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@greifswaldmoor.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

1.1. All peatlands in M-V rewetted by 2050! - State press conference on peatland and climate

All peatlands in Mecklenburg-Western Pomerania (M-V) are to be rewetted by 2050, Dr. Till Backhaus, Minister for Agriculture and Environment, stated during at state press conference “Peatlands in M-V and their importance for climate protection targets" on 28th July in Schwerin. According to the fact paper Peatlands in Mecklenburg-Western Pomerania in the context of national and international climate protection targets – status quo and development potential (German only) presented by the Greifswald Mire Centre - the federal state could enable a huge potential for climate protection. Peatlands cover about 13% of its land area. The drained peatlands currently cause almost 30% of the state's total greenhouse gas emissions. Every minute an average of 11 tonnes of CO_2 are emitted into the atmosphere from the drained peatlands - considerably more than the carbon sequestration of the entire forest area in M-V. The preparation and implementation of peatland rewetting and paludiculture as an alternative source of income concerns departments in several ministries. An inter-ministerial working group shall therefore promote peatland climate protection in M-V. For more information see the press release (German only) of the Ministry of Agriculture and Environment of Mecklenburg-Vorpommern.

1.2. Three weeks + art + tiny house - first paludiculture artist’s residency launched

1 Paludiculture tiny house (Foto: A. Nordt)

Creating art for paludiculture in a tiny house built from climate-friendly paludiculture materials and located right beside the wet peatland - this triple combination is the idea of the paludiculture artist’s residences, which the Greifswald Mire Centre together with the BURG Giebichenstein University of Art in Halle are offering this year. Now the first fellow has moved into the mobile home currently located on a rare restored coastal flood peatland at the Greifswald Bodden coast: Graphic designer and BURG graduate Vreni Knödler will work in the tiny house for three weeks. The Greifswald Mire Centre is looking forward to see what an artist’s delving into the complex ecological issues of peatlands, climate protection and paludiculture will bring about. The results are intended to contribute to changing the social dialogue on peatlands and to raise more awareness on their significance for climate protection and their possible sustainable use in the current perception. The surrounding landscape as well as the building materials made from paludiculture provide plenty of inspiration. The mobile and energy-efficient tiny house features, among other things, plywood made from wet alder, wall insulation made from cattails and a roof made from reed.

2. A paludiculture project presented: DESIRE

The DESIRE-project (Development of Sustainable (adaptive) peatland management by Restoration and paludiculture for nutrient retention and other ecosystem services in the Neman river catchment) aims to support wetland management to improve water quality in the Neman river basin (and thus the Baltic Sea) and to restore other ecosystem functions of peatlands. The project is implemented within the period of January 2019 – June 2021 (30 months) by eight partners and nine accompanying institutions from five countries – Germany, Poland, Lithuania, Russia and Belarus – with representatives from regional and national authorities, research institutions and private companies. DESIRE is coordinated by the University of Greifswald (Germany) and has a total budget of € 1.8 million. In the following sections we report about some selected interim results from the project.

2.1. Proposals of agri-environmental schemes for water retention and paludiculture

The importance of wetlands for safeguarding the future of our society is widely known. Still, too few tools ensure proper funding to protect intact or restore damaged wetlands. These tools may include e.g. paludiculture, or agri-environmental schemes (AES) supporting protection of wetlands.

2 Restored Peatland in Poland (Photo: T. Wilk)

The Polish Rural Development Programme has not yet provided neither measures specifically supporting paludiculture nor measures strictly promoting high water levels. As a part of DESIRE project, the Polish Society for the Protection of Birds has developed proposals for such schemes to be included in the new 2021-2027 Common Agriculture Policy together with project partners.

Scheme for paludiculture

Despite its development potential, paludiculture still is in a „testing phase", in Poland as elsewhere. It is not being implemented in Poland at a larger scale except for some local reed growing. Thus, support for paludiculture was proposed to be based not on a separate scheme, but rather to be integrated into other schemes by several „small" adjustments giving needed flexibility. The proposed set of regulations include:

A) Paludiculture should be treated as an alternative management with high water levels within extensive grassland schemes (with the exception of high-nature valuable grasslands). It could thus derogate from other requirements (e.g. grassland can be mown after 1th June or according to other needs of paludiculture management) and gives extra incentives for keeping high water levels by top-up payments.

B) Paludicultures, i.e. cattail, *Sphagnum*, reed etc. should be included in the list of cultures eligible for Single Area Payment (SAP), organic farming products and the list of crops related to the cultivation of sustainable agriculture (or integrated production).

C) The market for paludiculture biomass and biomass from nature-valuable late mown wet meadows should be supported by allowing and incentivising its use in fertilization (e.g. compost) or mulching in prescription of agri-environment-climate schemes or eco-schemes for arable lands.

D) Investment scheme for supporting farmers in purchasing adapted agricultural machinery, sluices for keeping water level high, biomass processing facilities, and market access to start-up paludiculture.

Water scheme

So far, many restrictions have impeded the development of provisions of the "water package" in Poland, e.g.: (i) impact of raising the water table on adjacent properties (especially in small farms), (ii) need for implementation of activities on lands of other ownership (ditches), (iii) requirements arising from the Water Law Act, (iv) the investment nature of activities (e.g. dams).

