Ecosystem services provided by peatlands in hemiboreal landscape

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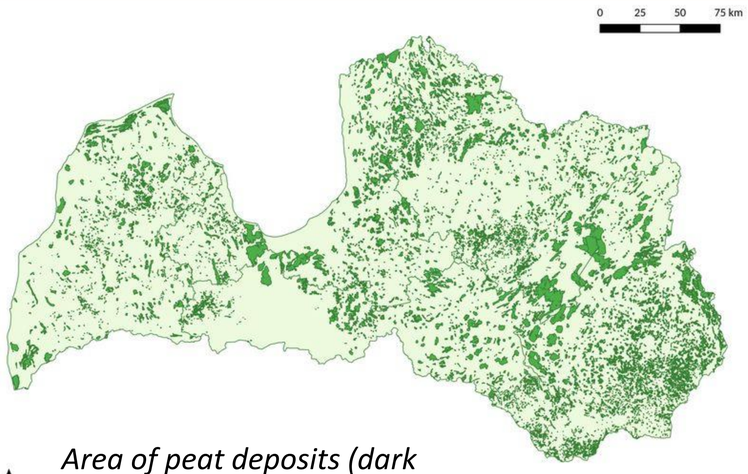
INTRODUCTION

Peatlands are important component of hemiboreal landscape due to their ecological functions and benefits.

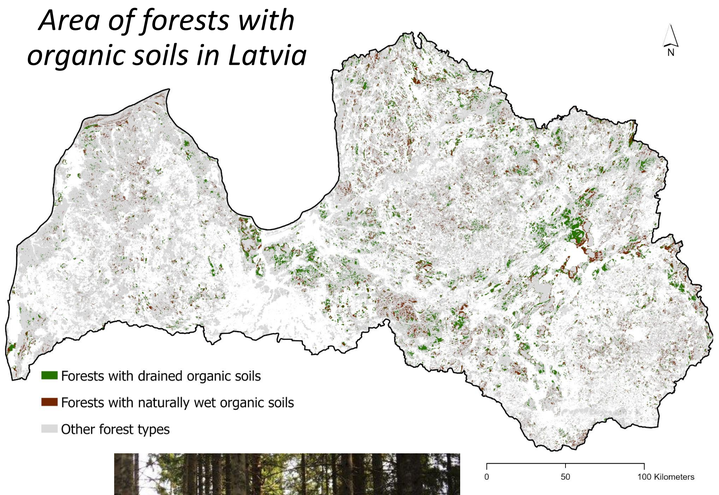
In Latvia:

- the total area of peat bogs is 640 kha (9.9% of the country's territory) including 49.3% fens, 41.7% raised bogs and 9% transitional mires.
- Approximately 400 kha are covered with forests with drained organic soils and ~ 340 kha are covered with forests with naturally wet organic soils (~12% and ~10% of the total forest area).
- Considerable area of organic soils is used for agricultural production (92 kha managed as cropland, 76 kha managed as grassland).
- Approximately 50 kha are affected by peat extraction - ~30% active peat extraction areas, ~34% areas with implemented or ongoing recultivation measures, mostly natural afforestation, and ~36% abandoned cutaway peatlands where recultivation should be carried out.
- According to the latest estimates, approximately 15.6% (976 kha) of the total land area is covered by soils where peat layer thickness exceeds 20 cm, with an additional 7.6% (480 kha) of the territory being covered by a peat layer with thickness less than 20 cm. These results indicate a difference from the previously known area of organic soils, which was 10.8% (Ivanovs *et al.*, 2023).

Scientifically sound information about the wide range of ecosystem services (ESs) provided by peatlands is needed to facilitate the ongoing intense discussions about the further management of organic soils.



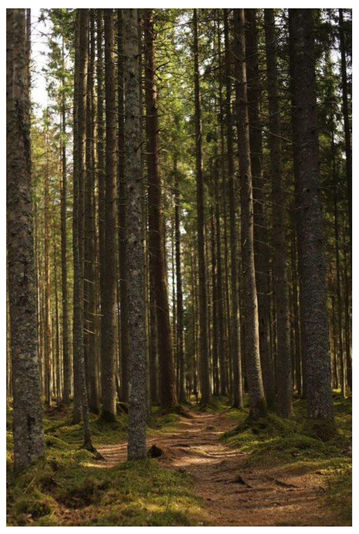
Area of peat deposits (dark green) in Latvia



