

CONSERVATION AND MANAGEMENT OF PRIORITY WETLAND HABITATS

IN LATVIA LIFE – WETLANDS LIFE13 NAT/LV/000578



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Wetlands include important habitats for conservation of plant and animal species, particularly raised bogs, petrifying springs with tufa formation, mineral rich springs and transition mires. All of them are rare in Europe and most endangered have a priority conservation status. Wetlands have been affected negatively by various human activities, like drainage, peat extraction, forest planting and land reclamation.

From June 2013 until November 2017 the EC LIFE+ Project "Conservation and Management of Priority Wetland Habitats in Latvia LIFE –Wetlands LIFE13 NAT/LV/000578" is carried out in the 4 project sites – Slitere National Park, Gauja National Park, Ziemeļu Mires Nature Reserve and Raunas Staburags Nature Reserve.

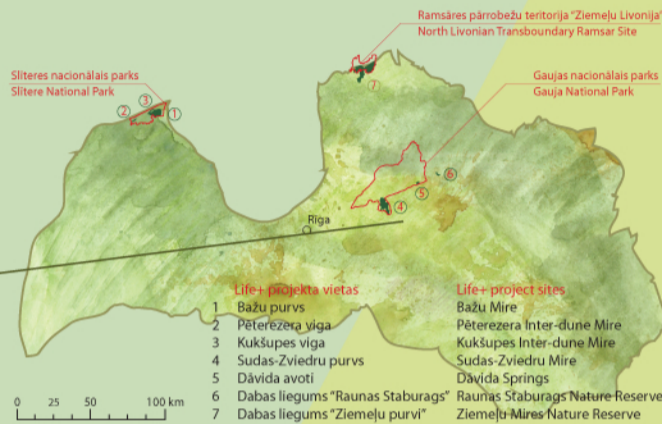
PROJECT OBJECTIVES:

- Secure the most favourable conservation status for priority wetland habitats - Petrifying springs with tufa formation (Cratoneurion) (7220*) and Active raised bogs (7110*) of Habitats Directive
- Management and improvement of conservation status of Petrifying springs with tufa formation (Cratoneurion) (7220*)
- Restoration of active raised bog habitats (7110*) and site hydrology in the drainage influenced area in the 3 project sites, long-term water logging and maintenance of the blocked ditches, increase the raised bog area by re-establishing of *Sphagnum* species
- Management of transition mires and quacking bogs (7140)

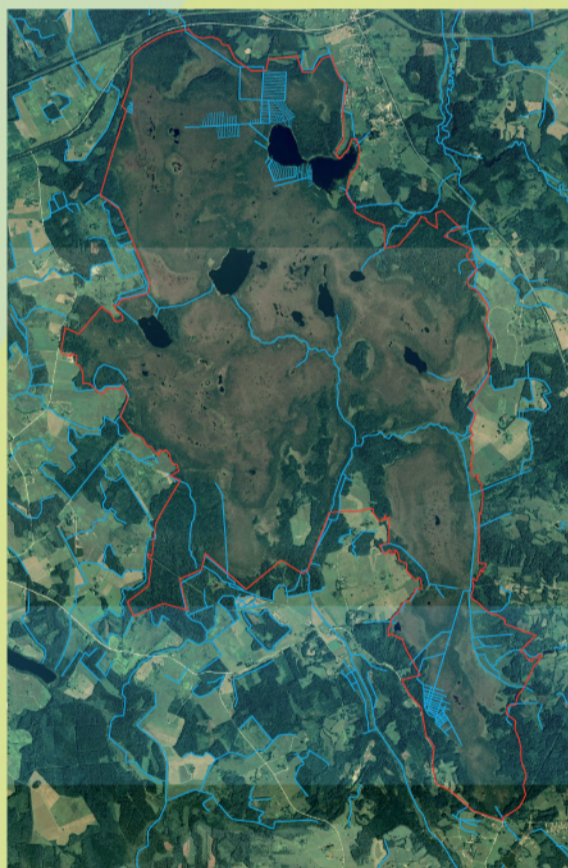


PROJECT SITES

Sudas - Zviedru Mire (2575 ha) is the largest raised bog in Gauja National Park. The site has developed as a result of ground paludification and includes raised bog with 33 lakes, bog pools and mineral islands, as well as sulphur springs. To stop the degradation of raised bog habitation, restoration of site hydrology and habitats is planned.



PROJECT ACTIVITIES



Raised bog restoration area in Sudas-Zviedru Mire

In the area of Dāvida springs, there are slopes with springs and streams, but in places spring fen vegetation has developed. The characteristic species in the fen vegetation is *Carex hostiana*, *C. panicea* and *Epipactis palustris*. In separate places in the fen springs reach the surface and include other species like *Cirsium oleraceum* and *Cratoneuron filicinum*.

