

Project Steering Group Meeting

November 14, 2025

Public awareness activities in Latvia

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The International traveling photo exhibition "Peatlands and Climate. Restoration Stories"

- March – University of Latvia House of Nature
- April – National Botanic Garden of Latvia (Salaspils)
- May – University of Latvia House of Sciences
- June – Mārupe Municipal Council
- July – Olaine History and Art Museum
- August – Mārupe Municipality Library
- September, October, now – Bulduri Technical School



LIFE PeatCarbon Project Steering and Working Group meeting in Helsinki

Key topics discussed:

- Project sustainability;
- Communication strategies;
- The applicability of carbon credits in peatland restoration.

In the last day – a field visit to southwestern Finland



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The International traveling photo exhibition "Peatlands and Climate. Restoration Stories" in Helsinki

Exhibition was opened at the Finnish Meteorological Institute.

Māra Pakalne presented framed photographs by the authors as gifts to the peatland researchers based in Finland.



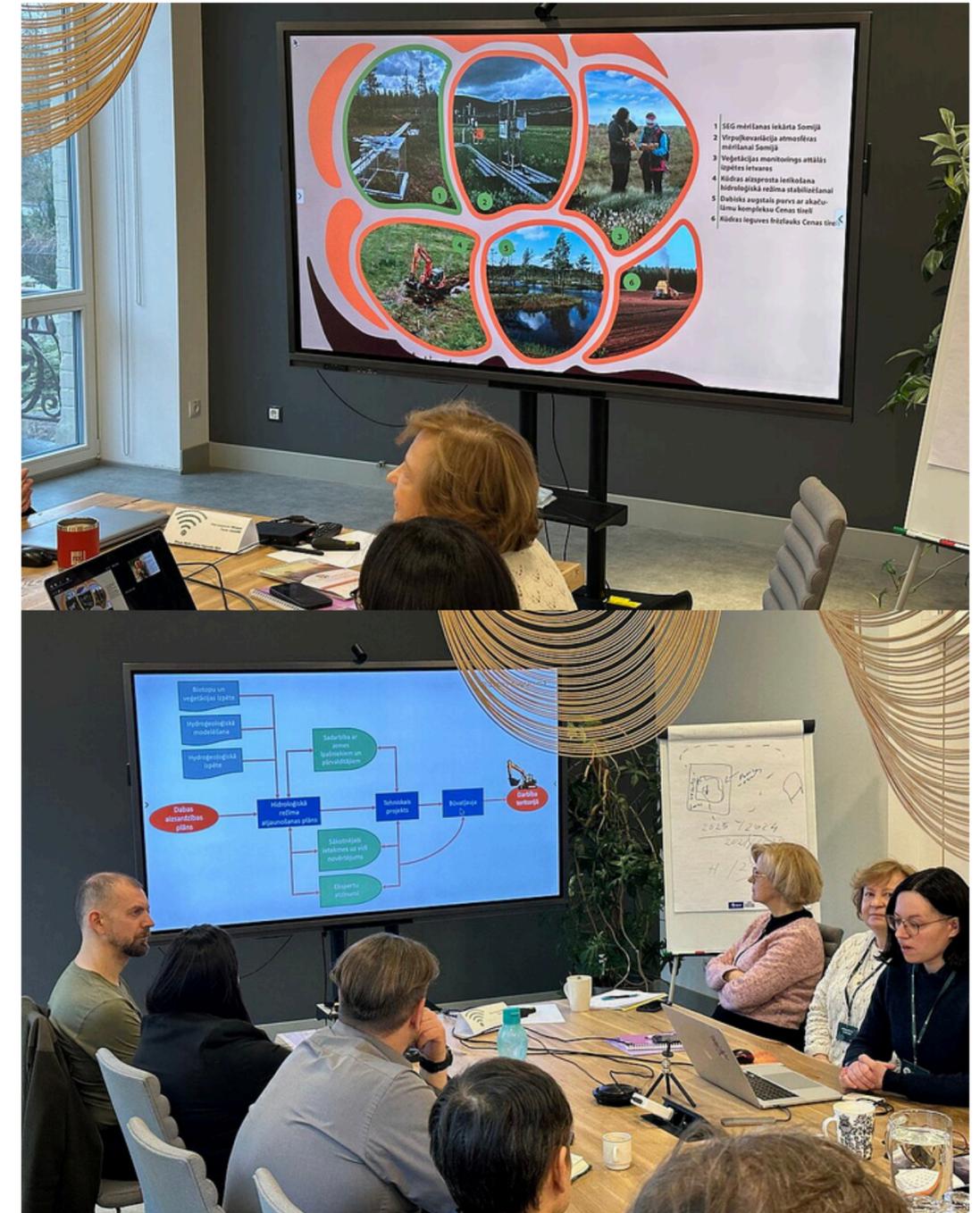
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Meetings with the “Riga Forests” Ltd and Latvia's State Forests

