

Paludiculture Newsletter

With this newsletter the Greifswald Mire Centre (GMC) aims to keep a growing community informed on peatlands and paludiculture. You will find news from research, practice, politics, as well as announcements of conferences and other events and recommended publications. Sign up per e-mail to communication@greifswald-moor.de for upcoming issues! The newsletter is currently provided by the BOnaMoor project coordinated by the Greifswald Mire Centre and financed by the German Federal Ministry of Food and Agriculture through the Agency for Renewable Resources (FNR).

Content

1. General information and news on peatlands and paludiculture	2
1.1. Rewetting, not watering down - peatlands and paludiculture in the EU's CAP	2
1.2. Bird of the year - votes for the Aquatic Warbler	4
1.3. Solar and wind power in peatlands? Only under wet conditions!	4
2. A paludiculture project presented: REMEMBER	5
3. News from other paludiculture projects	6
3.1. Projects international	6
3.1.1. Global Survey on paludiculture and wet livelihoods	6
3.1.2. Irish Farmer-Farmer Online Peatlands Survey	6
3.1.3. News from the DESIRE project	8
3.2. Projects in Germany	10
3.2.1. Bioeconomy with climate protection bonus - online info day: Utilisation of biomass from wet peatlands	10
3.2.2. A tiny house made of building materials from paludiculture biomass	10
3.2.3. Biogas from paludiculture?	12
3.2.4. First paludiculture polder for Typha cultivation in Lower Saxony	12
3.2.5. Sphagnum farm Barver honoured as regional lighthouse project	13
3.2.6. Win-win-win thanks to Sphagnum - information day on Sphagnum farming	14
4. Events on peatlands and paludiculture	15
5. Literature	16

1. General information and news on peatlands and paludiculture

1.1. Rewetting, not watering down - peatlands and paludiculture in the EU's CAP

At the end of October 2020, important decisions were taken to reshape the CAP. Although the European Commission had already published its legislative proposals for the next funding period in summer 2018, Brexit, the 2019 European elections and the slow-running negotiations on the EU budget (Multiannual Financial Framework 2021-2027) massively delayed the necessary decisions by the Council of Agriculture Ministers and the European Parliament. The current funding period, which actually expires in 2020, had to be extended by two years (transition period with "new money for old measures"). In all probability, the new support period will now only begin on 1 January 2023. The results of the decisions in the Council and Parliament were eagerly awaited, as the new Commission under Ursula von der Leyen, which was elected in 2019, had announced the European Green Deal in the meantime as the "European man on the moon moment", which was to ensure more coherence in EU policy-making and in which land use was to be a core issue. The Council and the Parliament could have requested changes to the CAP proposals submitted by the previous Commission in the trilogue of the three EU decision-making bodies, which started on 10.11.2020. In this context, a broad coalition of scientific institutions and civil society organisations from many EU Member States had published an [information paper](#) on peatland management in the EU in spring 2020.

However, these expectations were largely disappointed. There was no adjustment to the newly set goals of the Green Deal, Farm to Fork and Biodiversity Strategy; rather, the decisions of the Council and Parliament lead to a dilution of the already outdated Commission's proposal. Overall, the new "green architecture" is largely similar to that of the previous funding period. The 2-pillar model and the blocking of a large part of the budget for direct payments are maintained. Cross-compliance has become conditionality, greening became eco-schemes, but a higher level of ambition is hardly discernible, certainly not a paradigm shift true to the motto "public money for public services". However, such a paradigm shift would be urgently needed for the large-scale implementation and consistent promotion of a more sustainable, climate-friendly use of peatlands with paludiculture.

Two important adjustments were at stake here: First, a new minimum standard within the conditionality for maintaining agricultural land in "good agricultural and ecological condition" (GAEC), which, according to the Commission proposal, provided for GAEC 2 "Adequate protection of wetlands and peatlands". If ambitiously designed, this minimum standard could have contributed to the phasing out of drainage-based peatland management. Secondly, amendments to the Commission proposal provide for the recognition of paludiculture as eligible for aid. This would at least put paludiculture on an equal footing with drainage farming in terms of support, as both direct payments from the first pillar and support for measures under the second pillar can be received.

With regard to GAEC 2, there has been a tendency of dilution, but unfortunately in a negative sense for the necessary water levels in peatlands. For example, the Council of Agriculture Ministers formulated the standard as "minimum protection of wetlands and peatlands latest by 2025". This is not only with a technical weakening but would also cause substantial delaying effects with the proposed time limit until the middle of the decade. The Parliament, on the other hand, adopted the wording "Effective protection of wetlands and appropriate maintenance of peatlands". Simply maintaining the status quo of peatlands, if it were to be understood in this way, would result in further degradation through existing drainage systems with soil loss and high greenhouse gas emissions. A slight improvement over the status quo could be achieved if at least new construction, upgrading and deepening of drainage systems, as well as deep ploughing would be prohibited.

