



INFLUENCE OF CHANGES IN NATURAL CONDITIONS AND HUMAN ACTIVITIES ON MIRE DEVELOPMENT



Project "Sustainable and responsible management and re-use of degraded peatlands in Latvia – LIFE Restore"

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Introduction

Mires during the development have grown both horizontally and vertically. Their distribution and characteristics change over time have been affected by variety of conditions. Due to changes in plant feeding conditions changes appear also in the peat-forming plants composition, influencing peat types and properties.

Until the 20th century these changes in the territory of Latvia took place mainly under the natural conditions in the result of climate change. Since the man decided to use peatland, dry up for the farmland expansion or peat extraction, he affects mires and peat properties.

The aim of study was to find out the properties of peat and their changes in the various affected areas of as well as to evaluate which properties have changed the most as a result of drainage.

Study sites

There are approximately 195 degraded areas in Latvia, in need of tidying-up and recultivation. In the frame of LIFE Restore project 28 sites were selected for detailed study, and five sites among those were selected for further investigation of peat properties - Lauga, Kaigu, Drabiņu, Lielsalas and Ķemeri peatlands. These sites were chosen from various nature areas, peatlands of different genesis, age and degradation level. For visual understanding of processes, outcrops of contour ditches have been studied.

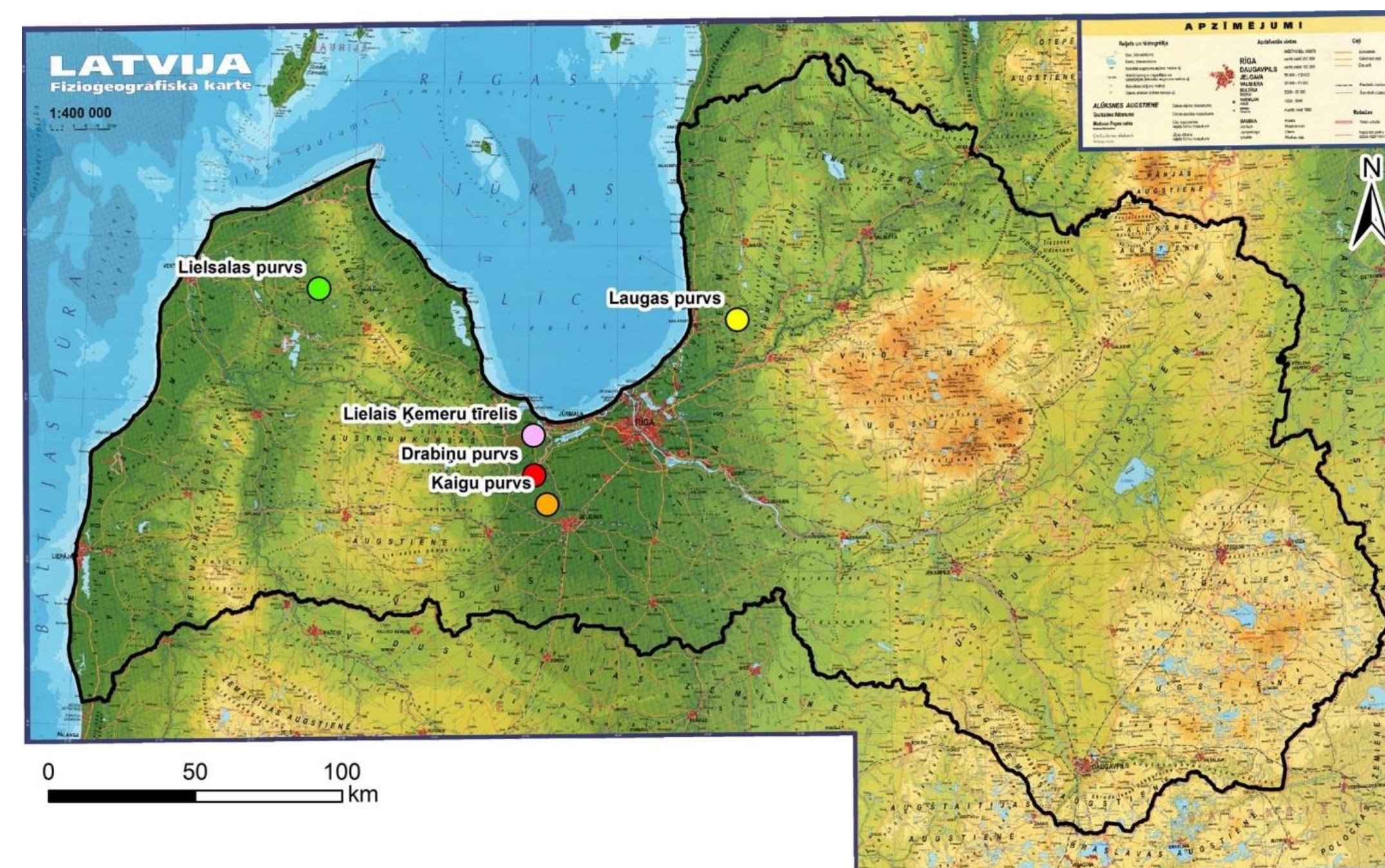


Fig.1. Location of study sites



Fig.2. Coring at the site Lauga-1



Fig.3. Landscape of Lauga-2 site



Fig.4. Coring in Kaigas peat field



Fig.5. Lielsalas cut-over peat fields

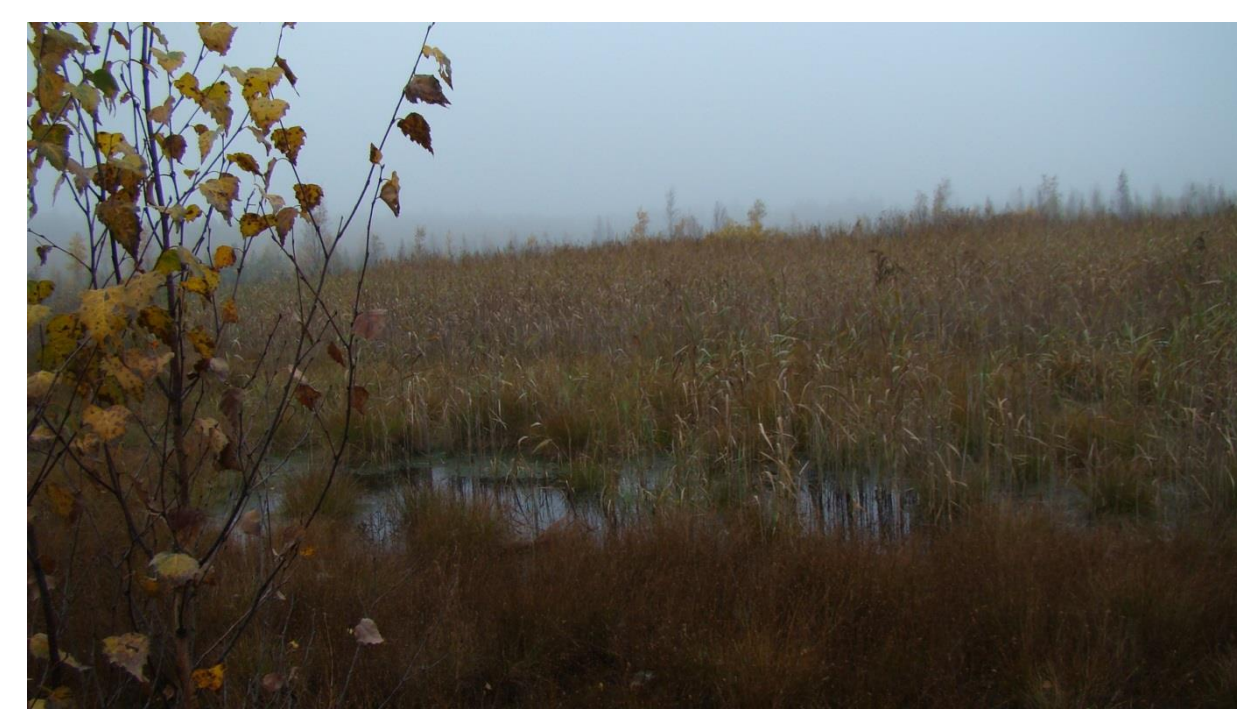


Fig.6. Renaturalisation of Lielsala peatland area

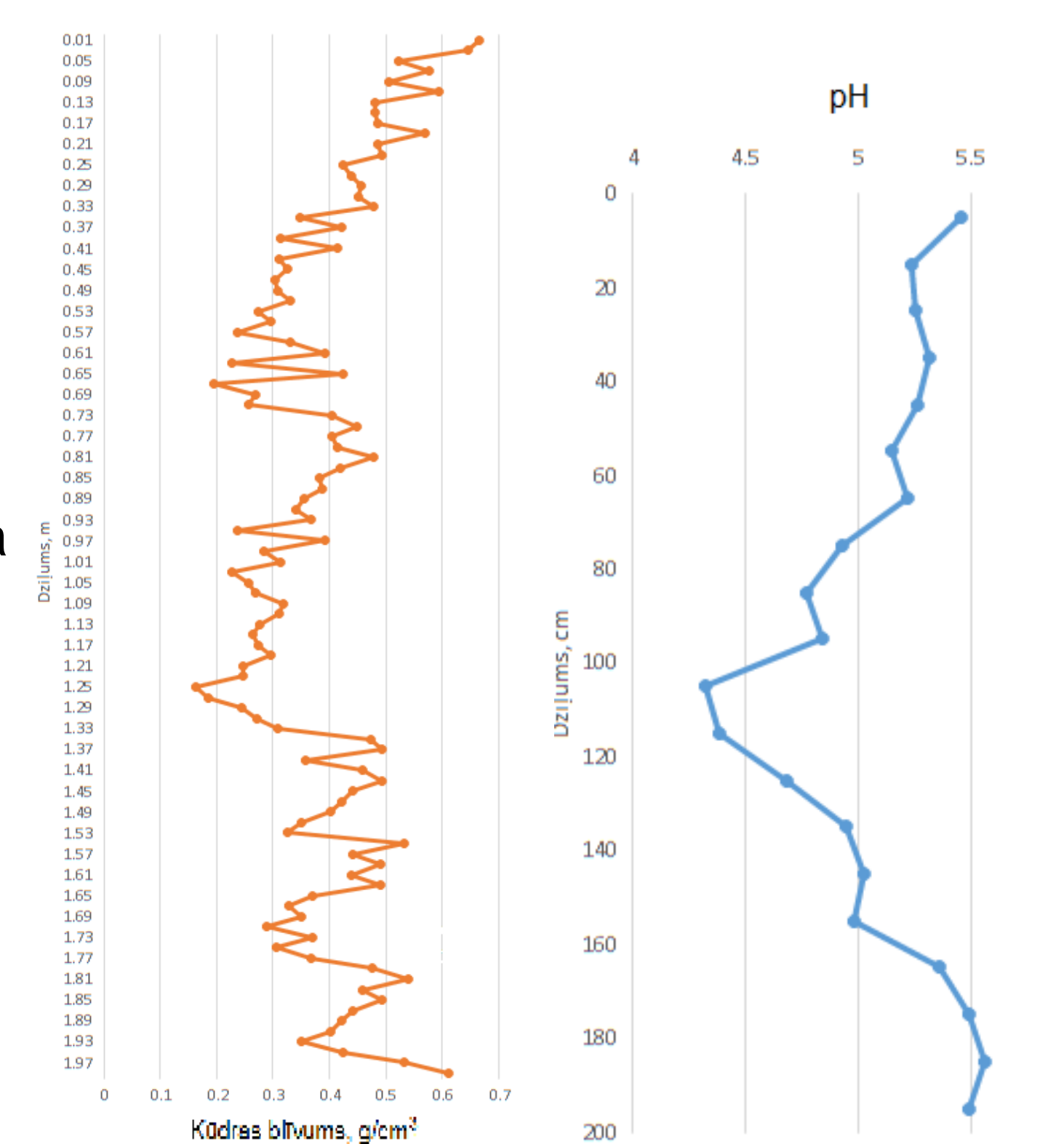


Fig.9. Changes in peat section of the Drabiņu peat cutting fields

Results

Studies of peat properties from the outcrops of peat cutting fields reveal changes in peat section which are based on natural peat composition and decomposition changes. The peculiarities develop changes in peat properties as the result of peatland drainage.

