ZSL | LET'S WORK FOR WILDLIFE

heritage lottery fund
LOTTERY FUNDED

# Guidance Document
# Conservation of Tidal Thames Fish through the Planning Process

**October 2016**


Zoological Society of London
Regent's Park
London, NW1 4RY

marineandfreshwater@zsl.org
zsl.org/thames

## Partnership

This Guidance Document has been developed by the Zoological Society of London (ZSL), kindly supported by the National Lottery through the Heritage Lottery Fund. This is a collaborative initiative between the institutions listed below.

## Contents

# Goal of the Guidance Document

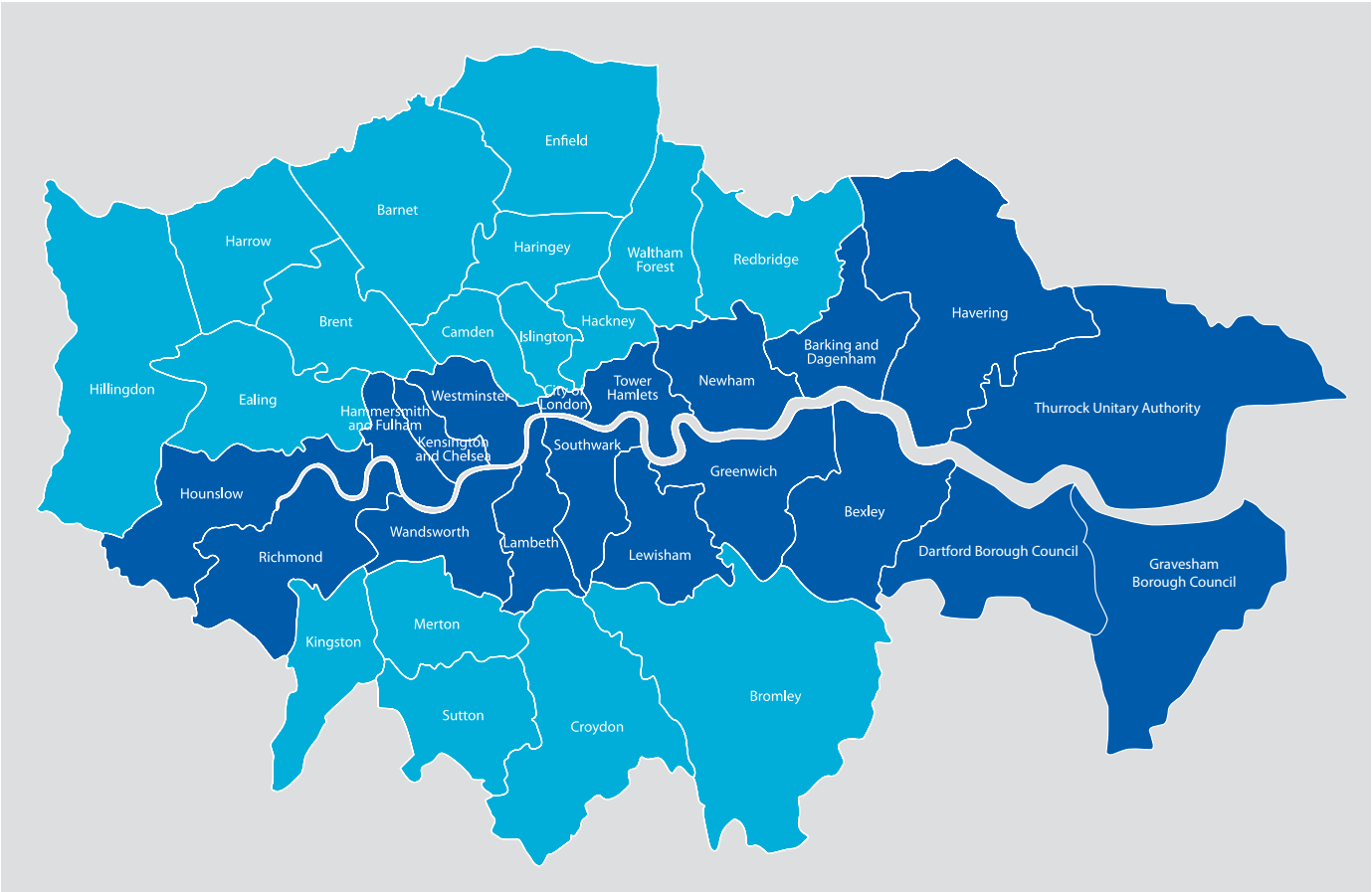
Our goal is to ensure that **important life stages of fish species and their habitats are protected in the Tidal Thames.** We have developed this Guidance Document for Developers, Planners, Biodiversity or Environmental Officers in Local Government and Ecological Consultants to provide a single point of reference for information relating to fish conservation in the region. This will help all parties to adhere to legally-binding regulation to protect fish and their habitats (Annex 2 and 3), and improve fish conservation in the Tidal Thames.