The proposal from the DESIRE project includes:

A) a separate scheme developed for floodplains (HWS “High water scheme”). HWS should support the extensive use of meadows (e.g. mowing after 1st June). In two out of five years it should be possible to abandon the swath (due to high water). The implementation of HWS should be limited to floodplains (e.g. flood risk areas designated on the official map), or
B) it should be possible to skip mowing in flooded areas (or areas periodically covered by water). The areas covered by water should be indicated by the relevant authority (e.g. on the basis of Sentinel satellite data) in case of implementation of any grassland scheme.

We believe that incorporating such proposals could strongly support wider implementation of paludiculture, wise water retention and wetlands restoration in the new CAP perspective. Our proposal has been submitted to the Polish Ministry of Agriculture and Rural Development in the spring., and is being currently analysed by the Ministry.

Authors: Tomasz Wilk, Marek Jobda, OTOP-Birdlife Poland

2.2. Peatland database for the Neman River catchment

The need to balance both the utilization and the conservation of natural resource management calls for spatial planning at multiple levels (strategic, tactical and operational). One work package of the DESIRE project provides spatial planning at both the strategic and tactical levels by evaluating the representativeness of peatlands in the Neman River basin in the Baltic Sea Region.

Therefore DESIRE is developing an online web mapping tool, and a test version can be found on www.neman-peatlands.eu. It’s an interactive map containing spatial data with parcels of separate peatlands, presented in a grid of 500 ha cells of entire catchment. The database contains major peatland statistics, e.g. peatland type, land use, conservation status, drainage status etc. Peatland data were obtained from available geospatial data and satellite images. For the analysis of Lithuanian part of Neman catchment the Lithuanian peatland database http://www.geoportal.lt was used. Belorussian and Russian peatlands were mapped by analyzing satellite images, and additional mapping carried out in the Kaliningrad region.

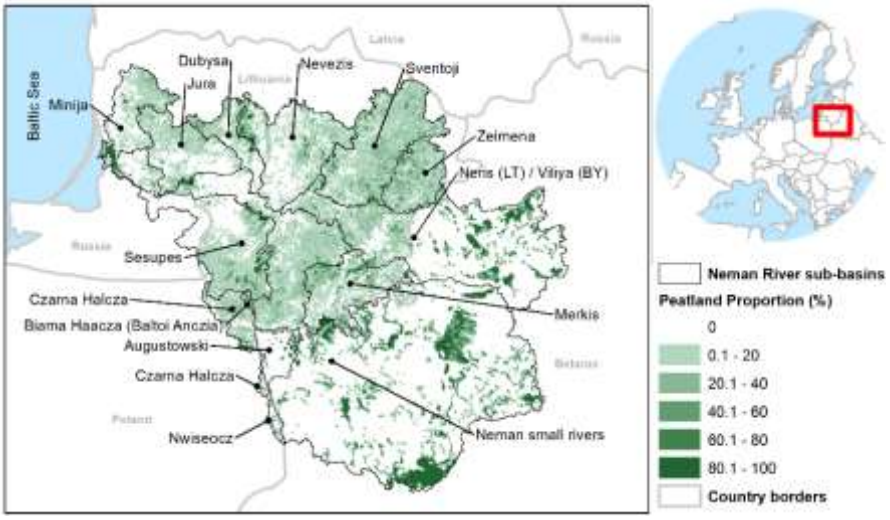
The database presents – as a result of the GAP analysis - the current situation of peatlands distribution and their status of disturbance within the Neman river catchment to policy makers, planners and land users. It is indicating the need to restore them and to implement Water framework Directives targets

to significantly improve water quality by nutrient retention. The database is intended to serve in the update of Neman River catchment management plan.

Users will be able to download data of peatland distribution with attributes along with the results of GAP analyses in working files (shape, gdb etc.) for free. The website will be in 4 languages: Lithuanian, Russian, Polish and English.

GAP analyses

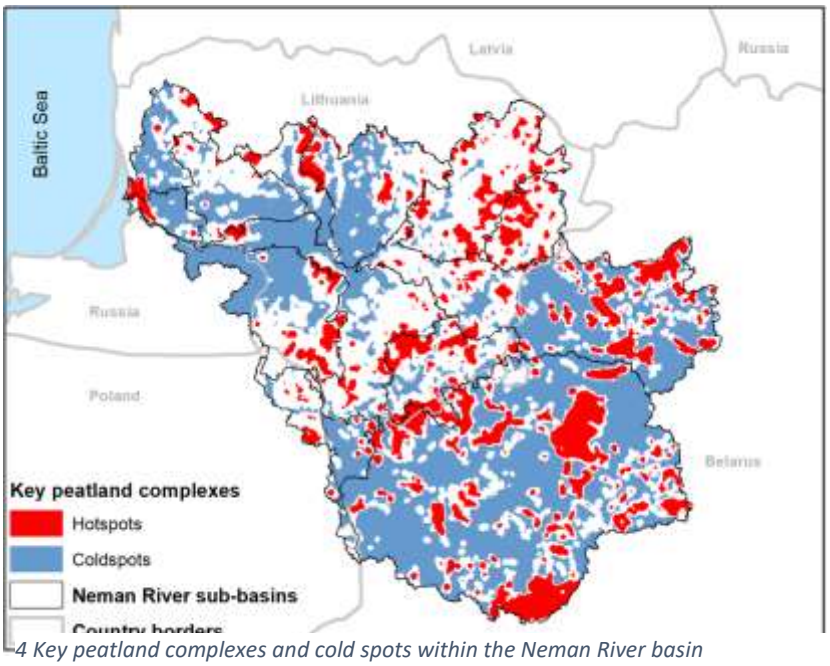
A GAP analyses - a comparison of actual with potential or desired performance - of peatlands within the Neman catchment was done by using three key performance indicators of current peatlands through (1) an analysis of current peatland distribution and representativeness, (2) a analysis of peatland representativeness and desired conservation needs, and (3) a hotspot analysis to identify potential areas for peatland restoration.



