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Fold out map by Thames Rivers Trust, Action for the River Kennet, South East Rivers Trust, Thames21, Zoological Society of London and Thames Estuary Partnership

Map illustration by Bek Crudace Illustration



ROADMAP FOR FISH MIGRATION IN THE THAMES RIVER BASIN



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 at almost every kilometre in the Thames River Basin. These structures make migration a significant challenge for fish.

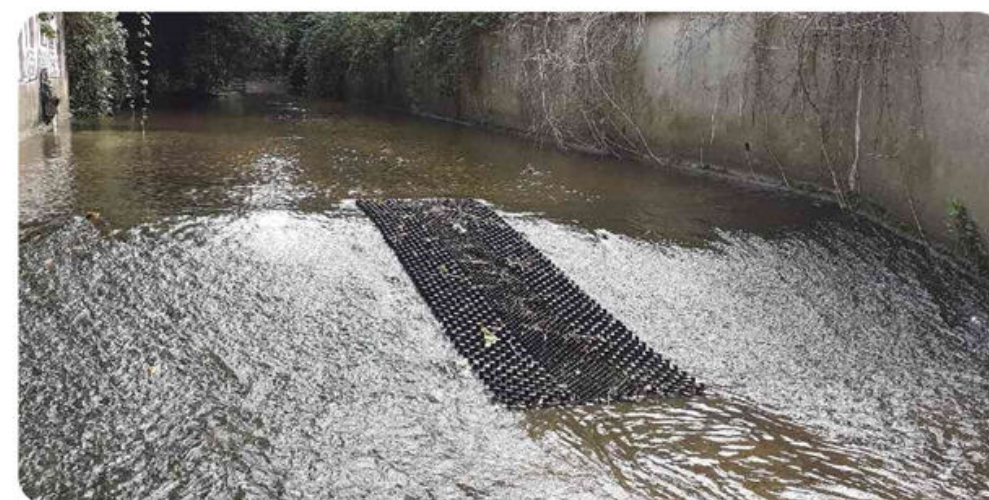
Migratory fish species move between freshwater and marine environments as they spend different stages of their life in different habitats. For example, the sea trout feed in the sea or estuary and spawn in freshwater rivers, whilst eels grow and mature in freshwater rivers in Europe before swimming back 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. Even those fish species that spend their entire life within our rivers often have different habitat requirements during their lives and need good river corridor connectivity to thrive.

If removal or the creation of a 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.



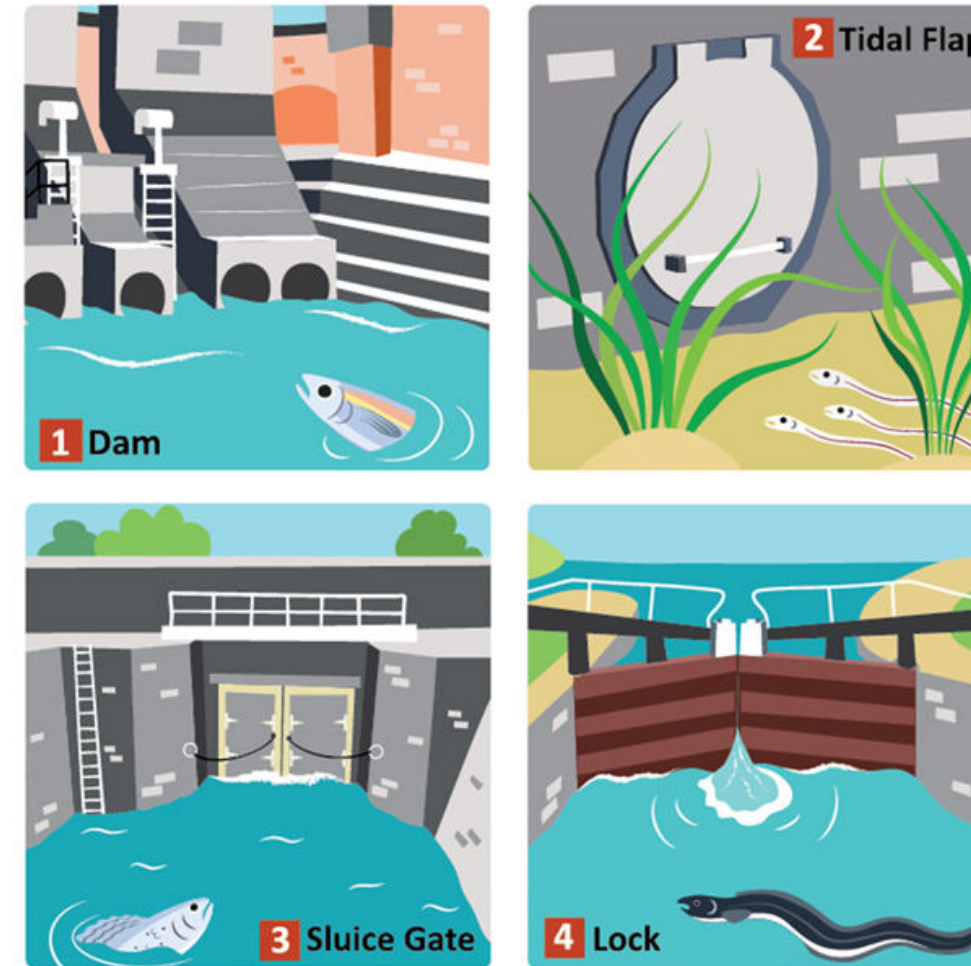
Gauging weir with fish baffles (Image by T21)



Weir with eel tiles (Image by T21)

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.