Key topics discussed:

- Peatland Hydrological Restoration and Management in Cena Mire;
- Monitoring and Research: Greenhouse Gases, Hydrology and Vegetation;
- Ecosystem Services and Carbon Credit Assessment;
- Knowledge Exchange and Future Cooperation.



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The LIFE PeatCarbon project in the international spotlight (1)

“EU Research”

13th June 2025

Restoring peat for the climate's sake

- ★ The LIFE PeatCarbon project team are working to restore peatlands across Finland and Latvia, helping save the peat carbon storage and mitigate the impact of climate change, as the project experts Dr. Māra Pakalne, Dr. Tuula Aalto, Dr. Sari Juutinen, Dr. Jenni Hultman, Msc. Rūta Abaja-Felce and Indigo Janka explain.

A significant proportion of Europe's peatlands have been drained over the past few centuries, often for use as agricultural land, which has led to rising emissions of carbon dioxide (CO₂), a major greenhouse gas. Peatlands act as a vast carbon sink in their natural wet state, but when the water level goes down, decomposition is strongly enhanced, leading to the emission of CO₂ into the atmosphere. “The moment that these peatlands are drained they will start emitting CO₂,” explains Indigo Janka, part of the team behind the LIFE PeatCarbon project. There is a balance in peatlands between inputs from plant photosynthesis, and outputs in the form of decomposition, which defines the net carbon sequestration capacity. “The outputs from peatlands, when in a pristine state, are smaller than the inputs, though the difference can be really small. It is question of accumulation over long time. It's a wet environment and anoxic conditions prevail, so decomposition is low. Historically the balance has favoured peat accumulation,” says Dr. Sari Juutinen, a senior researcher at the Finnish Meteorological Institute.

LIFE PeatCarbon project
The situation changes however when peatlands are drained, which leads to an increase in decomposition of the accumulated organic matter, and more carbon is then released to the atmosphere than is sequestered through the peatland. In Latvia, a lot of carbon storage capacity has



Välisuo project site in Finland. Photo: Jack Chapman.

been lost in this way over the past century or so. “In Latvia, peatlands have been drained since the '30s, while large quantities of peat have been extracted for export.”

“We have seen dramatic effects in a restoration area where dams were built in 2006. When you close ditches, water is then kept in the bog. We have seen that the water level has been raised at this site.”

explains Dr. Māra Pakalne, Manager of the LIFE PeatCarbon project. Peatlands in Finland have also changed dramatically over the last few centuries. “Peatlands have been drained extensively in Finland. Around half of the original Finnish peatland area has been drained for forestry,” says Dr. Sari Juutinen, a researcher at the Finnish Meteorological Institute. This trend threatens to accelerate climate change if left unchecked. “The amount of carbon in modern peatlands is almost equal to the amount in the

atmosphere, so big numbers are involved,” stresses Dr. Sari Juutinen.

This issue lies at the core of the LIFE PeatCarbon project, which brings together partners from four European countries (Latvia, Finland, Germany and Denmark) to restore peatlands and help reduce decomposition of old peat layers at four sites in Latvia and Finland. This starts from a deep understanding of the local environment. “In Latvia and Finland we have been carrying out lots of fieldwork, including hydrological, geological and vegetation studies and greenhouse gas flux monitoring, using an applying chamber as well as eddy covariance methods. The combination of methods allows us to get data from a wide area and also truly measure CO₂ exchange

over a peatland forest before and after the restoration, and to compare a restored area with the reference one. We have also developed hydro-geological models of the sites,” explains Dr. Māra Pakalne.

