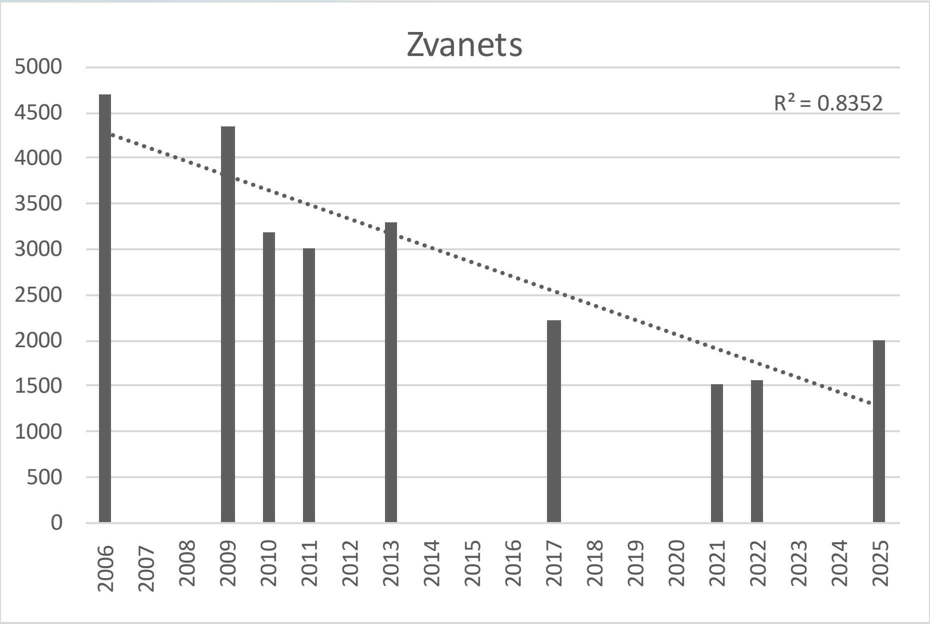
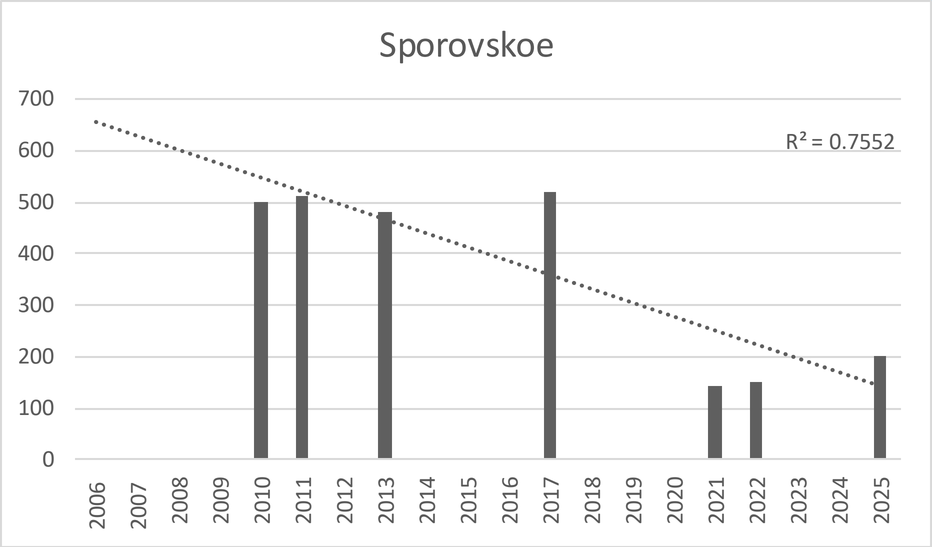
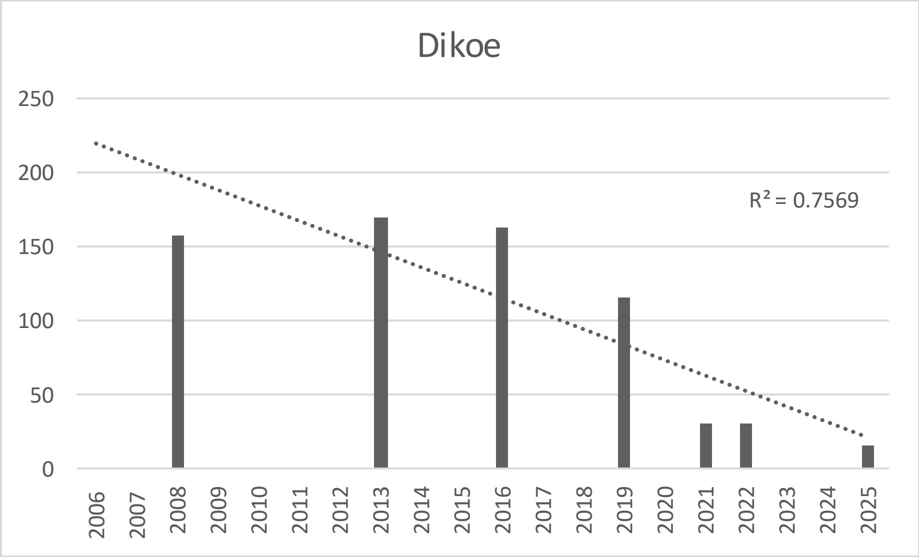
Achievements, challenges, and new developments in Aquatic Warbler conservation in Belarus

