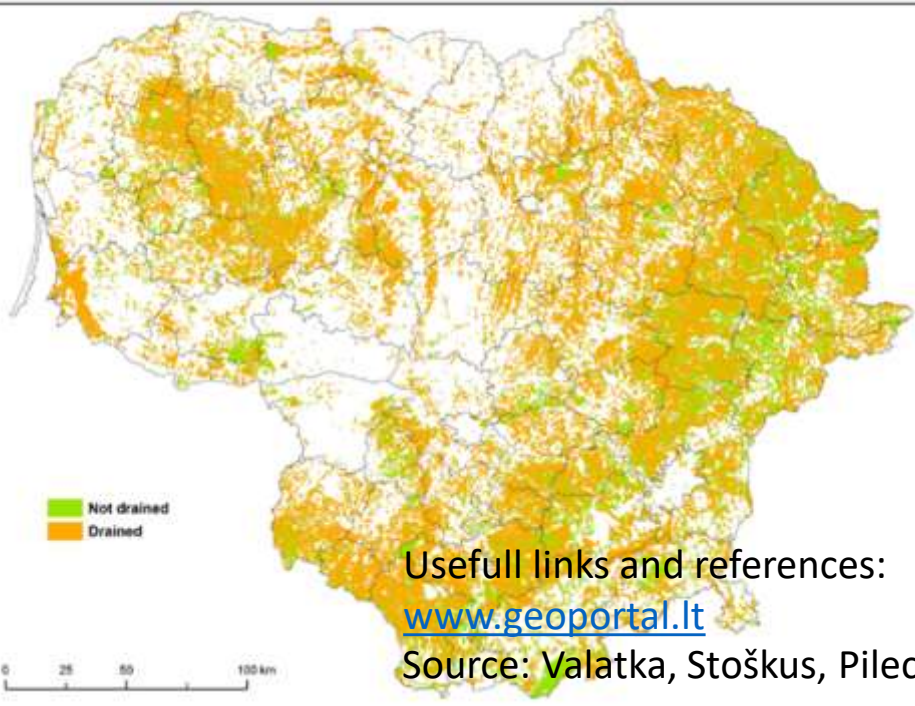
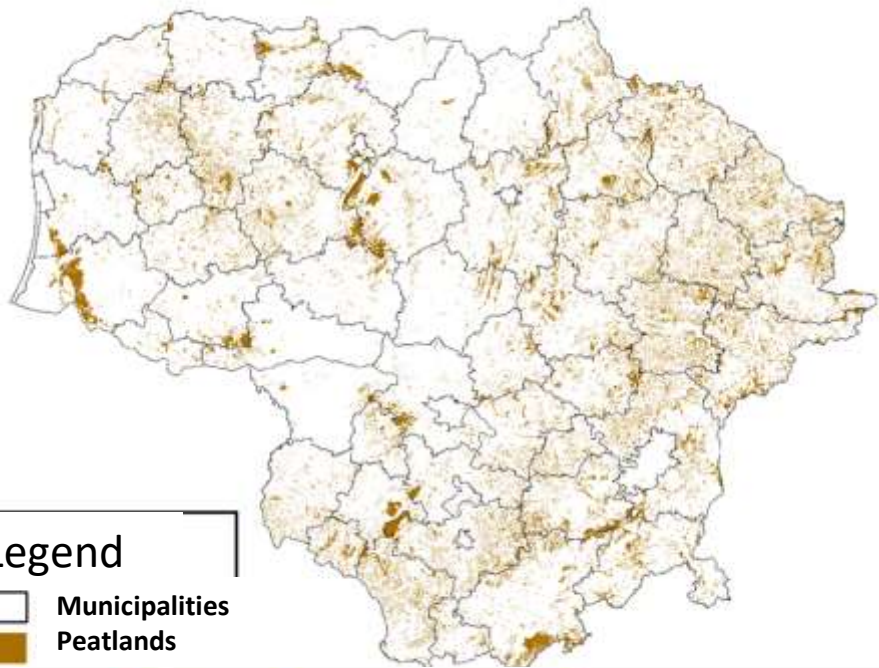




Peatland rewetting and paludiculture in Lithuania

“Peatland perspectives-Greenhouse gas emissions” on 5 September 2023

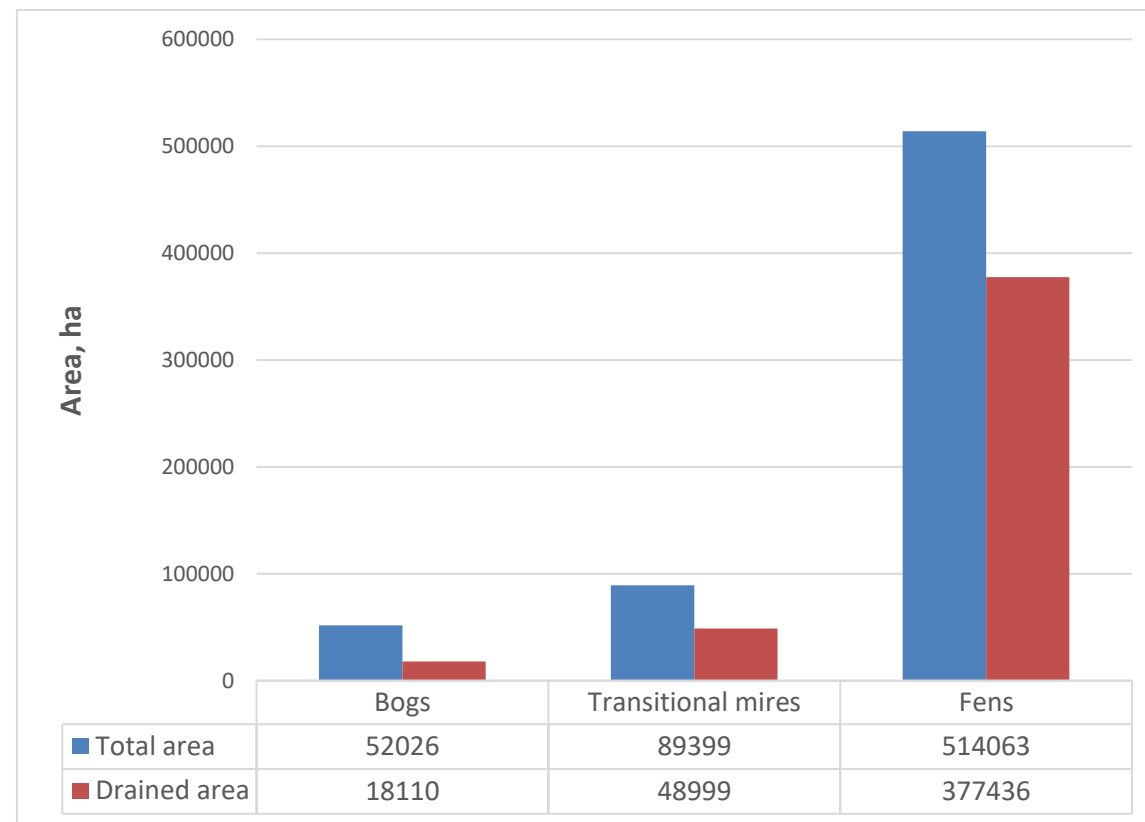
Dr. Leonas Jarašius
Nerijus Zableckis
Dr. Jūratė Sendžikaitė