A deep understanding of local conditions provides a solid basis for restoring peatlands, through measures such as building dams and closing ditches, as well as cutting trees, with the aim of raising the water level and reducing peat decomposition. “Restoration actions in the Finnish sites of Välisuo and Matorova



Peatland restoration area in Cena Mire with Skaitis Lake. Photo: Jānis Bālis.

Mires took place in the first half of 2024, and in August 2024 we could already see changes in the water table,” says Dr. Jenni Hultman, a senior scientist from the Natural Resources Institute Finland. The ideal location in which to build a dam depends on the local hydrology, and the project team is looking to establish a fuller picture in this respect. “You have to have an understanding of where the water comes from and where it goes in order to restore the natural hydrology of a site,” points out Dr. Sari Juutinen. Peat and hydrological studies have been carried out at both the Finnish and Latvian sites, including Lielais Pelečāres Mire, an enormous bog in Latvia covering over 5,000 hectares. “It covers a large area and it's only accessible by one road. So it's a big challenge to even reach it,” says Dr. Māra Pakalne. “We're also working at the Cena Mire site near Riga, as well as others.”

The Cena Mire previously covered around 10,000 hectares, but now only 2,500 remain, with much of the rest now used for urban development and agricultural land. Alongside restoring these and the sites in Finland, Dr. Māra Pakalne and her colleagues are also monitoring the impact of earlier restoration work at other LIFE project sites. “We have seen for example good effects in a restoration area where dams were built in 2006. When you close ditches, water is then kept in the bog. We have seen that the water level has been raised at this site, and die-off of pine trees is observed,” she outlines. An ecosystem model is being developed in the project to gain deeper insights into these effects, bringing together data from several sources. “The data collected is being used to train the ecosystem model to better understand the impacts of restoration on GHGs,” says Dr. Tuula Aalto, Finland national project coordinator. “We are using different types of remote sensing data in the project. In Latvia we are using airborne and satellite data, while our Finnish colleagues are working with data from drones and satellites,” says Rūta Abaja-Felce, a member of the project team.

A large amount of airborne data has been collected from most of the project sites, including some where restoration work has already been conducted. This allows researchers to compare the situation before and after restoration work. “We want to look at the effects of restoration. Does it lead to changes that we can see in the data?” explains Abaja-Felce. Some of the reference data will be gathered using the GEST (Greenhouse Gas Emission Site Types) methodology, an approach which



Greenhouse gas monitoring station in Matorova in Finland. Photo: Māra Pakalne.

gives researchers an insight into levels of GHG emissions at different sites based on vegetation and water level which can be further mapped using remote sensing images. “With the GEST methodology, the vegetation associated with different sites are linked with specific GHG flux values, using data on groundwater levels as well,” continues Abaja-Felce. “We can then map the vegetation from above by using remote sensing. In that way we can then look to produce GHG emission maps for each of the project sites.”

This approach is still being refined and modified, as not all GEST types are associated with precise GHG measurements, so scientists are also collecting GHG measurements from the different sites. The relationship between GHG emissions and vegetation types may also vary, depending on the prevailing climate conditions, which Rūta Abaja-Felce says highlights the need for observational data. “There could be some differences between Finland and Latvia for example, so we need these real GHG measurements on the sites, to classify the different vegetation types,” she explains. The

remote sensing data will be classified using information from the available literature, while GHG measurements gathered during the project will add a further level of detail. “We hope to refine our classifications, which will help us identify what types of GHG emissions could be expected from particular types of vegetation,” says Rūta Abaja-Felce.

The goal of ecosystem and hydrological modelling is to build a more complete picture of the relationship between hydrology, vegetation and GHG emissions at peatland sites, which can then guide ongoing restoration efforts. A key indicator of peatland health is the presence of original peatland vegetation, for example Sphagnum moss, which leads - together with other peatland vegetation - to the formation of peat, while the absence of it is linked with degradation. “Very dense cover of heath, without sphagnum mosses under the cover, means that a site is quite degraded,” outlines Rūta Abaja-Felce. This remote sensing method could be a cost-effective way of assessing the condition of peatlands, and in planning their restoration and ongoing



Skaitis Lake in Cena Mire Nature reserve. Photo: Jekaterina Matukova.



