



## LIFE Dee River project

LIFEDeeRiver is a major large-scale project to transform the River Dee and its catchment by restoring the river and surroundings back to its natural state. This will bring many benefits to the environment, most notably improving the numbers of salmon, lamprey and freshwater pearl mussels to help them become more sustainable in future.

## Erbistock weir

The Dee is a Special Area of Conservation (SAC) with Atlantic salmon an Annex II species that are a primary reason for selection of the site. One of the flagship projects of the LIFEDeeRiver was to be the removal of Erbistock weir as it is the first major barrier on the non-tidal section of the river Dee for Atlantic salmon (*Salmo salar*), sea lamprey (*Petromyzon marinus*), European bullhead (*Cottus gobio*), river lamprey (*Lampetra fluviatilis*) and brook lamprey (*Lampetra planeri*).

Erbistock weir is approximately 80m wide, stone built and set at an angle to the flow circa 46km from the tidal limit. A baulk fish pass was located on the right bank which is in a bad state of repair and is only suitable for a limited range of species (mainly salmonids) at certain flows. This can be seen in figure 2. Removal of the weir would open up approximately 88km of main stem river for all fish species.

There was an area of damage to the glacis of the weir, which made fish passage more challenging, due to competing attraction flows. The removal location was dictated, to a degree, by the location of this damage.



**FIGURE 1** View of Erbistock Mill across the weir in high flow - September 2023 © RRC



**FIGURE 2** Side view of section to be removed taken from lefthand bank till current damage to weir face.  
© LIFEDeeRiver

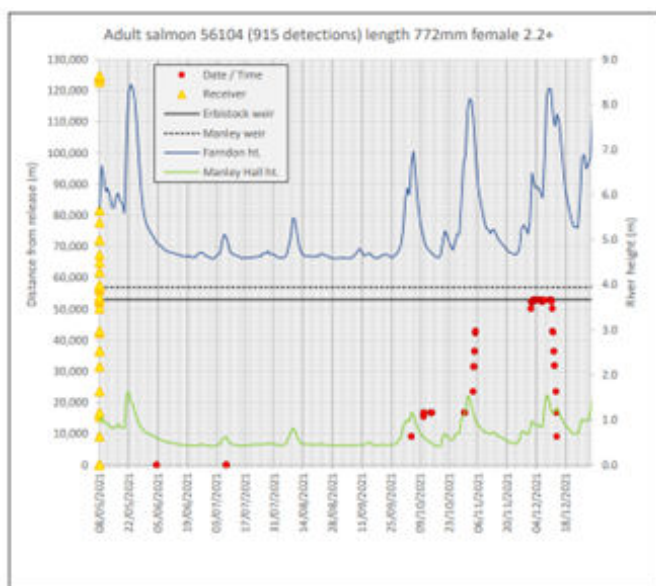


**FIGURE 3** Location map of Erbistock Weir near Wrexham, Wales. © LIFEDeeRiver

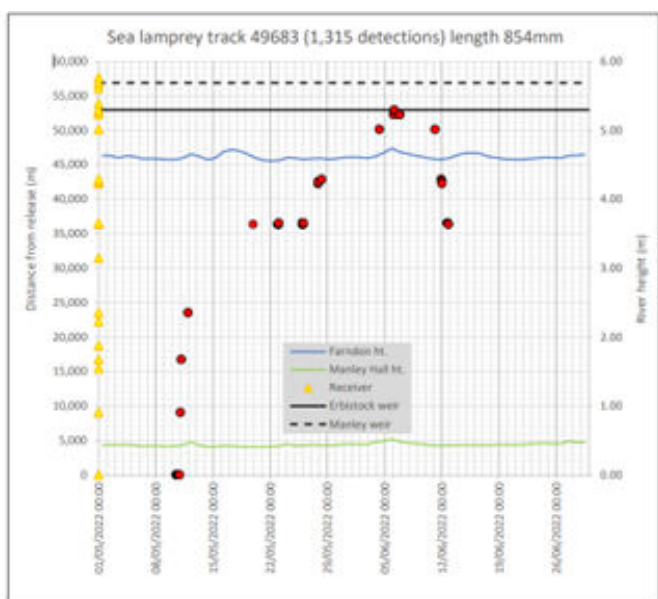


## Current issues

Through acoustic tracking studies, the LIFEDeeRiver project demonstrated that Erbistock weir was a partial barrier to *Salmo salar*, *Petromyzon marinus* and *Lampetra fluviatilis* (figures 4 and 5). On the graphs, the red dots indicate detections picked up on a receiver (receivers denoted as a yellow triangle on the Y axis). The solid black line indicates Erbistock weir.



