European Commission

Peatlands for LIFE

Natural peatlands (mires) are unique ecosystems home to many highly adapted, rare and threatened species, found nowhere else. Globally, peatlands regulate climate by storing massive amounts of carbon. Regionally, they influence hydrology, ensure flood prevention and act as a buffer against pollution. Peatlands are also archives of the past, documenting valuable information on biodiversity, climate and pollution in their stratified peat layers. And for centuries, people have depended on peatlands for water, food, fuel and recreation.

View of a Natura 2000 peatland site in Finland.

In Europe, more than half of all pristine peatlands have been lost or converted with only a few currently in good ecological condition. Despite their high environmental, economic and social importance, coupled with their potential to help global efforts in the fight against climate change, peatland degradation continues. This has seen them becoming part of the EU's nature conservation and restoration management policies. The EU Habitats Directive and the Natura 2000 network of protected areas play a crucial role for peatlands' protection, as does the LIFE programme, which has funded numerous projects on peatland restoration and conservation.

Fast facts

- A natural peatland is a wetland ecosystem in which organic matter production exceeds its decomposition. Under conditions of almost permanent water saturation and a lack of oxygen, dead plants and mosses accumulate as peat.
- Peatlands are generally classified as bogs and fens. Bogs are fed mainly by rain and snow, while fens develop in landscape depressions and are fed with surface and/or ground water.
- Peatlands are found worldwide. Despite covering just 3% of the world's land surface, they store nearly 30% of all soil carbon. In Europe alone, peatlands store five times more carbon than forests.
- Peatlands occur across Europe, but they are mainly found in Fennoscandia and the Baltics. Almost one-third of peatlands is located in Finland and more than a quarter in Sweden. Large peatlands can however also be found in Belgium, Estonia, France, Germany, Ireland, Latvia, Lithuania, the Netherlands, Norway, Poland, and the United Kingdom.
- The total area of all peatlands in Europe covers roughly 594 000 km^2, of which 54% are natural peatlands. In the EU Member States (EU27), the total peatland area is 268 000 km^2, of which 51% are natural peatlands.

Figure 1. Peatland distribution in Europe (the map shows the relative cover (%) of peat and peat-topped soils in the soil mapping units (SMUs) of the European Soil Database)

The EU's Habitats Directive distinguishes twelve peatland habitat types. In addition, bog woodland, grouped under the so-called Forests of Temperate Europe, counts as a naturally forested peatland. In total, some 33 000 km^2 of these 13 habitat types are protected in more than 8 700 Natura 2000 sites. This area represents roughly 24% of all remaining natural peatlands.

- In all peatlands, plants, water and peat are intricately connected. Understanding these interrelations is key for their conservation and sustainable restoration.
- Peatlands have for centuries been converted into agricultural land or forest through drainage and fertilisation, causing a dramatic change in the ecosystem. Moreover, at the end of the 19th century, large-scale peat mining first started for fuel and later for horticultural purposes. This peatland degradation continues today.
- Degraded, drained and cultivated peatlands release huge amounts of greenhouse gases into the atmosphere. After Indonesia, the EU is the second largest emitter of emissions from drained organic soils worldwide.
- In Europe, peat layers grow only 1-2 millimetres per year, meaning it takes thousands of years for peatlands to develop. Similarly, degraded mire ecosystems, especially raised bogs and blanket bogs, react very slowly to restoration measures. If such measures are successful, it can take several decades for the ecosystem to improve its conservation status.

RELATIVE AREA COVERAGE (%) IN THE EU PER PEATLAND HABITAT TYPE

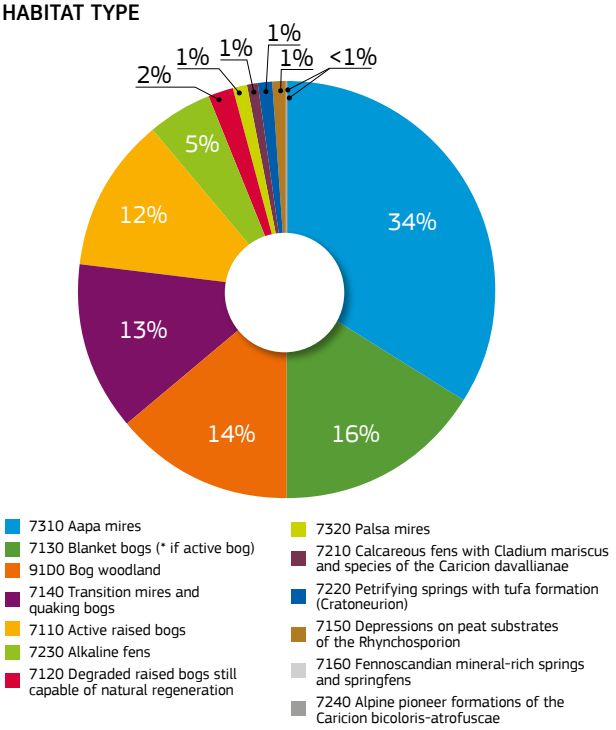

Figure 2: Relative area coverage of the different peatland habitat types in the Natura2000 network

