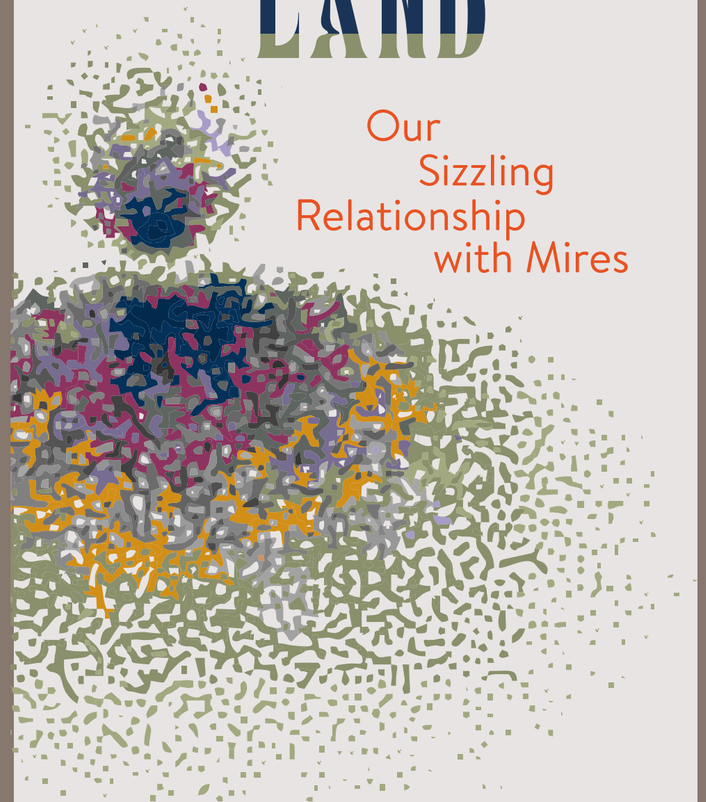
BETWEEN WATER AND LAND

Our Sizzling Relationship with Mires



Take a closer look at the peat moss and try to draw it

Wetlands lie at the frontier of water and land—complex, unique, and biodiverse landscapes that have always held a controversial place in human history. According to the Ramsar Convention, wetlands cover approximately 6% of the Earth's surface, occurring on every continent, including the Antarctic Peninsula. When we look closer at peatlands—where the earth surface is covered with peat—these vital ecosystems account for about 3% of our planet's landmass.

Welcome to an exhibition exploring wetlands in Estonia and around the world, highlighting their profound significance for both humanity and the natural world. On a global scale, wetlands serve as powerful carbon sinks, playing a crucial role in mitigating climate change. They are also unique habitats, providing a sanctuary for countless species that cannot feed or nest anywhere else.

The story of Estonia's mires reflects the fate of wetlands worldwide. Once largely shunned and sometimes even feared, these landscapes—with the growth of human technical capabilities—became areas to be exploited and reshaped according to our needs. However, the rapid disappearance of wetlands has triggered a host of negative consequences, proving their necessity in nature. Today, we have reached a situation where, on the one hand, efforts are being made to preserve and restore the remaining natural wetlands, while on the other, their destruction continues for the sake of economic gain.

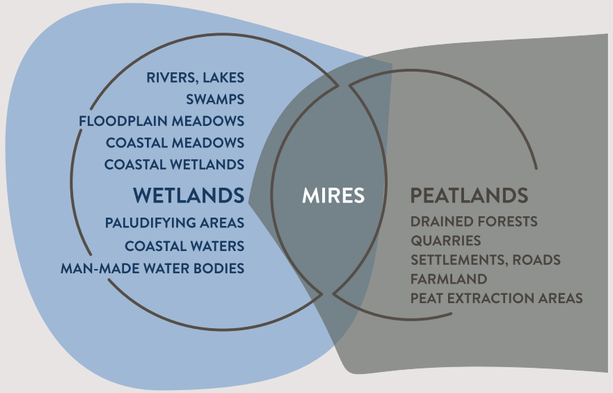
At this exhibition, you are invited to take a moment to explore, play, and reflect on the intersections between people and wetlands.

What is a wetland?

In a nutshell, a wetland is an area of land that is temporarily or permanently wet. A more detailed definition can be found in the international agreement, or convention, signed on February 2, 1971, in the city of Ramsar, Iran. The purpose of this agreement is to conserve and protect wetlands. According to the Ramsar Convention, wetlands are defined as “areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres.”

Check whether these statements are true or false:

All mires are peatlands, but not all peatlands are mires.
All mires are wetlands, but not all wetlands are mires.
All peatlands are wetlands, but not all wetlands are peatlands.



Mires and Peatlands – What Sets Them Apart?

Mires are peatlands defined by a peat layer at least 30 cm thick, which in Estonia accumulates at an average rate of 1 mm per year. Peat formation requires a water table that remains consistently near the surface; in these oxygen-poor (anaerobic) conditions, plant matter cannot fully decompose.