3 Sub-basins of the Neman River

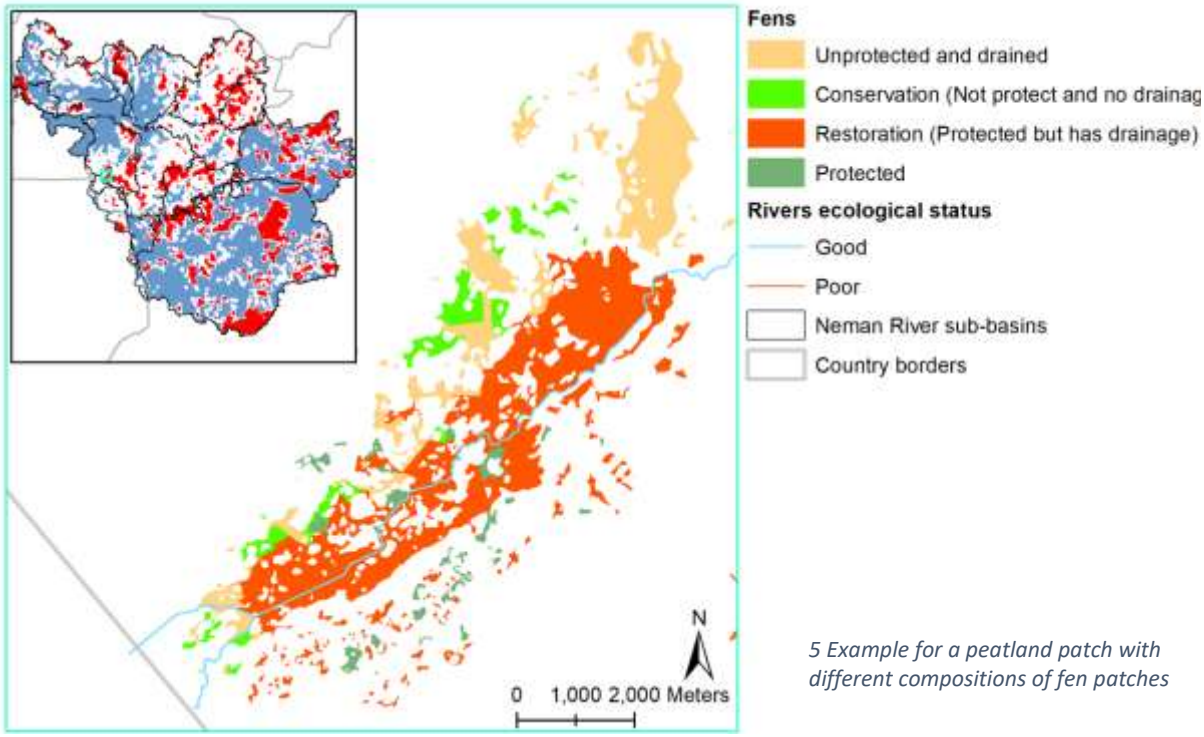
Initial results show the size, distribution and proportions of peatlands using a 1km^2 hexagon varies between the sub-basins of the Neman River (Figure 3). Both, Lithuania and Poland, have smaller fragmented peatland patches compared to Belarus that hosts larger peatland areas.

This peatland distribution emphasises the need for spatial planning to target key peatland areas for restoration and conservation. Applying spatial planning via a cluster analysis based on peatland proportions and spatial distribution has identified key peatland complexes with high connectivity (red hotspots), areas with low peatland density (blue) and areas free of peatlands (white) within the Neman River basin (Figure 4). The peatlands within the peatland complex can be considered as spatially functional given their proportions and distribution. Targeting these key peatland complexes (hotspots) for restoration and conservation to maintain functional peatland ecosystems would be most effective and deliver the most benefits in terms of ecosystem management for the Neman River basin.



4 Key peatland complexes and cold spots within the Neman River basin

At the level of tactical planning by focussing on a key peatland complex, spatial planning can identify individual peatland patches for restoration or conservation (Figure 5). Focusing on fens for improving water quality this figure shows the peatland patch with different compositions of fen patches with and without protection and drainage. Using a simple scheme, Figure 5 shows the recent protection and drainage levels of the fens, the ecological status of the river system and suggested measures related to improvement of water quality for a subarea. Patches which are already protected without drainage are presented in dark green, areas possibly to be protected through conservation with limited intervention in light green. Protected but drained areas in need of restoration are shown in orange. Unprotected and drained areas that would require a lot greater restoration effort are marked in beige. The next step on a hierarchical planning process would be operational planning considering landcover types, ownership and the best restoration/conservation requirements for each area of fen.



