

Influence of the Location of Flood Embankments on the Condition of Oxbow Lakes and Riparian Forests: A Case Study of the Middle Odra River Beds on the Example of Dragonflies (Odonata), Ground Beetles (Coleoptera: Carabidae) and Plant Communities

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Abstract : Past and current studies from different countries showed that river engineering leads to environmental degradation and extinction of many species - often those protected by local and international wildlife conservation laws. Through the years, the main focus of rivers utilization has shifted from industrial applications to recreation and wildlife preservation with a focus on keeping the biodiversity which plays a significant role in preventing climate changes. Thus an opportunity appeared to recreate flooding areas and natural habitats, which are very rare in the scale of Europe. Additionally, river restoration helps to avoid floodings and periodic droughts, which are usually very damaging to the economy. In this research, the biodiversity of dragonflies and ground beetles was analyzed in the context of plant communities and forest stands structure. Results were enriched with data from past and current literature. A comparison was made between two parts of the Odra river. A part where oxbow lake and riparian forest were separated from the river bed by embankment and a part of the river with floodplains left intact. Validity assessment of embankments relocation was made based on the research results. In the period between May and September, insects were collected, phytosociological analysis were taken, and forest stand structure properties were specified. In the part of the river not separated by the embankments, rare and protected species of plants were spotted (e.g., Trapanatans, Salvinianatans) as well as greater species and quantitative diversity of dragonfly. Ground beetles fauna, though, was richer in the area separated by the embankment. Even though the research was done during only one season and in a limited area, the results can be a starting point for further extended research and may contribute to acquiring legal wildlife protection and restoration of the researched area. During the research, the presence of invasive species *Impatiens parviflora*, *Echinocystislobata*, and *Procyonlotor* were observed, which may lead to loss of the natural values of the researched areas.

Keywords : carabidae, floodplains, middle Odra river, Odonata, oxbow lakes, riparian forests

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