Smart strategies for the transition in coal intensive regions

Project No: 836819

Post-mining North Bohemian landscape

Spontaneous succession in North Bohemian post-mining landscape

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Description

The North Bohemian Lignite Basin, or Mostecká Basin, is the largest brown coal deposit in Bohemia. Currently, despite the decline in the coal-fired power industry, coal mining is still the basic Czech energy raw material. Mining activity in the North Bohemian Lignite Basin (SHP) has been going on since the second half of the 17th century. At the end of the 19th century, mining already began to have a significant impact on the landscape, and mainly after 1948, surface mining began to be preferred, resulting in an increasingly significant change in the relief. As mining progressed, the anthropogenic load also increased. Mining peaked around 1984 and has been declining ever since. Currently, there are many remnants of anthropogenic activity, such as landfills, mining pits, mine sinkholes filled with water.

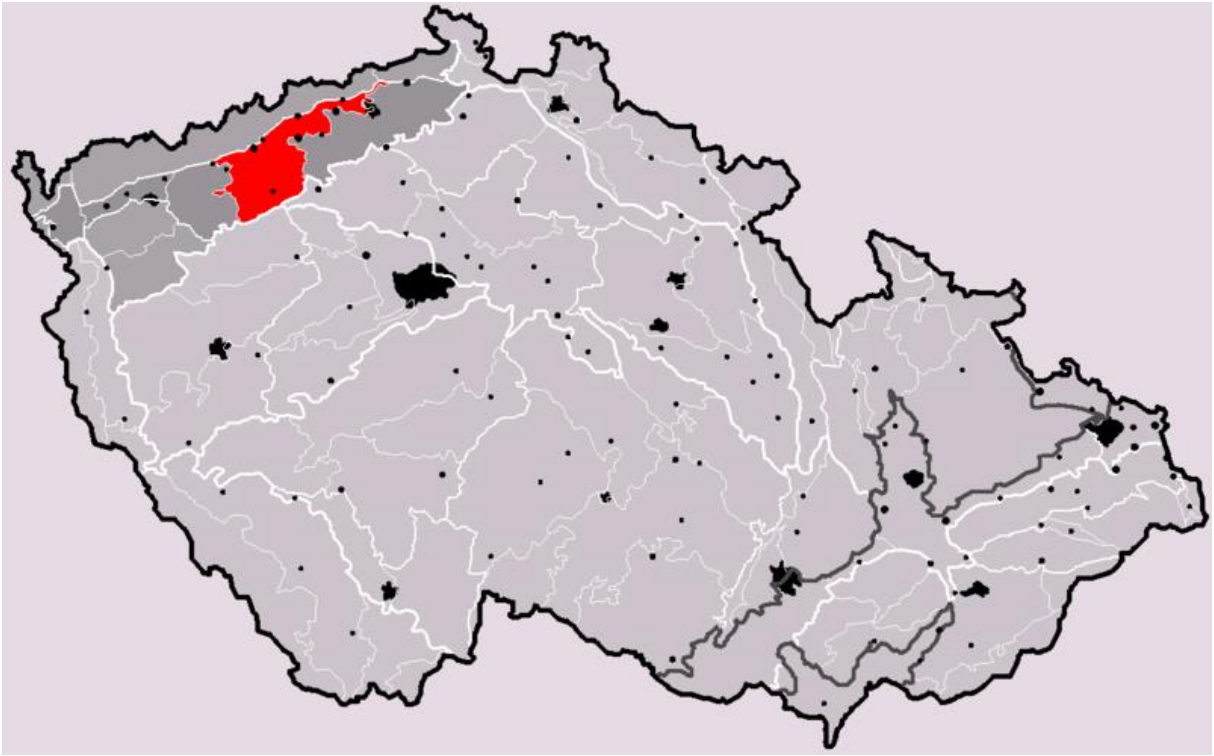

Figure 1 Location of the North Bohemian lignite basin within the Czech Republic. Source: cs.wikipedia.org

The North Bohemian lignite basin is located in northern Bohemia and extends into the districts of Louny, Teplice, Most and Chomutov. This is a relatively dry and warm region of the Czech Republic. While in 1945 there were more than 30 lignite mines in northern Bohemia. Currently, mining is still taking place in four surface quarries operated by Severočeském doly, a.s. and Seven Energy (Vršanská uhelná and Severní energetická).

Due to the burning of often low-quality coal in North Bohemian power plants and heating plants in the past, air pollution reached alarming values at the beginning of the 1980s. Following this, in 1991 the government's resolution Territorial-ecological limits on coal mining entered into force, on the basis of which the expansion of mining in

northern Bohemia was limited. The purpose of this resolution was not only to limit pollution, but also to protect inhabited areas from demolition due to mining, infrastructure, or nature.

