

# Current and future peatland use – Nordic perspective

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rrr2021 Conference  
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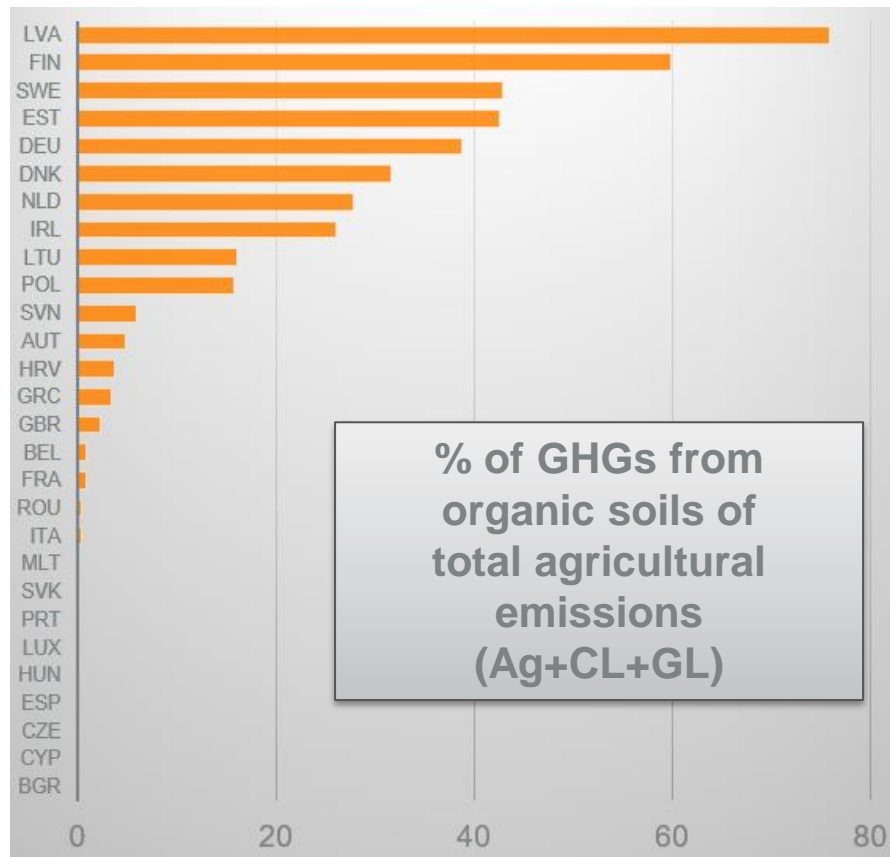
# Is the mitigation potential of drained peatlands used?

Synthesis of GHG inventories of EU MS  
(average of 2006-2015):

- In peat-rich countries >20% of agricultural emissions come from peat soils
- No mitigation measures for peat soils found (inventories reviewed in 2017)

Nordic countries in submissions 2020: no sign of mitigation measures

→ The potential to mitigate by cultivated peat soils is under-utilized



# Peatland use in Finland

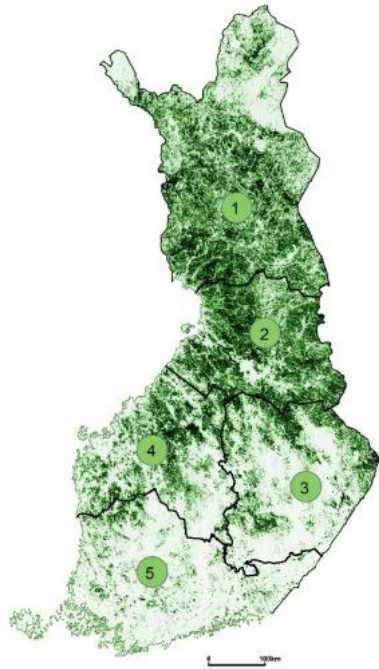


Figure 1. Peatland distribution in Finland (green colour) and the outlines of the five regions used in this study. 1 = Lapland, 2 = northern Ostrobothnia, 3 = eastern Finland, 4 = western Finland, 5 = southern Finland.

