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Can lateral bank erosion enhance ecological diversity? A case study from Sajó River, Hungary

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Lateral bank erosion is one of the key issues of the channel evolution of meandering rivers all over the world. Generally, it can cause extensive land degradation in different geographical and climate regions. The majority of scientific literature have discussed this process from the negative point of view since the stakeholders and local water management directorates try to reduce its harmful effects. In Central Europe only a few rivers have remained in a quasi-natural state where lateral channel migration intensively affects the surrounding landscape, especially the agricultural parcels (Bertalan et al. 2016). On the other hand, inaccurate river management or previous channelization constructions could even increase this process and moreover, threaten the local habitat diversity. In this study, we aimed to assess the possible positive effects of lateral bank erosion along a selected meandering reach of the Hungarian Sajó River. The study area consisted of a three-bend-section that is completely free forming. A series of both archive aerial imagery and UAV-surveys had been used for a detailed landscape-metrics analysis in ten time periods between 1952 and 2017 (Bertalan et al. 2018a). Parameters of channel planform dynamics (chord length, amplitude, normalized radius of curvature) were calculated for a time series analysis; moreover, area of erosion/accretion were determined based on the overlapping channel polygons. At the final time period, an in-situ ornithological survey was also conducted. According to our results, the morphological evolution of the investigated Sajó River section was found to be outstanding but at the same time the forest cover of the study area also developed increasingly. We found a linear relationship between the development trends of channel sinuosity and the changes of forest cover (Bertalan et al. 2018b). Along the eroding outer bank of one bend we revealed more than 400 nesting cavities of important and protected migratory bird species like the sand martin. This study presented an outstanding example of meander development where the bank erosion can have a positive effect of the surrounding landscape diversity.

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