As regards the areas affected by mining, from the legislative point of view of the Czech Republic, they must be recultivated (Act No. 334/1992 Coll.). In contrast to the past and the prioritization of production areas for agricultural and forestry reclamation, emphasis is currently placed on the involvement of more areas with a purely ecological - nature conservation function. Spontaneous and controlled succession becomes one of the forms of landscape renewal after mining.

Achievements

In the Czech Republic, reclamation methods are developed based on experience, but also on the basis of requirements and attitudes in society. The production functions of the post-mining landscape are now moving to multifunctional use, the effort is to create a varied landscape fulfilling many ecosystem services (e.g., recreation function of the newly formed lakes Most and Milada). Currently, there is a current transition to more natural reclamations and the inclusion of areas of ecological restoration (spontaneous succession). For the time being, smaller areas left by spontaneous succession have been preserved, for example on the Radovesická spoil heap, where two localities have been registered as important landscape elements and as such their protection (including against reclamation) is ensured on the basis of the Nature and Landscape Protection Act. Successive areas on the Radovesická spoil heaps were originally purpose-built for research on natural succession processes. However, from the point of view of fulfilling the provisions of the Act on protection of the agricultural land fund, the mining organization is obliged to proceed according to the approved Reclamation Plan, and the land is to be returned to as agricultural land or reclaimed by afforestation after the end of the purpose of the taking or by establishing a water body. Thanks to the amendment of the law (Act No. 41/2015 Coll.), was possible in the case of protection interests of nature to change the original authoritative decision on consent to the confiscation of agricultural land from the agricultural land fund, if the conditions decisive for the content of the consent have changed. habitat heterogeneity led here to the development of extremely diverse communities of plants and animals. Biological uniqueness of both succession areas is clearly documented by the results of biological surveys, which documented 57 specially protected or rare species, although the surveys are not complete. The protection concerns an area of 54.34 ha.

Figure 2 and 3 Two protected areas on the Radovesice spoil heap left for spontaneous succession, photo: Markéta Hendrychová

Similarly, as an example of the use of natural processes in the restoration of the post-mining landscape, we can cite the Hornojiřetínská spoil heap, which was assumed to be overloaded by the ČSA large-scale mine, therefore planting of tree was done only around the perimeter of the spoil heap for the purpose of camouflage towards roads and villages. A natural forest and forest-steppe communities containing a large number of larger and smaller wetlands emerged on the landfill. The neighboring Kopistá vysypka is one of the oldest, when in some places planting was still carried out in uneven terrain, which also caused the creation of many pools, which were soon settled by many amphibians, including the European-important large newt (*Triturus cristatus*).

The result of classic reclamation is often uniform stands of grasses and intensively managed forests. Water bodies tend to have reinforced steep banks. An example of good practice in hydric reclamation, however, is the revitalization of the area of the internal spoil heap of the ČSA mine, where, after stabilization of the terrain, the previously diverted flow of the Vesnický potok, which feeds the two water reservoirs that were created here, was diverted back into the space of mine. In order to ensure gravity flow, a dam was built at the lower reservoir and the original water level was raised. On that occasion, the shoreline was changed to be more diverse in the place of the expected shore, many bays, special sandy, gravelly, and pebbly beaches for birds, several islands and other nesting habitats for invertebrates, reptiles and birds were created.

Figure 4 Spontaneously overgrowen Hornojiřetínská spoil heap, photo: Markéta Hendrychová

Figure 5 and 6 Breakdown of the originally straight bank of the Marcela reservoir on the internal spoil heap of the ČSA mine photo: Markéta Hendrychová

Challenges

The closure of mines affects not only the local population and development, but also the future of post-mining areas and nature conservation. The social aspects and the transformation of the region are supported by a number of funds. A large proportion of spoil heaps, a lot of small and also large former mines are used by people for recreation, sport activities, forest and agriculture production. One of the fundamental and currently extensively addressed new possibilities for the use of former Czech lignite surface mines and their spoil heaps is nature protection. This priority is currently being considered in those mines where the state owns most of the territory, and the management of future new small-scale protected areas would thus be effective. In the case of preference for nature protection, there should be no technical and biological reclamation of the majority of the areas designated for restoration in the future. From the point of view of nature protection, it would be appropriate to leave large areas to natural renewal processes - spontaneous succession. The concept of ecological restoration brings more efficient management of finances during restoration, but also during subsequent maintenance, and makes it possible to ensure the existence of many rare organisms that have their center of occurrence on successional areas, in terms of distribution and abundance within the Czech population. Some mines are also the exclusive habitat of hundreds rare early successional species. In the Czech Republic, the ecological restoration of such large areas (over 100-1000 ha) has not yet been applied, so it is necessary to solve a lot of procedural and legislative issues to be successively implemented into practice.

Enabling conditions

They appear to be the most important conditions:

- support for the appropriate use of post-mining sites in terms of possibilities for use and provision of ecosystem services
- socio-economic development of affected regions
- delineation of ecologically significant areas and their protection
- correct setting of reclamation processes

References and further links

cs.wikipedia.org

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