Assessing the societal benefits of river restoration using the ecosystem services approach (Vermaat et al. 2015) [1]

The success of river restoration was estimated using the ecosystem services approach. In eight pairs of restored–unrestored reaches and floodplains across Europe, we quantified provisioning (agricultural products, wood, reed for thatching, infiltrated drinking water), regulating (flooding and drainage, nutrient retention, carbon sequestration) and cultural (recreational hunting and fishing, kayaking, biodiversity conservation, appreciation of scenic landscapes) services for separate habitats within each reach, and summed these to annual economic value normalized per reach area.

We used locally available data and literature, did surveys among inhabitants and visitors, and used a range of economic methods (market value, shadow price, replacement cost, avoided damage, willingness-to-pay survey, choice experiment) to provide final monetary service estimates.

Total ecosystem service value was significantly increased in the restored reaches (difference 1400 ± 600 € ha-1 year-1; 2500 - 1100, p = 0.03, paired t test). Removal of one extreme case did not affect this outcome. We analysed the relation between services delivered and with floodplain and catchment characteristics after reducing these 23 variables to four principal components explaining 80% of the variance. Cultural and regulating services correlated positively with human population density, cattle density and agricultural N surplus in the catchment, but not with the fraction of arable land or forest, floodplain slope, mean river discharge or GDP.

Our interpretation is that landscape appreciation and flood risk alleviation are a function of human population density, but not wealth, in areas where dairy farming is the prime form of agriculture.

Keywords: Nutrient retention, River corridor, Wetlands, Flood control, Biodiversity, Economic valuation

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http://dx.doi.org/10.1007/s10750-015-2482-z [2]

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