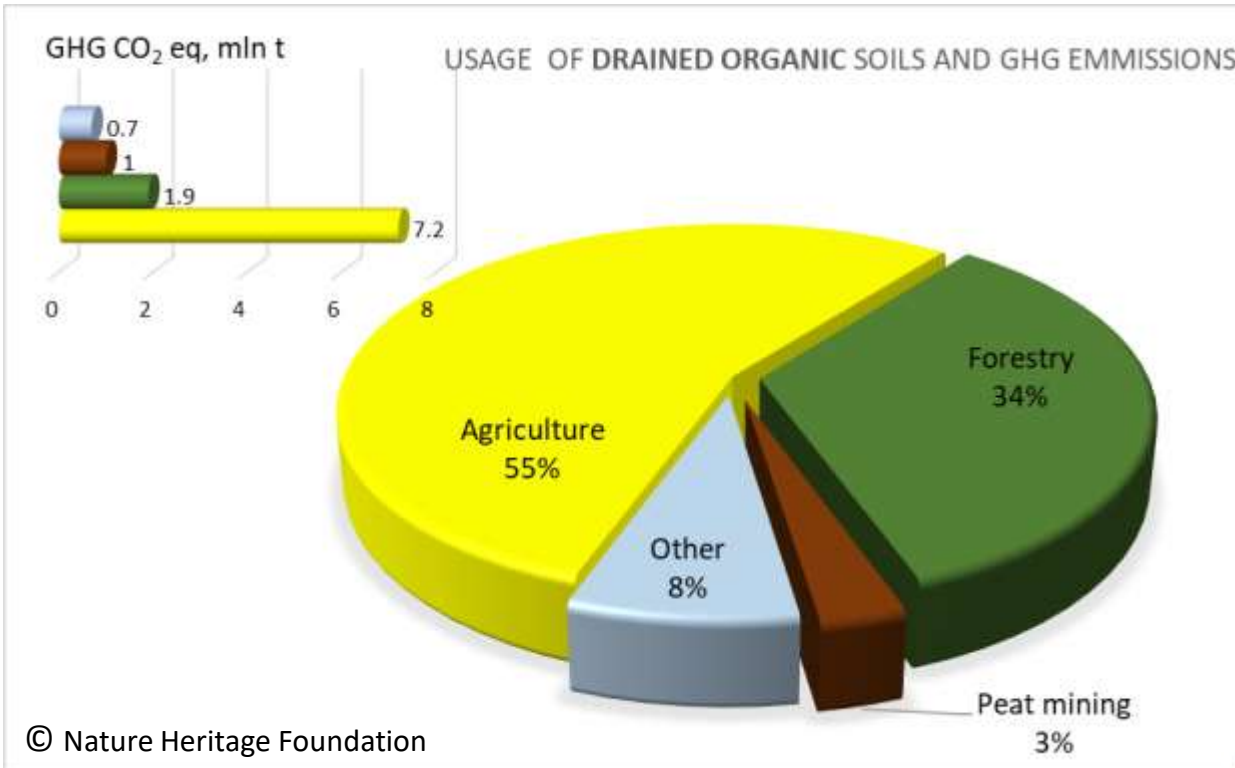
Usefull links and references:
www.geoportal.lt
 Source: Valatka, Stoškus, Pileckas, 2018

Peatlands in Lithuania– 654 thous. Ha
 ~ 10 % of Lithuania

78% – fens
 14% – transitional mires
 8% – raised bogs



Threats



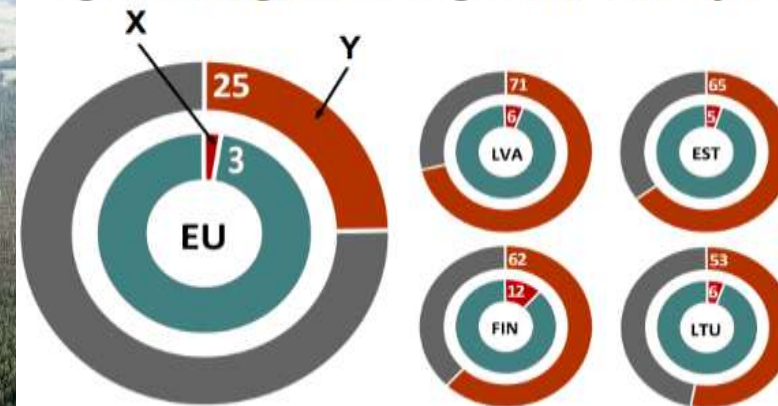
Almost 70% of the country's peatlands are drained.