5 Example for a peatland patch with different compositions of fen patches

Authors: Michael Manton, Vytautas Magnus University and *Nerijus Zableckis, Lithuanian Fund for Nature*

2.3. DESIRE for restoration and sustainable use of wet meadows in Žuvintas BSR

Žuvintas Biosphere Reserve is the second largest protected wetland complex in Lithuania (ca. 14,000 ha). It harbors numerous mires and peatlands. It is rich in habitats protected under Natura 2000 which provide home for many bird and plant species. It is considered as wetland of International Importance (Ramsar Site) and was designated as an UNESCO Biosphere Reserve in 2011, as the Reserve's territory and surrounding areas have a long land use history. This was particularly intensive during Soviet times, when a major part of Žuvintas territory (mostly wet meadows, fens and some parts of raised bogs) were strongly affected by drainage for land reclamation. The biosphere reserve acts as a nutrient sink for the surrounding intensively managed agricultural fields. Therefore, preservation and restoration of

6 Paludiculture demonstration sites at Žuvintas Biosphere Reserve (Photo: J.Sendzikaite)

organic soils combined with regular removal of biomass has top priority for nutrient retention and surface water purification, and for biodiversity conservation and climate change mitigation.

Thus, Žuvintas was predestined as a demonstration site within the project Paludiculture in the Baltic States, financed by the European Climate Initiative, which aims to increase capacities for low-emission peatland management and paludiculture in the Baltic states. Three potential project sites were selected on the reserve's territory and pre-planning documents required for rewetting, optimal water management, and establishment of wet meadow production schemes were compiled. In total, the three selected demo sites in the Žuvintas Biosphere Reserve cover 70 ha: the Amalvas polder (44 ha), the Berzines peatland (8 ha), and the Azuoliniai peatland (18 ha).

Investments for the implementation of the pre-planned wet meadow sites, e.g. construction of dams, removal of trees, shrubs, and stones, and establishment of paludicultures will now be financed within the EU-funded Interreg DESIRE project. Further maintenance of the grasslands is ensured via agreements with local farmers, who will manage the sites for at least 6 years within agri-environmental payment schemes; either the "Extensive wetland management" scheme or the "Conservation of Aquatic Warbler habitats" scheme.

The hydrology of the Amalvas polder was converted from a winter polder into a summer polder regime in a previous LIFE project (Restoring of hydrology in Amalvas and Žuvintas wetlands WETLIFE LIFE07 NAT/LT/530, in 2012). Floodings also in summer were brought back to the area covering over 200 ha. Since the area is intended to be used agriculturally, farmers and nature conservationists agreed to keep the average water level 30-40 cm below the surface during the vegetation period. For the rest of the year the polder is or can be completely flooded. Thus, the area is flooded in winter and spring, but towards the end of summer the water level might be lowered by pumping stations to enable farmers to harvest the biomass. However, these rules were not approved, and farmers optimised water levels for more conventional agricultural standards. Following the intervention of the DESIRE project in 2020, the agreement was accepted by the Municipality of Marijampole. Newly approved polder regulations

will now help to ensure a favourable water level regime both for wet meadow habitats and for farmers, who are responsible for the maintenance of the site.

Still, the utilization of the biomass is a challenge of the management. Therefore, the Lithuanian Fund for Nature and local farmers elaborated a "best practice": Farmers are using biomass for different purposes. A farmer from Amalvas polder uses the biomass as fodder for his own cattle, the rest will be used as bedding material for a neighbouring beef farm. After use the biomass mixed with manure is used as an organic fertilizer on cereal fields. The other two demo sites will be dammed to keep ground water levels apt for wet meadow habitats. Water level can be regulated and be lowered during harvesting time. As in Amalvas polder the biomass from Berzine peatland will be used for bedding cattle. The rest of hay will be used in pellets for heating. Cattle (Hereford) will be grazing on Azuoliniai peatland during summer. Ungrazed vegetation will be cut, and after regrowth grazed again.

7 Managed meadows at Žuvintas Biosphere Reserve (Photo: J.Sendzikaite)

Paludiculture as an innovative approach for peatland management, is included in the draft CAP Strategic Plan for Lithuania. Due to the lack of long-term and large-scale experiences, a lot of questions are yet to be answered. The demo sites in Zuvintas BR offers new insights for stakeholders and showcase low-emission peatland management for policy makers and land users.

Author: Nerijus Zableckis, Lithuanian Fund for Nature

2.4. Energetic use of biomass from paludiculture

As part of the DESIRE project, the Bialystok University of Technology (BUT, Poland) researches the energetic use of biomass obtained through paludiculture. Valley peattlands with wet meadows belong to the most valuable and diverse ecosystems in Europe and are essential elements of the agricultural landscape sustained by low-input traditional farming. Transformation of agriculture that began in the late 19th century led to a drastic decline in their range and far-reaching alteration of species composition. Therefore, in the management of biodiversity and biota of non-forested ecosystems, an introduction of measures aimed at reproducing the former landscape with characteristic species composition is the most common prescription.

At present, limited alternative exploitation of biomass harvested in extensively managed peatlands and near stream riparian grasslands is generally supportive of its use for raw material extraction or energy generation. Since landscape management often supports nature conservation objectives, a high level of social acceptance is assumed. Thus, the use of conservation biomass for the generation of bioenergy and biomaterials is recommended to policymakers to avoid negative consequences associated with energy crop production. This is especially true for the utilization of gramineous biomass for biogas generation, which is often suggested to be an up-and-coming and sustainable option, despite that material from landscape management often poses adverse features, which are challenging compared to the commonly used agricultural substrates or bio-wastes. Unfortunately,

even though some new studies have recently appeared, there is still a shortage of comprehensive researches that quantify the efficiency of energy generation from residual biomass and its contribution to the mitigation of climate change. Moreover, only a few studies covered the whole of energy balance and Life Cycle Analysis.

