

N° 8, received on 16-04-07

Mati Ilomets mati.ilomets@tlu.ee
Laimdota Truus laimdota.truus@tlu.ee
Kairi Sepp kairi.sepp@tlu.ee
Raimo Pajula raimo.pajula@tlu.ee

Institute of Ecology, University of Tallinn Uus-Sadama 5, EE-10120 Tallinn, Estonia

Natural sphagnum re-vegetation of an abandoned milled-peat field: an extreme success.

Raimo Pajula, Mati Ilomets and Laimdota Truus

Institute of Ecology, Tallinn University, Uus-Sadama 5, 10120 Tallinn, Estonia

Many cutting fields in Estonia were abandoned about 15-20 years ago during the collapse of soviet system. These areas with harsh microclimate and hydrology are unfavourable for sphagnum and other typical mire plant species re-colonisation in most cases. They are poorly vegetated, water table lies in deep and peat decomposition continues. Restoration of abandoned cut-over peatlands is an important issue not only in Estonia. Successful self-restoration is as an exception comprises unique information about re-vegetation process and promoting environmental conditions.

The Kõrsa bog, one of the best self-restored vacuum-excavated peatland, locates in SW Estonia, close to Pärnu city. We aimed to (i) clarify biotic and abiotic factors that lead to the successful and rapid restoration of mire vegetation and peat accumulation; (ii) distinguish the factors promoting *Sphagnum* establishment and expansion on an abandoned bog peat-field. The cutting area was abandoned in 1980. Pool with water table regulator for holding fire security water was excavated close to the area. This resulted (not intended but occasionally) in stable water level with 10-20 cm deep inundation on the abandoned peat field.

Warnstorfia fluitans and *Eriophorum vaginatum* were first colonisers on the area. *Warnstorfia* formed dense mats in shallow water and covered ca 50 % of the area. *Eriophorum* and *Warnstorfia* turned conditions suitable for *Sphagnum* colonisation and hence can be regarded as “nursery species” for sphagnum. During last ca 10 years *Warnstorfia* was outcompeted by *Sphagnum* that covers up to 60% of the area at present. Among 12 *Sphagnum* species *S. angustifolium*, *S. majus*, *S. fallax* and *S. fimbriatum* prevail. During the short succession time, trophic conditions and vegetation turned more oligotrophic. Rapid oligotrophication can be supported by *Eriophorum*, the species able to rapid utilization of nutrients and lowering the trophic level. Remarkable amount of new organic mass accumulated during ca 20 years. Thickness of new grown layer is up to 55 cm and 40 – 85 t ha⁻¹ dry mass accumulated. *Sphagnum* increment is high (5-8 cm year⁻¹). Up to today, most of new organic matter is accumulated in *Eriophorum* tussocks. Annual accumulation of total organic mass was 2-3.5 t ha⁻¹, and that for *Sphagnum* was less than 2 t ha⁻¹.

We concluded that the stable near-surface water table and slow throughflow are probably the most important factors promoting re-vegetation and sphagnum establishment and expansion on an abandoned bog peat-field. Without nursery plants, sphagnum self-establishment on bare peat is retarded.