PEATLAND RESTORATION IN LATVIA – EXPERIENCES AND LESSONS LEARNT

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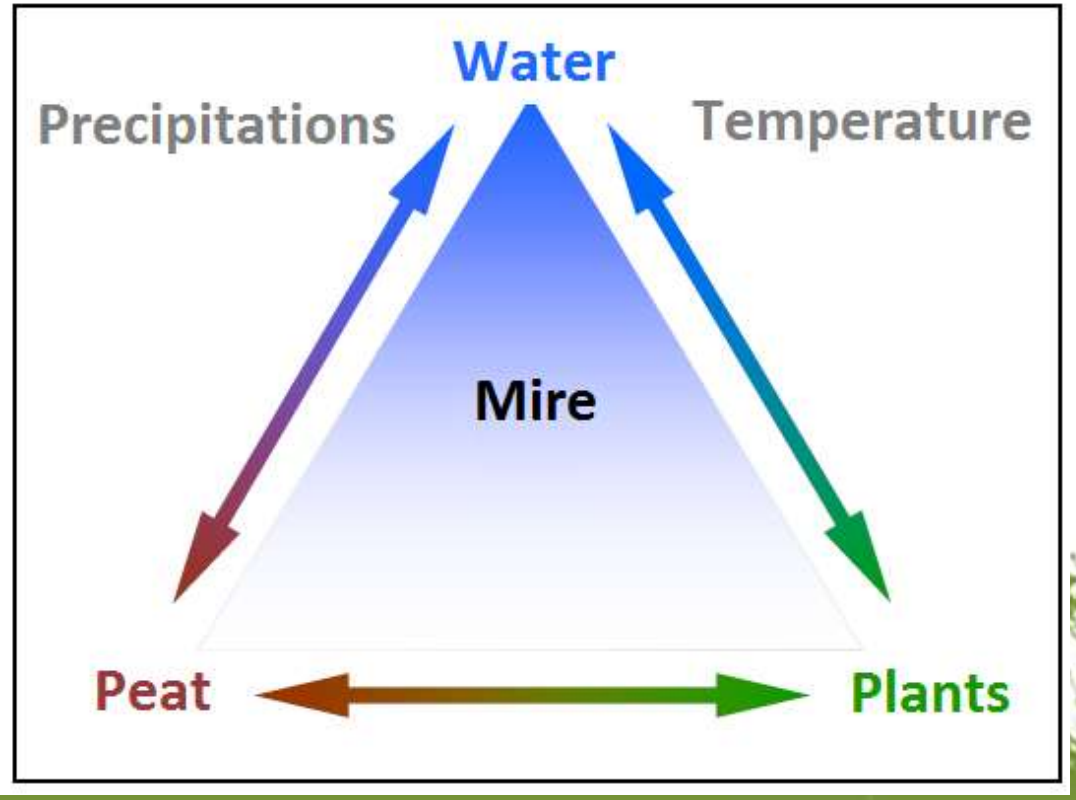
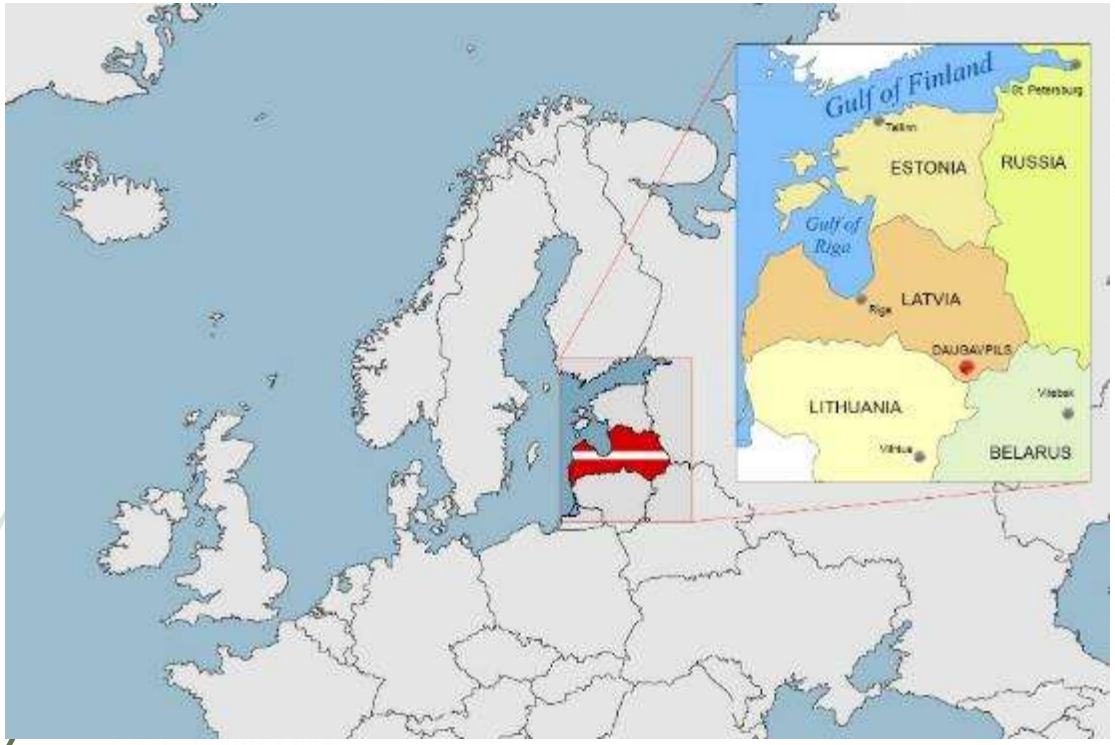
University of Latvia

CONTENT OF PRESENTATION

- Mires in Latvia
- Mire restoration experience

INTERACTION OF MIRE COMPONENTS





Mires 4,9%

Permanent water logging, active peat formation, continuous upward growth of the surface and specific plant cover adapted to these conditions.

In Latvia there are all together 6 Ramsar sites covering 148 145 hectares.

Total area of Latvia 64,635 km²

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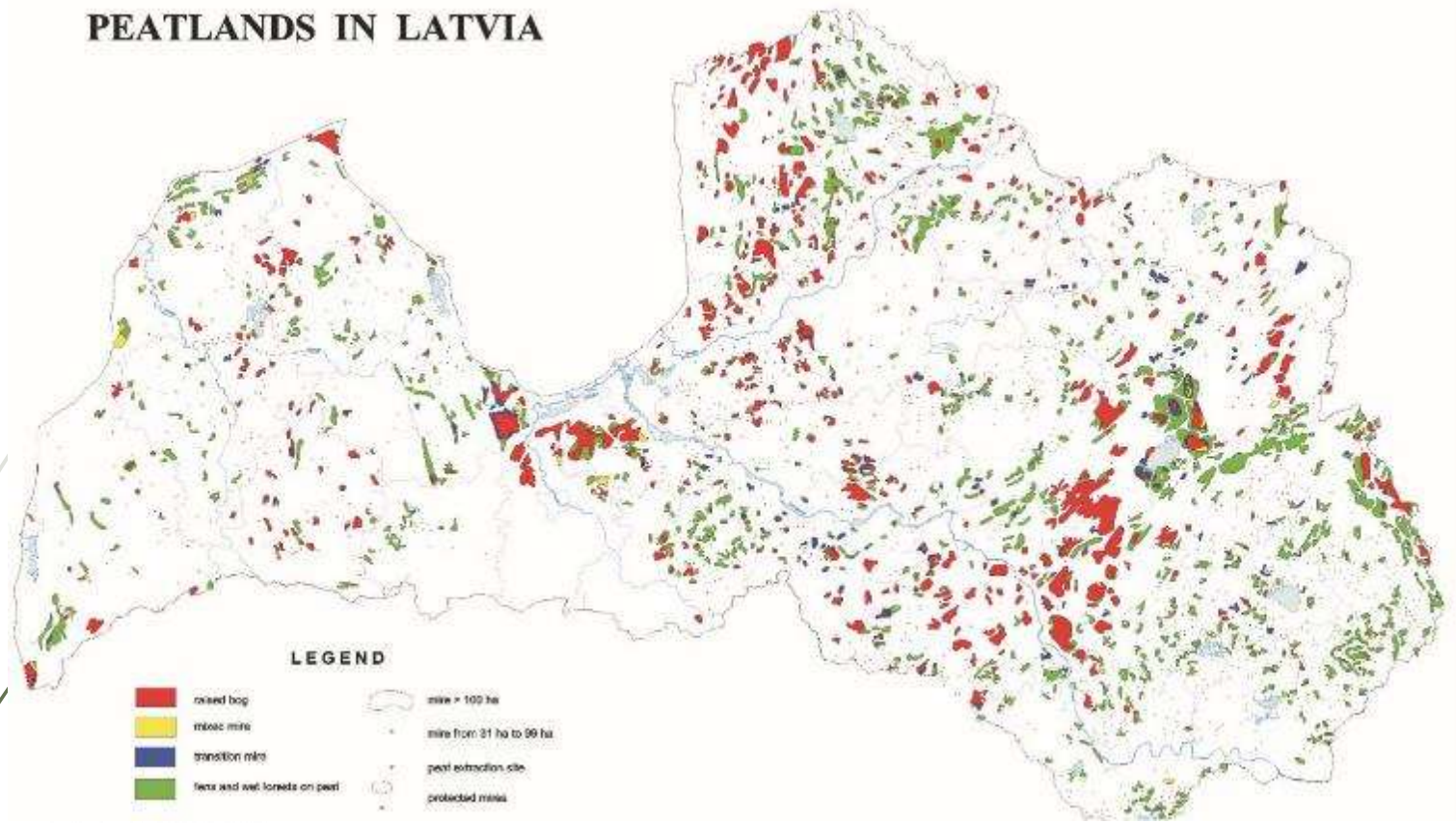