Drainage has opened up new opportunities for the economic use of peatlands, most of which have been used for agriculture and forestry, but have caused many problems in the long run:

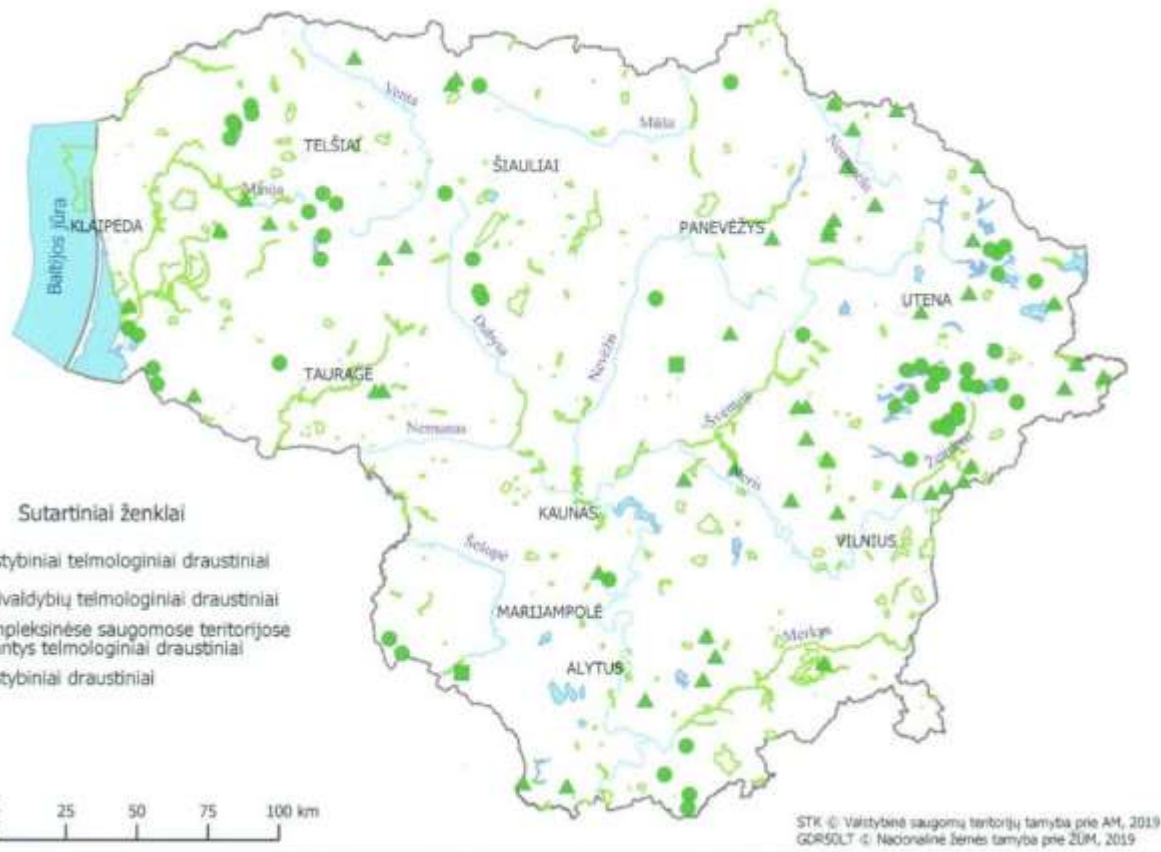
- peat decomposition and greenhouse gas (GHG) emissions;
- degradation of peat soils, loss of fertility and compaction of the soil surface;
- complex land management and use;
- nutrients loads (especially nitrogen) into inland waters and their eutrophication;
- habitat and biodiversity loss;
- increased risk of floods;
- increased probability of peatland fires.



Rewetting just X% of agricultural land will reduce agricultural greenhouse gas emissions by Y%



