

ARRT Project Summary

Project Title/Name: Costers Brook Connectivity Project: Oaklands Farm Multi-Culverted Bridge	Date (Start Date (Month/Year) – Finish (month/year)) Start: Initial Planning, Design, Budgeting: Summer 2011 End: Works completed end of May 2012
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Location: **Grid Ref & Place Name:** Oaklands Farm, Midhurst, GU29 0EJ. Grid Ref (farm track): SU 89432 20135

Country and County: United Kingdom, England

Project Status: complete/in-progress/planned: Completed

River Name: tributary/main river/catchment: Costers Brook/Western Rother/Arun & Western Streams

Contact Name of Project Officer/Manager and Organisation: Ses Wright, Project Officer for ARRT

Project Themes/Drivers: Pick all that apply: In-channel habitat & biodiversity Flood risk management Urban rivers Environmental flows/water resources Land use management–agriculture Economic aspects Fisheries Hydropower Water quality Land use management–forestry Social benefits Hydromorphology Climate resilience Monitoring Education & Engagement Catchment planning and survey work

Project Aims and Objectives: The culverted farm bridge comprises several concrete drainage pipes laid lengthways along the bed of the Costers Brook, with brickwork above to form the sides of the bridge. Under low flow conditions there is often insufficient water through the pipes to allow fish passage. At higher flow conditions the water velocity can be too great to enable all but the strongest migrating fish to navigate the culverted bridge. This is particularly the case if one or more of the culverts become blocked by debris, which increases the velocity through the remaining pipes to the point at which it significantly limits fish passage. The proposal was to either replace the bridge with a clear spanning alternative, or to look at modifications to the site to improve fish passage over a wider range of flows than currently exist.

Project Outcomes: The landowner preferred to keep the culverted bridge in-situ (having built the structure with his father when young) so means of improving fish passage other than replacing the bridge were undertaken. This was addressed by raising the riverbed level at the tail of the plunge pool immediately downstream of the bridge by constructing a rock and gravel ramp. The onsite works were delivered by Whiting Groundworks Limited in conjunction with the Wild Trout Trust (WTT). Approximately 20 tonnes of Sussex rough-hewn sandstone blocks of varying sizes (between 200-400mm width/length dimensions) was carefully placed into the Brook, top dressed with 20 tonnes of finer land-dug natural flint river gravel (~40-60mm diameter) to raise the water level of the plunge pool by approximately 200mm. The introduced stone and gravel increased the depth of water through the culverts and reduced flow velocity, enabling fish passage upstream of the structure as well as creating new spawning habitat for all flow-loving fish species, improving river morphology and flow, and enhancing connectivity between the river and adjoining wet woodland, thus improving biodiversity potential.

Project partners: WTT, Whiting Groundworks Limited, with support from the local Environment Agency.

Before the works:



High velocity, shallow flows disperse from the rows of concrete culverts laid slightly proud (higher) of the riverbed creating additional scour and fish passage problems. The aim of the project was to raise the downstream water level over a wider range of flow conditions to help increase the depth of water in the culverts and reduce the speed of flow both of which will significantly ease fish passage.

After the works:



Water depth through the culverts increased by approx 150-200mm with a lower flow rate over a greater range of flow conditions that enhance fish and eel passage at the site. Improved habitat and river connectivity also delivered.