Peatlands cover 10%

include mires, but also peat extractions fields and wet forests

EC LIFE PROJECTS FOR PEATLAND MANAGEMENT AND RESTORATION IN LATVIA

- **PEAT RESTORE LIFE15 CCM/DE/000138**
  Reduction of CO2 emissions by restoring degraded peatlands in Northern European Lowland (2016-2021)
- **REstore LIFE14 CCM/LV/001103**
  Sustainable and responsible management and re-use of degraded peatlands in Latvia (2015-2020)
- **WETLANDS LIFE13 NAT/LV/000578**
  Conservation and Management of Priority Wetland Habitats in Latvia (2014–2017)
- **HYDROPLAN LIFE10 NAT/LV/000160**
  Restoring the hydrological regime of Ķemeri National Park (2011–2018
- **RAISED BOGS LIFE08 NAT/LV/000449**
  Restoration of Raised bog habitats in the Especially Protected Nature Areas of Latvia (2010–2013)
- **MIRES LIFE04 NAT/LV/000196**
  Implementation of Mire Habitat Management Plan in Latvia (2004–2008)
- **LUBANA WETLANDS LIFE03 NAT/LV/000083**
  Management of the Lubana Wetland Complex, Latvia (2003–2007)
- **KEMERI LIFE02 NAT/LV/008496**
  Conservation of wetlands in Kemeri National Park (2002–2006)
- **TEIČI LIFE00 NAT/LV/007127**
  Measures to ensure the nature conservation management of Teici Area (2001–2003)

LIFE PROJECT EXPERIENCE

- Restoration of raised bog hydrology and habitats
- Management of fens
- Re-introduction of *Sphagnum* species in a degraded raised bog and cut-over peat field
- Elimination of invasive species *Heracleum sosnowskyi*
- Hydro-geological modelling using LiDAR data

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LIFE PROJECT «RAISED BOGS»
LIFE 08 NAT/LV/000449
(2008-2012)

MELNAIS LAKE MIRE NATURE RESERVE

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BULDING OF DAMS ON DRAINAGE DITCHES IN MELNAIS LAKE MIRE IN 2012

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MELNAIS LAKE MIRE NATURE RESERVE

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RESULTS: MELNAIS LAKE MIRE

Change of the proportions in *Sphagnum* coverage

Sphagnum magellanicum

Sphagnum cuspidatum

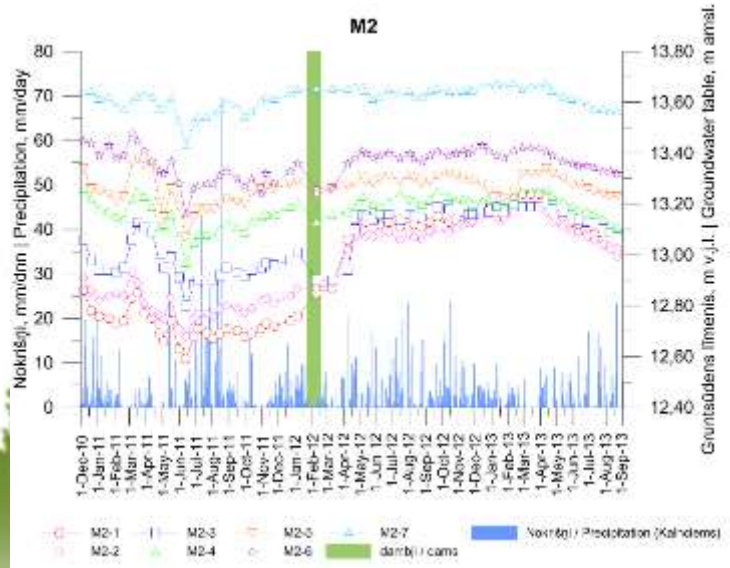
Sphagnum fallax

The coverage of species of more wet areas has increased

MELNAIS LAKE MIRE

2011

2012



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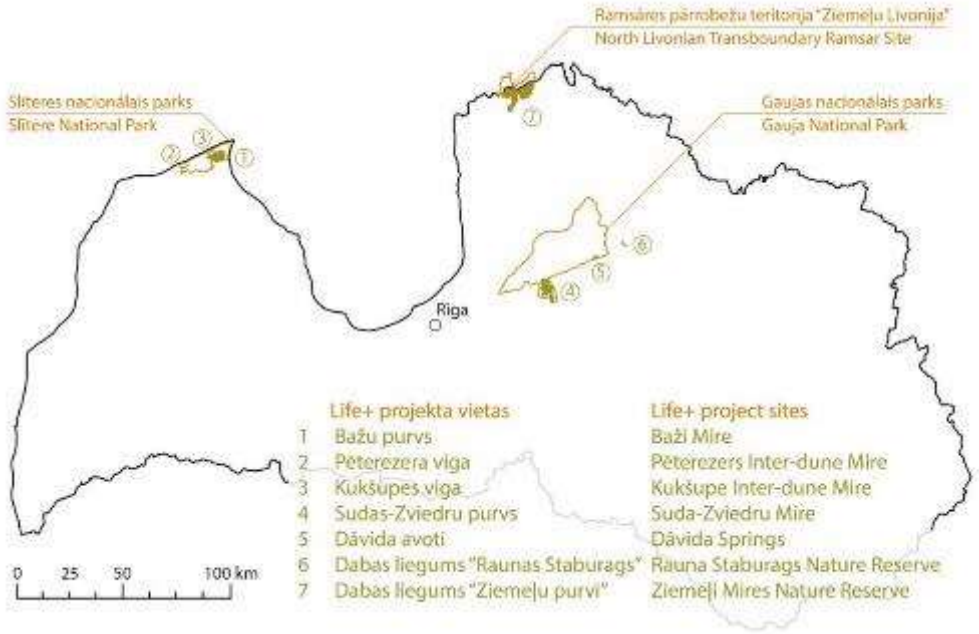
ROZU MIRE NATURE RESERVE

Before dam building

After dam building

EC LIFE «Wetlands» (2014-2018)

Project sites: Slītere National Park, Gauja National Park, Raunas Staburags Nature Reserve and Ziemeļu Mires Nature Reserve



Coordinating beneficiary: University of Latvia; 6 associated beneficiaries and co-financers

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MIRE STUDIES, MANAGEMENT AND MONITORING