In these saturated environments, peat mosses—small, water-retaining plants—frequently thrive. While peat is also formed by other plant species such as sedges, common reeds, and even trees, peat mosses are the plants most closely associated with mires in Estonia. They are considered the keystone species of a living mire. Estonia is home to 40 species of peat mosses. Mire types vary greatly worldwide, but in many of them, peat mosses remain central to the ecosystem's persistence and restoration.

Peatlands, in this context, refer to areas where the ground is also covered by a peat layer at least 30 cm thick. This includes both current and former, now drained mires. Peat formation has stopped in the drained mires because the water level in the ground has been lowered by humans. Many former mires have consequently been converted into agricultural or forest land. This is why we refer in the Estonian context to many former mires today as peatlands: although peat is found there, they no longer function as viable, living mires.

Nature View: Forest and bog in winter. Photo: Johannes Pääsuke, Estonian National Museum

PEAT: THE LIVING SPONGE OF THE MIRE

We rarely see what lies beneath the surface, but as we step onto a mire, we feel the soft, yielding ground that sometimes squelches underfoot. This elasticity is provided by peat—a soft, spongy, and acidic mass formed from partially decomposed plant matter in a waterlogged, anaerobic (oxygen-poor) environment.
Because fen peat is more decomposed, it is typically darker in color. In contrast, bog peat is lighter and far less decayed, allowing it to hold water just as effectively as a natural sponge.

Compare the weight of the peat samples

These two peat samples were extracted at exactly the same time from the same location. One has been thoroughly dried, while the other remains in its natural state. Lift each piece and compare the difference. This gives you a true sense of how much water peat can hold.

PEAT: A SLOW-GROWING SUBSTANCE

The peat layer beneath the mire vegetation accumulates incredibly slowly—averaging just 1 to 2 mm per year. In Estonia, the average peat thickness is 5 meters, though the record is held by Vällamäe Bog, where the layer reaches a staggering 17 meters. However, a thicker layer does not necessarily mean a more ancient mire. Mires began forming in our region immediately after the retreat of the continental ice sheet, making our oldest mires 12,000 to 13,000 years old.

When peat remains buried for millions of years and sinks deeper into the earth, it compresses into lignite (brown coal) and eventually into bituminous coal. These specific mineral resources are not found in Estonia.

„Grow" a Peat Layer

Take a piece of yarn from the basket and weave it into the warp. Each strand is approximately 1 mm thick, representing the average annual growth rate of peat. Using this scale, can you calculate the age of a typical Estonian bog with a 5-meter-thick peat layer?

MIRES AMONG ESTONIA'S WETLANDS

Estonia's climate is highly variable. Compared to humid tropical regions, it is cooler here, and the proximity of the sea further increases air humidity. For these reasons, a portion of the precipitation that falls does not evaporate. Additionally, Estonia's landscape is quite flat, and various soil types retain water efficiently. Consequently, Estonia is a favorable place for the formation of wetlands.

One distinctive type of wetland is the mire. Mires form either in moist depressions (e.g., on clay soil) or in places where lakes have become overgrown. Through the interaction of water and plants, peat is created—a mass of plant remains that has not fully decomposed. The appearance of these mires depends on the thickness of the peat layer and the amount of nutrients present. In Estonia, one can find both open, treeless mires and those covered by forest.

Estonian wetlands can be classified in many different ways. Here, we have divided them into six categories.

Identify the Wetland Types

Can you identify which type of wetland is featured in each photograph?
Place a matching colored magnet on the photo to mark your answer.
Flip the panel to reveal the correct colour.

Springs and Lakes

In Estonia, it is rare to see the bottom of a body of water, but with springs, it is possible. Springs bring deep groundwater to the surface, they do not freeze even in harsh winters. Large springs can form cold, nutrient-poor lakes with whitish tufa sediments at the bottom. Most Estonian lakes, however, are characterized by brownish water and dense vegetation. Streams and ditches carry sediments and nutrients into them, fueling vigorous plant growth.

Rivers and Floodplain Meadows

Rivers act as nature's highways, transporting water, nutrients and life across the landscape. Along the riverbanks, soft-stemmed plants are uniquely adapted to withstand the constant pull of the current.
When a river's gradient is gentle and its banks are low, floodwaters deposit nutrient-rich alluvial sediments across the valley floor. This process creates fertile floodplain meadows, where life flourishes during the warmer months. These meadows serve as vital nesting and foraging grounds for birds, while seasonal floods provide essential spawning habitats for fish.
In some of these extraordinarily biodiverse areas, a single square meter can host more than 40 different plant species.

Shallow Seas and Coastal Meadows

In Estonia, the dynamics of seawater are shaped by wind, coastal morphology, precipitation, and wave action. Where the coastline is low-lying—particularly in Western Estonia and on the islands—sediments, brackish water, and nutrients are carried far inland, creating unique habitats known as coastal meadows. Traditional grazing is essential to keep these landscapes open, maintaining a mosaic of short-grass turf, brackish lagoons, and salt pans. These coastal systems are also vital for the planet; when sediments accumulate in these shallow waters, they become highly effective at carbon sequestration, locking carbon away from the atmosphere for centuries.