There are more rays of hope on the recognition of paludiculture areas as eligible areas for direct payments: both the Council of Agriculture Ministers and the Parliament (AM 1148) have passed resolutions, which allow paludiculture at least as an exception under Art. 4 §1 c ii of the legislative text. The exemptions already in force in the current funding period, which allowed further eligibility of land for payments if it was removed from a use defined as agricultural in order to comply with biodiversity or water quality measures, were extended to include the aspect of climate protection, which explicitly includes paludiculture. While it is a great success that paludiculture could be included in CAP documents in this way, it remains open what actual effect such a definition will have. Exceptions do not have a high level of acceptance among farmers, as they entail additional effort of application and uncertainty about the actual refund and permanence. For the agricultural authorities they also mean additional work and make administration more difficult, so that overall no large-scale implementation of paludiculture is to be expected under this scheme, as is already the case with the derogations already in force.

However, the Parliament went further and has adopted amendments to recognise paludiculture both as an "agricultural activity" under Art. 4 §1 a (AM 866) and as "eligible hectares" under Art. 4 §1 c (AM 1148). If these changes will be retained in the trilogue and thus be included in the final CAP, they could indeed be seen as a breakthrough for sustainable peatland management. It would make remuneration of paludiculture possible, at least in an equal way to other agricultural uses. Thus, it would strengthen the recognition of these farming practices on peaty soils largely, both among farmers and landowners and in agricultural administration and policy making.

It now remains to be seen how these elements will be adopted in the trilogue as a result of the negotiations and what form they will take in the Member States. One important change to the CAP architecture, which has been already proposed by the European Commission and which has not been fundamentally touched by the Council of Agriculture Ministers and the Parliament, is that the Member States should be given greater flexibility in shaping the CAP within their sphere of influence. In future, for example, they will include precise definitions of the conditions and application of specific interventions in their national CAP strategic plans. The strategic plans will be sent to the EU Commission, checked for conformity and then implemented legally binding at Member State level.

This is particularly relevant for the precise definition of conditionality, here GAEC 2, and the associated level of ambition in the protection or appropriate conservation of peatlands ([joint background paper of GMC and DVL](#)). At the same time, it is necessary to define what is meant by the term "paludiculture" in the context of the CAP, whether as directly eligible agriculture or as an exceptional case. An EU-wide uniform definition would be desirable here, which could then be included in the intervention description of the strategic plans. In order to achieve a successful implementation of paludiculture on as large an area as possible, it ultimately requires effective programming of measures under the second pillar in the Member States or, as in Germany, the regions. For further up-scaling, a precisely harmonisation with other instruments promoting paludiculture and peat soil protection through national climate funds, funds for regional development (ERDF) and others is needed. A detailed overview on [instruments for climate-friendly peatland use in Germany](#) has been recently published by a team of authors of the GMC and DVL.

The proposals for amendments adopted at EU level in October should therefore only be seen as further, albeit important, intermediate steps towards the new CAP - nothing has been decided yet! For the negotiations in the trilogue, the Commission has announced that it attaches great importance to the objectives of the Green Deal with regard to environmental, biodiversity and consumer protection. It still sees sufficient room for manoeuvring with the decisions taken on the CAP. Parallel to the trilogue negotiations at EU level, the shaping of national strategic plans with important definitions and binding

proposals for intervention is already in full swing in the Member States and here the climate-friendly and sustainable use of peatland should be a priority as well: Rewetting, and not watering down!

Author: Jan Peters, jan.peters@greifswaldmoor.de, Greifswald Mire Centre, Germany

1.2. Bird of the year - votes for the Aquatic Warbler

The election campaign has started: The nominations for the [“Bird of the Year 2021” competition](#) in Germany run until December 15, 2020. #TeamSeggi, including the Greifswald Mire Centre, is committed to “Seggi first”. Make the little bird great again and support our nomination for the Aquatic Warbler!

The Aquatic Warbler is threatened with extinction worldwide. It has not been recorded as breeding bird in Germany since 2014. The "Seggi" lives in sedge stocks of wet fens. With the extensive drainage of peat soils, it has almost disappeared from Germany. The Aquatic Warbler is also an indicator of intact peatlands and thus a small, winged ambassador for the climate.

And there is hope: in the past year, Aquatic Warblers were brought from Belarus to Lithuania and resettled there in restored fens. The nomination for “Bird of the Year 2021” would not only give the Aquatic Warbler an upswing, but would also draw attention to peatlands and their importance for climate protection. The [Aquatic Warbler Conservation Handbook](#) summarizes the current state of knowledge on ecology, habitat management and protection of the Aquatic Warbler. Information is also provided on the website of the [Aquatic Warbler Conservation Team \(AWTC\)](#), which also includes scientists of the GMC.



1 Illustration #TeamSeggi (Illustration: S. Maier)

1.3. Solar and wind power in peatlands? Only under wet conditions!

Renewable energies such as wind and solar power are indisputably an important contribution to climate protection. However, if the systems are built on peatlands, they should go hand in hand with peatland rewetting or at least not hinder it. The [new position paper on solar and wind power plants on peat soils](#) (German only) of the Greifswald Mire Centre shows that e.g. in Mecklenburg-Vorpommern, the rewetting of peatlands could reduce emissions twice as much as the local wind power plants currently do and even seven times as much as the solar plants in the state currently avoid. A combination with the use of biomass from paludiculture on rewetted peatlands would also produce renewable raw materials as an alternative to fossil raw materials and fuels.