The document is divided into two sections, Overview (p. 4) and Detailed Guidance (p. 5-18), and it has been developed for:

- **Developers** when drawing up designs.
- **Planners** during the pre-application development stage.
- **Biodiversity/Environmental Officers** to help feedback on information they receive throughout the planning process.
- **Environmental Consultants** working to help all parties.

The document provides links to other reports/ webpages/documents to signpost the reader to where to find additional information.

The **Guidance Document focuses on fish conservation in the Tidal Thames between Teddington Lock and Gravesend*.** This includes the Tidal Thames bordering Thurrock Unitary Authority, Gravesham Borough Council and Dartford Borough Council; as well as the City of London and the 15 London Boroughs bordering the Tidal Thames: Barking & Dagenham, Bexley, Greenwich, Hammersmith & Fulham, Havering, Hounslow, Kensington & Chelsea, Lambeth, Lewisham, Newham, Richmond upon Thames, Southwark, Tower Hamlets, Wandsworth and Westminster.




***Throughout this document, the use of "Tidal Thames" refers to this area.**

# Overview

## Importance of the Tidal Thames for Fish

The Tidal Thames is an estuarine ecosystem that plays an important role in supporting North Sea fish stocks by:

- Providing the conditions needed for fish to spawn (lay eggs) and for juvenile fish to grow
- Being a rich foraging ground for fish
- Allowing migratory fish to move between saltwater and freshwater (and vice versa)

Since 1964, 125 fish species have been recorded in the Tidal Thames, 15% of which are protected under local, national and international regulation (see Annex 1 for full list of species and Annex 2 and 3 for protected species).

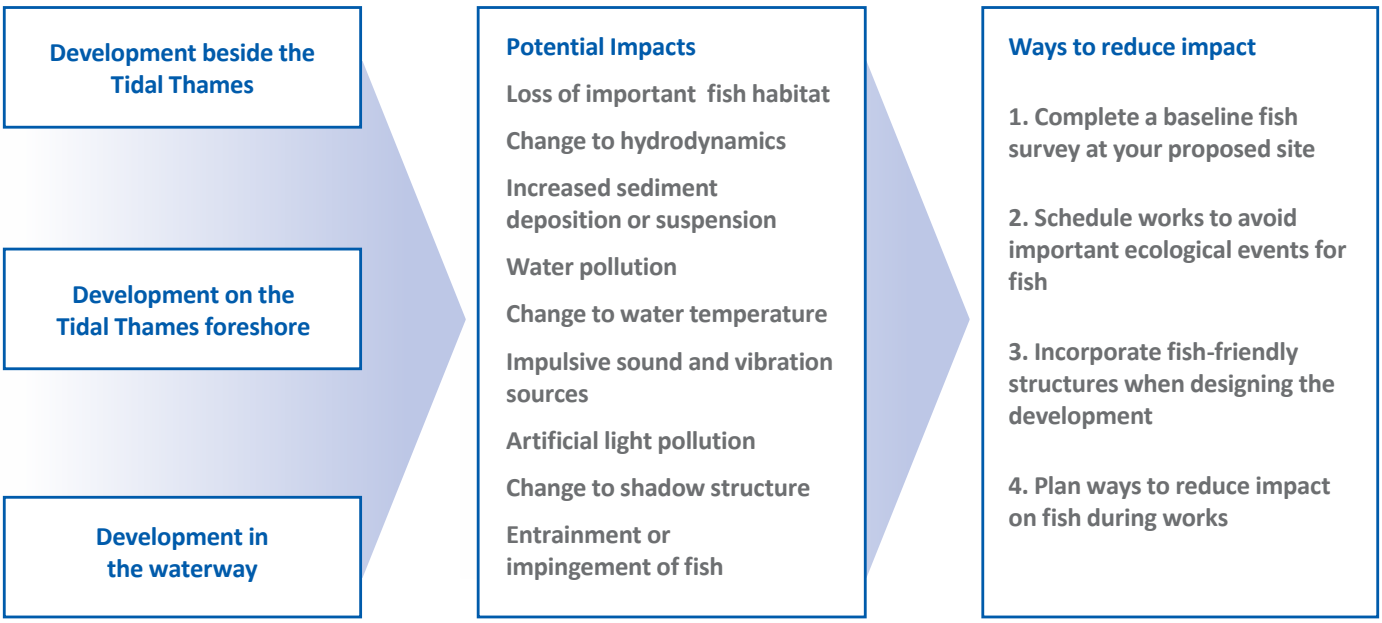
The Tidal Thames is the heart of London's Blue Ribbon Network and is not only an important habitat for fish, but also a vital corridor for transport of goods and people; recreational and commercial boating; development and wellbeing. By ensuring that developments in or beside the Tidal Thames enhance conditions for fish, the Tidal Thames will become a leading example of blue-green infrastructure and how an estuary can provide multi-functional ecosystem services in an urban environment.

