Revisiting restored river reaches – Assessing change of aquatic and riparian communities after five years (Lorenz et al. 2018) [1]

Hydromorphological restructuring of river sections, i.e. river restoration measures, often has little effects on aquatic biota, even in case of strong habitat alterations. It is often supposed that the biotic response is simply delayed as species require additional time to recolonize the newly generated habitats and to establish populations. To identify and specify the supposed lag time between restoration and biotic response, we investigated 19 restored river reaches twice in a five-year interval. The sites were restored one to ten years prior to the first sampling. We sampled three aquatic (fish, benthic invertebrates, macrophytes) and two riparian organism groups (ground beetles and riparian vegetation) and analyzed changes in assemblage composition and biotic metrics.

With the exception of ground beetle assemblages, we observed no significant changes in richness and abundance metrics or metrics used for biological assessment. However, indicator taxa for near-natural habitat conditions in the riparian zone (indicators for regular inundation in plants and river bank specialists in beetles) improved significantly in the five-year interval. Contrary to general expectations in river restoration planning, we neither observed a distinct succession of aquatic communities nor a general trend towards “good ecological status” over time. Furthermore, multiple linear regression models revealed that neither the time since restoration nor the morphological status had a significant effect on the biological metrics and the assessment results. Thus, the stability of aquatic assemblages is strong, slowing down restoration effects in the aquatic zone, while riparian assemblages improve more rapidly. When defining restoration targets, the different timelines for ecological recovery after restoration should be taken into account. Furthermore, restoration measures should not solely focus on local habitat conditions but also target stressors acting on larger spatial scales and take other measures (e.g. species reintroduction) into consideration.

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