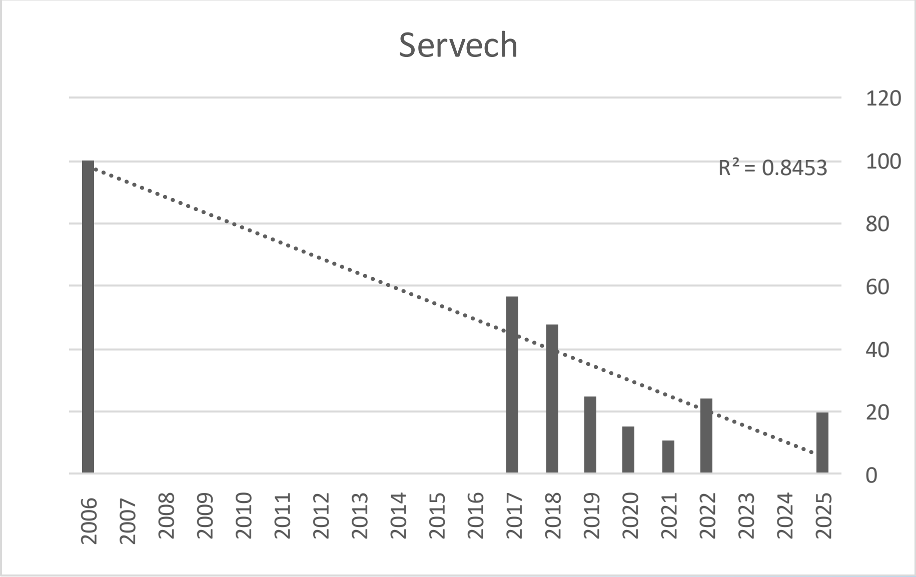
Dr. Alexander Kozulin, Olga Belyatskaya, Ivan Bogdanovich
Scienific-Practical Center of Natural Resources of the Belarusian National Science