## How Development affects Fish

All development (construction, operation and decommissioning) beside the Tidal Thames, on the Tidal Thames foreshore or in the waterway has the potential to impact fish. Developers and Planners should consider and reduce the potential impact on fish throughout the planning process. This document only details guidance relating to fish conservation, but we encourage Developers to consider all other wildlife during the planning process.

## Contact Point

There are a number of individuals and organisations who have researched fish ecology and behaviour in the Tidal Thames. If you have a question regarding fish conservation in the Tidal Thames please email **marineandfreshwater@zsl.org** and we will forward your email onto the relevant individual/organisation.



# Detailed Guidance

## How fish use the Tidal Thames

There is large variation in the number, location and seasonality of different fish species and their life stages in the Tidal Thames. This is influenced by the lifecycle and ecology of each fish species, but also by environmental conditions, such as temperature and rainfall.

Fish in the Tidal Thames can be grouped into four categories:

1. Fish that spend their entire life in the Tidal Thames.
2. Fish that are present mainly in the freshwater dominated area of the Tidal Thames, normally found above Hammersmith (but this is highly dependent on rainfall)
3. Fish that use the Tidal Thames to spawn or grow whilst they are juveniles, before returning to the North Sea
4. Fish that migrate through the Tidal Thames to freshwater or saltwater.

Intense development and flood defence has caused the Tidal Thames to be much narrower than it naturally would be (encroachment), which has led to faster tidal flows. The Environment Agency (EA) tends to resist encroachment into tidal waters to ensure that intertidal areas are protected.

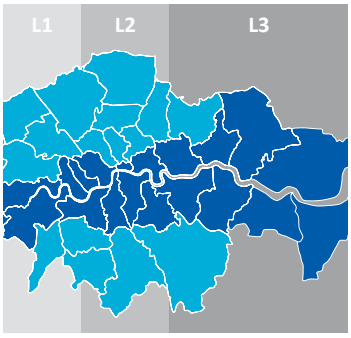
A common behaviour displayed by juvenile fish to overcome faster tidal flows is to use the tides selectively to help movement upstream and/or downstream. For example, a fish moving upstream on the flooding tide may seek refuge in slow-flowing waters during the ebb tide to maintain its position. This is known as Selective Tidal Stream Transport (STST) and means that areas of slower flowing water are very important for fish ecology in the Tidal Thames. Adult fish species with poor swimming ability may also require areas of slower flowing water to help their migration.

The following infographic gives an indication of where and when you are likely to find the most common fish species found in the Tidal Thames and those fish species protected by regulation (p.6). This infographic provides an overview of main trends, but is subject to change depending on the environmental conditions and the amount of rainfall in any given year.

