



Unlocking the Severn is a conservation and river-engagement project to unlock the UK's longest river for people and wildlife.

The project was delivered by Canal & River Trust, Severn Rivers Trust, Environment Agency and Natural England, and funded by the National Lottery Heritage Fund and the European Union LIFE Programme.

Background

Unlocking the Severn has been a once in a lifetime river restoration project, restoring connectivity for migratory fish on the UK's longest river and engaging thousands of people with the fascinating natural, cultural, and industrial heritage of the Severn.

The twaite shad are a species of herring which were once seen migrating upstream through the River Severn in their hundreds of thousands each May. The spring phenomena of the 'May Fish' migration, was once an important feature of life along the River Severn. However, the construction of navigation weirs in the mid-1800s separated the fish from their natural spawning grounds, blocking them from the upper reaches of the river for nearly 180 years. Although hugely beneficial for trade, permitting the transportation of more goods to support the industrial revolution, the construction of these river barriers sent the population of shad into chronic decline. The shad were confined to the lower reaches of the River Severn downstream of Diglis Weir in Worcester.

To reconnect this fragmented ecosystem, Unlocking the Severn harnessed modern engineering solutions, undertaking work on two major rivers at six sites which had been identified as the barriers to migration. The project has constructed 4 large fish passes at the weirs at Diglis, Bevere, Holt, and Lincomb on the River Severn. Two weirs have also been modified on the ecologically important tributary the River Teme, at Powick and Knightsford. The aim was to help restore the twaite shad population by significantly improving access to quality spawning and nursery habitat, re-establishing a total of 158 miles (253 km) of their former natural range. As well as reconnecting the river for shad, the project has also benefitted numerous other species of river wildlife, including salmon, eel, and lamprey, through improved access to river habitats beyond Worcester.

Alongside the construction of the fish passes, Unlocking the Severn delivered a ground-breaking scientific monitoring programme to improve knowledge and understanding of the twaite shad. In addition, the project has engaged local communities, and a wide-reaching online audience, in conservation, long-term protection, and sustainability of rivers and their wildlife. The support of volunteers and citizen scientists has been especially integral to the project's success.

The Fish Passes:

Construction of the four fish passes on the River Severn commenced in May 2019 with the final fish pass completed by May 2022, thereby unlocking the River Severn for migratory fish for the first time since the mid-nineteenth century – or around 35 generations of twaite shad!

The fish passes break down the height difference created by the weir, into more manageable sections. This allows fish to bypass the weir on their journeys upstream. Three of the fish passes (Diglis, Holt & Lincomb) are 'deep-vertical slot' fish passes, with a long channel of interconnected pools of water providing a more manageable ascent for fish. The fourth, at Bevere, is a nature-like bypass channel,

which more closely resembles a river channel, and was able to be constructed due to the greater amount of land available at this site.

At time of construction, Diglis Fish Pass was the biggest deep vertical slot fish pass in England and Wales, and includes a unique underwater viewing window. This window provides an amazing opportunity to monitor the movement of the fish, and also provides a memorable experience for local schools and members of the public to come and see wild fish moving in the river. More than 25 species of fish have been recorded using the Diglis Fish Pass, filmed by monitoring cameras through the underwater viewing window.

Scientific Monitoring

Scientific monitoring was a hugely important component of the project. It underpinned all other work: informing the fish pass design, measures of success, public engagement, citizen science, and international knowledge exchange and collaboration. Shad are a relatively poorly studied fish, but thanks to the dedication of scientists, students and volunteers who made up the Shad Monitoring Subgroup, the project resulted in one of, if not the, largest study into shad behaviour in Europe to this point.

Several techniques were used to monitor twaite shad migration and the success of the fish passes. Tagging of fish was an important method to track the behaviour of individual shad and their unique journeys through the river and back out to the estuary, as well as measuring the efficiency of the fish passes. Spawning monitoring using audio devices and citizen scientists gave insights into the location of potential spawning sites for the shad. Citizen scientists were also vital for helping estimate the migrating population through 'shad counting' sessions at Upper Lode Weir in Tewkesbury. Cameras in the underwater viewing gallery at Diglis Fish Pass provided data on the number of different species, including shad, using the fish passes during the spring migration season. Finally, eDNA samples were taken at different locations in the River Severn to test for the presence of shad.

Scientific monitoring results have proved that shad have successfully passed through all four fish passes on the River Severn. In 2022, eDNA samples were collected during the spring migration. Results demonstrated the presence of shad beyond the fourth and final fish pass. This confirmed that historic spawning grounds were accessible for shad for first time in almost 180 years!

You can find out more about the monitoring techniques used on our webpage here: www.unlockingthesevern.co.uk/about-the-shad/

Community Engagement

The scientific and engineering achievements of the project have been accompanied by a hugely exciting and successful community engagement programme which has reached over 65 million people through active participation, interactions and media impressions. Exciting tours, events and exhibitions, schools programmes and a wide range of volunteering opportunities have encouraged people of all ages, interests and backgrounds to be inspired and learn from the River Severn.

In the first year of being open to the public, 7018 people visited Diglis Island & Fish Pass, and that number will continue to grow over the coming years. More than 6,700 school children have been actively engaged throughout the course of the project, and online reach to schools was even greater: inspiring nearly 250,000 individuals with the story of the shad. Volunteers and citizen scientists have also contributed skills, expertise, and enthusiasm through giving over 15,000 hours of volunteering. This will also continue far beyond project completion and ensure an effective and long-lasting legacy.

You can find out more about the project on the website www.unlockingthesevern.co.uk or by following **@SevernUnlocked** on social media.