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Defining environmental river flow requirements – a review

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Abstract. Around the world, there is an increasing desire, supported by national and regional policies and legislation, to conserve or restore the ecological health and functioning of rivers and their associated wetlands for human use and biodiversity. To achieve this, many organisations have developed methods for defining “environmental flows”, i.e. the flow regime required in a river to achieve desired ecological objectives. This paper reviews the various methods available and suggests a simple categorisation of the methods into four types: look-up tables, desk-top analysis; functional analysis and hydraulic habitat modelling. No method is necessarily better than another; each may be suitable for different applications. Whilst look-up methods are easy and cheap to apply, they can be expensive to develop, are less accurate and more suitable for scoping studies; in contrast, although hydraulic habitat modelling is more expensive to apply, it is suitable for impact assessment at specific sites. Each method would need to be used within a wider decision-support framework. These are generally either objective-based to define a target flow regime for a specific desired river status, or scenario-based to indicate the relative merits of various flow regime options for the river environment.

Keywords: environmental flow, instream flow, river habitat modelling, building block method, flow scenario analysis, objective setting.

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