MANAGEMENT PLANS

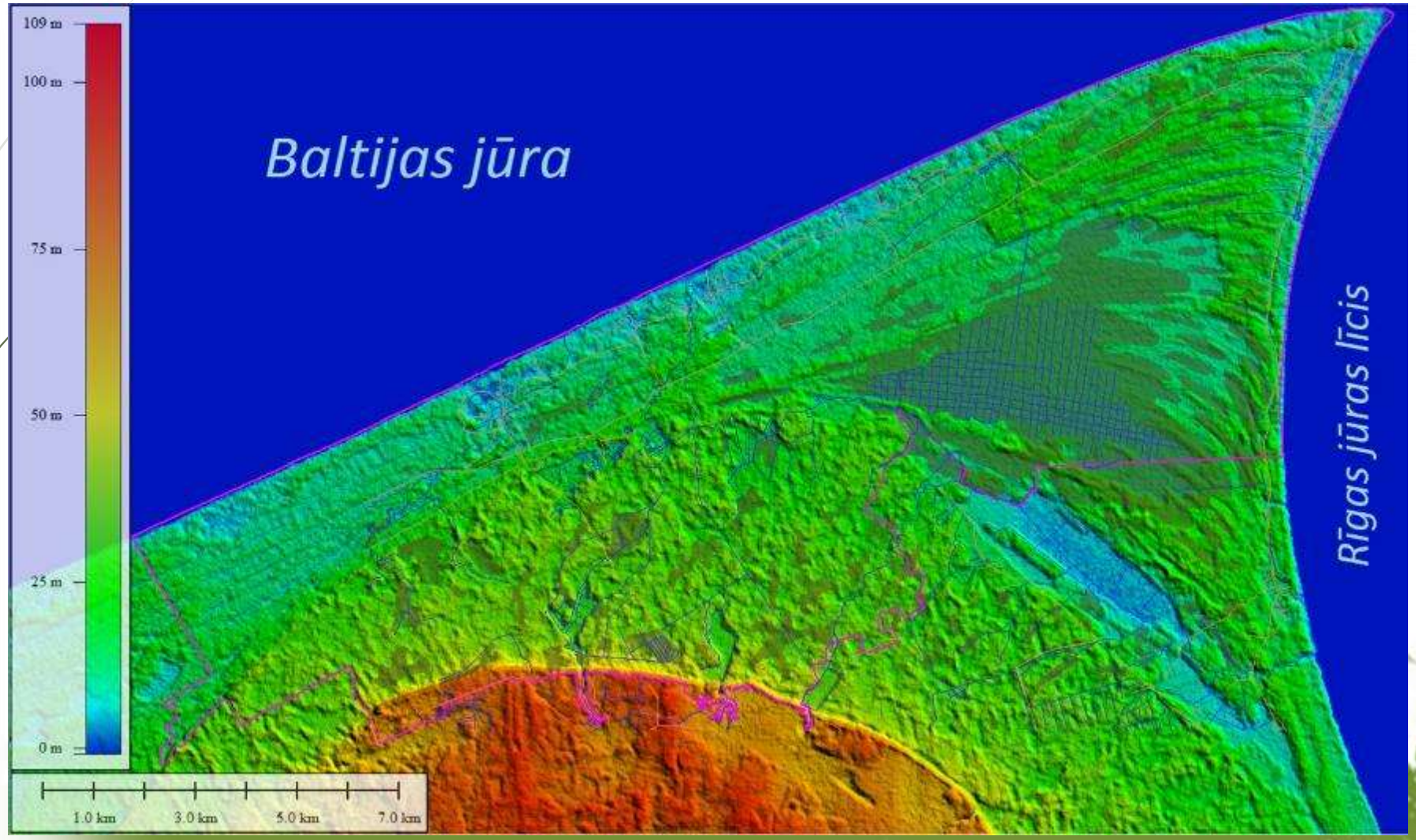
TECHNICAL DESIGNS

HABITAT AND HYDROLOGICAL MONITORING

MIRE RESTORATION ACTION

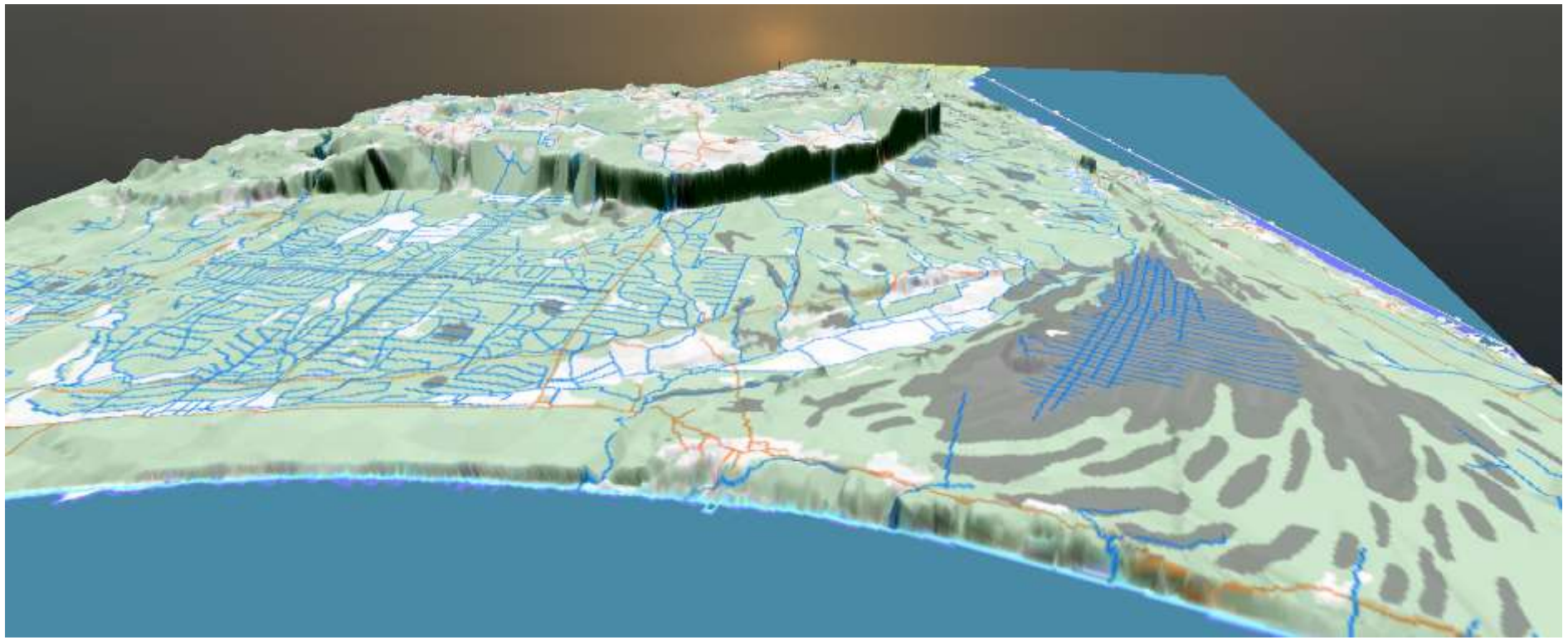
HABITAT AND HYDROLOGICAL MONITORING

BAZU MIRE AND INTER-DUNE MIRE COMPLEX IN THE SLITERE NATIONAL PARK



LIFE «WETLANDS» PROJECT

BAZU MIRE



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HABITAT MAPPING IN THE INTER-DUNE MIRES

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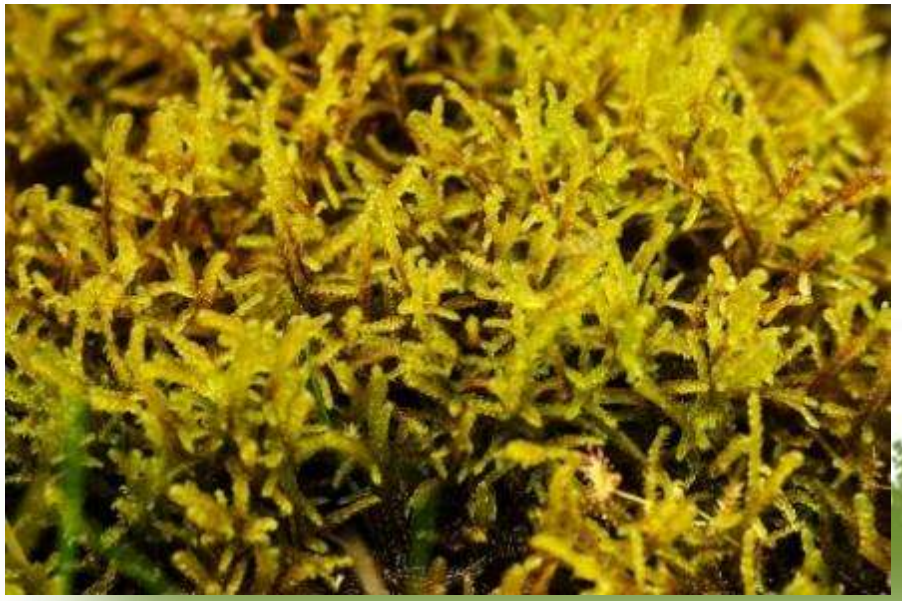
HYDROLOGICAL AND VEGETATION STUDIES IN THE INTER-DUNE MIRES

INTER-DUNE MIRES

Liparis loeselii
Drosera intermedia
Hamatocaulis vernicosus
Nymphaea alba



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BEFORE MANGEMENT

AFTER MANAGEMENT

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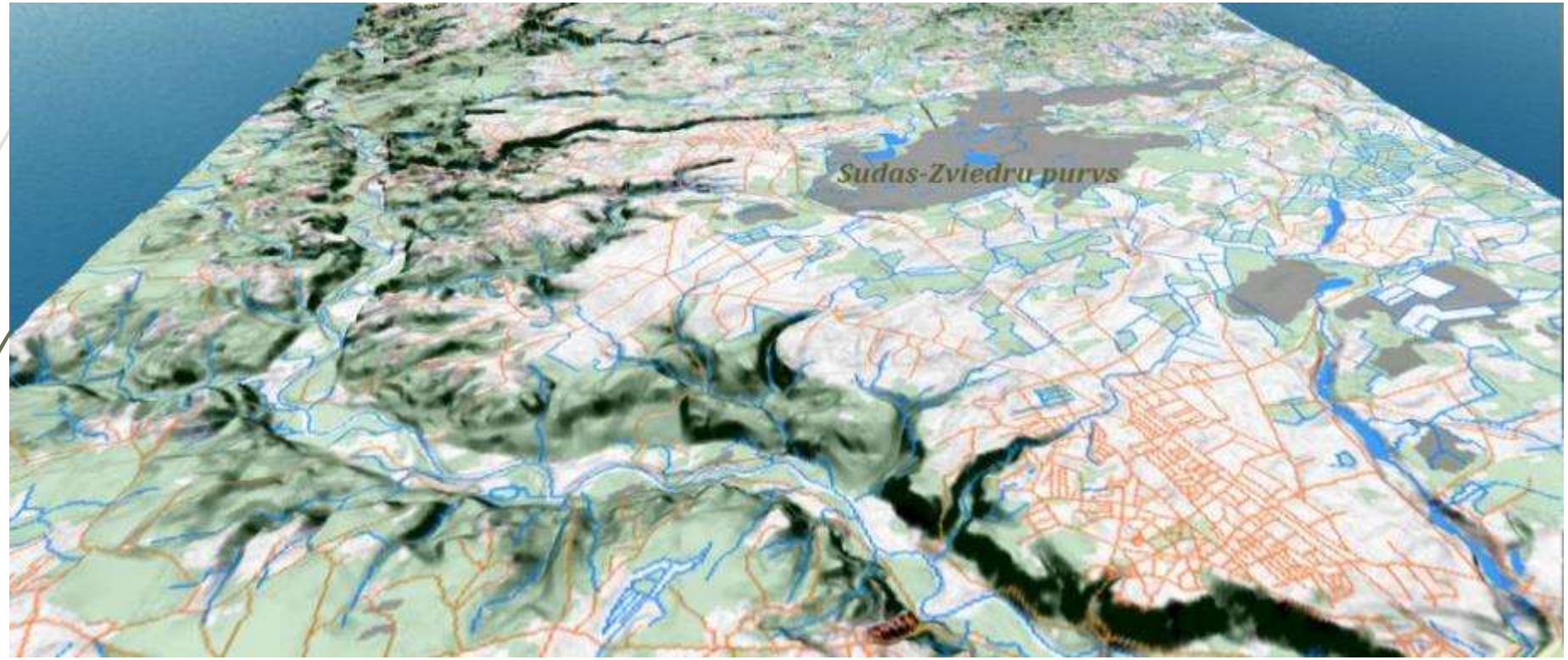
BAZU MIRE
IN SLITERE NATIONAL PARK

