



KESKKONNAAMET

Conservation and wise use of Estonian wetlands

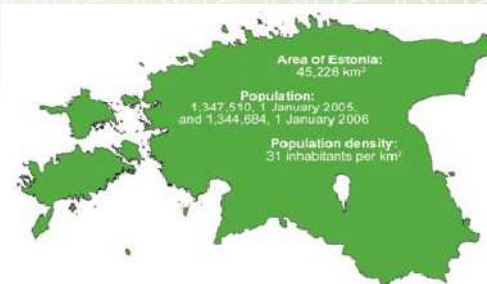
Kai Kimmel
Environmental Board

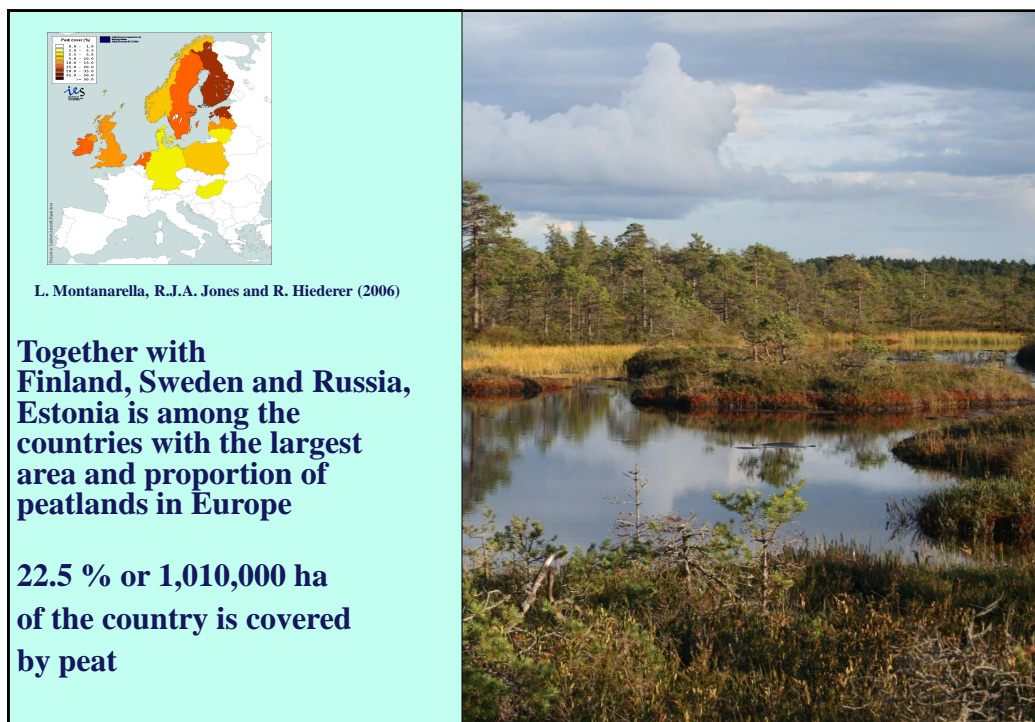
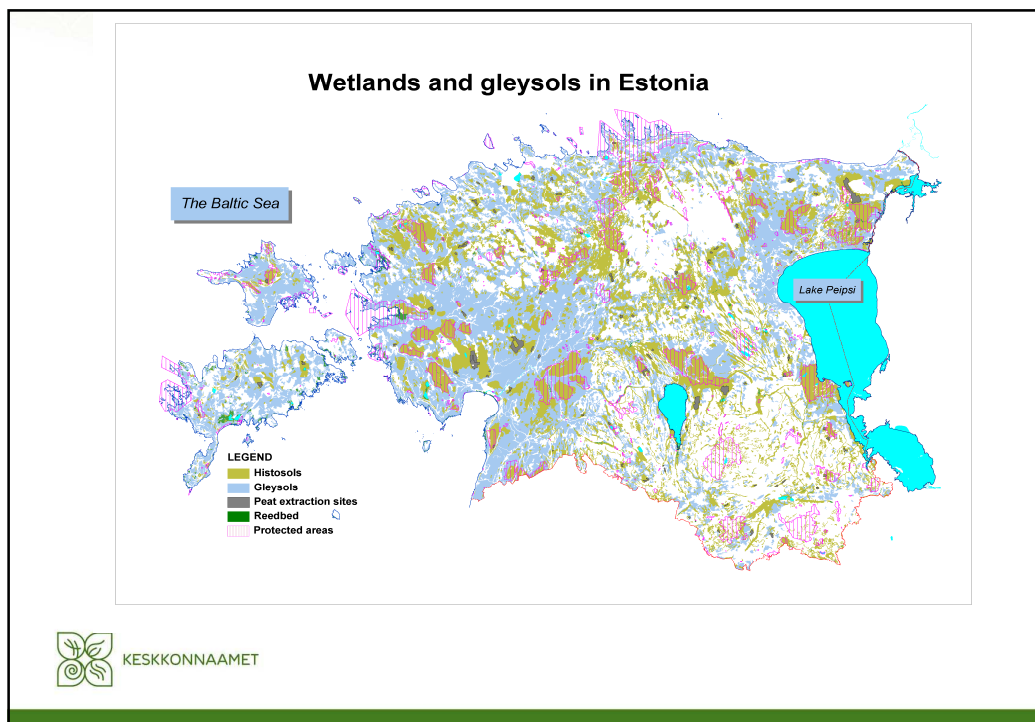
Estonian wetlands