Solutions

To provide fish with the best passage routes, it is preferable to remove the obstruction, particularly where it is no longer operated or maintained. However, removal can be complicated and expensive. Moreover, in some 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 upstream of the structure 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 and after (Image by Darren Tansley)

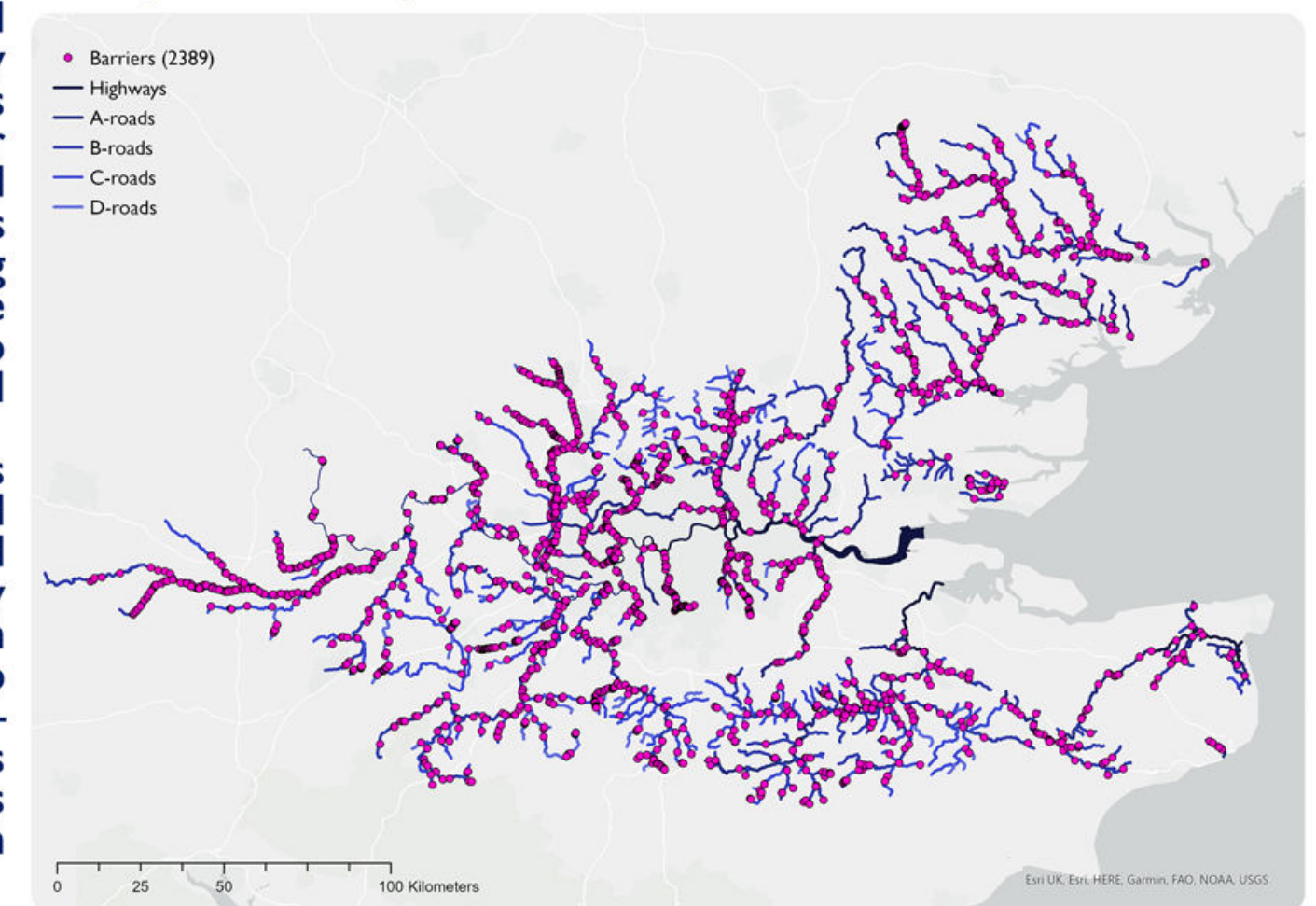
Fish Migration Roadmap

Improving the water environment is an important task for everyone. Good ecological standards, like increased river connectivity and high fish biodiversity, can only be achieved if stakeholders and communities work together.