The BUT studies an LCA of energy generation based on biomass feedstock coming from nature conservation and paludiculture. We focus on anaerobic digestion and biogas production because it seems to be the most beneficial for both the environment and economy. It includes the possibility of storage and flexible use of biogas: electricity, heat, methanation, and vehicle propulsion while preserving organic matter and biogens that can be reused in agriculture.

More information: https://wb.pb.edu.pl/

Author: Piotr Banaszuk, Politechnika Białostocka

The DESIRE-project (https://www.moorwissen.de/en/paludikultur/projekte/desire/index.php) is funded by the EU Interreg Baltic Sea Programme 2014–2020. It is a flagship project under the Policy Area "Nutri" of the European Union Strategy for the Baltic Sea Region (EUSBSR). The project is financed by the European Regional Development Fund (ERDF), the European Neighbourhood Instrument (ENI) and the Russian national funding. It is co-funded by the German Federal Environment Ministry's Advisory Assistance Programme (AAP) for environmental protection within the project SPARPAN (see above) and the Baltic Sea Conservation Foundation.

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. Paludiculture in the UK?

The UK Lowland Peat project, led by the UK Centre for Ecology and Hydrology along with ADAS and the Universities of Leicester, Bangor and Leeds, aims to provide the UK Department of Environment, Food and Rural Affairs (Defra) with evidence to help mitigate greenhouse gas (GHG) emissions from cultivated lowland peatlands in England and Wales. The large-scale drainage of English lowland peatlands began with Dutch Engineer Cornelius Vermuyden in the 17th century, who was so successful in his task that he received a knighthood and English citizenship. There is even a pub named after him in the town of Goole (not to be confused with Google: https://en.wikipedia.org/wiki/Goole) in Yorkshire. Much of the drainage infrastructure Vermuyden created still exists today, but attitudes to peatland drainage have changed somewhat during the last 350 years, as many of the peatlands he

drained have subsided below sea-level and as the consequences of peat oxidation for CO_2 emissions and the climate have become clear. Nevertheless, the 'black soils' of areas such as the Fenlands of East Anglia represent some of the UK's most profitable agricultural land, and most are intensively farmed to produce high-value horticultural and arable crops. Consequently, the trade-offs between economics, food security and rural communities on one hand, and climate mitigation and conservation on the other, are acute, and policymakers face a formidable challenge in trying to reconcile these apparently conflicting priorities.

As its primary aim, the Defra project aims to assess the extent to which GHG emissions can be mitigated by changing water management practices in peatlands under conventional agricultural management. To assess this, we have established a field experiment in which the effects of raising water levels (seasonally or continuously) on GHG emissions and crop production can be compared to 'business as usual' management. We are not expecting these measures to halt GHG emissions, but they may offer 'breathing space' by slowing rates of peat loss, while at the same time continuing to support rural economies and food security, until new forms of agricultural management on wet peatland can be put into place. Unfortunately, Coronavirus has halted progress on the experimental work for much of 2020, but in the meantime we have been keeping busy by producing two reports for Defra on issues related to lowland peat management.

The first report focuses on the opportunities for, and barriers to, paludiculture in England and Wales. The report was led by Barry Mulholland and Islam Abdel-Aziz at ADAS, and we were also lucky to benefit from the in-kind support and encyclopaedic knowledge of Richard Lindsay and Jack Clough[1] from the University of East London. The report considered a wide range of options for paludiculture, including the production of biomass for bioenergy and building materials, *Sphagnum* as a peat-alternative in the growing media industry, and a range of potential food crops or plants with medicinal uses. Richard even informed us that sundew was used in Renaissance times to promote 'youthfulness', which we think may have been a euphemism. The report highlighted the potential benefits of paludiculture for mitigating GHG emissions and conserving biodiversity. These were weighed against the costs and challenges for implementation, including water demand, the lack of markets for products and the risk of displacing food production and associated emissions elsewhere. Overall, we consider that paludiculture on lowland peat has considerable potential, but that the practical and economic barriers to its large-scale adoption remain high. To help the UK meet its land-management objectives for the 2050 Net Zero emissions target, it will be necessary to undertake further research, develop new markets and create the economic conditions to support the larger-scale adoption of paludiculture. At the same time, it seems unlikely that conventional farming on peat, which is so important to the UK's food production, will end, so it remains imperative that we develop effective strategies to reduce GHG emissions from these areas.

In the second report, led by Sue Page at the University of Leicester, we assessed the broader societal impacts of peatland drainage, in particular those linked to long-term subsidence. These include damage to linear infrastructure such as roads, railways, pipelines, power lines and to property, as well as the financial and energy costs, and increased flood risk, which result from large areas of land falling below river and sea level.

During the last 50 years, peatland drainage and subsidence, along with peat extraction, are also estimated to have destroyed around three quarters of the archaeological artefacts held in peatlands. The report recognises the agricultural and economic importance of drained lowland peatlands, but

[1] See: Carver, K., Clough, J., Lindsay, R. (2020) Water Works – – paludiculture in the Great Fen, England. Paludiculture Newsletter 2020/3

notes that the agricultural value of peat soils declines as peat wastage progresses, and can even be entirely destroyed through saline intrusion.

