

Background

Westcountry River Trust wishes to improve fish passage at Bolham weir on the river Exe (Lat: 50.927908, Long: -3.4975979). *Figure 1*. The Bolham weir, *Figure 2*, is currently a barrier to upstream migrating fish. It is proposed to construct a new larinier fish pass and eel pass bypassing the weir on true right bank and creating pre-barrages at the weir toe.

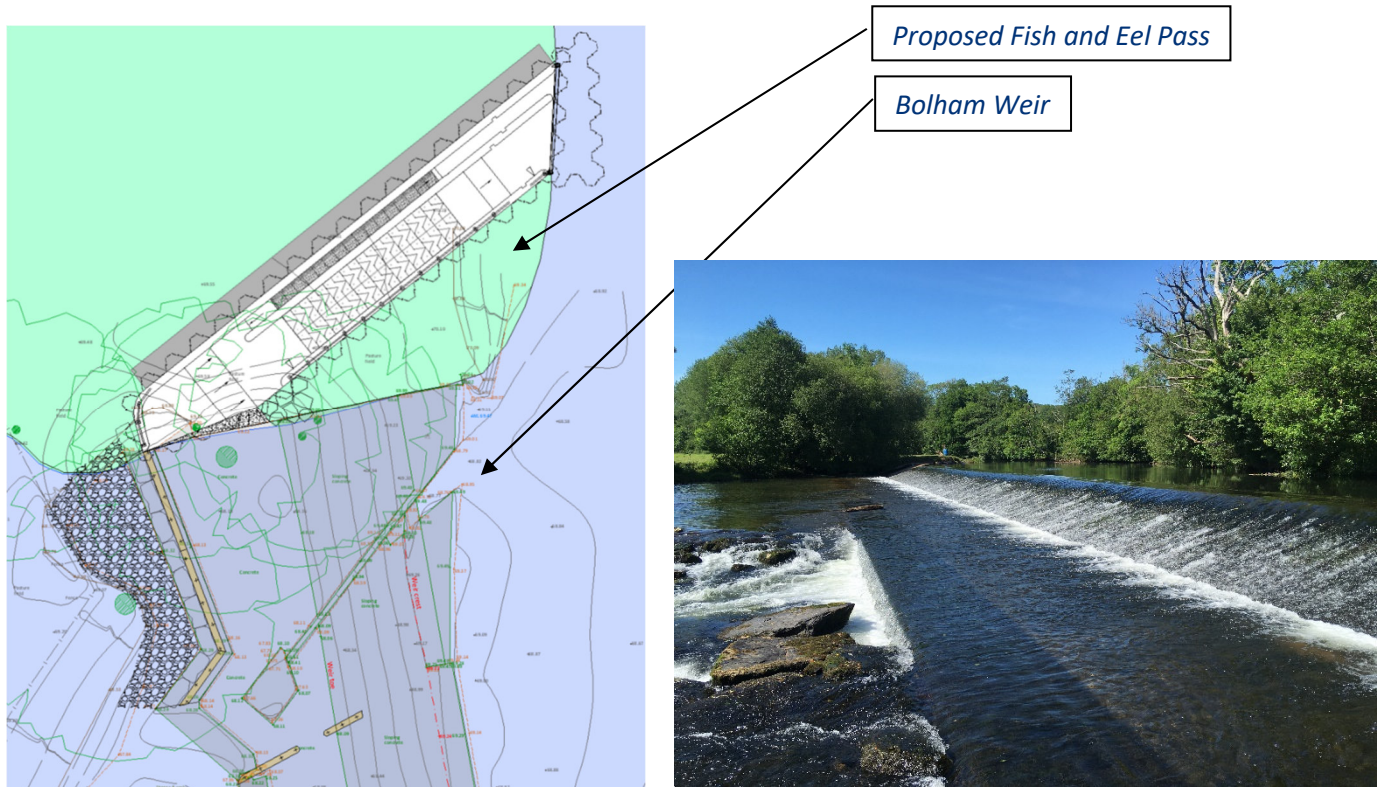


Figure 1. Location of proposed fish pass at Bolham

Figure 2. Bolham Weir

Key Design Issues

- The site is located within an area prone to flooding out.
- There is restricted access to the true right bank side (when viewed looking downstream).
- The fish and eel pass must not undermine the structural integrity of the existing weir.
- The fish and eel pass entrance must satisfy the Fisheries Technical requirements i.e. in particular the entrance must be sited at the most upstream position of the weir toe.
- The fish and eel pass must be technically sound, in terms of fish passage, robustness and durability at all locations under all flow conditions (where possible).
- The fish and eel pass should be designed, to suit the environmental and aesthetic setting within Bolham weir area.
- Any demolished / cut concrete should be disposed of site.
- There is restricted access to the site:
 - There is no vehicle access available from the true right bank side. Temporary track through private land will have to be built or route in river on pontoons.

Key Design Principles & Features

- The larinier fish pass and eel pass is designed as a RC concrete structure:
 - For robustness & durability.
 - To reduce the lifting requirements associated with pre-fabrication.
 - For compatibility with available access
- The fish and eel pass is located inland and bypasses the weir, such that the entrance is located on the true right bank side, to:
 - Satisfy fisheries technical requirements.
 - Facilitate the formation of a cofferdam to construct the work, whilst mitigating the structural risk to the existing weir.
- Rip rap stone is provided to provide:
 - Bank erosion and bed erosion protection upstream and downstream of the fish and eel pass to ensure that erosion is controlled to maintain the position and section profile of the fish pass.
- The fish and eel pass design facilitates shallow foundations to mitigate the risks associated with groundwater and river levels.
- The fish and eel pass general operations (maintenance) are made by hand with no requirement for vehicles or lifting plant:
 - All access is compatible for pedestrians and manual handling e.g. decking, handrails, ladders and penstock handwheels.

Construction Methodology

- It is assumed that:
 - The main site compound will be located on the true right bank side, which will be accessible by site traffic vehicles through temporary track or via pontoons.
 - Materials will be lifted by crane (land-based or pontoon); concrete poured from land using boom pumps; all subject to approved RAMS and FRAP. A site compound and delivery turning area can be established within the private field to the northeast of Bolham Weir. Herras fencing, warning signage required, *Figure 3*. Temporary access tracks to work areas will be formed of granular fill/crashed stone on geogrid from riverbank to the river level. The public right of way to the fish pass can be partially or completely closed for the duration of the works (subject to Local Authority approval). Public interface will need to be assessed by contractor.
 - 5 m clearance between access & compound areas and trees is required.
 - The works will be undertaken during dry weather and at a period of low flows. All necessary tree works will be agreed with the Landowner. Surplus materials / arisings will be removed from the site. Cofferdam and pumping may typically involve the use of dumpy bags and pumping seepage water via silt-buster or a settling pond in accordance with good practice. Land surrounding the fish pass will be re-graded and re-seeded. Any felled trees will be replaced with mature stock where appropriate. Any footpath / re-surfacing and disturbed ground will need to be reinstated and seeded where appropriate.

Bolham Weir

Buildability & Design Philosophy Statement

To be read in conjunction with DRA and drawings 02925_200 – 214

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Figure 3. Access Route & Compound Location