MORSELS FROM THE MOOR

Celebrating the flavours of Europe's peatlands and a new future for these wetland ecosystems







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I. INTRODUCTION

Peatlands are among the most critical ecosystems on Earth, yet they are often overlooked. These waterlogged landscapes quietly store immense amounts of carbon, safeguarding it from release into the atmosphere. Yet, for decades, they have been undervalued and mistreated, drained for agriculture and other land uses, turning them from natural carbon sinks into dangerous sources of greenhouse gas emissions.

Today, the need to protect and restore peatlands is more urgent than ever. As global efforts to address climate change ramp up, we must recognise that restoring peatlands back to health and halting their degradation is not just an option—it's a necessity. Rewetting drained peatlands revives their ability to store carbon, reduces emissions, and restores their role as protectors of biodiversity and water resources.

However, true change goes beyond simply halting further damage. It requires reconceptualising our efforts to manage and interact with peatlands in a sustainable way. Paludiculture allows for the cultivation of wetland-compatible crops, whilst helping to restore the health, biodiversity, and hydrological functions of drained peat soils. This approach challenges the mindset that land must be drained to be productive and instead promotes

a balance between economic activity and environmental responsibility.

"Morsels from the Moor" aims to raise awareness of the irreplaceable role peatlands play in climate regulation, and to shine a light on the potential of paludiculture as a climate-friendly and sustainable land-use strategy. In particular, we focus on how paludiculture can support food and feed production, a potential that is often ignored. By exploring the possibilities that arise from harvesting products grown in peatlands, we hope to inspire a shift in mindset—away from draining peatlands for intensive agriculture and toward a future of regenerative land-use practices that reconnect us with local water cycles and native plant systems.

In this book, you will find not only information about peatland ecosystems and paludiculture but also examples of how crops harvested from wet peatlands are part of European cuisine and heritage. Through these recipes and practical applications, we hope to showcase the incredible potential of paludiculture and to offer a call to action—urging policymakers, agribusinesses, farmers, consumers to rethink their approach to land use and recognise the immense value of healthy, thriving peatlands.

Did you know?

Wetlands are areas where water covers the soil or is present near the surface for at least part of the year; there are approximately 42 types of wetland ecosystems in the world, with peatlands being one of them¹.



II. UNDERSTANDING PEATLANDS

Definition and types of peatlands

Peatlands are a type of wetland characterised by the accumulation of organic matter from decaying plants, forming layers of peat. These ecosystems are formed when water is held on the land and - due to the lack of oxygen - organic matter cannot decompose and starts to collect over millennial timescales². They are usually identified from 10 cm of peat thickness, whilst some of them may also cover thinner peat lavers³. European peatlands cover 593,727 km² and are classified into several types, including bogs, mires, fens, and swamps, each with distinct characteristics and ecological functions.

In Europe, peatlands can be found almost in every country except for Malta⁴. The deepest peatland in Europe can be found in northern Greece, at up to 190 metres!⁵

Peatlands: silent heroes in climate regulation

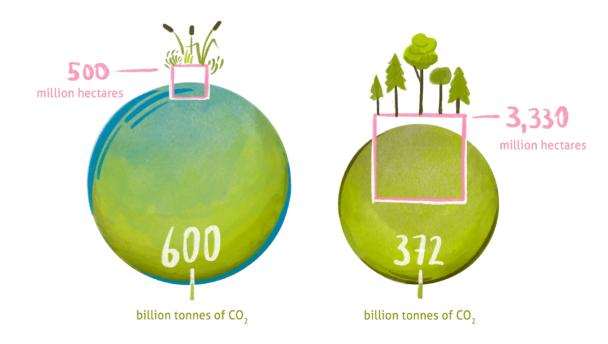
What makes healthy peatlands especially significant, is their ability to store vast amounts of carbon that would otherwise contribute to atmospheric greenhouse gases⁶. This long-term carbon sink function makes them a vital ally in global climate regulation. Their significance extends beyond carbon storage, as they are critical to the water cycle filtering and storing water, enhancing water quality, and helping to mitigate droughts⁷. Healthy peatlands also reduce the risks of peat fires, soil erosion, and desertification. Overall, peatlands offer more than just environmental services. Due to their habitat isolation and unique ecological characteristics, peatlands play a crucial role in maintaining biodiversity, supporting a wide range of specialised plant, amphibian, and bird species, many of which are rare and endangered across Europe.