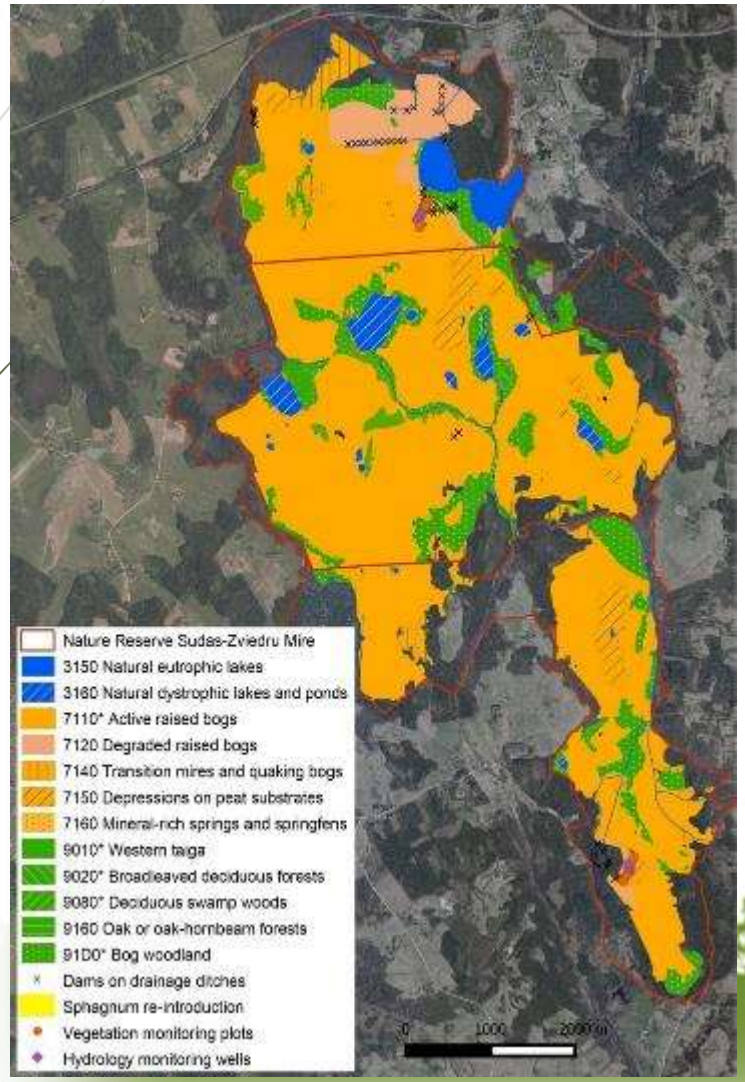
Total area 2,646 ha
Drainage ditches – 7,9 km

RAISED BOG RESTORATION BY BUILDING OF PEAT DAMS

SUDAS-ZVIEDRU MIRE IN THE GAUJA NATIONAL PARK



SUDAS-ZVIEDRU MIRE



VEGETATION DEVELOPMENT AFTER BUILDING OF PEAT DAMS

MITRĀJI
Life+ projekts

SPHAGNUM RE-INTRODUCTION

SPHAGNUM RE-INTRODUCTION IN SUDAS-ZVIEDRU MIRE

SPHAGNUM RE-INTRODUCTION EXPERIMENT

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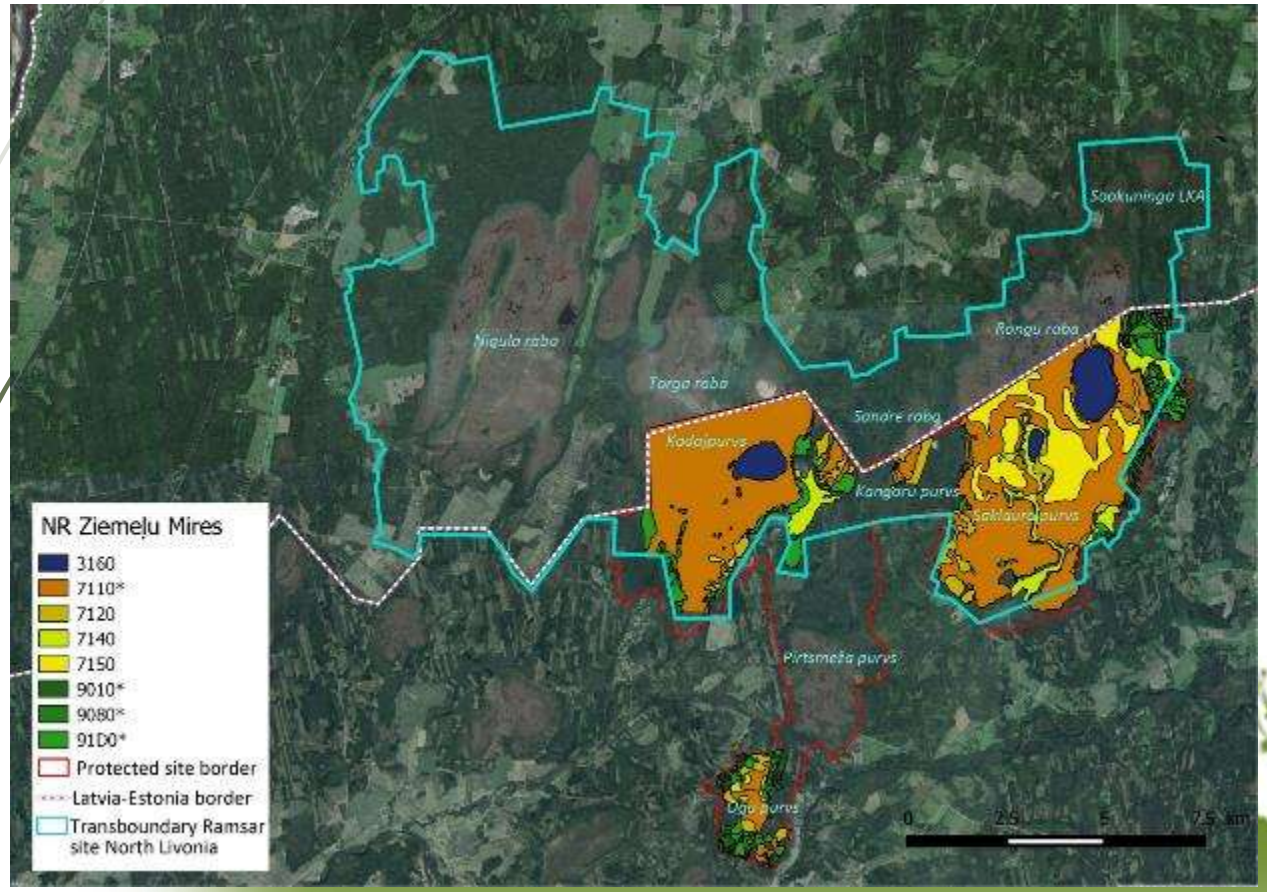
ZIEMEĻU MIRES NATURE RESERVE

Total area: 7718 ha

Northern bogs Ramsar site;
North Livonian transboundary Ramsar site together with Nigula and Sookuninga NR



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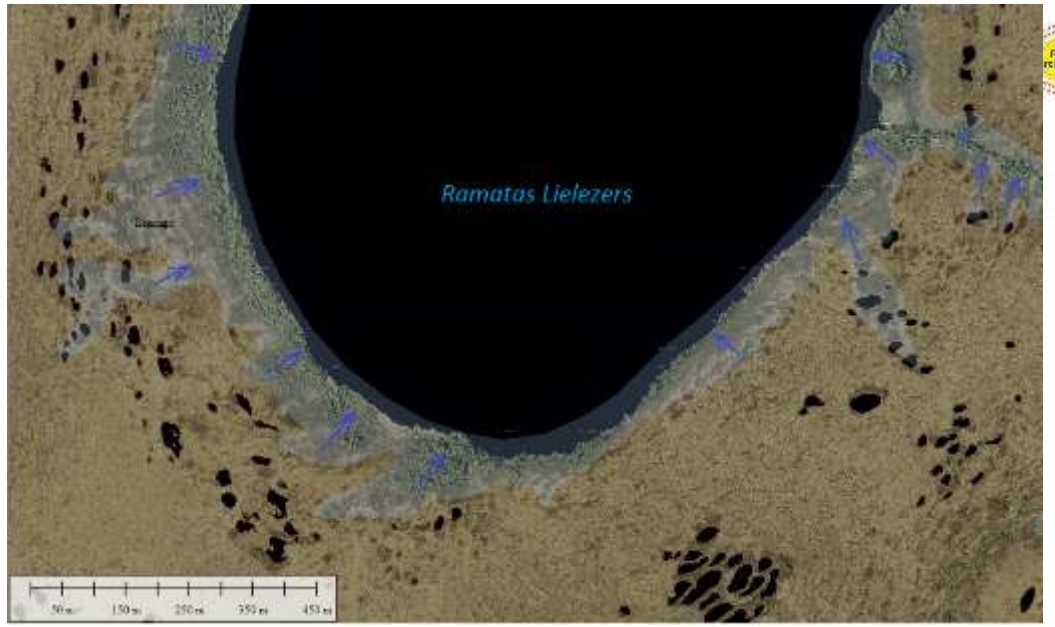
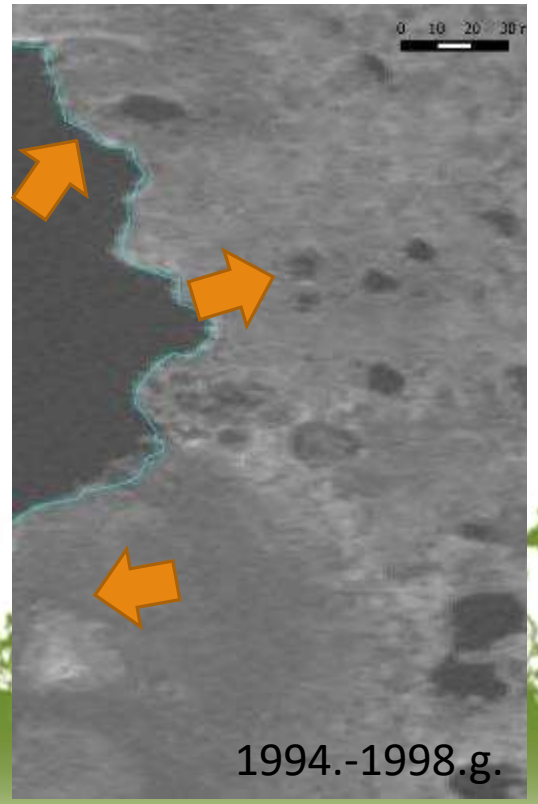
DRAINAGE INFLUENCE ON MIRE VEGETATION





