Can Eurasian Beaver reintroduction provide a nature based solution to water resource management issues?

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Beavers are known as ecosystem engineers and can profoundly alter ecosystem structure and hydrological function through this engineering activity, particularly the creation of dams and associated ponds. The presence of beaver dams can have major implications upon flow regimes, water quality and related water resource management issues.

Eurasian beaver (C. fiber) has now been restored to much of its former geographical range across continental Europe and there are trial reintroduction projects currently ongoing in the United Kingdom. However, much of the available research into the impacts of beaver, remains focused on the North American beaver (C. canadensis), located in very different landscapes. Therefore, knowledge of how beaver impact on the environment and the role they may play in the provision of ecosystem services or nature based solutions is vital to inform policy, regarding both the reintroduction of beaver in the United Kingdom and the wider management of these animals in intensively-managed, agriculturally dominated landscapes worldwide.

Results from the Devon Beaver Project will be presented, demonstrating that on a first order tributary draining from intensively managed grassland, a sequence of 13 beaver dams has: (1) increased water storage in the landscape (2) attenuated flow regimes and reduced flood flows (3) increased sediment, nitrogen and carbon storage (4) mitigated diffuse pollution from agriculture, with reduced sediment, nitrogen and phosphate leaving the site. In addition to the biodiversity benefits recorded by project partners, these results demonstrate that in intensively managed lowland agricultural landscapes, beaver activity can provide multiple benefits.

However, there remains a need to quantify if and how the hydrological impacts of beaver activity varies across spatial scales and with catchment land use. With this in mind, the experimental design and preliminary results from a suite of new UK based beaver monitoring projects will be presented. Together these projects aim to form an evidence base for understanding the potential role (and potential costs/challenges) that beavers could play in multiple benefit, natural process based, water resource management strategies.