Drained peat soils in Austria – Multiple benefits from rewetting

Potential to mitigate GHG emissions and support biodiversity by peatland management

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Current greenhouse gas emissions from drained peatlands

Drained peatlands are found in all parts of Austria (Fig. 1). The total peatland area is estimated to be ca. 80 000 ha and all greenhouse gas emissions in the official statistics originate from grasslands (13 000 ha). The reported GHG emissions from grassland on drained peatland amounted to 0.3 Mt CO_{2e} in 2022 and they are thus a minor part of the emissions from land use (LULUCF; Fig. 2). In addition, N_2O emissions equivalent to 0.05 Mt CO_{2e} were reported from grasslands as part of the total emissions.

Part of these grasslands are managed in a traditional extensive way and have cultural value.

Austria does not report GHG emissions from peatland forest because peatlands in forestland were not mapped. A new map is now available and will enable including emissions from drained peatland forests.

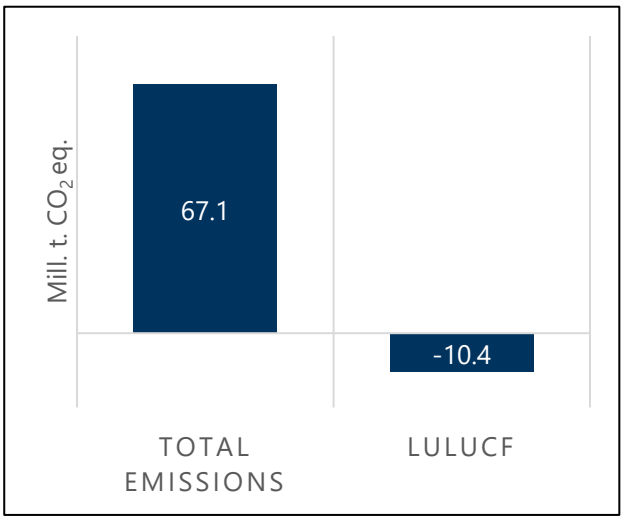

Figure 2. Total GHG emissions and net sink of the land use (LULUCF) sector of Austria in 2022

Many intact mires are in a poor state of preservation

Even 90% of Austria's peatlands are disturbed or lost, mainly due to land use change to settlements and agriculture but also intact mires are threatened by climate change and human activities.

Facing threats from climate change, drainage and nutrient pollution, the remarkable variety of mires in Austria needs to be preserved •Stephan Glatzel

National target of peatland restoration

In its Mire Strategy 2030+, Austria aims at conserving the existing mires, developing more sustainable land use on peatlands and improving their function as buffers against floods, drought and fire as well as reducing horticultural peat use as much as possible.

In the pathway to climate neutrality, Austria needs to turn peatlands into carbon sinks. This can be achieved by reduced drainage depths in or re-wetting of agriculturally managed and forested peatlands. Nature conservation measures and paludicultures are important in achievíng climate neutrality.

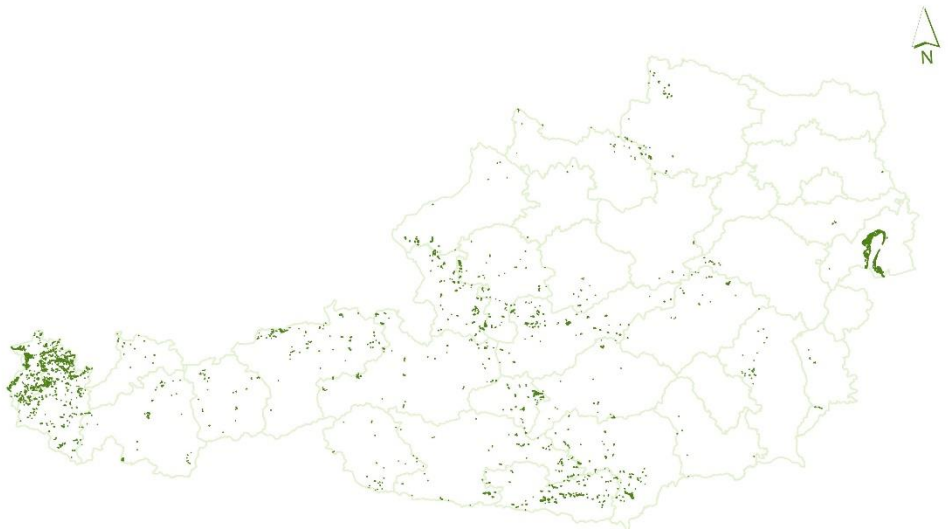

Figure 1. Peatland map of Austria (Based on data from the Global Peatland Database / Greifswald Mire Centre (2024)

Traditional grasslands must be protected

Grassland use ranges from very intensive to extensive, but damaged peatlands can be found even on extensive pastures in the Alps due to trampling by animals and disregarding fences.