1994.-1998.g.

2013.-2015.g.

GEOLOGICAL, HYDROLOGICAL STUDIES AND MONITORING IN ZIEMEĻU MIRES

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HABITAT AND HYDROLOGICAL MONITORING

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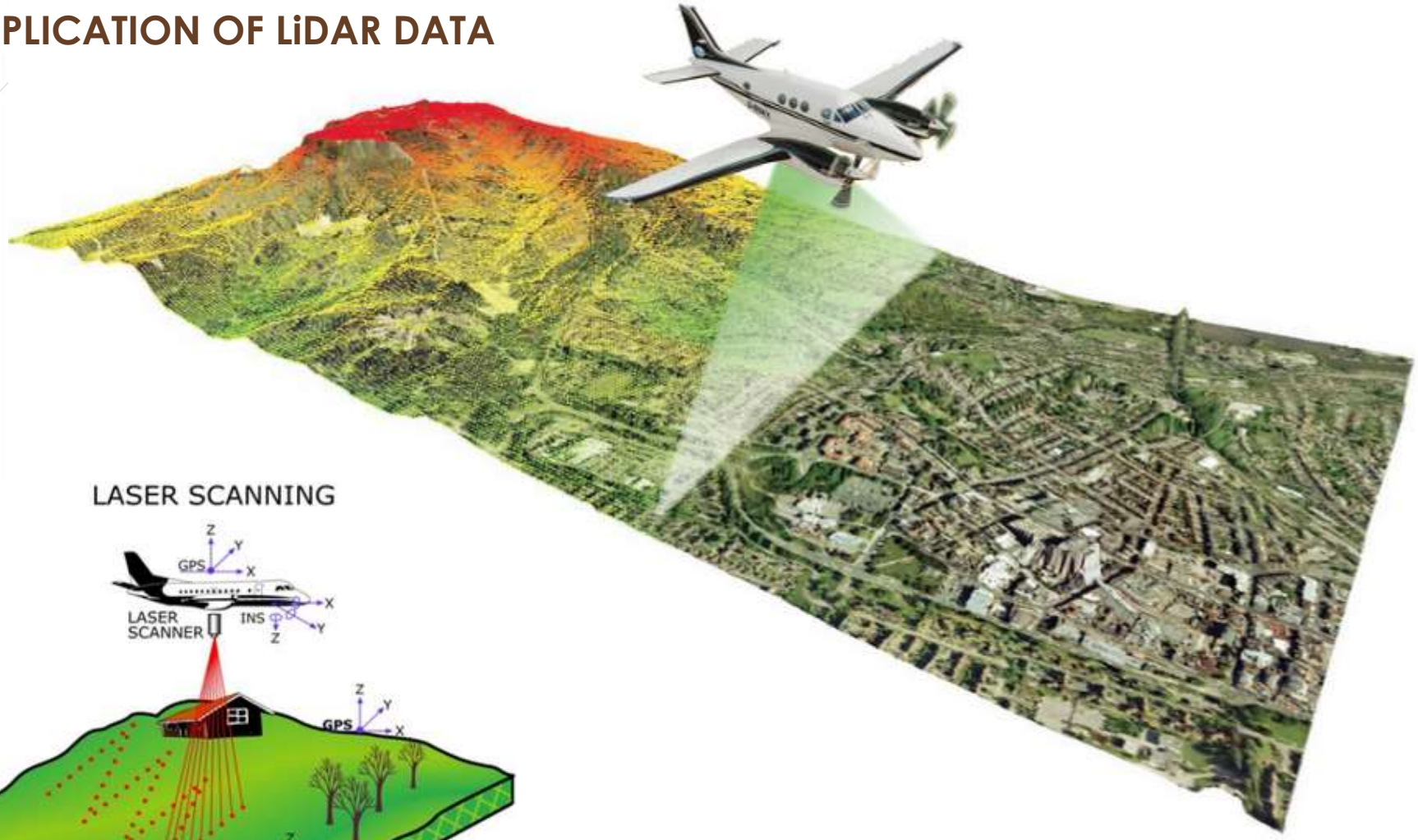
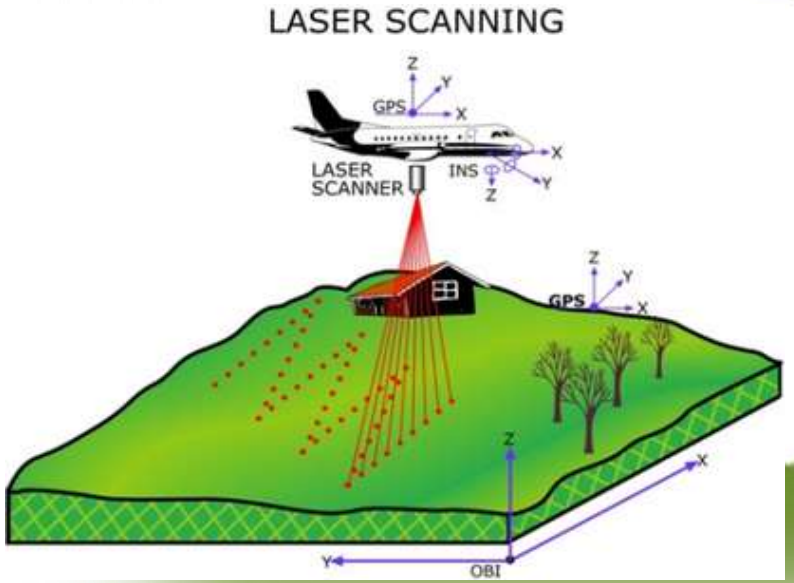
APPLICATION OF LiDAR DATA





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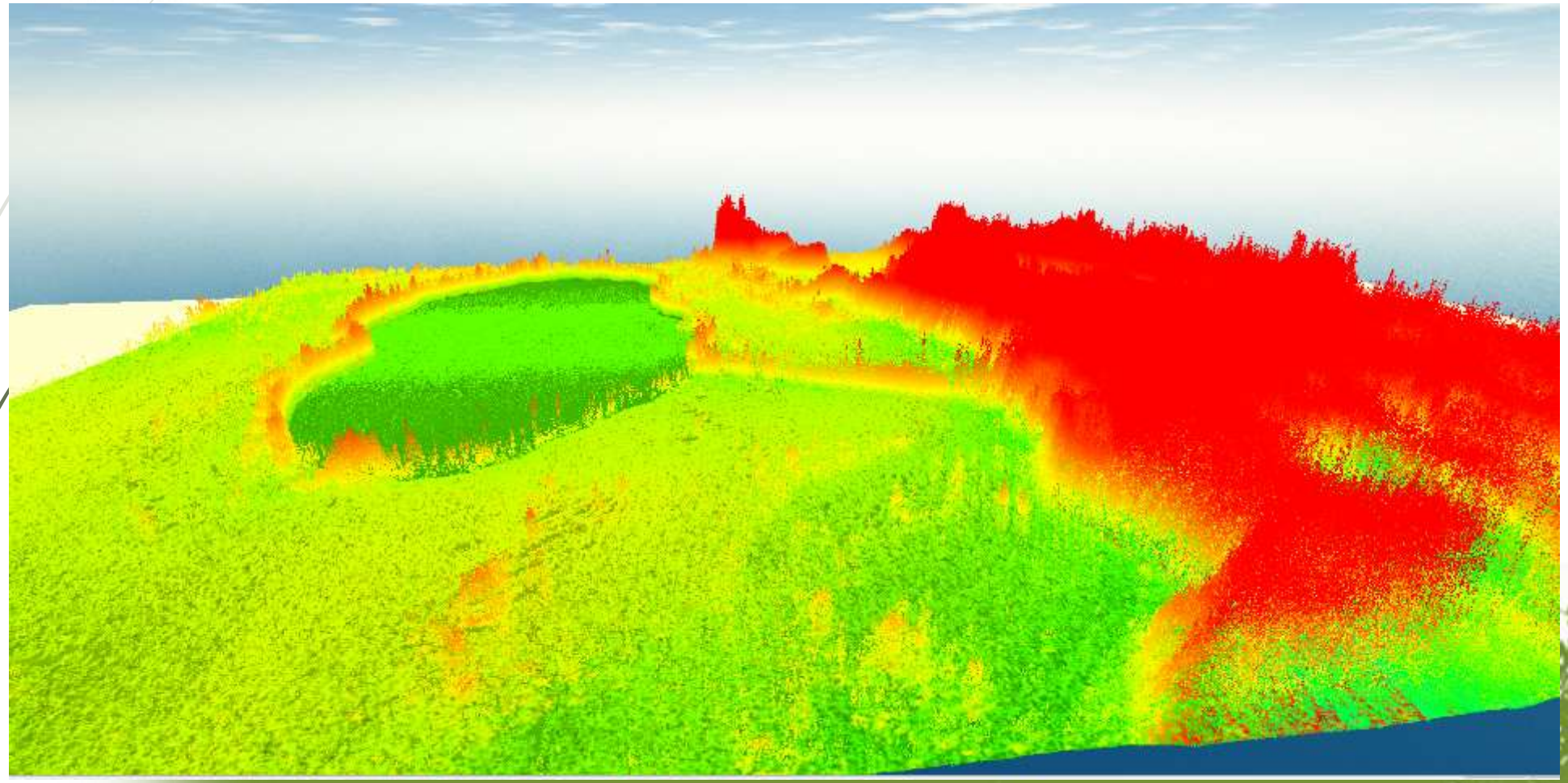
APPLICATION OF LiDAR DATA