2. A paludiculture project presented: REMEMBER

The role of emergent macrophytes in reducing the biogenic load on aquatic ecosystems



2 Naroch Lake in the Memel catchment area (Photo: B. Adamovich)

Eutrophication due to nutrient oversupply in the Baltic Sea remains the main cause of the partly alarming state of the marine ecosystem. Rivers are considered to be the main source of nutrient inputs. The Neman (Memel, Nemunas) is the fourth largest river in the Baltic Sea catchment. The Naroch lakes are located in the upper reaches of the Memel catchment in north-western Belarus. The waters and their adjacent semi-aquatic ecosystems (lakeside reeds, fens) are the special feature of the Naroch region and also characterise the "Narochansky" National Park. The [REMEMBER project](#) aims to investigate the role of reeds and swamps in semi-aquatic ecosystems of the Naroch National Park regarding nutrient input and retention in clear water ecosystems.

The Belarusian-German research consortium consists of scientists from the [Research Laboratory of Aquatic Ecology](#) at the Belarusian State University, the [Narochansky National Park](#) and the University of Greifswald, partner in the Greifswald Mire Centre. The project is coordinated and led by the University of Greifswald.

REMEMBER aims to find optimal conditions for the extraction of plant biomass, which export nutrients from the ecosystem. The harvested biomass can be used as raw material for building materials or energy. This can provide incentives for the development of companies and businesses. At a regional level, the results of the project should contribute to develop and promote local management plans as a basis for improving water quality in the Baltic Sea catchment area.



Author: Felix Närmann, felix.naermann@greifswaldmoor.de, Greifswald Mire Centre, Germany

3. News from other paludiculture projects

This section compiles news from current projects and initiatives on paludiculture from various regions and countries.

3.1. Projects international

3.1.1. Global Survey on paludiculture and wet livelihoods

Paludiculture uses spontaneously grown or cultivated biomass from wet peatlands under conditions in which the peat is conserved or even newly formed. While the practice is old, the term was only coined in the 1990s and a knowledge base around paludiculture is only currently emerging. To create a scientifically informed, global user-community the Hautes Études Commerciales (HEC) Montreal, the Greifswald Mire Centre and Maastricht University invite paludiculture initiatives worldwide to a global survey: https://hecmontreal.eu.qualtrics.com/jfe/form/SV_bqKWE2D6p8SR5X.

The survey is structured in the following sections: 1) Context of the paludiculture, 2) setting up the paludiculture initiative, 3) economic benefits and innovation, 4) managing and monitoring the paludiculture, 5) collaboration and networking, 6) opportunities and barriers, and 7) an outlook on the future of paludiculture. It takes about 30-45 minutes to fill it out.

The survey is systematic and therefore extensive. It takes about 30-40 minutes. If you have any questions or feedback regarding the survey, please send an email to Magali Simard (magali.simard@hec.ca).

The results of the survey will be presented at the [Renewable resources from wet and rewetted peatlands - RR2021](#) virtual conference in March 2021. The survey organisers plan two sessions to discuss the implementation of a worldwide paludiculture knowledge base for users: one session with presentations, and a second, subsequent open space session to foster the global user community. Moreover, best practice cases will be communicated to the Food and Agriculture Organization of the United Nations in support of its ongoing best practice compendium. The latter will also be presented at the session.

We would be delighted if you took part in this survey with your paludiculture initiative and thank you for it in advance. If you know of an initiative in your region or your work environment, please forward this invitation.

Author: Rafael Ziegler, rafael.ziegler@hec.ca, HEC Montreal, Canada

3.1.2. Irish Farmer-Farmer Online Peatlands Survey

The Limerick Institute of Technology (LIT), Irish partner in the [EU INTERREG Carbon Connects project](#), conducted an online survey about perspectives of peatland use of Irish farmers and landowners in July-August 2020. This online survey had four sections. The first section gathered information about current activities on their farmland, presence/absence of peatlands on their land and their size and status or condition. The second section focussed on their perception of peatlands with respect to carbon storage and sequestration functions; management of their peatlands and their preferred and current land use on their peatlands. The third and fourth sections concentrated on the perception of currently available options/venues of secondary income sources, practical and feasible secondary income sources on Irish peatlands and implementation of a "Peatland Carbon Incentive Scheme". The online survey was widely advertised via various media channels e.g. twitter and ["Farming for Nature" newsletter](#) in Ireland.

31 Irish farmers/landowners voluntarily participated in the online survey. The results showed that the majority of farmers participating in the survey are working part-time (68%) and major farm activities

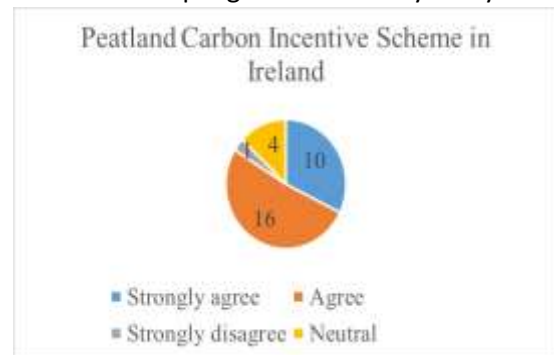
are sheep and cattle beef farming (68%), conversion into forest land (12%) and organic farmland (10%). About 74% of them know the type of peatland existing on their farmlands i.e. “raised peatland” vs. “blanket peatland” vs. “fen”. Regarding the status of these peatlands; 26% were “partially drained and degraded”, 35% were “some-what intact” and 17% were “highly intact (undrained with some disturbances)”. In addition, about 74% of the participants are aware that peatlands store and sequester carbon. 41% suggested that peatlands should not be tampered with and kept wet all the year. About 26% suggested that peatlands should be drained only enough to operate usual farm activities, i.e. they could be partially drained. In the online survey, LIT also asked the farmers/landowners about their knowledge on bio-based business models offering income sources from their peatlands. Only 32% were aware of such bio-based business models, which indicates a need for creating more awareness.