Although peatlands cover only about 3% of the Earth's land surface, they store more carbon—and do so more effectively and for longer periods—than any other terrestrial ecosystem. However, when drained and degraded,

peatlands become a significant source of greenhouse gas emissions, leading to greater ecosystem service loss and environmental damage per unit of land area than any other ecosystem⁸.

Did you know?

Worldwide, peatlands store around 600 billion tonnes of carbon – twice as much carbon as is held in all the world' forest biomass combined.⁹



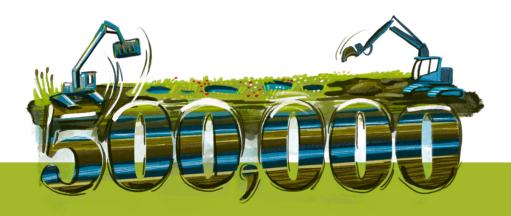
The impact of peatland drainage

IT TAKES 1,000 YEARS FOR A METER OF PEAT TO FORM, BUT ONLY A FEW SECONDS TO DESTROY IT¹⁰.

Today, peatlands are being lost and degraded at a rate that is ten times faster than their rate of expansion over the last 10,000 years. Due to human activities, 500,000 hectares of peatlands are being destroyed globally every year¹¹.

Nearly 50% of Europe's peatlands are degraded and primarily used for agriculture, forestry, or peat extraction (e.g., for horticulture and energy production). More specifically, over 80% of European bog, mire, and fen habitats are classified as being in poor or bad conditions.

As such, emissions from European drained peatlands account to close to 600 Mt CO₂ per year, which makes Europe the second largest current greenhouse gas emitter from peatlands globally¹².



Europe is the continent that has so far lost the most natural peatlands – around 10% due to drainage. Of the remaining peatland area, around 100 million hectares, 25% are degraded, and within the European Union, that figure rises to 50%¹³.

Rewetting peatlands: the path forward

At present, the biggest threats to peatlands are drainage and pollution. Intensive agriculture drains peatlands for production, leading to erosion and turning them into sources of greenhouse gases and pollution, as nutrients and sediments are washed away into surrounding water bodies¹⁴.

Given the critical role that peatlands play in climate regulation and biodiversity, restoring the hydrology functions of degraded peatlands is a high priority. Restoring the natural waterlogged conditions by raising the water table and rewetting the area reactivates the carbon sink function of peatlands and halt peat decomposition, which is responsible for greenhouse gas emissions¹⁵.

Additionally, this process improves water quality by filtering pollutants and reduces flood risks through enhanced water retention¹⁶. Promoting a sustainable approach to peatland management is a priority. Paludiculture integrates rewetting with productive land use. It allows for the cultivation of wetland-compatible crops such as reeds, sphagnum moss and berries, offering a sustainable economic alternative that preserves carbon in the soil.



III. PALUDICULTURE

What is paludiculture?

