thought it was a set-back not to be able to do a physical seminar the online seminar was a success and we managed to engage and inspire people.
Instead of arranging public meetings we have arranged a few excursions with school pupils and students as it has been regarded as safe by the Public Health Authority. We often get senior citizens who participate at the public meetings we normally arrange and that was something we wanted to avoid as they are in risk category.

6.3.7. Policy impact

The work performed by the CABs and other agencies follows the guidelines and policies stated in national and international agreements, e.g., the Water Framework Directive, the Habitats Directive and the Swedish Environmental Quality Objectives.

The Water Framework Directive states that all waterbodies must have good ecological and good chemical status. A range of assessment criteria are used when assessing the status of a waterbody. The system is complicated due to the extent of the variability and the large number of parameters that must be taken into consideration when doing an assessment. The waterbody is assigned a status that ranges from good to bad. There are five levels: high, good, moderate, bad and poor. If the status is lower than good, an action plan must be put in place. The classification of the morphology of a waterbody is the average sum of eight different parameters. If more than 15 % of a waterbody is affected to facilitate timber floating it will set five of those parameters to moderate or worse. The classification of the morphology is then one of several other parameters that is used to classify ecological status. Moderate or worse classification of biological parameters often reflects the status of the morphology of the waterbody.
However, the restoration does not automatically lead to an improvement of the ecological status as the status is determined by a range of other factors. Other factors that determine the ecological status are, e.g., migratory barriers, land use, eutrophication and the presence of ditches. In some cases, the ecological status of a waterbody does not improve following the ecological restoration unless these other factors are also addressed. However, in the northernmost counties the modification of rivers and creeks to facilitate timber floating and the presence of migration barriers (primarily culverts and dams) have been identified as the

leading causes behind low ecological status, while eutrophication and acidification are of less concern.
In total, 44 water bodies have been restored in the ReBorN project. In the water districts of the Bothnian Bay and the Bothnian Sea, the classification of the parameters of hydromorphology was done in May of 2019. Restoration work done after (2019-2021) has not been taken into account in the classification in cycle 3.
16 water bodies had their hydromorphological parameters improved by the actions in the ReBorN project. However, even when the restoration has been a part of the assessment a reclassification is not guaranteed, six of those did not improve their ecological status since there were still other parameters that were worse than good. In cycle 4 the status of more water bodies will be improved due to the measures done in ReBorN.

ReBorN contributes to achieving the national Swedish Environmental Quality Objectives number 8, 10, 12 and 16. Below is a short description of the objectives.

Number 8 – *Flourishing Lakes and Streams:*
Lakes and watercourses must be ecologically sustainable, and their variety of habitats must be preserved. Natural productive capacity, biological diversity, cultural heritage assets and the ecological and water-conserving function of the landscape must be preserved, at the same time as recreational assets are safeguarded.

Number 10 – *A Balanced Marine Environment, Flourishing Coastal Areas and Archipelagos:*
The North Sea and the Baltic Sea must have a sustainable productive capacity, and biological diversity must be preserved. Coasts and archipelagos must be characterized by a high degree of biological diversity and a wealth of recreational, natural and cultural assets. Industry, recreation and other utilization of the seas, coasts and archipelagos must be compatible with the promotion of sustainable development. Particularly valuable areas must be protected against encroachment and other disturbance.

Number 12 – *Sustainable Forests:*
The value of forests and forest land for biological production must be protected, at the same time as biological diversity and cultural heritage and recreational assets are safeguarded.

Number 16 – *A Rich Diversity of Plant and Animal Life:*
Biological diversity must be preserved and used sustainably for the benefit of present and future generations. Species habitats and ecosystems and their functions and processes must be safeguarded. Species must be able to survive in long-term viable populations with sufficient genetic variation. Finally, people must have access to a good natural and cultural environment rich in biological diversity, as a basis for health, quality of life and well-being.

The measures, performed by ReBorN, will bring us one step closer to achieving the goals set by the Water Frame Directive and our national environmental quality objectives as well as the goals for the Natura 2000 species and habitats.

We have also participated in the making of a new national manual for river restoration, produced by SwAM.

Results foreseen in the Grant Agreement form B3

The knowledge gained from the ReBorN project has been used in other similar projects, such as the SwAM financed project in Norrbotten; "Älvspecifik laxförvaltning"." where the objectives has been similar as the objectives in ReBorN. 8 migratory barriers (road-water crossings and dams) have been removed in the County of Norrbotten and small tributaries attached to river Kalixälven has opened up within the project. In the same project, 34.6 km of streams has been restored in the same way as in ReBorN and 348 spawning beds have been created. A coordinated management have been created with the owners of fishing rights and fishery management areas. The River Råneälven is the pilot river for the project, and if it is successful the same procedure will take place in other necessitous rivers. This project is in progress at present and it is complimentary to ReBorN. The project has been financed by national funds.

A similar project (SwAM funded), *"Levande laxälvar"*, has been doing measures in the catchment area of Lögdeälven and Sävarån. It started 2014 and ended 2018. The objectives have been to restore modified rivers and development of management plans for a sustainable population of salmon.

In January 2021, a new LIFE project, Ecostreams, started with actions in the counties of Västerbotten, Västernorrland and Jämtland. CABV is the coordinating beneficiary, and the project has a total budget of 17 million EUR. With the experience and knowledge of restoring freshwater ecosystems gathered from ReBorN LIFE – Ecostreams for LIFE will restore 140 kilometres of river stretches in the three counties for atlantic salmon, freshwater pearl mussel, brown trout, european bullhead and scapania moss. The project will also remediate 221 migration barriers, where 22 are old dams and 199 are undersized/misplaced road culverts. Additionally, reintroduction of the threatened freshwater pearl mussel in scarce areas and adaptive sustainable management plans of fish populations will be implemented. In line with ReBorN, demonstration areas with information of forestry consideration to aquatic environment will be created in all three counties.

In 2021, the LIFE project ReVives (Reviving freshwater pearl mussel populations and their habitats, LIFE20 NAT/FI/000611) started. The project has a budget of 9.5 million EUR and the objective is to increase freshwater pearl mussel populations by improving their – and their host fishes' – habitats in Finland, Sweden and Estonia. The project owner is the University of Jyväskylä, Finland and the CABN is a partner in the project. The conservation and restoration actions will be carried out in 14 river systems and the river restorations will totally affect 77 ha and 117 km. To save dying-out freshwater pearl mussel populations, adult mussels will be revived – and juveniles produced – in captivity.
The knowledge from the ReBorN project will be transmitted to the ReVives project.