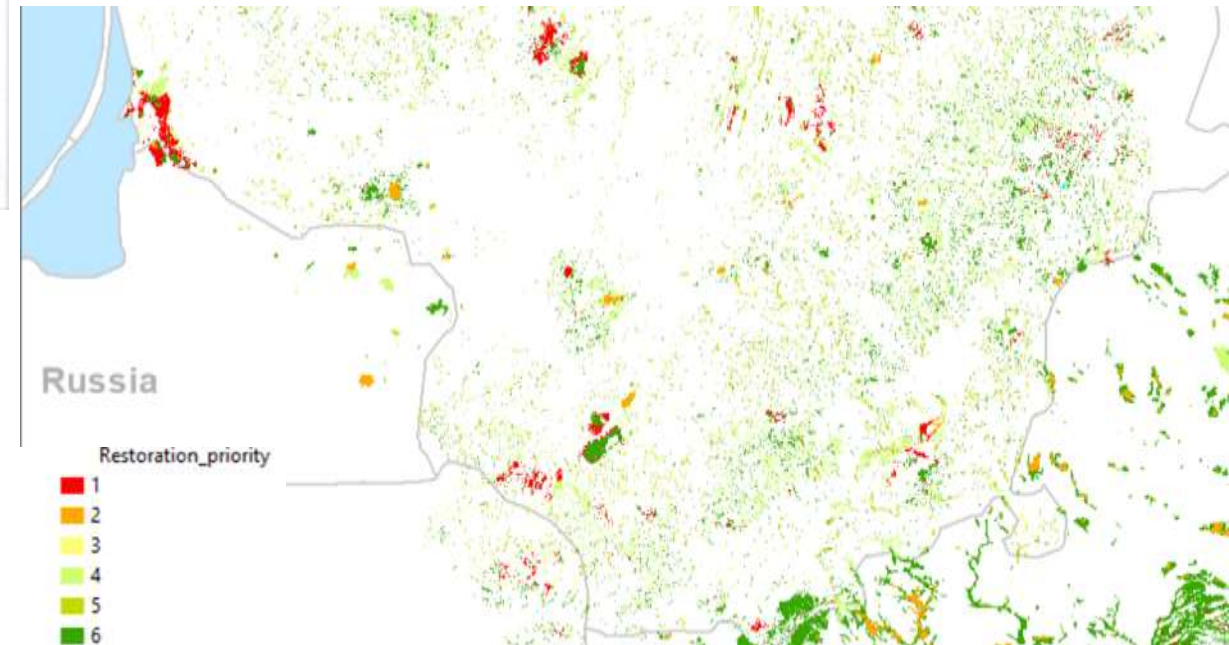
Conservation status



- The total area of peatlands included in the protected area network is 158 thousand ha, which makes up 24.5% of all Lithuanian peatlands;
- 107 telmological reserves have been established in Lithuania to protect typical and unique wetland complexes;
- 7 Ramsar sites (totally occupies 65.6 thousand ha)

... conservation status of most habitats of European importance (7110, 7140, 91D0, etc.) is unfavorable

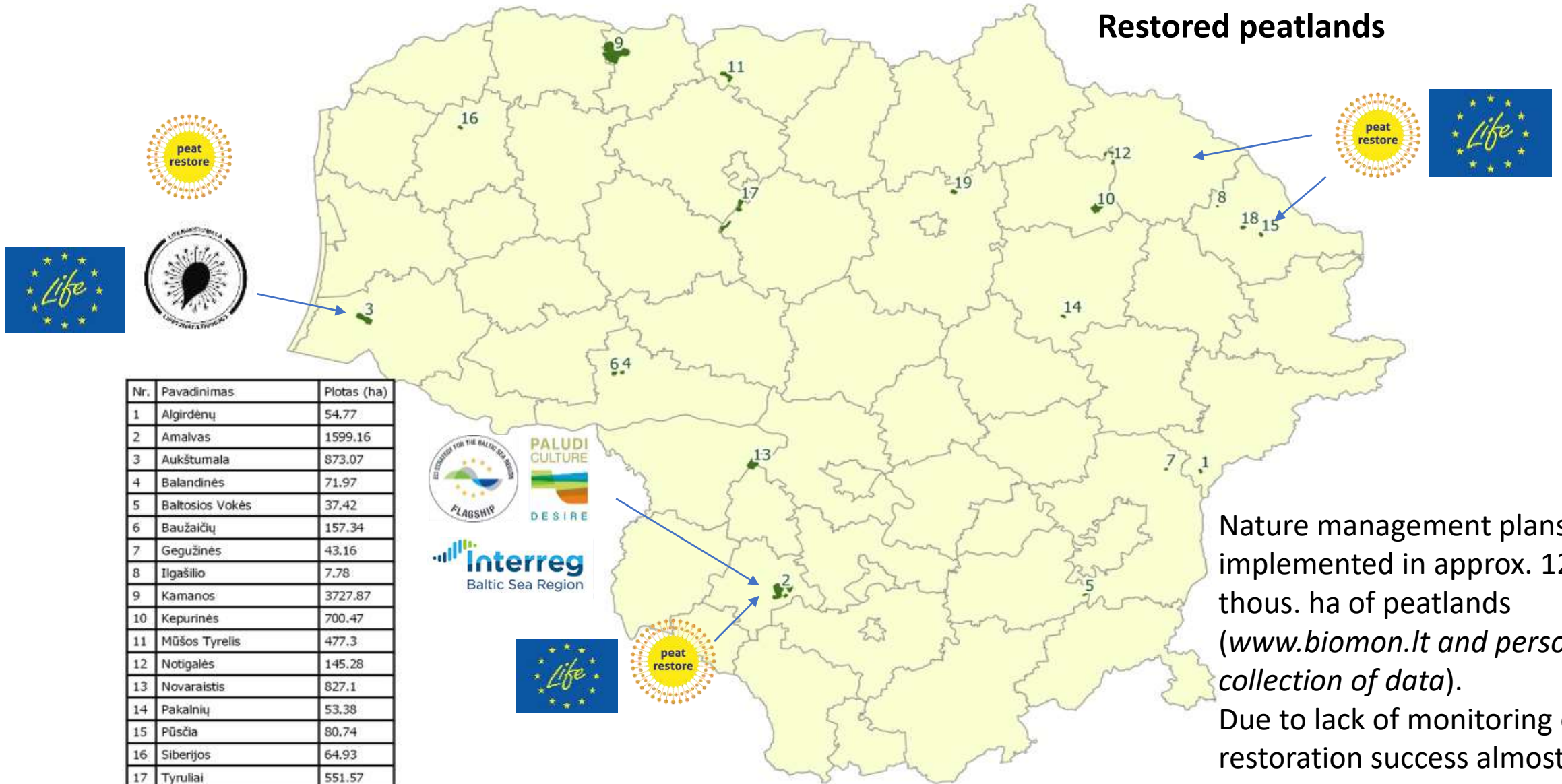
Analysis of restoration priorities indicate that status of protected areas does not imply better conservation status



Why we need to restore and preserve the peatlands

- **Paris agreement**, carbon neutrality by 2050
- **European Green Deal**
- **National Climate Change Management Policy Strategy** - *increase the potential of absorption in LULUCF sector, preserve and restore wetlands (peatlands), increase resilience of agriculture sector, ensure sustainable use of natural resources - water and soils.*
- **National Energy and Climate Sector Action Plan** – *to implement organic soils protection as one of the measure to reach the GHG emission reduction targets by 2030 (restore hydrological regime in 1000 ha; adaptation target – restore 8000 ha of peatlands, alternative measures – tax of GHG for extracted peat, restoration of abandoned peatlands.*
- 2021-2030 National development plan – *to protect and restore wetlands.*
- The activity Strategy for 2019-2023 of the State Forestry Enterprise – *increase the area of restored damaged peatlands from 400 to 600 ha each year.*
- Habitat directive (National Law on Protected areas, Law on Special Land Usage Conditions etc.)
- Water framework directive....
- *Community and society willingness.*