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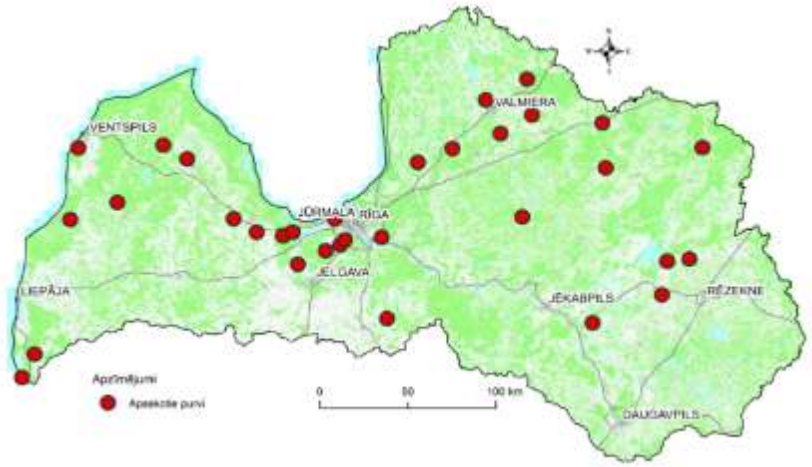
RAUNAS STABURAGS NATURE RESERVE

Total area 25 ha

DĀVIDA SPRINGS IN GAUJA NP
RAUNAS STABURAGS

ELIMINATION OF *HERACLEUM SOSNOWSKYI*

RESULTS OF INVENTORY OF POST-HARVESTED PEATLANDS IN LIFE «RESTORE» PROJECT



- Defined a type of peatland
- Assessed moisture conditions
- Peatland degradation stages
- Restoration possibilities

Surveyed peatlands – where peat extraction ceased 40 years ago and recently.




BRYOPHYTES

Moerckia hibernica

Campylopus introflexus

CALCAREOUS FEN DEVELOPMENT AFTER PEAT EXTRACTION

Liparis loeselii

Cladium mariscus

«Restoring degraded peatlands in Northern European Lowland in service of climate change mitigation»

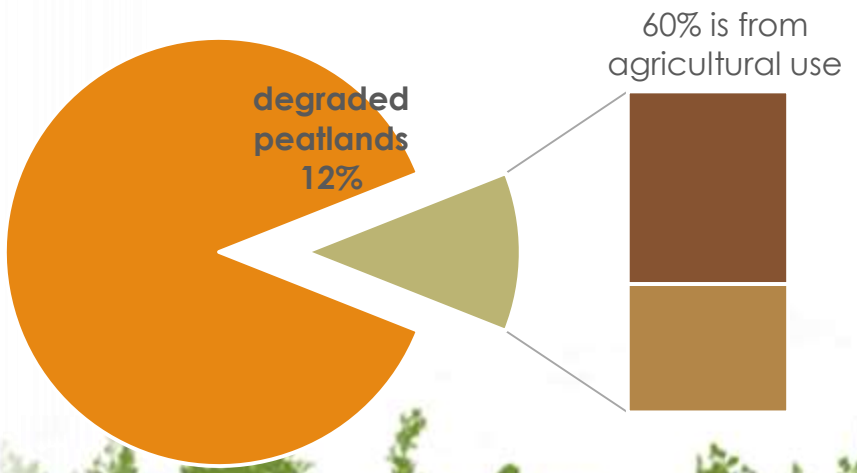
an EU-peatland project funded by LIFE Climate Change Mitigation Project (2016-2021)

PEATLANDS IN EUROPE-PROTECTED BUT DEGRADED HABITAT

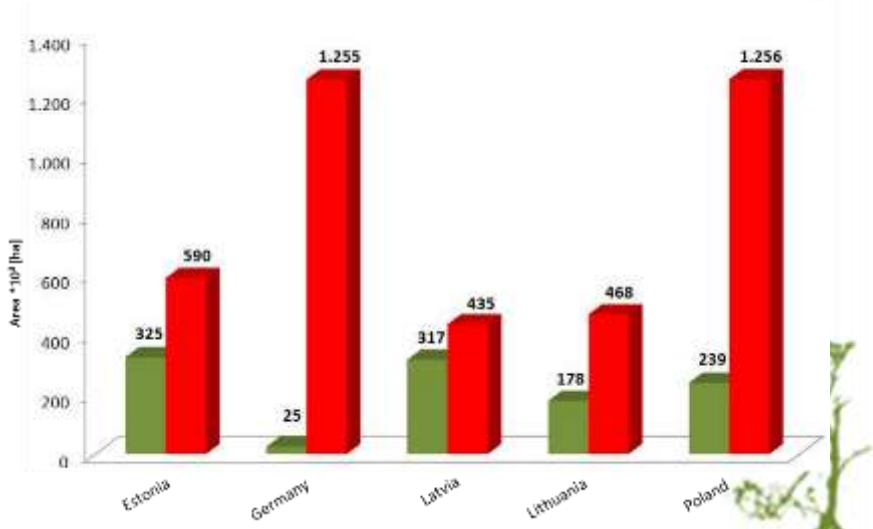
85 % of EU peatland habitats (mires and bogs) according to the Habitats Directive are listed as threatened

agriculture is one of the main threats

Total EU CO2 emissions

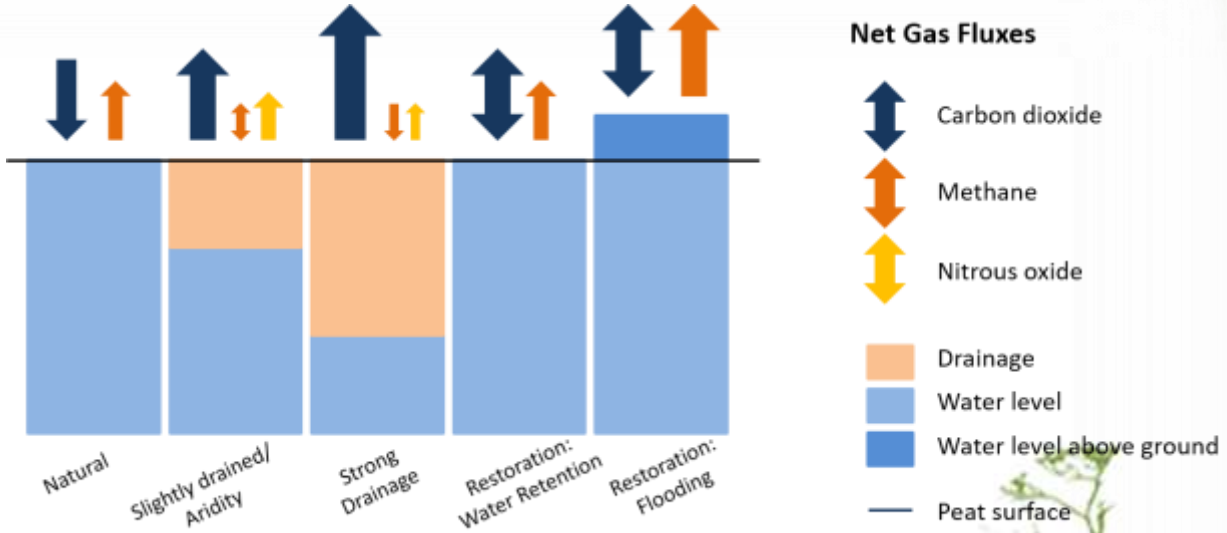


Areas of near-natural peat land (green bars) and drained peat land (red bars).



PEATLANDS IN THE CONTEXT OF CLIMATE CHANGE

Peatlands are permanently waterlocked carbon sinks - implementing Paris Agreement target of reducing GHG emissions until 2030.