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The LIFE PeatCarbon project in the international spotlight (2)

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LIFE PEATCARBON PROJECT: THE ROLE OF PEATLANDS FOR CLIMATE CHANGE MITIGATION

Dr. biol. Māra Pakalne from the University of Latvia provides insights into the LIFE PeatCarbon project by exploring the significance of peatlands in mitigating climate change

Peatlands are vital for biodiversity and water regulation, but remain among Europe's most threatened ecosystems. The LIFE PeatCarbon project brings together experts from Latvia and Finland, with partners in Germany and Denmark, to demonstrate how peatland restoration and greenhouse gas (GHG) monitoring can deliver scalable climate solutions and strengthen regional collaboration.

Information about the LIFE PeatCarbon project

The LIFE PeatCarbon project, running from 2022 to 2027 and coordinated by the University of Latvia, works in Latvia and Finland to improve the site's hydrology and vegetation diversity in over 5,400 hectares of raised bogs and aapa mires. The project reduces GHG emissions, prevents further peatland degradation, and tests remote-sensing-based monitoring methods.

Funded by the EU LIFE Climate Action Programme, it brings together 12 project beneficiaries from Latvia, Finland, Germany and Denmark to develop transferable best practices and cost-effective tools that support climate change mitigation across the Baltic Sea region.

Peatland role in climate change mitigation

Peatlands are vital for climate change mitigation as immense natural carbon sinks – storing about 30% of the world's soil carbon while covering only about 3% of the Earth's surface. Restoring and preserving wetlands, including peatlands, significantly reduces GHG emissions.



Peatland restoration results in Cēna Mire in Latvia. Photo: Jānis Bikše.

In their natural state, peatlands sequester carbon rather than release it as CO₂, accumulating it as peat over thousands of years. Given their ecological importance and carbon storage capacity, protecting and restoring peatland ecosystems is critically important amid increasing environmental pressures and global warming.

Peatlands in Latvia and Finland: General situation

Peatlands in Latvia have been degraded by human activities such as drainage and peat extraction, causing them to transition from carbon sinks to sources of GHGs. Still, the most valuable are now under state protection within National parks and nature reserves. As long as the drainage effect remains, their natural ecosystems continue to deteriorate, highlighting an urgent need for protection and restoration.

The LIFE PeatCarbon project addresses this by applying nature-based solutions across four sites in Latvia – Cēna Mire, Lielais Pelečāres Mire, Melnais Lake

Mire, and Sudas-Zviedru Mire – and two in Finland – Matorova Mire and Vālisuo Mire – to mitigate emissions and revive ecosystem functions.

Peatland studies within the LIFE PeatCarbon project

Within the LIFE PeatCarbon project, scientists conduct comprehensive research on peatlands in Latvia and Finland. They perform hydrological and geological surveys, develop hydrogeological models, and establish water table and GHG monitoring points using chamber and eddy covariance methods. Vegetation monitoring plots assess ecosystem recovery, while wireless sensors, ground-penetrating radar, and remote sensing support hydrological modelling projecting up to 50 years ahead.

In Finland, research also targets microbial dynamics, GHG fluxes, and vegetation shifts. These integrated methods enable precise evaluation of restoration impacts on peatland hydrology, carbon balance, and ecosystem regeneration.



Peatland restoration results in Melnais Lake Mire in Latvia. Photo: Jānis Bikše.

Problems identified through the project's experience

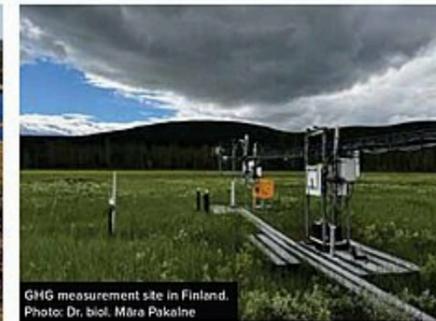
The LIFE PeatCarbon project highlights several major problems affecting peatlands. Decades of drainage for agriculture and forestry have lowered water tables, accelerating peat decomposition and releasing large volumes of GHGs. Peat extraction has further degraded ecosystems, turning many peatlands from carbon sinks into sources of emissions. Invasive plant species and disrupted hydrological regimes hinder natural regeneration.

