



Ayrshire Rivers Trust  
working to improve Ayrshire's rivers and lochs

CELEBRATING 20  
**YEARS**  
2000-2020

### Nineveh Trust Funding Report.

#### Hag and Tulloch Burns Fish Passage Easement.

One of the quickest ways to improve fish stocks in rivers is to open up habitat from which they are barred. Man-made barriers are limiting productivity on many rivers around the country which is why Trusts, Boards and improvement associations are prioritising projects to reconnect fish with habitat in their natural range from which they have long been excluded.

The European Union Water Framework Directive (WFD) requires that member states achieve 'good ecological status' of water bodies which have been heavily modified. One of the key requirements of the directive is the requirement for unimpeded fish migration, emphasising the need to improve the ability of fish to migrate up and downstream unconstrained. To meet the minimum requirements for the WFD the river or watercourse must be in a state where there is connectivity

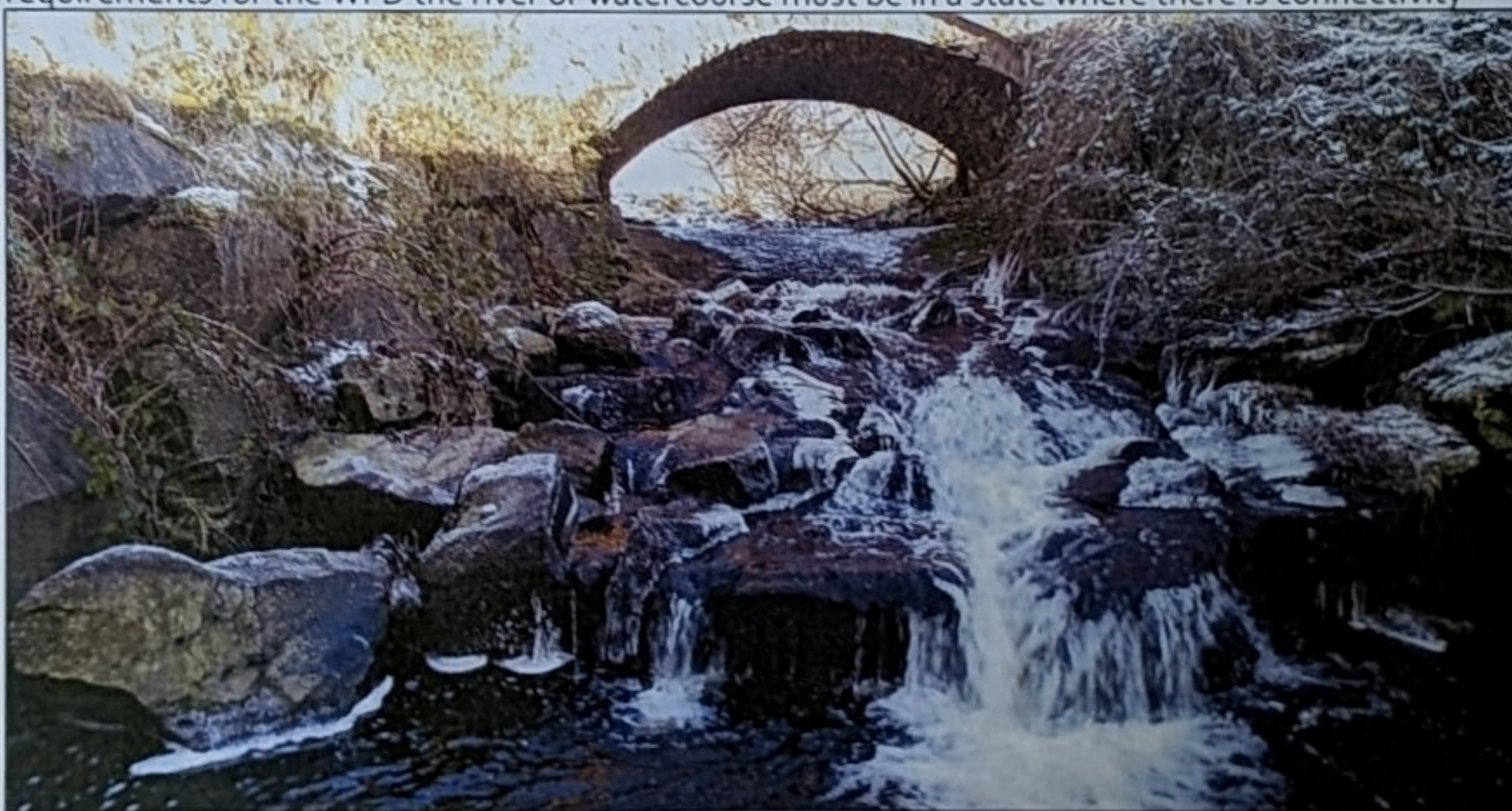


Figure 1: Tulloch Water in low flow prior to any modifications. The gradient between the bottom pool (in the foreground) and the top of the barrier (under the bridge) can be clearly seen from this angle.

between all river areas from estuary to source in both upstream and downstream directions. This project has helped to improve connectivity of the habitat within two sub catchments of the River Irvine.