Fens and Spring Fens

Where the peat layer is thin, the roots of wetland plants can still reach the underlying groundwater to obtain a steady supply of nutrients. As a result, fens are generally characterized by high biodiversity and lush vegetation. It is in these species-rich fens that the majority of Estonia's orchids are found. Occasionally, however, the groundwater may be nutrient-poor, leading to a more sparsely populated, species-poor fen. In spring fens, groundwater flows directly to the surface, creating unique, constantly saturated habitats.

Transitional Mires

As the peat layer gradually thickens, the roots of many plants can no longer reach the nutrient-rich groundwater below. At this stage, we begin to see a shift in the plant community; peat mosses (*Sphagnum*) and cranberries emerge, and in some areas, common reeds may still grow vigorously. We have entered a transitional mire.

Raised Bogs

As the peat layer thickens over time, peat mosses become the primary architects of the landscape. Beneath stunted, dwarf pines, the intoxicating scent of marsh Labrador tea fills the air. In early summer, the white, fluffy heads of hare's-tail cottongrass can turn the entire surface of the bog snowy white. With its shimmering pool-eyes and vast moss carpets, the open raised bog is undoubtedly Estonia's most picturesque and iconic wetland.

Baltic Dunlin (Calidris alpina schinzii). Photo: Pjt56, CC BY-SA 4.0

MIRES AS A HABITAT

The life within a mire reflects the landscape itself: not overly flamboyant, but unique and specialized for soft terrain and waterlogged conditions. When comparing different mire types, fens are more species-rich than raised bogs because they are nourished by mineral-rich groundwater. In contrast, raised bogs receive their meager nutrients solely from precipitation and airborne dust. Because the peat moss carpet tightly sequesters water, many bog plants have—surprisingly—adapted to dry conditions.

The soft terrain and open vistas of the treeless bogs provide a safe nesting ground for birds—sandpipers and golden plovers in the raised bogs, and common cranes in the transitional mires or fens. Waterlogged patches across these wetlands are ideal breeding grounds for dragonflies and various other insects, which in turn serve as prey for both spiders and birds. Large mammals visit these mires seasonally, primarily in summer, or use them as safe resting places during migration. There are obligate species that cannot survive anywhere else—such as sundews, cranberries, peat mosses, or the willow ptarmigan—while for others, these wetlands represent a vital sanctuary within their wider world.

Build the Mire Biodiversity Tower

The complex web of relationships between species sharing the same environment forms a unique, resilient community—a natural ecosystem held in delicate balance. Each block in this game represents an essential species or group that lives in a fen, transition mire, or raised bog.

Use these blocks to build a Tower of Mire Biodiversity, symbolizing how species within a community support one another. Try building your tower chronologically: start with fen species at the base and finish with raised bog species at the top, mimicking the natural history of a mire.
How many blocks can you carefully remove and reposition at the top before the structure collapses? When too many species—especially keystone species—are lost, the entire community eventually ceases to exist.

- FEN SPECIES
- TRANSITIONAL MIRE SPECIES
- RAISED BOG SPECIES
- PROTECTED SPECIES
- LOCALLY EXTINCT SPECIES

PEOPLE AND MIRES

Modern technology has given humans the power and capacity to transform "useless and dangerous" wetlands into something more profitable and tailored to our needs. The value of peat, which has accumulated slowly beneath the earth over millennia, gained significance in Estonia in the late 19th century, when it was first used on farms as fuel and animal bedding.
Industrial-scale peat extraction began in the 1920s, reaching its peak in the 1970s and 80s when up to two million tons were harvested annually. While extraction continues today, peat is now primarily used in horticulture, with the majority being exported. Ultimately, it is through drainage and extraction that human activity has most profoundly reshaped the face of Estonia's mires.

Share Your Mire Story in Our Guestbook

Dear Guest, we would love to hear from you! If you are willing, please share a story, memory, or experience related to the wetlands with other visitors and the exhibition team.

Berry pickers in the forest near Tuusna, 1929. Iisaku Parish

1 Digging a ditch on the southern boundary of the Tammsaare farms. A.H. Tammsaare Museum in Vargamäe

2 Digging a ditch in the Uulu-Tahkuranna bog settlement. Foundation of Estonian Rural Museums, Estonian Agricultural Museum

3 The National Geographic "Yellow Window" in Valgesoo Bog, Põlva County. Estonian National Museum

4 Berry pickers in the forest near Tuusna, 1929. Iisaku Parish. Estonian National Museum

5 Hunting stand near Vana-Kaiu village at the edge of Loosalu Bog. Photo: Hanno Talving, Estonian Open Air Museum

6 Students on a hike. Estonian National Museum

7 Harvesting bedding peat in Ridalepa Bog. Pärnu Museum Foundation

8 The famous winter road – "Viru Road" – across Sirtsi Bog. Overview map of the Republic of Estonia 1:200,000, 1938. Land and Space Board

9 A ditch excavated by machine in the Kärevere Forest District. Foundation of Estonian Rural Museums, Estonian Agricultural Museum

10 Adila Bog Reclamation Society. A finished drainage ditch. Foundation of Estonian Rural Museums, Estonian Agricultural Museum

