

[Fish community responses and the temporal dynamics of recovery following river habitat restorations in Europe \(Thomas et al. 2015\) \[1\]](#)

Considerable uncertainty exists regarding the ability of reach-scale habitat restorations to promote ecological integrity and affect community composition in degraded streams and rivers and the time scales at which these effects take place. Restoration of habitats on the reach scale (hundreds of meters to a few kilometers) is expected to support threatened species because many of them are habitat specialists. In contrast, generalist species are predicted to be replaced in restored reaches. We used a large data set for 62 reach-scale restoration projects in 51 stream systems in Germany, Switzerland, and Liechtenstein and analyzed the changes in fish community composition induced by the restorations in terms of species richness, species turnover, Brillouin diversity index, total fish abundance, and proportion of alien and endangered species.

We further analyzed the temporal dynamics of the fish community recovery over a period of 19 y postrestoration. Species richness and Brillouin diversity index increased in most of the restoration projects (66 and 57%, respectively), but recovery to historical reference conditions was not achieved. Total abundance was enhanced by most of the projects. Species composition in restored reaches underwent directed shifts for at least 10 y, with high and variable species turnover in the first years that decreased over time. The effects of restoration on Brillouin diversity index were highly variable in the first few years after restoration, but tended to increase over time. These dynamics must be considered more carefully in future protocols for evaluating restoration results, and final evaluation of restoration outcomes on fish communities should not be made too early. Our results indicate that reach-scale habitat restorations may be a suitable tool for increasing local fish abundance and slightly enhancing species diversity. However, more targeted approaches are needed to support threatened species and repress alien species.

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