Climate change intensifies these pressures, increasing the risk of fires and biodiversity loss. Together, these factors demonstrate that without active protection and restoration, peatland ecosystems in Latvia and Finland will continue to deteriorate, contributing to climate change.

Importance of GHG monitoring, methods, results

Monitoring GHG emissions is essential to evaluate the effectiveness of peatland restoration. Within LIFE PeatCarbon, researchers combine ground-based and remote sensing methods to achieve accurate results. Chamber measurements and eddy covariance towers quantify CO₂, CH₄, and N₂O fluxes, while hydrological and vegetation data help interpret emission dynamics.

Remote sensing and modelling tools allow extrapolation across larger areas



GHG measurement site in Finland. Photo: Dr. biol. Māra Pakalne

and long-term projections. Initial results confirm that restored peatlands reduce emissions compared to degraded ones. These insights are crucial for national GHG inventories and policy development, and demonstrate that peatland restoration is an effective climate change mitigation strategy.

Restoring peatlands in Latvia and Finland: Scientific innovation meets climate action

In Latvia, the positive effect of restoration measures at sites such as Lielais Pelečāres Mires, Cēna Mire, Melnais Lake Mire, and Sudas-Zviedru Mire reaches more than 5,400 hectares. Rewetting and blocking drainage ditches have raised water tables, reduced GHG emissions, and created conditions for natural vegetation recovery. In Finland, actions at Vālisuo Mire and Matorova Mire have restored over 300 hectares.

Early monitoring shows improved hydrology and positive trends in peatland ecosystems. Together, these efforts demonstrate that large-scale rewetting effectively transforms degraded peatlands back into functioning carbon sinks and biodiversity-rich habitats, significantly contributing to climate change mitigation.

In Latvia monitoring is carried out also in the LIFE project sites where peatland restoration was carried out in earlier LIFE Wetlands and LIFE Mire and LIFE

Raised bogs projects. Monitoring results show very good restoration sites both by the improved site hydrology regime and the development of natural raised bog vegetation in the previously degraded areas.

Restoring degraded peatlands conclusions

The LIFE PeatCarbon project demonstrates that restoring degraded peatlands is an effective climate action. Rewetting and nature-based solutions significantly reduce GHG emissions, enhance carbon sequestration, and support biodiversity. By combining field research and innovative monitoring, the project provides transferable practices that strengthen climate change mitigation efforts across the Baltic Sea region and the EU as a whole.



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19th September 2025

International participations

- A Conversation for a Greener Future and photo exhibition opening in Berlin, Germany;
- 12th INTECOL Wetlands and 20th European Society of Wetland Scientists Conference in Tartu, Estonia;
- IUCN UK Peatland Programme Conference 2025 in Derry~Londonderry, Northern Ireland;
- BOG4LIFE International Symposium – Peatland Perspectives: restoring for tomorrow in Zwolle, the Netherlands.