Dynamics of the number of male aquatic warblers at the main nesting sites

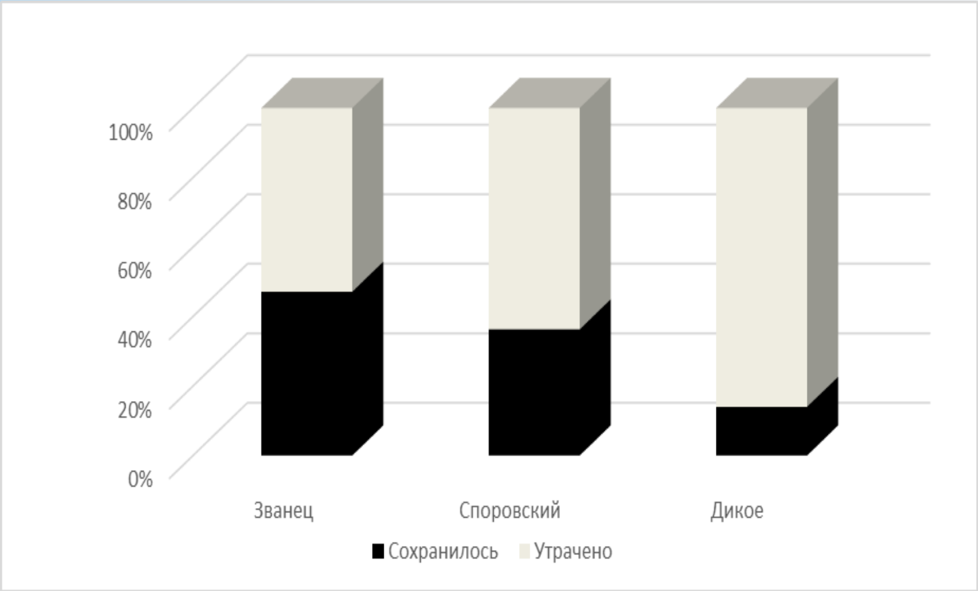








The main reason for the decline in the number of aquatic warblers is the overgrowth of open sedge marshes with shrubs and reeds



Thanks to management measures (mowing, controlled burning), open sedge areas have been preserved:

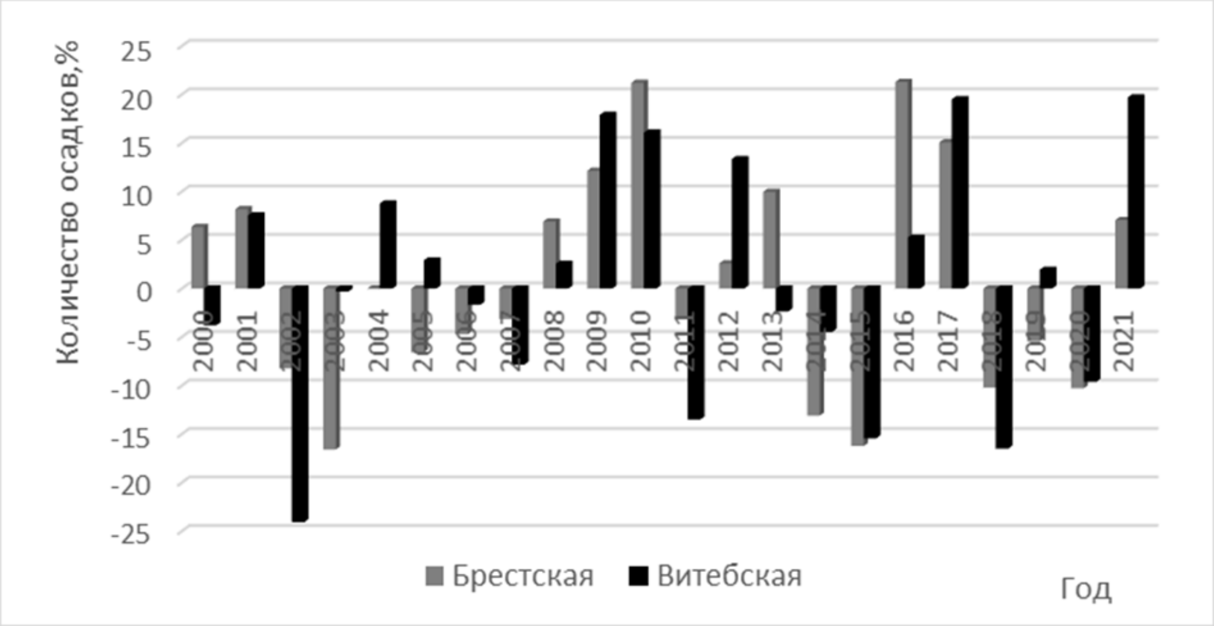
4000 ha - in Zvanets

900 ha - in Sporovskoye

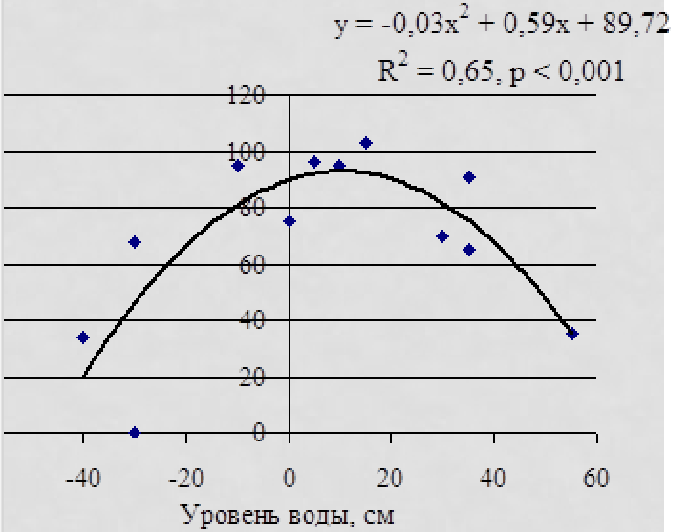
80 ha- in Dikoye (no measures were taken)

The main reasons for open mires becoming overgrown with reeds and shrubs are:

- Disruption of the wetland hydrological regime as a result of drainage and watercourse regulation;
- Discontinuation of the use of wetlands for mowing;
- Climate change with increasing dry years

