FRESHABIT LIFE IP
Healing the Kingdom of Water

Layman´s Report
Project activities and results 2016–2022

METSÄHALLITUS

Photo: Jari Ilmonen.

Healing the Kingdom of Water

What do brown trout, people, and freshwater pearl mussels have in common? It is the need for clean water, a vital condition for all three. FRESHABIT LIFE IP was an extensive nature conservation project where we restored freshwater bodies such as lakes, rivers, and streams.

The objectives of the water restoration were to improve the habitat of water birds, freshwater pearl mussel, fish, and other aquatic and wetland organisms. In addition to these objectives, restorations promoted the recreational use of the areas and increased their attractiveness or nature and landscape conservation values, which makes this work beneficial for both people and nature.

The improvement of habitats began in the head waters and drainage areas, where even large water bodies originate, and work was also carried out in lakes and main rivers.

When you do something, do it properly: Seven years of extensive project, includes various types of work for the environment and nature, with approximately EUR 20 million.

A significant 60 percent of the project budget was provided by the LIFE programme of the European Union. Rest of the funding consisted of associated beneficiary's own contribution and co-financers contribution.

The immense work required the efforts of many people, as water bodies and drainage areas know no boundaries. This included a large number of research institutes, government agencies, companies, organisations, and funding providers. Everyone was needed: Each brought their own special expertise to support others in the project.

The new methods and models developed in FRESHABIT are available nationally or even internationally, but pilot restoration of water bodies was carried out at local level. Various restorations took place in eight different target areas, including streams, rivers, route waters, bird wetlands, and other lake areas with their drainage areas. In particular, Natura 2000 sites and improving the living conditions of Species in the EU Habitats and Birds Directives were at focus, but positive impacts can also be seen elsewhere across the water bodies.

42
Natura 2000 sites

107
Habitats and Birds Directive species

Photo: Iiro Ikonen.

Target areas

Various restorations took place in eight different target areas:

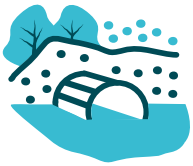
1. Naamijoki
2. Ostrobothnia rivers: Ähtävänjoki, Isojoki
3. Vanajavesi
4. Koitajoki
5. Puruvesi
6. Central Finland: Etelä-Konnevesi, Päijänne, Saarijärvi
7. Karjaanjoki
8. Southwest Finland: Karvianjoki, Kiskonjoki.

Photo: Viliina Evokari.

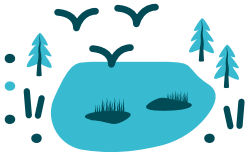
1 Naamijoki

The tributary of the Tornionjoki river, Naamijoki has been an important spawning area for the sea trout, but water quality has deteriorated due to the drainage of the peatland in the drainage area and the cleaning of riverbeds. Little fingerlings do not wish to swim in dirty waters. The precise impact of the restoration took place at the intersection between Teurajärvenoja and Naamijoki, where the water quality is particularly poor. Teuraoja and Kivijärvenoja, which were once channelized, were restored by partial filling of the riverbed and by making a series of wetlands. In addition, emissions from private forestry areas in the river Naamijoki were controlled by building water protection structures.

79 ha
of restored peatlands



2,685 ha
of improved catchment area



2
lakes with water level raised

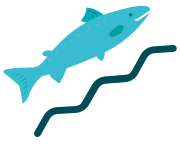
Photo: Jari Ilmonen.

2 Ostrobothnia rivers

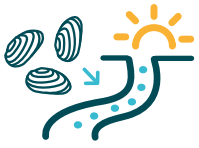
The Lapväärtin-Isojoki river and Ähtävänjoki river together form the Ostrobothnia rivers target area. The River Ähtävänjoki freshwater pearl mussels have spent a successful romantic spa break at the Konnevesi research station and, under careful supervision, the first "test tube babies" have been returned to their home river to grow. There is plenty of restoring to do. Restorations have been made where water is found: In streams, flowing waters, bird wetlands, and peatlands. A major clearing project was completed when the Villamo dam was demolished. The sea trout will now be able to travel more than 70 km further upstream on its migration.

140 ha
of restored peatlands

8,830 ha
of improved catchment area



77 km
of re-opened migration routes for salmonid fish

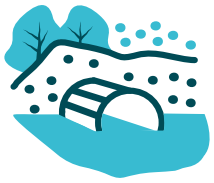


1
saved freshwater pearl mussel population

Photo: Eeva Einola.

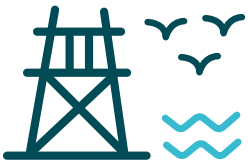
3 Vanajavesi

Especially in the spring, lake Vanajavesi in Häme region can be quite noisy. The bird wetlands of Vanajavesi are popular nesting and resting areas. The majority of Natura 2000 sites managed were bird wetlands, but some head waters were also restored. Even though the excavator is working, and the reed is falling, biodiversity may flourish.



430 ha
of improved catchment area

7
restored bird lakes



5
bird watching towers

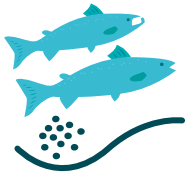
Photo: Maarit Similä.