8 Subsidence of peatland soil in England (Photo: Ch. Evans)

Furthermore, the costs of drainage are often 'hidden', or disconnected, from the original activities. For example both the drainage of land, and the rising costs of flood defence and road repair are funded (wholly or partly) by the taxpayer. Yet there is little awareness among the different funding agencies that these costs are connected, or how much of the costs of maintaining infrastructure are attributable to peat subsidence. The report concludes by recommending a more joined-up approach to agricultural peatland management in which the full range of both costs and benefits of different forms of peatland management are quantified, as a basis for more informed decision-making in future.

Both reports, along with other information about the project, are available at: https://lowlandpeat.ceh.ac.uk/outputs

Author: Christopher D. Evans, UK Centre for Ecology & Hydrology

3.1.2. CLEARANCE project just finalised

The CLEARANCE-Projekt (CircuLar Economy Approach to River pollution by Agricultural Nutrients with use of Carbon-storing Ecosystems) has addressed the importance of existing wetlands and their restoration as Wetland Buffer Zones (WBZ), especially with regard to nutrient retention. The project was able to demonstrate the role of WBZ using model catchments and to investigate synergies between water purification and other ecosystem services. The key concept of CLEARANCE is the multifunctional use of WBZ. The wetland biomass including the absorbed nutrients is harvested and provide raw materials. The restoration of WBZ on organic soils simultaneously reduces greenhouse gas emissions. There are also other benefits, such as the biodiversity of the riparian zones typical of the location and the recreational effect.

At the end of the project in summer 2020 CLEARANCE published a brochure on multifunctional riperian wetlands (German, English and Polish). The brochure provides a general introduction to important nutrient cycles and their importance for clean water and shows the ecological advantages of wetland fringes. It explains the sustainable agricultural use of wetlands and possible uses for the biomass produced. In parallel to the brochure, the project also provides an interactive online web tool that allows users to calculate nutrient removal potentials for different wetland plants by harvesting and to present potential utilisation possibilities. The tool will be available at www.clearance-project.com in September 2020. A review article on the state of knowledge regarding wetland buffer zones, rewetting and retention of nitrogen and phosphate has been published (to the article). Other publications you find in section 5 (Jablonska et al. 2020).

One subproject investigated the attitude of people towards natural, small rivers with riparian wetlands in comparison to modified rivers that are restricted by straightening and drainage and have largely lost their natural ecosystem functions. Although the economic situation of the participating project countries Poland, Denmark and Germany differs considerably, the majority of the respondents were prepared to pay similarly high amounts of money for measures to improve the water quality in rivers and the adjacent Baltic Sea by restoring wetlands (see brochure).

In various workshops, both opportunities of riverine wetlands and their management and obstacles to their implementation became clear (see article). The implementation of wetland agriculture in wetlands is still associated with high technical and institutional obstacles. The project was able to propose recommendations for the improvement of the European agricultural policy (CAP) and the Water Framework Directive (WFD).

The European Green New Deal and the currently low interest rates should now be used for investments in wetland restoration and management to promote regional economic development, climate and water protection.

Further information: http://opendata.waterjpi.eu/dataset/clearance-circular-economy-approach-to-river-pollution-by-agricultural-nutrient.

Author: Claudia Oehmke, Greifswald Mire Centre

3.2. Projects in Germany

3.2.1. Paludiculture in a twin pack - Cattail and reed to optimise peat moss growth

To provide purified water for irrigating Sphagnum farming sites the OPTIMOOS project now planted filter basins with a total size of 3,200 m² with cattail and reed. This is intended to promote *Sphagnum* as the target species, but at the same time all three paludiculture plants produce raw material for horticultural substrates. The ca. 17 ha trial area can be visited during the public information day on 04.09.2020 (see 3.2.2). In the joint project OptiMOOS the four partners (Universities of Greifswald, Rostock and Oldenburg, Lehr- und Versuchsanstalt für Gartenbau Hannover-Ahlem) are researching the optimisation of Sphagnum farming with regard to water management, climate balance, biodiversity and product development (see Paludiculture Newsletter 02/2020). It is funded by the Ministry for Environment, Energy and Climate Protection of Lower Saxony and the European Regional Development Fund (ERDF).

9 Cattail planting at Hankhauser Moor (Photo: G. Gaudig)

Author: Greta Gaudig, University of Greifswald/ Greifswald Mire Centre

3.2.1. Information day: Sphagnum farming in the peatland Hankhauser Moor on 4.09.2020

Win-win-win through peat mosses – this is shown at the public information day on Sphagnum farming in the Hankhauser Moor north of Oldenburg on September 4th. The day is organised by the projects Peatland and Climate Protection (MoKli), Optimizing Sphagnum farming (OptiMOOS) and Breeding and Mass propagation of Peat Mosses (MOOSzucht) of the Greifswald Mire Centre. Since peat moss can provide new income in rural areas and is doubly good for climate protection. Their cultivation transforms conventional bog grassland into a climate-friendly production system that stops peatland shrinkage. In addition, peat mosses can replace the finite resource peat in horticulture and thus also help to save greenhouse gases. The Hankhauser Sphagnum farming site, which is owned by the Deutsche Torfgesellschaft mbH, provides an example of how Lower Saxony pioneering in sustainable peatland management (paludiculture) and climate protection.