The results from Lielsala, Drabiņu, Kaigu and Lielsais Ķemeri peat sections show the main differences that are observed in sediment composition, density and decomposition. The results of natural densities of Lielsala bog peat in the upper part of the cut are larger than other bogs. The main factors influencing the natural density indicators are the degree of decomposition, the amount of minerals and the use of hydrological regime. The consequences of draining are most evident in the results of peat analysis of the Lielsalas mire, where the values of peat density and degradation are much higher than in other mires



Fig.7. Differences of peat properties observed in the ditch wall.

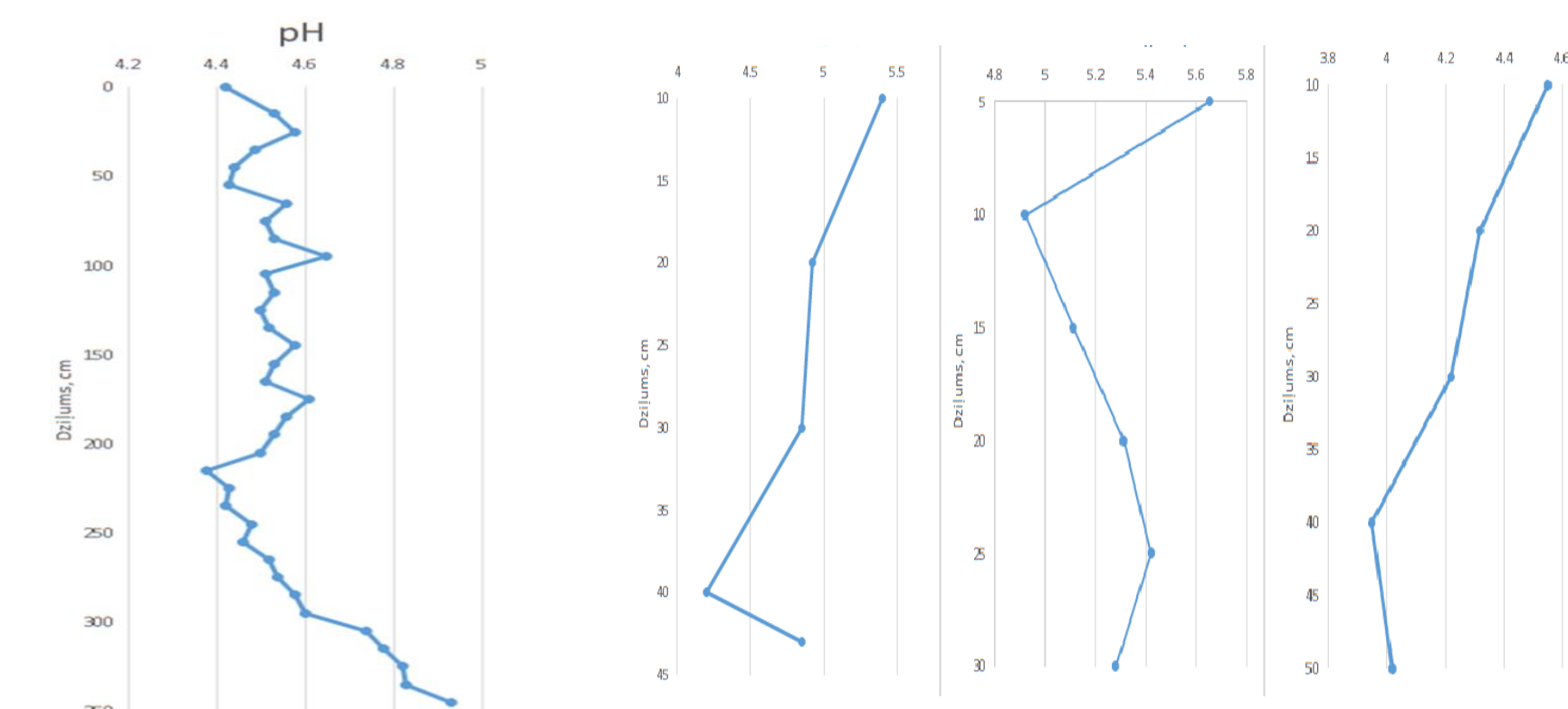


Fig.8. Changes in pH values of Ķemeri and Lielsalas peat cutting fields

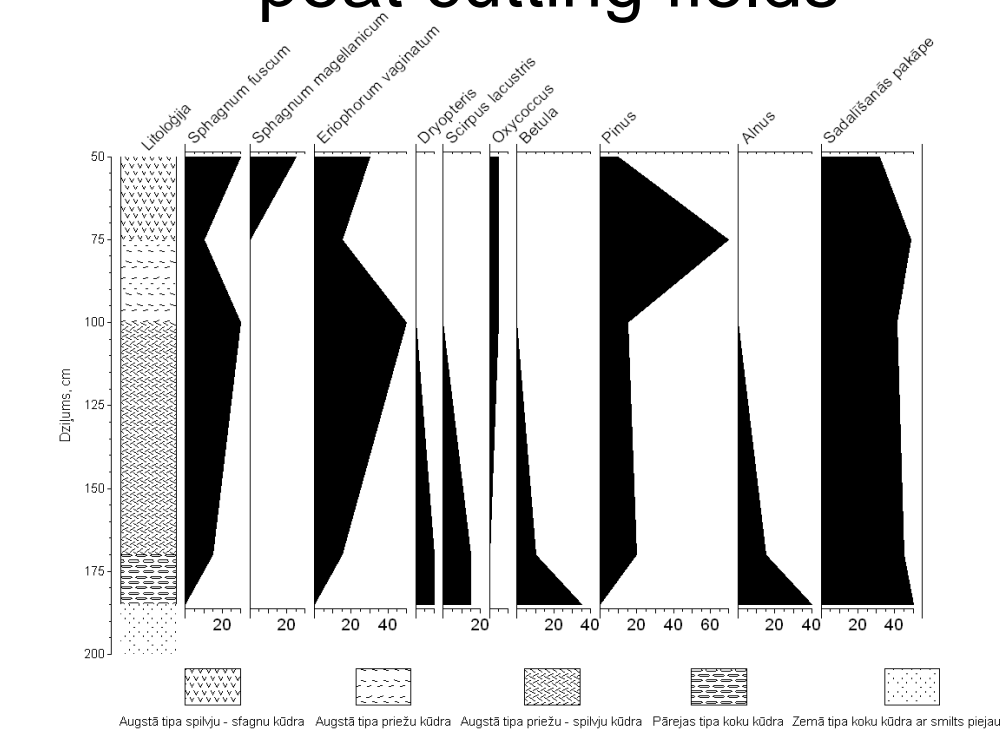


Fig.10. Botanical composition of Kaigu peat files

Conclusions

The results of the peat property studies allow to conclude that the main changes in the properties of peat caused by human activities are the increase of the peat density and pH value, as well as the tendency to increase the amount of mineral substances in the upper layer of sediment. However, it should be noted that this trend, to a lesser extent, is also characteristic of natural bogs.

Research shows that in the developed borehole the predominantly low-type or "black" peat has been retained, the thickness of the layer may vary even at short distances, which requires detailed measurements of the residual peat layer, in order to assess both the potential residual resources and, above all, the choice of field recultivation measure.

In order to evaluate the changes in the degraded field peat properties and therefore the best recultivation methods to be selected, it is important to perform a complex study of peat properties.

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