

Mitigation potential of cultivated thick layered peatlands in Finland

Authors: Hanna Kekkonen*, Hannu Ojanen**, Arto Latukka***, Kristiina Regina *

Introduction

Finnish cultivated land is a net source of greenhouse gas (GHG) emissions. The main source of GHGs is cultivated peatlands, although only 10% of cultivated land are peatlands; this title produces 60% of Finland's total agricultural GHG emissions (reporting sectors Agriculture+cropland and grassland in LULUCF). The more north your farm is located the harder it is to avoid cultivating them.

In the *National energy and climate strategy by 2030*, cultivated peatlands are seen as **the most potential** target for greenhouse gas mitigation in agriculture.

Leaving peatlands out of production is not an attractive option for farmers. In a new way of thinking environmental payments could be paid for ecosystem services like GHG mitigation. That could lead e.g. to profitable production of biomasses in paludiculture, keeping the groundwater table close to the ground level. Regional thinking could be applied: in the southern part of the country the aim should be removing peat soils from production as more mineral soils are available for replacement. In the north, less radical mitigation measures could be applied instead. Targeting measures to the fields with deepest peat layer would be cost-efficient.

Material and methods

In this study, we examined the area and location of agricultural thick layered peatlands (>60cm peat layer) by region, Centres for Economic Development, Transport and the Environment (CEDTE), and how many hectares of those are in extensive use. In theory, those fields would be the most potential to be rewetted or used in paludiculture.

Agricultural statistics were used to define the extensive area and soil database to classify fields based on peat depth. Mitigation potential was calculated based on the difference of IPCC 2013 emission factors (CO₂, N₂O and CH₄) in categories "rewetted" and "grassland".

Conclusions

60% of Finnish cultivated peatlands are thick layered (>60 cm peat layer), and 23 300 hectares of those are in extensive use. If all extensive, thick layered peatlands were rewetted, Finnish total GHG emissions from cultivated peatlands could diminish 4.6% (Table 1).

Most potential area to mitigate GHGs is southern Finland, seven southernmost CEDTEs (excluding Åland), where about one third (7000 ha) of extensively cultivated thick layered peatlands locates. In total, southern Finland has almost 40 000 hectares of cultivated thick layered peatlands. If all 7000 extensive hectares were rewetted, total GHG emissions from cultivated peatlands would diminish 1.4% annually.

More reliable emission factors for paludiculture are needed for a more accurate estimate. Also, policy changes are necessary to make paludiculture a potential alternative from farmers' perspective.

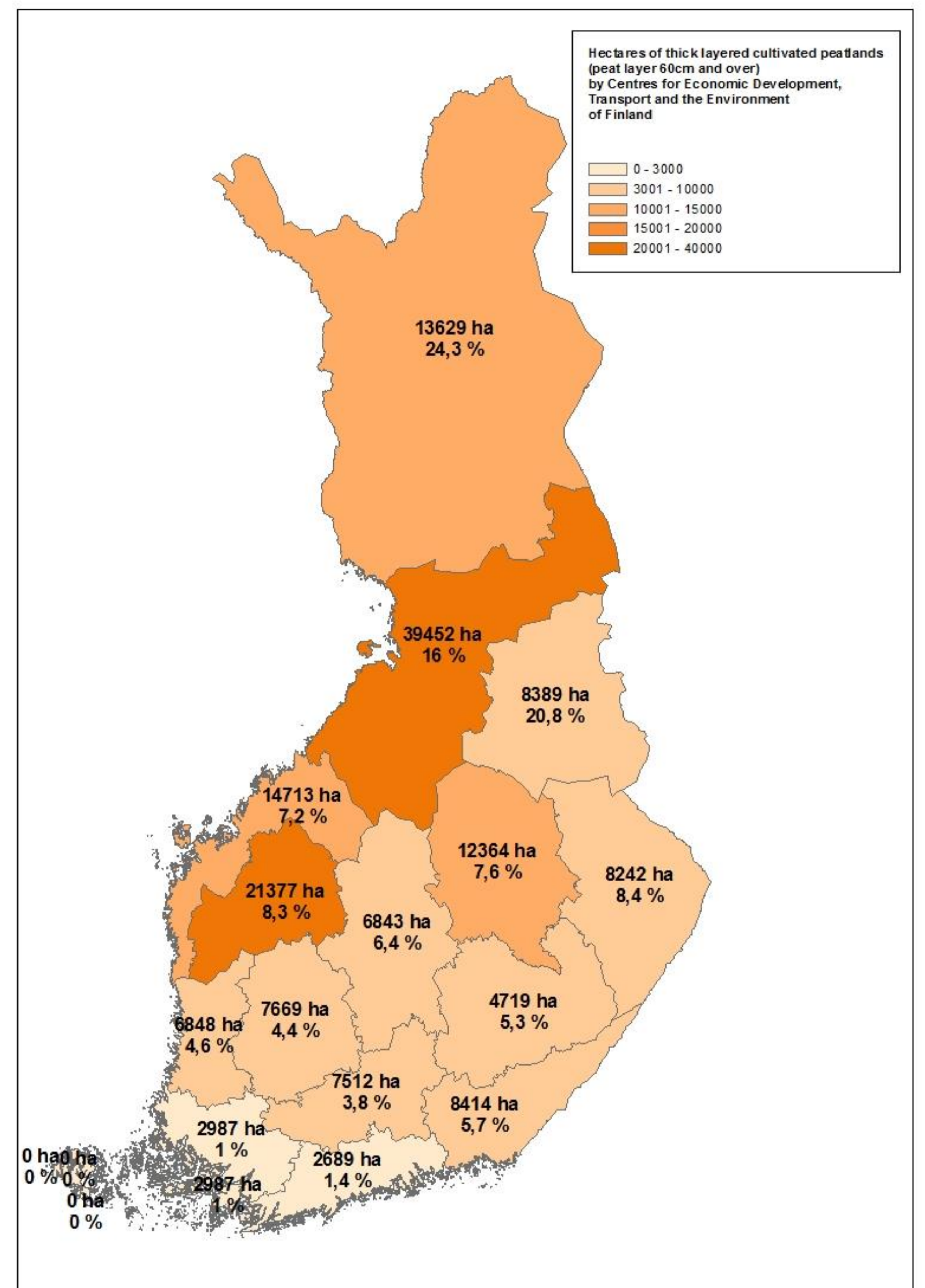


Fig. 1 Area of thick layered cultivated peat soils by region in Finland

	Whole Finland	Southern Finland
Total area of cultivated peatland (ha)	241 872	55 059
Thick* layered cultivated peatlands (ha)	154353	38209
Thick* layered cultivated peatlands in extensive use (ha)	23285	7109
Mitigation potential if all extensive fields rewetted (kt CO ₂ e)	329	100
Mitigation potential (% of total emissions)	4.6	1.4

*peat layer 60 cm or over