

## **The restoration of peatland after peat extraction and afforestation: examples of the mire system of Gourgon and the raised bog of Verines in the Monts du Forez (Massif Central, France).**

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Spruce trees (*Picea abies*) planting combined with drainage is the main recession cause for the mires in granitic Eastern Massif Central. Peat exploitation only took place in few bogs, which have therefore been hardly damaged.

Only in the last decade, some important rehabilitation works have begun thanks to the implication of numerous local, regional or national actors.

There are two flagship operations, one being in progress and the other at the planning stage.

The first one, which began in 2004, takes place on the mire system of Gourgon, in highlands pastures (1300-1400 m). It involves the University of Saint-Etienne, the Rhône-Alps Natural Areas Conservancy, the Loire Department Council, the Loire-Brittany Water Agency and a private forest owners group. The work aims to eliminate many hectares of spruce trees planted during the 70s on heaths and bogs, to rehabilitate the hydrology and carry out a long-term scientific monitoring (climatology, hydrology, flora, fauna, soils).

The second operation is currently in an advanced state of preparation. It concerns the raised bog of Vérines, which covers about 4 ha at an altitude of 960 m in the northern part of Monts du Forez. The bog originally included a raised bog of 2.6 ha and a combination of peripheral fens. Peat was exploited during two short periods (1942-1949 and 1975-1980). Even if it took place only on 22.5% of the total area, it was noticed that 80% of the raised bog have been removed or strongly disturbed by the water level drop.

Preserved area since the agreement signed in 1998 between the Noirétable municipality and the Loire Department Council, Vérines mires were the subject of a first rehabilitation campaign in 2002. Many objectives have been reached:

- to preserve the peat accumulation process in the biggest extraction pit (called "Michelin pit") colonized by *Carex rostrata*, *Eriophorum vaginatum* and *Sphagnum* sp. ;
- to restart this process in some parts of the former fens ;
- to avoid as much as possible the water evacuation by filling up the drainage ditches from the former quarry ;
- to eliminate the birches (*Betula alba alba*) and pines (*Pinus sylvestris*) who colonized the 3 unexploited parts of the raised bog.

In 2007 a new step of the site rehabilitation began, and works are planned for 2008. It aims to rebuild a part of the raised bog by using peat coming from another local bog doomed to destruction because of a dam to be heightened.

Among the numerous problems, the main seems to be the peat destructuration during the extraction, transportation and landing processes. It is imperative to keep the physical properties of the peat as it determines the water dynamic and the ground water level variations. Another issue will be to ensure a quick recolonization by the peat-producing vegetation.

This experiment will allow us to test the relevance of theoretical models about the running of raised bogs. A scientific monitoring of the local hydrology will be set up before and after restoration.