CASE STUDY

Remove structures that are no longer needed

Project Summary

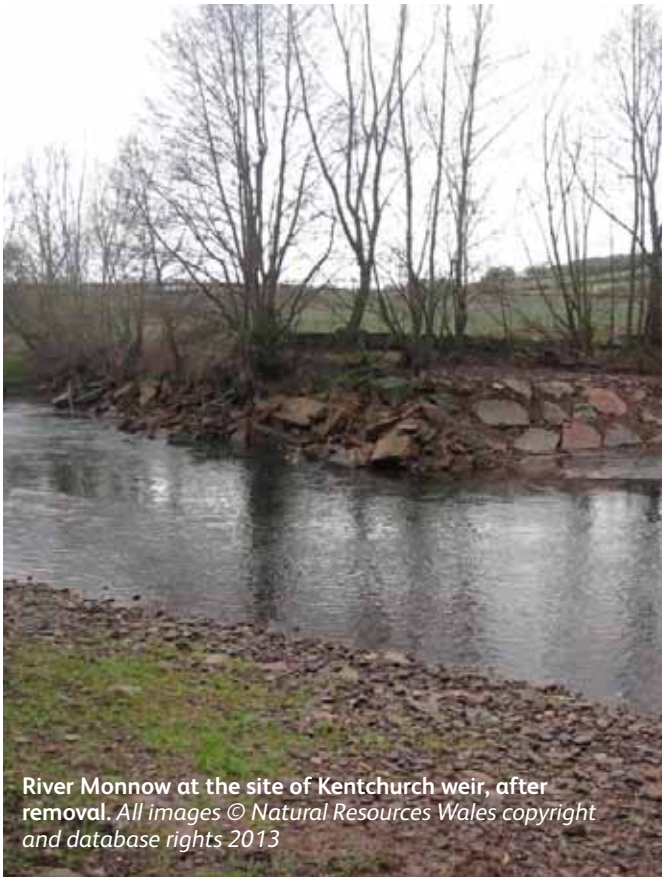
Title: Kentchurch Weir Removal
Technique: Weir removal
Location: River Monnow, Kentchurch, Monmouthshire, England / Wales
Cost of technique: ~~£~~~~£~~~~£~~~~£~~
Overall cost of scheme: ~~£~~~~£~~~~£~~~~£~~
Benefits: ~~£~~~~£~~~~£~~
Dates: 2011

Mitigation Measure(s)

Remove structures that are no longer needed
Improve channel geomorphology to create habitat

How it was delivered

Delivered by: Environment Agency Wales (now Natural Resources Wales)
Partners: UK European Fisheries Fund Operational Programme; Atkins; Cardiff University; local landowners.



River Monnow at the site of Kentchurch weir, after removal. *All images © Natural Resources Wales copyright and database rights 2013*

Removal of Kentchurch weir

CASE STUDY

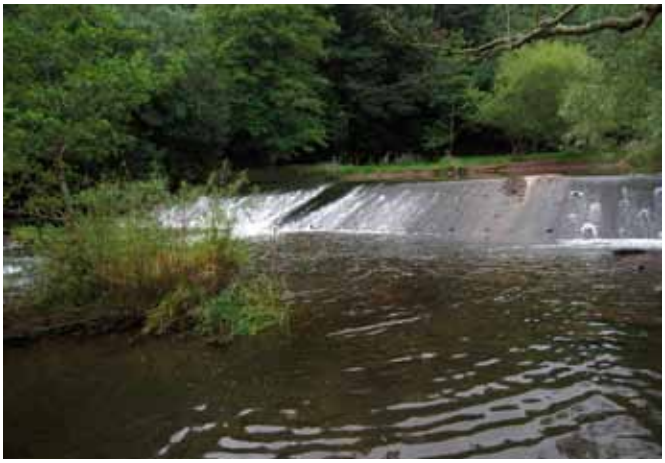
Background / Issues

Kentchurch Weir was situated on the River Monnow within the Kentchurch Estate near Hereford, where the river marks the border between England and Wales (the counties of Herefordshire and Monmouthshire respectively).

