Type of presentation: POSTER

Title: The effects of bog restoration in formerly afforested peatlands on water quality and aquatic carbon fluxes

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Forest-to-bog restoration is a land management practice where drained afforested blanket bogs are being restored to open bog by removing the trees and blocking drainage ditches. This management is carried out with the aim to re-create healthy blanket bog habitat and functionality e.g. carbon sequestration and nutrient cycling. Over the course of 3 years, we studied changes in stream and river water quality as well as changes in dissolved organic carbon (DOC) concentrations and export across a series of forest-to-bog restoration sites in Northern Scotland.

Our results showed significant increases in DOC, phosphate, K and NH_3 (2-99-fold) in pore- and surface- water in the first year post-restoration, which may have implications for the recovery of bog vegetation. In streams significant increases in Fe, Al (both 1.5-fold), and phosphate (4.4-fold) were found. Restoration activities did not significantly increase aquatic carbon exports from the studied catchments. However, as more restoration is carried out within the catchments and the proportion felled increases, greater impacts on streams and rivers may be observed.

Type of presentation: ORAL

Title: Restoring afforested bogs as multi-functional landscapes

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In the Flow Country of northern Scotland, large-scale restoration of formerly afforested blanket bog is underway. In the UK, restoration of peatlands is considered a cost-effective solution for greenhouse gas mitigation that can also deliver multiple benefits, including for biodiversity and water quality. We conducted research to evaluate changes in water quality, greenhouse gas emissions, vegetation, microbial communities and invertebrate assemblages following large-scale conifer removal and drain blocking. We found that while there has been some progress in restoration sites towards conditions found in blanket bogs, there are still some barriers to the full recovery. In particular, we have identified that biogeochemical processes as well as invertebrate and microbial communities all suggest that hydrology is not fully recovered yet. Furthermore, nutrients derived from brash decomposition appear to have long-term effect on water quality and vegetation. We discuss how novel management techniques may overcome these barriers in the future.