4 Koitajoki

The extremely endangered landlocked salmon of the Lake Saimaa can be found in the Koitajoki river, in Ilomantsi. The spawning and fingerling areas of the landlocked salmon have been restored both by machinery and by hand. The transfer of moss rocks will accelerate the spread of moss providing shelter and nutrients, but requires a lot of voluntary work. In the Koitajoki area, drainage area restorations and restoration of peatlands were also carried out, both of which aim to achieve the same objective, i.e. to reduce the nutrient load in the water bodies.

490 ha
of restored peatlands

2,525 ha
of improved catchment area



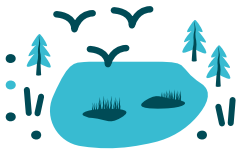
12 ha
of restored spawning grounds for whitefish and land-locked salmon

Photo: ProPuruvesi.

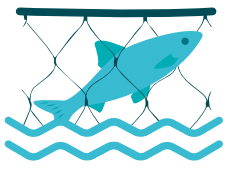
5 Puruvesi

Puruvesi is a lake belonging to the Saimaa Lake complex and famous for its clear waters. In recent years, however, large and shallow bays have begun to eutrophicate. The eutrophication has been fought by building water protection structures that hold nutrients, such as wetlands and surface drainage fields. Nutrients have also been effectively removed through selective fishing, catching 117 tonnes of cyprinid fish in 2016–2021. In addition, overgrown bays have been mowed repeatedly. We also surveyed the underwater nature in Lake Puruvesi.

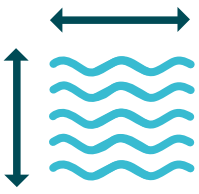
9,720 ha
of improved catchment area



80 ha
of mowed lakeshore habitats



117 T
of cyprinid fish biomass removal

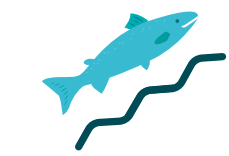


26 ha
surveyed study areas in lakes

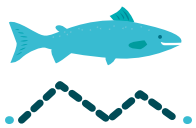
Photo: Saija Koljonen.

6 Central Finland

On the Saarijärvi route in Central Finland, the migratory fish are celebrating. Two fish passes, in Hietamankoski and Leuhunkoski, opened the way for the lake trout and its friends on the entire Saarijärvi route. Water birds are also delighted when their favourite areas in lake Ylinjärvi and lake Kilpilampi, in Karstula, were restored. In addition, we conceived a regional water protection plan for the Arvajan reitti Natura 2000 site, and surveyed the underwater nature in lakes Konnevesi and Päijänne.

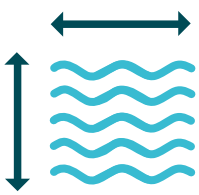


2
fish passes



530 km
of re-opened migration routes for salmonid fish

4
restored bird wetlands

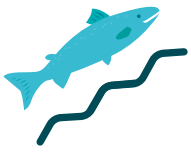


44 ha
surveyed study areas in lakes

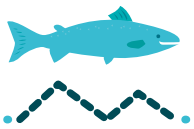
Photo: Jari Ilmonen.

7 Karjaanjoki

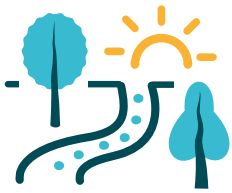
The Karjaanjoki river flows in the middle of the busy Uusimaa region. It is also the home of freshwater pearl mussels, some of which went for a rehabilitation holiday to the Konnevesi research station. In the meantime, habitats of the mussel were restored, and two significant fish passes were also built on the Karjaanjoki River in Åminnefors and Billnäs, which will allow the trout to travel to its home waters again.



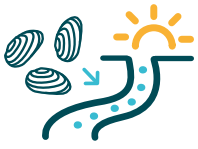
2
fish passes



45 km
of re-opened migration routes for salmonid fish



6 km
of restored streams

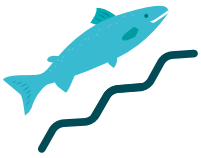


1
saved freshwater pearl mussel population

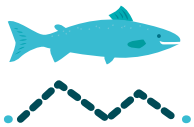
Photo: Rami Laaksonen.

8 Southwest Finland

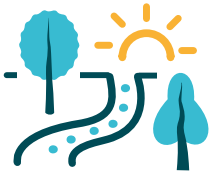
In the rivers of Southwest Finland target area, the work was concentrated in the drainage areas of the river Kiskonjoki and the river Karvianjoki. The possibilities of salmon fish to migrate were improved in the Kiskonjoki river by fish passes built in the area of Koskenkoski power plant and the Hålldam dam. The freshwater pearl mussels of river Karvianjoki had reached a bad state and are recovering at the Konnevesi research station. In the meantime, tributary streams have been restored. In Southwest Finland, a number of METSO nature conservation areas have been established along trout waters.



2
fish passes



45 km
of re-opened migration routes for salmonid fish



14.9 km
of restored streams

108 ha
new conservation areas

Photo: Mika Puustinen.

Boost for nature conservation with complementary funding

The aim of the European Union is to halt the loss of biodiversity in its region. The Natura 2000 network of sites that are important for nature conservation safeguards habitats for habitat types and species defined in the Habitats Directive. The Prioritised Action Framework (PAF) 2021-27 supports the implementation of the Natura network (ym.fi).

The framework programme assesses how the EU funding ought to be directed in the implementation of the conservation of Natura 2000 sites, in order to ensure the conservation status of species and habitats. In other words, the programme indicates whether there is a need for complementary funding. FRESHABIT's PAF working group collected information from various sources of funding and organised seminars for water management experts.