11 Berry picker. Katase village, Iisaku Parish. Estonian National Museum

12 The peat industry: A view of peat stacks in a bog. Estonian History Museum

13 Peat extraction in Laane (Urkete) Bog, Vee Parish, in the 1920s. Estonian National Museum

14 Ilmari Manninen and Arno Mõtus in the middle of Avaste Bog, on their way from the Maalinna bog island to Vigala. Estonian National Museum

15 A peat-cutting trench in the Rabivere raised bog, Hageri, where the legs of a corpse were uncovered at a depth of 110 cm at the upper end. Estonian National Museum

16 Observation tower in Kuresoo Bog, Soomaa National Park. Photo: Hanno Talving, Estonian Open Air Museum

17 Bogshoers on a hike in Marimetsa Bog. Estonian National Museum

18 Drone footage: Mattias Veermets. Osoon presenters on a former winter road through Avaste Bog

19 Windrowing peat in Ervita Bog, 1964. Järvamaa Museum

20 Palasi hideout. Virumaa Museums Foundation

21 Botanist Viktor Masing sitting on a wooden boardwalk in Endla Bog, holding a pine shoot. University of Tartu Museum

22 Lake Nigula in Nigula Bog, Pärnu County, 1967. Pärnu Museum Foundation

23 The fourth Spring Bog Run. Photo: Gunnar Vaidla, Estonian Sports and Olympic Museum

Botanist Viktor Masing sitting on a wooden boardwalk in Endla Bog, holding a pine shoot. University of Tartu Museum

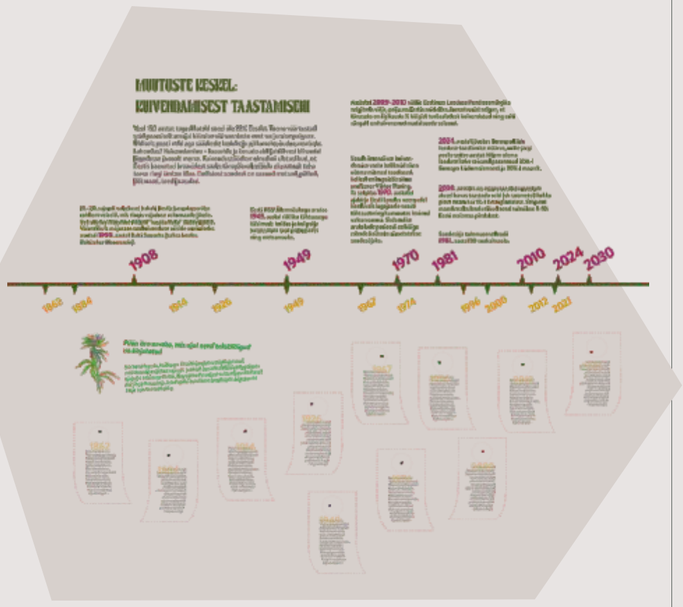
IN THE MIDST OF CHANGE: THE MIRE WAR

In response to the rapid disappearance of mires due to intensive drainage, a public movement to preserve Estonia's mires emerged in the 1970s. This period is famously known as the "Mire War". Professor Viktor Masing became a leading figure advocate for the protection of these ecosystems, and as a result of the movement, 30 mire conservation areas were established in 1981.
Despite these efforts, the majority of mires in Estonia and across Europe have been lost. Today, mires cover only 7–8% of Estonia's total land area, with approximately 70% of those remaining under state protection. Most protected areas are raised bogs, as fens and transitional mires have become even rarer. Over the last 15 years, a new perspective has emerged: a commitment to wetland restoration, seeking to give back at least a small portion of the land once taken from the mires.

This display traces the shift in public discourse on mires through newspaper headlines and articles. It spans over a century of changing perspectives: from an 1895 aphorism and Soviet-era "shock work" in drainage to the "Mire War" of the 1970s and the modern reclamation of bogs as symbols of national identity.

IN THE MIDST OF CHANGE: FROM DRAINAGE TO RESTORATION

Just 150 years ago, mires covered over 22% of Estonia. At that time, these wetlands were valued primarily as places for berry-picking or as refuges from invading enemies. Generally, however, they were viewed as mosquito-infested wastelands and a farmer's nightmare. The solution? Drainage. Using a vast network of ditches and pipes, water was channeled away into rivers and out to sea. These drainage efforts were so immense that the total length of the ditches dug in Estonia could circle the entire Earth along the equator. Today, these former mires have been transformed into forests, farmlands, industrial sites, roads, and settlements.



The lower section of the display features excerpts from Estonian fiction describing our bogs. Visitors are invited to identify the title, author and time period of each excerpt. Together, these stories illustrate the dramatic cultural shift from a historical fear of the 'terrifying bog' to a modern appreciation of its beauty and harmony.

At the turn of the 20th century, cattle farming in Estonia expanded rapidly, driving an urgent need for new grasslands. This turned the attention of estate owners toward the "useless" mires. To investigate the most effective methods of wetland drainage, the Baltic Mire Society (Baltischer Moorverein) was founded in 1908.