Anthropogenic degradation turns carbon sinks to GHG sources

- jeopardise their capability to store CO_2 and NO_2
- spoils the opportunity to comply with the Paris Agreement

PROJECT IDEA

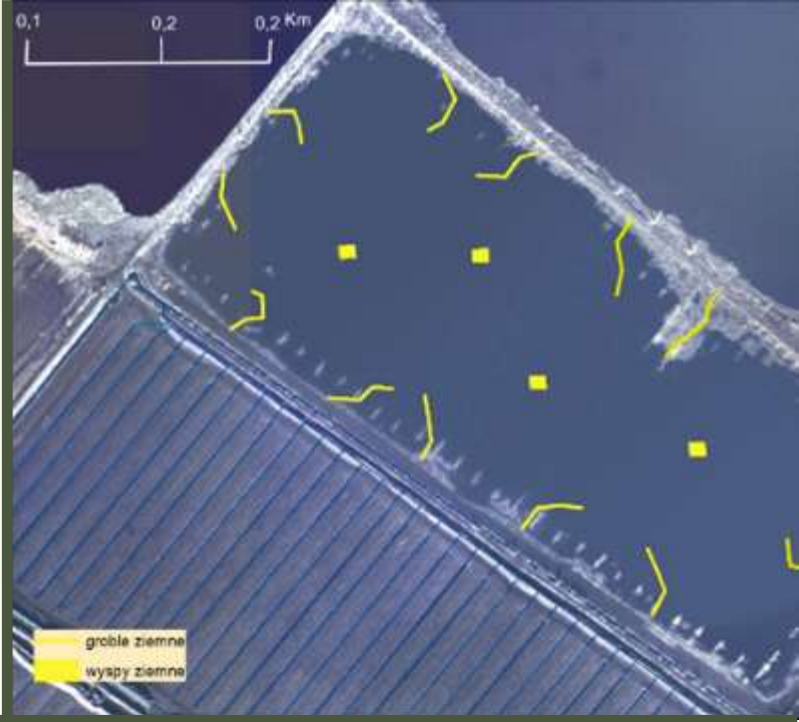
Leading partner

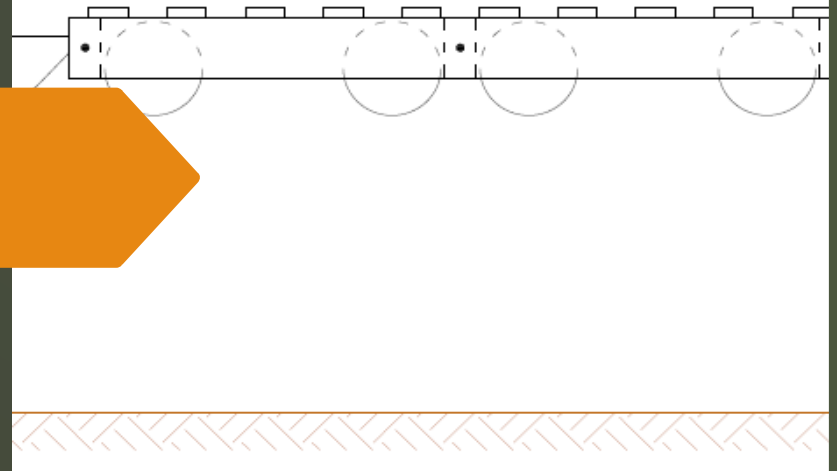
- Estonia
- Latvia
- Lithuania
- Poland
- Germany

Countries which are significant CO_2 emiters form degraded peatlands

To estimate the peatland's contribution to climate change mitigation, GHG are measured before, during and after raising the water table.

Artificial floating islands with peat forming vegetation and alter the shorelines on post exploitation peat water reservoirs, allowing the vegetation to spread and occupy the open water body.





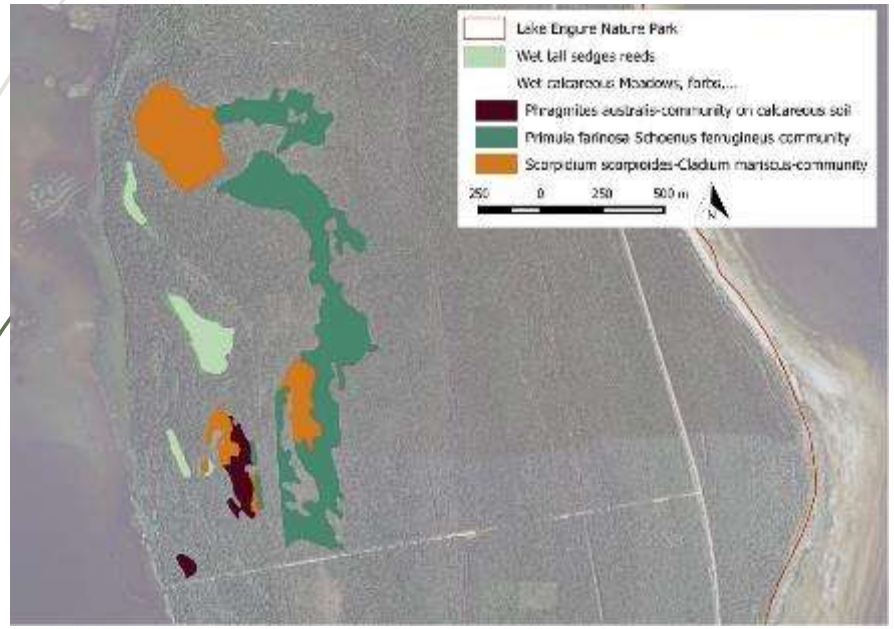
ENGURE LAKE NATURE PARK, RAMSAR SITE

Ophrys insectifera

Schoenus ferrugineus

Cladium mariscus

GEST TYPES IN ENGURE FENS



GEST approach supplemented with measurements and linked with relevant data on hydrology, peat depth and condition, pH, trophy and land use