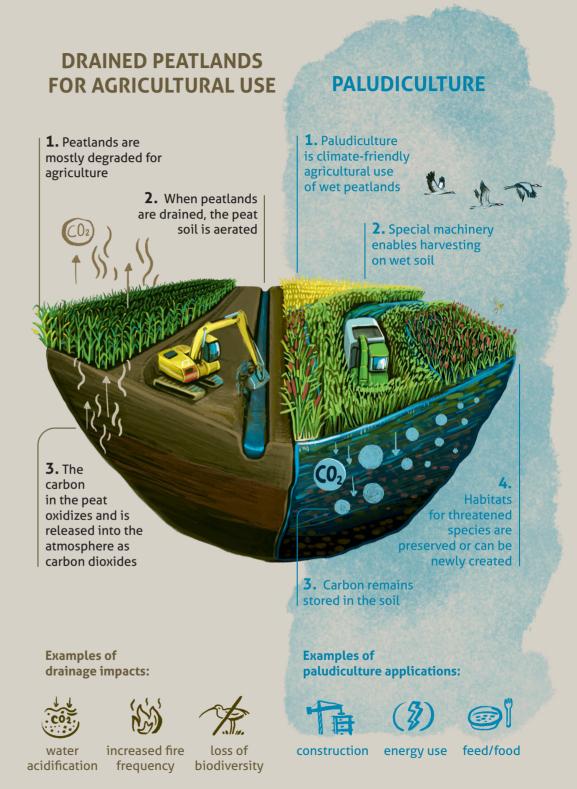
Paludiculture is defined as the productive land use of wet and rewetted peatlands that preserves the peat soil and thereby minimizes CO2 emissions and subsidence¹⁷. The practice should take place on peatlands that were once degraded and subsequently rewetted, meaning that pristine peatlands are not targets for paludiculture and should remain intact.

Pristine peatlands are vital as they provide essential ecosystem services and support rich biodiversity, offering habitats for a wide range of plant and animal species. Preserving these intact ecosystems is crucial for maintaining ecological balance and ensuring environmental health.

Paludiculture offers a unique opportunity for more sustainable land use. The materials it produces can be used in various industries, ranging from industrial biochemistry and construction materials to biofuel production, heat generation and even the development of pharmaceuticals and cosmetics. Additionally, it provides innovative solutions for sustainable food and feed production. By combining rewetting with economic viability, paludiculture a forward-thinking represents approach to regenerating peatlands. Each paludiculture site is unique, and there is no one-size-fits-all crop or technique. Paludiculture use above ground biomass, while below-ground biomass- comprising a significant portion of the net primary production - remains for peat formation. This is why it can be described as a "climatefriendly" practice.

Paludiculture requires:

- Rewetting, applied on drained peatlands, means raising the water to a high-water table near the soil surface throughout the year, which is essential to minimise emissions and peat degradation.
- Lightweight and adapted machinery for harvesting to avoid further damaging the delicate peat soil.



Paludiculture crops

Typical paludiculture plants are those that can cope well with high moisture levels and whose above-ground biomass has economic value. See below some examples of crops.

Cattail Typha angustifolia

Applications: cattail is a paludiculture superstar! It is used for construction and insulation materials, all the way to becoming fodder for cattle and a peat free horticulture growing media. This Swiss army knife of a plant can seemingly do it all!

Habitat and ecology: cattails are well adapted to living in shallow waters, generally in marshes across the world. They provide nesting sites and are a source of food and cover for a whole range of wetland species¹⁸.

Featured in this cookbook! - Bog myrtle Myrica gale

Applications: bog myrtle has been found to have uses in medicines and cosmetics, as an insect repellent for those pesky mosquitoes on the bogs, but in our case, as flavouring for beer.

Habitat and ecology: they are most found in nemoral Atlantic bogs¹⁹.





Reed Phragmites australis

Applications: reeds are another species that are host to a wide range of uses. Mostly used in housing materials for thatching, insulation, and construction, they show their polyvalence when it comes to fodder production, but also possibilities in biogas and paper production.

Habitat and ecology: able to grow in many habitats on mud or in shallow water, they thrive in eutrophic marshes and swamps. Reed is also among the most important bird nesting habitats²⁰ ²¹.



Featured in this cookbook! - Cranberry Vaccinium oxycoccos

Applications:_cranberry is perhaps more modest in its polyvalence, but its cultural importance and staple in food and drink makes it likely the most well-known of the species thus far.

Habitat and ecology: located in raised bogs, found mostly in lowlands and hills of northwestern and northern Europe²².

