

An evidence base for setting flow targets to protect river habitat

This document has been produced to underpin decisions about defining appropriate environmental targets to control adverse effects of anthropogenic flow modifications on the characteristic flora and fauna of UK rivers. Whilst its primary aim is to underpin the review of UK Common Standards targets set for rivers with special wildlife designations for their river habitat, the evidence contained within it is also relevant to the control of flow-related impacts on river ecology under the Water Framework Directive and the UK Biodiversity Action Plan (BAP).

What was done

A targeted search of the published literature was undertaken to provide an up-to-date characterisation of the effects of flow modifications on the biological communities of river systems. This included an evaluation of mechanisms of impact, environmental factors confounding simple relationships between flow modifications and biological responses, and quantitative relationships between the magnitude of flow modification and biological effects. An evaluation was also made of analyses undertaken in the UK to inform the definition of flow standards to support high and good ecological status under the Water Framework Directive.

Results and conclusions

A list of key messages was drawn from the evidence base. The biological responses of riverine communities to flow modification are mediated through changes to habitat character (such as current velocity, substrate conditions) and habitat space (water depth, water area, inundation regime), which are also influenced by physical modifications to the river channel. The biological impacts are many and varied and local

hydroecological investigations typically only characterise a limited subset of these.

The characteristic biological communities of rivers are adapted to the natural flow regime of the river, acting within a natural channel geomorphology. Overall, the published literature suggests that modified flow regimes that result in only small deviations from the naturalised flow regime (i.e. the flow regime that would occur in the absence of abstractions and discharges), operating in a natural (or physically restored) channel geomorphology, will have least impact on characteristic biological communities.

Natural England's viewpoint

This evidence base provides an important foundation for making decisions about ecologically acceptable flow regimes in rivers.

Selected references

Nearly 90 references were used in the construction of this evidence base. A selection of key references is provided below.

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Further information

For the full details of the research covered by this information note see Natural England Research Report NERR035 - *An evidence base for setting flow targets to protect river habitat*.

Contact us

For further information contact the Natural England Enquiry Service on 0300 060 0863 or e-mail enquiries@naturalengland.org.uk.

Keywords

Conservation objectives, management standards, river and stream habitats, river regulation, sites of special scientific interest (sssi), water abstraction.

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