In the County of Norrbotten, in an already finished project called "Kustmynnande vattendrag i Bottenviken- metodutveckling och ekologisk restaurering, ett gränsöverskridande svensk-finskt samarbetsprojekt" a fish ladder made of composite was installed in 2018 in the river of Alterälven to facilitate fish to migrate pass a hydropower dam. In a follow-up project called "Innovativt fiskvandringsprojekt för juvenil och lekvandrande fisk i Norrbottens län" the function of the fish ladder is monitored. The project is financed by national funds, and it will end in 2022.

We have received national funds to restore wetlands, mainly by removing diches. This work has been done in both counties. Some of the restored wetlands are within the project rivers catchment areas.

The CABV and SFA participate in the integrated LIFE project Grip on LIFE (Using functional water and wetland ecosystems and their services as a model for improving GReen infrastructure and Implementing PAF in Sweden) together other counties. The project runs 2018 to 2023. It will gather and disseminate knowledge and develop methods for best practice in forestry and restoration of wetlands and streams.

A large water restoration project, TRIWA LIFE, will start in 2023. TRIWA LIFE is a Swedish-Finnish effort to improve the conditions of riverine ecosystems in the whole international catchment area of River Torne NATURA 2000 site, the main rivers are among the largest free-flowing rivers of Europe. The overall aim is to improve conservation status for species and habitats of the Habitats Directive and reach good ecological status according to the Water Frame Directive. 103 hectares of streams will be restored, 399 anthropogenic migration barriers will be removed so more than 3 366 km of tributary river and stream will open up for fish migration.
Additionally, 2 521 hectares of wetland, that was historically ditched for forestry use, will be restored so the water quality and the wetland habitats will be improved.

Two projects within the Kolarctic CBC Programme (www.kolarctic.info) work with river restoration with a focus on salmon, brown trout and freshwater pearl mussel. The CABN are involved in both projects and knowledge from the ReBorN project will be transmitted to the new projects. The name of the two different projects are Ecological Restoration of Arctic Rivers (KO1078 ReArc) and Salmonid Fish and Freshwater Pearl Mussel– Riverine Ecosystem Services and Biodiversity in the Green Belt of Fennoscandia (KO1017 SALMUS).

The CABN participate in a project called EMRA (Environmental planning, measures and Actions in Regulated water systems). It is a Swedish-Finnish cross border project financed by Interreg Nord programme. The project aims to perform restoration actions, knowledge exchange about restoration rivers and increase the knowledge about trout and grayling by doing genetic analysis.

A new project within the Kolarctic CBC Programme started in December 2021. It is a project where CABN, together with partners in Norway and Finland, will develop an education package for excavator operators that are working with river restoration, wetland restoration and removal of migratory barriers. EXcavator Pro in Ecologicial ResToration (EXPERT, KO5008).

The SFA is a partner in the Interreg (Botnia-Atlantica) financed project KLIVA (Vattenbalans, ekosystemtjänster och metalltransport i ett klimat i förändring). The use of natural resources effects the aquatic environment, the availability of ecosystem services and the possibility of achieving environmental goals. During the years 2019–2022, the KLIVA project is working with stimulating to climate-adapted measures in agriculture and forestry.

The SFA is a partner in the Kolactic project IMPRESS. The project addresses the need to combine economic activities in timber industry and long-term values associated with forest ecosystems, such as preservation of biodiversity and carbon storage. The SFA will produce a

climate resilience plan with focus on forest management in the northern part of Sweden, which hopefully can apply on the whole North Calotte.

To make it easier for SwAM to distribute national funding they have developed a database where all CABs can insert projects. Based on the database the SwAM grant funding to the CABs. there are some smaller projects financed by national funds. CABN and CABV have so far been successful in receiving funds and hopefully it will continue.

Additionally, 105 foremen and coordinators (employees and consultants) have been trained within the ReBorN project. These people will remain a useful resource for future restoration projects all over the country.

We will also after the project ends continue to use the demonstration areas, not just for activities correlated to ReBorN, but for other projects and excursions as well. The demonstrations sites provide perfect settings to show best practice methods and concrete restoration actions for private landowners, contractors, municipalities other authorities, teaching groups etc.

6.4. Analysis of benefits

Direct / quantitative environmental benefits

The targeted species, salmon (Salmo salar 1106), freshwater pearl mussel (Margaritifera margaritifera 1029) and otter (Lutra lutra 1355) have more natural habitats. For salmon (and brown trout) the measures have increased the habitats available for them. That means larger habitats for reproduction and foraging and an opportunity for the fish populations to increase. The measures done for fish also benefits freshwater pearl mussel since it needs a salmonid as a host during its larvae stage. It is also the only way for at freshwater pearl mussel to migrate, when it is attached to the gills on a salmonid. Many species of freshwater mussels are host specific. Larvae of the freshwater pearl mussel depend on young trout and salmon. The freshwater pearl mussel releases its larvae in the late summer and live as parasites on their gills for almost a year before they leave their host and bury in the substrate. The larvae stay buried in the substrate for 4-5 years until they measure approximately 5 cm. Hence, freshwater pearl mussel populations depend on the successful reproduction of salmon and trout in order to survive.
That, in combination with more suitable habitats for the mussels makes the status for the mussels in the targeted Natura 2000 sites more favourable. The recovery of freshwater pearl mussel populations is dependent upon the distribution and successful reproduction of its hosts. An impact on the freshwater pearl populations following the successful reproduction of brown trout and salmon will not be possible to detect until 6-7 years after a spawning event, when the young mussels can more easily be monitored as they leave their invisible existence buried in the sediment and start living at the surface.
The otter's main diet is fish, so when fish stocks increase the otter population is favoured. When water courses are restored, many rapids are re-created. The otters need open water during the winter, so they can search for food. Slower running waters freezes to ice during the winter, but the rapids have open water where the otters can search for food. We can already see an increase in otter population (annex 10.10).
The chances that the targeted habitats, fennoscandian natural rivers (3210) and watercourses of plain montane levels with the Ranunculion fluitans and Callitricho-Batrachion vegetation (3260), will improve their conservation status in the targeted Natura 2000 sites increases with the measure taken in the project.
The modification of rivers and creeks to facilitate timber floating has been identified as the major reason why many waterbodies are assigned a status that is less than good, and several water bodies have been and will be reclassified as a result of the actions carried out as part of ReBorN and the water bodies are one step closer to having a good or high ecological status.