# Common and Protected Species

| Common Name | Scientific Name | Type of fish | Teddington Lock to Wandsworth Bridge (L1) | Wandsworth Bridge to O2 Arena (L2) | O2 Arena to Gravesend (L3) | Spawning Event |
|---|---|---|---|---|---|---|
| **Atlantic Cod** | *Gadus morhua* | 3 | | | A,B,C,D | |
| **Atlantic Salmon** | *Salmo salar* | 4 | A,B,C,D | A,B,C,D | A,B,C,D | |
| **Barbel** | *Barbus barbus* | 2 | A,B,C,D | | | |
| **Brown/Sea Trout** | *Salmo trutta* | 4 | A,B,C,D | A,B,C,D | A,B,C,D | |
| **Bullhead** | *Cottus gobio* | 2 | A,B,C,D | | | |
| **Common Dace** | *Leuciscus leuciscus* | 2 | A,B,C,D | A,B,C | A | at L1 during B |
| **Common Goby** | *Pomatoschistus microps* | 1 | A,B,C,D | A,B,C,D | B,C | at L1 during A & B |
| **Dover Sole** | *Solea solea* | 3 | | A,B,C,D | A,B,C,D | at L2 & L3 during A & B |
| **European Eel** | *Anguilla anguilla* | 4 | A,B,C,D | A,B,C,D | A,B,C,D | |
| **European Plaice** | *Pleuronectes platessa* | 3 | | | B,C,D | |
| **European Seabass** | *Dicentrarchus labrax* | 3 | B,C | B,C | A,B,C,D | |
| **European Smelt** | *Osmerus eperlanus* | 4 | B,C,D | A,B,C,D | A,B,C,D | at L1 during A & B |
| **European Sprat** | *Sprattus sprattus* | 3 | | | A,C,D | |
| **Flounder** | *Platichthys flesus* | 3 | B,C,D | A,B,C,D | A,B,C,D | at L3 during B |
| **Herring** | *Clupea harengus* | 3 | | | A,B,C,D | |
| **Long-snouted Seahorse** | *Hippocampus guttulatus* | 1 | | | C,D | |
| **Nilsson's pipefish** | *Syngnathus rostellatus* | 1 | | B,C,D | B,C,D | |
| **Pouting** | *Trisopterus luscus* | 3 | | | A,D | |
| **River Lamprey** | *Lampetra fluviatilis* | 4 | B,C,D | | | |
| **Roach** | *Rutilus rutilus* | 2 | B,C,D | B,C,D | B,C,D | at L1 during B |
| **Sand Goby** | *Pomatoschistus minutus* | 1 | | A,B,C | A,B,C,D | at L2 during A & B |
| **Short-snouted Seahorse** | *Hippocampus hippocampus* | 3 | | | B,C | |
| **Twaite Shad** | *Alosa fallax* | 4 | | | A,B,C,D | |
| **Whiting** | *Merlangius merlangus* | 3 | | | A,B,C,D | at L3 during B & C |

| Type of fish key | |
|---|---|
| 1 | Spend entire life in Tidal Thames |
| 2 | Mainly present in freshwater dominated Tidal Thames |
| 3 | Use the Tidal Thames to spawn or grow whilst juveniles |
| 4 | Migrate through the Tidal Thames to freshwater or saltwater |




| Location/Timing key | |
|---|---|
| A | January - March |
| B | April - June |
| C | July - September |
| D | October - December |

| Protection Status |
|---|
| Blue - protected species |
| Navy - common species |
| Grey - protected and common species |

*Further information on protected species is found in Annex 2 and 3

# Development and Fish Conservation

All development (construction, operation and decommissioning) beside the Tidal Thames, on the Tidal Thames foreshore or in the waterway has the potential to impact fish. Whether this impact is positive or negative, temporary or permanent, and what level of impact it causes depends on the design of the development, scheduling of works and the consequence of development activities.

Developers and Planners should consider the impact on fish throughout the planning and development process and find ways to mitigate and manage impacts if they cannot be avoided. Permanent loss of intertidal and/or subtidal habitats should be avoided.

The information below suggests some of the major steps to reduce the impact of development on fish in the Tidal Thames.

## 1. Complete a baseline fish survey at your proposed site

The infographic provided on the previous page gives an indication of what fish species you would expect to be present at different times of the year in different areas of the Tidal Thames. However, due to the dynamic nature of the Tidal Thames, it is important to complete a baseline fish survey prior to planning a development to assess what species are present at the proposed site, if site-specific data are not already available. These surveys should focus on those fish species protected under regulation (Annex 2 and 3).

