

Project Title: **Tree removal and peatland restoration impacts on water quality in the Halladale River Atlantic salmon spawning sites**

This project aims to determine the impact of tree removal and peatland restoration on the chemical water quality of River Halladale Atlantic Salmon spawning sites. Monitoring has been ongoing since June 2013 to measure a range of water quality parameters (Table 1) in the River Halladale and its tributary the River Dyke (pre-felling), which are salmon spawning sites. Additionally, streams which collect drainage directly from felled plots and flow into the Rivers Dyke and Halladale are also being monitored as they discharge into salmonid waters (Figure 1).

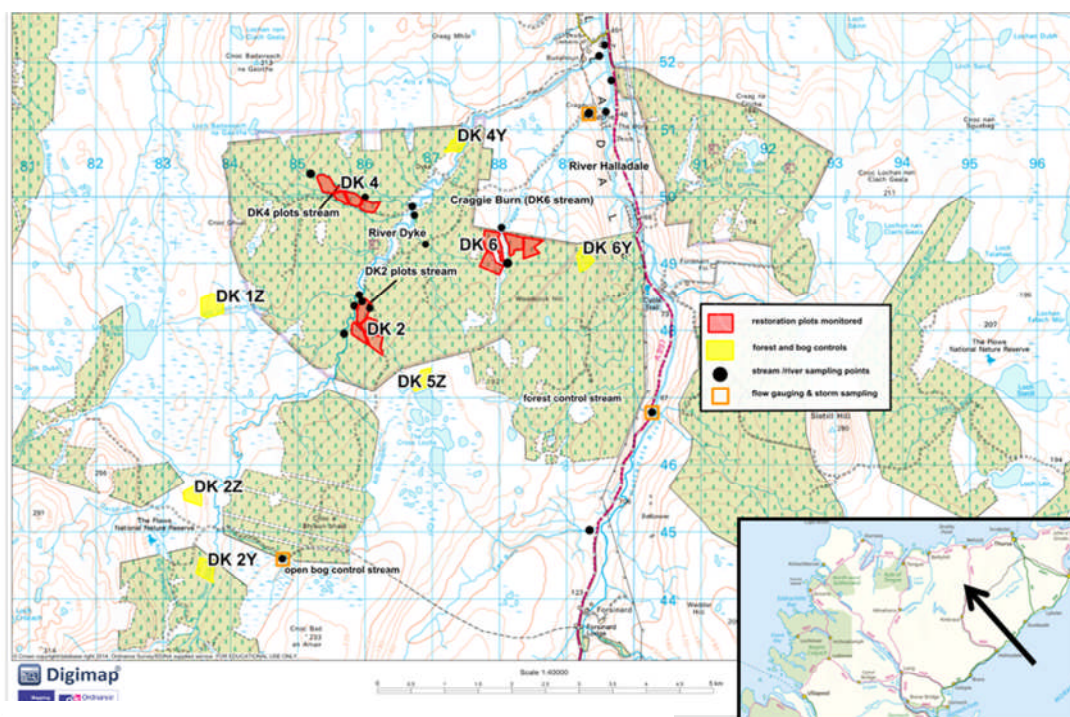


Figure 1: Map of stream and River sampling sites

Peatland restoration on blanket bog aims to return damaged peatlands into a peat accumulating system with natural bog vegetation. This is achieved by removing trees and raising the water table. The effect of felling in particular can include increased concentrations of nutrients, metals and pH alterations - all parameters that juvenile salmon are sensitive to, particularly in the egg, alevin and fry stages. It is therefore important to monitor these water quality parameters. Tree felling was scheduled for November 2013, but this has now been delayed (due to various factors) and re-scheduled for July 2013. This avoids both salmon spawning and the time when eggs and alevins are present, therefore minimising the risk to salmon populations.

Water Quality monitoring consists of monthly sampling for the following parameters in the field and in the laboratory (Table 1). The funds from this MASTS grant have been directly used to support these analytical costs, in the purchase of filters and standards (Table 2). The items purchased by this grant will support the analysis of around 650 samples for dissolved organic carbon and a lesser number for other parameters. In addition to routine monthly sampling, samples are also collected during high flow events, using automatic water samplers (Figure 2).

Table 1: Monthly field and laboratory measurements

Field Measures	Lab Measures
pH	Dissolved organic carbon
Electrical Conductivity	Dissolved nitrogen and phosphorus
Temperature	Aluminium
Dissolved oxygen	Iron
Stream discharge	Manganese
	Zinc
	Base cations (K, Na, Ca, Mg)
	Suspended Particulate Matter
	Turbidity

Table 2: Breakdown of costs for MASTS grant SG106

ITEM	QUANTITY	COST (unit)	TOTAL COST
Glass Fibre Filters (Fisherbrand)	7	£27.63 + VAT	£232.09
Cellulose Acetate Filters (Sartorius)	2	£90.72 + VAT	£326.59
pH 4 buffer solution	1	£3.85 + VAT	£4.62
pH 7 buffer solution	1	£4.11 + VAT	£4.93
Conductivity standard 1413 μ S/CM	1	£31.45 + VAT	£37.74
Glass Forceps	1	£2.10 + VAT	£2.52
		total	£608.49

Claim to MASTS = £500 of total order cost