How LIFE and the EU are helping

On 20 May 2020, the European Commission adopted the new **EU 2030 Biodiversity strategy**. The strategy is a comprehensive, ambitious and long-term plan aimed at putting Europe's nature on a path to recovery with benefits for people, the climate and the planet.

Having high biodiversity value and being natural carbon sinks, peatland ecosystems are featured in the strategy, which calls for their restoration and strict protection.

Since its creation in 1992, the LIFE Programme has played a very important role for peatlands in Europe. So far 363 projects to conserve and restore peatlands have been co-financed by LIFE, targeting the 13 habitat types of raised bogs, mires, fens and bog woodland. 28% of these projects focus primarily on peatlands, while others include peatland restoration and associated habitats as part of a larger landscape approach.

Commonly applied restoration actions focus on rewetting by blocking outflow in drainage ditches, installing bunds, removing dikes and fragmenting infrastructure. Other actions include halting the pumping in polders, top-spoil removal and the elimination of woodland to reduce trees competing with peat forming vegetation.

However, despite the large-scale restoration of degraded peatland habitats, their overall conservation status remains unsatisfactory. Out of a total of 62 assessments under Article 17 of the Habitats Directive reporting for the 2013-2018 period, including 13 peatland habitat types in eight biogeographical regions, only seven (11%) currently show a favourable status. This mainly relates to peatlands in remote or inaccessible areas in the Alpine, Boreal and Macaronesian (Azores) biogeographical regions, which are not impacted by human activities. Unfortunately, 31 assessments (50%) are deemed unfavourable bad and 24 (38%) unfavourable inadequate, demonstrating that much more still needs to be done.

Due to the very slow growth of peat layers, the real success and results of LIFE peatland restoration projects will therefore only be enjoyed by future generations. Nevertheless, the first signs of positive trends can already be seen in raised bog habitats in Denmark, the United Kingdom, Poland, and Belgium, where a series of LIFE peatland projects have taken place.

LIFE Nature projects have played a substantial role in large-scale peatland restoration. Over the years, substantial knowledge and experience has been gained on restoration practices for different peatland habitat types in various stages of degradation.

A snapshot of LIFE's work

Reviving a fragile ecosystem in the Scottish Highlands

The 'Flow Country' – 140 000 ha Caithness and Sutherland Peatlands on the northern tip of Scotland - is the largest area of active blanket bogs in the United Kingdom. However, parts have been seriously damaged by hill drainage and forestry, causing both direct loss of habitat and hydrological changes.

The restoration efforts under the LIFE project **Blanket Bog - Restoring active blanket bog of European importance** (LIFE00 NAT/UK/007075) in North Scotland achieved ambitious goals including:

- Purchasing some 3 900 ha of peatlands, including 2 275 ha of pristine blanket bog.
- Removing spruce afforestation and commercial forestry from over 1 500 ha of blanket bog.
- Raising the water level on more than 1 000 ha by blocking drains in peatlands.
- Holding awareness raising activities to boost tourist numbers.

While the project ran from 2001 to 2006, it also developed a management plan for the area until 2015, ensuring the long-term sustainable management of the peatlands.

This project is one of six UK LIFE Nature projects that has focused on blanket bogs since 1998. In fact, thanks to LIFE, more than 10 000 ha of degraded blanket bogs have been restored and and some 42 000 ha of unqiue blanket bog habitats have been positively impacted across the country. This corresponds to 11% of all blanket bogs protected in the UK Natura 2000 network.

Photo: LIFE00 NAT/UK/007075 - © Hans Joosten

An excavator closing drainage ditches at the project site.

Find out more:

https://www.theflowcountry.org.uk/assets/Uploads/PeatlandsStrategy.pdf

A small wild bog gets a boost

Despite its name, Denmark's Lille Vildmose (Small Wild Bog) is the largest active raised bog in Northwestern Europe. Decades of peat-cutting and farming have left their mark on this area of outstanding natural beauty. Of its original 5 500 ha, only about 2 000 are in their natural state today.

