



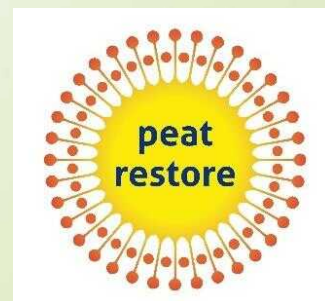
# Restoring peatlands for climate

## Polish experiment in application of peatland restoration methods for climate protection-floating islands

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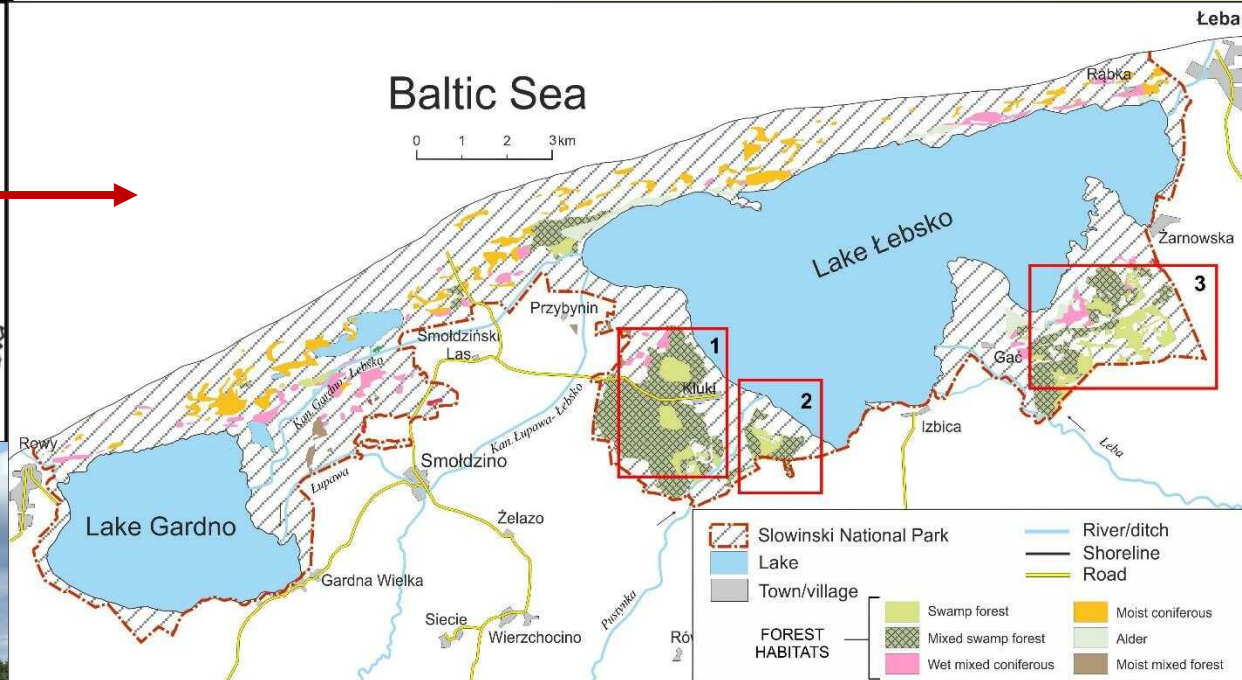
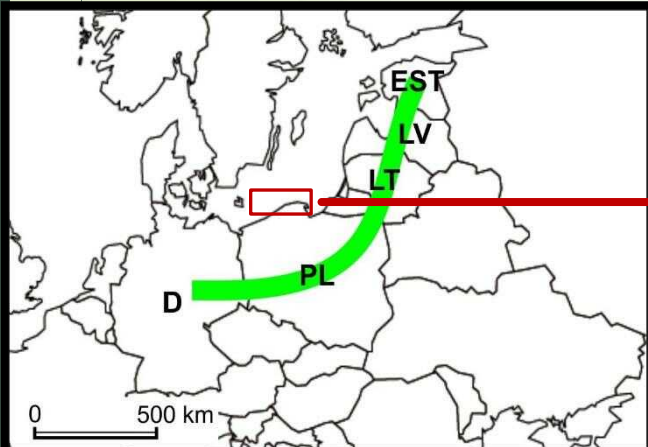
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# The project peatlands