In 1949, the Supreme Soviet of the Estonian SSR debated a matter of national importance: how and to what extent to drain mires for conversion into farmland and commercial forest.

As intensive drainage programs accelerated, several scientists began to speak out in opposition, with Professor Viktor Masing emerging as the most prominent voice. Throughout the 1970s, he used the pages of the magazine Eesti Loodus to repeatedly explain the ecological vitalness of these wetlands and to debunk deep-seated misconceptions. This period of heated public debate, centered primarily on the preservation of raised bogs, became famously known as the "Mire War".

As a result of this movement, 30 mire conservation areas were established in 1981.

Between 2009 and 2010, the Estonian Fund for Nature conducted a comprehensive inventory to determine the state of Estonia's remaining wetlands. The study revealed that approximately two-thirds of all peatlands have been drained, with the condition of fens having deteriorated most severely.

In 2024, the European Union's Nature Restoration Law came into force. It mandates that by 2030, restoration measures must be in place for at least 20% of the EU's land and marine areas.

By 2030, according to various strategic plans, Estonia aims to restore mires (including swamp forests) across just over 1% of the country's total territory. If successful, functional, natural mires would then account for 8–9% of Estonia's land area.

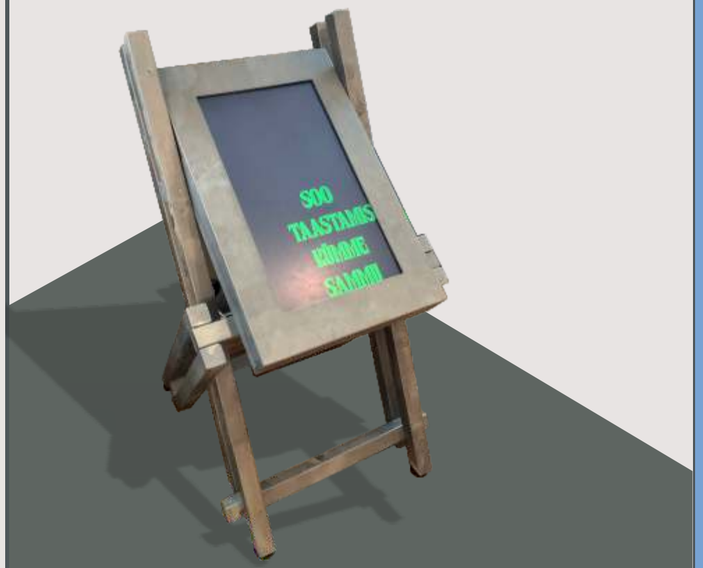
"Life is much like a mire or a bog; as long as you've got a good pair of boots, you'll make it through dry."

The newspaper *Postimees*, 14 March 1895

TEN STEPS TO MIRE RESTORATION

Imagine living in a village nestled at the edge of a bog. Over half a century ago, drainage ditches were carved into the land to make room for forests and hayfields. Today, part of that bog has turned into drained peatland forest; you have to wander much further to find cloudberries and cranberries, the frogs no longer herald the spring, and some of the wells run dry in the heat of summer. Now and then, fires break out—stubborn blazes that are nearly impossible to quench on the parched peat.
The villagers have begun to wonder: could this dry ground ever become a living bog again?

Explore the ten steps needed to transform a drained area back into a thriving mire. But there's a catch—the steps have been hopelessly jumbled! What do you think is the most logical order to follow?



RESTORATION ON THE GROUND

Following the engineering design, dams are built across the ditches to bring the water back to the land

SECURE THE FUNDING

Create a budget and apply for the necessary restoration grants from the appropriate funds

WHO LIVES HERE?

Commission baseline studies on the natural environment and the cultural history of the restoration area

DRAFT THE RESTORATION PLAN

Create a restoration plan based on your data, then present it to stakeholders for feedback and discussion

WE WANT OUR BOG BACK

Local residents are in favor of restoring the bog near their village

WHO IS THE OWNER?

Before any work can begin, you must identify who owns the drained peatland

WHAT'S NEXT?

In the coming years, you can watch as the bog begins its journey to recovery

GET THE ENGINEERING DESIGN

Based on the restoration plan, commission a detailed engineering design to guide the physical construction

UNCOVER THE HISTORY

Dive into old maps, photos, and local stories to discover what the bog was like in the past

RUN A VIRTUAL TEST

Use computer modeling to simulate how water should flow to restore the bog. Ensure that these changes do not impact any land outside the restoration site

DON'T FORGET THE DIALOGUE!