- flat topography (0 -318 m)
- wide variety of glacial formations and
- humid climate

supports considerable water resources and wetland ecosystems, particularly mires

Various coastal wetlands are connected with the long and diverse shoreline







Wetland types

The EU Habitat Directive lists some 40 wetland habitat types - 33 types are found in Estonia

- **marine and coastal**
 - **estuarine**
 - **lacustrine**
 - **riverine**
 - **palustrine**
-
- **anthropogenic wetlands including constructed wetlands (sewage treatment plants) and reservoirs**

Wetland area

900 160 ha – area of wetland habitats reflected in the Natura 2000 database

As detailed mapping has not conducted for several habitats there are only preliminary and rough area estimations

Although the data base includes not all wetland types, also there are differences on interpretation of habitat types.

Consequently, the actual area of preserved wetlands in Estonia is most likely over a million hectares



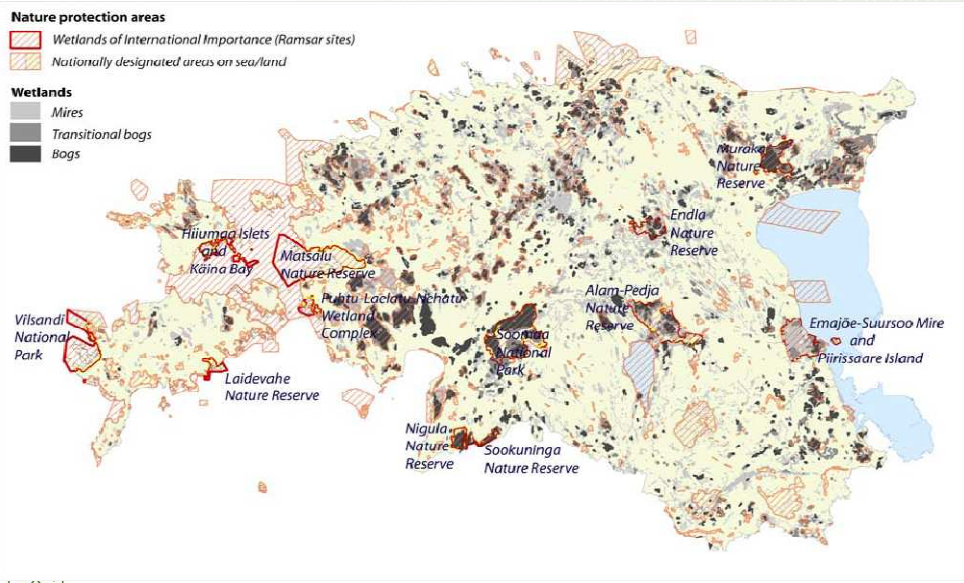
Wetland conservation

- 1910 Vaika bird islands
- 1924-1940 (Linnulaht, Ratva bog)
- 1957 Matsalu, Nigula, Viidumäe; Nehatu, Muraka, Nätsi
- 1971 Vilsandi, Lahemaa
- 1970-1972 “mire war” in Eesti Loodus
- 1981 mire protection areas (28+2)
- 1990 s Soomaa, Alam-Pedja
- 1997 Ramsar program, 10 Ramsar sites
- 2000-2007 Natura 2000



KESKKONNAAMET

Nationally designated protection areas and internationally important Ramsar sites (twelve, 224,213 ha)