Ayrshire Rivers Trust with support from Nineveh Trust, East Ayrshire Renewables, Hugh Fraser Foundation and Darvel Angling Club installed 2 new fish passes on tributaries of the upper Irvine; one on the Hag Burn and one on the Tulloch Burn aka Gower Water. Since we started looking at options for these barriers, considerable time has passed. Securing funding for work can be a major problem when developing plans for fish passes and while the Scottish Environmental Protection Agency (SEPA) does have funding through the Water Environment Fund (WEF), it isn't available for



all projects as it is reserved for larger projects where the greatest benefits will be felt such as opening up large areas of habitat on major watercourses.

After months of acquiring funding, the relevant permissions, licences and meetings with contractors we finally began work in the summer of 2018 for the fish barrier easement works on the Hag Burn and Tulloch Water. The reality is from conception to delivery, the work takes years of behind the scenes effort. Actually installing baffles is by far the quickest part of the project!



Using untreated oak baffles installed to the existing concrete aprons on the Hag and Tulloch Burns ART have created depth and resting places for migrating fish. These bridge aprons have been  
**Figure 2: Baffles being fixed to the concrete bridge apron on the Tulloch Water. The timber baffles slow the velocity of water and create depth and resting places for migrating fish.**

almost total barriers for several years. However with the installation of baffles we have created routes for migrating trout and salmon.

The driver behind both of these projects is reconnecting fish with their natural habitat; improving habitat connectivity increases the robustness of salmon and trout populations. The burn above each of the bridges offers fantastic habitat for juvenile salmonids (salmon and trout) and operated below its carrying capacity (a small isolated population of trout exist above each of the barriers). Barriers of this nature disconnect areas of habitat from the catchment and whilst that means migratory fish can't access these habitats that is only half the story. Isolated populations like this are susceptible to inbreeding creating genetic homogeneity potentially causing inbreeding depression (reduced biological fitness as a result of breeding with related individuals) to occur. If there was to be a pollution issue that affected an isolated population of fish, there would be no way to repopulate the area without the intervention of man.





Figure 3: An oak sleeper being cut prior to fitting. Oak was used owing to its longevity in water, whilst more expensive than traditional larch these sleepers should last many years longer. When this bridge next requires repairs, ART will request a permanent technical fish pass solution be installed. In the meantime these baffles should ameliorate the situation.

With low flows during the summer it was the ideal time to carry out this work, as water management was significantly easier during this time. The work on the Tulloch was difficult as there is a significant gradient from the pool at the foot of the concrete apron to the pool above the bridge. Creating resting areas, slowing the flow and creating depth were all critical factors in aiding fish over this obstacle. This meant clever use of timber baffles to manage the water as it comes over the bridge apron. ART explored the idea of using car and tractor tyres (halved and mounted to the concrete) to achieve our aims but ultimately SEPA reasoned that these might invite people to tip their waste over the bridge so a more traditional approach was adopted.

To review the success of these projects ART will monitor the fish populations above the barrier easements for the next three years. If we find improved numbers of trout (compared to our baseline surveys) then we can surmise that more trout are migrating over this obstacle. Finding juvenile salmon upstream of these obstacles is the ultimate goal for the Trust as these obstacles were far more difficult for salmon to migrate over. We began monitoring in the summer of 2019. ART surveyed both watercourses and recorded encouraging numbers of juvenile trout but not salmon. However, across Scotland returning numbers of adult salmon in 2018 were very depressed and when carrying out survey work the old adage of "absence of evidence is not evidence of absence" should always be born in mind when evaluating results.



