

occurs on bare peat, and *S. cuspidatum* in water. Other species rarely occur there: *S. rubellum*, *S. magellanicum* and *S. girgensohnii*. There are often stands of *Betula pubescens* and *Pinus sylvestris* along the drainage ditches with *Picea abies* in the understory. The occurrence of some ruderal species, such as *Calamagrostis epigejos* and *Lupinus polyphyllus*, is restricted to small parts of the locality; they do not seem to be spreading.

**Zoology:** The locality is being gradually recolonized by some typical tyrphobionts from surrounding bogs (butterflies *Colias palaeno*, *Vacciniina optilae*, *Boloria aquilonaris*, dragonfly *Aeshna subarctica*, spider *Pardosa sphagnicola*). Due to the dark, overheated surface, also some thermophilous insect species occur (*Cicindella campestris*). Reptiles are represented by the viper (*Vipera berus*) and viviparous lizard (*Zootoca vivipara*). Several wetland birds occur on the water bodies, i.e. *Charadrius dubius*. The open parts of the peatland became a habitat for a rare bog bird – black grouse (*Tetrao tetrix*). Another rare species, common crane (*Grus grus*), was also recorded here last year.

**Management:** The first part of the restoration was blockage of the drainage system, at first the lateral, later the main drainage ditches. Another measure of restoration of the water regime was creation of shallow depressions on the peatland surface. In total, 14 shallow depressions were formed with a size of approximately 10 × 10 m. Erosion of the surface was locally prevented by trunks placed on the peat and fixed by sticks. This was done mainly on sites where water flows during precipitation extremes. After these technical measures, wetland plants were reintroduced, at first higher plants, but later mainly sphagnum mosses. Mulch from surrounding peaty meadows was spread over the peatland to facilitate species introduction and for improving the microclimate.

A new nature trail was built and opened in May 2012. The trail is closed to the public during winter and spring to avoid disturbance of the black grouse.

## 2. Restoration of the Borová brook valley

**Location:** Brook valley around Borová, North West from Český Krumlov, South Bohemia  
(48°52'40.058"N, 14°12'53.459"E)



**History:** In the 1970s and mainly 1980s, the large scale regulation of water regime in the landscape was carried out over the whole

country (at that time Czechoslovakia). The purpose was to increase self-sufficiency in agricultural production, which was desired by the communistic government. As a part of this (in many cases uneconomical) effort, the water regime of Borová brook and its catchment area were also regulated.

In a large-scale drainage project (done in 1982-1984), the original meandering stream of Borová brook was straightened and reduced. The stream bed was embedded to the unnatural depth of 1.2-1.8m and strengthened by concrete blocks. At the same time, agricultural land in the catchment area (17.8 km<sup>2</sup> large) of the brook was drained. The result of this intervention was a serious disturbance of the water regime in the whole catchment area and led to the degradation and decline of natural and semi-natural communities.

Preparatory work on the restoration of the Borová brook started in 1994 by the administration of the Blanský les Protected Landscape Area. An important part of the preparatory work was

a detailed geological, hydrogeological, hydrobiological, zoological, botanical, and landscape research of the area. The restoration started in 1998.

**Botany:** The vegetation around the brook valley is nowadays formed mainly by mesic and wet pastures, and hay meadows, dominated by cultural grasses such as *Festuca rubra*, *Holcus lanatus*, *Arrhenatherum elatius*, and *Lolium perenne*, but also species like *Rhinanthus minor* and *Dianthus deltoides* are common there. These grasslands were established either on former crop fields (recently nearly missing in the area) or are the results of the degradation of former species rich wet meadows. The degradation of wet meadows was quickened by the building of the drainage system. Fragments of the former semi-natural wet meadows are, however, still preserved in the surroundings, including a nature reserve, where seasonally wet meadows dominated by *Molinia caerulea* are protected. Species typical of the wet meadows are represented, for example, by *Senecio rivularis* and *Iris sibirica*.

**Zoology:** Invertebrates inhabiting the water habitats of the brook valley positively responded to the restoration project. The examined groups (Tricladida, Hirudinea, Mollusca, Crustacea, Ephemeroptera, Odonata, Plecoptera, Heteroptera, Megaloptera, Trichoptera, and Coleoptera) generally increased in their numbers of species after the restoration. Species requiring slowly flowing water were mainly favored. Creation of small pools nearby the brook stream (see below) was therefore largely responsible for the changes between the pre-restoration and post-restoration species numbers of invertebrates. The pools increased site heterogeneity and supported many species such as *Radix auricularia* (Mollusca), *Notonecta glauca* (Heteroptera), and *Hyphydrus ovatus* (Coleoptera). Vertebrates recorded on the locality included, for example, the fish groundling (*Barbatula barbatula*) and tree frog (*Hyla arborea*).

**Restoration measures:** For the restoration of the Borová brook was used at that time in the Czech Republic an unusual way of restoration, because an entirely new streambed was created to restore the prior regulation conditions. Until that time, only modifications of artificial streambeds had been used in restoration projects. Due to the lack of experience, the restoration was divided into two phases – the first phase took place in 1998 (upstream of Borová) and the second in 2000 (downstream from Borová). The purpose of this division was to better implement the experience from the first part of the project into the second part. During the restoration, the length of the brook was increased by 6.3 km. A shallow meandering streambed, where sections of speedily running water alternate with sections of a slow stream, was created. The artificial stream channel was filled by soil or partly used for the creation of the pools around the stream. The streambed was strengthened by a layer of stones collected at the locality. Slopes and stream banks were covered by topsoil. Tree species like alder (*Alnus incana* and *A. glutinosa*), bird cherry (*Prunus racemosa*), and willows (*Salix aurita*, *S. cinerea*, *S. caprea*, and *S. fragilis*) were planted along the stream banks. The drainage system in the catchment area was kept as functional and drains the water into the newly created streambed. The project also included regeneration and partial reconstruction of old country roads and planting of accompanying alleys. The expense of the project was 6 890 000 CZK (approximately 275 600 EUR). The project was fully funded from the Program for Revitalization of River Systems by the Ministry of Environment. The good functionality of this system was demonstrated during the flood in 2001. The shallow streambed enabled the spilling of water into the surrounding meadows, where the flow was slowed by the vegetation. Hence, the flood wave was not so dangerous (was lower and slower) than expected with the original artificial stream regulations.

### 3. Holašovice, the village of UNESCO Heritage

One of the best preserved villages in the country represents a unique complex of rural baroque houses. Most of them were built during the 19th century. The village survived the communist era and in 1995 was declared as a historical monument under Czech legislation and in 1998 as a UNESCO Heritage site.

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