

Catchment Restoration Fund (CRF) Project Briefing Note

Darley Abbey Fish Pass

Why do we need a fish pass? Many fish species such as the salmon, sea trout and eel have to migrate hundreds of miles from the sea to the headwaters of rivers to spawn. Other coarse fish such as barbel, chub, roach and perch do not migrate from the sea but they do need to be able to swim up and downstream to reach different parts of the river that will provide suitable habitat so that they can complete their lifecycle.

The Derwent Valley Mills in Derbyshire is a World Heritage Site. This international designation confirms the outstanding importance of the area as the birthplace of the factory system where in the 18th Century water power was successfully harnessed for textile production.

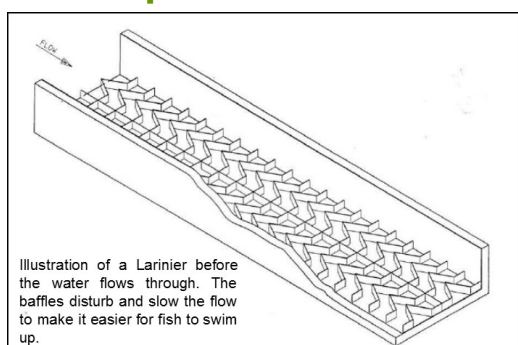
Stretching 15 miles down the river valley from Matlock Bath to Derby, the World Heritage Site contains a fascinating series of historic mill complexes with historic weirs, including some of the world's first 'modern' factories.

However, the weirs of the Derwent Valley prevent fish from migrating and are one of the reasons why it is not reaching its ecological potential.

Weirs and dams create barriers that divide up a river into isolated sections. As a result, wildlife, water, silts and gravels are no longer able to move freely through the river corridor which in turn means that it no longer functions effectively as a healthy river ecosystem.

In this beautiful and historic valley, a careful balance is being struck between our industrial heritage and the ecological status and potential of the river.

Description of Works



Named after their inventor, Larinier passes rely on a series of low, thin baffles, usually of a herringbone design on plan, fitted on the base of a rectangular trough.

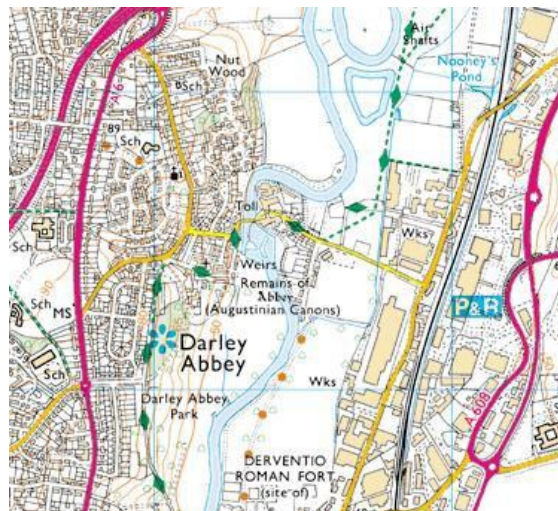
At Darley Abbey a Larinier fish pass has been carefully selected from a range of options. Being in a World Heritage Site, it was clear that the weir could not be removed or modified significantly and the Larinier was judged to be the least visually obtrusive. It will be put through the island in the weir where, as the visualisations below indicate, it will hardly be seen. It is being built by Trent Rivers Trust with funding from the Catchment Restoration Fund. The contractors carrying out the work are A and V Squires and the pass was designed by Fishtek Consulting.

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The Larinier fish pass at Darley Abbey will be 3m wide internally and 24.40m long, with two sections at a 15% gradient set end to end, separated by a small resting pool. It will be the largest in the country built by a Rivers Trust. A careful balance is being struck so that the pass is unobtrusive to people, but fish find it. It therefore needs to pass enough water to create an 'attraction flow' for fish, hence its size. A concrete lined trench will be precision made at a specified level such that there is enough water down it for fish to be attracted while retaining sufficient water over the weir.

The concrete will be pumped across to the island and formed in situ. The Larinier has been crafted in individual sections, by Hutchinson Engineering, further down the Trent near Newark. The edges are carefully curved and filed after being galvanised so that fish are not injured. They will be taken to the island by boat and bolted and chemically fixed.

The contractors are taking detailed precautions to avoid polluting the river, and will ensure that crayfish plague which threatens the native white clawed crayfish is not spread by destroying or carefully cleaning equipment between jobs.



What will success look like?

In 2012 the Environment Agency and Derby City Council opened fish passes at Borrowash and Derby. These allow salmon to swim as far upstream as Darley Abbey. This year, salmon have been seen leaping at the Darley Abbey weir. With the fish pass, they will no longer have to leap uselessly, wasting energy and probably dying, but will be able to pass through and reach the river upstream, into the Ecclesbourne and the Derwent as far as Milford.

About the team

Project Manager: Julie Wozniczka

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Finance: Sandra Worsley

Director: Chloe Palmer

Other contacts

Environment Agency: Jim Finnegan

Trent Rivers Trust will use video filming to monitor the fish using the pass, probably for a full year after completion. This will be a useful addition to the Environment Agency's monitoring programme and is being planned alongside this.



Trent Rivers Trust is working with the Environment Agency, World Heritage site and hydro power interests to work out how to allow fish past the historic weirs at Milford and Belper. This work is also funded by the Catchment Restoration Fund.



At Darley Abbey, the fish pass will be built in the island, and the upstream exit will be in a slot in the stonework just above the water line shown towards the right of the **picture on the left**. The stones will be removed and then replaced in their original positions above the slot. The entrance for fish swimming upstream is at the downstream of the island and will be as shown in the **picture on the right**. Carefully matched stone will be placed around it to protect it from erosion.



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