Protected wetlands

Preserved valuable wetland type	Estimated total area of preserved wetland type (ha)	Area of protected wetland type (ha)
A Marine/Coastal Wetlands	292,150	44,290
shallow marine waters	267,650	33,000
marshes/coastal meadows	24,500	11,200
B Inland Wetlands	608,410	270,400
seasonally flooded meadows	20,000	13,700
non-forested peatlands	388,100	175,000
wet forests	100,100 -161,100	80,000
Total wetland area reflected in Natura 2000 database	900,160	314,690



3 “pillars” of the Ramsar Convention

- Working towards the wise use of wetlands
- Establishing a global ecological network through the development of the List of Wetlands of International Importance
- Encouraging international cooperation in the delivery of wetland conservation and wise use



KESKKONNAAMET



12 designated sites
4 new sites under designation

seminar in Estonia (2007): monitoring of wetlands





Ecosystem services

Millennium Assessment (2005):

ecosystem services are the benefits people obtain from ecosystems. These include:

- provisioning services
- regulating services
- cultural services

that directly affect people

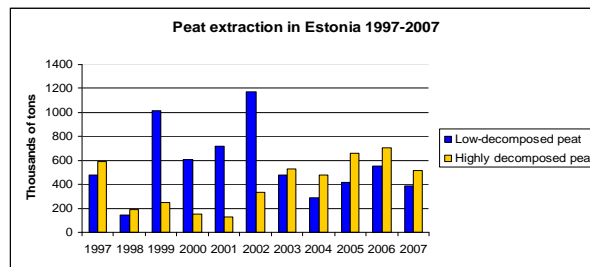
- supporting services

that are needed to maintain these services

Services	Explanation (sub-services)	Most relevant
Provisioning		
Fuel	Peat (heat and electricity production); fuel wood	Peatlands, constructed energy wetlands
Fiber (materials)	Gardening peat, reed and cattail (construction), wood, hay	Peatlands, reedbeds, floodplain and coastal meadows
Food	Fish (coastal and inland lake fisheries), berries	Low sea, lakes, rivers, peatlands, wet forests
Biochemical products	Peat in chemical industry; curative mud; herbs as natural medicines	Peatlands
Land	For grazing	Coastal meadows
Fresh water	Drinking water	Some rivers
Regulating		
Climate regulation	Regulation of greenhouse gases (source and sink)	Peatlands
Hydrological regimes	Groundwater recharge and discharge; storage of water	Rivers, lakes, peatlands
Pollution control	Retention, recovery and removal of excess nutrients and pollutants	Rivers, constructed wetlands
Natural hazards	Flood control, storm protection	Floodplains, coastal wetlands
Cultural		
Spiritual and inspirational	Personal feelings and well-being ("home landscape", island of silence)	All, in particular bogs, coastal meadows
Recreational	Opportunities for tourism and recreational activities; bird watching	All, in particular peatlands, coastal and floodplain meadows
Aesthetic	Appreciation of natural features	All wetlands
Educational	Opportunities for formal and informal education and training	All wetlands
Research	Sediments as an archive for study, survey field	Peatlands, lakes
Supporting		
Biodiversity	Habitats for species	All wetlands
Soil formation	Sediment retention and accumulation of organic matter (peat accumulation)	All wetlands
Nutrient cycling	Storage, recycling, processing and acquisition of nutrients	All wetlands

1. Provisioning ecosystem services

Fuel, fiber, biomass, food, clean water, space for agriculture, forestry



KESKKONNAAMET

2. Regulating ecosystem services

Climate regulation

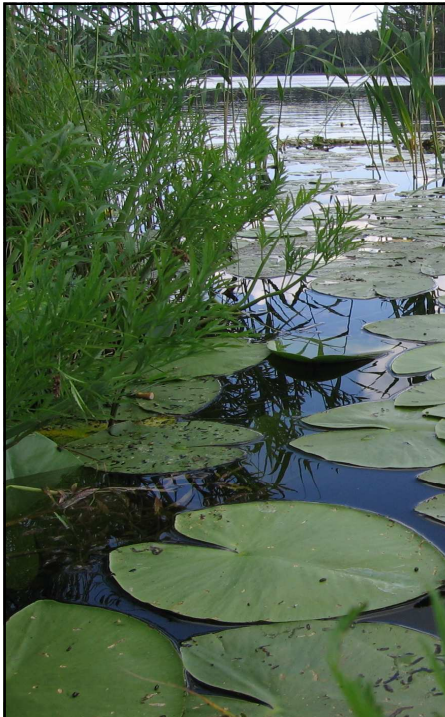
One of the most important roles of peatlands may lie in the regulation of global climate change through sequestering and releasing of a major proportion of fixed carbon in the atmosphere