There were many types of complementary projects, which supported our project either directly or indirectly. In the most concrete complementary projects, monitoring was carried out at sites restored by FRESHABIT, or complementary restorations were carried out in the same water bodies.

From the beginning, the aim of the project was to spread the good, and to multiply the LIFE funding. We succeeded very well. Projects complementing FRESHABIT were more than 100, with a total value of EUR 231 million.

There were many types of complementary projects, which supported our project either directly or indirectly. In the most concrete complementary projects, monitoring was carried out at sites restored by FRESHABIT, or complementary restorations were carried out in the same water bodies. Expert cooperation, for example, has enabled the development of forestry methods in a more water-friendly direction, drawing on our experiences, or enabled the data collected by our project to be processed into conclusions and data products.

Photo: Jari Ilmonen.

It all starts from headwaters

The streams of the headwaters are in good condition if they look wild and untouched – a fallen tree here and there, water moss, a winding course, big rocks, and plenty of spawning gravel where the fish can reproduce. A straight and deep stream is rarely in its natural state: often this indicates that land drainage for forestry, clearing and channelising for timber floating or hydropower have molded the streams away from their natural state.

We have restored streams at the project locations, in order for them to provide more vital habitats for fish as well as other species. Streams are also beautiful to look at, and the restoration work also increases the pleasantness of the areas and promotes their recreational use.

Water protection begins on the way to the rivers and lakes

Just like people, water also gets mucky as it travels its long journey. Along the way, the flowing water picks up solids and nutrients that decrease the water quality. This environmental load on the water bodies comes from the entire drainage area and is in part a natural process, but the loading caused by agricultural and forestry activities must be reduced, in order to improve the condition of the water bodies.

We have reduced the environmental load on the waterways in the project areas by using constructed wetlands and other structures that absorb the load.

Modelling can be used to forecast the amount and source of the environmental load in order to help reduce the load and strengthen water protection measures. For the first time, we have combined several loading models into a toolkit, which can be used to, for instance, illustrate how rain water can wash out solids and nutrients into the

Photo: Katarina Pessa.

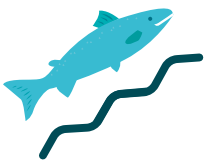
water bodies, from land that has been left bare by forest renewal.

You can learn more about the model family in the FRESHABIT drainage area restoration and modelling story map (metsakeskus.maps.arcgis.com, in Finnish).

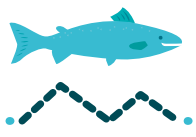
The fish can pass – finally

Few animals have such love for the place of their birth as salmon do. After reaching maturity, the fish return to breed in the same waters in which their life began. Although this instinct is powerful, even the strongest of salmon cannot break through a concrete wall. In Finland, many migratory routes have been blocked by dams.

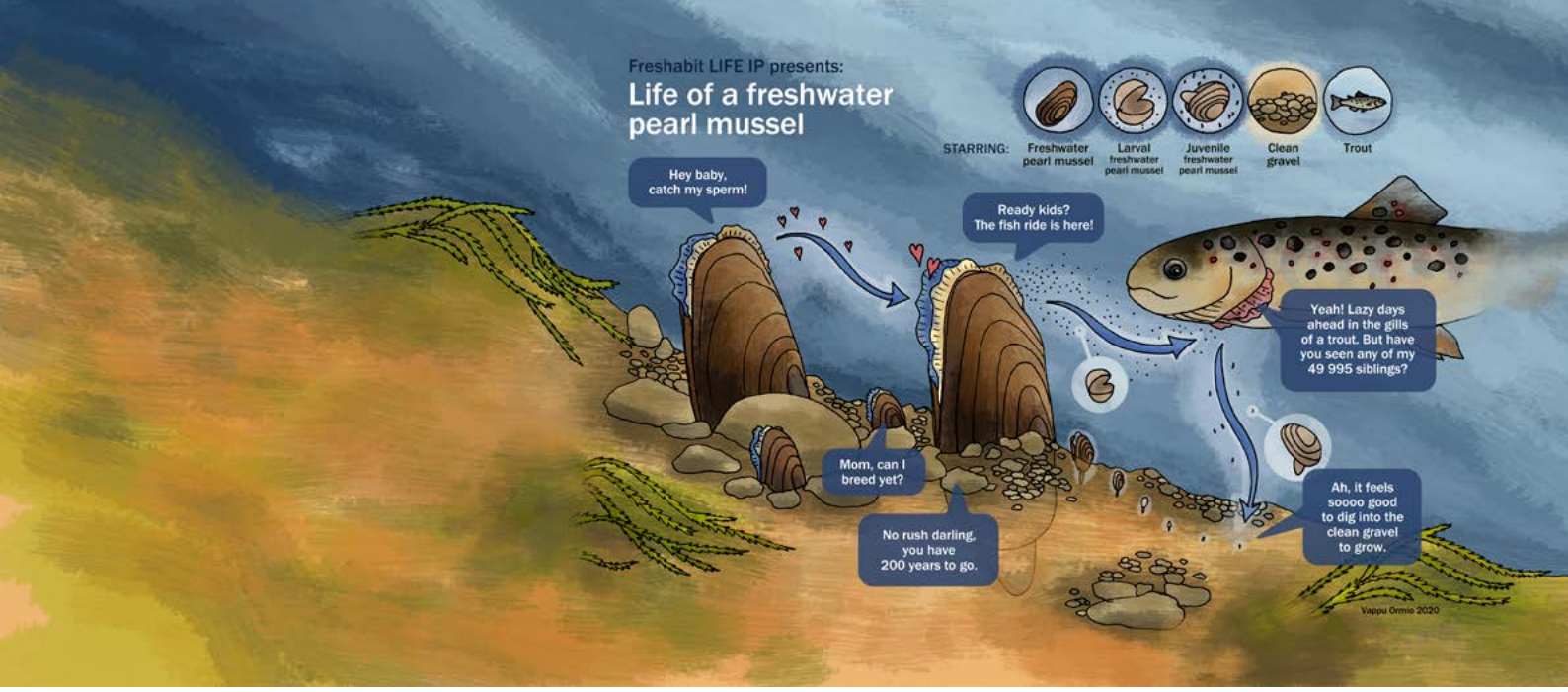
We have fixed these blocked migratory routes in seven of the project locations by building fish passes and restoring the fishes' living environments. These measures are a good beginning, but long-term additional work is needed, including waterway restoration work and monitoring of the outcomes of this. Where migratory routes have been blocked for decades, restoring them also takes a long time.



