



River Calder Restoration: Habitat Enhancement

Project Report, November 2020

Summary

With funding from the Scottish Environment Protection Agency (SEPA), the Spey Catchment Initiative took measures to improve habitat for fish and other aquatic biodiversity in the River Calder near Newtonmore. Poor salmonid juvenile productivity had been linked to sub-optimal substrate and sediment processes. As there is very little riparian woodland along the river, Large Wood Structures (LWS) were installed to mimic natural dead wood and kickstart hydro-morphological processes to increase natural erosion and deposition, encouraging formation of higher quality, more diverse habitats in the channel and potentially providing water quality enhancements.



Background, Aims and Rationale

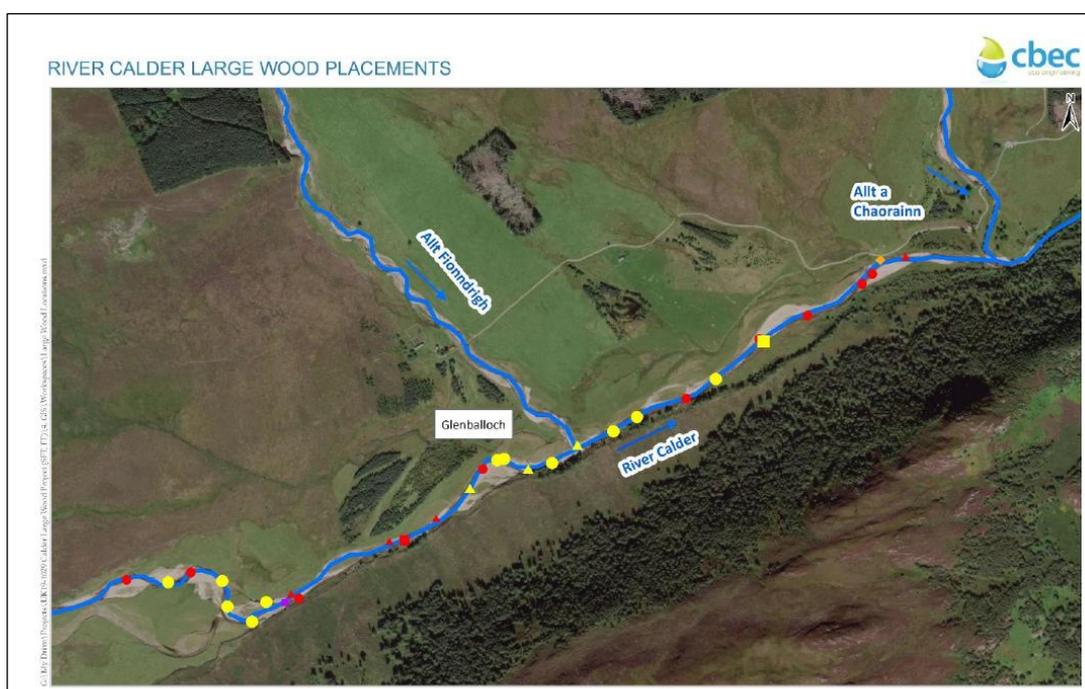
The Calder is a major tributary of the Spey draining Glen Banchor, a glen to the west of the village of Newtonmore characterised by a mountain and moorland landscape. It forms part of the River Spey Special Area of Conservation (SAC), designated for its internationally important populations of Atlantic salmon.

There is clear evidence for a decline in salmonid fish populations in the Spey catchment and most other Scottish salmon rivers over recent years. The causes are complex and as yet uncertain, but as the downward trend becomes increasingly evident there is a growing imperative to take action to boost breeding and survival success where it is achievable and most needed.