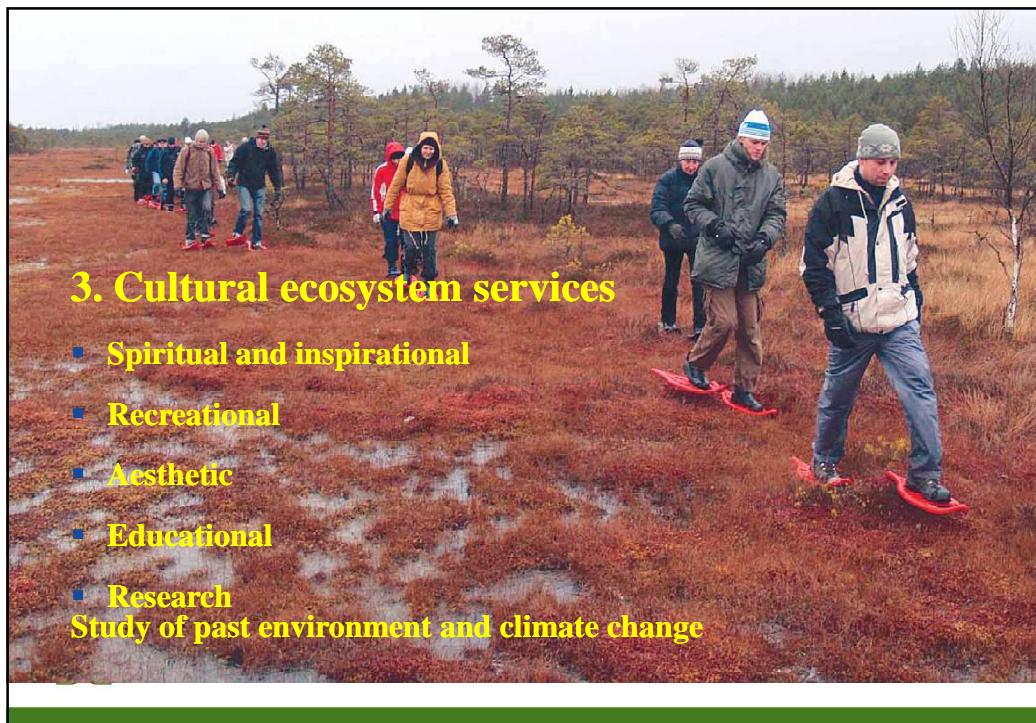
Water regulation

Water storage. Groundwater recharge and discharge. Flood control. Depending on local conditions

Pollution control

Efficient in removing pollutants (nitrogen, phosphorus) from inflowing water. Wastewater treatment. Constructed wetlands. Potential of wetland restoration







