

SAC345 Cumwhinton
Cumwhinton, Cumbria
 Small scale permanent

BIG Challenge 2015 submission category: Small scale permanent

Project overview

The culvert is a twin bore brick culvert carrying the Pow Maughan watercourse underneath the railway line.

The works site is bounded by a small woodland, a railway line and agricultural land which is used predominantly for grazing. Pow Maughan Beck flows into the River Eden which is a SAC and a SSSI site.

The cost of the project was approximately £175,000 and the area of the worksite was less than 0.2 hectares.

The key aim for this biodiversity project was to increase the general bat roosting potential, improve riparian habitat in terms of a fish shelter, particular brown trout populations and the bank ecology.

The site team were 6 in total including the Site Manager and an Environmental Advisor, who was part time on this project.

What were the biodiversity conditions on site, prior to the enhancement?



Photo: Pow Maughan stream profile before the enhancement works

The downstream western headwall may have been used as a roosting location for small numbers of pipistrelle bats.

Adjacent to the headwall, there was breeding roost of Myotis bats. The woodland contained standard trees which had little bat roosting potential.

Were there any specific conditions that led to you carrying out this work?

The silt mitigation required the installation of 2 no of concrete aprons either ends of the culvert.

All this work required a Flood Defence Consent, however the only condition placed upon us was the ensuring that the work was completed by mid –October.

Due to the presence of a maternity roost adjacent to the worksite and the potential for bats to roost within the culvert headwall, European Protected Licence was required and thus there was the requirement for additional bat boxes.

What were the biodiversity measures taken?

- The stream was silting up due to the presence of a fence which was used to allow cattle to poach the stream bank. This fence was removed to allow better passage for the fish.
- Small pieces of locally occurring rock were placed within the downstream concrete apron, with a protrusion 50mm at 1m centres, creating riffles.



Photo: Pow Maughan stream profile widen and enhanced post work completion

This improved aesthetic value to the Pow Maughan, by increasing the concrete roughness, which reduced the water speed locally and provided valuable resting areas for fish, who would then be able to traverse 30m up the culvert.

- Block stone was stacked on top of each other in the form of a 'green rock armour' at either ends of the culvert. The gaps between the blocks are used as a refuge for species or allowed access to enter the bank.
- A maternity bat roost was found adjacent to the upstream culvert meant the work could only start in September. In addition, the stream is known for the brown trout spawning and therefore we were required to be out of the water by mid-October

- Additional bat habitat was created within vicinity of the area, installing 9 no. of bat boxes on trees and five natural crevices were left unfilled, as they did not pose a risk to the structural integrity of the repairs/ headwall.
- At the end of the project, new fence line was installed which ran behind the bank ensuring that cattle would not poach it, allowing riparian species to flourish.

allow the construction of the concrete apron and scour protection without causing water pollution.

Stone were installed in 1 metre centres by using youngman boards. The brick repairs were done via rope access from the railway line, however to ensure that no debris could enter watercourse, a proprietary floating pontoon system was used. Long Term Benefits.

The project's long term benefits are riparian aesthetics and ecology in turn this will improve the area for bat foraging. In addition, the project has improved bat roosting areas.

How would you best describe the project?

An enhancement.

Further information

Broad Methodology The stream was dammed using a proprietary system and then over pumped in order to

Lessons Learnt Going forward, all scour protection schemes which require concrete aprons in front of the culvert entrances will have use stone protrusions within it.

Using a local seed mix to cover the exposed soil areas adjacent to the stone blocks.

What was your personal motivation for carrying out the enhancement?

I wanted to deliver biodiversity on a small scale project, with many enhancements happening only on large scale schemes.

I was attracted to this project as it had a number of environmental interfaces. It motivating to see a few small changes making a big difference.



Photo: Bat boxes located on nearby trees