



## **Fine sediment transfer in upland river systems and implications for connectivity: River Esk, North York Moors, UK.**

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Recent changes in UK upland catchments are placing traditional infrastructure and upland farming practices under increasing pressure. These changes can have a huge effect on land use and management practices, which in turn influence the generation of runoff and sediment movement through fluvial systems. It is vital to determine the sources, transfer and fate of fine sediment in upland UK catchments in order to predict impacts of future land use change. For example in the River Esk, it is particularly important to determine the implications of fine sediment delivery on fish spawning and pearl mussel habitats in the light of recent decline in both species.

This paper presents the initial results of monitoring of fine sediment fluxes throughout the River Esk catchment. Two principal monitoring stations are located on the trunk channel and a distributed network of mass flux suspended sediment samplers strategically deployed in the river network. Flow and suspended sediment flux are monitored at the two gauging sites, mass flux samplers are sited in the centre of relatively stable river reaches and a continuously recording turbidity meter has been deployed at the upper gauging site. This has enabled us to estimate the volumes of sediment moving within the Esk system, investigate relationships with storm rainfall and establish key areas for sediment supply within the catchment. These key areas for supply, transfer and sedimentation within the catchment can be used to understand sediment connectivity within the river system.