

Hinksey Stream bypass channel

Bypass channel to improve fish passage and improve habitat along the main River Thames

Tributary and Main River: Hinksey Stream, River Thames

County: Oxfordshire

Project start date: 2011. Main construction between September & October 2012

Project end date: Summer 2013, after planting-up and addition of river habitat features (wood and rock)

Length: 100m

Cost: £ 80,000 (approx.)

Grid reference:

SP521045 (Upstream)

Site background and objectives

The longest river flowing entirely through England, the Thames, has thirty-eight main tributaries and flows through nine counties. It is one of the most modified and heavily managed rivers in the UK. Alterations have included the addition of many structures such as weirs and locks, primarily to aid navigation, but these also present barriers to fish passage and wider river connectivity.

Iffkey lock was a barrier to fish migration on the main Thames at Rose Hill. Hinksey Stream provided a natural bypass for this structure; however a weir at Hinksey was also a barrier.

The aim of the work was to restore fish passage in this section of the main Thames by building a new channel to bypass Hinksey weir, allowing Hinksey Stream to act as bypass channel for the main river. The works also aimed to provide habitat in the new section of channel, specifically for gravel spawning.



Hinksey weir – August 2013



Bypass channel looking upstream – August 2013

Design and Implementation

Design works started in 2011. It was initially thought that the project could be carried out within the Environment Agency's permissive rights, however local authority planning permission was required. The site is very close to the centre of Oxford, which imposed some controls on the project during construction. Access to the site was gained via one of the main roads into the city, so a traffic management plan had to be drawn up at the request of the local council. It was agreed that the site would not allow vehicle access during rush hour periods to mitigate for this. The proximity of the site to Oxford also meant that a comprehensive flood risk assessment was needed before the project could go ahead.



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Construction began on site in September 2012. Mains services ran through the site, but the exact location was not known, so the team had to hand-dig to find these before excavation works could begin. An archaeological survey was also carried out. Within four weeks the Environment Agency's experienced internal workforce team had completed structural works. Access for large machinery was difficult, so it was decided to use a floating pontoon to bring machinery and equipment over from the opposite bank where the land was owned by a local nature reserve. Most of the excavated material was taken off site to a location outside the floodplain, reducing project cost compared to sending this material to landfill.

Upstream control structure – August 2013



Downstream end of the new channel – August 2013

In terms of the overall design, the main limiting factor was space. The landowner was keen to retain as much land as possible for grazing, so the design needed to be both space-efficient and stable to allowing fencing to be erected close to the banks. The inlet structure was constructed first, with the rest of the channel dug to meet it. The structure was designed to allow 1 m³/s into the bypass. The channel is 100m long and the weir has a 1m drop, therefore the new channel gradient was set at 1 in 100. Channel design had to be fairly sinuous to incorporate this gradient and was narrowed slightly at the entrance and exit points to create an attraction flow for fish.

Due to the predominantly clay substrate and a lack of existing vegetation or woody material available at the site, once construction of the channel was complete, the banks and surrounding area remained as bare soil for some time. Extremely wet weather during and soon after construction also meant that it was impractical to line the banks with top soil, as had been planned. The site was planted in the summer of 2013 and some woody material and rock habitat features were added to the channel.

To protect the bare channel in the short-term, control boards were inserted across the inlet structure to regulate the flow. These were gradually removed as the channel re-adjusted and vegetation began to stabilise the banks. Vegetation establishment has been mixed; the upper banks now have a good cover indicating a good seed bank was present, but despite having a full growing season, the in channel banks are patchy. Installation of coir rolls is being considered to help some of these areas vegetate more quickly.

Pools and riffles were incorporated into the design to encourage the formation of bed and flow diversity. Gravel was added to create spawning habitat, which is especially lacking on the main Thames, where spawning gravels are mainly restricted to weir pools.



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Gravels could be seen in the new channel. Banks had begun to re-vegetate; some bare earth patches remain– August 2013



Some woody material and stones were added to encourage bed diversity– August 2013



Subsequent performance – RRC's views (2013)

Although the channel banks have been slow to re-vegetate, the design is stable and functioning well in a variety of flow conditions. Most importantly, the main project objective to provide an opportunity for fish passage around Iffkey lock and Hinksey weir has been achieved.

This project proves that it is feasible to restore fish passage along a major UK river, close to an important urban area and with limited space and budget. The addition of live woody material and additional gravels will ensure that the project maximises the additional habitat benefits that bypass channels can offer, not only for fish, but also for invertebrates and other river species.

Monitoring will be carried out by the Environment Agency to quantify the success of the scheme in terms of improved fish passage. A pre-works fish survey and fixed point photography have already been undertaken.

References:

http://www.environment-agency.gov.uk/static/documents/Leisure/Thames_Barrier_Project_pack_2012.pdf
<http://thamesrivertrust.org.uk/facts-and-figures/>



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