Qualitative environmental benefits

With the measures done in the ReBorN project the targeted species and habitats will have a promising future. We have already seen results from the measures done in the project with the spawning grounds being use by trout and salmon (annex 10.8).
However, the measures are just one part in our environmental work. We must also continue with other issues such as migratory barriers and fishery management. Beginning in the 1990s, several projects in the Norrbotten and Västerbotten counties have been carried out to improve the health of the aquatic ecosystem and the availability of habitat. These include the restoration of rivers from the impact of timber floating, restoration of feeding grounds, nursery areas and spawning areas for salmon and trout, removing migratory barriers and liming to counteract acidification (the latter only in the county of Västerbotten).

The Swedish Forest Agency and the Swedish Transport Administration have been remediating inaccurately constructed culverts for many years. The forestry companies are also making improvements to road-river crossings when carrying out maintenance work (e.g., repairing culverts). In addition, the CABs in Norrbotten and Västerbotten have continuously been working on removing migration barriers throughout their respective counties, within the scope of other projects. The work done by the CABs and other agencies is following the guidelines and policies stated in national and international agreements, e.g., the Swedish Environmental Objectives and the Water Framework Directive.
Overfishing has resulted in the decline of most of the fish stocks that migrate up the rivers to spawn. Management decisions affecting both the commercial and recreational fishery on Atlantic salmon and sea trout have contributed to the increase in abundance of those two species and as a result the number of individuals that migrate up the rivers to spawn.
Much of the impact the measures will have on the aquatic community will not be possible to detect and measure until after a certain time lag, which can be several years. While it is possible to quickly assess whether salmon and trout are using newly created spawning grounds and thereafter measure reproduction success by recording the abundance of juvenile fish the impact on salmon and trout recruitment will not be apparent until the next generation returns to the stream to spawn (approximately 5-7 years later). As populations of Atlantic salmon, brown trout and freshwater pearl mussel are continuously being monitored by the County Administrative Boards of Norrbotten and Västerbotten, it is expected that future monitoring will reveal effects on the populations of those species that will only be possible to detect and measure once several years have passed.

Social and economic benefits

The long-term / qualitative economic benefits of the project can mostly be connected to benefits for fishing tourism and ecotourism. Both industries have large potential in Northern Sweden and is one of the largest growing industries. Through the measures, our project has improved the possibility for populations to thrive. The targeted species salmon, freshwater pearl mussel and otter are favoured by our measures, but other species of fish and aquatic animals are also favoured. In our short monitoring we can see growing populations, due to our actions in combination with other restoration and legal actions. This will benefit the sport fishing tourism and with that kind of tourism comes an increase in sold fishing licenses, income for accommodation, food etc.
The project itself creates jobs for foremen and excavator operators as well as administrative jobs.
The gained experience from the project have encourage us to apply for more projects and we have both larger and smaller projects running or project that are about to start. All new projects are creating jobs for people in the region.

Best Practice lessons

During the project time, we constantly developed and tuned the methods so if the project will be replicated you always have to use updated measures.
We mainly used excavators to move the boulders and gravel. For the final work of the spawning beds were done manually with special tools. The Hartijoki method is developed in the northern part of Norrbotten and a well-known method of recreating spawning beds. For more details see chapter 6.3.1. Stream crossings are constructions that evolve the whole time, for stream crossings.

Another thing we have learned is that cooperation leads to more benefit for nature. Through our cooperation we have managed to restore over 200 km of streams. Working on our own it would have taken decades to reach the same goal. The measures that were used always needs to be site specific and therefore it is important to adjust the solution to the site.

Innovation and demonstration value

We have constantly improved and evolved our restoration methods. We have learned how the excavators should be used so we will get the best results. We have also learned more about what type of excavator we should use, by using a bigger excavator, you can move larger boulder and reach further with the spoon but if the surrounding area is sensitive (for example wetlands) a smaller excavator can be better to use.
By having service teams, we have made the restoration more time efficient since the preparation work has been done before the excavators entered the rivers.

Creating spawning sites is necessary to succeed with ecological restoration goals. The quality of spawning sites quality is by far the largest factor affecting restocking of depleted fish populations. The final touch of the spawning beds has been performed manually with custom made tools. The method used is a special technique called *Hartijoki*, developed in the northern part of Norrbotten. The method has, during the project time, been altered to fit the work with excavators. The creating of spawning sites was done in two steps. Large material was removed with excavators equipped with special spoons with gripping bars, and final adjustments were made manually with, for the purpose, special tools. Spawning beds were preferably done in areas with intermediate current. A finished bed contains natural gravel in a mixture of small stones from 0.5 cm-8 cm in diameter. The boulders and oversized stones were used to create a support on the downstream end of the spawning area and to regulate flow in and over the bed. The goal was to get a waterflow to pass through the gravel bed.

Drones have been used in other projects to evaluate restoration but not as extensive as in ReBorN. Rewetted areas have never been evaluated like this.

We have created four demonstration sites within the project. These have been used and will be used for education, excursions, media etc.
The project has been very active with dissemination, we have had several excursions and educations towards targeted groups. We have produced a short film that is used for education and seminars.
The project has had exchange of experience with the Scottish LIFE project “Pearls in Peril”, the Swedish project Triple Lake and the Swedish LIFE project “Remibar”.

Policy implications

An unexpected obstacle was the legislation regarding the use of drones and drone data. The legislation changed during the project time, and it has been difficult to understand the new legislation and to get the proper permits (for details see chapter 6.2).

7. Key Project-level Indicators

All indicators are assessed and entered in the database. The data is also compiled in annex 10.15. Below are some of the indicators.

1.5. project area/length: the amount (length of streams) has exceeded our objectives. For project areas Kalixälven, Råneälven, Åbyälven, Byskeälven and Lögdeälven we have done more than stated in the "Data Snapshot 2017- LIFE15-Forecast". We have not reached our objective for project area Piteälven, see 6.1.6. We have reached and exceeded our overall objective (202 km) with 40.8 km.

11.1. Website: our website is frequently visited and our expected values at the end (over 6 700) of number of unique visits as well as number of individuals are exceeded.

11.3. Surveys: there were only 62 persons that answered the first survey and 103 answered the second survey. The expected end and beyond end values were overestimated.

12.2. professional training or education: 105 foremen, coordinator and other persons have attended at least one of our courses. The expected number was underestimated from the start. Some field seasons we have had more than 22 excavators, so the number of foremen had to be higher. We have had foremen returning several seasons but also some that had only worked one season, and all of them have to learn the task.
Additionally, we have had personal from consultant companies as well as from municipalities at the courses. We see the courses as a way to spread the know-how about stream restoration so other can start similar projects.

