

# Recultivation after the Peat Mining at Branský les I.

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## Abstract

*The contribution describes a recultivation process after peat harvesting in the Bransky Les I. location. The recultivation of peat bogs is one way to increase the volume of water in nature. This practical experience shows how complicated it is to achieve this goal. Harvesting of peat was finished in 2018. The process of recultivation was started in 2019 and finished at the end of 2020. Nowadays, in 2024, the locality was visited to see what has happened in the last six years after the end of harvesting.*

**Keywords:** *recultivation of peat bogs, peat harvesting*

## 1 Introduction

Peatlands are a significant part of the landscape, and as such, they are protected by Act 114/1992 Coll. on Nature and Land Protection. These days, returning water to the landscape is a hotly debated topic. One of the ways to do this, especially in mountainous areas, is through the revitalization of disturbed peatlands. In most cases, this disturbance is the result of forestry work in the area and damage caused by peat extraction in the past. The primary goal of peatland restoration is a return to a naturally functioning, self-contained ecosystem (Townsend *et al.* 2003.) Peatlands are able to influence biochemical processes, and in addition to being a source of nutrients, they are a significant carbon store, and especially effective at retaining water in the landscape. They are also a habitat for numerous species of endangered plants and animals, as well as an irreplaceable source of fresh water (Jung *et. al.*, 2012). Peatlands are unique islands of northern nature in Central Europe. Even in the worst drought, streams originating in living bogs do not dry up.

Peats belong to the so-called wetlands, which are divided into two main groups, wetlands with humolite formation, which include peatlands covering less than 3% of the earth's surface (Moore *et al.*, 2017), and wetlands without humolite formation, in which we can also count hydric-affected habitats after mining, where revitalization did not take place.

The Třeboň wetlands cover an area of 2200 hectares. These are predominantly peat forests, peaty areas around ponds, spring bogs and peat meadows. The uniqueness of the area contributed to the creation of a PLA (Protected Landscape Area) in low altitudes, in which wetlands and man-made ponds are in harmony with the landscape of preexisting peatlands. At the end of the 20<sup>th</sup> century, it was listed as a wetland of international importance (Ramsar), where ponds and related wetland biotopes including four areas of peat bogs,

Červené blato, Rašeliniště Mirochov, Široké Blato and Žofinka, were added in 1990, and in 1993 (Janda, 1993; Hátle, 2000; Soukupová *et al.*, 2002).

After 1754, the Imperial-Royal Patent of Forests and Timber limited the use of wood and timber as fuel on Czech lands, replacing it with coal and peat. In the Třeboň region, peat was mined more intensively only in the 19<sup>th</sup> century, a number of localities were partially drained and mining was carried out by hand, the so-called borking (Kučerová, 2021). Peat mining on a larger scale began in Branná near Třeboň before the Second World War and during the war period, when alternative energy sources were being sought.

In the 1950s, the Branná Plant belonging to the state-owned company Rašelina n.p. was opened, which foreshadowed intensive mining in the vicinity of Branná, from where in the 1970s mining expanded to the location Branský Forest I. In this location, mining took place on a relatively large mining site with an area of 72 ha, approx. 2 km southeast of the village of Branná near Třeboně. Prior to mining, it was a wooded area, adjacent to drainage channels that were built under the Schwarzenbergs, and the dominant tree species was Scots pine (*Pinus silvestris* L.).

In 2018, peat extraction on an area of approximately 65 ha was completed at the Branský Forest I location (five ha was reclaimed and handed over in 2005). In the following year, the reclamation plan was updated, it was approved in early 2020, then reclamation and revitalization work was underway. At the beginning of 2021, the areas were handed over to the owners, namely LČR, s.p. and the City of Třeboň. Currently, it has been approximately six years since the end of mining and three years since the handover of the areas by Rašelina a.s.

The aim of the contribution is to evaluate the reclamation and the state of the areas at the present time.

## 2 Material and methods

The site is located in forest area 15b – Třeboňská panev, on the territory of the Třeboňsko Protected Area at an altitude of around 440m above sea level. It is located in a large area of forest vegetation at stage three and four for water habitats, with climatic area B slightly warm, average temperature 7.3°C, average precipitation 640mm. Geological subsoil: rH – Quaternary peats, alluvial deposits, T – Tertiary, mainly Neogene clayey and sandy sediments. In June 2019, a typological survey was carried out, from which it follows that there are modal organo-soils at the site, defined by the gley horizon of the subsoil, mosaic-like following on gleys of a predominantly Hippic character (peaty). Typologically, these are habitats defined by SLT mainly 3R and 3T.

The area of the mining site is classified as a III. PLA zone. According to the current territorial plan of Třeboň, elements of the Territorial System of Ecological Stability (ÚSES) are located on the territory of the mining site. In the territorial plan of Třeboň, this local biocenter has a functional use of „natural areas“, which are supposed to ensure conditions for nature and landscape protection. The mining site is located between two sewers – U1–9 and Podřezanská, and is further bounded by a road and an intersection between forest areas 43 and 44. Before mining, the flat area now forms a depression decreasing from south to north as a result of mining. There is a main drainage channel running through the center of the area, which flows into the sewer in the northern part of the site. The groundwater level fluctuates according to the season and rainfall.

Regarding the state of the site after reclamation in 2020, in the area of interest, as part of technical reclamation, a stabilized layer of organic earth with different thicknesses of approx. 60 cm was left. A functional network of drainage channels was left, creating drainage for the given area.