Almost half of the Irish farmers/landowners participating in the survey consider provision of regulating ecosystem services (reducing erosion, improving water quality, carbon sequestration) as highly practical and feasible business model. 39% of the survey participants think that it is feasible to remove invasive species such as Bracken and Rhododendron for conversion into biochar. 37% consider it practical promoting biodiversity parks open to the public and 25% are in favour of growing medicinal herbs adapted to wet peatland condition for pharmaceutical industries (see table for details).

3 Table: Perspective of Irish farmers/landowners interviewed in the LIT online survey about practical and feasible business models on Irish peatlands

Business model	Highly practical & feasible (%)	Somewhat practical & feasible (%)	Not practical & feasible (%)
Growing Typha and Common Reed for cattle feed, biogas or biochar; Alder for furniture	3	62	35
Establishing wind and solar plants for renewable energy	17	62	21
Growing medicinal herbs for pharmaceutical industries	25	29	46
Growing herbs for food industry	22	44	33
Removing invasive Bracken and Rhododendron for biochar	39	39	21
Maintaining wet, vegetated peatland for ecosystem services (reduced erosion, improved water quality, increased carbon sequestration)	46	50	4
Biodiversity (recreational) park	37	56	7
Development as a constructed wetland for treating farm runoff & improving water quality	38	50	13

The LIT developed a scenario for implementing the “Peatland Carbon Incentive Scheme”. This incentive scheme, if conceived, could have four stages, with the first stage having a third party team evaluating the status (drained vs. undrained) of farmers/landowners peatlands in Ireland. The second stage would consist of quantifying the total carbon stored in the peatland via sampling and laboratory analysis. A third party team would conduct this sampling work. The third stage would involve reporting the status of peatland and amount of carbon stored to a local government authority in Ireland. The fourth and the final stage would involve provision of financial incentives to Irish farmers/landowners based on the status of their peatland and amount of the carbon stored in it. We had asked this four-stage question to Irish farmers/landowners and **84% agreed and strongly agreed** that there is a greater need for developing and implementing a “Peatland Carbon Incentive Scheme” in Ireland (see Figure 1).



4 Figure: Agreement to a Peatland Carbon Incentive Scheme in Ireland (survey included 31 farmer/land owners) (A. Tilak)

This online survey indicated that there is great awareness among Irish landowners/farmers concerning their peatlands as carbon stores and there is an urgent need for implementing business models providing incomes sources for re-wetting of peatlands, e.g. a “Peatland Carbon Incentive Scheme” for long-term ecological and economic benefits.

The EU INTERREG Carbon Connects project is a North-West European project consisting of partners from the Netherlands, France, Belgium, UK and Ireland. The project aims to reduce the high carbon footprint of peatland soils in Northwest Europe by introducing new bio-based business models developed for sustainable land management practices.

and facilitating the transformation in land use towards wet agriculture. The project promotes alternative practices, sustainable business models and credit schemes for wet agriculture by 1) raising water levels of mismanaged peatlands, 2) introducing new crops (e.g. cattail, reed, peat moss) on mis-managed peatlands, 3) enabling both carbon sequestration and biomass harvesting (e.g. for building material), 4) public relations.

Authors: Amey S. Tilak, Amey.Tilak@lit.ie, und Seamus Hoyne, Seamus.Hoyne@lit.ie, Limerick Institute of Technology (LIT) - Irish partners of EU Interreg Carbon Connects project, Ireland

3.1.3. News from the DESIRE project

Neman River Basin Management Plan

To improve the quality of the Neman river and the Baltic sea , [DESIRE](#), a flagship Interreg project of the EU strategy for the Baltic Sea region was initiated in 2019. The project works on improving peatland management and retention of nutrients through rewetting and paludiculture in the Neman catchment. Within the scope of the project, the Neman river basin management plan (RBMP) of Lithuania (which comprises ca. 50 % of the Neman River catchment area) was analysed. The purpose was to assess the existing peatland management practices or any restoration plans described therein, and to stimulate higher recognition for sustainable peatland management in the RBMP. Although peatland rewetting is included in some programmes offered by the Lithuanian environmental agency, measures are neither sufficient nor sustainable. Paludiculture offers an all

in all solution, from helping restoration of the natural hydrological regime, preventing further degradation of peatlands, enabling nutrient retention for better water quality to enriching biodiversity and mitigating climate change by reduction of greenhouse gas emissions. Moreover, the socio-economic benefits it can provide can never be disregarded. Therefore, with an attempt to provide sustainable peatland management a higher recognition in the river basin management plan, a proposal has been elaborated. In addition to the existing water bodies already described in the RBMP, it attempts to consider wetlands/peatlands as new water bodies in itself. The proposal termed [BLUEPRINT](#) provides a step wise guide for potential addition of important information and aspects of sustainable peatland management at every stage of the river basin management plan. Thus, it aims to intricately integrate sustainable peatland management into the RBMP. However, for a successful integration, implementation and water protection, a transboundary basin management is required. Currently there are no multi-lateral agreements in place for joint management, only unilateral agreements for monitoring and data exchange. There is a need for formation of a joint commission for coordinated management of the transnational Neman river basin district, including joint management of peatlands and paludiculture.