14.3 future funds: it is difficult to predict future project since we are continuing to apply for new projects from many different international and national funds.
To get a fair number, we have compiled all projects related to water that are in process now and will be proceeding after the ReBorN project has ended. We have calculated the budget for each project within the counties of Norrbotten and Västerbotten.
The projects are:

- LIFE project Ecostreams (LIFE19 NAT/SE/000333). The budget of Ecostreams in the county of Västerbotten is approximately 7 million EUR.
- LIFE project ReVives (LIFE20 NAT/FI/000611). The budget of ReVives in the county of Norrbotten is approximately 4 million EUR.
- LIFE project Grip on LIFE (LIFE16IPE SE009). The budget of GRIP for the county of Västerbotten is 1 675 000 EUR.
- LIFE project TRIWA starts in 2023. The budget for the Torne River in the county of Norrbotten is approximately 12 million EUR.
- Kolarctic project ReArc. The budget of ReArc in the county of Norrbotten is approximately 830 000 EUR.
- Interreg project EMRA. The budget of EMRA in Norrbotten is approximately 1.8 million EUR.
- Kolarctic project EXPERT. The budget for EXPERT in the county of Norrbotten is 20 000 EUR.
- Interreg (Botnia-Atlantica) project KLIVA. The budget for the project in the county of Västerbotten is 406 700 EUR.
- Kolactic project IMPRESS. The budget for the project in the county of Västerbotten and Norrbotten is 35 000 EUR.

- In the County of Norrbotten, there are some smaller projects financed by national funds. The total budget for all of them is approximately 6 million EUR.
- In the County of Västerbotten, there are some smaller projects financed by national funds. The total budget for all of them is approximately 3 million EUR.

The prediction of 2 million EUR in future funds have been exceeded by far. The investment in the aquatic environment in the counties of Norrbotten and Västerbotten can be as much as over 36 million EUR.

8. Comments on the financial report

8.1. Summary of Costs Incurred

The following table shows the project costs incurred compared to the approved budget in Amendment no 3 to Grant Agreement:

Cost category	Budget according to the Grant Agreement in €	Costs incurred within the reporting period in €	% **
1. Personnel	4 510 353 €	4 455 928 €	99%
2. Travel and subsistence	836 939 €	824 844 €	99%
3. External assistance	6 477 328 €	5 764 675 €	89%
4. Durable goods			
Infrastructure	122 207 €	91 263 €	75%
Equipment	6 065 €	7 985 €	132%
Prototype			
5. Land purchase / long-term lease			
6. Consumables	205 715 €	213 831 €	104%
7. Other Costs	162 647 €	198 188 €	122%
8. Overheads	731 630 €	686 804 €	94%
TOTAL	**13 052 884 €**	**12 243 516 €**	**94%**

In the end of the project 94% of the budget is consumed. The reason why the entire budget has not been spent is mainly that we saved money by using our own staff instead of consultants as coordinators and foremen in action C1 and C2. Another reason is that the hourly rate for excavators has been lower than budgeted. The development of the exchange rate from the application to the completion of the project has also been to our advantage.

There are no major deviations from the budget in Amendment no 3 to Grant Agreement but there are some minor deviations worth mentioning. All these deviations can be handled within the existing budget.

External assistance:

In this cost category, we have spent less than budgeted. The main reason is that the hourly rate for excavators has been lower than budgeted. Also, we saved money by using our own staff instead of consultants as coordinators and foremen in action C1 and C2.

Infrastructure:

The total budgeted cost for the suspension bridge at Högåker demonstration site was 50 000 € (20 000 € Infrastructure and 30 000 € External assistance). The final cost for the bridge is approximately 60 000 €. However, the distribution between the cost categories differs from the budget (11 000 € Infrastructure and 49 000 € External assistance), hence the low consumption in cost category Infrastructure.

Also, there has been no need for gravel at the demonstration sites (action E3), so the budgeted 9 500 € has not been used.

The "Beneficiary's certificate for Durable Goods" is enclosed in annex 10.27 and 10.28.

Equipment:

In cost category *"Equipment"* the costs are a bit higher than budgeted. This is due to a cost for 50% of a trailer at CABV that was not in the budget. The trailer is for transport of an iron horse used for diesel transport to excavators in the restoration work. The iron horse with trailer is used in two different projects. The iron horse is fully financed in the other project and the trailer is financed 50/50 by ReBorN and the other project.

The "Beneficiary's certificate for Durable Goods" is enclosed in annex 10.27 and 10.28.

Consumables:

Some field clothing and other field gear is purchased for the last field season of the project. We certify that the field clothing and other field gear purchased for the project and for which the life-expectancy is longer than that of the project, will in the future be used exclusively for nature conservation activities.

Other direct costs:

Cost incurred in cost category "Other direct costs" is higher than foreseen. It is difficult to discern the main reason for this as it is due to many small differences between budget and outcome. This is partly due to that many cost items in this cost category seems to be more expensive than expected in the budget stage, for example costs for meeting rooms, refreshments (food and coffee) and conference fees during meetings and educations.

Also, travel costs for persons not reported in the Personnel category are transferred to this cost category, in total 16 300 €, this is higher than the budgeted 10 500 €.

- Costs for the Scotland trip described in Midterm report 1 chapter 6.1.20 and Annex 10.17 to Midterm report 1 sums up to 6 400 €.
- During the first years (216-2018) of the project we had four employees at CABV who worked in the project during the field seasons as technical coordinators/field coordinators and foremen but did not report their time but their travel costs in the project. This was because we wanted to save money in the project since we did not know about the favorable budget situation during the first years of the project. These costs sum up to 8 900 €.

- A member of the ReBorN steering group traveled to Nordic Platform meeting in Denmark 2019. The cost is 1 000 €.

A summary of these costs is enclosed in annex 10.41.

Since the ReBorN crew could not meet up at the final seminar, we decided to have one final physical meeting at the end of the project. Luckily the Covid-19 restrictions in Sweden were eased in the beginning of 2022 and we were able to meet up in March 2022 in Hemavan. The cost was not in the budget but can be transferred from External assistance. The cost for the meeting in Hemavan was 13 160 €. A summary of these costs is enclosed in annex 10.41.

In this cost category we also have some minor costs that were not in the budget, for example:

- costs associated with the drones (licenses for flying, fees for drone data program, surf for iPad used with the drones etc.)
- fees for ReBorN-website and share point

All these costs can be accommodated within the existing budget.

Comments on costs after the project end date:

Some employees at CABV and CABN worked on the final report during the month of April 2022. The costs for this have been reported and paid after the project end date, i.e. during April 2022.

The cost of the “Certificate on the financial statements” has also been reported and paid after the project end date, during June 2022.

