

Examination of soil and water quality along the Koppány Valley Habitat Rehabilitation Experimental Area

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Landscape and land use change play an important role in the Koppány Creek Valley in Somogy County, Hungary. Once, the area was characterized by large extent of forestland, peaty and swampy areas but these were almost totally altered, made them suitable for arable farming. During our research we compared the maps of the first three military surveys, covering an era of 1770 to 1870 and in addition, the Unified National Map from the end of the 20th century.

Besides the analyses of the above mentioned maps, soil analyses were done on sloping and on flooded areas as well and water analyses on an experimental area, covering an approximately 2 km section of the Koppány Creek below Gerézdpuszta (Koppány Valley Habitat Rehabilitation Experimental Area).

In addition to the chemical analyses, biota was also examined. Macrozoobenton was analysed and Saprobity Index was determined.

This approach allowed us to give a detailed description of the experimental area, including water and soil quality analysis.

Comparison the soils of the forested and non-forested areas, we can state that overall water management capacity has suffered negative changes, including the change of infiltration and water holding capacity from good to bad. Brown forest soils disappeared on significantly large areas that are now covered by shallow, weakly humic soil types with a soil surface formed on loessy parent material or very close to and/or mixed with it. These changes in soil characteristics means more erosion, more runoff and soil loss, and at the bottom of the slope, more sediment accumulation. Shallow drillings proved the soils to be 160-240 cm, respectively. Concerning the original thickness of the original soils in the area it means 60-140cm sediment accumulation.

Chemical analyses of the water at the beginning, at the end of the experimental area and between the creek and a fishpond proved that – in average – the water quality after the fishpond is one class below the quality of the other two water sampling points.

Water quality class of the Koppány Creek at the Koppány Valley Habitat Rehabilitation Experimental Area was III. B. (less polluted) based on the analysis of the 298 individuals from 13 taxons, characterized by caddis-fly (*Hydropsyche angustipennis*).

Saprobity Index proved the water to be a Hungarian average: β -mesosaprob ($S=2.05$), water quality = Class II (good).

Based on our results we call attention on the importance of reforestation and on the rehabilitation of the former wetlands. Covering the erosion hotspots could greatly improve infiltration capacity of the soils, resulting less runoff erosion, less sediments, better water management. Furthermore, wetlands filter pollution arriving from agricultural lands and as habitats provide refuge for rare and protected species, floodplains provide protection functions against flooding, and furthermore it is important as landscape value. The reintroduction, rehabilitation and protection of naturally flooded and swampy areas would equally serve the increase of water quality, biodiversity and decrease of negative flooding effects.