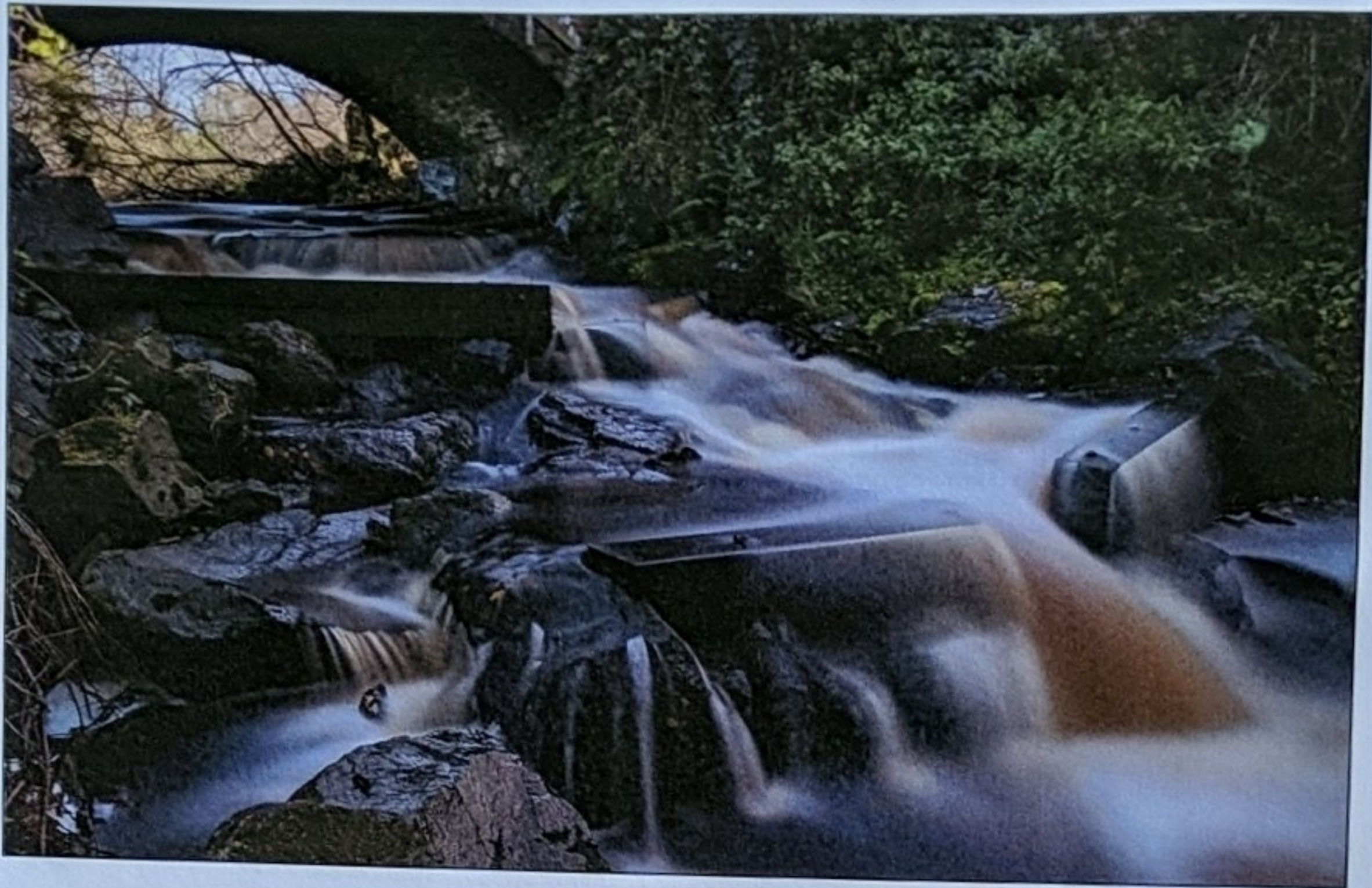


Figure 4: Tulloch Water Baffles complete. Note the concentrations of water, allowing fish to migrate over the bridge apron.