Over ten years, numerous large-scale restoration measures were carried out to improve the conservation status of the bog habitats in the **LIFE Lille Vildmose** project (LIFE10 NAT/DK/000102), including:

- Restoring the bog's Lake Birkes to its former glory as a shallow lake with a surface area of 130 ha.
- Raising the water level on 770 ha of peatland.
- Cutting down 200 ha of trees.
- Reducing the numbers of racoon dog, American mink, and red fox to protect the existing breeding birds.
- Erecting two new observation platforms and installing information boards in eight key project areas to encourage tourism.
- Laying the foundations for further restoration on additional areas degraded by peat excavation.

The bigger wetland areas and lakes have vastly improved the living conditions for the resident black stork, wood sandpiper, hen harrier, white-tailed eagle, crane and short-eared owl, among others. Visitor numbers are up with the public keen to know more about this raised bog's ecology and conservation. Thanks to LIFE, Lille Vildmose is now one of the largest and popular nature sites in Denmark.

Beyond **LIFE Lille Vildmose**, six additional LIFE Nature projects have focused on raised bog restoration in Denmark. In fact, concrete restoration measures have taken place on 56% of all raised bog sites in the Danish Natura 2000 network.

Find out more:

https://naturstyrelsen.dk/naturbeskyttelse/naturprojekter/life-lille-vildmose/

Photo: LIFE10 NAT/DK/000102

Part of the restored Lille Vildmose raised bog in Denmark.

Photo: LIFE11 NAT/PL/000423

Poland safeguards its alkaline fens

Restoring alkaline fens in Poland.

photo: LIFE13 NAT/PL/000024

With almost 17 000 ha of alkaline fens in its Natura 2000 network, Poland protects the largest area of this peatland habitat in the Continental Region. The intensive drainage of wetlands has resulted in the loss of 80% of Poland's alkaline fens, which are home to a large number of endangered and protected species. But only 10-15% of these fens still possess their characteristic vegetation.

Two large LIFE projects targeted this unique and species-rich fen habitat: **AlkFens_PL - Conservation and restoration of alkaline fens in the young-glacial landscape of northern Poland** (LIFE11 NAT/PL/000423) and **AlkFens_S_PLife - Conservation of alkaline fens in southern Poland** (LIFE13 NAT/PL/000024). Both projects aimed at halting this habitat's degradation and improving its ecological status by:

- Removing trees on some 240 ha and preparatory mowing on 346 ha for the extensive use of fens.
- Improving water conditions by installing valves, pipes and dams.
- Purchasing 66 ha of fens to ensure strict protection.
- Preparing comprehensive documentation and conservation plans.
- Designating five new nature reserves.
- Reintroducing a rare and endangered plant species, known as bog saxifrage, in the eight best preserved patches of the habitat.
- Monitoring water, vegetation and flora as well as carbon binding in restored fens and publishing results.

Find out more:

http://alkfens.kp.org.pl/en/

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Restoring peatlands across five EU countries

The Baltic States, Poland and Germany have huge areas of peatlands, which are in urgent need of conservation and restoration. The LIFE Clima project **LIFE Peat Restore** (LIFE15 CCM/DE/000138) is coming to the rescue by reviving around 5 300 ha of drained and degraded peatlands in these countries. In addition, a method of standardised measurements and calculation of greenhouse gases is being developed and applied in all partner countries.

The project measures include:

- Rewetting degraded peatlands by filling ditches and building dams to stop water draining.
- Measuring greenhouse gas emissions before and after restoration to show policymakers the vital role peatland restoration plays in curbing climate change.
- Creating guidelines for peatland restoration and use, following EU climate policy and legislation.
- Organising field trips, scientific conferences, workshops, and other activities to raise awareness of peatlands among the wider public.

As well as restoring degraded peatlands in the five EU countries, **LIFE Peat Restore** will also input to climate change mitigation by providing scientists and policymakers with robust carbon data from peatlands. In addition, a handbook and set of guidelines will help politicians, authorities, and conservation managers to make the right decisions when it comes to peatlands' use. Awareness raising activities will enhance the profile of peatlands and their importance among the wider public.

Photo: LIFE15 CCM/DE/000138 - ©Aivars Petrins

Black grouse (Tetrao tetrix) - a rare bog inhabitant at some project sites.

Photo: LIFE15 CCM/DE/000138

A closed drainage ditch from the Augstroze Nature Reserve project site in Latvia.

Find out more:

https://life-peat-restore.eu/en/

Learn more

ec.europa.eu/life
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EU 2030 Biodiversity strategy

https://ec.europa.eu/environment/nature/biodiversity/strategy/index_en.htm

How to apply for LIFE funding

The European Commission organises annual calls for proposals.
Full details are available at https://ec.europa.eu/easme/en/life

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European Commission – Executive Agency for Small and Medium-sized Enterprises (EASME) – B-1049 Brussels (EASME-LIFE-ENQUIRIES@ec.europa.eu).

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