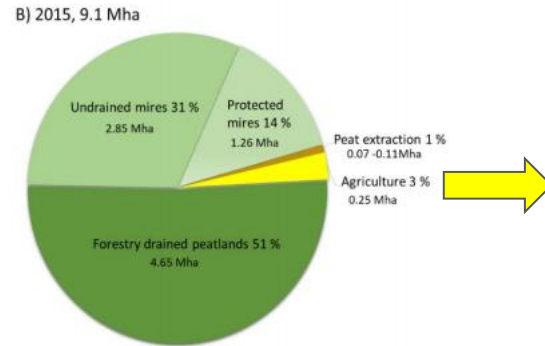
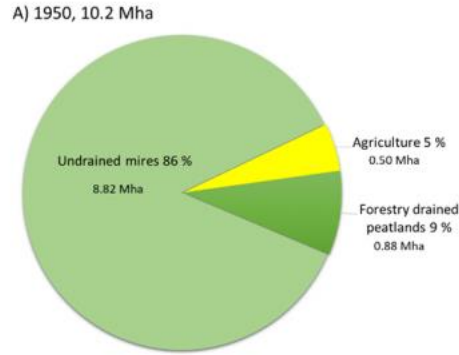
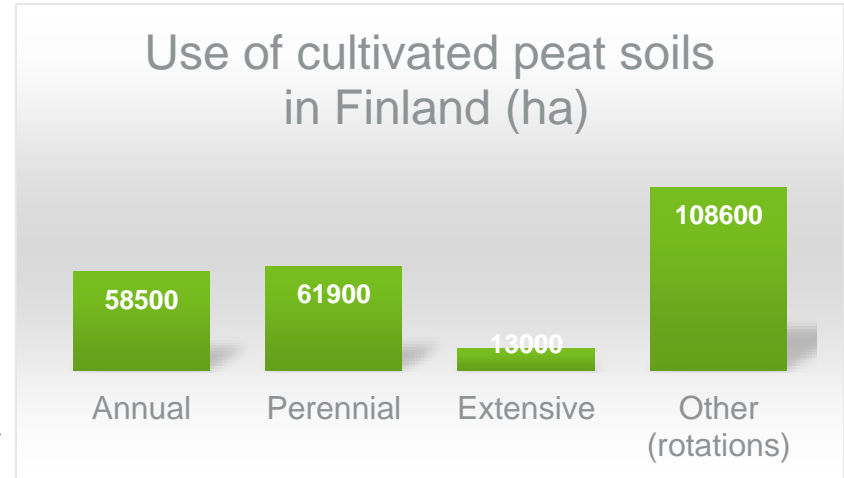


Figure 3. A) Mire exploitation in Finland in 1950 and B) in 2015.



Annual:  $\geq 8/10$  years annual crop  
 Perennial:  $\geq 8/10$  years perennial crop  
 Extensive:  $\geq 8/10$  years no food or feed production

Ref. Kekkonen et al. manuscript

# Government programme of Finland has progressive ideas on mitigation in LULUCF

- Finland carbon neutral by 2035
- Climate law will be renewed to cover also LULUCF
- Estimation of climate impacts will be part of normal law preparation procedures
- LULUCF:
  - Launch of a climate programme in the land use sector
  - Reduce clearance of peat soils
  - Programme for afforestation and rewetting
  - Piloting of carbon markets in Finland
  - Promote paludiculture
  - Sufficient funding of CAP, LIFE and ERDF to reduce GHG emissions
  - Strengthen research, education and extension services on C sequestration

