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Research Article

Rivers as living systems

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- Abstract
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Abstract

1. Fresh water and the ecosystem functions of catchments are essential to all life, and provide benefits upon which society depends. Yet there is widespread evidence of increasing degradation of river quality in many parts of the world.

2. Rivers are complex living systems, and must be managed on a systemic basis. Historic parochial approaches to management can exacerbate wider-scale problems by degrading ecosystem functions.

3. Reversal of long-term ecosystem degradation, not merely reducing the rate of ongoing damage to ecosystem functioning, is vital for achieving sustainability. In an already ecologically impoverished world, *restoring* ecosystem functions and the capacity of catchments to support human needs may be the only form of investment in a sustainable longer-term future.

4. A ‘building block’ approach can enable local issues to be addressed by technologies that protect or restore ecosystem functions at the catchment scale. They may also represent a cost-effective means for targeting investment.

5. Shifts in thinking and action are required if a move from a reactive to a systemic approach to the water environment is to be achieved. These shifts include acknowledgement of the central importance of ecosystem functions, protecting these functions through management action, valuing them appropriately, and taking longer-term and wider-scale perspectives in management decisions. A focus on restoration of function at the catchment scale, achieved through greater inclusion of all sectors of society in decision-making, is an essential element of this approach.

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