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Created by Thames Estuary Partnership

Combined Essex Catchment version 1
Roadmap for Fish Migration in the



ROADMAP FOR FISH MIGRATION IN THE COMBINED ESSEX CATCHMENT



Rivers and fish migration

Rivers play an essential role in regulating flood risks, transporting sediment, and supporting biodiversity. The flow and connectivity of a river are crucial indicators of a river's health. Among a river ecosystem's key functions is the ability of fish species to use it as a migration route, something which can be threatened by barriers across a river.

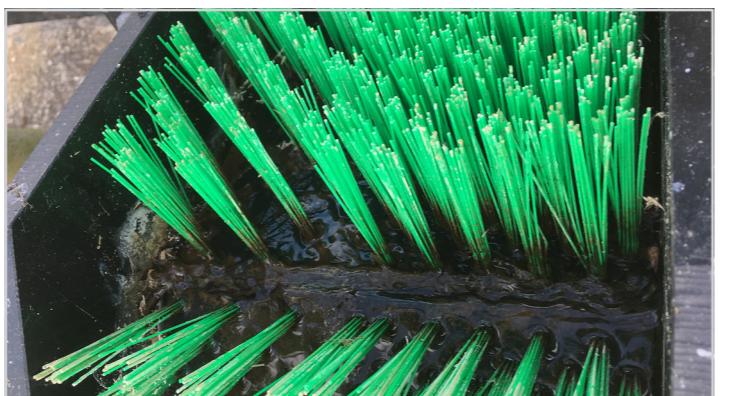
Barriers like weirs, sluices, and locks, installed for water management purposes on rivers, can be found almost every two kilometres in the Essex Catchment. These structures make migration a significant challenge for fish.

Migratory fish species move between freshwater and marine environments as they spend different stages of their life in different habitats. For example, the sea trout feed in the sea or estuary and spawn in freshwater rivers, whilst eels grow and mature in freshwater rivers in Europe before swimming back to breed in the Sargasso Sea on the other side of the Atlantic. Barriers in rivers can cut migratory fish off from suitable spawning and habitat sites, subsequently affecting their populations.

If removal or bypass are both impossible, a technical fish pass should be considered. Examples include a baffle fish pass which enables fish to migrate, and tiles or brushes specifically designed for eels.



Baffle fish pass and eel tiles



Brush eel pass

Types of barriers

Obstructions to fish passage come in many forms. Many of these structures serve a vital purpose whether that is to regulate or monitor flow, supplement the water supply, protect against flooding, or control the ingress of tidal flow. But all too often these barriers are impassable to fish and break up the river, isolating parts of habitats from one another.



Waterfall



Weir



Lock



Gate

Solutions

To provide fish with the best passage routes, it is best to remove the obstruction, particularly where it is no longer operated or maintained. However, removal can be complicated and expensive. Moreover, in most cases, the obstruction still has its uses, such as maintaining upstream water levels or mitigating downstream flood risk.

If a structure cannot be removed, it is key to investigate whether it can be bypassed. This is often a good solution, as it gives the opportunity to provide a stretch of good habitat such as a gravel bed, in which several fish species chose to spawn and which may not be available in the main river due to siltation caused by the impounding effects of the structure.



Bypass channel before

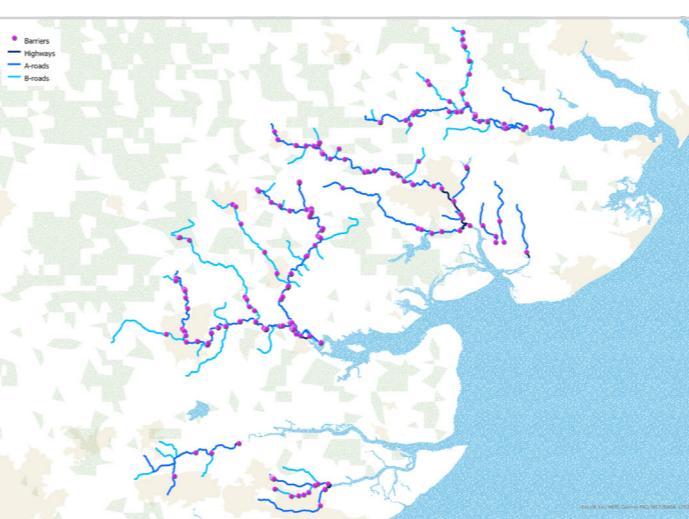


Bypass channel after

By thinking of rivers as migratory routes ('Highways', 'A-roads' and 'B-roads'), barrier locations and upstream river network connectivity (highlighting open and closed river sections for fish and eel – see reverse of the map) can be easily visualised in entire catchments.

The Roadmap works as a tool for collaborative projects by showing where strategic steps can be taken by various organisations and authorities to improve their riverside development and flood management plans.

The Roadmap also allows those who work and live along the river, such as riverside communities, environmental groups, local authorities and developers to understand the extent of river fragmentation, so they can make better decisions based on actual data.



Location of barriers on the migratory routes

The Roadmap can help all users to reprioritise barriers and develop a more targeted and integrated approach to carry out sustainable restoration works. That in turn will help improve river connectivity – allowing migratory fish species to reach their habitats and complete their life cycle.