2

## Location



Location of raised bogs in the Słowiński National Park



Wielkie Bagno

- 1. Kluki** – 262 ha
- 2. Ciemińskie Błota** – 91 ha
- 3. Wielkie Bagno** – 455 ha



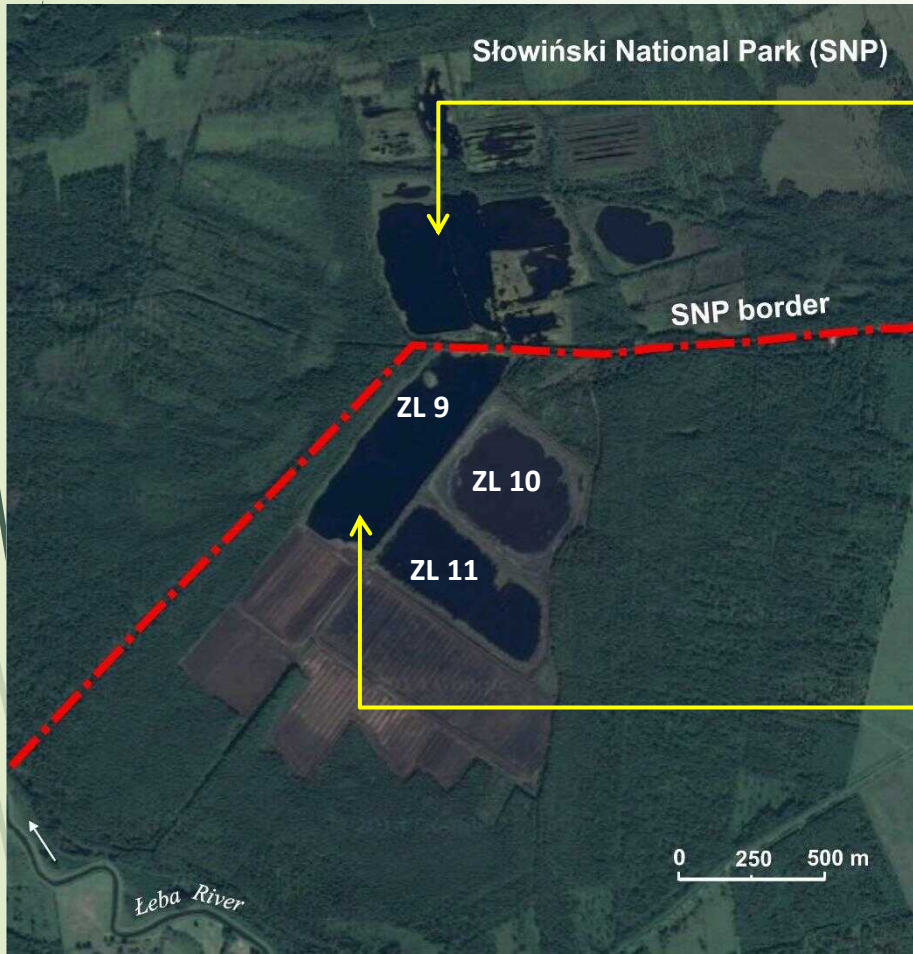
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3

