

At the Anglers' forum held at Worcester racecourse on 22 April it was agreed the Angling Trust would coordinate concerns raised by affected angling clubs and the Agency would reply to these concerns.

The comments were received by the Agency following a meeting between the Angling Trust and representatives of the Save Powick Weir Facebook group and the following angling clubs on 21 June 2016: Barbel Society, Birmingham Angling Association, St Johns Angling Society, Kinver Freeliners Angling Club, Wards 84 Angling Club, and White Swan Piscatorials Angling Club.

Please note the project is still at the design stage and answers below are correct as of August 2016.

Some questions will be answered during the detail design phase which is expected to be complete in the spring of 2017.

A) IMPACT CONCERNS:

Waters above Powick Weir:

Immediate:

- Depth loss leading to reduced coarse angling opportunity and fish predation.

EA reply

There will be a reduction in water depth immediately above the weir reducing along the river as you move upstream. This impact disappears above the railway bridge near Bransford. We are investigating suitable designs to manage the impacts, with the change in depth being determined during the detailed design phase, which is due for completion in the spring of 2017.

Angling will change due to the drop in water levels but overall angling opportunities should increase as there will be greater habitat diversity leading to more diversity of species and greater reproductive success. This will have a positive impact in the immediate vicinity as well as many kilometres from Powick Weir.

We would expect a reduction in cormorant numbers where the river becomes shallower.

We want to work with angling clubs to monitor the long term impact. If there are clubs or individuals interested in helping with monitoring and supplying catch returns please let us know.

- Increased water velocity leading to bank erosion, and loss of access for coarse angling (peg loss).

EA reply

There will be no significant increase in overall water velocity upstream of the weir as it will equalise. The current wetted channel will narrow which will create more flow diversity; in some areas flow velocity will increase and in others a pool will form. The creation of riffles and pools will occur as the natural process in the river is restored. These riffles will provide essential spawning habitat for many fish species including chub, dace and barbel.

The banks will be monitored and any slips managed appropriately. We expect it to take two seasonal high water events for the naturalisation of embankments to occur.

We hope access for anglers will improve. The opportunity for equally placed formal pegs along the currently impounded section may reduce but we understand much of the angling now practiced on the lower Teme is a more roving type of fishing and a lower water level will aid safer access to the water edge. We would like to meet individual angling clubs on their sections to discuss any specific concerns and suggestions they may have as well as potential opportunities.

Future:

- Bank collapse and land loss.

EA reply

The banks show good tree growth and there is likely to be good stability but some banks may slump.

We will work with the landowners to monitor any bank erosion.

We would welcome the opportunity to facilitate a site visit to view the weir removal at Kentchurch on the River Monnow to demonstrate the results and impact of a similar project.

- Tree fall and channel blockage (liability for tree removal – on EA or riparian owner?).

EA reply

Specialist arboriculture advice will be taken prior to works on the weir to reduce the likelihood of tree fall. Some trees will be coppiced or pollarded in advance of the work in order to maintain root structure and to help prevent vulnerable trees from falling into the river.

Landowners are responsible for maintaining trees along rivers and the Environment Agency has discretionary powers to undertake tree work for flood risk benefits.

We would note that woody debris in a river channel is essential to create habitat diversity and is particularly useful for juvenile fish protection and predator avoidance.

- Fish rescues, poaching and fish predation during low water conditions

EA reply

It is unlikely fish rescues will be required on this part of the Teme, given the volume of water as it is just a few kilometres from the river Severn. It would require the upper and middle reaches of the Teme to completely dry up for this to become a problem at Powick. It is important to note that the low flows on the River Teme upstream of Leintwardine, which occasionally require fish rescues, have no bearing on the flows around Powick.

If anglers see anyone removing or moving fish illegally they are encouraged to report the incident on the Environment Agency's 24-hour incident hotline (0800 80 70 60) as it is happening or as soon as possible after witnessing the event.

As stated earlier there is no reason to suggest that predation levels will increase. Riffles and pools create channel diversity and give more places for fish to hide from predators compared to an open impounded section. An increase in habitat diversity and connectivity will provide more food so larger specimen fish are less likely to be taken.

- characteristic changes to the topography of the river, with "V" gouging of the river bed and the destruction of gravel areas due to the increased velocity of the river during times of flooding.

EA reply

There will be an increase in localised velocities immediately upstream of the weir as the impoundment will be removed but overall the velocity will not significantly increase and will equalise as noted above.

The river will not however form a V gorge. The channel profile will change from a uniformed deep, slow moving section to one of riffles and pools. Some of the glides may be quite deep. The gravels will move around to create this, which is a natural process which will improve the spawning gravels and refresh gravels downstream that are currently rather degraded.

Waters below Powick Weir:

Immediate:

- Bank collapse and land loss.

EA reply

Bank slippage is already taking place as it occurs as a natural process and will continue to do so regardless of changes to the weir.

Detailed design models will show the effect of water velocity and potential for bank erosion following changes to the weir. We will be considering mitigation works as part of our design to minimise slippage caused by works on the weir, as appropriate. Any remedial work will prioritise safeguarding property and infrastructure.