Area of forests with organic soils in Latvia



Hemiboreal peatland in Latvia, photo: Z.Lībiete

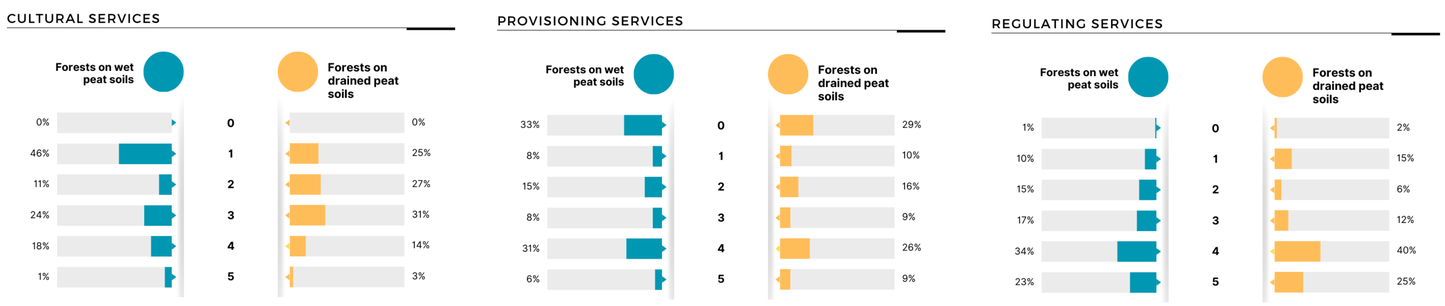


Hemiboreal peatland forest in Latvia, photo: I. Pauliņa-Saltā

DIVERSITY OF ECOSYSTEM SERVICES IN HEMIBOREAL PEATLANDS

Indicators for evaluating the potential of selected forest ecosystem services in Latvia (Jūrmalis *et al.*, 2023):

- Provisioning (biotic):
  - Potential bilberry (*Vaccinium myrtillus*) yield;
  - Potential lingonberry (Vaccinium vitis-idaea) yield;
  - Habitat suitability *for game species (Roe deer, Capreolus capreolus, Red deer,* Cervus elaphus, moose, *Alces alces*, wildboar, *Sus scrofa*).
- Regulation & Maintenance (biotic)
  - Potential phytoremediation by trees and ground vegetation;
  - Noise attenuation potential;
  - Stabilization potential of toxic heavy metals (Hg, Pb, Cd);
  - Stabilization potential of forest ecosystems to ensure resilience against anthropogenic (recreational) pressure;
- Cultural (biotic)
  - Suitability of the forest compartment to provide environment for recreation;
  - Visual attractiveness of forest stands



Forest area (%) characterized by different ESs scores, by ESs group and forest site-type group (forests on wet peat soil and forests on drained peat soil). 0—ES not provided; 1—ES value very low; 2—ES value low; 3—ES value average; 4—ES value high; 5—ES value very high. Jūrmalis et al., 2023.



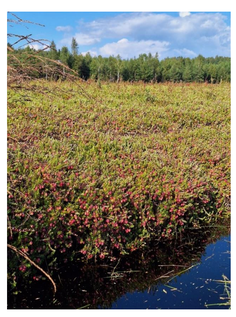
Environment for recreation, photo: Z.Lībiete



Peat extraction area (what is restoration here?), photo: I. Krīgere



Habitat for diverse species, photo: Z.Lībiete



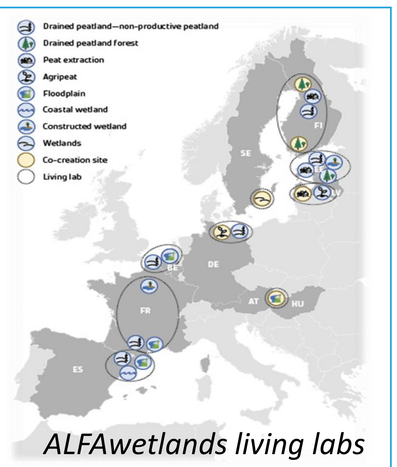
Cranberry plantations on former peat extraction fields, photo: A. Bārdule



Harvested wood products (materials), photo: Z.Lībiete

ALFAwetlands - Wetland restoration for the future

- The **ultimate goal of ALFAwetlands** is to improve the geospatial knowledge base of wetlands, to evaluate the pathways of wetland restoration that incorporate a co-creation process and to provide information and indicators for sustainability to maximise climate change mitigation, biodiversity and other benefits.
- **Living labs** have a key role in ALFAwetlands project. Living labs form a system that supports and integrates ecological and environmental research with economic and social science research and mapping and modelling to improve European wetland restoration practices while taking into account climate and biodiversity and ecosystem services benefits. ALFAwetlands living lab´s sites in Latvia:
  - Wood ash application on peat extraction area (drained peatland forest, non-productive)
  - Co-creation & berry cultivation in former peat extraction area (agripeat - agriculture area on peatland)
  - Agroforestry shelter belts & plantations on agricultural peatland (drained peatland forest, productive)
  - Afforestation of agricultural peatland (non-drained peatland forest, productive)
- Webpage: https://alfawetlands.eu/



ALFAwetlands living labs

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