## Wielkie Bagno



Reservoirs on the Wielkie Bagno



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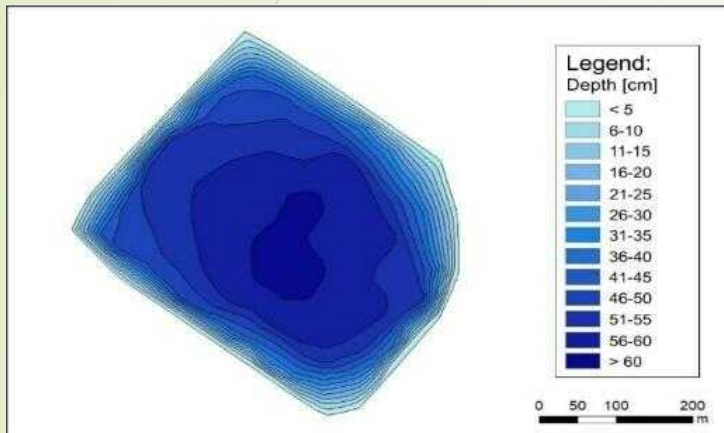


# Characteristics of water reservoir

4

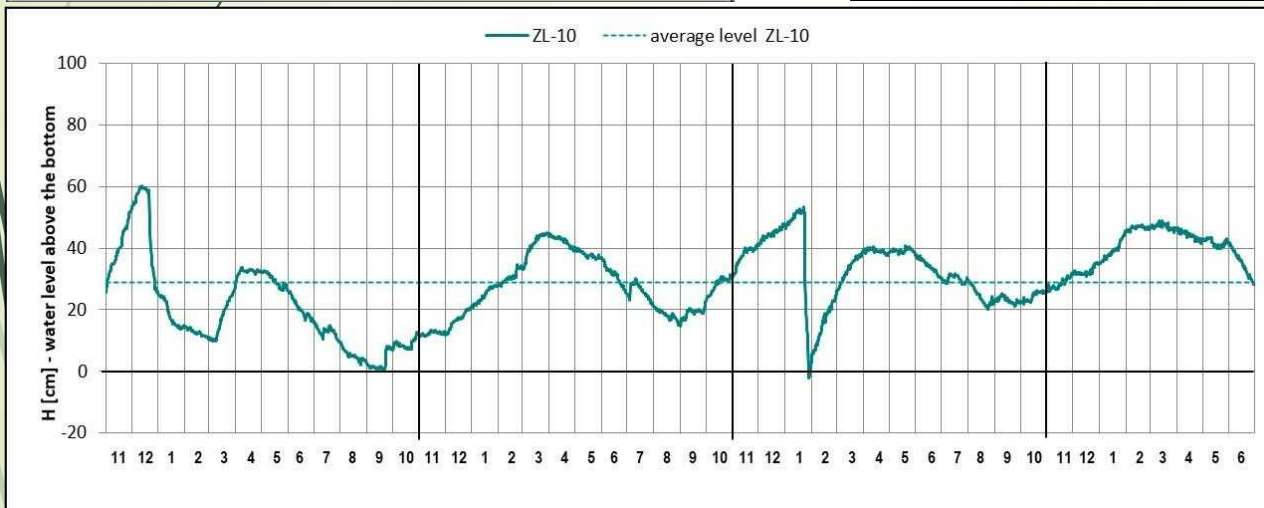
## ZL10 reservoir – basic data

### 1. Bathymetric plan



### 2. Morphometric data

Surface [ha]	17.8
Depth max [cm]	90
Depth average [cm]	70
Capacity [m <sup>3</sup> ]	26.000 -128.000