Restored peatlands



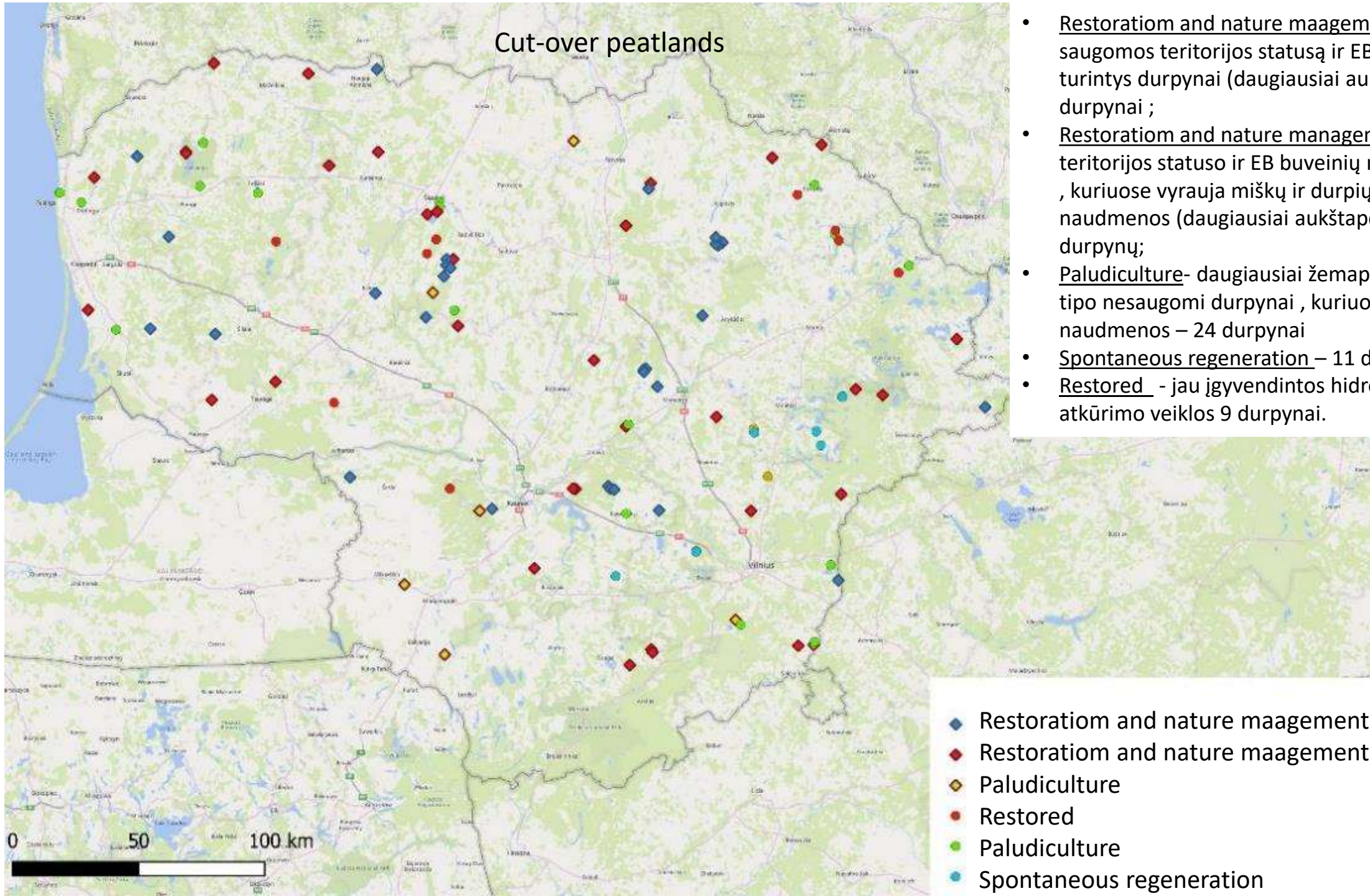
Nr.	Pavadinimas	Plotas (ha)
1	Algirdėnų	54.77
2	Amalvas	1599.16
3	Aukštumala	873.07
4	Balandinės	71.97
5	Baltosios Vokės	37.42
6	Baužaičių	157.34
7	Gegužinės	43.16
8	Ilgašilio	7.78
9	Kamanos	3727.87
10	Kepurinės	700.47
11	Mūšos Tyrelis	477.3
12	Notigalės	145.28
13	Novaraistis	827.1
14	Pakalnių	53.38
15	Pūsčia	80.74
16	Siberijos	64.93
17	Tyruliai	551.57
18	Velniabalė	119.43
19	Žaliosios girios - Klimbalės	156.89

Nature management plans were implemented in approx. 12 thous. ha of peatlands (*www.biomon.lt and personal collection of data*).