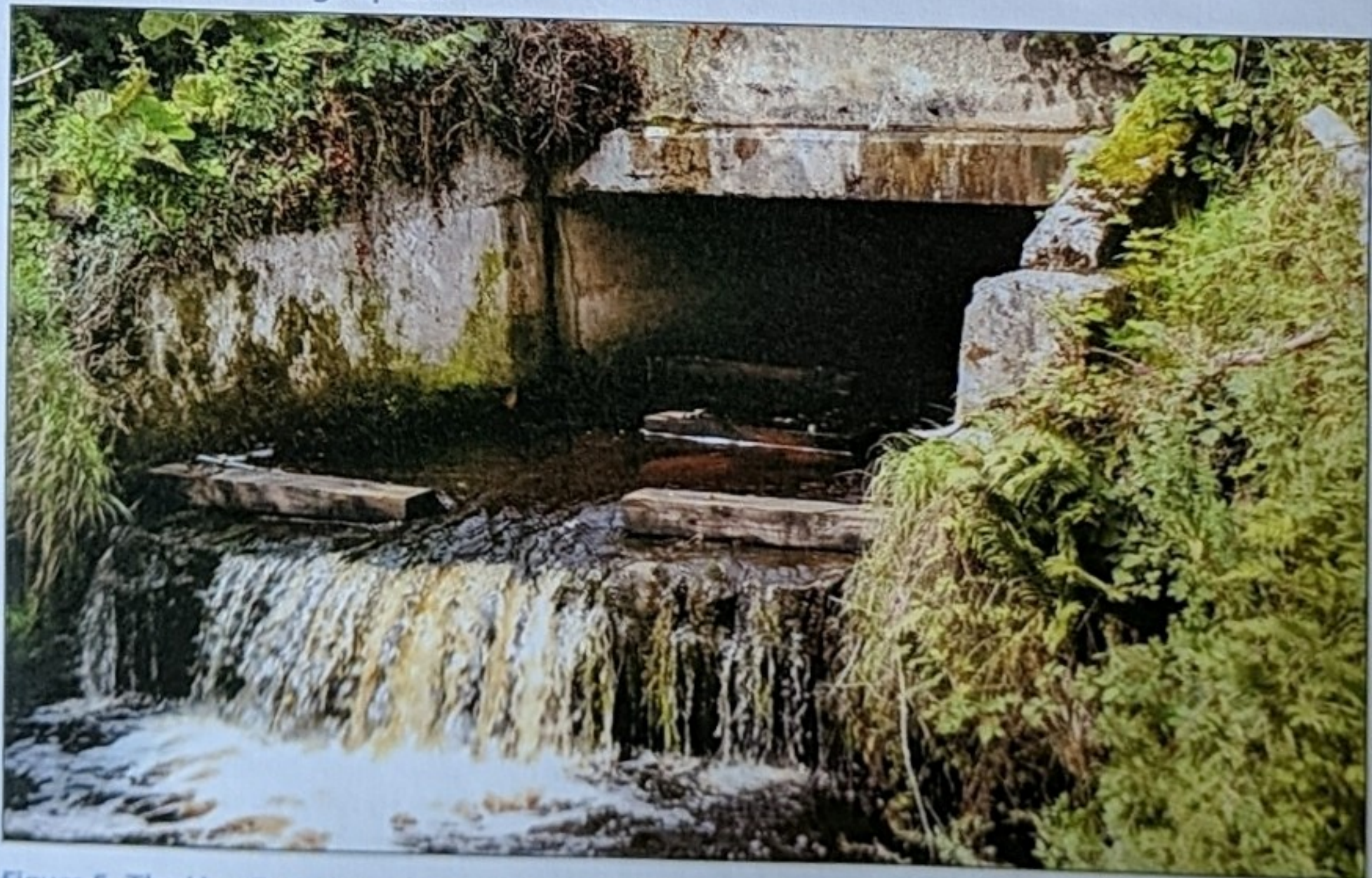


Figure 5: The Hag Burn complete with oak baffles, note the concentrated plume of water for fish to migrate up and the increased depth of water behind the oak baffles.

This project should help increase the number of returning adult fish to the River Irvine in future years. This will benefit not only the environment but the local angling clubs. Supporting clubs and



associations with work such as this has never been more crucial as fish numbers continue to decline. ART are committed to doing everything possible to reduce declines and improve fish numbers in a sustainable, environmentally sensitive manner. Reconnecting river systems is one of the lowest cost, highest return solutions in river conservation.

Local anglers have spent a considerable number of hours watching the obstacles and have reported many fish ascending the barriers, which has been fantastic to hear. ART have also observed fish using the eased routes.

Volunteers from local angling clubs have been clearing the Hag and Tulloch Burns of obstructions and debris to allow fish migrating and emigrating the burn unhindered passage. Both burns are relatively small and heavily wooded which often results in small blockages. Some woody debris is of great benefit to watercourses and we are advising volunteers where their efforts are best focussed.



Figure 6: Local angling club volunteers remove a woody debris build up from the burn to help improve fish passage.

ART have carried out electrofishing monitoring accompanied by volunteers on the Hag Burn and can report healthy numbers of trout but failed to find salmon. However, in the winter of 2019/20 volunteers have observed salmon in the Hag Burn upstream of the culvert. ART continue to make minor adjustments to the structures to improve their effectiveness at a variety of water heights.

ART will continue to monitor these projects with the hope of finding naturally produced salmon above both barriers however in the meantime increasing trout numbers are very welcome.



Figure 7: A brown trout makes the ascent over the Hag Burn culvert. Attracted by the central plume of water fish can more easily make the leap and have resting places and depth to migrate through the culvert.