### 3. Water level fluctuations



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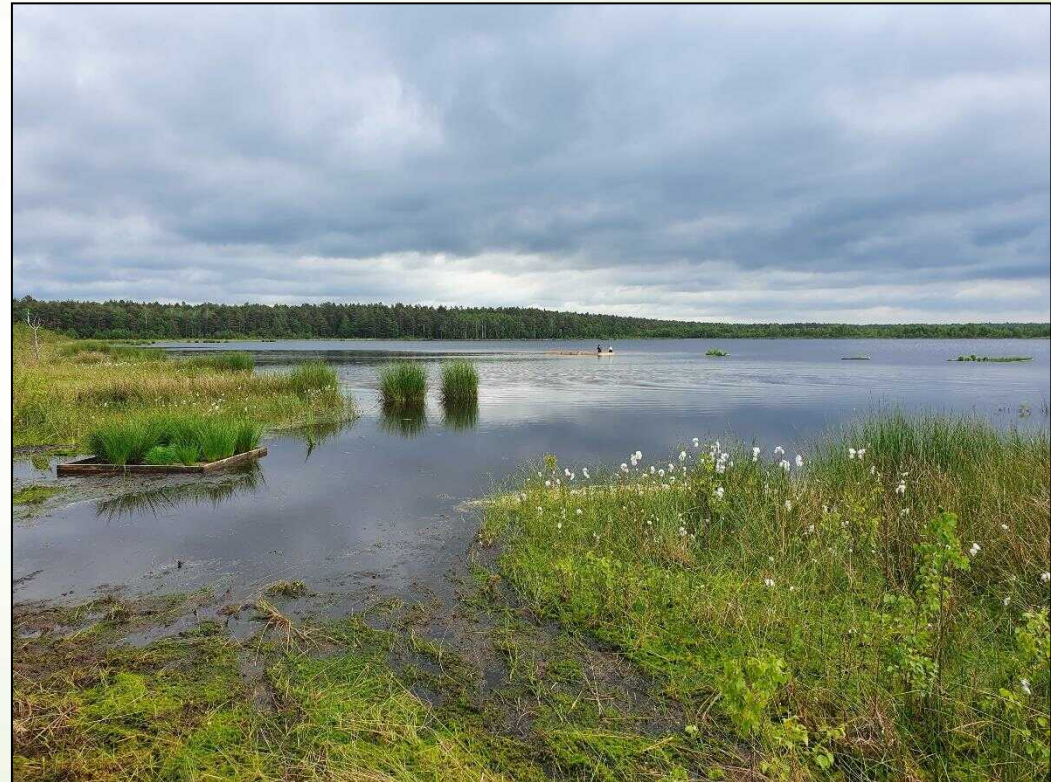
# Floating islands

5

## The idea of floating islands

- The idea of creating artificial floating islands is not new, though in most cases, they have been used for different purposes.
- Such islands have been built across the world.
- In most cases the purpose was to:

- improve the water quality
- management of stormwater
- diversification a habitat for birds



The first floating islands in the Słowiński National Park (W. Spychała)



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# Floating islands

6

## Problems to be solved

1. Selecting the appropriate island structure, which should be durable in the conditions of winter icing of the reservoir
2. Ensuring the sustainable buoyancy of the islands
3. Selecting an appropriate island anchorage in the reservoir and combining into larger islands sets
4. Choosing the right substrate for plants
5. Selection of appropriate plant species composition and planting method



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# Floating islands

7

## Construction

- ▶ For the construction of islands coniferous wood (pine, spruce) was used
- ▶ Two types of material were tested for the main structure:
  - logs of medium thickness without bark
  - thick, non-planed boards
- ▶ Thinner openwork construction was used at the bottom of the structure, which has been filled by spruce branches or coconut mat.



Coconut mat at the bottom of the wooden structure (W. Spychała)



Structure of the island  
(W. Spychała)



# Floating islands

8

## Island buoyancy

- Structures built only of wood without additional floats began to sink after one season.
- Floats from hermetically sealed plastic pipes were tested – but they failed due to the non-permanent fastening.
- A natural expanded cork float was therefore tested and proved to be durable.



