



Natural re-vegetation and restoration as controls on runoff from gullied peatlands: implications for natural flood management

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The UK supports 15% of the world's blanket peat cover, but much of this vital resource is significantly degraded. As such, the restoration of eroding UK peatlands is a major conservation concern, and landscape-scale restoration through the re-vegetation of bare peat and damming of erosional gullies is extensive in areas of upland Britain. The hydrological impacts of these restoration interventions is increasingly well documented, with recent work showing that following re-vegetation: water tables rise, overland flow becomes more prevalent and storm hydrographs have significantly longer lag times and reduced peak discharges. The impacts on stormflow are almost doubled by the addition of gully blocking. These findings suggest that restoration of eroding blanket peat has the potential to reduce downstream flood risk and contribute towards natural flood management (NFM) initiatives.

In addition to active restoration efforts, some eroded gullies have re-vegetated to varying degrees through longer-term natural processes, but little is known about how these systems compare to catchments that have been subject to intervention. Until now, the most severely degraded areas of peat have been the focus of restoration works, but as many of these areas now show trajectories of recovery, the attention of restoration work and flood control is starting to shift to areas of naturally re-vegetated peat.

This paper details stormflow characteristics from 12 naturally re-vegetated gullies in the Southern Pennines, UK, where the natural re-vegetation is variable and partial. We compare their behaviour to catchments that were restored seven years ago, as well as data from eroding and intact control sites. Preliminary findings suggest that the naturally re-vegetated gullies produce highly variable peak discharges with behaviour observed similar to both the unrestored and intact control sites, and lag times similar to those of the intact catchment. Interestingly, the site which had been restored by both re-vegetation and gully blocking produced the longest lag times throughout the study period, indicating that the naturally re-vegetated systems could gain additional NFM benefits from gully blocking.