Due to lack of monitoring of restoration success almost impossible to assess the GHG emission reduction

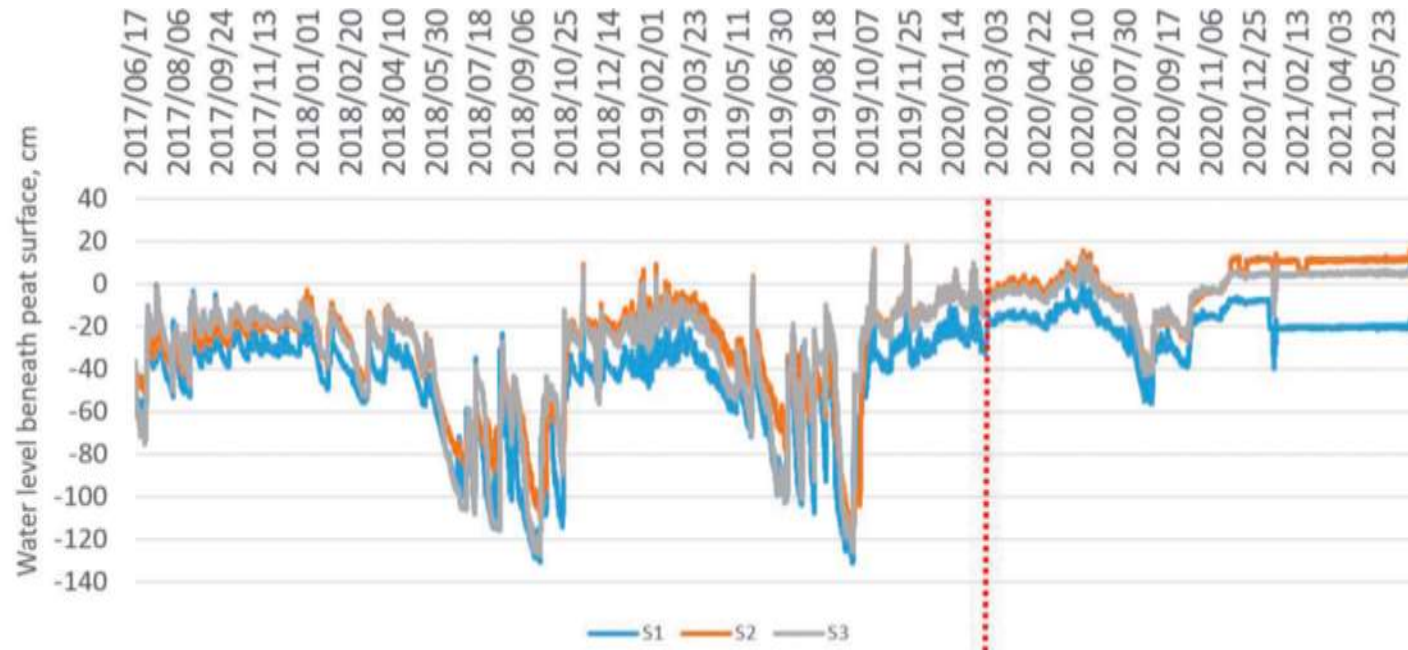
Cut-over peatlands

- Restoration and nature management I priority – saugomos teritorijos statusą ir EB svarbos buveines turintys durpynai (daugiausiai aukštapelkiniai) 33 durpynai ;
- Restoration and nature management – saugomos teritorijos statuso ir EB buveinių neturintys durpynai , kuriuose vyrauja miškų ir durpių gavybos telkinių naudmenos (daugiausiai aukštapelkiniai) – 30 durpynų;
- Paludiculture- daugiausiai žemapelkiniai/tarpinio tipo nesaugomi durpynai , kuriuose aptinkamos ŽŪ naudmenos – 24 durpynai
- Spontaneous regeneration – 11 durpynų;
- Restored - jau įgyvendintos hidrologinio režimo atkūrimo veiklos 9 durpynai.



- ◆ Restoration and nature management I priority
- ◆ Restoration and nature management
- ◆ Paludiculture
- Restored
- Paludiculture
- Spontaneous regeneration

Sachara peatland. "Reduction of CO2 emissions by restoring degraded peatlands in Northern European Lowland" (LIFE15 CCM/DE/000138, LIFE Peat Restore).



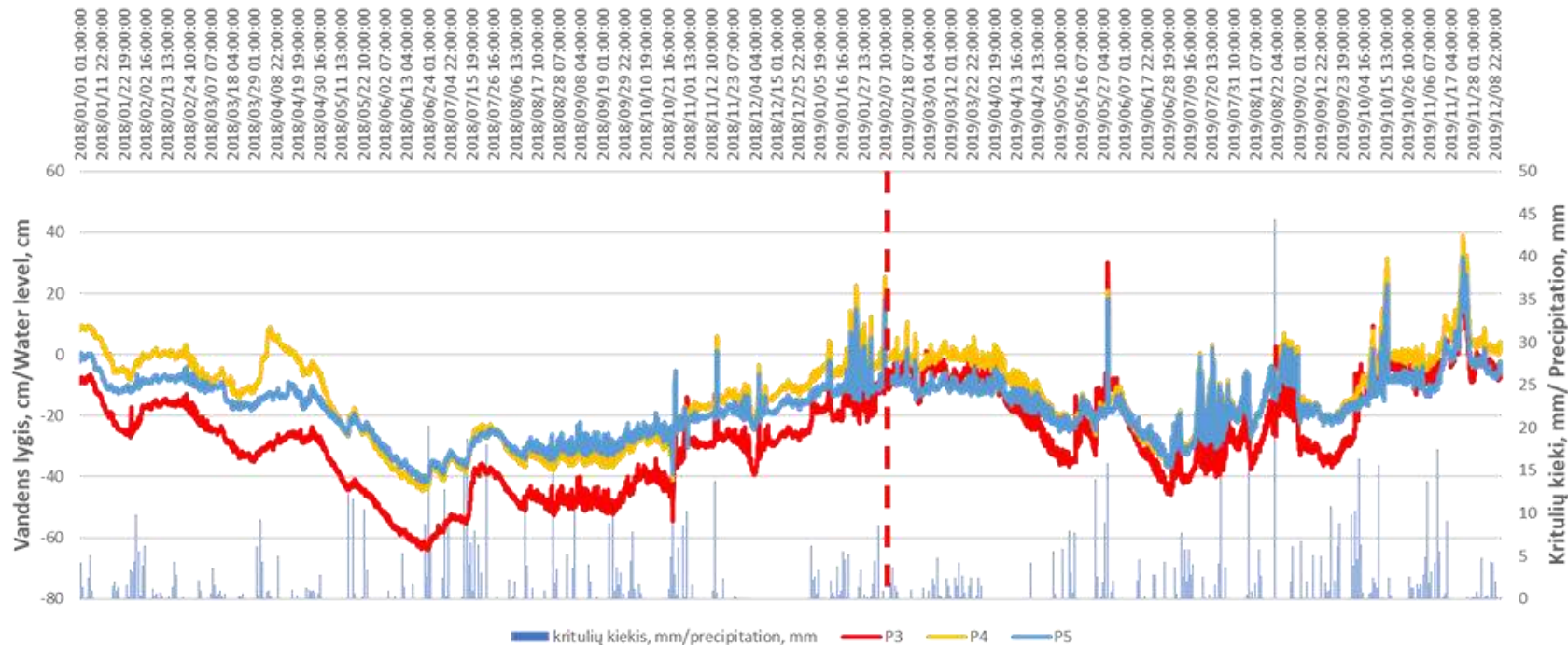
Pūsčia peatland. “Reduction of CO2 emissions by restoring degraded peatlands in Northern European Lowland” (LIFE15 CCM/DE/000138, LIFE Peat Restore).



