

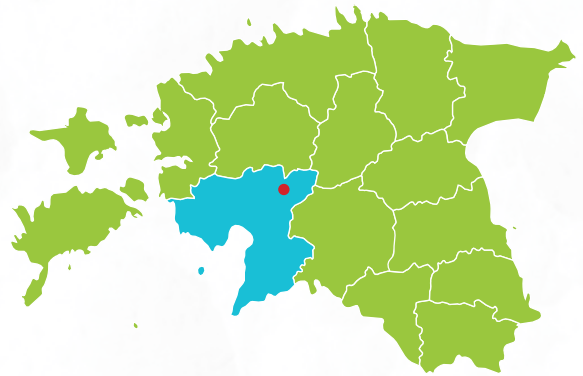


Pärnu catchment

Raul Paat, Edgar Karofeld

Organisation responsible for the site:

University of Tartu



Country: Estonia

Region: Pärnu catchment

Type of Sponge territory: Peatlands

Geographic coordinates of the site centroid point:

N 58.581 E 24.914

The study site is located within the Pärnu River catchment and focuses on wetland-rich tributary systems associated with Soomaa National Park and adjacent protected landscapes. The region contains one of Estonia's National Parks called Soomaa, which includes one of the most exceptional peatlands (mainly raised bog type) and floodplain systems in Estonia, and is characterised by strong interactions between peatlands, floodplains, groundwater, and river networks. Drainage for forestry and agriculture has altered most of the parts of the catchment and

modified natural hydrological processes. Recent restoration efforts aim to re-establish natural water retention of the Nature Reserves and improve these ecosystems' functioning. One of the most astonishing things to see in Soomaa is the "fifth season" which happens during the spring when snow melts and floods the floodplains of the rivers running through Soomaa National Park. The locals living there are used to it, and it's not affecting their everyday life, so this is a good example of how people can live in harmony with nature.



A drone picture of Kõrsa cut-over peatland in 2024. The trees were growing there before the restoration. Taken by: Marko Kohv (University of Tartu)



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Site characteristics

Climate

Humid temperate zone oceanic climate with distinct seasons but mild temperature fluctuations.

Soil

Different soils cover the area, but large parts are covered with peat or peaty soils.

Hydrology

The main river is the Pärnu River. Hydrology is controlled by peatlands, floodplains, groundwater interactions, but also drainage.

Vegetation

Wetland and forest ecosystems dominate the study area, with extensive raised bogs, fens, swamp forests, floodplain meadows, and alluvial forests forming a highly diverse landscape. The area supports exceptionally high biodiversity and provides important habitats for protected plant, bird, and wetland species.



RESTORATION EFFORTS

Conservation program

Long-Term conservation plans for Nature Reserves. Soomaa National Park conservation management plan, Kikepera Nature Reserve conservation management plan, etc. Natura 2000, Ramsar.

Restoration program

The restoration program is part of the Nature Reserves Conservation management plans.

Economic investment

Restorations by Estonian Forest Management Center (using EU Cohesion Fund), Horizon 2020 Waterlands project.



From 2023: Extracted Kõrsa peatland in the Pärnu catchment
Photo: Edgar Karofeld, University of Tartu



From 2025: Rewetted Kõrsa extracted peatland in the Pärnu catchment
Photo: Edgar Karofeld, University of Tartu

SPONGEBOOST'S ROLE

The specific objectives for the Pärnu catchment case study area are to:

1. Create a representative hydrological model over the area.
2. Use the model to figure out what would be the most appropriate land use plan to tackle the problems coming from climate change, which would help to plan further restoration works.



Monitoring program

The monitoring is primarily conducted in accordance with the Conservation Management Plans of the Nature Reserves. The programs mostly consist of monitoring of biodiversity. Several water-level monitoring programs in various peatlands are maintained by the University of Tartu, while additional monitoring is carried out by the Estonian State Forest Management Centre (RMK) to assess the effects of restoration activities. No specific monitoring has been conducted within the SpongeBoost project itself. Instead, we use data available through national monitoring programs (e.g., major river discharge data), satellite products, and nationwide spatial datasets (land use, drainage, and soil data). These datasets are used to construct hydrological models for selected Pärnu River subcatchments using the HBV Light modelling framework.

Interpretation and analysis

The ongoing water-level monitoring indicates that the closure of drainage ditches generally leads to increased water levels in peatlands and improvements in local hydrological conditions. However, the modelling work is still in progress, and the catchment-scale effects of peatland restoration remain uncertain. In particular, it is not yet fully understood to what extent restoration measures can alter the overall hydrological functioning of river catchments in the region. The modelling framework aims to provide insights into the potential influence of peatland restoration on landscape-scale water retention processes and its contribution to improving climate resilience under changing environmental conditions.



Vegetation monitoring on Kõrsa drained bog in Pärnu catchment.
Photo: Edgar Karofeld, University of Tartu