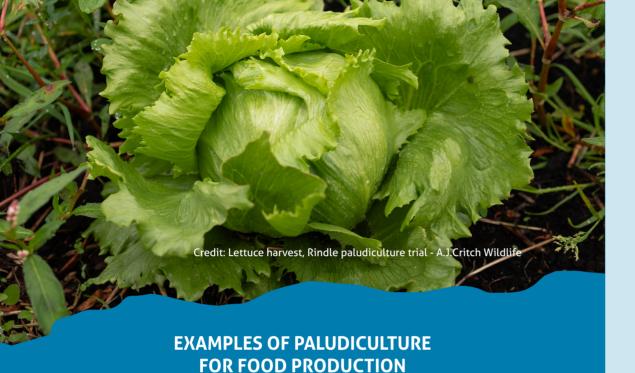


Peat moss Spagnum sp.

Applications: peat moss is one of the most important plants in peatland restoration as it is a founder material. This alone proves its cornerstone application as the primary goal of paludiculture is to restore peatlands. Besides this, it is used as a growing medium or as a substrate for various plants and species.

Habitat and ecology: there are species of sphagnum that occur all over Europe, no matter the climate. However, although they are typically found in wetlands, local hydrology plays a big role in determining the species found²³ ²⁴.





The Rindle paludiculture trial

Paludiculture is often associated with growing non-food crops, however in North West England, The Wildlife Trust for Lancashire, Manchester & North Merseyside are using paludiculture to grow traditional food crops. These include celery, lettuce and blueberries, with the hope for more species to be trialled in the future such as kale and wild rice.

Celery is naturally a bog plant and so enjoys wetter conditions, blueberries require acidic soils, and as lettuce only has a shallow root system the higher water levels are more easily tolerated. The water table has been raised to different levels (at ground level, 30cm below and 50cm below) to find the best balance for crop yield and at the lowest greenhouse gas emissions.

Different plant varieties are also being trialled: five varieties of blueberries were planted, and whilst four are doing well, one didn't survive. Several methods of sowing and harvesting are also being trialled. This information can then be passed onto farmers who are interested in undertaking paludiculture on their land.

Find out more at www.lancswt.org.uk/blog/what-wetter-farming

IV. RECIPES

The plants found in the following recipes represent some of the diverse edible crops that grow on European peatlands. Some other food crops include cattail, celery, bilberry, watercress & water mint.





Peatland Herbal Salt

This potent herbal salt isn't something for the fainthearted. It is great with earthy soups and is excellent paired with balsamic vinegar when seasoning your dish. If the flavour is too intense, you may dilute it by adding other local herbs to the mixture. We recommend lovage, celeriac or marjoram.

Ingredients:

- 60g of coarse salt
- 20g of dried and ground downy birch leaves
 5g of the rapeseed-bog myrtle oil mixture
- 5g of finely ground calamus root
- 3g of finely ground angelica root
- 7g of finely ground marjoram leaves

Pickled Bilberries and Cranberries

You would be surprised how well these sour-fruity bites combine with savoury dishes. If cranberries and blueberries are not enough for you, you can experiment with other fruits like fresh lingonberries or cloudberries.

Ingredients:

- 1-part fresh bilberries or cranberries
- 2-parts vinegar (white wine, apple cider or balsamic)
- 1 teaspoon of thyme

Instructions:

Combine all ingredients together and keep in the fridge for at least 12 hours before serving.

Sweet Beer Syrup

Long before hops were established as a bittering ingredient in beer, other ingredients like bog myrtle were in common use. This beer sirup has a strong taste, which makes it perfect for adding flavour to pastries or vinaigrette.

Ingredients:

- 330ml Gageleer original
- 50g Sugar (preferable brown candied sugar)



Instructions:

Pour approx. 2l of beer into an open pot and add the sugar. Let it simmer so you can clearly see the vapour evaporating from the liquid. Stop when the liquid has reduced to about one sixth of its original volume. Beware the syrup becomes thicker when cooled down.

"Due to its intensive aroma, our beers only require bog myrtle in small amounts. Because bog myrtle in our region only grows in lowland marshes in nature reserves, we cooperate with the local departments of the 'Natuurpunt' for growing and collecting the herbs. [...] there is no big deal on our supply chain. We wait until the moment it is there, and then we collect it"

Juul Appels, Gageleer, Belgium

Onion Lingonberry Soup

This onion soup is flavourful and savoury. Add the kick of the lingonberry jam, a splash of bog myrtle beer and you end up with a roasted-buttery-fruity soup that is simply delicious.