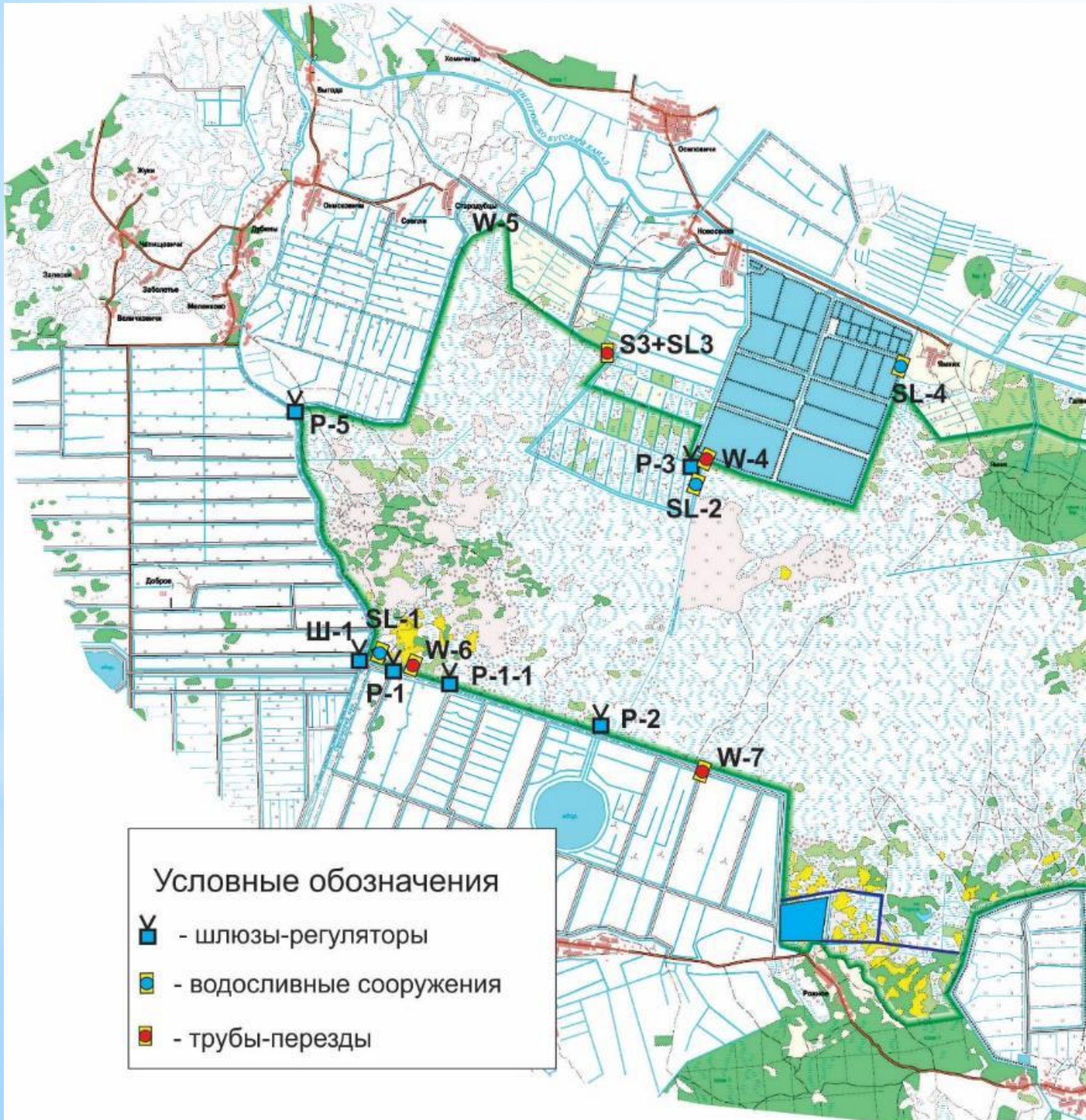


Amount of precipitation by years



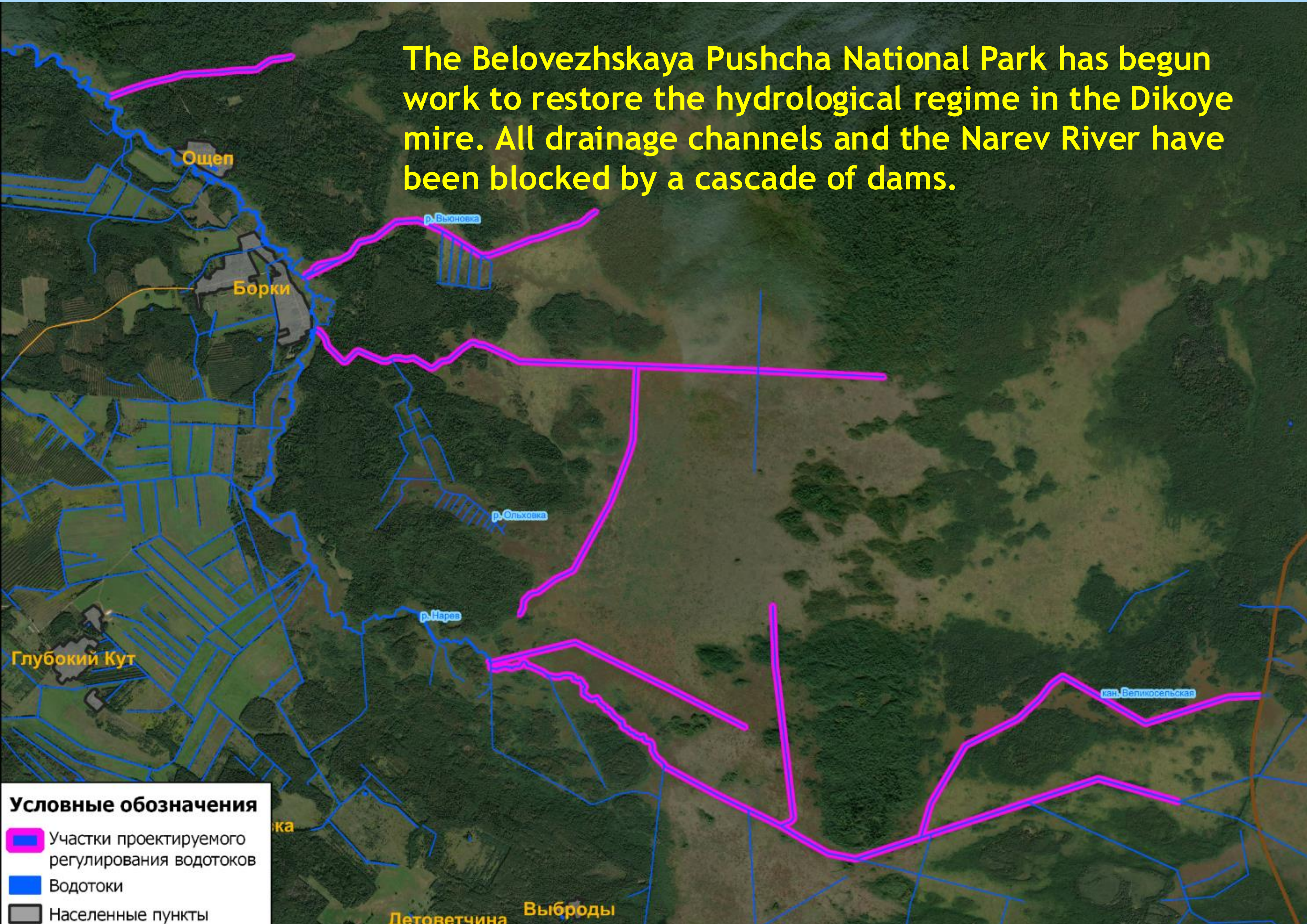
Aquatic warbler density versus water level