8.2. Accounting system

Beneficiaries separate cost accounts for the project costs

The beneficiaries included in the project utilise separate cost accounts for the project costs. The structure of separate cost accounts was confirmed by the beneficiaries during the first monitor visit to the project on 29 November 2016, see the letter from EASME (Ref. Ares(2017)1816422 - 05/04/2017). A list of project codes per beneficiary was annexed to the progress report from 28/04/2017. There are no changes to the cost accounts listed in that list. The beneficiaries are continuously informed that all project costs must be registered under the project code and that the cumulative expenditure since the start of the project must be in accordance with costs reported on the Individual Financial Statement of the beneficiary. Cost registered under the project-specific codes are approved by authorized persons of the beneficiaries.

Coordinating beneficiary regularly requests the associated beneficiaries extracts from the accountings to make sure that the cumulative expenditure since the start of the project are in accordance with costs reported on the Individual Financial Statement of the beneficiary.

During monitor visit on 28 - 29 August 2018 extract from the accounting systems from all beneficiaries except for the Municipality of Gällivare were reviewed with no comments by

the monitor. The extracts included totals or sub-totals of cost categories and reflected all costs registered under the project codes. The extract from the accounting system with totals or sub-totals of cost categories that reflect all costs registered under the project-specific code from the start of the project for the Municipality of Gällivare were submitted in Annex 10.20 to midterm report from 30/06/2019, deviations were also explained by the Municipality of Gällivare.

A clear reference to the project on the invoices and Procedure of approving costs

All beneficiaries are informed, and regularly reminded, about the importance of ensuring that the invoices contain a clear reference to the project. In connection with the order the supplier is asked to mark the invoice with the project reference. Unfortunately, it happens that the project reference is missing. In these cases, the invoice is permanently marked with the reference in the invoice processing systems and accounting systems. The persons responsible for the project and the financial administrator at each beneficiary ensures that the invoices are marked with the project reference before registering the cost into the Individual Financial Statement of the beneficiary.

The procedure of approving costs is described below for each beneficiary:

CABV:
It is the project leader or other person working in the project who makes purchases on behalf of the project. In connection with the order the supplier is informed about the importance of marking the invoice with the project reference. The purchaser (project leader or other person working in the project) receives the invoice in the invoice processing system, VISMA Proceedo, and checks the invoice in terms of content (that the invoice refers to what has been ordered, terms of agreements etc.) and formally (if it includes the reference to the project etc.). If the invoice is correct the cost can be approved and registered under the project specific code in the accountings. The final, formal approval is done by the head of the department.

CABN:
The project leader (or other person working in the project) is the one that makes the purchases in the project. The invoice then arrives in VISMA Proceedo, which is the invoice processing system for CABN. The person that made the purchase (often the project leader) then checks the invoice, terms of agreement, that it includes the correct reference, that the invoice refers to what has been ordered etcetera. When the invoice has been checked and is OK, the project leader (or other person in the project that made the purchase) makes the account coding with the project specific code in VISMA Proceedo and sends it to the head of the unit for final approval.

Gällivare:
The manager and the coordinator for the ReBorN project at Gällivare municipality ensure that the goods purchased is included in the project budget. The manager and the coordinator make sure that the procurement rules, both national and specific project rules, are followed. In all purchases, the supplier is informed to refer to the Reborn project on the invoice. The person who made the purchase receives the invoice and puts the correct codes for the Reborn project on it. This is done electronically by the accounting system, Å-data. Then the invoice is checked by the manager who adds the correct accounting. The invoice is certified by the manager and the coordinator before the invoice is included in the accounting system.

Nordmaling:
The only costs the municipality of Nordmaling handles is the cost of travel and accommodation within the project as well as the staff members hours worked on project. Hours worked on project is reported on the approved timesheet that came with the project and is then submitted to the line manager for review and approval. When booking hotels and travel, we make sure that the project code (ReBorN LIFE15 NAT/SE/892) is noted as a reference on every incoming invoice. All incoming invoices are certified and reviewed by an appointed person in the office and then sent to the staff member responsible for authorization and payment of invoices belonging to the project. All timesheets and invoices are then sent to the manager of the financial department for final review and reporting.

SFA:
It is the project leader or other person working in the project who makes purchases in the ReBorN project. In connection with the order the supplier is informed about the importance of marking the invoice with the project reference. The person that made the purchase receives the invoice in the invoice processing system (VISMA Proceedo) and checks the invoice in terms of content (that the invoice refers to what has been ordered, terms of agreements etc) and formally (if it includes the reference to the project etc). If the invoice is correct the cost can be approved and registered under the project specific code in the accountings. The final, formal approval is done by the head of the unit.

SwAM:
Officer and Project leader for Reborn ensures that the item to be purchased is in project budget, both financially and as an action to be carried out. Officer and Project leader also ensures that the procurement rules are followed, both project and national rules. When purchasing a travel, external expert etc. it is important that the one who purchases, besides the internal rules for purchasing an item, informs the supplier to put a reference to the Reborn project on the invoice. The person who made the purchase receives the invoice and put the right codes for the Reborn project at it. This is made electronically via the accounting system, Agresso. Thereafter the invoice is controlled by a financial officer who adds the correct accounting. The invoice is certified by a superior before the invoice is entered in the accounting system.

Time registration system

A description of the time registration and validation systems for project beneficiaries was submitted in Annex 10 to the progress report from 28/04/2017 (CABV, CABN, SFA, Nordmaling and Gällivare). According to the letter from EASME (Ref. Ares(2017)3600219 - 17/07/2017) descriptions of the time registration and validation routines confirm that the time registration procedures applied by the beneficiaries fully correspond to the requirements of the LIFE programme. SwAM utilise the same electronical time registration system as CABV, CABN and SFA. Information about SwAMs time registration and validation routines were provided in Annex 10.21 and 10.22 to the midterm report from 30/06/2019.

8.3. Partnership arrangements

Financial transactions between the coordinating beneficiary and the associated beneficiaries

First pre-financing from the European Commission was received by Coordinating beneficiary on 04/08/2016. The transactions of the first pre-financing between the coordinating beneficiary and the associated beneficiaries were executed as soon as the Partnership Agreements were set and signed in the beginning of year 2017. Due to some budget modifications between beneficiaries, see progress report from 28/04/2017 and progress report from 30/06/2018, some complementary transactions were executed during spring 2018. Due to the formal budget amendment in Amendment no 3 to Grant Agreement some complementary transactions were executed in October 2021.