7
fish passes



700 km
of re-opened migration routes for salmonid fish



Drawing: Vappu Ormio.

Freshwater pearl mussels get a romantic spa break

The status of the freshwater pearl mussel is bad: In the rivers of southern Finland, there are mostly old freshwater pearl mussels that are in a poor condition and do not have the strength to reproduce.

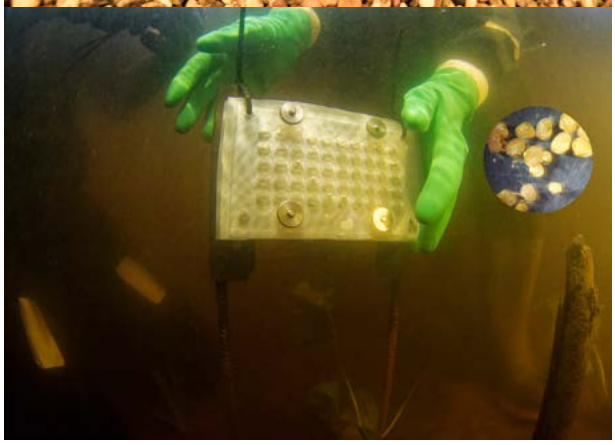
Even if they would have enough strength, their larvae need salmonid fish in order to grow, as they spend their first winter living on the fishes' gills before then descending to the streambed. Without salmon or trout, there is no future for the freshwater pearl mussel. Furthermore, the poor quality of the streams and rivers and the environmental loading from the drainage area inhibit in many areas the growth of the small freshwater pearl mussels, even if there would be host fish for the larvae.

Freshwater pearl mussels from four target rivers have been rehabilitated at the Konnevesi Research Station, and in a rearing establishment in Austevoll, Norway. Good results were achieved and the Finnish freshwater pearl mussel populations from Ähtävänkoki and Mustionjoki rivers started to reproduce during the project.

The small freshwater pearl mussels developed from larvae on fishes' gills were facilitated at the research station, until they were big enough to be returned to their restored home waters.

The young mussels were first transferred back to their own waters in breeding boxes, where they can be monitored for a couple of years. Results from the first river-breeding year 2021–2022 have been promising, showing good survival and growth for the small pearl mussels in both Ähtävänjoki and Mustionjoki.

There are many stages in the life of the freshwater pearl mussel, where everything has to go right.



Photos: Jari Ilmonen.

Photo: Jari Ilmonen.

Knowledge promotes water protection

Lakes and streams contain diverse and largely unknown underwater nature and cultural heritage. The FRESHABIT LIFE IP project has started mapping the unknown and developing mapping methods suitable for inland waters. The methods developed can also be utilised in other areas, thus promoting the conservation work and sustainable use of natural resources in the areas of the most valuable species and habitats.

At times, there seems to be too much information. This is where modelling will be especially useful. By combining spatial data and mathematics, we can enable water-considerate land use design.