Ingredients for one portion:

- 100g margarine
- 2 large onions
- 1 tablespoon yeast flakes
- 1 teaspoon peatland salt
- 2 juniper berries
- 1 bay leaf
- 150g spelt or wheat semolina flour
- 2 big tablespoons lingonberry jam
- 330ml bog myrtle beer Gageleer 0% or Gageleer original

Instructions:

Start by making a roux as a base for the soup and for flavouring. Melt the margarine in the pan. Then slowly add the semolina flour while stirring continuously. Stir on a low flame until the flour turns light brown.

Melt the margarine in a pan on medium flame. Now add the onions together with the peatland salt and fry them slowly until they are golden.

Add the beer, together with the bay leaf and juniper berries, and let it simmer down to about half its volume. Add some water to the soup until you think it has a creamy consistency. Add the yeast flakes and simmer for a few minutes.

To finish, poor the onion soup on a plate, stir in some roux and then one or two tablespoons of the lingonberry jam and enjoy!



Tarte Flambée

Tarte Flambée (also known as Flammekuche) is a pizza-like dish that started as a rural recipe, which is known in different forms to the bordering regions of Alsace (France) and Baden (Germany). An old tale says that it was meant to test the people's home ovens when prepared for baking bread. The oven had reached its peak temperature when you could bake a tarte flambée well. As a twist on the traditional tarte flambée, we have added the sour blueberries and cranberries featured earlier in this book.

Ingredients for the dough:

- For the dough
- · 200g plain white flour
- 1tsp salt
- 1 tbs olive oil
- 110ml water

Ingredients for toppings:

- 200ml smetana or sour cream
- 1 red onion
- 4 tablespoons pickled blueberries and cranberries
- A pinch of salt and pepper
- Handful of chives
- · A pinch of nutmeg
- (for those who like it) bacon and gruyere cheese

Instructions:

Start with the dough. Blend all ingredients together and kneed at least for one minute. Now set the dough aside. Next, cut the onions into slices. Mix the sour creme with nutmeg, salt and pepper. Roll the dough flat, with a rolling pin. Add the sour creme mixture with a spoon like you would add tomato sauce on a pizza dough. Add the onion slices, blueberries, cranberries and if you like, bacon and cheese. Bake in the oven preheated to 200° for ca 20min. Serve with chives!



Rooster Combs Pastry

The cloudberry is famous in Scandinavia but grows all over the northern hemisphere, like Canada, Alaska and Russia. You can easily find cloudberry jam in a shop for Scandinavian products. In this recipe, the cloudberries have a complex bittersweet aroma that compliments the earthy flavour of the poppy seeds.

Ingredients for the dough:

- Sweet yeast dough:
- 270ml oat milk
- 70g Margarine
- 500g flour
- 50g of sugar
- 42g fresh yeast pinch of salt

Ingredients for the stuffing:

- 150g poppy seeds (blended)
- 70g cloud berry jam
- 30g beer syrup

Instructions:

For the dough, mix the flour and the sugar in a big bowl and make a depression for the other ingredients. Crumble the fresh yeast into the depression and then add the slightly heated oat milk on top. Knead the dough. Cover the dough with a kitchen towel and let it rise for 30 minutes in a warm place. Add the salt and the margarine and knead again. Let the dough rise again for another 30 minutes.

For the stuffing, it's important to blend the whole poppy seeds so they turn into a wet doughy mass. Then stir the cloudberry jam and the beer syrup into the poppy seed mass.

Combining dough and stuffing: Roll the dough flat with a rolling pin. Now cut the dough into square pieces roughly 20cmx20cm. Add four heaped tablespoons of the stuffing to the middle in a long strip and fold the piece over. Bend the folded dough slightly and make 4-7 cuts along one side (With a bit of imagination, it's supposed to look like a rooster comb).