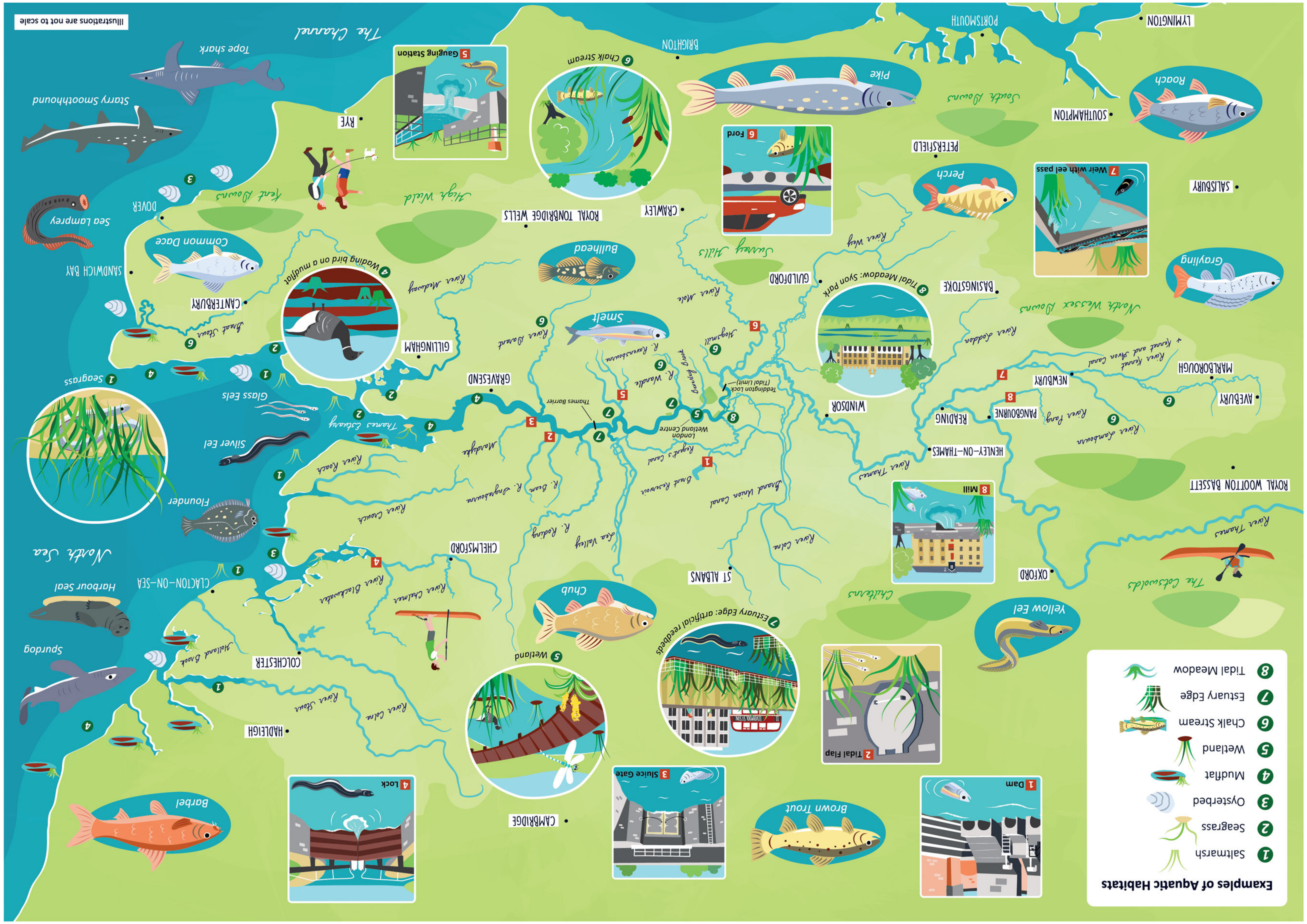
Using GIS technology, the Fish Migration Roadmap provides a method that focuses on a sea-to-source approach that, like a road network, looks at rivers as interconnected migratory routes. By thinking of rivers as migratory routes ('Highways', 'A-roads', 'B-roads', 'C-roads' and 'D-roads'), barrier locations and upstream river network connectivity can be easily visualised in entire catchments.

The Roadmap works as a tool for collaborative projects by showing where strategic steps can be taken to improve their riverside development and flood management plans. It also allows those who work and live along the river to understand the extent of river fragmentation, so better decisions based on actual data can be made.

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 the different habitats they need at different stages in their life cycle.



Barriers to fish migration (Map by TEP)



Examples of Aquatic Habitats

- 1 Saltmarsh
- 2 Seagrass
- 3 Oysterbed
- 4 Mudflat
- 5 Wetland
- 6 Chalk Stream
- 7 Estuary Edge
- 8 Tidal Meadow