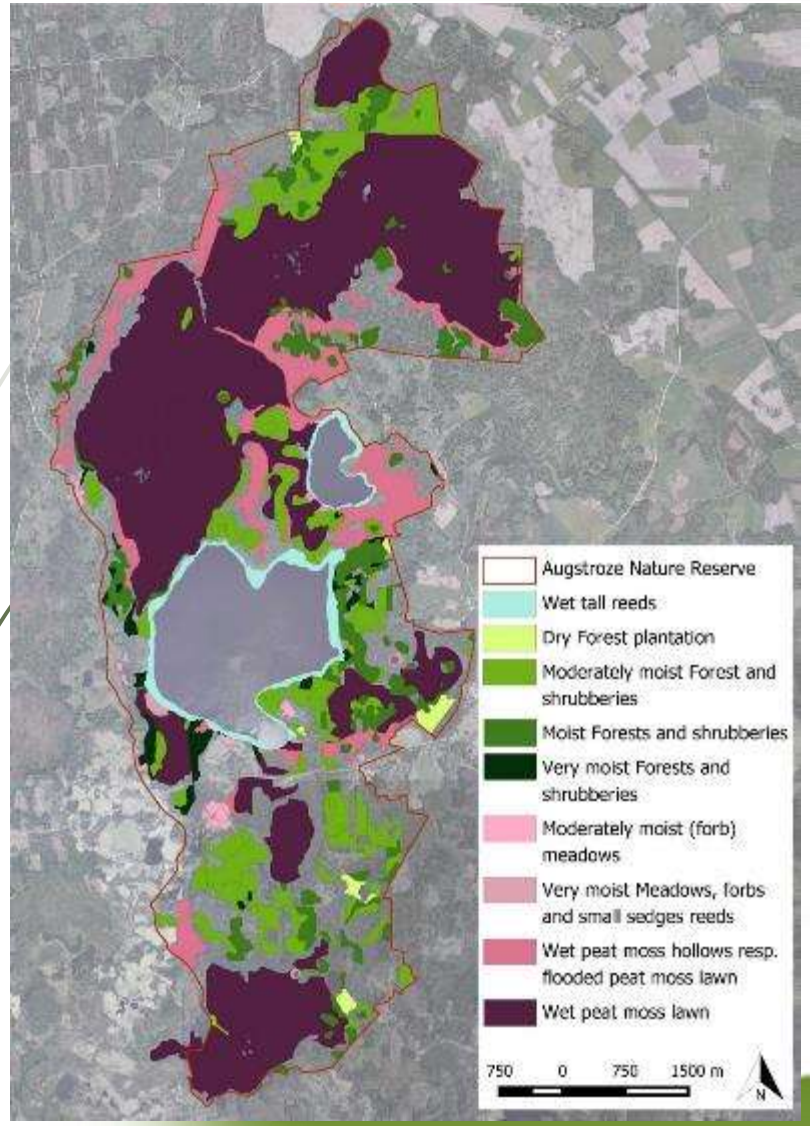
GEST TYPES AND HABITATS OF EU IMPORTANCE IN ENGURE FENS

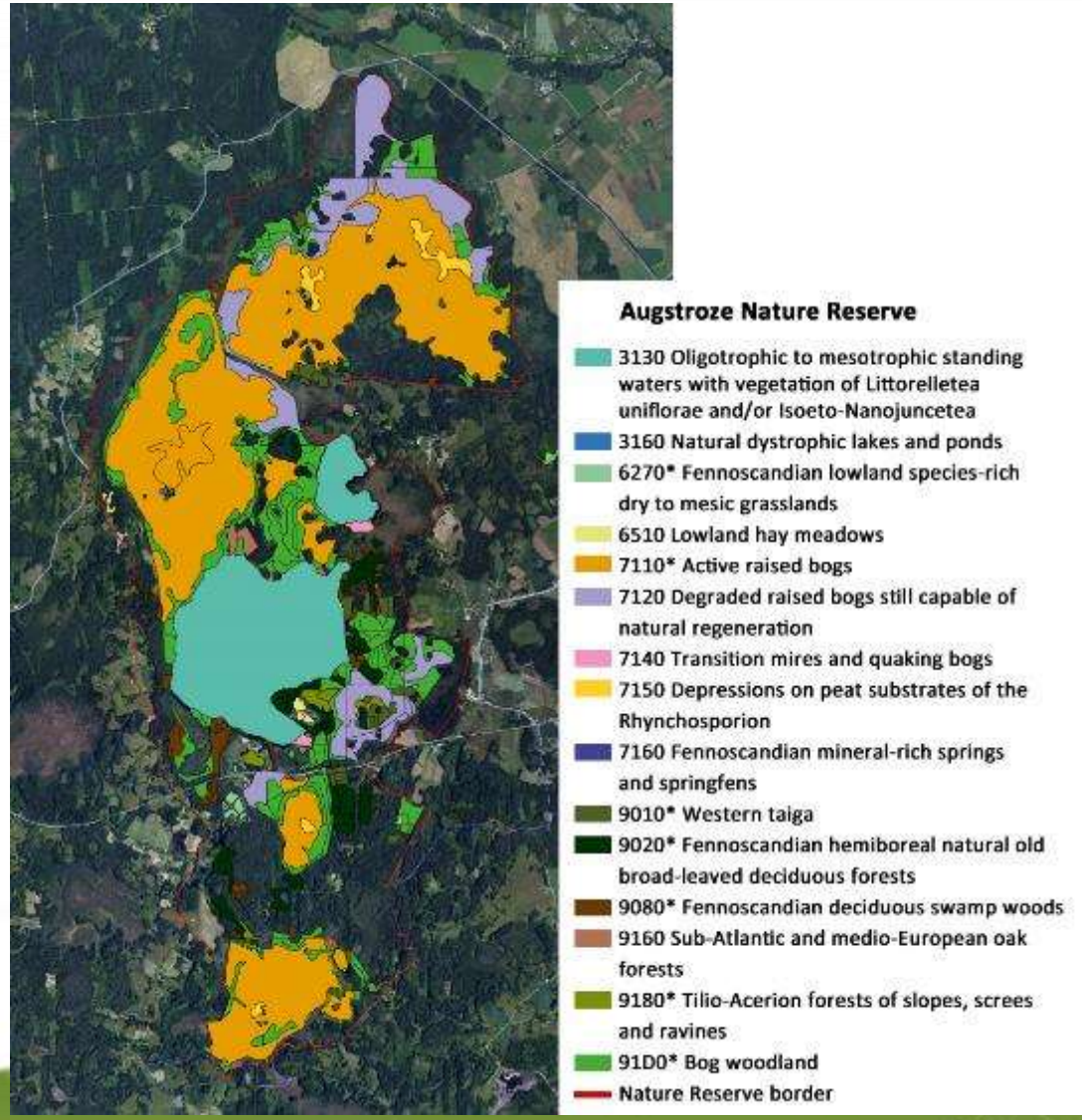
- 7230 Alkaline fens with *Schoenus ferrugineus*
- GEST type*: Primula farinosa – Schoenus community*

- 7210 Calcareous fens with *Cladium mariscus* and species of *Caricion davallianae**
- Gest type*: Scorpidium scorpioides-Cladium mariscus community*

GEST TYPES

EU HABITATS





GEST TYPES AND HABITATS OF EU IMPORTANCE IN AUGSTROZE

- Intact raised bogs 7110*
- *Gest type: Wet peat moss lawn*

- Degraded raised bogs still capable of natural regeneration 7120

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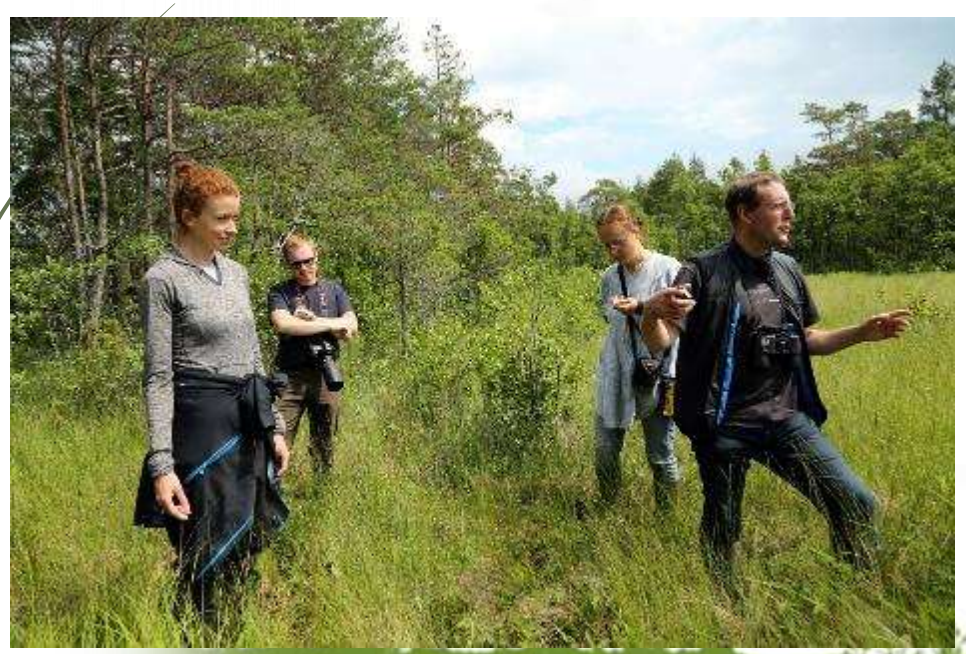
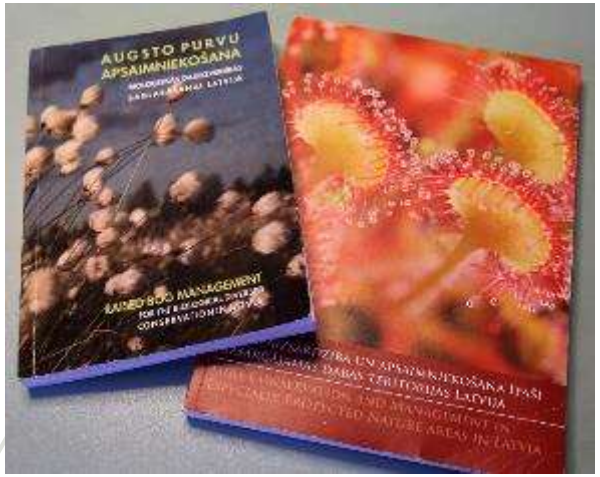
EXPERIENCE EXCHANGE

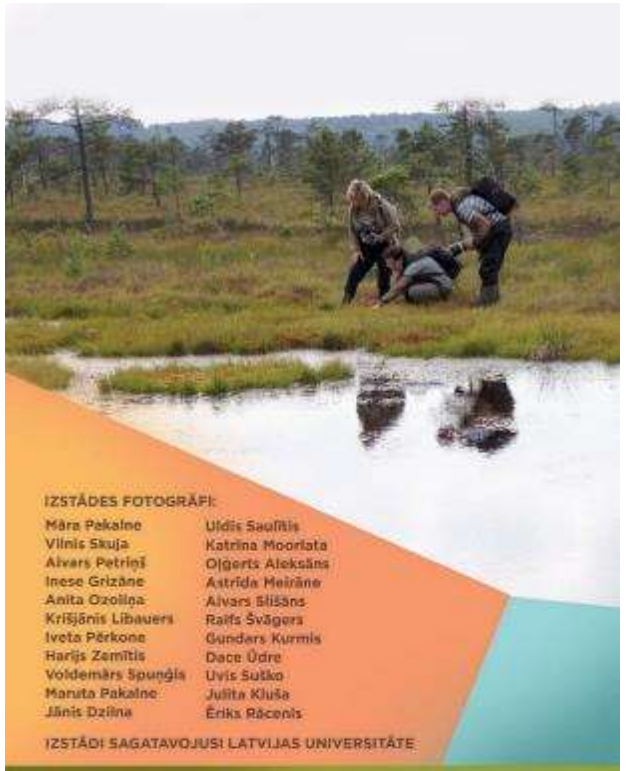


CONCLUSIONS

- Raised bog restoration in Latvia is carried out mainly within EC LIFE projects and has been sucessful in the project sites;
- Hydrological and habitat monitoring shows that after raising of water level by building of peat dams on the drainage ditches, immediate changes take place in site hydrology and afterwards also in raised bog vegetation;
- Rising groundwater level in mires by building dams on the drainage ditches is an effective way of mire restoration;
- Re-establishment of *Sphagnum* species is an indicator of mire regeneration in the degraded mire areas;
- After rising of groundwater table, regeneration of mire species takes place in the same vegetation season.

MULTIMEDIA AND PHOTO EXHIBITION, FILMS ABOUT THE PROJECT SITES, BOOKLETS AND GUIDELINES





THANKS FOR THE ATTENTION!

Project website: LIFE+Wetlands»

www.mitraji.lv

E-mail: mara.pakalne@lu.lv

Project website: https://life-peat-restore.eu/en/

EC LIFE PROJECT «LIFE PEAT RESTORE» LIFE 15 CCM/DE/000138
«Reduction of CO2 emissions by restoring degraded peatlands in Northern European Lowland» (2016-2021)