Rumtopf

The original Rumtopf is left to sit from spring to late summer. Ideally, you add the various fruit at the moment they become ripe. As this is a peatland cookbook, potential candidates could be blueberries, lingonberries, cloudberries, cranberries or black crowberries. Traditionally the rum pot is drunk for Christmas. But be careful, because if you drink too much, you'll have to wait another year for your next batch!

Ingredients:

- 2 parts (peatland) fruits of your choice
- 1 part sugar
- 3 parts rum

Every time you add fruit to the pot you should add half as much sugar, and one and a half times the amount of rum in weight than the weight of the fruits you added.





V. THE ROLE OF THE EU FOR PEATLANDS & PEOPLE

To meet the Paris Agreement, the European Union itself should rewet half a million hectares of peatland every year²⁵.

The transition from drainage-based agriculture to paludiculture requires a fundamental shift in land-use practise that changes the material, economic and cultural reality of peatland farmers, land managers and community members. This mean that governments and businesses have a direct duty to support local people through institutional incentives, funding and capacity building.

The EU's Green Deal highlights healthy peatlands as a nature-based solution for reaching key climate, biodiversity, and sustainable land-use goals. Similarly, the EU's Biodiversity, Soil Strategies and Nature Restoration Law, underscore the ecological value of peatlands and suggest paludiculture among other restoration practices. However, the current pace of progress falls far short of the ambition needed to meet the commitments outlined in the Paris Agreement.

Crucially, since peatlands are primarily drained for agricultural use, the Common Agricultural Policy (CAP) plays a key role in shaping their management and potential restoration. The 2023-2027 CAP

introduced a series of green elements in compliance with the Green Deal. For the first time, paludiculture became eligible for payments, either through a cross-compliance mechanism under GAEC 2 (Good Agricultural and Environmental Conditions) or through eco-schemes.

To date, however, GAEC 2 has seen limited implementation, with several member states asking for derogations to its implementation until 2025, citing the lack of data and maps as major obstacles. Similarly, none of the eco-schemes developed by member states included paludiculture. Looking to the post-2027 CAP, peatlands need much stronger support and recognition within this policy framework.

VI. CONCLUSION Historically, draining peatlands was a major step for regional development. These soils helped people grow food, as well as provided fuel and other materials to live. Today, the escalating ecological crises force us to reconsider this approach. We now recognise that peatland drainage releases substantial greenhouse gases, worsening the climate crisis. Understanding these environmental impacts underscores the urgent need for change. This book underscores the importance of peatland restoration and protection, presenting paludiculture as a sustainable alternative to traditional, drainage-based agriculture. Restoring the hydrological functions of drained peatlands through paludiculture is more than an agricultural shift—it represents a commitment to a sustainable, resilient future. Embracing this change means safeguarding invaluable ecosystems and

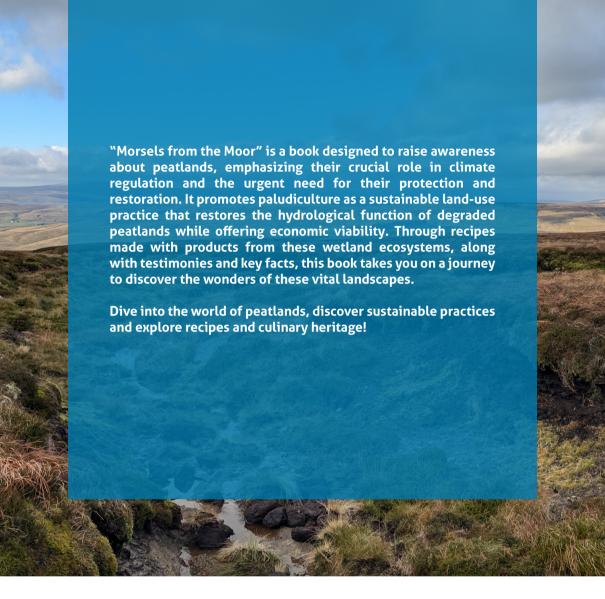
The future of peatlands, and of our environment, hinges on our willingness to act boldly and collaboratively now.

ensuring that agriculture harmonises with the landscapes it

depends upon.

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