HABIT-CHANGE

adaptive management for protected areas

# HABIT-CHANGE

The European network of protected sites is challenged by anthropogenic activities and climate change. Nature conservation institutions have to deal not only with potential alterations of habitats brought about by climate change, but also with the fact that the methods of targeted conservation and protection may no longer be appropriate. Therefore, it is necessary to evaluate and enhance existing management strategies taking into account new challenges, especially in the areas embracing wetland habitats which are first to suffer from climate change. Moreover, adequate guidelines are urgently needed to provide for improved management of protected areas under changing climate conditions.

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EUROPEAN REGIONAL DEVELOPMENT FUND

*The Biebrza National Park in spring*

The INTERREG project "Adaptive management of climate-induced changes of habitat diversity in protected areas" HABIT-CHANGE has been devised as an international effort to take the challenge and deliver management guidelines for protected areas under changing climate conditions.

The task of developing strategies for sustainable use of natural resources was entrusted to 17 partner agencies in 8 Central European countries with the Leibnitz Institute of Ecological and Regional Development in Dresden as the Lead Partner. The project's overall objective is to evaluate, enhance and adapt existing management and conservation strategies in protected sites to proactively respond to likely influences of climate change as threats to habitat integrity and diversity.

The project aims at:

1. developing monitoring concept to detect changes caused either by human activity or climate change effects;
2. providing insight in the development of habitats during the last three decades, leading to management suggestions on a long term basis;
3. evaluating and enhancing existing management strategies due to new and changing climate conditions;
4. helping local stakeholders to implement abstract scientific knowledge into practical on-site management of protected areas.

*Alder carr in the Biebrza National Park in autumn*

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## BIEBRZA NATIONAL PARK

The Biebrza National Park (BNP) was selected for the purpose of the project as an object of studies owing to its well documented history of wetland management. Unique in Europe for its marshes and peatlands, as well as its highly diversified fauna, especially birds, the Park was designated as the wetland site of global significance and is under protection of the Ramsar Convention. It is, at the same time, a well studied site and the largest of all national parks in Poland. The BNP is a part of the International Bird Area PL044 "Biebrza River Valley" and PLB200006 Natura 2000 site. It covers the area of 59 223 ha and embraces 15 547 ha of forests, 18 182 ha of agricultural land and 25 494 ha of wetlands including vast marshy areas.

The Park occupies the bottom of a huge post-glacial depression oriented north-east to south-west. The 160 km stretch of meandering Biebrza river cuts here the several kilometre wide valley filled with peat and surrounded by moraine plateaus rising from 10 to 30 m above the river bed. At present, the river system within the Park is left entirely unmanaged and its hydrological regime is close to natural. The Biebrza river sinuous bed in the Park has been preserved in almost 100% natural state.


Peat soils in the Biebrza Valley

Source: Żurek S. The Biebrza Valley geomorphology. PAN. 1991

*Marsh marigolds*

The valley of the river Biebrza has two distinct contractions allowing to distinguish its three separate parts. These are the Biebrza Basins: the Northern Basin that encompasses the area of the valley east of the village of Sztabin; the Central Basin situated between Sztabin and the village of Osowiec as well as the Southern Basin positioned between Osowiec and the mouth of Biebrza where it flows into the Narew river.

Open habitats - mires and meadows - take most of the area while about 20% of the valley is taken by swampy woodlands of black alder and downy and silver birches.

The fairly untouched character of the Biebrza marshes, exceptionally well preserved aquatic environment and a variety of species, communities and ecosystems places the Biebrza National Park among the most important wetland sites in Central Europe. The outstanding natural value of the Park consists in the fact that its vegetation has retained original natural composition and zonal distribution of habitats and plant communities.

HABIT-CHANGE

The Biebrza marshes have maintained a surprising homogeneity of habitats over large surfaces. It is to be seen in the early spring when hectares of marshes are covered by blooming marsh marigold. Later in summer, mire habitats are dominated by tall sedges, sedge-moss vegetation and inundated low sedge–moss communities which have become already very rare elsewhere in Europe.

The major biodiversity assets of European importance protected in the park include critically endangered mire habitats such as active raised bogs, transition mires and quaking bogs as well as alluvial forests build by alder and European ash. Wetlands and mineral hills support vast array of flora with more then 1000 species of vascular plants. The list of rare plants is long and includes, among others, such specialities as: martagon lily, red helleborine as well as heath-spotted and lady's slipper orchids. Populations of rare plants are used as indicators of habitat changes induced by climate change.

The riverine habitats of Biebrza marshes provide shelter for numerous bird assemblages. As many as 278 bird species were recorded in the Park, and 191 breeding birds in that number.

Studies on local avifauna provide valuable information on the status of habitats and its changes due to modifications of the environment inside and outside the Park. Climate change may be one of the reasons for observed shifts in bird occurrence and their population numbers.

*White egret – newcomer in the Biebrza National Park*

## THREATS

At present, deficiencies in water circulation, which may be driven by climate change, have become one of the most serious threats to the Park wetlands. Climate change may affect habitat functioning and its components directly and indirectly, for example modification of trophic chain will affect vegetation and nutrient supply which significantly changes the potential of site to support populations of fauna and flora. Disturbances in water circulation have already resulted in drying out of habitats, soil degradation as well as transformation and loss of wet meadow ecosystems together with numerous species. The loss of organic matter is a very important indicator of water circulation deficiency.