The information day is for free and is addressed to experts and other interested persons and offers the opportunity to talk to scientists and practitioners. The 17-hectare pilot site can be visited on a 2.5 km tour. There is information on the use of peatland, paludiculture, modern potting soils and much more. Technology used in Sphagnum farming and the measurement of greenhouse gases can also be seen. If you like, you can walk in snowshoes over a wet peat moss lawn.

Registration is not necessary, weatherproof clothing and (water)proof shoes are recommended for the rough terrain. Meeting point is the car park Moorseiter Straße 37, 26939 Ovelgönne. The event can be cancelled at short notice if the Corona regulations change.

Author: Greta Gaudig, University of Greifswald/ Greifswald Mire Centre

3.2.3. Where to put the hay? 5500 small bales as giveaway!

Nature conservation-compatible mowing and biomass utilisation in the Binsenberg spring mire in Mecklenburg-Vorpommern

10 The Primula-Schoenetum - a plant society threatened by extinction (Photo: N.Seifert)

From 2018 to 2020, extensive revitalisation measures were carried out in the Binsenberg spring mire at the Kleines Landgrabental in eastern Mecklenburg-Vorpommern. The area, which is primarily owned by the Succow Foundation, partner in the Greifswald Mire Centre, has a total size of almost 40 ha and is mainly used as extensive grassland. Parts of the area have not been used for agricultural purposes for many decades and have developed into extensive reed beds.

Despite the melioration of the spring mire in the 1980s, very rare and highly endangered plant species and vegetation types of the calcareous fens have survived in parts of the Binsenberg, including habitat types 7230 and 6410 of the FFH directive. Ongoing - and subsequent to the now completed measures for the restoration of the hydrological system, a specially adapted mowing regime is indispensable for the preservation of the plant species and vegetation types.

Due to the partly very wet soil conditions, but also in order to protect the sensitive vegetation, the mowing is carried out with adapted, soil-conserving mowing technology and baling press of a landscape conservation company on an area of approx. 8 ha. Since the Binsenberg is located in a site of collective importance (GGB, formerly FFH) and the habitat types contained therein are subject to a ban of deterioration, the mowing is financed by the State Office for Agriculture and Environment (StALU) Mecklenburg Lake District. Until now, however, the costs for the maintenance mowing had to be applied for annually from the StALU. The respective order could then only be placed after approval of the state budget - which mostly made early mowing as required in nature conservation impossible. At the same time it led to a medium to very low hay quality. Since autumn 2019, funds have fortunately been available for three years, so that the first cut of the two string mowing could already be realised in June 2020.

11 Soil-conserving mowing technology for small bale production (Photo: C. Barnick)

The aim is to secure or restore mesotrophic conditions, at least in some areas, through hay production and thus the removal of biomass from the area. The hay is pressed into handy square bales weighing about 7-9 kg. Although the hay is actually of good quality, especially for farm animals in need of roughage such as horses or sheep, the disposal of the mowed material is always a challenge. The Succow Foundation has neither its own farm nor its own transport or storage infrastructure. The bales are too small and the amount of work involved too great for large farms in the surrounding area, so they only accept them in exceptional cases and free of charge. A further complicating factor is that the hay bales easily absorb moisture due to their shape. So a brief rain shower quickly turns a few thousand hay bales into a pile of moist biomass that can no longer be used as fodder and has to be disposed of in the composting plant for a fee. Storage in the open air for several days is therefore a high risk and pressure is high to find buyers for the hay bales as quickly as possible.

12 Square, practical, good: Hay from wet peatlands in small bales (Photo: C. Barnick

For pragmatic reasons, the Succow Foundation has therefore decided to give the hay away free of charge to small and private livestock owners in the region immediately after pressing via an advertisement in the local newspaper and an ad in small ebay ads. Experience shows that there is an enormous demand for the hay. For example, in June 2020 4000 hay bales were given away within very short time and many parties interested had to go away empty-handed. The demand for hay from this wet peatland was certainly high due to continuing drought and associated low hay yields from grasslands on mineral soil and drained peatlands. However, we assume that there is demand for the product "small-balled hay". Apart from the small size attractive for small-scale and private livestock farmers the hay is guaranteed to be free of the common ragwort (*Senecio jacobea*) deadly poisonous to horses, as it only colonises on mineral soils.

More information (in German): https://www.succow-stiftung.de/binsenberg

Authors: Carl Barnick, Nina Seifert, Succow Foundation/ Greifswald Mire Centre

3.2.4. Developing incentives for Paludiculture

According to the German government's Climate Action Plan 2050, the land use sector (land use, land use change, forestry = LULUCF) should remain a net carbon sink until 2030 and develop it towards a more effective sink until 2050. The EU LULUCF regulation as part of the 2030 Climate & Energy Framework of the EU sets a similar goal. Since official projections[2] indicate that the target will not be reached in the coming years, more ambitious measures are required in Germany to reduce the existing greenhouse gas (GHG) emissions and to secure the sink capacity in the LULUCF sector.