Spey Fishery Board data indicates that compared to other similar tributaries the Calder has been under-performing in terms of its productivity for salmon and trout for some years, with numbers of salmon and trout fry and parr consistently low since the early 1990's. It was suspected that this is partially due to the observed relative uniformity of channel geomorphology, linked to the sparsity of riparian woodland and, consequently, woody material in the channel. By introducing Large Wood Structures (LWS) to the river, there was an opportunity to restore and enhance habitats in and around the river to help bolster salmonid breeding success. This approach is in effect mimicking natural dead wood in river channels which occurs in more wooded catchments and is increasingly recognised as an essential component for the ecological and hydro-morphological functioning of the river system. The LWS are also likely to mitigate flood risk by helping to slow the rate of flow to some degree, through the physical barriers formed by the wood itself, increased channel roughness and friction, and possibly gradual development of increased channel area, encouraging the river to spread out over a larger area at higher flows. The LWS are also likely to mitigate flood risk by helping to slow the rate of flow to some degree, through the physical barriers formed by the wood itself, and increased channel roughness and friction. Over time, they may also cause the raising of the river bed due to gravel deposition around the LWS, encouraging the river to spread out over a larger area at higher flows and providing increased temporary water storage to reduce flood risk in Newtonmore down below.

The sustainability of the project is ensured through delivery of a complementary initiative to create over 22ha of new riparian native woodland on both banks of the Calder, due for completion in spring 2021. As it establishes, the woodland will provide a source of future woody material in the river, as well as many other ecological and flood risk mitigation benefits. Together the proposed actions have the potential to achieve positive change on a landscape scale, hugely improving the resilience of the Calder catchment to future climatic threats.

Groundworks



Consultants cbec Eco-engineering were appointed to draw up a design extending over a 1.6 km section of the Calder for strategic placement of LWS (whole or large parts of felled trees with root balls attached) in the channel in positions where they would have best effect. A total of 29 medial and bar apex placements were installed, with the structures securely anchored in to the banks and/or river bed and further stabilised with boulders. The trees were harvested from a nearby windblown conifer plantation. The work was completed over 10 days during August 2020 using local contractors G.S. Campbell Ltd.



Monitoring and Evaluation

Photographic record

Detailed photography of the river channel focussed on the area around each structure was undertaken immediately after installation and will be repeated at least annually. One LWS has been selected for on-going medium to long term time lapse photography by local specialists Scotland: the Big Picture.

Aerial surveys

Drone mounted technology was deployed by Edinburgh University/Scottish Rural College prior to works to record detailed visual images and topographic data, and will be repeated at annual intervals, to facilitate monitoring of morphological and land cover change at various scales. The project has and will continue to provide opportunities for post-graduate student research.

Ecology

Long term fish data from regular Spey Fishery Board surveys is available and will be compared to future surveys at annual intervals. Electrofishing and redd counts are undertaken. During a salmonid redd count survey in November 2020, a number of redds were seen associated with gravel deposition around the LWS in the reach where little spawning activity had previously been recorded, a very encouraging early result. Aquatic macro-invertebrate samples were taken before the works at strategic locations and will be repeated in spring 2021 and at 2-3 year intervals thereafter to provide an integrated indicator of water quality and ecological status.



Water temperature

Automated continuous water temperature loggers are installed in the river, one upstream of the project reach and one downstream. Data will be downloaded regularly to monitor long term trends, and shared with the Scottish River Temperature Monitoring Network run by Marine Scotland Science.

Publicity and knowledge dissemination

The glen is well used for recreational access, and on-site interpretation will be installed to explain and highlight the restoration work. Both the LWS project and the current woodland creation scheme are being widely shared online and through other media channels, and have already been the subject of a short film professionally produced by Scotland: the Big Picture. The outcomes of on-going monitoring will be shared via appropriate scientific and sector platforms, and use of the site for further study, research and visits will be encouraged.

We would like to acknowledge funding support from SEPA, the kind permission of Pitmain and Glenbanchor Estates and Cluny Estate, and the support and assistance of our other partners.

**Penny Lawson, SCI Project Officer
30/11/2020.**