Second pre-financing from the European Commission was received by Coordinating beneficiary on 25/10/2019. The transactions of the second pre-financing between the coordinating beneficiary and the associated beneficiaries were executed 18/12/2019. The allocation of second pre-financing between beneficiaries were based on budgeted costs per beneficiary after some budget modifications between beneficiaries (budget modification a)-l), see Midterm report from 30/12/2020). Due to the formal budget amendment in Amendment no 3 to Grant Agreement some complementary transactions were executed in October 2021.

Third pre-financing from the European Commission was received by Coordinating beneficiary on 26/02/2026. The transactions of the third pre-financing between the coordinating beneficiary and the associated beneficiaries were executed 28/06/2021. Due to the formal budget amendment in Amendment no 3 to Grant Agreement some complementary transactions were executed in October 2021.

Also, there have been two repayments of pre-financing to Coordinating beneficiary from associated beneficiaries, SwAM and Nordmaling, during May 2022. This is due to lower total final costs for the beneficiaries than budgeted.

Contributions from two of the Associated beneficiaries, SwAM and Gällivare, are intended to cover costs of other beneficiaries, CABV and CABN. Contribution from Associated beneficiary SwAM has been transferred to Coordinating Beneficiary on a yearly basis. Parts of the transactions are thereafter transferred to CABN. Funds for 2016, 2017, 2018, 2019, 2020 and 2021 have been distributed among the beneficiaries. The final transactions took place in the end of June 2022 when the Final Financial report was done.

Contribution from Associated beneficiary Municipality of Gällivare for year 2016-2021 has been transferred to Coordinating Beneficiary on 28/02/2020, 04/12/2020 and 17/12/2021.

Details about the transactions between beneficiaries are described in annex 10.33.

This is the final distribution of funding between the beneficiaries:

	CABV	CABN	Gällivare	Nordmaling	SFA	SwAM	Total Project
Total eligeble costs incl OH	**9 603 178 €**	**2 117 505 €**	**272 853 €**	**22 676 €**	**219 410 €**	**7 895 €**	**12 243 516 €**
Union contribution	5 742 301 €	1 293 584 €	163 739 €	13 606 €	128 223 €	4 740 €	7 346 193 €
Own contribution (to cover own costs)	118 119 €	119 402 €	109 114 €	9 070 €	91 187 €	3 155 €	450 047 €
Co-financers contribution	160 260 €	- €	- €	- €	- €		160 260 €
Contribution from SwAM	3 421 611 €	704 519 €	- €	- €	- €		4 126 130 €
Contribution from Gällivare	160 886 €	- €	- €	- €	- €		160 886 €
Total contribution	**9 603 177 €**	**2 117 505 €**	**272 853 €**	**22 676 €**	**219 410 €**	**7 895 €**	**12 243 516 €**

Financial reporting by the beneficiaries and preparation of the consolidated cost statement

Each Associated beneficiary prepares and sends the Individual Financial Statement including supporting documents, such as ledger, invoices, timesheets etc, to Coordinating Beneficiary according to an established time schedule for the financial reporting of the project. Prior to each reporting period Coordinating beneficiary sends out instructions to the Associated Beneficiaries. The Financial manager at the Coordinating Beneficiary prepares the Consolidated costs statement on basis of the approved and signed Individual Financial Statements from the beneficiaries.

Consolidated cost statement and Individual Financial statements are enclosed in annex 10.26-10.32.

Comments on the Individual Financial Statements and Consolidated costs Statement

Personnel sheet CABV:

In the Individual Financial Statement for CABV the salary costs are calculated in a separate annex for each year. This is due to the large number of people who worked in the project each year. The calculation for year 2018 was annexed as an example in annex 10.28 in midterm report from 30/06/2019. The same method has been applied for year 2016, 2017, 2019, 2020, 2021 and 2022. Full excel files for each year are enclosed in annex 10.34-10.40.

Funding sheets:

The percentages used to calculate the requested union contribution for each beneficiary in the Individual Financial Statements reflect those foreseen in the Grant Agreement.

The requested union contribution and beneficiaries' own contribution in the Grant Agreement did not balance the foreseen costs on beneficiary level. According to the contribution plan in Grant Agreement some of the beneficiaries (SwAM and Gällivare) contributes to costs of other beneficiaries (CABV and CABN). In the funding sheets of the Individual Financial Statements the beneficiaries have reported their own total contribution to the project. Due to this the costs and income in the Individual cost Statement sheets of the beneficiaries will not be in balance and the reported income of the specific beneficiary who contributes to another beneficiary (SwAM and Gällivare) will be higher than the reported costs in the Individual Financial Statement of the beneficiary. To ensure that the income indicated in the Consolidated costs statement will not be reported twice, CABV and CABN have not declare the contribution received from SwAM and Gällivare in their Individual Financial Statements.

This leads to:

- Costs declared in the Individual Financial Statement of CABV is higher than the income/contribution since CABV has received financing from SwAM and Gällivare, the Individual Financial Statement of the beneficiary is not in balance.

- Costs declared in the Individual Financial Statement of CABN is higher than the income/contribution since CABN has received financing from SwAM, the Individual Financial Statement is not in balance.
- Total costs reported by SwAM in the Individual Financial Statement is significantly lower than their total contribution since SwAM has transferred financing to CABV and CABN, the Individual Financial Statement is not in balance. Most part of the contribution from SwAM will cover the costs related to CABV and CABN in the Consolidated Cost Statement.
- Total costs reported by Gällivare in the Individual Financial Statement is lower than their total contribution since Gällivare has transferred financing to CABV, the Individual Financial Statement is not in balance. Most part of the contribution from Gällivare will cover the costs related to CABV in the Consolidated Cost Statement.
- The Consolidated Costs Statement is in balance

The picture below shows how the financing is distributed between the beneficiaries:

	CABV	CABN	Gällivare	Nordmaling	SFA	SwAM	Total Project
Total eligeble costs incl OH	**9 603 178 €**	**2 117 505 €**	**272 853 €**	**22 676 €**	**219 410 €**	**7 895 €**	**12 243 516 €**
Union contribution	5 742 301 €	1 293 584 €	163 739 €	13 606 €	128 223 €	4 740 €	7 346 193 €
Own contribution (to cover own costs)	118 119 €	119 402 €	109 114 €	9 070 €	91 187 €	3 155 €	450 047 €
Co-financers contribution	160 260 €	- €	- €	- €	- €		160 260 €
Contribution from SwAM	3 421 611 €	704 519 €	- €	- €	- €		4 126 130 €
Contribution from Gällivare	160 886 €	- €	- €	- €	- €		160 886 €
Total contribution	**9 603 177 €**	**2 117 505 €**	**272 853 €**	**22 676 €**	**219 410 €**	**7 895 €**	**12 243 516 €**

Comments on the 2% rule:

The 2% rule is not a problem in this project. Even if all Personnel costs will be classified as non-additional the 2% rule will still be respected:

- Total Personnel costs: 4 455 928 €
- Total public contribution from beneficiaries: 4 737 063 €
- 4 737 063 € / 4 455 928 € = 1,0639. The sum of the public contribution exceeds by 6,39% the total salary costs.