According to the projections, the role of the forestry and timber sector as carbon sink will decrease due to the age-class structure (reduced growth rate) and changed timber utilisation. Forestry will no longer be able to compensate for the GHG emissions from drained peatlands which are the largest source in the sector right now. Large-scale rewetting of peatlands is required to maintain the LULUCF sector as net carbon sink. Furthermore, paludicultures on rewetted peatlands can make an additional contribution to protecting the climate, because non-renewable fossil raw materials can be substituted.

As paludiculture is currently not implemented on a large scale and, above all, there are no economic incentives to switch from conventional drainage-based to wet production processes, the DUENE

[2] Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit (ed.) (2019): Projektionsbericht 2019 für Deutschland gemäß Verordnung (EU) Nr. 525/2013. Online: https://www.bmu.de/download/projektionsbericht-der-bundesregierung-2019 (accessed: 18.08.2020).

Institute, partner in the Greifswald Mire Centre is conducting a research project "Incentives for paludiculture for the implementation of the climate protection goals 2030 and 2050" (FKZ 3719 42 509 0) on behalf of the German Environmental Agency (UBA).

The project (2019-2021) analyses the potential contribution of paludiculture for meeting the climate objectives, provides information on obstacles and costs for the establishment of paludiculture and identifies measures suitable for promoting peatland rewetting and paludiculture. We will analyse and discuss the suitability of selected measures and assess their transferability to the international context. Finally, we will develop proposals for designing and combining market-related incentives for the implementation of paludiculture and an effective reduction of GHG emissions from peatlands in Germany.

Author: Achim Schäfer, DUENE e.V./ Greifswald Mire Centre

4. Events on peatlands and paludiculture

4.1. RRR2021 conference will take place virtually

COVID-19 prohibits the planned in-person conference on "Renewable Resources from Wet and Rewetted Peatlands", while research and implementation of paludiculture are rapidly evolving. The Greifswald Mire Centre acknowledges the need for international exchange and is looking forward to explo¬ring the opportunities of an inspiring virtual conference with you. You are invited to submit abstracts for virtual presentation, workshop, excursion per video or exhibition. The keynote speakers will be Prof. Dr. Dr. h.c. Hans Joosten (University of Greifswald, Germany), Zélie Peppiette (European Commission, Belgium), Dr. Bärbel Tiemeyer (Thünen-Institute, Germany) and Prof. Dr. Kristiina Regina (Natural Resources Institute Finland (Luke), Finland). For more details, the GMC will send the 2nd announcement soon. See also the conference homepage www.rrr2021.com.

Please note the following important dates:

Abstract submission	September 30th 2020
Notification of acceptance	November 15th 2020
Registration deadline	February 20th 2021
Conference	March 09-11th 2021

4.2. Further events

4.9.2020	Public information day „Sphagnum farming in the peatland Hankhauser Moor" https://www.moorwissen.de/de/paludikultur/projekte/mokli/veranstaltungen.php
8.9.2020	Conference "Peatland management", Bad Oldesloe https://metropolregion.hamburg.de/natur/13676786/moormanagement
10.9.2020	"Nachwachsende Rohstoffe aus vernässten Mooren – eine Chance für den niedersächsischen Moor- und Klimaschutz?"; Online event www.3-n.info
14.-17.9.2020 postponed to Feb. 2021	6th IAHR Europe Congress, Warsaw, Poland; https://iahr2020.pl/

14.-18.9.2020 postponed to Sep. 2021	Symposium "Mires of Northern Eurasia: biospheric function, diversity, management", Petrozavodsk, Russia, mire2020@krc.karelia.ru
18.-23.10.2020 postponed to Oct. 2021	11th INTECOL International Wetlands Conference, Christchurch, New Zealand; http://www.intecolwetlands2020.co.nz/intecol20
26.-30.10.2020 only online	Conference of the Geological Society of America (GSA), Montreal, Canada - session T153 „Soils and Long-Term Environmental Change" https://community.geosociety.org/gsa2020/home
25.-27.11.2020	Conference "Sustainable & Resilient Urban-Rural Partnerships – URP2020", Leipzig, Germany https://www.urp2020.eu/ (hybrid conference)
15.-18.2.2021	6th IAHR Europe Congress , Warschau, Polen https://iahr2020.pl/
9.-11.3.2021 Only online	RRR2021 – Conference on "Renewable resources from wet and rewetted peatlands", Greifswald, Germany, www.rrr2021.com
25.-30.04.2021	EGU General Assembly 2021, www.egu2021.eu
2.-7.5.2021	International Peatland Congress 2020, Tallinn, Estonia www.ipc2020.com
17.-21.5.2021	TISOLS 10th International Symposium on Land Subsidence, The Netherlands, www.tisols2020.org
19.-24.6.2021	RE3 Conference "From Reclaiming to Restoring and Rewilding", Quebec, Canada, http://www.re3-quebec2020.org/
2706. – 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, Geneva, https://eurosoil2020.com/wp-content/uploads/2020/01/Eurosoil-2020-Geneva-Sessions-Descriptions-V4.pdf
31.8.-04.9.2021	SER Conference "A NEW GREEN DEAL FOR EUROPE'S NATURE. Science and political action towards socio-ecological restoration", Alicante, Spain, www.sere2020.org
10.-15.10.2021	11. INTECOL International Wetlands Conference, Christchurch, Neuseeland; https://www.intecol2021.com/

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Further new publications on peatlands, rewetting and nature conservation on peatlands can be found in the IMCG Bulletin, which is regularly published on the IMCG homepage.

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

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