Measures to optimize the hydrological regime in the Zvanets nature reserve have made it possible to regulate water levels in the mire even during severe droughts

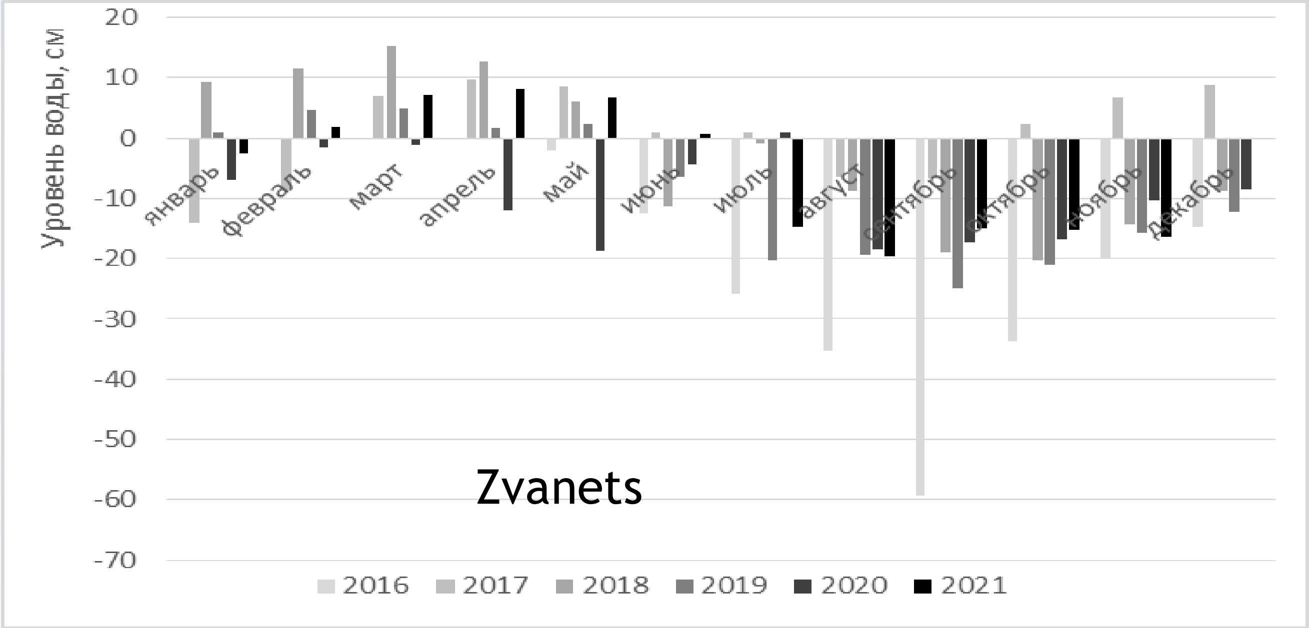



Servech
To optimize the hydrological regime of the mire on the Servech River, an overflow water regulation structure was built, which helped avoid droughts and floods.