HABITAT AND HYDROLOGICAL STUDIES IN THE PROJECT SITES

Habitat and hydrological studies are carried out in the project sites – Sudas-Zviedru Mire, Bažu Mire and Ziemeļu Mires. Data is summarised in the Management Plans for the implementation of raised bog restoration actions.

Paleobotanical studies reveal that Sudas – Zviedru Mire has developed as a result of ground paludification about 9200 – 9400 ago. Spore-pollen studies show that medium decomposed fen grass peat started to accumulate on the clayey sand. The lowest peat layer was covered by medium decomposed transitional mire type reed-wood-cotton grass peat. Low decomposed raised bog *Sphagnum* peat has been accumulating since the beginning of the Holocene Thermal Maximum until nowadays.

Nowadays Sudas-Zviedru Mire is a typical raised bog with a labyrinth of bog pools. There are lot of smaller and larger lakes in the mire. In the southern part sulphur springs occur and also several mineral islands. *Sphagnetum magellanici* and *Empetro nigri* – *Sphagnetum fuscum* characterise the bog hummocks, but *Rhynchosporium albae*, *Caricetum limosae* and *Scheuchzerio-Sphagnetum cuspidati* are found the hollows. *Sphagnum magellanicum* lawns with *Trichophorum cespitosum* occur also. Sudas – Zviedru Mire includes a rare mire community in Latvia – *Eriophoro-Trichophoretum cespitosi*.

The presence of mineral islands with different types of forest adds to the species richness of the mire. The mire supports a peculiar species composition, having together species of western and eastern distribution in Latvia, such as, *Trichophorum cespitosum* and *Chamaedaphne calyculata*.

Dāvida Springs are located on the left bank of Vaive River. It is a place where 34 springs run out. Small waterfalls are located on the steep slopes. From the spring water iron hydroxides are deposited. It is a complex including Montio-Cardaminetea communities on the steep slopes, Phragmito-Magnocaricetea and fragments of Scheuchzerio-Caricetea fuscae mire vegetation. Here are springs, streams, tall-sedge communities near the flushes as well as small-sedge vegetation. Characteristic species are *Cirsium oleraceum*, *Deschampsia caespitosa*, *Veronica beccabunga*, *Myosoton aquaticum*, *Equisetum palustre*, *Chrysosplenium alternifolium*, *Caltha palustris*, *Cratoneuron filicinum*, *Conocephalum conicum*, *Plagiomnium ellipticum* and *Bryum pseudotriquetrum*.

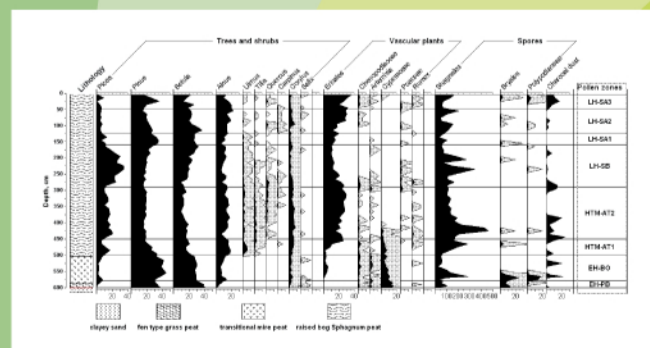
MANAGEMENT OF WETLAND HABITATS

Conservation of wetland habitats will be achieved by particular management measures, including (1) elimination of invasive species *Heracleum sosnowskii* (15 ha) within habitat of petrifying springs with tufa formation, (2) cutting of shrubs and trees in transition mires in the area of (7 ha), (3) re-establishing the active raised bog habitats and restoration of site hydrology (501 ha).



HABITAT AND HYDROLOGICAL MONITORING

The success of management measures of active raised bog habitat (7110*), petrifying springs with tufa formation, transition mires and quacking bogs are evaluated during monitoring of habitats and site hydrology. In order to obtain reference data the monitoring was started prior the practical management actions. The following indicators were chosen for monitoring – plant species composition, vegetation structure and the height of the groundwater level. Vegetation in the drained part is compared to that in the intact area. In the plots, groundwater level measurement is carried out. Plant species composition and the percentage cover are determined. The size of the plot determined is 1x1 m. Records about *Sphagnum* re-establishment in the ditches will be made. Monitoring results are revealed in Monitoring Protocols and summarised in Reports.



Simplified pollen percentage diagram from central part of Sudas-Zviedru Mire. LH means Late Holocene, HTM - Holocene Thermal Maximum, EH - Early Holocene, SA - PB names of local pollen zones characterising climate changes according to Blitt-Sernander Climatic zones.