- silt deposition into established fish spawning gravels - heavy metals, chemical laden silt from behind - and above the weir, washing down into the current spawning grounds of the lower Teme and Severn.

EA reply

Silt deposits will be redistributed naturally with the first flood event.

Any silt loading from the impoundment behind the weir will be much lower than may come down the river from other sources such as agricultural inputs. There is no evidence of heavy metal contamination. The silt will be tested as part of our preparatory works and will be managed during the weir works. Work will be undertaken in a responsible manner to prevent damage to the existing biodiversity through working processes and careful timings of the work. If the silt is found to contain any onerous substances then it will be removed from site as contaminated waste, however works carried out by the Environment Agency in the 1990s did not find any such contaminants and very little silt.

It is important the gravels are allowed to redistribute through natural processes as these will be cleaned and refresh the poor spawning gravels downstream.

Future:

- effect of continuous and increased silt deposition due to upstream bank collapse.

EA reply

Banks will not continuously collapse after the initial effect of the works although they will adjust as in any natural river system.

The majority of sediment inputs into a river are related to issues with farming practices which numerous organisations including the Environment Agency are working hard to address.

- increased tree-fall debris

EA reply

As noted above, fallen trees will be managed by the Environment Agency if they pose an increased flood risk. The Environment Agency will also continue to monitor the effects of our works on riverside trees. As stated above we would note that small woody debris in a river channel is essential to create habitat diversity and is particularly useful for juvenile fish protection and predator avoidance.

Working responsibly and protecting the archaeological features of the site (for example Old Powick Bridge) are paramount to our approach.

B) DATA REQUESTED:

Before any final decision on the project, more detailed data modelling to show predicted effects of full weir removal:

EA reply

Further data modelling is important for us to determine the most advantageous solution to the partial weir removal and as we progress through the detailed design stage.

We will share our findings when the detailed data modelling has been completed, a better visualization is available and we are able to fully illustrate our way forward. We would welcome the opportunity to explain the results at a meeting with the Angling Trust and affected clubs.

- Detailed mapping of depth changes upstream and downstream of weir.

This is planned as part of the project development stage however we would note this mapping will show indicative depth changes.

- Low water (summer) levels at existing shallow points (schedule in river walk-overs to identify vulnerable areas).

As part of our due diligence checks this is planned as an action in the project development stage.

- Predicted increases in water velocity, for a variety of river levels (low to high water conditions).

This is planned as part of the project development stage. Please note modelling at this scale will be unable to show flows at very specific points, but rather will show flow and magnitude of change in areas.

- % loss of water available to traditional coarse fishing methods.

There will be data to show the expected water depth.

- Overview mapping of changes to course of river, identifying where new erosion will take place.

A river is a dynamic habitat and will naturally move over time. Changes to the weir will only contribute in a small part to this natural process.

Ahead of any construction work, reference data should be collected to provide baseline fish levels, to allow scientific assessment of the effect of any changes in years to come, generally lacking in past examples cited by the EA, e.g.:

EA reply

We recognise we need to work with angling clubs to monitor fish populations and angling stocks to determine success. If there are clubs or individuals interested in helping with monitoring and supplying catch returns please let us know.

- a) 3 years of shad monitoring test data from below Powick Weir (2015 kick data already collected by Bournemouth University).

EA reply

Historical records as highlighted at the Angling Trust's April Forum show the site below Powick is important for shad spawning. This area will be improved by refreshed gravel deposits.

The real benefit for the species will be enabling their access to many more kilometers of spawning habitat upstream, by partially removing the weir.

Bournemouth University's study of current spawning downstream of Powick will continue. We have also completed and will continue to monitor shad numbers elsewhere in the system as part of the wider Unlocking the Severn project.

b) 3 years of coarse fish catch and/or electrofishing data from above and below Powick Weir.

EA reply

Routine monitoring already takes place on the Teme, but probably not at the level of resolution to show a change at this specific location. Any trends are often masked by large inter-year variation because of fish movement, making inter year comparisons at a site level hard to achieve. A monitoring methodology will be considered as part of the wider project evaluation.

c) Collect full results of ongoing barbel study/tracking to identify if weir is currently effectively blocking passage for barbel especially at spawning times.

EA reply

We are planning to conduct a fish tagging exercise however the results gained from this over one season can be very subjective.

C) WE WOULD LIKE CONSIDERATION OF AND COMMENT ON ALTERNATIVE PROJECT MODELS, AVOIDING COMPLETE WEIR REMOVAL:

1) Installation of an easement at Tewkesbury Weir (with Powick Weir remaining intact), then carry out shad monitoring of the established spawning grounds below Powick Weir (3 years, improving status required).

EA reply

The works at Powick Weir are one component of the wider Unlocking the Severn project – where funding is allocated to re-establish 253km of lost habitat and spawning ground for the shad. There will be other benefits, but the aim is focused on the shad. Such an easement as proposed will not help achieve this wider project aim as Powick Weir provides a physical barrier to fish migration which needs to be overcome to increase their access to historic spawning and nursery habitat for in excess of 40km upstream on the river Teme.