8.4. Certificate on the financial statement

We appointed an internal auditor of County Administrative Board of Stockholm. He has provided a Certificate on financial statement for Coordinating Beneficiary County Administrative Board of Västerbotten (legal reg. no 202100-2460) and the Associated Beneficiary County Administrative Board of Norrbotten (legal reg. no 202100-2478). According to the changes of the clause about certificate on financial statement in the "Letter Amendment no 1" to our project the other Beneficiaries are not required to submit the certificate.

The auditor has extensive experience of auditing Swedish LIFE+ projects and he is independent from both the Coordinating Beneficiary and the Associated Beneficiary as he is employed by an organization, County Administrative Board of Stockholm (legal reg. no 202100-2247), not involved or dependent in the project or in its Beneficiaries.

The "Certificate on the financial statements" is enclosed in annex 10.23.

8.5. Estimation of person-days used per action

Estimation of person days used per action for the total project period for all beneficiaries in comparison with the approved budget in Amendment no 3 to Grant Agreement:

Action type	Budgeted person days	Estimated % of person days spent
A1: Collection of pre-restoration data on habitat charcteristics and juvenile fish density	20	50%
A2: Information to local stakeholders, permits and licenses from landowners	330	99%
A3: Elaboration of work plans	53	17%
A4: Public procurement	30	340%
A5: Training of foreman and excavator operators	60	602%
C1: Restoration of channelized stream sections	9 091	112%
C2: Restoration of spawning areas	894	129%
D1: Monitoring of stocks of migratory fish and freshwater pearl mussel	15	1027%
D2: Monitoring of number and function of spawning sites	15	107%
D3: Monitoring the impact on geomorphology and hydraulics	0	
D4: Monitoring of otter	6	400%
D5: Monitoring of rewetted areas	0	
D6: Monitoring of socio-economic impact	10	93%
D7: Monitoring of the impact on ecosystem functions	20	100%
D8 Management of the indicator performance table	12	117%
E1: Communication plan - general communication	36	110%
E2: Notice boards, website, laymen's report etc	233	47%
E3: Forestry best practice and project actions demonstrations areas	576	123%
E4: Project coordinated seminars, workshops, conferences, field trips and public meetings	108	153%
E5: Networking	181	81%
E6: Final seminar	58	50%
F1: Project managing	3 340	103%
TOTAL	**15 088**	**114%**

In total 114% of the budgeted person days has been spent but the total budget for Personnel is not consumed. This is because most of the actual daily rates are in line with, or lower than, the rates foreseen in the budget.

Comments on major deviations:

A4 Public procurement: This action has been a lot more time-consuming than budgeted. The project management considers it very important that this work is done correctly and in accordance with laws and regulations thereof the high number of person days spent. However, the increased cost is accommodated within the existing total budget of the project.

A5 Training of foremen and excavator operators: This action has been more time-consuming than budgeted. In the beginning of every field season, we have a week of training for foremen, coordinators and technicians. This is necessary to keep a high quality of the restoration work (C1 and C2). The increased cost is accommodated within the existing total project budget.

D1 Monitoring of stocks of migratory fish and freshwater pearl mussel: Originally this activity would be performed by external consultants and was budgeted under External assistance. Since CABV and CABN had experienced personnel in place that can perform the work, and it was difficult to find external consultants for this task, we decided to let our own personnel perform this task. The change was not in the formal budget amendment due to the relatively minor amount but the necessary budget shift was described during monitoring visit 10-12 October 2022 and accepted in the letter from EASME ref.ares(2017)5678196 - 21/11/2017.

D4 Monitoring of otter: To get “after measure” data from all of the selected otter monitoring sites, we decided to re-visit all of them in 2021. Usually, this monitoring is spread over a number of years, but we wanted to have the data at the end of the project time, so we increased our monitoring pace. This was more time consuming than budgeted. The increased cost is accommodated within the existing total project budget.

E4 Project coordinated seminars, workshops, conferences, field trips and public meetings: This action has been more time-consuming than budgeted. We have arranged and attended several conferences, meetings and excursions to gain more knowledge and to inform the public, municipalities, water councils, politicians etc. about the project. The increased cost is accommodated within the existing total project budget.

9. Deliverables

Deliverables	Deadline	Admitted	Content	Status 31/03/2022
A.1 Pre-project ecological status reference points for each river	09/2017	Progress report 30/06/2018, annex 7.2.	In order to create reference points in the form of juvenile densities (fry / 100 m^2) and the number of spawning salmon and trout, this report compiles all available electro-fishing and migration data for the rivers of project ReBorN-LIFE: Kalixälven, Råneälven, Piteälven, Åbyälven, Byskeälven and Lögdeälven.	Completed
A.2 Documentation of culture - history for each river	10/2017	Progress report 30/06/2018, annex 7.4 and 7.5.	A record of the cultural history adjacent to the concerned watercourses (with focus on Lögdeälven, Råneälven and Åbyälven) has been performed within the project, aiming to give a holistic summary of the anthropogenic utilization of watersheds during history.	Completed
A.3 Work plan	12/2017	Progress report 30/06/2018, annex 7.4 and 7.5.	The work plan is a planning tool, clarifying and describing upcoming actions. The work plan is collectively produced up by all parties within the project and is continuously updated and developed.	Completed
C.1 The first compilation of work done-maps of progress, updated each year to be presented at the project website	06/2017	Progress report 28/04/2017, annex 1 and 2.	We restored 10,9 km the first season. The website is updated with new maps after each season.	Completed