In 2008, EA Wales supported by Atkins constructed a fish pass at Osbaston Weir, which is also located on the River Monnow, approximately 3 km upstream of the confluence with the River Wye. This scheme had restored habitat connectivity in the lower River Monnow catchment, after fragmentation that had lasted for centuries.

With the weir at Osbaston now being passed by hundreds of brown trout, plus salmon and other species of fish, the last remaining major barrier on the Monnow was the weir at Kentchurch, a further 20 km upstream.

There is excellent river habitat in the upper reaches of the Monnow, but the full potential of this habitat was not being realised, as it was effectively inaccessible due to the two metre high weir. The removal of the weir was preferable to creating a fish pass at the site as removing the barrier would completely reinstate full habitat connectivity and therefore generate major biodiversity improvement, and allow the uninterrupted transportation and supply of river gravels to downstream reaches.



(1) Kentchurch weir during high flows;
(2) Kenthcurch weir during low flows, just prior to removal

Step-by-step

Preparation

- The weir was inspected in 2008 as part of strategic study conducted to identify opportunities for removing barriers to fish passage within the catchment of the River Wye. This study was followed by a feasibility study regarding weir removal.
- Bathymetric (level) survey and sediment sampling and analysis were conducted to ascertain the risks of pollutant release and the increased risk of bankside failure from water level change from weir removal.

Demolition

- Weir demolition took two weeks.
- Straw bales were installed downstream to create a sediment trap during removal.
- Work commenced by slowly removing a section of the weir through demolition to bed level adjacent to the abutment on the east side of the river. The river was diverted to flow through the lowered section and the level progressively lowered to the downstream level.
- Much of the material that was excavated was recycled on site in order to reinstate access routes between the farmer's fields.
- Upstream regarding of the bed and banks to increase stability and reduce risk of significant erosional impacts.

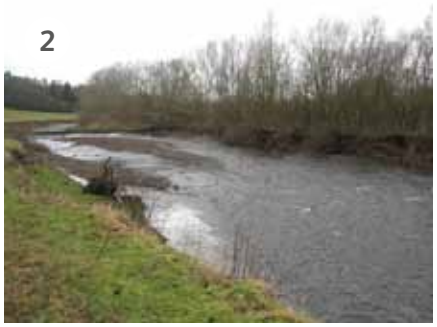
Monitoring

- Active monitoring programme, in collaboration with Cardiff University.
- Intervention to ensure re-naturalisation of the river happens in a way that does not have unacceptable adverse consequences for other stakeholders.

(1) Straw bales in place as a downstream sediment trap; (2) Excavator lowering the first section of weir to create a flow channel; (3) Demolition of the main weir; (4) Earthworks to previous site of weir after

Benefits

- The removal of Kentchurch Weir has allowed a further 160 km of the River Monnow catchment to return to its natural condition of connectivity and flow.
- The largest weir removal project in Wales, and one of the biggest in the UK.
- The project has resulted in improved access for fish to the river's upper reaches and in the immediate vicinity of the weir.
- It also reduces the risks of poaching and predation by removing a bottleneck where fish may be held up.
- A natural environment and habitats for macrophytes and invertebrates have been restored.
- Hydromorphological conditions have been restored through natural recovery, allowing natural processes to shape the watercourse.
- Farmers received new roads adjacent to the river.



(1) River Monnow upstream of the weir prior to removal, (2) River Monnow upstream on the weir, six months after removal

Lessons Learnt

- Engagement with local research organisations can provide multiple benefits when it comes to post-construction monitoring.
- The channel has adjusted naturally with very little intervention, suggesting that future weir removal projects do not need to include for significant bed and bank re-profiling (i.e. restoration works) post demolition.

Project contact: Fisheries and Biodiversity Team, South East Area, Natural Resources Wales