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Plant cover recolonization in Raessaare milled bog, SW Estonia.

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Plant cover was studied on previous peat cutting area (6.1 ha) in the marginal part of the Raessaare bog in SW Estonia (57° 59' N, 24° 44' E). In early 1970's the area was rehabilitated for cranberry plantation, but abandoned in the late 1980's. The aim of the study was to follow the bog plant cover recolonization pattern in response to hydrologic conditions.

Plant species were identified for ground vegetation and percent cover for each species was estimated on 1 x 1 m plots. Tree layer cover (%) and tree growth (tree ring measurements) were provided near the ground vegetation plots. Data on water table depth, water electrical conductivity and pH were collected at the date of vegetation sampling. Twelve piezometric tubes were inserted on the area and water depth measured biweekly from November 5, 2004 to October 30, 2005. Programmes STATISTICA, CANOCO and TWINSpan were used for data analyses.

TWINSpan classification of 100 sample plots separated 12 clusters with species of low to high demands (according to the Ellenberg ecological values) for moisture (water table at the date of sampling, annual mean, annual absolute difference), water pH, and electrical conductivity and nutrients. The vegetation with lower pH and lower demands for nutrients were spread in the border area with the remained natural bog. Tree invasion (dominantly Scots pine and white birch) started from more drained part, close to main ditches and the tree growth (both, tree number and diameter) increased as dams on ditches disintegrated in the late 1980's.

On sites with deeper soil water level dense dwarf shrub (mainly *Calluna vulgaris*) cover developed and *Sphagnum* species occurred. *S. angustifolium* was a pioneer sphagnum species distributed on sites with higher water level (mean annual). Invasion of *S. fuscum* was related with distribution of *Calluna vulgaris*. *S. magellanicum* preferred more open sites with more stable and high water level. Dwarf shrubs and sphagnum mosses (*S. angustifolium* and *S. magellanicum*) would grow together with *Pleurozium schreberi* on forested sites but the coverage of mosses was low because of abundant tree litter on soil surface. Sites with high surface water table were covered with fen vegetation – different *Carex* species, *Agrostis canina*, etc. Some patches with pure *Oxycoccus palustris* (with coverage about 40%), mostly on *S. angustifolium* carpet, could still be found. In sites where *Calluna vulgaris* expanded, cranberry withdrew.

It was concluded that to improve the conditions for sphagnum expansion the tree layer should be cut. The aim of it is to reduce evapotranspiration from tree crowns, and to decrease the amount of tree litter. In water level regulation, the rise it to the level of 0-15 cm below the bog surface was recommended.