According to the reclamation plan created at the request of the owners, about 55 ha were handed over in a state ready for reforestation, and about 10 ha were left ready for the creation of a “peat ecosystem” (the area north of the road crossing the mine area). In accordance with the recultivation plan, the wishes of the owners and concerned state authorities (apart from the AOPK CR), there was no significant interference with the locality’s water regime, which means there was no damming of the main drainage channel and no rise in the groundwater level. In the area designated for the creation of a „peat ecosystem,” side channels were disabled by including a five-meter section in the connection area to the main drainage channel. Eight pools with a size of approx. 400 m<sup>2</sup> were built on the territory, in the places of the original drainage channels. The areas were beginning to become massively overgrown with sedge (*Scirpus sylvaticus* L.), common dogwood (*Agrostis capillaris* L.), bush reed (*Calamagrostis epigejos* (L.) Roth), red nettle (*Juncus effusus* L.), red wormwood (*Persicaria maculosa* Gray), with the occasional occurrence of hedgehog (*Echinochloa crus-galli* (L.) P.Beauv.). Small birch saplings appeared here and there. The owners assumed that the territory would be left to spontaneous succession with a possible subsequent network or planting, while fulfilling legislative obligations.



**Fig. 1:** Part of the site set aside for forest reclamation on the right of the road. A section set aside to create a „peat ecosystem“ to the left of the road. March 2021.

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### 3 Results and discussion

The state of the locality in 2024. The territory has been left to spontaneous succession. The areas are overgrown with birch. Scots pine (*Pinus sylvestris* L.) is rarely found. In higher places, especially on the edges of the area, different types of willows are starting to appear, specifically the eared willow (*Salix aurita* L.) and the ash willow (*Salix cinerea* L.). The herbaceous layer is dominated by common dogwood (*Agrostis capillaris* L.), bush reed (*Calamagrostis epigejos* L.) and decomposing nettle (*Juncus effusus* L.). St. John's wort, St. John's wort (*Hypericum perforatum* L.) and spotted St. John's wort (*Hypericum maculatum* Crantz) are found in places. Here and there the reed-like scab (*Phalaris arundinacea* L.) appears. The red worm (*Persicaria maculosa* Gray) has almost disappeared. Pool starfish (*Callitriche stagnalis* Scop.) grows in the canals. The green grasshopper (*Pelophylax esculentus* L.) is abundant in the canals. A green layer covered most of the previously mined areas. The difference between the „peat ecosystem“ and the rest of the land can be seen in the greater concentration of decomposing nets around the side channels, which are different from the side channels in the water-filled “forest” part. However, the ground water level is also lowered here so that the peat on the surface is too dry in the summer and moisture on the surface is dependent on water coming from precipitation. Although optimal conditions have not been created for the restoration of the wetland, and probably not even the forest, here too nature shows that it can eventually take care of itself.



**Fig. 2:** A section set aside to create a „peat ecosystem“ September 2024.

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## 4 Conclusion

The paper describes the state of the area, six years after the end of peat extraction at the Branský Forest I location. Although the reasons for the need to restore wetlands and increase water capacity in the landscape are well known, implementation in practice often encounters a number of pitfalls, leading to various compromises, as in the case of reclamation in Branná. Despite the failure to create a wetland, the area meets all the prerequisites for the creation of a forest, which is essentially the same condition that the site had before mining.

## 5 Summary

Six years after harvesting, the peat bog is covered by birch, and the ground is mainly covered by grass. Even though measures for optimal conditions for wetland restoration were not carried out, nature shows that it is capable of doing it on its own. Conditions in the locality are conducive for the growing of trees.

## References

- HÁTLE, M. 2000. Information Sheet on Ramsar Wetlands (RIS). In: *Ramsar Sites Information Service*. <https://rsis Ramsar.org/ris/494>.
- JANDA J. 1993. Information sheet on Ramsar wetlands Czech republic/trebonská rašelinište - 3cz006. In: *Ramsar Sites Information Service*. <https://rsis Ramsar.org/ris/494>.
- JUNG, S., TIWARIA, K., POULIKAKOSA, D., 2012. *Frost halos from supercooled water droplets*. Edited by William R. Schowalter. Princeton University, Princeton, NJ, and approved, p. 1–6
- KUČEROVÁ, A. 2021. Po těžbě rašeliny spouští?. *Botanika*. 9, 9–11. <https://www.ibot.cas.cz/botanika/wp-content/uploads/sites/19/2021/04/Botanika-2021-01-Kucerova.pdf>
- MOORE, P. A., LUKENBACH, M. C., WADDINGTON, J. M., KETTRIDGE, N., PETRONE, R. M., DEVITO, K. J. 2017. Peatland water repellency: Importance of soil water content, moss species, and burn severity. *Journal of Hydrology*. 554: 656–665.
- SOUKUPOVÁ, L., KVĚT, J., JENÍK, J. 2002. *Fresh water wetlands and their sustainable future: a case study of the Tréboň Basin Biosphere Reserve, Czech Republic*. UNESCO Parthenon Pub Group, Paris, 495 pp.
- TOWNSEND, Colin R., BEGON, Michael A., HARPER, John L. 2003. *Essentials of ecology*. Department of Zoology, University of Otago, Dunedin, New Zealand, No.Ed. 2 pp.xix + 530 pp. ref.many.

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