The sunken island (K. Bociąg)



Floats made of plastic pipes (W. Spychała)



Floats made of expanded cork (W. Spychała)



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# Floating islands



Island without anchorage - drifted to the shore (K. Bociąg)

9

## Anchoring the islands

As part of the tests we verified:

1

Types of anchors

A. Heavy, concrete element serving as an anchor

B. A wooden oak pile hammered into the bottom

2

Fastening to the bottom

A. In all four corners of the island

B. In two opposite corners

C. Single, in the middle - from the bottom

A. A steel cable

B. A steel chain

A kind of flexible joint

3

4

Method of connection between the islands

5

Length of the anchoring element to the bottom

A. Using a chain or a cable

B. „A” + a wooden bumper



A steel chain to join islands (W. Sychała)



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## Choice of substrate

- ▶ Two types of peat substrate were tested:
  - local peat obtained in the mine - loose,
  - peat from the Kaliningrad Oblast - cut out in a form of brick, maintain the peat structure



Peat milled from the mine in Krakulice (W. Spychała)



Island structure filled with peat (M. Makowska)

## Plant species

- Several species of plants were tested to check their rate of island colonization, wintering efficiency and resistance to pressure from visiting birds.
- Local specimens were used for plantings - not introducing alien genotypes.



Tested plants



# Floating islands

12

## Plant species

- ▶ Apart from planted plants, the islands also feature species grown from seeds, especially *Juncus effusus*, *Juncus articulatus*, *J. bulbosus*, *Bidens sp* and *Carex sp*.
- ▶ Some of them, eg *Juncus spp*, are eaten in autumn by birds.



Planting sphagnum moss (M. Makowska)



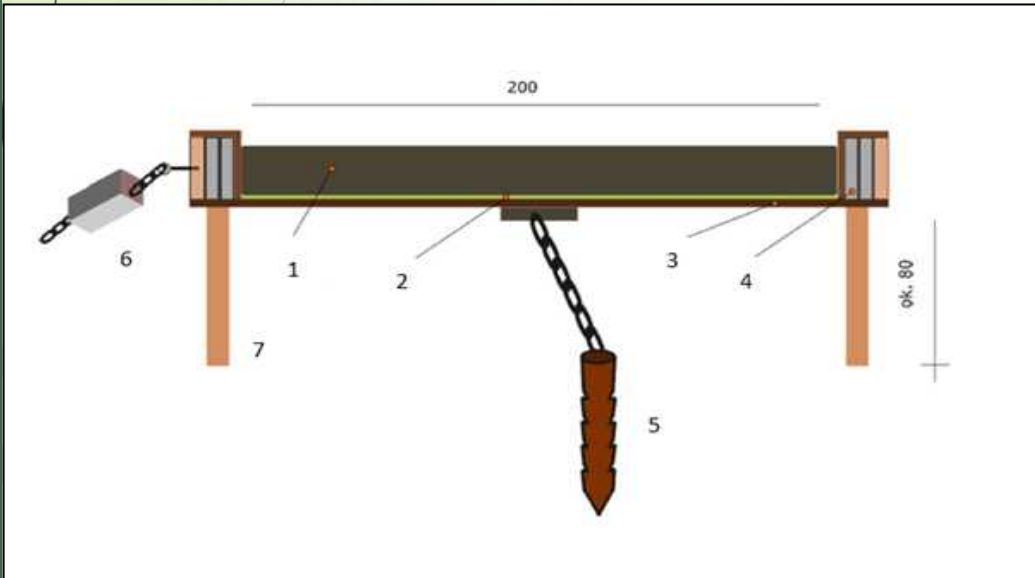
An island planted with calla palustris (M. Makowska)



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## Results of floating islands tests

- ▶ The islands were installed in early spring 2021 - almost 200 in total.



The final construction of the floating island (cross-section):  
 1 – peat (ca. 15 cm); 2 – coconut mat; 3 – bottom; 4 – filling the sides with expanded cork mat; 5 – a stake driven into the bottom to anchor the island; 6 – bumper; 7 – leg



Islands launching (W. Spychała)



# Floating islands

14

## The spatial arrangement of the islands

➔ The installed islands form two clusters:

1. Something like a spit 50 m from the shore, formed by a combination of squares and two lines.
2. Concentration of a few squares in the center of the reservoir.



Floating islands located on ice  
(W. Spychała)



Floating islands – views from the drone  
(A. Olszewska)



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**Thank you  
for your attention!**

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