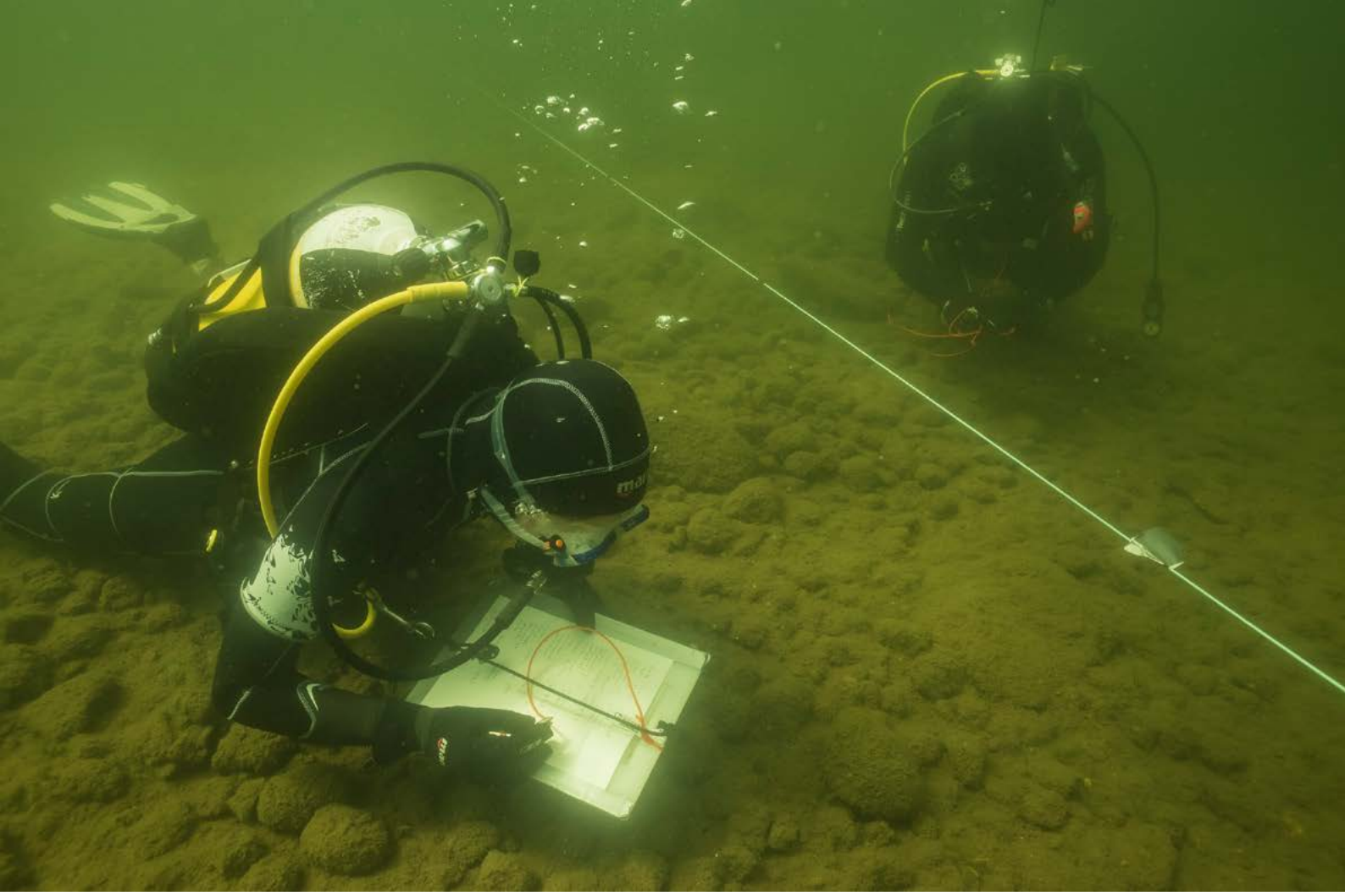


Photo: Jari Ilmonen.

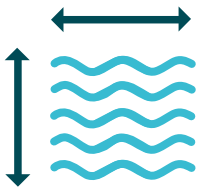
A peak into the depths of the lake

In the land of thousands of lakes, puddles, and ponds, the underwater life still remains largely unknown.

At FRESHABIT, we have been mapping this familiar, yet unknown world using new types of mapping methods. With the help of and extensive field observations, we have collected data on the bottom structure and soil, benthos, and spawning areas of Konnevesi, Päijänne, and Puruvesi.

In addition to nature, we were looking for signs of humans: These areas have been inhabited for a long time, and there are signs of people also in the waters, such as old wooden fishing traps.

Occasionally, lake mapping is a combination of detective work and biology: How to reliably distinguish between various species? What are the ambiguous images on the sonar display? Read more in our Lake mapping story map (storymaps.arcgis.com, in Finnish).



70 ha
surveyed study areas in lakes

Photo: Jari Ilmonen.

The unknown status of streams

Besides lakes, we are also investigating flowing waters. There are more than 100,000 km of headwater streams in Finland, but we do not have a comprehensive picture of their condition. For this purpose, we have developed a spatial data-based mapping method for assessing the status of small streams. The method is based on inventory data on the structure of streams, the shore zone, and ecological status, collected from pilot areas. These inventory data have been combined with spatial data on streams' drainage areas and tested in the terrain. As a result of the work, tools for the design and practical implementation of national water management have been created.

Streams are small in size, but why are they so unknown? See our story map for new ways to assess the status of streams and the surrounding nature (syke.maps.arcgis.com, in Finnish).

145 km
of stream inventories

Photo: Pentti Olli.

Utilising modelling results to control agriculture and forestry emissions

The less nutrients and solids from forests and fields enter the water systems, the better the water quality. In order to improve water protection effectively, sources of loading must be identified and located. The amounts of nutrients and solids washed from forests and fields can be calculated on the basis of spatial data in various ways.

In FRESHABIT, we have developed computing tools based on open spatial data. These tools can be used to identify locations within the drainage areas that are important sources of load, and which should be specifically targeted at water protection work. These map data are beneficial, for example, in the planning of buffer zones of water bodies in felling areas and various water protection structures in whole drainage areas.

Let the maps and images describe the tools in more detail, and explain why they play a crucial role in water protection:

- FRESHABIT LIFE IP catchment area restorations and modelling (metsakeskus.maps.arcgis.com, in Finnish)
- Effects of forest cutting scenarios on nutrient loading (metsakeskus.maps.arcgis.com, in Finnish)
- Saarijärvi route regional water protection plan for forestry (metsakeskus.maps.arcgis.com, in Finnish).