Keep the conversation going. Continue to collaborate with the stakeholders who are most affected by the restoration work

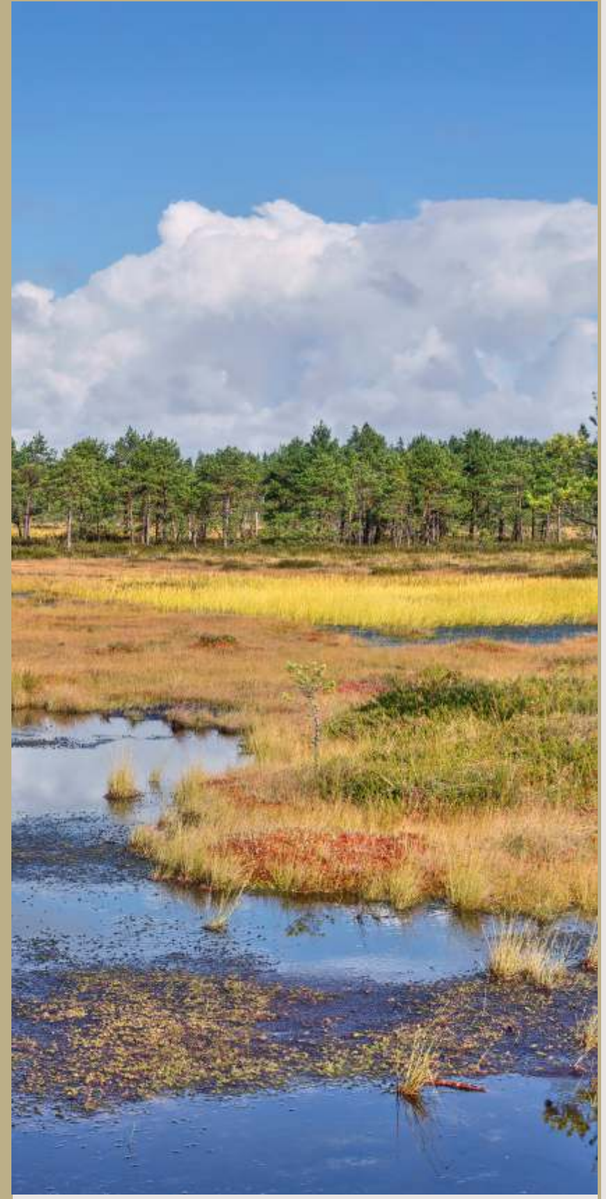


Photo: Arne Ader

HOW DOES MIRE RESTORATION WORK?

In front of you is a model of a drained mire landscape. Long, straight ditches quickly channel water away from the area, causing the central wetland to dry out.

To restore the water balance, you can install dams (or weirs) within the ditches to raise the water level and change the direction of the flow. You can move, remove, or add these dams yourself.
Watch closely to see how your interventions affect the movement of water. Can you find the natural spring? Notice the exact moment it begins to bubble or when it starts to run dry.

When you place a dam, water will start to flow back into the peatland, where it begins to rehydrate the landscape—you will see the porous yellow surface turn darker as it soaks up the moisture. Observe how the water moves through the mire and where it eventually settles. As the ground becomes sufficiently saturated, the specialist species that rely on these wet conditions will begin to appear. Your mission is to help as many of these "mire creatures" as possible by restoring their habitat!

After your session: Please remove the dams and return them to the storage area. This ensures the next visitor can start their own journey of mire restoration.

Use the dams to redirect the water and restore the drained mire

Wild Calla
(Calla palustris)

Blueberry
(Vaccinium myrtillus)

Marsh-marigold
(Caltha palustris)

Common Crane
(Grus grus)

Western Capercaillie
(Tetrao urogallus)

European Golden Plover
(Pluvialis apricaria)

Moose
(Alces alces)

European Badger
(Meles meles)

Eurasian Lynx
(Lynx lynx)

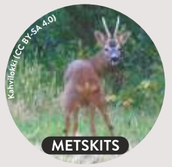
Common Chaffinch
(Fringilla coelebs)

Liverleaf
(Hepatica nobilis)

Moor Frog
(Rana arvalis)

Cloudberry
(Rubus chamaemorus)

Large White-faced Darter
(Leucorrhinia pectoralis)



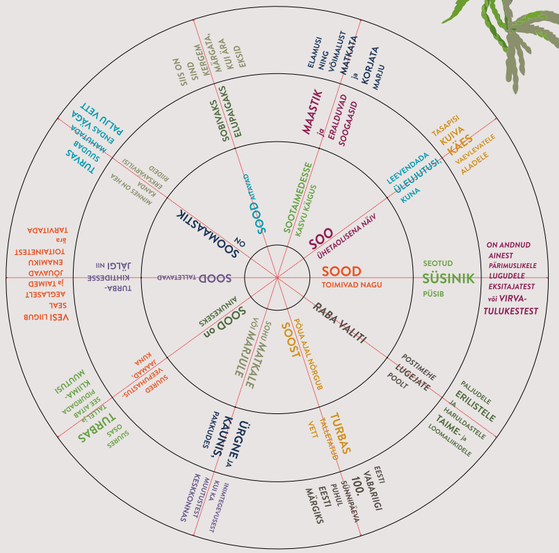
European Roe Deer
(Capreolus capreolus)

WHY DO WE NEED MIRES?

Humans are generally very practical, often weighing the benefits of their actions at every turn. Naturally, we have asked the same of our wetlands: do we even need them? The answer is a resounding "yes!" Mires play countless roles in our ecosystem—some of which we likely have yet to discover. However, we have already managed to unravel many of the mysteries surrounding their immense value. Well, just as a reflection, sometimes it might be useful to ask ourselves, do wetlands need humans?