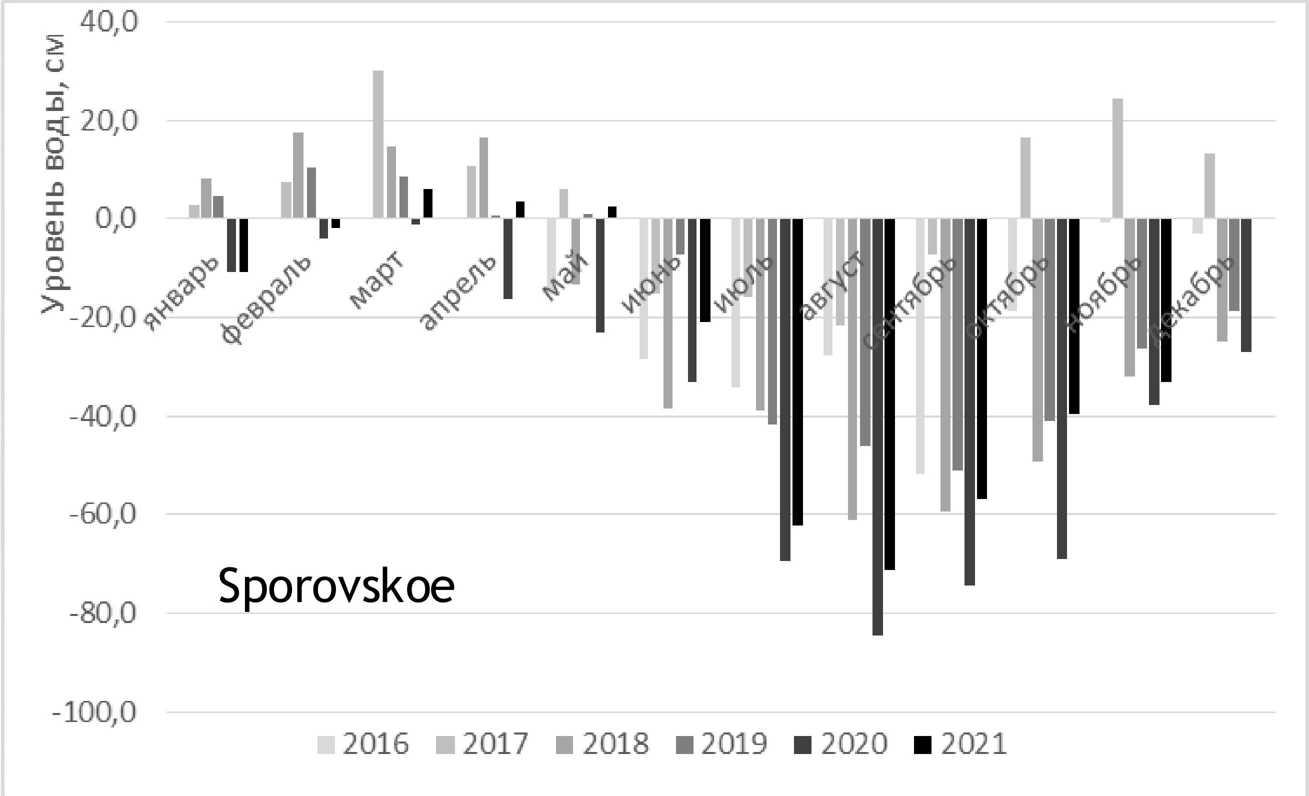
The Belovezhskaya Pushcha National Park has begun work to restore the hydrological regime in the Dikoye mire. All drainage channels and the Narev River have been blocked by a cascade of dams.



Average monthly water levels at Zvanets mire, where hydrological regime optimization measures have been implemented,



and at Sporovskoye mire, where measures to regulate water levels in the Yaselda River are still being planned.