Photo: Viliina Evokari.

Restoration of water bodies

The battle for the bird wetlands

Nature requires assistance in recovery – often restoring species and habitat diversity from human exploitation can be boosted by excavator grabs or mowing.

Many birds are feeling blue. Due to the increase in nutrients, the old glory of bird waters threatens to be just a memory. It is hard to paddle around and dive in dense reed fields. The overgrowing is the result of eutrophication of water and the lack of shore pasturing. In many bird wetlands, the water level has been lowered to meet the needs of agriculture for pasturing and cultivation.

We restored the bird wetlands by raising the water level, removing shore vegetation, digging open water streambeds, increasing shore pasturing, and reducing the number of small predators, such as raccoon dogs and minks, which are invasive species in the Finnish nature. The results of the restoration work are especially enjoyable for water birds, gulls, and waders, but also for other wetland birds.

The restoration of bird wetland sites in the Vanajavesi area is facing a fairly common problem: The overgrowth of lakes due to excessive solids and nutrient loads originating from the drainage area.

Seven bird lakes were restored in Vanajavesi. Lake Ahtialanjärvi is a shallow, eutrophic

Photo: Eeva Einola.

bird lake close to the city centre of Lempäälä where, during nesting season, there is a real buzz. In lake Ahtialanjärvi, the battle against the aquatic flora has meant mowing large stands of reed-grass each year.

Several nesting islands have also been built there during the FRESHABIT project. At best, dozens of birds can be nesting on a few-square-metre nesting island. The popularity of the area is ensured by highly effective domestic safety forces – a black-headed gull colony, who loudly keeps the egg thieves away and ensures nesting peace for all bird species, regardless of size or colour.

There are times, when mowing is not enough, and more robust measures are needed, i.e. excavators. The eutrophicated lake Tykölänjärvi has been dredged and the submerged weir has been renewed.

In Tykölänjärvi, there are unusual inhabitants benefiting from the restoration of the lake: A dragonfly species specialised in water-soldier lakes, the green hawker, laying eggs only on water-soldier crop, which only occur rarely in certain types of lakes in different parts of Finland.

The birds can once again live happily in Vanajavesi. One of the finest bird landscapes in our country can be explored in more detail in a separate storymap (storymaps.arcgis.com, in Finnish).

11
restored bird wetlands

Photo: Viliina Evokari.

Eat the roach

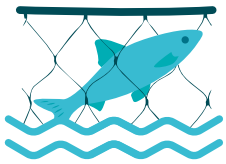
Unfortunately, eutrophication is also accelerated by movement under the surface of the lake. Cyprinid fishes are good in their main task, i.e. reproducing and finding food. With their soft mouths, they dig food from the lake bottom and, simultaneously, nutrients accumulated in the bottom are released into the water. Roach, rudd, white bream, bream, tench – the list of eutrophic species goes on.

When small perches are put in, the fish stock of many lakes is skewed: Plenty of small fish of prey, but the predators have disappeared. Large predatory fish relying on their sight do not manage in the muddy water, unlike cyprinid fishes that chew on everything they come across. A large number of small fish eat a lot of zooplankton. As nutrients increase and zooplankton declines, phytoplankton increases.

Selective fishing can provide first aid to an eutrophicated lake. When masses of cyprinid fishes are removed from the lake, so are large amounts of nutrients. In a balanced lake ecosystem, predatory fish, such as pike-perches, pikes, and large perches, keep the cyprinid fish population under control, while the zooplankton does the same for the phytoplankton.

In FRESHABIT, selective fishing was carried out on two lakes.

- See the fishermen at work in the Naamijoki river (youtube.com, in Finnish)
- Read more about management fishing in Puruvesi story map (propuruvesi.maps.arcgis.com).



145 T
of cyprinid fish biomass removal

Photo: ProPuruvesi.

Water protection structures to the rescue

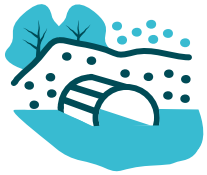
On their way from the head waters of the drainage areas to the water bodies, rain and melting waters collect nutrients and solids. If the water's force is not considered when shaping the soil and restoring ditches, rain flushes over the bare ground surface, and the flowing water erodes the streambeds in the drainage area, Nevertheless, the erosion can be significantly reduced by careful planning, recognising and respecting the force of the water.

Over time, humans have heavily shaped the water routes and reduced the amount of water remaining while cultivating the land, and draining peatlands, thus exposing the water bodies to increased loads. However, building barriers can decrease the accumulation of nutrients and solids into the water bodies', and thus soften the impacts of human activity.