Before



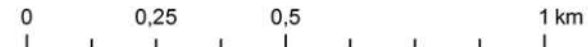
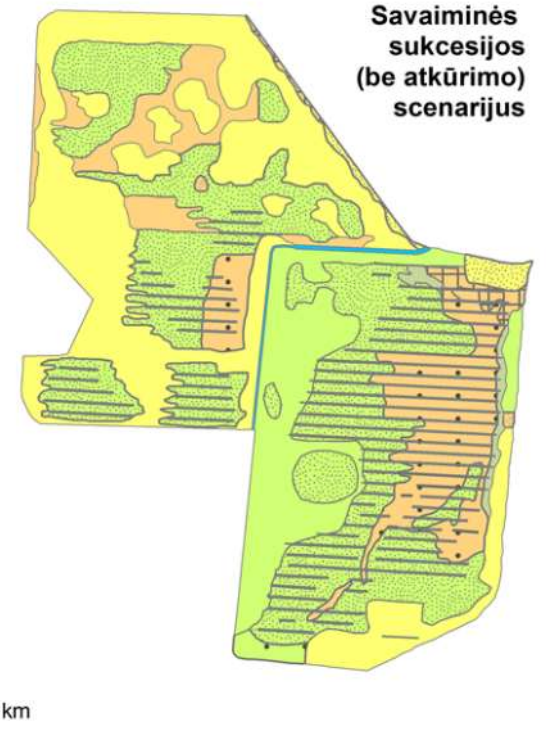
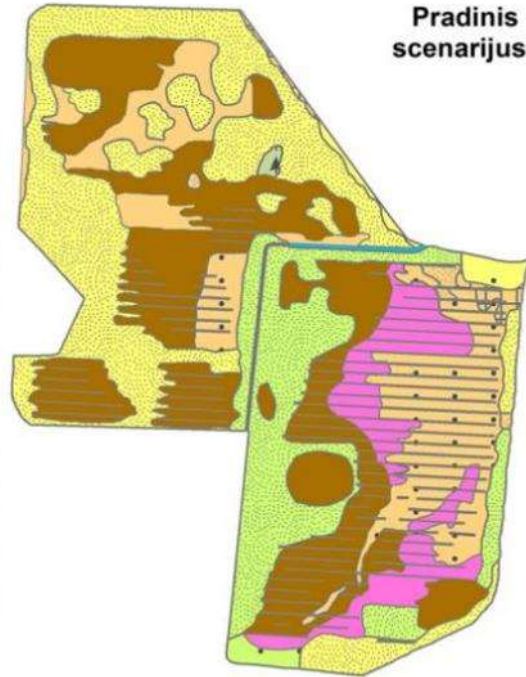
After



- Restoration of hydrological regime in 81 ha, over 200 dams constructed, 32 ha area cleared.
- Comparison of 2018 (before rewetting) and 2019–2021 (after rewetting) data shows that after implementation of restoration measures the average water level was 8–23 cm higher in all measurement points