The problem of the rapid overgrowth of all mires with reeds (Zvanets) and shrubs (Sporovskoye, Dikoye, Servech) remains unresolved

In the Sporovsky Nature Reserve, approximately 300-400 hectares of mires are mown annually using specialized equipment, harvesting approximately 970 tons of mires biomass.The cost of mowing is partially offset by the sale of hay and bedding.

Disadvantages of mowing for reed and shrub control:

- Work can be performed after the nesting season, when impact on reeds and shrubs is minimal;
- The need for regular re-mowing in the same areas;
- High cost;
- The need to remove mown biomass;
- Managing large areas requires extensive equipment.

Given the lack of sufficient equipment and funding for annual mowing over large areas, we are researching and developing new, more effective methods for restoring open fen mires.

A method of removing reeds and shrubs using contact application of glyphosates at a specific height

The method was tested on a fen mire area (about 30 hectares) overgrown with reeds (stem density is 75-90 per square meter) and willows

A 30-hectare mire area overgrown with reeds and shrubs (June 2024)

The same area after removing reeds and shrubs with glyphosate applied directly to plants (June 2025)
(stem density is 0-9 per square meter)

A single contact treatment of reeds and shrubs with Tornado 360 glyphosate results in:

- 78-95% of reeds and 70-80% of shrubs are killed;
- sedge layer vegetation is virtually undamaged;
- insect species composition and biomass increase;
- bird species composition and density increase.

2. Method of trampling winter sprouts

Features of the biology of reed growth and

development:

- In established thickets, sexual reproduction of reeds (by seeds) is minimized, and vegetative reproduction predominates.
- Beginning in June, winter buds form on the rhizomes, reaching 7-15 cm in length by November and emerging at the soil surface.
- In the spring, new reed stems grow from these buds.
- In the Zvanets mire, living reed rhizomes are located at a depth of 20-40 cm from the soil surface.
- Winter buds are very fragile and easily break under soil pressure exceeding 300 g/cm2.

A method of controlling reeds by trampling winter shoots was tested in the Zvanets mire

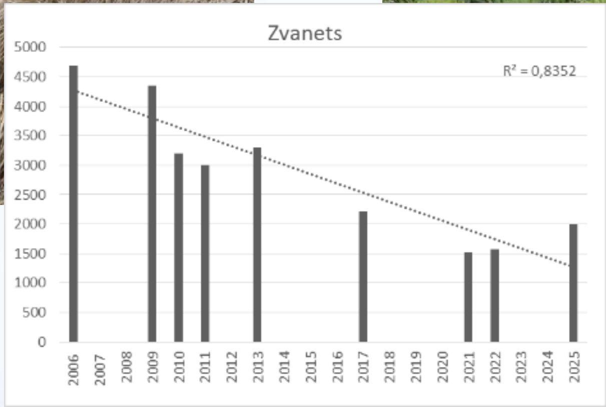
- The degree of impact of machines on winter shoots depends on the soil density and specific ground pressure.
- Machines with a ground pressure of less than 150 g/cm² have virtually no effect on growth cones.
- With a ground pressure of more than 300-500 g/cm², the degree of impact on reed shoots depends on soil moisture.
- Soil compression not only breaks growth cones but also disrupts the structure and destroys rhizomes.


A single pass of roller equipment kills more than 76-93% of reed
stems. The pressure on the soil is approximately 500-600 g/cm2.

Zvanets 2025

May 2, No fire

May 2, fire management



A strategy for species conservation in conditions of total hydrological disruption and climate change

1. Ensure optimal hydrological conditions in key mires by constructing water-regulation structures on the watercourses feeding the mires (Sporovsky - Yaselda River, Dikoye - Narev River).

2. Develop and implement new, more effective methods to clear reeds and shrubs and maintain open key habitats.

3. Create favorable habitat conditions for the aquatic warbler in restored habitats (mires in the Chernobyl zone, etc.) by applying new methods.

4. Restore species populations in re-wetted areas (at least five new areas) through translocation.