26 February 2014
Issue 405

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Source: Klauer, B., Schiller, J., & Bathe, F. (2014). Concept for cost effective improvement of river morphology in the context of the European Water Framework Directive. *Journal of Environmental Planning and Management* (November), 1–17. DOI:10.1080/09640568.2014.969833.

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How to do river restoration on a budget

A step-by-step approach to planning cost-effective river restoration is outlined in a new study. The study describes a method that compares different combinations of restoration measures and could be useful in helping decision-makers meet ecological objectives on limited budgets.

The EU's Water Framework Directive (WFD) requires Member States to achieve 'good' status of their ground and surface waters by 2015. In the context of the Directive, 'good' means that limits for certain chemicals are not exceeded and that plant and animal communities do not differ substantially from those in pristine waters.

The Directive also requires Member States to select cost-effective measures for meeting these objectives. However, authorities have struggled to determine the most cost-effective measures because research on cost-benefit analysis is under-developed in the area of water management.

Working with an existing concept called BAS*IN*FORM (river BAS*IN IN*FORMation and management system), the study's authors developed a method to support the process of selecting and prioritising cost-effective measures for river management. BAS*IN*FORM has already been tested by environmental authorities in Brandenburg and Thuringia, Germany, to select cost-effective water management measures.

The researchers favoured a 'stepping stones' approach, in which, rather than restoring entire rivers, the aim is to restore a co-ordinated network of smaller river sections in order to provide habitats for reproduction and allow migrating species to pass through.

The idea is that, given the correct configuration, the network should ensure the ecological integrity of rivers in the wider area. This approach also has the advantage of being cheaper, and more practical, than restoring entire rivers.

The researchers' method is intended to help decision-makers identify sections of rivers where measures should be targeted, taking into account costs and practicalities of implementation. It involves three main steps:

1) planning of measures
2) setting up successful spatial combinations of measures
3) choosing the best combination of measures.

In the first step, the river area is divided into sections, possible measures are explored and costs of restoration are estimated. In the second step, a geographical information system (GIS) tool (a mapping technology) is used to test different combinations of river sections to identify those that would fulfil the requirements of the 'stepping stones' approach if restored.

In the third step, the most promising combinations are presented as a shortlist and illustrated with a map and summary table, including costs. This shortlist is then reviewed as part of a participatory process by local stakeholders, decision-makers and experts.

The researchers point out that the final decision about which river sections to restore could be made using a 'decision support and optimisation tool'. However, they suggest that a less formal process — allowing for decision-makers' own judgements — would be faster, cheaper and more appropriate, given likely uncertainties within the process.

The current study only explores the method as a concept, using hypothetical values. Originally, BAS*IN*FORM was developed for the German state of Brandenburg as a way to find cost-effective measures for tackling nutrient pollution under the requirements of the WFD. The next step, say the researchers, will be to develop it as a ready-to-use tool. It could then be used by other EU Member States.

Environment