GEST approach for GHG assessment. Example from Pūsčia

PŪŠČIOS PELKĒ



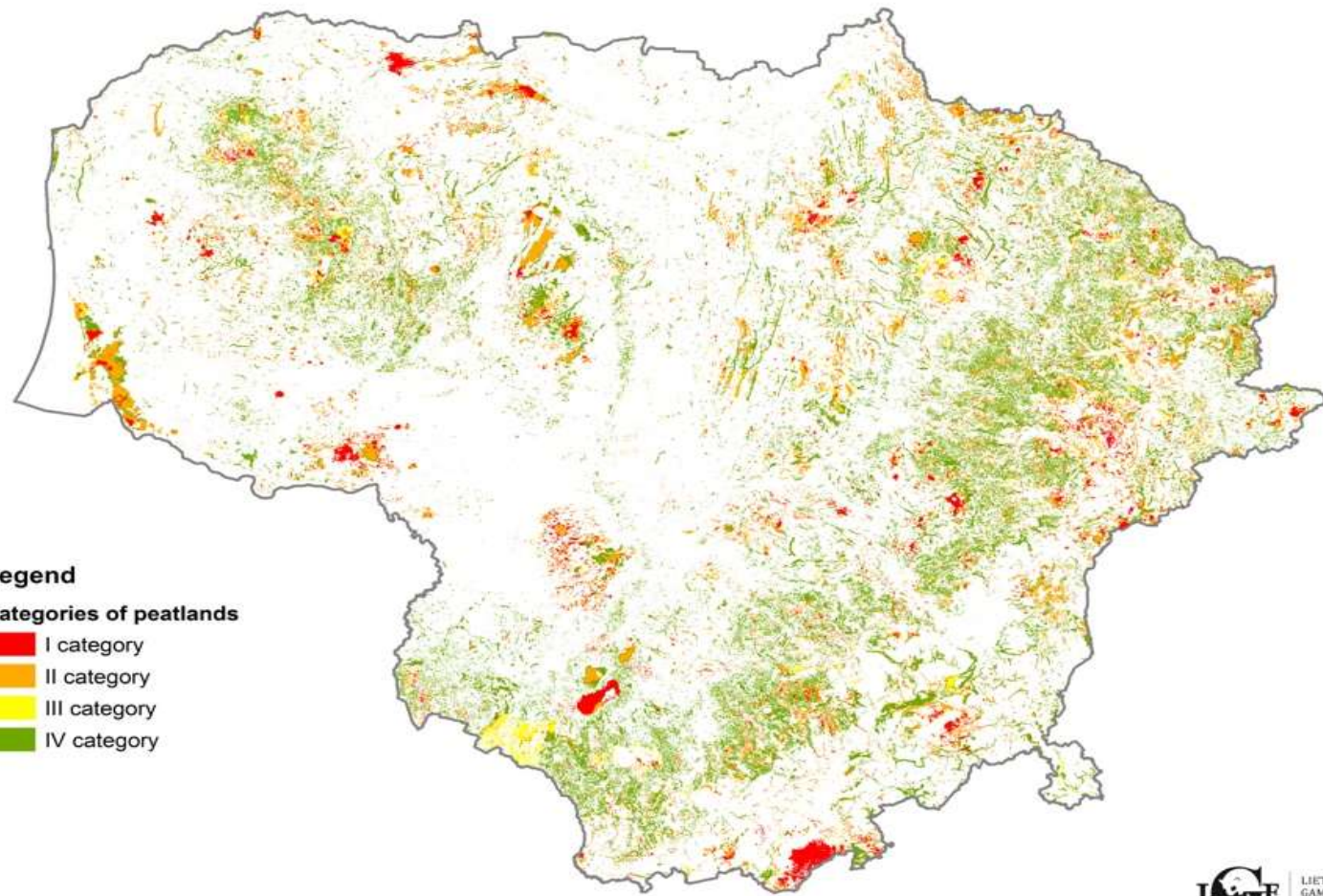
Total emission reduction by 69 % or 14 t CO₂ eq./ha a year from all project sites

GEST tipai

- | | | | |
|--|--|--|--|
| | Pilkos durpēs (drēgnos) | | Atvīri vandens telkinīi ar griovīi |
| | Drēgni aukštapeikū virzīnai | | Sausi oligotrofīnai mīškai ir krūmīnai |
| | Drēgni nendrynai ir aukštēji zolīnai | | Vīdutinīo drēgnumo oligotrofīnai mīškai ir krūmīnai |
| | Labai drēgnos pīevos, aukštēji zolīnai, žemīēji viksvīnai ir nendrynai | | Drēgni oligotrofīnai mīškai ir krūmīnai |
| | Šlapios pīevos ir aukštēji zolīnai | | Labai drēgni oligotrofīnai mīškai ir krūmīnai |
| | Šlapi žemīēji viksvīnai ir nendrynai (dažnīausīai su samanū dangā) | | Sausi mezotrofīnai ar eutrofīnai mīškai ir krūmīnai |
| | Šlapi aukštēji nendrynai | | Vīdutinīo drēgnumo mezotrofīnai ar eutrofīnai mīškai ir krūmīnai |
| | Šlapios kīmīnū vejās | | Drēgni mezotrofīnai ar eutrofīnai mīškai ir krūmīnai |
| | Šlapios kīmīnū vejās su pušīmī | | Labai drēgni mezotrofīnai ar eutrofīnai mīškai ir krūmīnai |
| | Šlapi kīmīnū duburīi (užmīrkusīos kīmīnū vejās) | | |

Paludiculture in Lithuania.

Feasibility study on the potential to restore peatlands and apply paludiculture



Legend
Categories of peatlands
 I category
 II category
 III category
 IV category

Data sources:
 Peatlands DB © Lithuanian fund for nature
 GRPK © The Ministry of Agriculture of the Republic of Lithuania

0 50 100 Km

Author:
 Lithuanian fund for nature, 2019

Category	Name	Area, ha	% from all country's peatland area
I	Areas not suitable for paludiculture	116 959.62	18.2
II	Conditionally suitable areas after consideration of major restrictions	244 054.50	38.1
III	Suitable areas after consideration of restrictions	17 202.12	2.7
IV	Fully suitable areas without restrictions	262 689.53	41.0
Total sum		640 905.77	100.0

- Agricultural land use dominates in the 4th category, covering 206 149 ha or 78 % of all peatlands. Abandoned peatlands, which are neither included into forestland cadaster, nor having habitats, or any protection status, are listed in this category as well.
- Analysis of peat type distribution in four different paludiculture categories shows, that 4th category is dominated by fen peatland type (96 % of all areas in 4th category).

Paludiculture pilots in Lithuania. Baisogala. Maintenance of wet meadows



Paludiculture pilots in Lithuania. Liepakojai (Žuvintas BR). Maintenance of wet meadows



Paludiculture pilots in Lithuania. Sphagnum farming in Aukštumala



Reintroduction of peat-forming vegetation on peat fields in Aukštumala peatland, Lithuania: a – levelling of peat surface (April 2019), b – collection of donor material; (c) manual and (d) mechanized application of the donor material; e – straw mulching; f – flooded field covered with straw mulch (September 2019).

Photos: J. Sendžikaitė, L. Šveistytė, Klasmann-Deilmann Šilutė.

Paludiculture pilots in Lithuania. Sphagnum „farming“ and establishment of other peatland forming vegetation in Ežerėlis cut-over peatland



Peatland restoration for climate. 4 pilot GHG reduction projects in peatlands. Private funds





Thank you for attention

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