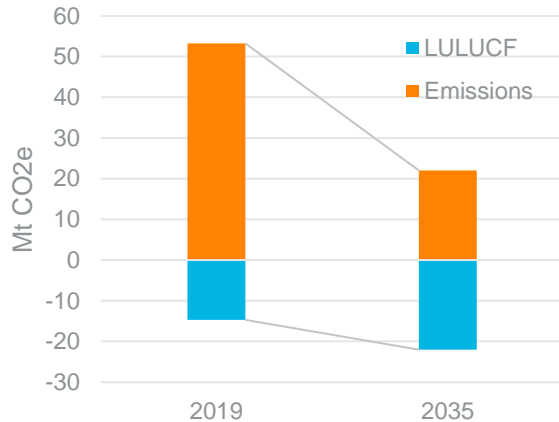


# How can peat soils help to reach C neutrality?

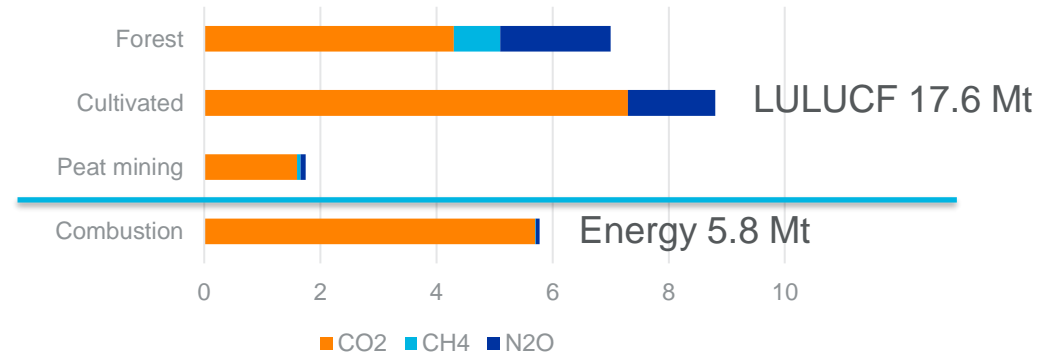
Finland aims at carbon neutrality by 2035: this requires both emission reductions and a larger C sink  
Peat combustion emits 5.8 Mt and drained peat soils reduce the sink in LULUCF sector by 17.6 Mt → there should be some mitigation potential?

Now there are incentives to cut peat mining but no incentives for mitigation via peatlands in forestry or agriculture.

Current emissions and suggested target for 2035\*



Emissions from peat 2018\*\*



\*[https://www.ilmastopaneeli.fi/wp-content/uploads/2021/02/ilmastopaneelin-raportti\\_ilmastolain-suositukset\\_final.pdf](https://www.ilmastopaneeli.fi/wp-content/uploads/2021/02/ilmastopaneelin-raportti_ilmastolain-suositukset_final.pdf) (in Finnish)

\*\*[http://stat.fi/tup/khkinv/khkaasut\\_raportointi\\_en.html](http://stat.fi/tup/khkinv/khkaasut_raportointi_en.html)

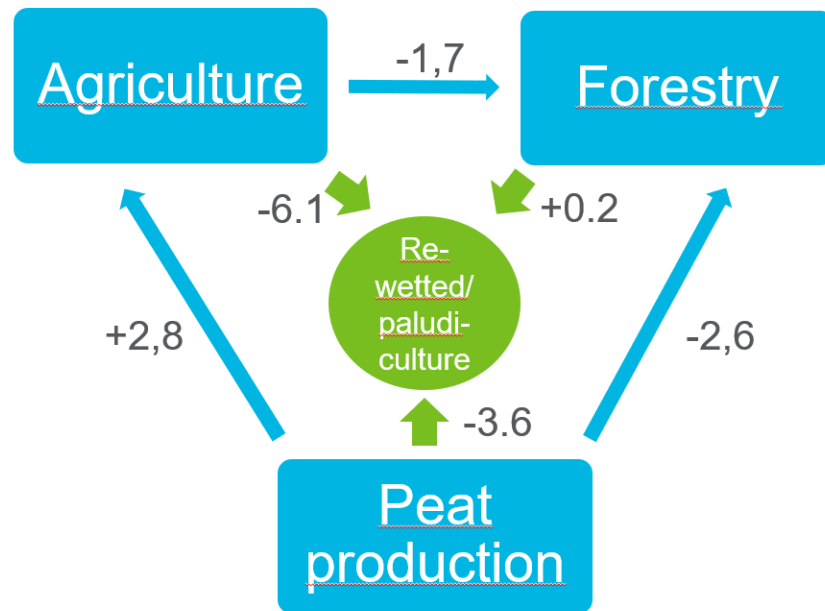
# Rapid land use changes may have side-effects