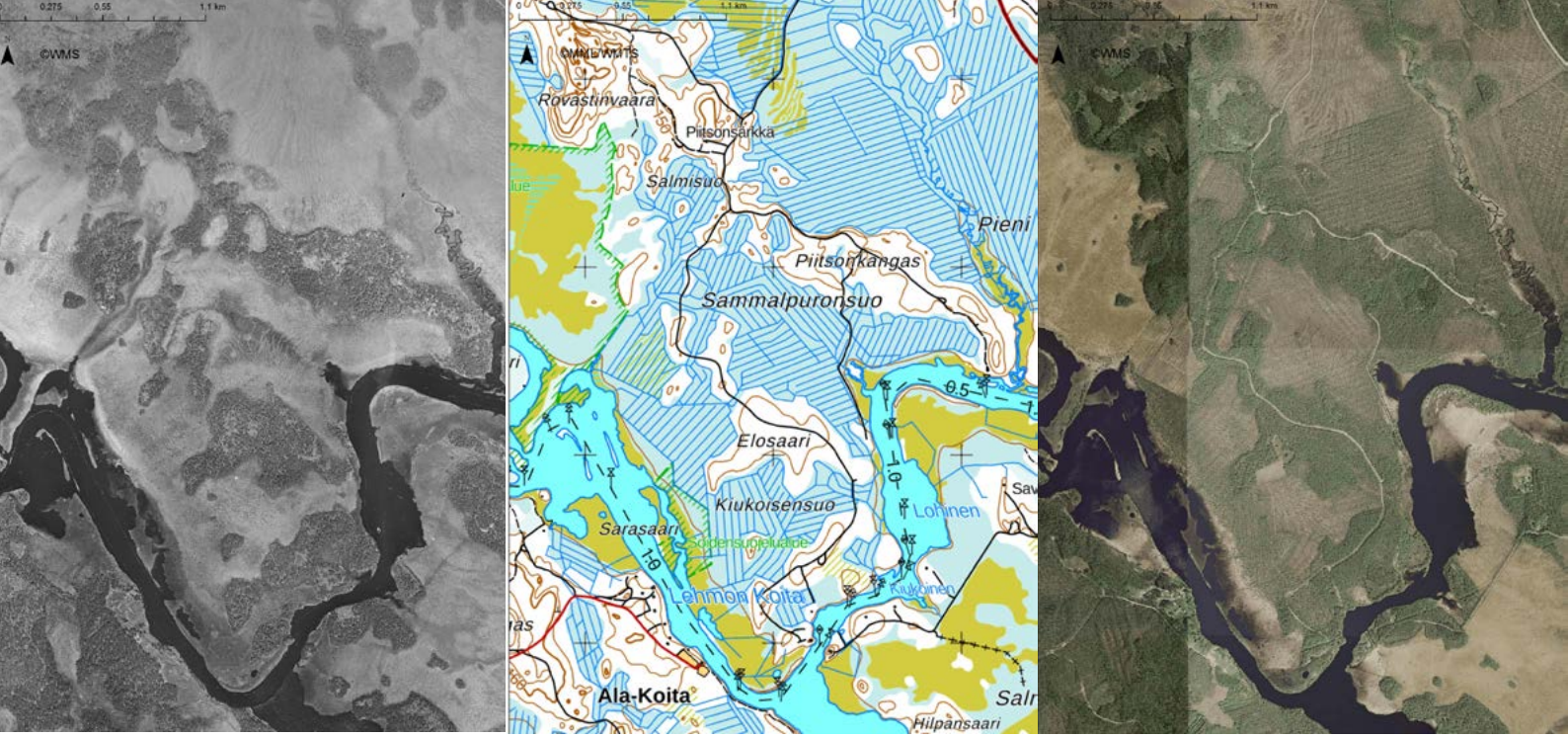
FRESHABIT reduced the load on water bodies by building surface drainage fields, wetlands, and submerged weirs in man-made streambeds. These structures slow down the flow of water and give the solids time to land at the bottom of the basins and ditches. By blocking ditches and directing water to flow on the ground surface in surface drainage fields, we give nutrients time to be absorbed into soil and vegetation.

Kuonanjoki ('slag river'), worthy of the name, carries nutrients from its drainage area, making Puruvesi, known for its clear waters, cloudy. The loading is reduced by precise procedures, i.e. by building numerous sedimentation basins, wetlands, and submerged weirs across the river drainage area. The picture shows the restored wetland on the Pieni Vehkajärvi lake. The storymap "Towards a cleaner Puruvesi" (propuruvesi.maps.arcgis.com) presents the implemented water protection structures in an interesting and clear manner using images and videos.

40 ha
of constructed wetlands



500
water protection structures



References: Aerial pictures 1944 and 2017. © National Land Survey of Finland 2021.

Traces of peatland drainage to be repaired for a long time

The restoration of peatland nature allows water to stay in the same location. Ditch drainage has dried the peatlands, and increased the amount of nutrients and humus washed from the peatlands into the water bodies. The aim is to restore the former natural state by filling the ditches and, if necessary, removing the trees. As the water level remains high, forest plants are gradually replaced by peatland species, and the peatland landscape begins to recover.

Recovery is slow, taking decades, but beneficial for the nature. The positive impacts of peatland restoration extend far. Restoration reduces the loading on water bodies from drained peatlands. When restoring peatlands also small water habitats can be restored.

The scars of drainage are deep in the soil surface of Finland. A pair of images from Koitajoki area shows how overwhelming the state-subsidised drainage was during the 1950's to 1970's. In Freshabit we restored about 600 hectares of drained peatlands in Koitajoki area, but work still remains for others to be done.

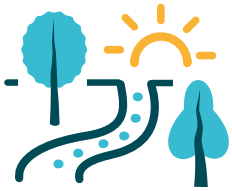
870 ha
of restored peatlands

Photo: Jari Ilmonen.

Only a fraction of the streams left natural

Rivers and streams are not doing well: Most of our flowing waters have been dammed and channelised for the demands of land drainage, logging, flood protection, and electro-economy in the 1900s. In addition, land use in the drainage area, especially drainage, loads the stream waters. This is not a tiny issue – in Finland, there are an estimated 100,000 kilometres of streams, i.e. flowing waters smaller than rivers, and merely a fraction of these remain in natural state. The habitats of water organisms are becoming less diverse, and water quality is deteriorating.

