PEATLAND RESTORATION IN LATVIA – EXPERIENCES AND LESSONS LEARNT

Dr. Māra Pakalne
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
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**

**HYDROPLAN LIFE10 NAT/LV/000160**
Restoring the hydrological regime of Ķemeri National Park (2011–2018)

**RAISED BOGS LIFE08 NAT/LV/000449**

**MIRES LIFE04 NAT/LV/000196**

**LUBANA WETLANDS LIFE03 NAT/LV/000083**

**KEMERI LIFE02 NAT/LV/008496**

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

MELNAIS LAKE MIRE NATURE RESERVE
BUILDING OF DAMS ON DRAINAGE DITCHES IN MELNAIS LAKE MIRE IN 2012
MELNAIS LAKE MIRE NATURE RESERVE
RESULTS: MELNAIS LAKE MIRE

Change of the proportions in Sphagnum coverage

The coverage of species of more wet areas has increased
MELNAIS LAKE MIRE

2011

2012
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
MIRE STUDIES, MANAGEMENT AND MONITORING

MANAGEMENT PLANS

TECHNICAL DESIGNS

MIRE RESTORATION ACTION

HABITAT AND HYDROLOGICAL MONITORING

HABITAT AND HYDROLOGICAL MONITORING
BAZU MIRE AND INTER-DUNE MIRE COMPLEX IN THE SLITERE NATIONAL PARK
HABITAT MAPPING IN THE INTER-DUNE MIRES
HYDROLOGICAL AND VEGETATION STUDIES IN THE INTER-DUNE MIRES
Liparis loeselii
Drosera intermedia
Hamatocaulis
vernicosus
Nymphaea alba
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
SPHAGNUM RE-INTRODUCTION
SPHAGNUM RE-INTRODUCTION IN SUDAS-ZVIEDRU MIRE
SPHAGNUM RE-INTRODUCTION EXPERIMENT
Northern bogs Ramsar site;
North Livonian transboundary Ramsar site
together with Nigula and Sookuninga NR
DRAINAGE INFLUENCE ON MIRE VEGETATION
GEOLOGICAL, HYDROLOGICAL STUDIES AND MONITORING IN ZIEMEĻU MIRES
HABITAT AND HYDROLOGICAL MONITORING
APPLICATION OF LiDAR DATA
APPLICATION OF LiDAR DATA
RAUNAS STABURAGS NATURE RESERVE
Total area 25 ha
ELIMINATION OF HERACLEUM SOSNOWSKYI

DĀVIDA SPRINGS IN GAUJA NP
RAUNAS STABURAGS
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

Campylopus introflexus

Moerckia hibernica
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)
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 CO₂ and NO₂
- spoils the opportunity to comply with the Paris Agreement
PROJECT IDEA

Leading partner

- Estonia
- Latvia
- Lithuania
- Poland
- Germany

Countries which are significant CO₂ emitters 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*¹
- Gest type: *Scorpidium scorpioides-Cladium mariscus* community

¹: *Caricion davallianae* is an indicator plant community.
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
EXPERIENCE EXCHANGE
CONCLUSIONS

- Raised bog restoration in Latvia is carried out mainly within EC LIFE projects and has been successful 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

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)