Land use practices generally changes slowly

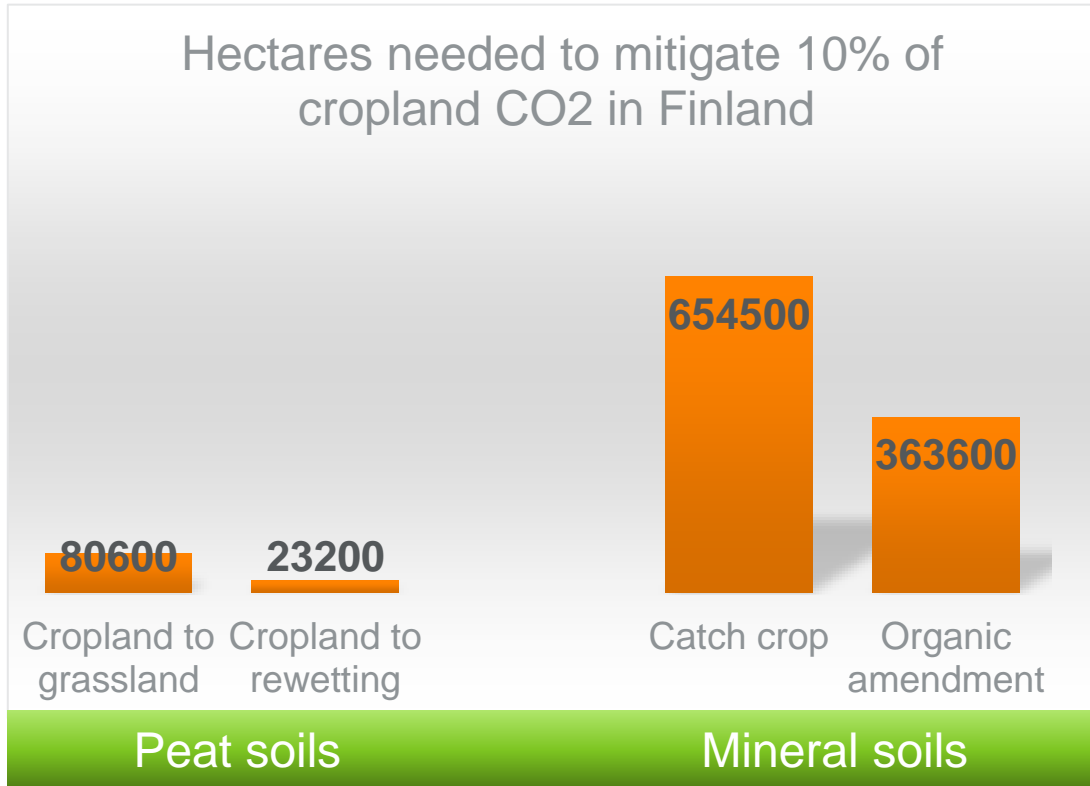
Rapid changes in society may induce unwanted land use changes.

Lack of regulation for after-use of peat mining sites → they may end up in agricultural use → the worst option (they may still have a deep peat layer when the companies give them up)

Change in C loss (t/ha/a) when a hectare of land changes from one land use class to another\*



# 1% of field area could mitigate 10% of agricultural CO<sub>2</sub>



Mitigation can occur without extensive socio-economic losses

Measures on peat soils are effective per hectare but those on mineral soils are easier to accept by landowners

These measures are not mutually exclusive – they all are achievable 😊

No incentives to reduce cultivated area:

Gradually diminishing payments after quitting cultivation

Private funding

Too few hectares under the current CAP measures:

Higher payments

Better targeted areas

## Barriers and solutions for mitigation

Uncertainties in mitigation efficiency:

More specific EFs

Means to avoid high CH<sub>4</sub> emissions and water pollution in rewetting

No incentives for rewetting:

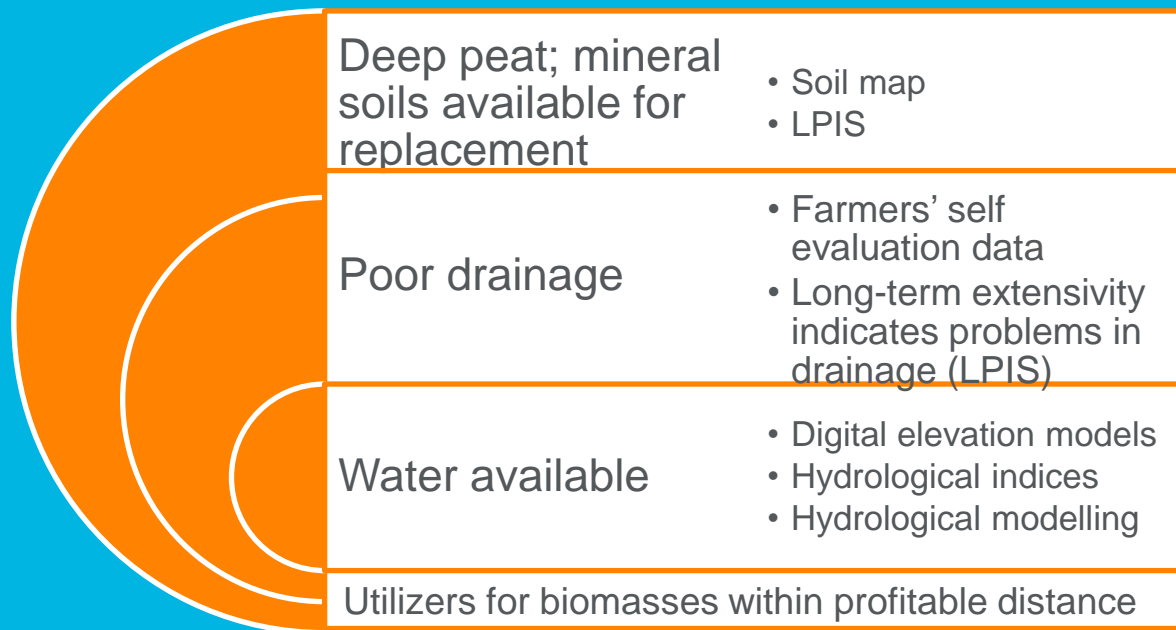
Fine-tuning of the payment for controlled drainage/nature managed fields

Local well-planned rewetting projects

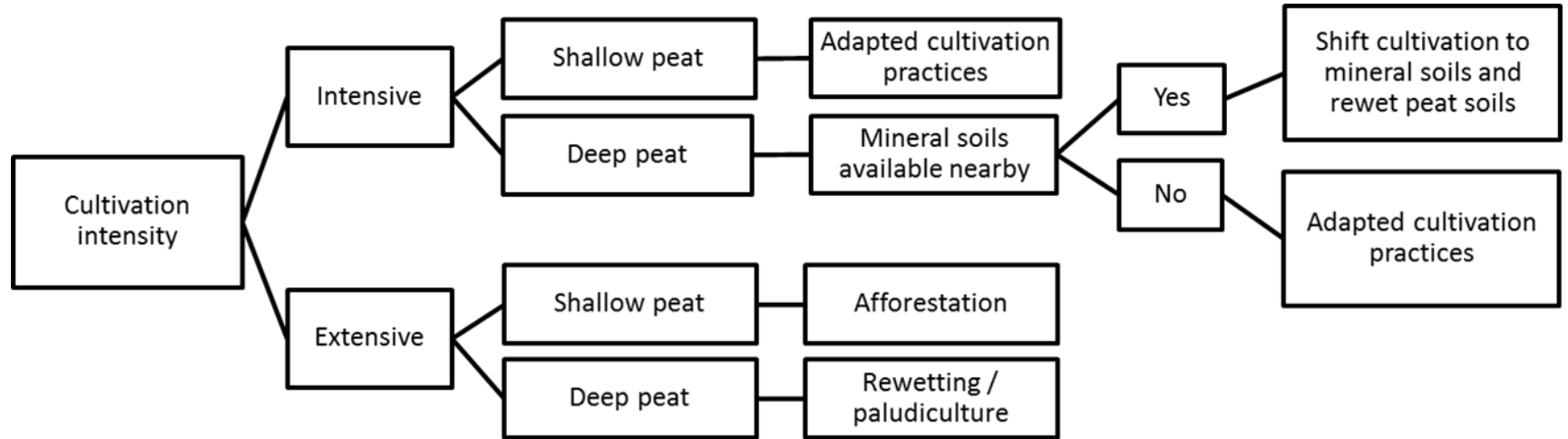


# Some fields are more readily available for interventions

- We cannot rewet all at once – better start from small dedicated areas but do it well (to avoid side-effects and increase acceptability)
- Drivers of rewetting:



# Principles of targeting mitigation measures




CARBON MANAGEMENT  
<https://doi.org/10.1080/17583004.2018.1557990>

 Taylor & Francis  
Taylor & Francis Group

 Check for updates

Mapping of cultivated organic soils for targeting greenhouse gas mitigation

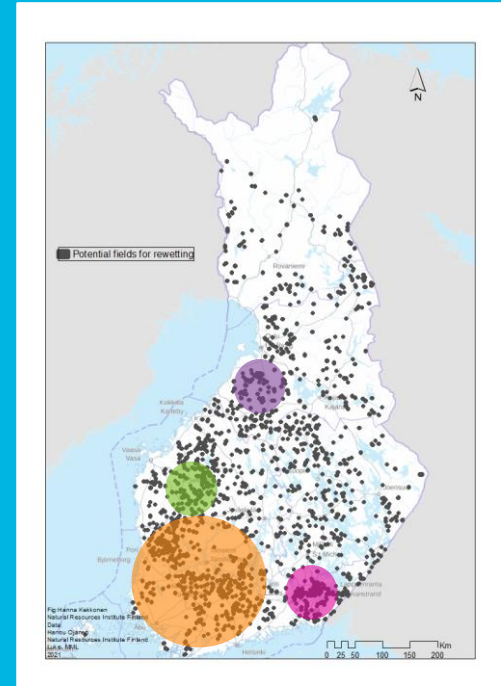
Hanna Kekkonen<sup>a</sup> , Hannu Ojanen<sup>b</sup>, Markus Haakana<sup>c</sup>, Arto Latukka<sup>c</sup> and Kristiina Regina<sup>b</sup>

# Nation-wide mapping of rewettable parcels

- Examples of criteria that can be used:
  - Peat layer >60 cm
  - Extensive cultivation 8/10 years
  - Farmer estimated the drainage status poor or very poor (+ all parcels with missing information of the drainage status)
  - Slope 2%; no difference in elevation 100 m from the field border

As soon as you have the map you can approach farmers regionally and even more fields can be found

This approach helps to avoid conflicts between neighbours and to create farmer communities producing certain biomasses



# More detailed mapping can be done in catchment scale

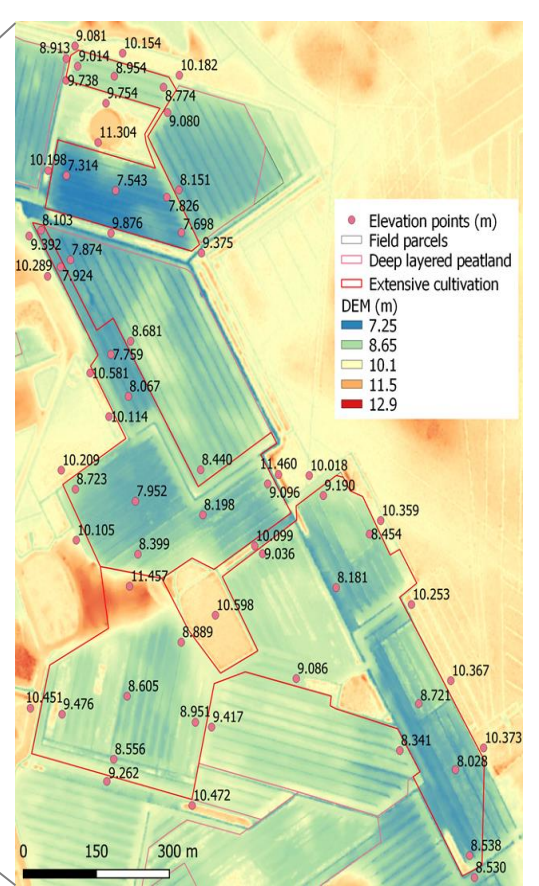
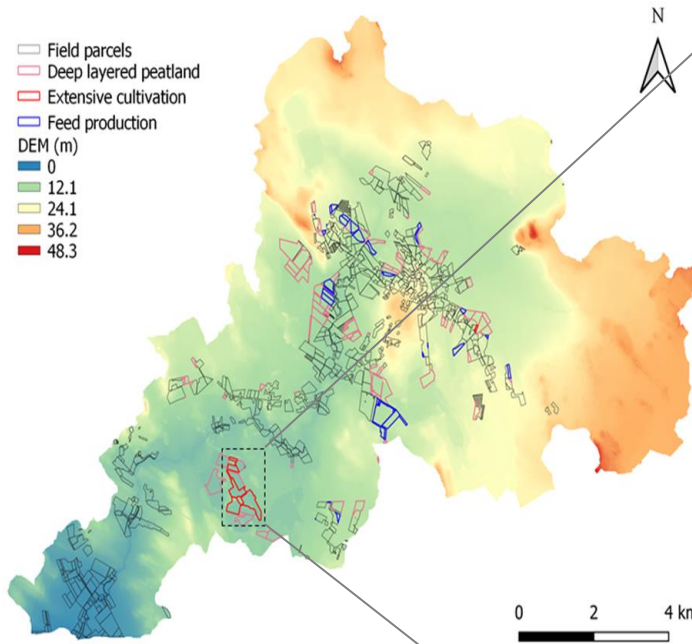


