

Evaluation of a river restoration project rehabilitating historical meanders: a case study for the Dommel (Flanders)

The channelisation of water courses is a threat for the diversity and abundance of ecological communities. Changes in the physical habitat compromise the survival of numerous species. The aim of this restoration project was to rehabilitate historical meanders to create a sound initial situation, on which a further spontaneous development of the river system should be possible.

We evaluated whether the achieved river restoration measures have created a larger structure diversity and if the habitat suitability for diverse biotic groups has been increased.

The habitat suitability and the biotic groups in the different stretches were quantified and compared in terms of habitat measurements and population sizes (fish, benthic invertebrates, macrophytes) in a 'restored meandering river reach' and a 'non-restored reference reach'.

The river is characterized by relative mineral-poor water. These types of water courses are low to moderately productive. Aquatic plants should be well-developed and often dominated by pondweed vegetation. Nevertheless, the vegetation is mainly dominated by species characterised by a nutrient-rich environment. Overall, the presence of macrophytes enhances the abundance and diversity of the juvenile fish. The abundance of fish species was larger in restored reaches compared to reference reaches. A better community structure in the restored reaches, indicates that more species are reproducing in these areas. This is particularly well demonstrated by large numbers of juveniles from different age classes. One can thus conclude that restored reaches not only attract a dult fish from the surrounding habitats, but also exhibit the capacity to enlarge self-sustaining fish populations by reproduction and are able to shelter sensitive reference species of benthic invertebrates, which are a benchmark required by the European Union Water Framework Directive.

Furthermore, we demonstrate the influence of an incidental factor such as water pollution on the evaluation of the river restoration project.