Spin the Wheel of Discovery

Align the three discs correctly to reveal seven "pearls of wisdom" about the importance of our mires. Stay sharp—there are actually a few more bits of trivia about these extraordinary landscapes.



Mires act like mitigate flooding because water moves through them slowly, allowing plants to absorb and filter out excess nutrients

Mire landscapes are and the release of natural bog gases because peat acts like a massive sponge, capable of storing immense volumes of water

During droughts, centenary of the Republic of Estonia, gradually seeps out to provide a lifeline to parched lands

When hiking within their peat layers remains largely locked away within the peat, helping to mitigate global climate change

Mires preserve by mire plants during growth an ancient archive of human and environ-mental history

The seemingly uniform landscape suitable habitat offering unique experiences and the opportunity to hike and gather wild berries

Mires are the only ancient and beautiful, the raised bog was chosen by readers of the daily paper *Postimees* as a symbol of Estonia

Mires help water stored in the peat it is wise to wear bright colors so you can be easily spotted should you lose your way

To celebrate the or berry-picking in the mire, have inspired folklore and legends of will-o'-the-wisps and forest spirits

Carbon sequestered natural water treatment plants, for a vast array of unique and rare plant and animal species

WETLANDS OF THE WORLD

The world's wetlands come in many forms—each with its own distinct character and story. Their extraordinary diversity, shaped by the shifting interplay between land and water, has created some of our planet's most vibrant habitats.
Nearly 40% of all global species depend on wetlands for survival. These landscapes also provide essential ecosystem services: they purify our water, mitigate the effects of droughts and floods, prevent erosion, and act as natural buffers against storm damage. Furthermore, humanity's ingenious adaptations to wetland life—from traditional fishing to rice cultivation—have enriched our global cultural heritage with deep-rooted traditions.

Despite our growing awareness of their value, wetlands are vanishing at an alarming rate. They are being lost to drainage projects, the removal of mangroves, and the expansion of oil palm plantations. They are also under threat from pollution, river channelization, and the uncontrolled development of our riverbanks.
As our climate warms and ocean temperatures rise, the vibrant life of our coral reefs is dying. Human-driven pollution has a catastrophic impact on every wetland habitat—from the invisible threat of microplastics to the devastating environmental contamination caused by armed conflicts and massive oil spills. Across the globe, wetlands are disappearing three times faster than our forests.

Discover the World's Great Wetlands

Our globe highlights 13 diverse and remarkable wetlands of international significance. Lift the hatch and peer inside to catch a glimpse of these extraordinary landscapes. On the underside of each hatch, you will find a portrait of a key species that calls that wetland home.

To uncover the names of these global treasures and the creatures that live there, simply open the drawer below to explore!

1 CORAL REEFS

Great Barrier Reef,
East Coast of Australia
(~348,700 km²)

Green Sea Turtle
Chelonia mydas

2 COASTAL LAGOONS AND ESTUARIES

The Everglades Coastal Area,
Florida, USA (~10,000 km²)

American Crocodile
Crocodylus acutus

3 MANGROVES

The Sundarbans,
Ganges River Delta,
India & Bangladesh
(~10,000 km²)

Bengal Tiger
Panthera tigris tigris

4 SALT MARSHES and COASTAL MEADOWS

The Wadden Sea,
North Sea, Europe
(~11,000 km²)

Baltic Dunlin
Calidris alpina schinzii

COASTAL WETLANDS

The water in coastal wetlands is typically brackish—a mixture of salt and fresh water with a salinity between 0.5 and 18‰.
Many of these areas are also shaped by tidal cycles, where the regular rise and fall of the sea creates a dynamic and ever-changing environment.

5 RIVERS, RIPARIAN ZONES, AND INLAND DELTAS

The Danube River,
Central & Eastern Europe
Length: 2,850 km
Catchment Area: ~817,000 km²

Danube Salmon
Hucho hucho

6 LAKES

Lake Baikal,
Russia
(~31,500 km²)

Baikal Seal
Pusa sibirica

7 PEATLANDS (including Mires)

Hudson Bay Lowlands,
Canada (~320,000 km²)

Sundews
Drosera spp.

8 FLOODPLAINS

The Pantanal,
Brazil, Bolivia & Paraguay
(~195,000 km²)

Giant Water Lily
Victoria cruziana

INLAND WETLANDS

In inland wetlands, the water is typically fresh, though in rare cases, it can be saline. These ecosystems are heavily shaped by fluctuations in water levels—the unique "hydrologic signature" created by changing seasons and varying rates of precipitation.