The traditional extensive or paludiculture-like land uses on peat soils (litter meadows) have value as cultural heritage sites and must be preserved. They keep the landscape open and host rare species like orchids. There is good agreement on preserving these sites as they are valued by landowners, support tourism, and are an important element of national identity.

Reed harvesting is also a traditional way of using wet ecosystems especially on the shores of Lake Neusiedl, which is the second largest reed stand in Europe. Reed is harvested in the winter and used for many purposes. In future climate with no frost, the harvesting methods must be developed to protect the soil.

The restoration potential of forests on peatlands should be utilised

The area of forests on peatland has been poorly known because the soil types in forests were not mapped. However, based on the latest mapping efforts (Moldaschi et al. 2024) there are about 42 kha forest on peat soils in Austria, and this area should be better known for implementing the peatland strategy. The topsoil conditions in forestry use are favourable for peat decomposition and thus wetter management options should be applied to preserve the peat.

The effect of climate change manifests as dying spruce stands in some peat forestry areas. Restoration to peat bogs is a feasible option for the future management of such sites as it has been estimated that the prevailing precipitation is sufficient for sustaining the hydrology.

Rewetting has important local benefits

If all drained peatlands were rewetted the emission mitigation would amount up to 0.2 Mt (Fig. 3). Even though the greenhouse gas (GHG) mitigation potential of peatland restoration is estimated to be only 1-2% of total GHG emissions of Austria, they are a major component of GHG mitigation potential in some regions. It is advisable to develop regional strategies for the mitigation of GHGs, involving restoration of peat soils and implementing paludicultures.

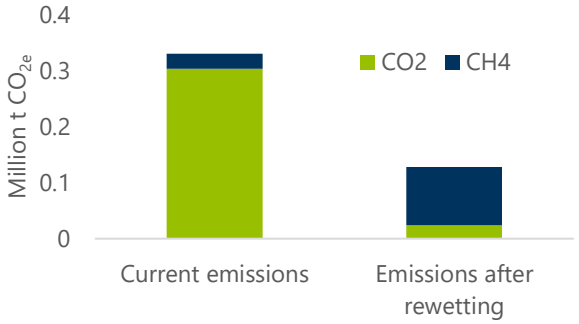

Fig. 3 GHG mitigation by rewetting all drained peat soils in Austria.

As many Austrian peatlands are sloping, restoration measures must be planned on a landscape level. Therefore, taking a landscape perspective is important when restoration measures are planned.

There are good examples of improved biodiversity in rewetting. Examples of them are the former peat production site Pichlmeir Moor (front page) and emergence of *Drosera rotundifolia* in Rotmoos (last page).

The additional benefits from rewetting change are:

- Flood, drought and fire prevention
- Less nutrient pollution in watercourses
- New business opportunities from paludiculture
- Feeding sites for migrating birds, leading to less damages to fields
- Improved status of protected areas currently surrounded by drained areas
- Improved sustainability of food production and consumption.

References

Moldaschi E. et al. 2024. Organische Böden in Österreich: Ausmaß, Bewirtschaftung und Treibhausgasemissionen. Umweltbundesamt Report REP-0932, Wien 2024.

IPCC 2014. https://www.ipcc.ch/publication/2013-supplement-to-the-2006-ipcc-guidelines-for-national-greenhouse-gas-inventories-wetlands/

What is rewetting?

In rewetting, water flow out from a drained area is restricted. The ground water level rises and enables restoring the wetland functions of the ecosystem. Emissions of carbon dioxide (CO_2) and nitrous oxide (N_2O) decrease and the increase in methane (CH_4) emissions is usually moderate.

The effects of rewetting were calculated assuming an instant change from the current reported average emissions of each land use type to emissions corresponding to the default emissions of rewetted peatlands (IPCC 2014).

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