



Spatial variation in water quality within the water bodies of a Peak District catchment and the contribution of moorland condition

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Upland locations are significant water supply sources providing over 70% of fresh water in Great Britain. However, the peatlands of the Peak District, Southern Pennines are highly contaminated with anthropogenically derived, atmospherically deposited pollutants, such as heavy metals. This is due to their location between the cities of Manchester and Sheffield, the centre of the 19th century English Industrial Revolution. These peatlands are also severely eroded; therefore erosion could be releasing these pollutants into the fluvial system, representing a threat to both aquatic ecosystems and drinking water supplies. These threats are regulated under the Water Framework Directive (WFD) and the Water Supply Regulations respectively.

There are two aims of this project. The first aim is to identify spatial and temporal variability of water quality within the Bamford water treatment works (WTW) catchment. This was achieved by fortnightly spot sampling at eight of the tributaries into the reservoir system. The second aim is to assess the contribution of moorland condition to water quality within the Bamford WTW catchment. Similarly, this was achieved by fortnightly spot sampling at eight moorland streams, draining from a variety of peatland conditions (bare peat, restoration, intact and heather burn).

Water samples were analysed for carbon (DOC, POC & TOC), pH, hardness and a suite of heavy metals, including copper, iron and zinc. In addition, stream temperature and stage height was recorded. Preliminary results highlight a number of issues within the Bamford WTW catchment: under the WFD streams are not achieving 'good' status for pH, copper and zinc, and under the Drinking Water Standards (DWS) streams are not achieving targets for aluminium, iron and colour. For example, the DWS for colour is 20 hazen units; however, mean values for streams within the Bamford WTW catchment range from 40 to 742 Hazen Units. Further analysis of the results will identify where spatial issues and priorities exist in space and time, as well as in relation to WFD objectives and DWS. The relationships between heavy metals and carbon (DOC, POC & TOC), pH, temperature and stage height will also be investigated, and the impacts of moorland restoration on carbon and heavy metals in water supplies will be discussed. Overall, this project is intended to provide evidence of the links between moorland restoration and management and DWS and WFD objectives; therefore, enabling continued support for moorland restoration work. This project was funded by the Environment Agency and Severn Trent Water Limited.