In FRESHABIT, we improved the diversity of the habitat of modified streams by adding rocks, spawning gravel, wood, and aquatic mosses into the water bodies. Furthermore, we improved the water quality by reducing the load from the drainage area by means of water protection structures and by restoring peatlands.



25 km
of restored streams

Photo: Juha-Pekka Vähä.

Throw the volunteers in

What do you have when you combine group work, enthusiasm for spawning, positive goals, and smooth implementation? Good volunteer camps, of course! FRESHABIT has restored several spawning and fingerling areas of migratory fish in various parts of Finland. WWF Finland has been the leader of the voluntary work, and the restorations have been immensely popular.

In voluntary camps, flowing waters were modified more suitable for migratory fish. Enthusiastic stream restorers have poured gravel, stones, and wood material into the water. As well as built dams, reinforced streambeds, and made curves in straight and deep trenches. In just one day, it is evident, how the landscape becomes better for the nature, stone by stone.

5 volunteer camps
40 days of voluntary work
100 participants

Photo: Jari Ilmonen.

Experience underwater nature

Do you always dive with your eyes closed?

Now is the time to open your eyes and experience the underwater nature.

Freshwater nature is proved to be good for us. Nature offers several positive effects: it can strengthen one's mental, physical, and social well-being, as well as support learning. Nature offers various types of well-being services to different groups of people, as can be seen from the report produced by the Natural Resources Institute Finland (jukuri.luke.fi).

Here are tips on experiencing the underwater nature.

Watch!

Worlds of Water (vedenvaltakunta.fi) is a grand, beautiful, fascinating, and also fitting name for Petteri Saario's documentary series on Finnish aquatic nature. The series of six document episodes shows adventures under and above water on diverse inland waters, along waterways, along fish, and on fishers' journeys.

See the series Worlds of Water at YLE Areena (areena.yle.fi, in Finnish).

Photo: Docart.

Photo: Viliina Evokari.

Life of the brown trout

How do I separate a trout from a salmon? What is threatening the life of a trout? How can trout populations be saved? You will receive an answer to these and many other questions at the exhibition of the Yllästunturi Visitor Centre Kellokas. The exhibition is part of Kellokas' basic exhibition, which is free of charge.

However, let us reveal already, that the sharp eye distinguishes salmon and trout from each other by the number of spots and the shape of the upper jaw, tail, and fins.

Photo: Essi Aarnio-Linnavuori.

Learn!

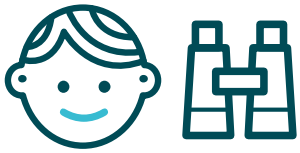
Not for school, but for life: Environmental education is intended for both children and adults, because there is always plenty of wonderful and new matters to learn in the aquatic nature. With these tips, you will familiarise yourself with your nearby stream or cottage shore better – and perhaps discover something completely new. You will also find out how each of us can influence the status of nearby waters.

The Finnish Association for Nature Conservation has drawn up a Vesistöopas (Freshwater guide, pdf 8 MB, sll.fi, in Finnish), which contains good observation tips and encouraging guidance for those interested in waters.

In terms of nature, hydropower is renewable but controversial. Hydropower´s Nature (vesivoimanluonto.org, in Finnish) is an easy-to-understand information package on the impacts of waterpower on nature and how these can be corrected.

Exploring the local waters with schoolchildren has never been easier. Natur och Miljö has compiled a great package of material and exercises in Finnish Syväsukellus matalaan veteen (pdf 6 MB, naturochmiljo.fi) and in Swedish En djupdykning i sötvatten (pdf 6 MB, naturochmiljo.fi). You cannot but be excited about mussel race and the video blogs of small animals.

Instead of pen and paper grab your phone! WWF's mobile learning materials Suuri Rantaseikkailu (The Great Shore Adventure) and Vesistömysteeri (Freshwater Mystery) (wwf.fi, in Finnish and Swedish) also inspire a secondary school student to peek under the water surface. The Adventure in the Kingdom of Water guide (pdf 5 MB, wwf.fi, in Finnish) provides more tips on exploring the aquatic environment.



140
school days
2500
participants

Photo: Eeva Einola.

Experience!

It is always a good time to go into nature, and it will be a little easier when you aim for good hiking opportunities. In FRESHABIT, we have renewed or made entirely new nature paths, bird-watching towers, and duckboards for bird sites in Puruvesi, Southwest Finland, and Vanajavesi target regions.

The materials produced in FRESHABIT are available to everyone. The materials can be found from the project homepage (metsa.fi, in Finnish) and from the story map (storymaps.arcgis.com).

For more information, please contact:

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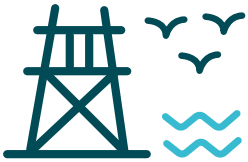
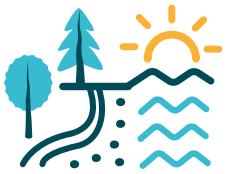


5
bird watching towers



9 km
of new or renovated nature trails

1,500 m
of new duckboards

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www.metsa.fi/en/project/freshabit-eng

Cover photo: Landscape in Puruvesi. Photo: Jari Ilmonen.

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