*Martagon lily*

*Lady's slipper orchid*

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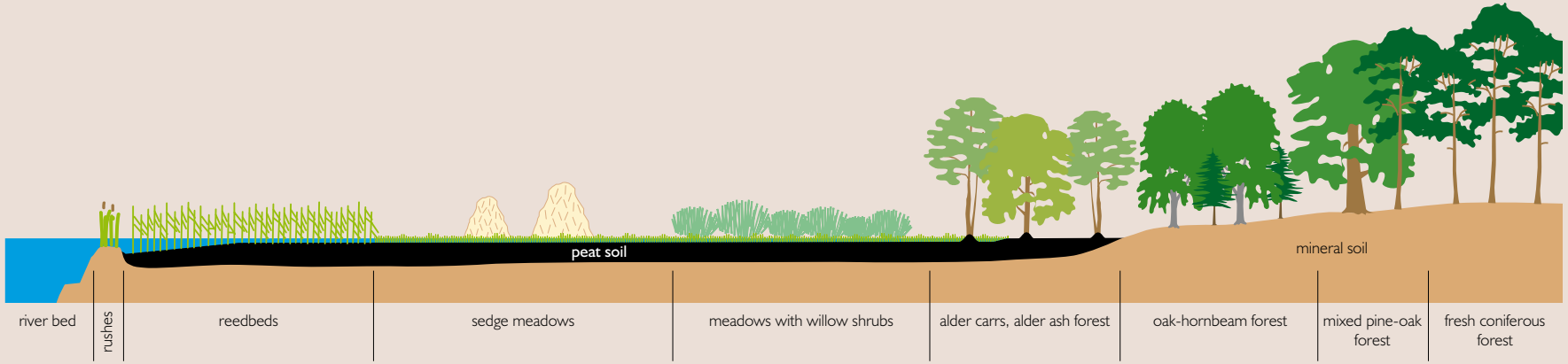
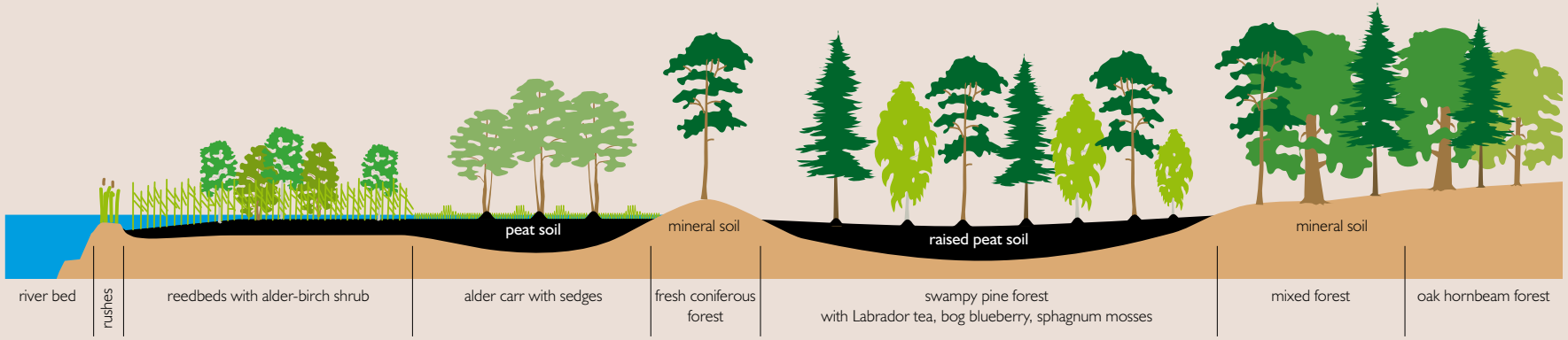
Transect **Barwik**




Transect **Grzędy**




## RESEARCH

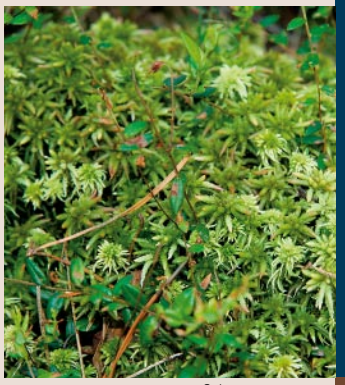
The project's overall objective is to reduce or alleviate natural and human induced impacts including climate change on vulnerable wetland sites.

In order to design adaptive measures there is a need to first measure and evaluate changes in habitats and relate these findings to climate change scenarios. The study carried out in the framework of Habit-Change project is focused on examination of habitat conditions and their alterations over the last decades. The investigations are conducted within the entire Park and, in detail, along the two transects cutting the vegetation zones of the Biebrza Valley in Barwik (Southern Basin) and Grzędy (Central Basin). On the designated plots the features of habitats are being studied such as soil quality, as well as biodiversity of communities, fauna and flora. The results of the study will constitute a base for development and validation of effective methods for assessing climate induced changes including simple and integrated indicators of habitat changes.

*Tufted sedge*

*Swampy pine forest*

*Birch woodland*



*Sphagnum moss*

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*Cranes*

*Geese on Biebrza flood waters*

*Ruffs on Biebrza meadows*

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