9 GEOTHERMAL SPRINGS

Kenya Lake System in the
Great Rift Valley, Kenya
(~320 km²)

Lesser Flamingo
Phoeniconaias minor

10 TROPICAL SWAMP FORESTS

Cuvette Centrale Swamp Forests,
Democratic Republic of the
Congo & Republic of the Congo
(~145,000 km²)

Western Lowland Gorilla
Gorilla gorilla gorilla

11 MAN-MADE RESERVOIRS

Lake Kariba,
Zimbabwe & Zambia
(~5,400 km²)

Hippopotamus
Hippopotamus amphibius

12 IRRIGATED FIELDS

Mekong Delta,
Vietnam (~40,000 km²)

Sarus Crane
Antigone antigone

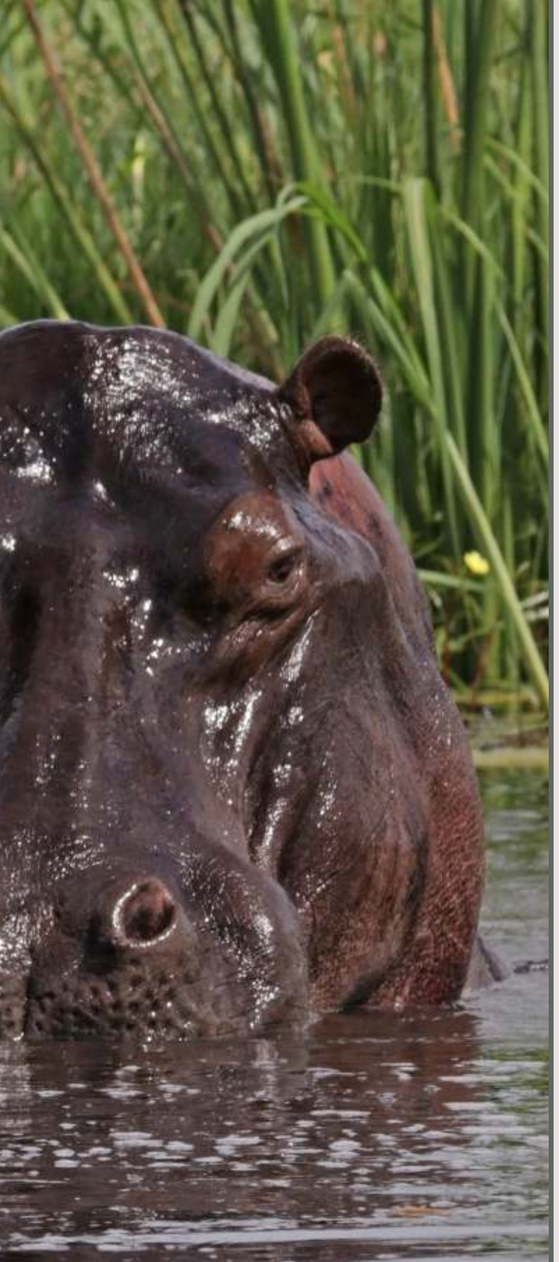
13 POLDERS AND FISH FARMS

Yangtze River Delta Polders,
Taihu Lake region, China
(~12,000 km²)

Oriental Stork
Ciconia boyciana

MAN-MADE WETLANDS

Some wetlands are created by humans, primarily by obstructing natural drainage or redirecting the flow of water through irrigation.
Globally, the most extensive anthropogenic (man-made) wetlands are rice paddies.



MIRES, CARBON, AND CLIMATE

The Earth's atmosphere consists of 78% nitrogen and 21% oxygen, with all other substances accounting for the final 1%. Carbon dioxide (CO_2) currently makes up only 0.042% of our air; while this figure may seem small, it has a profound impact on our climate as one of the primary greenhouse gases. Over the past two centuries, the concentration of CO_2 in the atmosphere has increased by 1.5 times, triggering rapid climate change that threatens our established way of life.

The primary key to slowing climate change is reducing the concentration of carbon dioxide in our atmosphere. One solution is to decrease our dependence on fossil fuels. Another is to protect ecosystems that act as carbon sinks—habitats that absorb more carbon from the air than they release.
Among all ecosystems, wetlands—especially mires and coastal wetlands—sequester carbon for the longest duration. While peatlands cover only about 3% of the Earth's land surface, they store a staggering one-third of all terrestrial soil carbon. However, this vital storage only remains effective as long as the mire stays wet.

CORN is a fast-growing annual cereal that sequesters a lot of carbon quickly. However, the plants die in the fall, and as they decompose, that carbon is released back into the atmosphere within the same year.

Compared to a cornfield, a FOREST stores carbon much longer. Depending on the species, trees lock away carbon for a century or more. Even when a tree dies, decomposers help return that carbon to the cycle very gradually.

While MIRES sequester carbon very slowly, they store it as peat for thousands of years. Research shows that a 10 cm layer of peat over one hectare holds more carbon than a hectare of spruce forest containing 250 cubic meters of timber.

Catch the Carbon

Choose from three different ecosystems capable of capturing carbon from the atmosphere. Toss the "carbon balls" into the baskets to see which ecosystem is best at storing carbon for the long term.

On the reverse side of the stand, watch the educational film "Mires and Carbon"

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Special thanks: Kai Vellak, Villu Soon, Mart Meriste, Ode-Maria Punamäe, Elin Soomets-Alver, Jüri-Ott Salm, Edgar Karofeld, Mari Palolill, Kärt Mell, Tiit Leito, Kristo Elias, Mattias Veermets, Pille Porila, Hiite Maja SA, Salibar

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WaterLANDS

MOTOR