



Understanding gully blocking in deep peat

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The Peak District, in the UK, contains rural blanket peat moorland of around 150 square km. It is the second most visited National Park anywhere in the world and is surrounded by urban conurbations. Industrial pollution, fire and overgrazing have led to massive gully erosion in the peat. Many gullies are over 8 m deep and the gullies are continuing to retreat headwards. The result is a huge loss of peat soil from the landscape and heavy dissection and desiccation of the soils. Urgent work is required to stop gullies from extending further into the peat. This poster presents results from three interlinked investigations which aim to answer; i) Which techniques for gully blocking in deep peat work and which are most successful?; ii) Where will gully blocking work within gully systems? and iii) How do we strategically choose which gullies to block out of the thousands that exist on the site? For question (i) field experiments were carried out to compare sedimentation and erosion associated with dams of heather, wool, wood, stone and moulded plastic installed in different ways and with different spacings. Wood and stone dams work best but close dam spacing is required with seeding of cotton grass recommended to stabilise dams installed. Characteristics of naturally revegetated gullies were assessed to aid question (ii). Five modes of revegetation were found primarily on slopes under 6 degrees and where there was a thin covering of redeposited peat sediment. LIDAR technology coupled to a GIS was used in a novel approach that addressed question (iii). By using high resolution data to map the topography of the landscape and then numerically infilling the gullies it was

possible to compare maps of water flow paths and determine which gullies would have the biggest impact on hillslope saturation and downstream discharge. Thus it was possible to identify which gullies it would not be appropriate to block and which it would be more beneficial to block. The technique allows individual gullies or gullied areas to be identified to aid decision-making on where to direct resources for gully blocking.