



Scales of Natural Flood Management

Alex Nicholson (1), Paul Quinn (2), Gareth Owen (2), David Hetherington (1), Miguel Piedra Lara (1), and Greg O'Donnell (2)

(1) Ove Arup and Partners International Ltd., Newcastle upon Tyne, UK (alex.nicholson@arup.com), (2) School of Civil Engineering and Geosciences, Newcastle University, Newcastle upon Tyne, UK (p.f.quinn@ncl.ac.uk)

The scientific field of Natural flood Management (NFM) is receiving much attention and is now widely seen as a valid solution to sustainably manage flood risk whilst offering significant multiple benefits. However, few examples exist looking at NFM on a large scale (>10km²).

Well-implemented NFM has the effect of restoring more natural catchment hydrological and sedimentological processes, which in turn can have significant flood risk and WFD benefits for catchment waterbodies. These catchment scale improvements in-turn allow more 'natural' processes to be returned to rivers and streams, creating a more resilient system.

Although certain NFM interventions may appear distant and disconnected from main stem waterbodies, they will undoubtedly be contributing to WFD at the catchment waterbody scale.

This paper offers examples of NFM, and explains how they can be maximised through practical design across many scales (from feature up to the whole catchment). New tools to assist in the selection of measures and their location, and to appreciate firstly, the flooding benefit at the local catchment scale and then show a Flood Impact Model that can best reflect the impacts of local changes further downstream. The tools will be discussed in the context of our most recent experiences on NFM projects including river catchments in the north east of England and in Scotland. This work has encouraged a more integrated approach to flood management planning that can use both traditional and novel NFM strategies in an effective and convincing way.