4. Supporting ecosystem services

Soil formation

Nutrient cycling

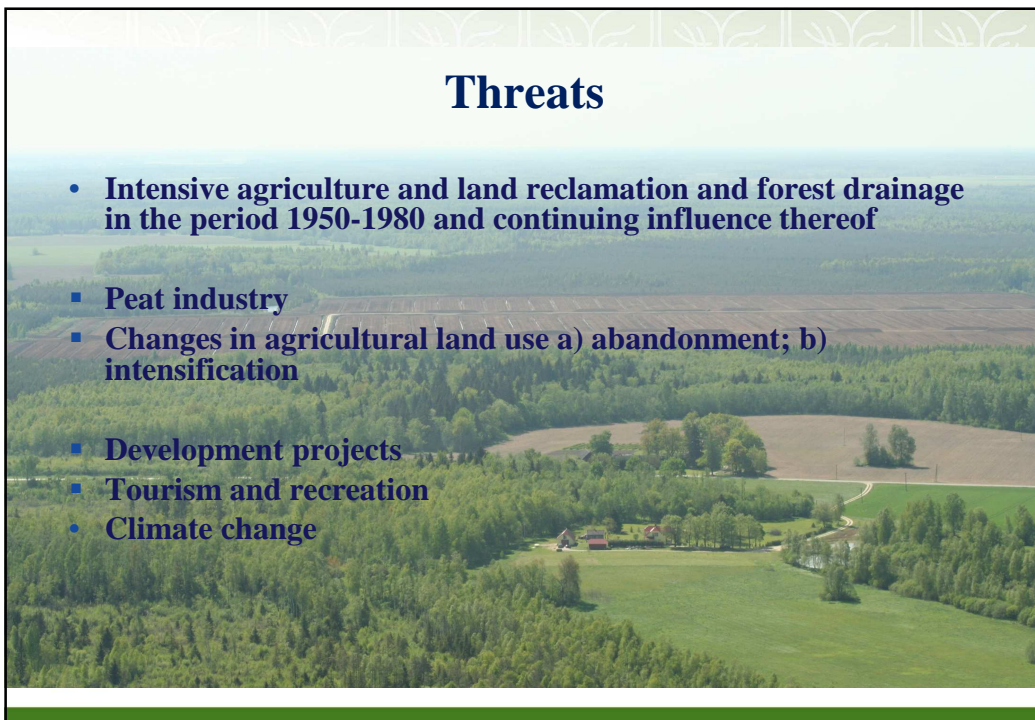
Biodiversity

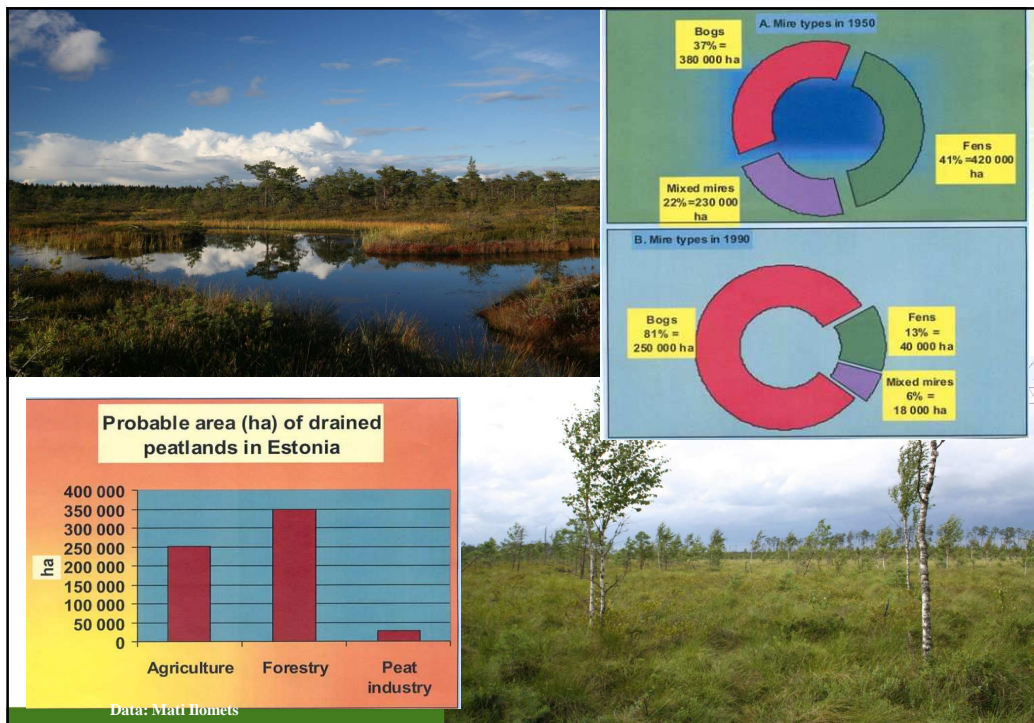
33 wetland habitat types
(6 priority habitats for EU)

117 species of European
importance depend on wetlands

Threats

- **Intensive agriculture and land reclamation and forest drainage in the period 1950-1980 and continuing influence thereof**
- **Peat industry**
- **Changes in agricultural land use a) abandonment; b) intensification**
- **Development projects**
- **Tourism and recreation**
- **Climate change**





The first results of studies have shown that one of the main ecosystem services of peatlands, the accumulation of carbon and the binding of CO₂, has fallen in quantity in Estonia

due to drainage, Estonian peatlands have turned into sources of carbon gases instead of sinks

the need to restore degraded peatlands to natural ecosystems is evident



Conclusions

- **Estonia has achieved substantial progress in the area of wetland conservation and a significant proportion of valuable wetlands are legally protected.**
- **There are still crucial challenges:**
- **addressing of drained wetland areas that have become sources of greenhouse gases; attaining sustainable use of peat resources and ensuring the restoration of cut-away peatland areas**
The concept of the conservation and sustainable use of Estonian peatlands being initiated recently with the aim to find consensus between different interests of service use – mainly the interests of peat extraction and conservation has to be developed to the strategy and relevant action plan
- **maintenance of the traditional management of semi-natural wetlands**

