

# River Medway Canoe Trail

## projects to increase recreational use, and the ecological status, of the River Medway in Kent

by  
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**T**he Environment Agency wishes to increase recreational use of the River Medway in Kent and, at the same time, improve the river's ecological status in accordance with Water Framework Directive targets. This is being achieved by removing the barriers to canoe passage and fish migration currently presented by locks and weirs. Over the last three years the Environment Agency has provided new launch sites, landing stages, "log flume" type weir passes, toilets, showers, camping and car parking with disabled access. The river has been opened up to recreational use and now attracts more canoeing visits than ever before.



*Eldridges Lock Canoe and Fish Pass in use*

*Courtesy of Halcrow*

Canoe use is popular where there is easy access to the water, but relatively limited elsewhere, particularly due to the need to carry or "portage" canoes around locks. Supported by the British Canoe Union, the idea of the "Medway Canoe Trail" was conceived. Over the last three years all of the ten locks on the river have been provided with improved landing stages, specifically designed to make getting in and out of canoes easy, so canoeists can carry their canoes around the locks and get back in on the other side.

These landing stages were designed and supervised by Halcrow with input from the Environment Agency and British Canoe Union, constructed by Mackley Construction Ltd, Breheny Civil Engineering Ltd and Jackson Civil Engineering Ltd, and, in 2008, won an Institution of Civil Engineers "Engineering Award", in the

"Small Project" category.

To further reduce the inconvenience caused by locks, canoe and fish passes are being installed at various sites to enable easy passage downstream and opportunities to tow upstream. Canoe use is expected to continue increasing dramatically as access to the full length of the river between Maidstone and Tonbridge (30 km) improves. A number of youth and community groups are represented amongst canoeists.

The Medway Canoe Trail is intended to provide access for all to the River Medway, with users of all ages and backgrounds being represented. In addition to the general public and canoe clubs, groups that have been attracted include:



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Low-level canoe portage at Hampstead Lock

Courtesy of Halcrow

- Kent Scouts.
- Sea Cadets.
- Fairbridge: A national charity supporting disadvantaged young people, to develop confidence, motivation and skills they need to turn their lives around.
- Leap Training: Another group that provides canoeing trips for disadvantaged young people.
- MCCH: Pathways to Inclusion aims to improve the ability of adults with learning disabilities, autism or mental health problems to access, housing, social and health care, learning, employment, leisure and financial services.

The Environment Agency encourages use of the river by charitable organisations by remitting their charges and providing free access to the river.

### The First Three Passes

A successful trial installation at Porters Lock, the first of its type in the UK, used a new technique to provide canoe and fish passes in a single structure. Blocks of artificial reeds, or “fish brushes”, allowed construction of a combined pass at relatively low cost. Two more canoe and fish passes have been constructed since, at Eldridges Lock and East Lock. Due to site characteristics, their designs vary: one being the innovative “fish brush” style, but applied differently, and the other a more conventional pass with the canoe pass and fish pass being separate.

### Porters Lock Canoe and Fish Pass

With the experience gained, it is clear that the new “fish brush” style of combined pass can be applied in many different ways, from a steel retrofit as at Porters Lock, to a naturalised channel as proposed at Radcot Weir on the Thames, where a “soft-engineered” design incorporates nine resting pools. Almost any layout can be



Porters Lock Canoe Pass

Courtesy of Halcrow

accommodated, subject to a maximum gradient of 1:12, providing ease of construction, versatility and relatively low cost.

The first three canoe and fish passes on the River Medway recently won an Institution of Civil Engineers “Engineering Award”, in the “Environment” category.

This pass, constructed in May 2009, consisted of a steel trough containing artificial reeds or “fish brushes”, installed within an existing concrete bypass channel. The “fish brushes” slow the water velocity and create eddies and back-flows, allowing fish to swim up. Canoes can also pass down, since some of the water flows over the top of the brushes, and the reeds or bristles deflect out of the way. Canoes can be towed up a walkway alongside without “portaging” around the lock.

