

**United Utilities Sustainable Catchment Management – Whitendale Trial Preliminary Results  
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United Utilities PLC supplies water and wastewater services to around 7m people within the North West of England and is a significant landowner within the region. Much of the water sources used by the company are from upland areas and much of these are subject to some form of habitat designation. United Utilities PLC has secured funding from OFWAT the water industry financial regulator to invest in its catchment land with a view to improving water quality, improving the status of its SSSI land and to enhance its biodiversity value. Funding has been allowed for two of our estate areas, Bowland and the Southern Estate areas to the tune of around £9m. The focus of the programme is to re-wet upland areas, stabilise areas of eroded areas and working with tenant farmers develop a sustainable approach to farming the land. United Utilities PLC and its regulators are keen to evaluate the effect of land management interventions so the programme will undertake extensive monitoring of the effects of the work.

United Utilities PLC along with many other water companies with similar upland water sources have seen an increase in colour over the last 30 year. It is believed that this is strongly affected by drying out of the uplands due to manmade drainage and periods of drought. Much of the work already carried out on the effect of re-wetting by blocking grips/gullies has focused on the effects on vegetation reflecting the habitat restoration and moorland stabilisation interest. There appears to be little information available on the effect on water quality both during and after re-wetting activities. As we plan to carry out a major programme of grip blocking we felt we needed to know:

- Does the blocking of grips decrease the runoff of suspended solids and the concentration of dissolved organic carbon (DOC – Water Colour?)
- Which grip-blocking technique is the most effective for affecting an improvement in water quality?
- Does the blocking of grips cause a flush of water colour and/or suspended solids that could put water resources at risk?

The three grip blocking techniques were tried at Whitendale in Bowland. There were using peat turves, heather bales and sheet piles. United Utilities PLC commissioned the University of Durham\* and University of Leeds\* to carry out water quality monitoring for the three grip blocking techniques and provide answers to the above questions.

The grip blocking was installed in February 2005. Individual grip blocking techniques were applied to defined grips systems and these were compared to each other and against control grips. Monitoring has taken place weekly using primarily automatic and some manual sampling. The samples were primarily analysed for colour (absorbance at 400nm), suspended solids, pH and conductivity. The level of the water table was also measured in relation to the blocked grips.

The preliminary results indicate that the blocking of grips:

- Decreases runoff of water and water colour from grips.
- Increases the concentration of colour within blocked grips, meaning that higher colour spikes could be experienced.
- Significantly increased the water table depth
- Has an inconclusive effect on suspended solids concentration given the complex suite of processes which effect sediment flux and issues with sampling suspended solids concentration.
- Showed no discernable difference between the different grip blocking techniques used in terms of runoff.
- Initially increased water colour in blocked grips relative to unblocked grips for a period of around two months.

Monitoring is continuing to establish whether there is a flush out of colour from blocked grips with the onset of wetter autumn conditions.

**\* United Utilities PLC thanks Alona Armstrong and Fred Worrall of The University of Durham and Joseph Holden of The University of Leeds for undertaking this work.**