

Jihočeská univerzita v Českých Budějovicích

Přírodovědecká fakulta



RIGORÓZNÍ PRÁCE

# Natural peat bog regeneration

Mgr. Jiří Mach

České Budějovice, 2008

## RNDr. THESIS

Mach J., Lanta V. & Bastl M. (2008): The effect of mining and vegetation scarification on the survival and establishment of *Pinus rotundata* Link. and *P. sylvestris* L. in contrasting peat bog habitats. – Polish Journal of Ecology (accepted). (IF 0,433)

Lanta V., Mach J. & Holcová V. (2006): The effect of dam construction on the restoration succession of spruce mires in the Giant Mountains (Czech Republic). – Annales Botanici Fennici 43 (4): 260-268. (IF 0,408)

## ANNOTATION

The limitation of the natural regeneration of *Pinus rotundata* stands, a unique Central European peat bog ecosystem, was studied. Seedling survival and establishment of sown and planted seedlings of *Pinus rotundata* and *P. sylvestris* was monitored in relation to the occurrence of different moisture and light conditions in mined, scarified and intact treatments. Significant differences in seedling survival and establishment for both pine species were found.

Spruce mires are rare and endangered plant communities of central and western Europe. To start the regeneration of spruce mires, palisade dams sealed with peat were used to block draining ditches in the Giant Mountains. Four years after construction of dams, there were significant differences in vegetation above and below the dams.

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České Budějovice, 8.8. 2008

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Mgr. Jiří Mach

## STANOVISKO SPOLUAUTORŮ

Z pozice spoluautorů potvrzujeme, že Jiří Mach má zásadní podíl na vzniku publikací, na kterých je založena tato rigorózní práce.

České Budějovice, 8.8. 2008

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Mgr. Vojtěch Lanta, PhD.

České Budějovice, 8.8. 2008

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Mgr. Marek Bastl

České Budějovice, 8.8. 2008

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Mgr. Veronika Holcová

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Dziekanów Leśny 5 May 2008

Mr.

Dr. Jiří Mach

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Dear Dr Mach,

I congratulate you the paper positively commented by the reviewer. In fact, the paper is easy to follow, is based on the proper selection and actual references, the hypotheses and conclusions are clear and the text is written in good English. I have only few remarks as following :

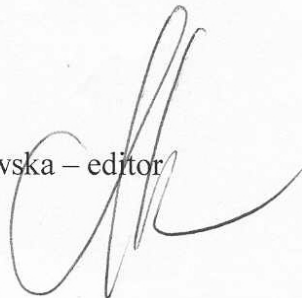
- The *scarification* treatment should be described in detail on page 6 – the moss layer was partly removed/disturbed? Up to what depth? On what area of plot? Etc. This explanation should be repeated in *Abstract*, *Discussion* and in the figure/table captions when it is necessary!
- The subchapter 2.2 ( note the new enumeration!) should be removed on page 3. See text.
- Authors of Latin names should be provided at first time when the species is cited! See page 1 (title!), 3 and others!
- A minor corrections in the figures! Decimal dots!

We are going to publish your paper in issue 1/2009 ( March 2009) – the earlier issues are in layout or full of waiting papers. We have to have the corrected and clearly-printed version not later than in July 2008!

We have to remind the payment conditions – see our [www](http://www) page for details!

Best regards

Anna Hillbricht-Ilkowska – editor



The effect of mining and vegetation scarification on the survival and establishment of  
*Pinus rotundata* Link. and *P. sylvestris* L. in contrasting peat bog habitats

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#### Abstract

The survival and establishment of tree seedlings represents a critical step in the process of forest stand regeneration. In this study, we evaluated the effect of peat mining and vegetation scarification (removal of understorey vegetation and peat moss layer up to depth of 15 cm) on seedling survival and establishment of two congeneric tree species, *P. rotundata* and *P. sylvestris*, under different moisture and light conditions. Two long-term experiments with planted and sown seedlings were conducted on three peat bogs in the Bohemian Forest and the Třeboň Basin (Czech Republic). Significant differences in seedling survival and establishment for both pine species were found. The positive effect of lower groundwater level and shading was the best predictor for survival and establishment of planted seedlings of both pine species in a mined peat bog, especially for *P. rotundata*. Nevertheless, low groundwater level and vegetation scarification had negative effect on *P. rotundata* seedling survival and establishment in pristine peat bogs. *P. rotundata* seems to be more adaptable to newly appearing conditions in both environments of abandoned mined peat bog and of vegetation scarification. Our results suggest that it is more reasonable to use seedlings of *P. rotundata* than seedlings of *P. sylvestris* to restore mined peat bogs.

#### Keywords

mining, scarification, survival, *Pinus rotundata*, *Pinus sylvestris*, seedling, peat bog,  
groundwater, shading

# The effect of dam construction on the restoration succession of spruce mires in the Giant Mountains (Czech Republic)

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## Abstract

Spruce mires are rare and endangered plant communities of Central and Western Europe. In the Czech Republic, they were intensively destroyed and drained during 1970's. To start the regeneration of spruce mires, palisade dams sealed with peat were used to block draining ditches in the Giant Mountains. Four years after dams construction, there were significant differences in vegetation above and below the dams. Vegetation above dams successfully developed towards plant communities characteristic to spruce mire forests. Below dams, the colonization by forest floor species continued. These differences indicate that palisade dams effectively retain water and help the regeneration of spruce mire forests. Our results support construction of palisade dams in such habitats.

## Keywords

Community structure, Dam, Drainage ditch, RDA, Restoration, Spruce mire