The pass was designed and installed in five months, at an overall cost of under £100,000. The main contractor was Breheny Civil Engineering Ltd, with steelwork design, fabrication and erection by Hunton Engineering Ltd. Halcrow provided concept design input and undertook site supervision.

### Eldridges Lock Canoe and Fish Pass

An entirely new channel was constructed, some 80m long, using relatively gentle gradients and incorporating resting pools. The Environment Agency needed delivery to a tight budget and timescale, and the design was required to operate with a limited water supply in the summer months. A reinforced concrete channel with “fish brushes” expedited the design and construction stages, limited implementation cost and associated risk, and minimised leakage and water supply requirements.

The design of the pass included:

- Sloping sections with fish brushes, gradient 1:25, to allow a range of fish to pass.
- Level resting pools to allow canoes to “line up” before a descent, and fish to rest.
- Recycled plastic fendering provided a more sustainable approach than hardwood.
- A gravel invert provides invertebrate habitat.
- A restricted entrance minimises flood flows, reducing scour risk alongside the pass, thus allowing more economical erosion protection.
- The entrance invert level and resting pool allow fine tuning of flows by installing additional brushes, or by reducing the height of the top brush pair (not needed).
- The outlet is arranged to provide a distinct “jet” to improve fish attraction.
- Walkways alongside and platforms at each end allow canoeists to get in and out, and tow canoes upstream.
- A safety gate at the entrance can be closed when floods are expected.



In use

Courtesy of Halcrow



1 Elver (Eel) pass (under grating) 2 Canoe Pass



3 Fish Pass (note baffles) 4 Fish Pass baffles controlling flow

(Left) East Lock pass nearly complete and (right), water flows for first time

Courtesy of Halcrow

The design was completed in some two months, and construction was completed by Dean and Dyball Civil Engineering Ltd in ten weeks. Halcrow undertook the design and provided site supervision. The overall cost was approximately £200,000.

### East Lock Canoe and Fish Pass

At East Lock, the challenge was to install a canoe and fish pass in the existing concrete bypass channel, to timescales and budgets even tighter than before.

Due to the short existing channel, the pass would be too steep for the “fish brush” type. Using the “Larinier” baffle style fish pass and dedicated “elver” (eel) pass, the gradient was increased to 1:6. A separate canoe chute conforms to this gradient.

A reinforced concrete structure minimised the impact of steel fabrication lead times and enabled a complex geometric shape. Polystyrene void formers minimised the deadweight applied to the existing structure and carbon footprint of the project. The existing footbridge was relocated to provide headroom.

With both design and construction taking place in 12 weeks, this was a fast-track project. The overall cost was around £80,000. Halcrow undertook the design and provided site supervision. Construction was undertaken in March 2010, to a five week programme, by Dean & Dyball Civil Engineering Ltd.

### The Future

The installation of fish and canoe passes overcomes barriers that previously existed in the form of weirs and locks, addressing

important EU Water Framework Targets and encouraging increased recreational use of the river. This project demonstrates how a flexible approach and “can-do” attitude produce results that are not only effective, but also timely and economical.

Two of the first three passes use different adaptations of the innovative “fish brush” style of combined canoe and fish pass: the first of their type in the UK. These have been very well received, with the British Canoe Union already referring to the River Medway as a “Gold Standard of Canoe Trail”.

With proposals at other lock sites in hand, the Environment Agency hopes that the River Medway will become the national “demonstration” river for canoe and fish passes. At Teston Lock, a combined fish and canoe pass will be integrated into an existing natural bypass channel within an overall environmental enhancement project. The new “fish brush” technique is eminently suitable for this location.

The Environment Agency’s aim is to open the River Medway fully to both canoes and fish, with recreational use taking place throughout the year (other than during floods).

Additional photographs of the improvements can be viewed at:  
[www.allingtonlock.co.uk/improvements2006.php](http://www.allingtonlock.co.uk/improvements2006.php)  
[www.allingtonlock.co.uk/canoeing2009.php](http://www.allingtonlock.co.uk/canoeing2009.php)

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Fish brushes being installed

Courtesy of Halcrow