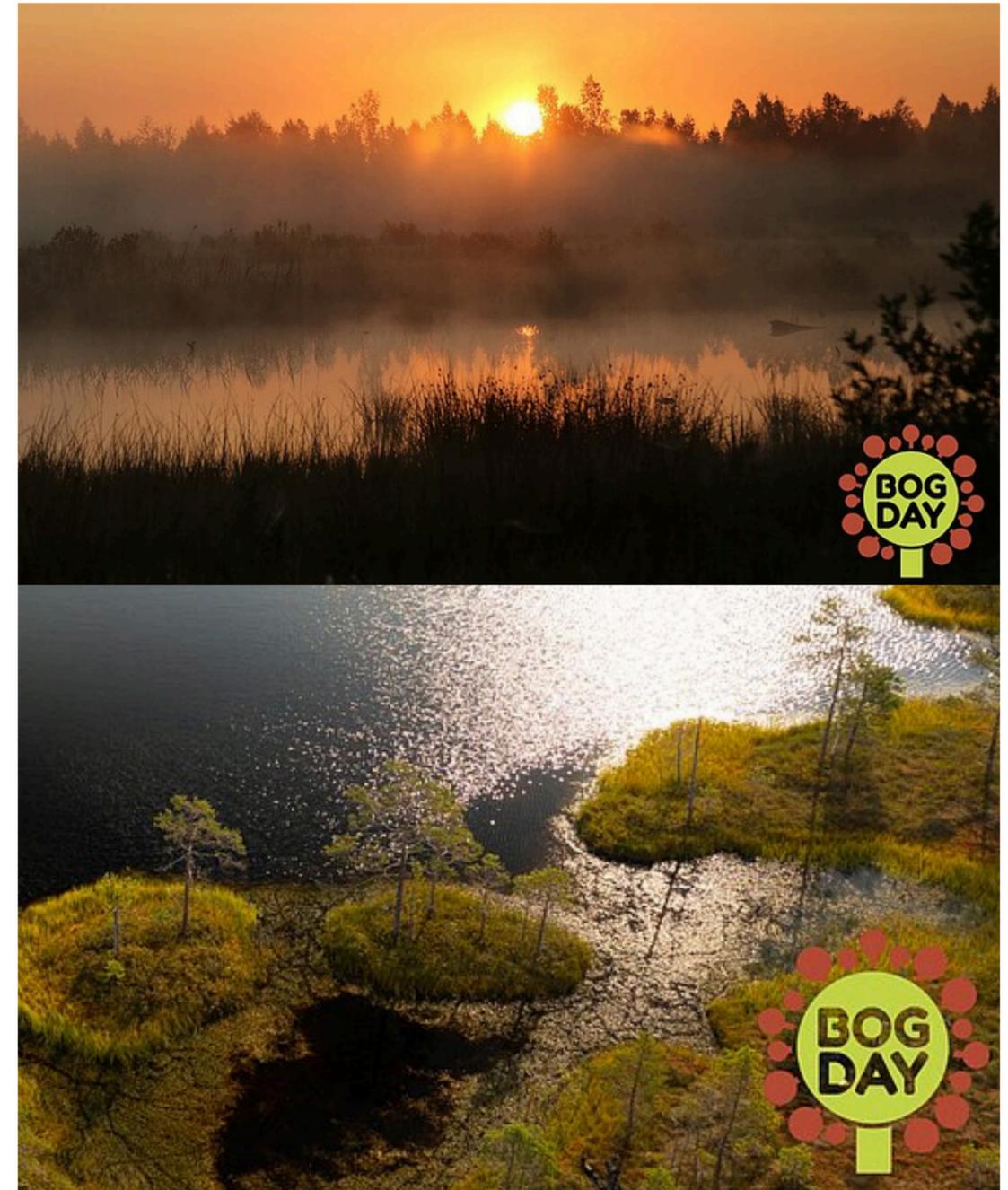


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International Bog Day

- Every year, on the fourth Sunday of July, International Bog Day is celebrated worldwide
- This year, the event took place on July 27
- Project collaborated with IUCN UK Peatland Programme to publish International Bog Day Events



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LIFE PeatCarbon project Demonstration Seminar in Latvia

Key topics discussed at the Cena Mire:

- Peatland Restoration Techniques and Hydrological Recovery;
- Greenhouse Gas Measurement and Monitoring Results;
- Knowledge Exchange and Cross-Border Cooperation;
- Field Practice – pathway to Public Awareness.



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LIFE PeatCarbon project Demonstration Seminar in Latvia (2)

Key activities at the Botanical Garden:

- Exhibition “Peatlands and Climate. Restoration Stories” viewing;
- Opening of the new permanent peatland exhibition;
- Collaboration opportunities for the future;
- Video filming in Demonstration Seminar and at the Cena Mire.



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More information about LIFE PeatCarbon communication activities:



<https://www.peatcarbon.lu.lv/>
<https://www.peatcarbon.lu.lv/en/>



https://www.instagram.com/life_peatcarbon/



<https://ej.uz/facebooklifepeatcarbon>



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