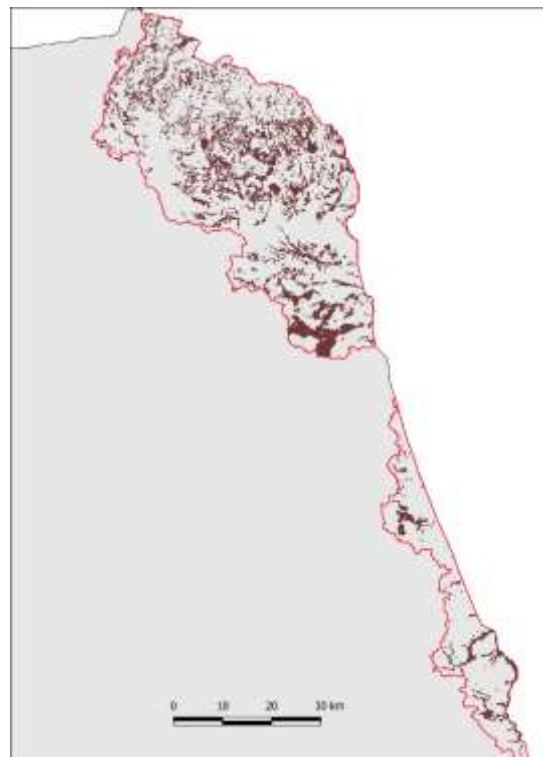
Authors: Mridul Trehan, mridul261292@gmail.com, and Wendelin Wichtmann, wendelin.wichtmann@uni-greifswald.de, Greifswald University - partner in the Greifswald Mir Centre

Mapping wetlands in the Polish part of the Neman River catchment area

The [DESIRE project](#) developed the first detailed GIS database on wetlands in the Polish part of the Neman catchment area (total area of the catchment 250,510 ha). Up to now, wetlands in this region did not receive much attention. Earlier studies in this field were of a general nature, or covered only fragments of the catchment area.

Wetlands were mapped by the Bialystok University of Technology. The GIS database contains wetland type, protection status, land use, and impact of drainage. The study was based on own materials from field surveys as well as data obtained remotely from high-resolution orthophoto maps and Digital Terrain Models (0.2 m and 1 m pixel size, respectively).

The GIS database contains information about 5,101 wetlands, with a total area of 40,893 ha (range: 0.03 – 902.13 ha; average: 8.02 ha). The most numerous wetland type is eutrophic wetland (including floodplain meadow and forest, rich fen, reed and sedge marsh, alder and willow swamp) and covers the majority of the wetland area (28,923 ha). Mesotrophic peatlands (including quaking bogs, spring and percolation mires, Birch and Alder-Sphagnum woods) cover 5,551 ha. In the Polish Neman River catchment also over 600 oligotrophic peatlands were found, with a total area of 6,419 ha. Unfortunately, in almost 60% of the peatland sites drainage infrastructure has been installed in the



5 Distribution of wetlands in the Polish part of Neman River catchment (Map: A. Kamocki)

past, which led to changes in these ecosystems. The vast majority of drainage systems are currently unmaintained, which favours rewetting. The database will be available in the WEBGIS system of the DESIRE project.

Author: Andrzej K. Kamocki, a.kamocki@pb.edu.pl, Bialystok University of Technology, Faculty of Civil Engineering and Environmental Sciences, Poland

3.2. Projects in Germany

3.2.1. Bioeconomy with climate protection bonus - online info day: Utilisation of biomass from wet peatlands

On December 10th and 11th 2020, the Greifswald Mire Centre and [Landcare Germany](#) offer a free video event on [bioeconomy with a climate protection bonus - utilisation of peatland biomass](#), each from 10 a.m. to 12 a.m. The session on the first day deals with material use e.g. as building material, that on the second day deals with energetic use and production of substrates. The information event provides a practical overview of how biomass from wet and rewetted peatlands can be used, which sales markets there are, and how these can be adapted and established for reeds, Sedges, Cattails or peat moss with presentations from companies and experts.



6 Pellets from reed biomass (Photo: lensescape.org)



7 Mouldings from reed (Photo: S. Abel)

Biomass from wet peatlands is still a demanding raw material for which the sales markets still have to be further developed. It can contribute to climate protection in various ways: by reducing greenhouse gas emissions from the peat soil used under wet conditions, by replacing fossil raw materials and by long-term carbon storage, e.g. in building materials. Whether as packaging, moulding, insulating material, peat substitute or for generating heat or electricity - every product entails also climate protection.

