



LATVIJAS  
UNIVERSITĀTE  
ANNO 1919



Project LIFE 08NAT/LV/000449  
**„Restoration of Raised Bog Habitats in the Especially Protected Nature Areas of Latvia”**

**Vegetation monitoring in Rožu, Aizkraukles and Aklais Mires  
(2010-2013)**  
Report summary 2012

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2012

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The monitoring is aimed at assessment of the effects of mire habitat restoration at three project sites: Rožu Mire, Aizkraukles Mire and Aklaus Mire.

In 2010, in order to assess the changes in degraded raised bog habitats caused by restoration actions 71 monitoring plots were established: 21 in Rožu Mire, 20 in Aizkraukles Mire, and 30 in Aklaus Mire. In 2011, 10 new plots (in Rožu and Aizkraukles Mire – five plots in each) were established. Totally, data from 81 plots were recorded and summarized into the monitoring report. The monitoring plots are located in transect lines perpendicularly to drainage ditches and in sites relatively less affected by drainage (in relatively untouched raised bog habitats as reference sites), five plots at each transect line. In all cases, the transect lines are parallel to transects of hydrological monitoring.

All plots were described according to a standard protocol, including parameters such as microrelief, vegetation structure, cover of vascular plant, moss and lichen species (estimated in percent) and vitality of trees, shrubs and dwarf shrubs (estimated in four classes). Each plot was attributed by an ID code. Geographical coordinates of each plot were recorded and a digital data file created. Additionally, digital photographs of all plots were taken every year and named according to the ID codes.

Both in 2011 and 2012, all the plots were repeatedly visited and all parameters estimated according to the standard protocol. Photographs of each plot were repeatedly taken and stored using the same ID codes.

At the moment of monitoring in 2012, the bog restoration actions were completed in Rožu Mire (peat dams built) and partly in Aizkraukle Mire. In Rožu Mire the water table in ditches was elevated for about 10-30 cm. In Aklaus Mire and Aizkraukle Mire no visible changes in the vicinity of the monitoring plots were observed.

In most of cases, in 2012 no significant changes in the plots were observed. This indicated that the raised bog vegetation is relatively stable, therefore little changes in species richness and species covers were recorded which might be annual fluctuations not related to hydrological or other natural changes in the habitat. Neither the cover of species, nor the vegetation structure and vitality of dwarf shrubs, shrubs and trees were significantly changed in comparison to 2010 and 2011.

An excellent indicator for changes in hydrological regime in raised bogs is vitality of heather *Calluna vulgaris* which usually, according to the previous experience in restoration in the bogs in Latvia, rapidly reacts to rewetting of peat in drained areas.

Due to elevation of water table and rewetting or partly overflooding the bog surface, the heather is dying out. The changes in heather vitality, recorded in four classes, were estimated in all three monitored sites (Fig. 1, 2, 3).

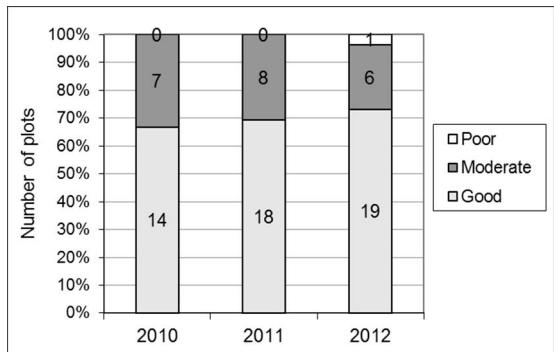


Fig. 1 Changes in vitality of heather in Rožu Mire (2010-2012). 2010: n=21, 2011-2012: n=26.

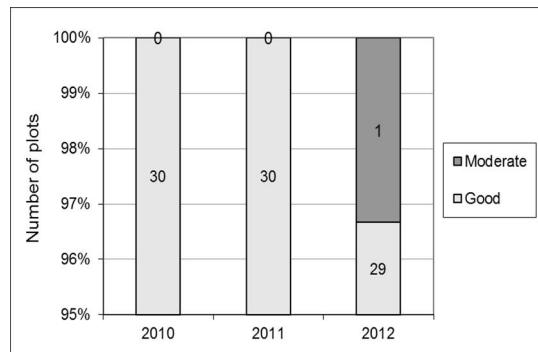


Fig. 2 Changes in vitality of heather in Aklais Mire (2010-2012). n=30.

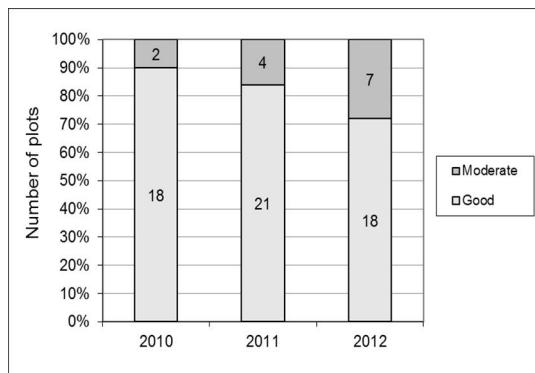


Fig. 3 Changes in vitality of heather in Aizkraukle Mire (2010-2012).  
2010: n=20, 2011-2012: n=25.

Significant changes (from good to poor vitality) obviously indicating elevation of water table were observed only in a single plot Rožu Mire – dying out of heather (an example Fig. 4, 5).

Excellent indicators for drainage impacts in raised bogs are cover of sphagnum mosses and cover of mosses typical for dry coniferous forests (e.g. *Pleurozium schreberi*, *Dicranum polysetum*, *D. scoparium*, *Hylocomium splendens*) which usually form a considerable proportion of the total moss cover in drained sites. Over the monitoring period 2010-2012 the cover of sphagnum and other mosses has slightly changed, but no significant changes to be obviously related to the hydrological changes were observed.



**Fig. 4** RO01 monitoring plots in Rožu Mire in 2010. Plot centre is located 2 m from the ditch, heather is the dominant species indicating impact of drainage.



**Fig. 5** RO01 monitoring plots in Rožu Mire in 2012. Due to peat dams built on the ditch in 2012, the water table in the ditch is elevated partly overflowing the monitoring plot. Dying out of heather was observed indicating changes in hydrological regime (rewetting of the drained peat).

In Aizkraukle and Aklais Mire no significant changes related to restoration action could be expected in autumn 2012.

Overall, according to the monitoring results since 2010, the changes in bog vegetation in all three sites (Rožu, Aklais, Aizkraukle Mire) are insignificant and mostly are related to natural fluctuations. However, the three year period before restoration actions assures the reference status for comparison to the expected changes in vegetation in the forthcoming years. The changes can be expected in 2013 when the building of dams on ditches could have an effect on the water table consequently causing changes also in vegetation and positively affecting ecosystem recovery.