**FIGURE 4** Acoustic track of adult salmon that failed to pass Erbistock weir. © LIFEDeeRiver



**FIGURE 5** Acoustic track of adult sea lamprey that failed to pass Erbistock weir. © LIFEDeeRiver

## Planning and funding

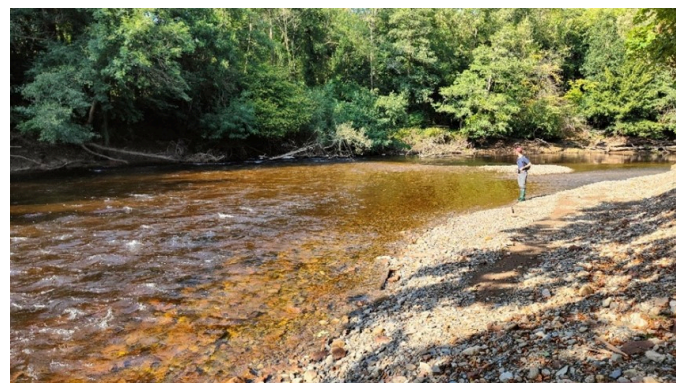
The project is generously supported by the European Union LIFE+ Nature and Biodiversity Programme, as well as Natural Resources Wales, Welsh Government, Dwr Cymru/Welsh Water, Eryri National Parc, and the River Restoration Centre.

All management of the project was done within the dedicated LIFEDeeRiver project team, with assistance from colleagues both within and outside Natural Resources Wales.

The final cost for the removal of Erbistock weir was just over £500,000, which offered a saving of around 30% on the initial quote, through savings made by the contractor. The removal has ensured that passage for all fish species (not just the SAC features) is now unhindered for the first time in nearly 200 years.

## Proposal

The proposal was to remove approximately 40m of the weir to create a new primary flow channel. This will mimic the natural width of the river in the area to imitate the natural morphology present to encourage natural processes to re-establish. All stone removed from the site was redistributed within the channel, either to provide protection for the remaining weir, or as habitat creation.



**FIGURE 6** 200 m above the removed Erbistock weir. Bars and islands can be seen here at low flow as river gravel becomes mobile again – September 2024 © RRC

Detailed flow and flood flow assessments were made prior to securing all required permissions. As the structure had no current impoundment licence, this had to be granted to allow removal to be carried out, as well as HRA assessment, Flood Risk Activity Permits, planning permission and European Protected species licences.



**FIGURE 7** View of the removed weir and free flowing river the end stages of completion  
© LIFEDeeRiver

## Heritage

The weir in its current form was of an unknown age, with records of a structure at the site dating back to the 11<sup>th</sup> Century. Through discussions with Cadw and Heneb there was a requirement to carry out a level 2/3 survey on the site ([Historic Building Recording - Heneb](#)). It was recognised that the site was previously listed with the Mill building, but this listing had been removed following work to the mill building in the 1990's.

Heneb archaeologists carried out a level 2 survey in 2023, covering the landscape and setting of the features (mill building and weir). During the removal of the weir a periodic watching brief was carried out by archaeologists from Heneb, which allowed them to record the con-

struction materials, artifacts and fully document the weir. This link with heritage has ensured that we have all learnt more about the construction of the weir, protecting history and ensuring the records are available to the public.



**FIGURE 8** Some of the long diagonal weir was retained to help protect the mill September 2024  
© RRC

## Delivery

Work on site was carried out by a local contractor (S E Metcalfe a'i Gwmni Cyf) over an 11 week period in 2024. Flows during this period remained low for much of the time, with work on the weir only halted for 1½ days due to high flows. Access was created to the weir from the right bank, where a compound area was created, and machinery were able to track on the top of the weir crest to access both banks.

Dry working areas were created on both banks using dumpy bags filled with river gravel. Once work was completed, these bags were simply slit and the gravel introduced to the system. All stone material remained on site, with metalwork found within the old weir removed and recycled. The work was completed without any H&S incident. Several impromptu rescue drills were carried out during the works, with all staff on site at the time working well.

There was one minor environmental incident when a hydraulic hose on one of the machines split. A small amount of biodegradable oil ent-



ered the watercourse, but the machine operator deployed the correct spill kit and all oil was contained and removed within minutes, leaving no impact to the environment.

## Results

During work contractors spotted sea trout passing the site, indicating that the removal would be effective. In May 2025, a sea lamprey redd was spotted by LIFEDeeRiver officers upstream of where Erbistock weir had been, indicating that sea lamprey had successfully migrated past the structure that previously been a significant challenge to them.

Further monitoring will be carried out using drones on pre-programmed flight paths. These drone surveys will be used to monitor the changes in the upstream and downstream changes to the river channel. Initial results are shown in figure 9.

## Lessons learnt

- Early contractor involvement is key to successful delivery of works of this scale. By engagement with the successful contractor, fewer trees had to be removed than planned, and the access into the river was much simpler (and therefore less costly) than anticipated.
- When working in high water volume environments, it is important that the safety of the contractors is recognised. We had a dedicated rescue team on site for 8 weeks through the most high risk part of the contract.

For more information: [Natural Resources Wales / LIFE Dee River](https://naturalresources.wales/life-dee-river), or to contact a member of the team [lifedeeriver@cyfoethnaturiolcymru.gov.uk](mailto:lifedeeriver@cyfoethnaturiolcymru.gov.uk).

*Views and opinions expressed in the article are those of the author only and do not necessarily reflect those of the European Union or the beneficiaries of the project. Neither the European Union nor the beneficiaries can be held responsible for them.*



**FIGURE 9** Orthorectified image of the post removal area above Erbistock works 4 November 2024.  
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