To register, write a short e-mail to sekretariat@lpv.de. You will then receive a dial-in link for the event. The event is organized as part of the [MoKli project](#). The project is funded as part of the [National Climate Protection Initiative \(NKI\)](#) of the [German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety](#).

3.2.2. A tiny house made of building materials from paludiculture biomass

How to demonstrate which building materials from paludiculture exist, how they can be used, how one can live in such building materials, ideally doing this in many places, in a mobile showroom - how could that be possible? Best in a tiny house! A pilot example on wheels emerged from the idea in 2020. It was built by the small NGO SoLe e.V. in close cooperation with the Greifswald Mire Centre. The following building and insulation materials made from paludiculture plants were used:

In the tiny house, Alder is in the panels of the interior wall cladding and in the solid kitchen worktop. Reeds are used to cover the canopy roofs, for wall insulation as insulation panels in the form of bundles from Reed stalks (both from the Hiss Reet company) and in the fiberboard of the cabinet (Zelfo Technology). Cattail is used in different forms as insulation material: 1) pure seed wool as blow-in insulation, 2) blow-in insulation from the whole plant (leaves, cobs, stems) prepared by the company Hanffaser Uckermark and 3) Typhaboard panels manufactured by the company Typhatechnik. For the latter, cattail leaves are cut uniformly in length and width and then pressed into the form of OSB panels using mineral glue. Insulating mats made of grass (Gramitherm company) are also installed. Sedge and wet meadow hay was fibrillated by Zelfo Technology and then pressed into sheets, whereby the fibers adhere to themselves and no additional glue is needed. The colored plates - partly as sandwich panels with a firm outer layer and a loose core - were used as furniture panels for the integrated staircase in the tiny house. A pellet stove serves as heating and can be equipped with pellets from paludiculture.



8 The tiny house is ready for visitors and guests (Photo: A. Nordt)

Visitors can see and compare the various insulation materials through small windows in the interior wall cladding. The mobile tiny house functions as a (guest) residence - fully equipped with kitchen, sanitary facilities) and sleeping area - as well as an exhibition or "to look at, touch and experience" for those interested. In summer 2020, two artists spent a 3-week residency there, dedicated to the subject of "Peatland, climate protection and paludiculture" (see [Paludiculture Newsletter 4/2020](#)). The tiny house is currently located near Greifswald on the edge of the Karrendorfer Wiesen coastal flood mire, and can be used and visited.



9 right: Cupboard and stairs made of fiberboard made of reed and sedge / wet meadow hay. (Photo: A. Nordt)

10 above: View from the kitchen, on the right small "insulation windows" are visible in the wall (Photo: T. Galke)

Currently greenhouse gas emissions related to the production and maintenance of the tiny house are analysed. It seems highly likely that there is a triple climate win: First, peatland management changed to paludiculture reduces greenhouse gas emissions from the soil. Secondly, the carbon is stored in durable building materials. Thirdly and simultaneously these materials replace products based on fossil raw materials. Further information on the tiny house, which is funded as a project by the [Sustainability Culture Fund](https://www.sustainabilityculturefund.de), is available at www.paludi-tinyhouse.de.



Author: Anke Nordt, anke.nordt@greifswaldmoor.de, Greifswald Mire Centre, Germany

3.2.3. Biogas from paludiculture?

Pellets, briquettes, bales from paludiculture for heat generation - there are several research projects about this underway and a biomass heating plant already working satisfactorily. But could biogas also be obtained from paludiculture? In a first [study](#), scientists from the Institute for Biogas, Circular Economy and Energy in collaboration with DUENE e.V., partner in the Greifswald Mire Centre, examined this on behalf of Greenpeace Energy. The result: It makes sense to use reeds, sedges, reed canary grass or cattail in biogas plants, since these plants are a particularly climate-friendly renewable energy source. In addition to reducing greenhouse gas emissions, a change to wet peatland management is replacing fossil fuels. If a medium-sized household were to switch from natural gas to biogas from paludiculture, it achieved an annual greenhouse gas reduction of 31.8 t. This corresponds to a drive of approx. 250,000 km in a mid-range car with CO₂ emissions of 125 g / km.



11 Cover of the brochure "Biogas from paludiculture"

When establishing biogas plants for biomass from paludiculture, however, it should be noted that mowing in (early) summer is required for high biogas yields. This may conflict with the goal of protecting biodiversity (e.g. of breeding birds), which is less likely in the case of late summer or winter mowing. Nature conservation requirements should be thoroughly checked and taken into account.

3.2.4. First paludiculture polder for Typha cultivation in Lower Saxony

The first pilot area is currently being set up as part of the new [KliMo joint project "Product chains from fen biomass"](#). In the Hohenböcker Moor, district of Oldenburg, the groundbreaking ceremony was held on Friday, October 9th 2020 by representatives of the district of Oldenburg, the municipality of Ganderkesee, the land owner (Domain Office Oldenburg), the project management company (Lower Saxony State Agency for Water Management, Coastal Protection and Nature Conservation NLWKN) and the construction company (Heino Müller Baggerbetrieb). A polder of approx. 0.5 ha is being created here to test the cultivation of Cattail and Reed and to investigate the effects on climate, water and biodiversity. Scientists continuously collect data on this area. Among other things, the Thünen Institute of [Climate-Smart Agriculture](#) carries out greenhouse gas exchange measurements. A drastic reduction in greenhouse gas emissions is expected. The Department of Spatial and Environmental Sciences at the University of Trier and the Institute for Environmental Planning at the Leibniz University of Hanover will examine changes in water quality and biodiversity. The Institute for Crop Production

and Soil Science at the Julius Kühn Institute collects crop production data and evaluates it to optimize future cultivation methods.

