

## [Mountain river restoration measures and their success\(ion\): effects on river morphology, local species pool, and functional composition of three organism groups \(Januschke et al 2014\)](#)

[1]

We investigated temporal effects of restoration on river morphology, on species and functional composition of benthic invertebrates, floodplain vegetation and carabid beetles at three study sites in the mountain river Lahn (Germany). We sampled restored and nearby non-restored sections 3–5 years and 7–9 years after restoration. In the restored sections, instream microhabitat heterogeneity was higher due to the increased presence of finer substrates, while cobbles and coarse gravel were still dominant. Instream habitat composition did not change between the two sampling events. Areas of restored floodplain were characterized by a more diverse habitat mosaic and by unvegetated bars, vegetated islands and secondary channels. In restored sections, floodplain habitat heterogeneity was maintained 7–9 years after restoration, but vegetated areas increased, while unvegetated bars and aquatic areas decreased. The species composition of all studied groups was more variable over time in restored than non-restored sections. In contrast to benthic invertebrates, the immigration rate of floodplain vegetation and carabid beetle species was higher in restored sections. Assemblage composition of all three organism groups changed over time, with the highest change in carabid beetles and smallest in benthic invertebrates. Restoration changed the abundances of functional response groups, mainly for carabid beetles, by supporting species that indicate increased hydrodynamics and early successional stages. Changes of functional response groups in non-restored and restored sections across time indicated decreased hydrodynamics or hydrological connectivity for all organism groups. Although the response of organism groups differed, our results support the conjecture that restored sections accumulate species and enhance the local species pool.

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