Deliverables	Deadline	Admitted	Content	Status 31/03/2022
C.2 The first compilation of work done-maps of progress, updated each year to be presented at the project website	06/2017	Progress report 28/04/2017, annex 1 and 2.	We created 110 spawning beds the first season. The website is updated with new maps after each season.	Completed
D.1 Chapter on monitoring in Final Layman's report including data report year 5	03/2022	Final report 30/06/2022, annex 10.17	By using data from the regional monitoring programme we have compiled a report about the status of fish populations in the rivers. Additionally, we have done some monitoring of glochidia larvae (freshwater pearl mussel) on trout and salmon.	Completed
D.2 Chapter on monitoring in Final Layman's report	03/2022	Final report 30/06/2022, annex 10.17	We have monitored a sample of created spawning sites within the project, in total 347 spawning areas in both counties. Traces of spawning activity have been noticed on 165 (47.6 %) sites.	Completed
D.3 Project report on geomorphology and hydraulics	03/2022	Final report 30/06/2022, annex 10.9	The monitoring has been carried out in Lögdeälven. The results show there was a significant increase in channel planform width during restoration and the geomorphic complexity increased during restoration.	Completed
D.4 Chapter on monitoring in Final Layman´s Report	03/2022	Final report 30/06/2022, annex 10.17	Compiled data from the monitoring of otter in the county of Norrbotten, close to ReBorN project areas, before and after restoration. The signs of otter (dropping and traces) have increase with 29% in the monitoring sites.	Completed
D.5 Chapter on monitoring in Final Layman´s Report	03/2022	Final report 30/06/2022, annex 10.17	By using drones, we have measured the areas before and after restoration. The wet areas have increased with 19.6%	Completed

Deliverables	Deadline	Admitted	Content	Status 31/03/2022
D.6 Report on results of landowner enquires	03/2022	Final report 30/06/2022, annex 10.11	We have sent out two questionnaires, in the beginning of the project and in the end, to landowners and the public. We have also compiled the number of sold fishing licenses before and after restoration.	Completed
D.7 Summary report project effect on ecosystem functions aimed at professionals within the field of expertise	03/2022	Final report 30/06/2022, annex 10.14	A analyse of the effects of the project on ecosystem functions presented in a report. The analyse and the report was done by consultants.	Completed
D.7 Layman's report on project effect on ecosystem functions	03/2022	Final report 30/06/2022, annex 10.17	A chapter in the Layman´s report describes the effects on ecosystem functions.	Completed
E.1 Communication plan completed	12/2017	progress report 30/06/2018, annex 7.13	The communication plan contains guidelines to the communicative work within the project. It has been used as when we have shared knowledge about restoration etc., both for internal and external purposes.	Completed
E.2 Folder	10/2017	progress report 30/06/2018, annex 7.15	A short summery of the project and interviews with people affected by the restoration.	Completed
E.2 Film	05/2020	midterm report 30/12/2020	A short summery of the problems with timber floating and the project and interviews with the project manager and a former person who worked with timber floating.	Completed
E.2 Website	12/2016	progress report 28/04/2017	The website contains information about the project, Natura 2000 and LIFE, our project areas etc. The website is both in English (https://www.rebornlife-eng.org) and Swedish (www.rebornlife.org)	Completed

Deliverables	Deadline	Admitted	Content	Status 31/03/2022
E.2 Notice boards	10/2020	progress report 30/06/2018, annex 7.1	We have produced 45 notice boards and placed them on strategical places along the project areas and in the city halls of municipalities.	Completed
E.2 Layman's report	03/2022	Final report 30/06/2022, annex 10.17	A Layman's reports have been be produced in English and Swedish. It contains a historic background to the timber floating era and the objectives and the results of the project. The report also describes the targeted Natura 2000 species.	Completed
E.3 Chapter in Layman´s report	03/2022	Final report 30/06/2022, annex 10.17	A chapter in the Layman´s report describes the dissemination actions and the four demonstration sites.	Completed
F.1 Established steering committee	08/2016	progress report 28/04/2017	The steering committee has consisted of representatives from all partners.	Completed
F.1 Established reference group	09/2016	progress report 30/06/2018	Instead of having one reference group, we have had smaller groups that have been focused on specific topics.	Completed
F.3 Chapter on after-LIFE plan in final report	03/2022	Final report 30/06/2022, annex 10.17	A chapter in the Layman´s report describes the After-LIFE actions.	Completed

10. Annexes

10.1. Gantt chart, schedule of all actions
10.2. The restoration work done in all areas with maps, km and number of spawning beds.
10.3. Deviation in Vitbäcken, project area Piteälven
10.4. Number of restored spawning sites (action C2) within project ReBorN in county of Västerbotten (LIFE15 NAT/SE/000892)
10.5. Number of restored spawning sites (action C2) within project ReBorN in county of Västerbotten (LIFE15 NAT/SE/000892)
10.6. Monitoring of the salmon and trout stocks in rivers within project ReBorN (LIFE15 NAT/SE/000892)
10.7. LIFE ReBorN – Evaluation of prevalence and intensity of glochidia on Salmonidae
10.8. Monitoring of function of spawning sites of within project ReBorN (LIFE15 NAT/SE/000892).
10.9. River hydromorphological response to restoration as part of the ReBorN project
10.10. Utterförekomst före och efter miljöåterställning av vattendrag i projektet ReBorN LIFE (summary in English)
10.11. Monitoring of rewetted areas (action D5) within project ReBorN in the county of Norrbotten (LIFE15 NAT/SE/000892)
10.12. Monitoring of rewetted areas (action D5) within project ReBorN in the county of Västerbotten (LIFE15 NAT/SE/000892)
10.13. Monitoring of socio-economic impact of the project ReBorN (LIFE15 NAT/SE/000892)
10.14a. Monitoring of the impact on ecosystem functions
10.14b. Ecosystem services, summary in English
10.15. Key Project-level indicators.
10.16. List, links and pictures when ReBorN has been in the media
10.17. Layman's report, in English and Swedish
10.18. Meetings, excursions and conferences in action E3
10.19. Meetings, excursions and conferences in action E4
10.20. Meetings, excursions and conferences in action E3/E4 (combined)
10.21. Meetings, excursions and conferences in action E5
10.22. Documentation from final seminar
10.23. Certificate on financial statement for Coordinating Beneficiary County Administrative Board of Västerbotten and the Associated Beneficiary County Administrative Board of Norrbotten
10.24. After LIFE plan
10.25. The changes in status of water bodies according to the Water Framework Directive due to ReBorN-LIFE (LIFE15 NAT/SE/000892)
10.26. Consolidated cost statement
10.27. Individual financial statement CABV
10.28. Individual financial statement CABN
10.29. Individual financial statement Gällivare
10.30. Individual financial statement Nordmaling
10.31. Individual financial statement SFA
10.32. Individual financial statement SwAM
10.33. Distribution of funds between beneficiaries
10.34. Personnel 2016 CABV
10.35. Personnel 2017 CABV
10.36. Personnel 2018 CABV

10.37. Personnel 2019 CABV
10.38. Personnel 2020 CABV
10.39. Personnel 2021 CABV
10.40. Personnel 2022 CABV
10.41. Other direct costs
10.42. Notice boards