From the raw materials - Cattail and Reed biomass - the project partners Jade Hochschule Oldenburg, the Technical University Ostwestfalen-Lippe, Floragard Vertriebs-GmbH and the 3N Kompetenzzentrum e.V. develop products such as insulation materials and peat substitutes and test them in practice. Currently, a ca. 300 m long polder dam with a ring trench is being built for the pilot plantation. Photovoltaic systems provide electricity for the water pump. A weather station will be built next to the test pole.



12 Ground breaking ceremony for the paludiculture pilot site in the community of Ganderkesee (Photo: 3-n)

Further pilot areas are being planned and will be set up in two other regions in Lower Saxony next year (2021). The aim is to be able to make regional-specific statements. The primary aim is to test the paludiculture cultivation concept, to adapt it to the conditions in Lower Saxony, to develop it further and to demonstrate it. In addition, the provision of ecosystem services is fundamentally examined and documented. Another focus is on the development of sustainable products that are scientifically and practically tested and monitored.

The joint project is funded by the European Regional Development Fund (ERDF) and the Lower Saxony Ministry for the Environment, Energy, Building and Climate Protection. The project sponsor is the Lower Saxony State Agency for Water Management, Coastal Protection and Nature Conservation (NLWKN) in cooperation with the 3N Competence Center Lower Saxony Network Renewable Raw Materials and Bioeconomy e.V. in Werlte.

Author: Colja Beyer, beyer@3-n.info, Competence Center Paludiculture Lower Saxony, Germany

3.2.5. Sphagnum farm Barver honoured as regional lighthouse project

One year after its groundbreaking start, the [European Committee of the Regions \(CoR\)](#) has recognized the Barver Sphagnum farm as a regional lighthouse project in agricultural climate protection. The Committee had sought “best practice” climate protection projects across Europe that implement objectives

of the EU Commission's Green Deal. With the carbon credit scheme [MoorFutures](#) from Mecklenburg-Vorpommern, another German flagship project for climate protection on peat soils was awarded.

With its Green Deal, the EU Commission is calling for climate engagement in the regions of Europe and according to their own strengths. In Lower Saxony, there are many drained peatlands, which are regional CO₂ emission hotspots. They are responsible for 12% of the federal state's greenhouse gas emissions, and for an even higher proportion in the peatland-rich North-west of Lower Saxony. These emissions can be drastically reduced if the water level is raised close to the surface. Instead of working against the water as before (drainage), in future land use should be done in line with the water (close to natural, high water tables). On agricultural land, a conversion to site-adapted use – to paludiculture – is required.

This is exactly what the recently awarded sphagnum farm Barver does: It grows peat moss (*Sphagnum*) on typical, degraded raised bog grassland. It aims to make paludiculture better known in the region, provide practical experience and contribute to climate protection. The European recognition of Diepholz's peatland protection commitment makes the subject of paludiculture even more visible for the EU institutions. The Barver Sphagnum farm was implemented as part of the [CANAPE Interreg project](#).



13 From the bird's eye view: the Barver Sphagnum farm flooded after heavy rain (Photo: J.-U. Holthuis)

Author: Jens-Uwe Holthuis, jens-uwe.holthuis@web.de, project manager NSRP CANAPE, Foundation for Nature Protection in County Diepholz, Germany

3.2.6. Win-win-win thanks to Sphagnum - information day on Sphagnum farming

Win-win-win thanks to Sphagnum mosses - that was shown on September 4th 2020 at the 2nd information day on peat moss (*Sphagnum*) cultivation on the pilot site in the Hankhauser Moor north of Oldenburg: Sphagnum can bring a new income source to rural areas and provides a double win for climate protection. Their cultivation transforms conventional raised bog grassland into a climate-friendly production system that stops peat degradation and loss. In addition, Sphagnum can replace the finite resource peat in horticulture and thus also help to save greenhouse gas emissions. The Hankhauser Sphagnum farming site provides another example that Lower Saxony is a pioneer in sustainable peatland management (paludiculture) and climate protection.



14 Greenhouse gas measurements and information boards at the pilot site at Hankhauser Moor (Photos: S. Hirschelmann)

Peat affects us all: Each of us "eats" peat every day - indirectly through the consumption of vegetables grown on peat. However, peat is a finite resource. In addition, drainage for peat extraction and the utilisation of peat leads to the release of enormous amounts of greenhouse gases. That is why the University of Greifswald and the Moorkultur Ramsloh company have been working together with other partners on various projects since 2004. At present, they show on 17 ha in the Hankhauser Moor, how peatlands can be managed sustainably and are good for people, the climate and the environment. During the information day, a tour along various information booths provided knowledge about climate effects of peatland use, paludiculture, water filtration, biodiversity, selection of highly productive peat mosses as well as modern potting soil and peat substitutes. The Sphagnum harvesting technology was presented and the University of Rostock demonstrated how greenhouse gas exchange measurements are carried out. A total of around 50 participants were on site.