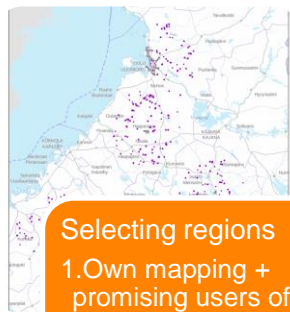
Table 1. The areas of different field parcel categories, their remained areas after removing field parcels with slope > 2%, and the shares of the areas and remained areas of parcels partly or totally on deep layered peat (725 ha) in C2.

| Land   | Area (ha) | Area (ha) when slope ≤ 2% | Share, (%) when slope ≤ 2% |
|--|-----------|---------------------------|----------------------------|
| Total agricultural land                              | 115       | 56.97                     | 49.45                      |
| Field parcels partly or totally on deep layered peat | 725       | 725                       | 100                        |
| Total deep layered peatland                          | 725       | 56.97                     | 7.86                       |
| Extensive cultivation <sub>2</sub>                   | 39        | 5.38                      | 14                         |
| Feed production <sub>2</sub>                         | 182       | 25.10                     | 53                         |

10% of deep peat parcels suitable for rewetting in this catchment



# How well did mapping predict rewettable parcels? We will know in 3 year's time



## Selecting regions

1. Own mapping + promising users of paludi-biomasses
2. Contact to regional authorities: active drainage communities, land consolidation or extension service



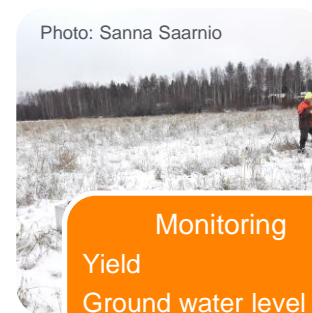
## Contacting farmers

1. Webinars/workshops
2. Farm visits



## Implementation

1. Plan for mitigation for all peat parcels
2. Parcels for rewetting selected
3. Project offers planning +equipment for blocking the ditches



## Monitoring

- Yield
- Ground water level
- GHGs and water quality on some sites
- Economy
- Farmers' experiences

A project aiming to rewet at least 20 fields just started. Different ways to implement cooperation of farms, companies and contractors will be experimented.

# Peat production goes down and new production chains will develop: example of cooperation by farmer, company and contractor.



Farmer produces  
reed canary grass  
in paludiculture



Contractor harvests  
the reed canary grass  
and common reed from  
watercourses



Company produces  
growing media on  
the farm



Company packs  
and sells the  
product

Benefits: farmer does not need specialized machines, company can locate far from the sites of raw material production

# Conclusions

- The “low-hanging” fruit should be found first but we should not stop there: strengthening the C sink in LULUCF requires lots more
- We should find a way to make landowners proud on the mitigation potential of their peat fields
- Funding by society is not the only solution anymore: private funding and markets of renewables are developing fast
- Further studies on targeting are needed to find the right way of rewetting for different cases to avoid side effects like high CH<sub>4</sub> or nutrient losses

Newspaper 1829:  
list of rewarded  
landowners: the  
reward for drainage  
was a silver spoon  
or goblet.



Since the late 18th century  
landowners were rewarded  
for draining peat soils and  
peat soils saved people from  
famine 👍

Now the descendants of  
these landowners can be paid  
for rewetting and the the  
same soils can be "heroic"  
again? 👍



Interview of a farmer who is happy  
with his decision to rewet a peat  
field that provided very poor grain  
yields:

<https://youtu.be/mpxM05HisOU>



# Thank you!

The presented data was produced in projects funded by the Ministry of agriculture and forestry, Academy of Finland and EU LIFE-IP



strateginen TUTKIMUS



SOMPA



LIFE17 IPC/FI/000002 LIFE-IP CANEMURE-FINLAND

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