2) If shad status improving based on (1), proceed with partial Powick Weir removal (e.g. 0.7m) combined with construction of an appropriately sized rock ramp or fish pass in weir pool, to improve connectivity.

EA reply

We are currently investigating to what extent Tewkesbury weir acts as a barrier to shad migration, so currently there are no plans to undertake any work at Tewkesbury. As stated previously the decline in shad on the river Severn was as a direct result of loss of access to their spawning areas through the creation of barriers to their migration. Where it is impossible to remove the obstruction, such as in the case of the navigation weirs, expensive bespoke shad passes have been designed. Even employing the latest knowledge and designs no fish pass is as efficient as no barrier for fish passage success. A fish pass also does not restore natural morphological conditions needed to refresh spawning gravels. For these reasons the first option considered in any restoration is to see if the obstruction can be removed, we believe this is possible at Powick and hence represents the best option for all fish and riverine restoration.

3) If (2) not acceptable, minimize risks by implementing a phased weir drop (e.g. 3 x 0.5m, carried out over 10 years) with annual depth, flow and fish monitoring to assess environmental impacts.

EA reply

There would be no fisheries or economic benefits in taking this approach. Indeed to prolong construction could have a detrimental effect and cause prolonged inconvenience.

4) The alternatives other than weir removal to be explored, such as fish passes, ramps and lifts, which must be combined with a study of the aqua culture of the Shad and the restocking of shad above and to the upper reaches of the Teme (which has proven to be successful in the USA and Europe in supporting the repopulation of the Allis Shad).

EA reply

The aim of this project is to reconnect lost habitat. Restocking may be useful to speed up the use of the newly restored habitat but is not the sole answer. Initially we will rely on natural re-colonisation rather than stocking but this will be reviewed as part of the monitoring element of the project. As stated previously no fish pass is as effective as a weir removal. Fish lifts are not appropriate technology on smaller obstructions like this; they are more commonly used on large dam structures. The River Teme Restoration Plan requires the restoration of natural processes.

D) MITIGATION

At the meeting held at Worcester racecourse, one of the reasons stated for opting for a full removal of the weir was that it was cheaper than a fish pass solution and would mean there was more money available to instigate habitat improvements on the river to mitigate for the inevitable issues arising from increased erosion that will be caused by the project. We would therefore like to know:

1) What is the difference in cost between fish pass solutions and weir removal?

EA reply

This project is about finding the right solution to meet the above stated aim, in this case weir removal.

2) How much money will be set aside and ring fenced for mitigation and habitat work on the effected stretches?

EA reply

The purpose of the detailed design procedure is not only to determine the best available method of fish passage but also to investigate the effects of its provision and the mitigation and habitat improvement works necessary. The Environment Agency will endeavour to determine sufficient budget to be able to do this work.

3) How will this project money be allocated, who will decide where the money is spent and who will carry out the work?

EA reply

Funding will be allocated through the project team's governance. There will be funding for mitigation works if appropriate. The Environment Agency has a framework tendering process to determine the best placed consultants and contractors to carry out the work.

It is our understanding that one of the Environment Agencies key targets is to increase angling participation and improve fisheries FOR ANGLERS. We therefore feel that it is essential that any large project like this should have benefits for angling participation and improve the angling environment. As Shad are not a legal quarry for anglers we feel it is key that benefits for coarse fishing are uppermost in the minds of those planning this project. Therefore we would like to know:

EA reply

Please note this project does not use rod licence funds but rather from government sources and partnership match funding. The Environment Agency acknowledges its commitment to improve fisheries for anglers and it is hoped that by improving fish migration through the partial removal of Powick Weir we are doing this.

It is important to note that following a competitive tendering process the Angling Trust successfully won the contract to deliver the Agency's angling participation objectives. We would be keen to work with clubs and the Angling Trust in increasing angling participation in and around Powick.

1) What pre and post project monitoring work will be done to assess the success of the project for coarse fish stocks?

EA reply

The focus of this project, as stated above, is the shad and reconnecting shad to its historic habitat – although there will be benefits to many other fish species. Outside of the project we are looking to see if we can extend our existing monitoring to include some more work in the lower reaches of the Teme. We would need catch returns from clubs to make this really worthwhile and are keen to work with local clubs.

2) What pre and post project monitoring work will be done to assess the success of the project for coarse angling participation levels?

EA reply

We are not planning to monitor angling participation levels. There are many factors affecting angling participation - not all of which are related simply to the number of fish.

3) There is an ongoing barbel study being carried out by SRT which involves tagged barbel being tracked, will the project wait to see the results of this tracking and the weirs impact on spawning barbel before plans are complete?

EA reply

We will continue with the detailed design phase as planned. We will review the results of the barbel study, which we are supporting, when they become available. We note that initial results indicate that only a very low percentage of barbel made it upstream over Powick weir in the 2016 spawning season despite good flows. This supports earlier work on barbel that shows even relatively small barriers can act as a significant deterrent during crucial spawning migration.

Final note

We would like to meet individual angling clubs on their sections to discuss any specific concerns and suggestions they may have as well as potential opportunities.

If there are clubs or individuals interested in helping with monitoring and supplying catch returns please let us know.