The information day was organized by the [MoKli project](#). The project is funded as part of the [National Climate Protection Initiative \(NKI\)](#) of the [Federal Ministry for the Environment, Nature Conservation and Nuclear Safety](#).

4. Events on peatlands and paludiculture

25.-27.11.2020	Conference "Sustainable & Resilient Urban-Rural Partnerships – URP2020", Leipzig, Germany, https://www.urp2020.eu/ (hybrid event)
15.-18.02.2021	6th IAHR Europe Congress "Hydro-environment research and engineering. No frames, no borders", https://iahr2020.pl/ (online)
09.-11.03.2021	RRR2021 – virtual conference "Renewable resources from wet and rewetted peatlands", www.rrr2021.com (online)
25.-30.04.2021	EGU General Assembly 2021, www.egu2021.eu (online)
02.-07.05.2021	International Peatland Congress, Tallinn, Estonia, https://www.peatlandcongress2021.com (online)
17.-21.05.2021	TISOLS 10th International Symposium on Land Subsidence, Netherlands, www.tisols2020.org
19.-24.6.2021	SER 2021 RE3 Conference " From Reclaiming to Restoring and Rewilding A new global trajectory: Catalyzing change through the UN Decade on Ecosystem Restoration" https://www.ser.org/page/SER2021virtual (online)
22.-27.08.2020	II. ISHS International Symposium on Growing Media, Soilless Cultivation, and Compost Utilization in Horticulture, Ghent, Belgium; https://www.growingmedia2021.com/
27.06.-08.07.2021	VI International Field Symposium "West Siberian peatlands and carbon cycle: past and present", Khanty-Mansiysk, Russia https://mukhrinostation.com/wspcc2021/
23.-27.08.2021	Eurosoil2020, https://eurosoil2020.com/wp-content/uploads/2020/01/Eurosoil-2020-Geneva-Sessions-Descriptions-V4.pdf , Genf, Switzerland
September 2021	Symposium "Mires of Northern Eurasia: biospheric function, diversity, management", Petrozavodsk, Russia, mire2020@krc.karelia.ru
31.08.-04.09.2021	SER Konferenz "A new Green Deal for Europe's nature. Science and political action towards socio-ecological restoration", Alicante, Spain, www.sere2020.org

20.- 22.09.2021	Landscape 2021 - Diversity for Sustainable and Resilient Agriculture, Berlin, Germany, www.landscape2021.org
10.- 15.10.2021	11. INTECOL International Wetlands Conference, Christchurch, New Zealand; https://www.intecol2021.com/

5. Literature

Durant, D., Farruggia, A., Tricheur, A. (2020): Utilization of Common Reed (*Phragmites australis*) as Bedding for Housed Suckler Cows: Practical and Economic Aspects for Farmers. Resources. DOI: [10.3390/resources9120140](https://doi.org/10.3390/resources9120140)

Hirschelmann, S., Raschke, I., Stüber, M., Wichmann, S., Peters, J. (2020): Moorschutz in der Gemeinsamen Agrarpolitik – Instrumente für eine klimaverträgliche Moornutzung in Deutschland. Berichte für die Landwirtschaft. <https://buel.bmel.de/index.php/buel/article/view/320/527> (in German)

Humpenöder F., Karstens, K., Lotze-Campen, H., Leifeld, J., Menichetti, L., Barthelmes, A., Popp, A. (2020): Peatland protection and restoration are key for climate change mitigation. Environmental Research Letters. DOI: [10.1088/1748-9326/abae2a](https://doi.org/10.1088/1748-9326/abae2a)

Junior, E. S. O., van Bergen, T., Nauta, J. (2020): Water hyacinth's effect on greenhouse gas fluxes: A field study in a wide variety of tropical water bodies. Ecosystems. DOI: [10.1007/s10021-020-00564-x#citeas](https://doi.org/10.1007/s10021-020-00564-x#citeas)

Koehn, D., Günther, A., Jurasinski, G. (preprint, 2020): Mature black alder shows intermittent events of high stem methane emissions. DOI: [10.1101/2020.09.01.277350](https://doi.org/10.1101/2020.09.01.277350)

Koojiman, A., Cusell, C., Hedeäs, L., Lamers, P. M. (2019): Re-assessment of phosphorus availability in fens with varying contents of iron and calcium. Plant and Soil 447 (1); DOI: [10.1007/s11104-019-04241-4](https://doi.org/10.1007/s11104-019-04241-4)

Liu, L., Guo, X., Wang, J. (2020): Cryptic lineages and potential introgression in a mixed-ploidy species (*Phragmites australis*) across temperate China. Journal of Systematics and Evolution. DOI: [10.1111/jse.12672](https://doi.org/10.1111/jse.12672)

Tanneberger, F., Appulo, L., Ewert, St., Lakner, S., Ó Brolcháin, N., Peters, J., Wichtmann, W. (2020): The power of nature-based solutions: How peatlands can help us to achieve key EU sustainability objectives. Advanced Sustainable Systems. DOI: [10.1002/adsu.202000146](https://doi.org/10.1002/adsu.202000146)

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Responsible in terms of press law: Nina Körner, Wendelin Wichtmann

