Mires-on-the-Moors Hydrological monitoring summary

Exmoor Mires Project 2010-2015 Feb 2011

The aim of the hydrological and hydrogeological monitoring is to assess the water quality and supply impacts of a moorland ditch blocking program that will be conducted across Exmoor National Park. The monitoring will evaluate the numerous hydrological and hydrogeological project objectives, provide a comprehensive baseline dataset for future collaborations/research opportunities and contribute to the current understanding of peat groundwater and surface water processes.

Below is a list of hydrological and hydrogeological objectives provided by the Mires-on-the-Moors project partners (South West Water; Exmoor National Park Authority; Dartmoor National Park Authority, Natural England and the Environment Agency) that will be assessed during the Mire project:

- Retention of groundwater within the mire system.
 - Re-establishment of natural stream flows, for example:
 - 1. A lowering of peak flows and an increase of baseflow.
 - 2. A reduction in water velocity at peak flows.
- Reduction in gully erosion.
- Quantification of groundwater-surface water interactions that occur between the newly formed surface water pools that will be created by ditch blocking and the groundwater system leading to an increased understanding of the impacts on downstream surface water flow regimes.

The assessment of the project objectives requires the accurate quantification of rainfall, evapotranspiration, groundwater levels, seepage flux, water velocity, gully erosion, overland flow, through flow and discharge at two monitoring sites selected across Exmoor National Park that consist of small headwater catchments (*ca.* 1-3 km²).

Contact

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BEFORE AND AFTER EXAMPLE PICTURES OF MIRE RESTORATION SITES

Example 1 BROADMEAD

BEFORE restoration – summer 2006





In the ditch before restoration

The ditch was fenced, over 3m deep, eroding and cracking, drying out the peat with large chunks dropping of the side in to the ditch. The restoration contractor put in 16 wooden blocks, backed up with peat sourced from borrow pits. The ditch was filled with locally cut moorland bales and these were covered over with ditch spoil from the bank on the side of the ditch.



Ditch after restoration



The ditch, fence and scrub encroachment are now gone (all removed by the contractor).

Replaced by some new pools in the small peat borrow pits along the line of the ditch (being enjoyed by an educational group from Pinkery outdoor centre)



POST Restoration summer 2010

Example 2 ROOSTHITCHEN MIRE RESTORATION SITE (eroding gully)



BEFORE

Ditch before blocking (left), the site was eroding back from the spring head with lots mobile peat and shillet in the gully bottom

DURING

The restoration works (below) wooden blocks were built and backfilled with peat, bales were then put into the ditch and finally the whole lot covered over with ditch spoil to complete the job









AFTER

View of filled in ditch in August 2010 (left). The small areas of bare peat visible are the partially vegetated peat borrow pits, from which peat vas derived to seal the wooden dams

View of the vegetation monitoring transect in 2006 (bottom left) and 2010 (bottom right). Note and compare the position of the tape which was relocated to the exact spot marked by wooded pegs - **The ditch is completely gone!**



Before - bare eroding peat in ditch



After- no evidence of ditch remains

Example 3 ROOSTHITCHEN BOUNDARY DITCH



i.Boundary Ditch Aug 2008 ii. Boundary ditch immediately after restoration works

Example 4 – WOODEN DAMS AT BLACKPITTS (installed March 2007)



Before (construction materials at the ready)



Immediately after construction of a new block



August 2010 -block hardly visible

Example 5 NEW PEAT DAMS AT BLACKPITTS



Dry peat cuttings in Summer 2006 and 1 year after blocking with peat (photo 2008)

Example 6 BLOCKING THE MAIN DRAINAGE DITCH AT BLACKPITTS



Just before the ditch was blocked in March 2006 and 1 year later

Example 7 BANK RE-PROFILING WORK AT BLACKPITTS



Main drain before blocking- summer 2006, After blocking (March 07) in summer 2007 and after bank re-profiling in August 2007

Example 8 THE USE OF MOORLAND BALES FOR DITCH BLOCKING AT BLACKPITTS





Cutting and baling moor grass

Moorland bales and peat dams



Using bales to block gullies



Fence across gully to hold bales



Bales being put in place



Bale block - 1 year later