The design of the baseline survey will depend on the location of the proposed development, but should be completed during the months where works are planned to be completed. Once the fish species present at the site have been identified, the below steps can be focused to eliminate and/or mitigate the impact of development specifically for those species.

## 2. Schedule works to avoid important ecological events for fish

Wherever possible, construction and decommissioning should be carefully planned to avoid key ecological events such as fish spawning, fish aggregation and fish migration. The timing of these ecological events are species and location specific, so all fish species present or moving through the proposed site of a development should be considered independently and then as a fish community as a whole (p. 6).

Development should avoid habitats identified as essential for fish biology, such as spawning grounds, unless the impact is temporary and can be completed during the months that fish do not spawn.

## 3. Incorporate fish-friendly habitat and structures when designing the development

Fish conservation can be improved through the creation of additional foreshore habitat and the sensitive design of structures that have physical contact with the river (e.g. bridge piers, river walls etc.). The information below provides an overview, much of which is covered in the Environment Agency's Estuary Edges Document in more detail.

Hydrogeomorphological studies to model changes in water movement and sediment transport must be conducted during the design process of in-river structures to increase likelihood that they will help, rather than hinder, fish and do not negatively impact flow and scour patterns. We would recommend consulting with local environmental partners regarding the appropriateness of different options. An important step is to provide some funding to monitor the impact these structures have on fish communities after installation, to inform the design of future developments.

## 3a. Create additional or more-natural foreshore habitat

- Structures that provide areas of reduced water flow and/or back-eddies could aid fish migration or movement of juvenile fish. This could include installing concrete structures or current deflectors (Fig.2).

- The building of carefully designed terraces and/or artificial slopes in a setback development will increase the diversity of the foreshore and provide improved habitat for fish. In general, terraces/slopes need to include a shallow gradient to allow use by both flat fish and pelagic fish species. Another option is to create a folded terrace, where different steps of a terrace are connected at one end by a slope to allow fish movement between the levels (Fig.1). Planting with a range of native plant species, appropriate for the particular area of the Tidal Thames, such as saltmarsh species and reeds, should increase stability and increase the number of different habitats available to fish. Additional options to secure sediment are recommended (e.g. brushes) due to the high velocity of the Tidal Thames current. The materials used need to be carefully considered and specific for each development (p. 14 of Estuary Edges Document).

- The creation of an intertidal embayment (a shallow bay set back into the foreshore) in a setback development may provide important shelter or areas for fish to spawn.

These examples need to be carefully planned, designed and modelled to ensure they would help fish conservation.

Case studies in the Tidal Thames are included in the Estuary Edges Document. One particularly successful example was completed in 1997 at the Greenwich Peninsula Terraces (Case Study 6, p. 37-40 of Estuary Edges Document). The gently sloping folding terraces planted with common reed, grey club-rush, sea club-rush and sea aster have proved to be an important habitat for a range of juvenile fish species, including the European Bass (Fig. 1).

## 3b. Modify structures with physical contact with the river – this could include river walls, bridge piers, bridge abutments, bridge footings, jetty/wharf piles etc.

- Increase the surface complexity of structures in the water to provide more places for algae and/or invertebrates to colonise. For example, this could be achieved through cladding of building materials with a more complex structure. This is likely to benefit fish by providing more cover and/or food (Fig. 2).
- Create areas with overhanging platforms, which may provide cover for fish and reduce predation (Fig. 2).
- Include structures that provide areas of reduced water flow and/or back-eddies which could aid movement of juvenile fish or fish migration. This could include installing concrete structures or on the foreshore in front of structures. These would have to be carefully designed and modelled to ensure that they lead to reduced flow (Fig.2).

These options can be incorporated into riverside structures at a relatively low cost, but would need to be designed specifically for each location.

## 3c. Design of Sustainable Drainage Systems (SuDS)

Sustainable Drainage Systems (SuDS) are prioritised in the National Planning Policy Framework and are recommended for all developments. It is vital that Developers create a drainage strategy during construction and in the final development to ensure that run off from site does not affect the intertidal system of the Tidal Thames. Poorly designed drainage systems can lead to pollution, local erosion and habitat damage.


Figure 1: A good example of the creation of terraces in a setback development to aid fish conservation. This example is taken from the Estuary Edges Document and is located at Greenwich Peninsula. Surveys at this site have found large numbers of juvenile fish using the intertidal saltmarsh habitat.

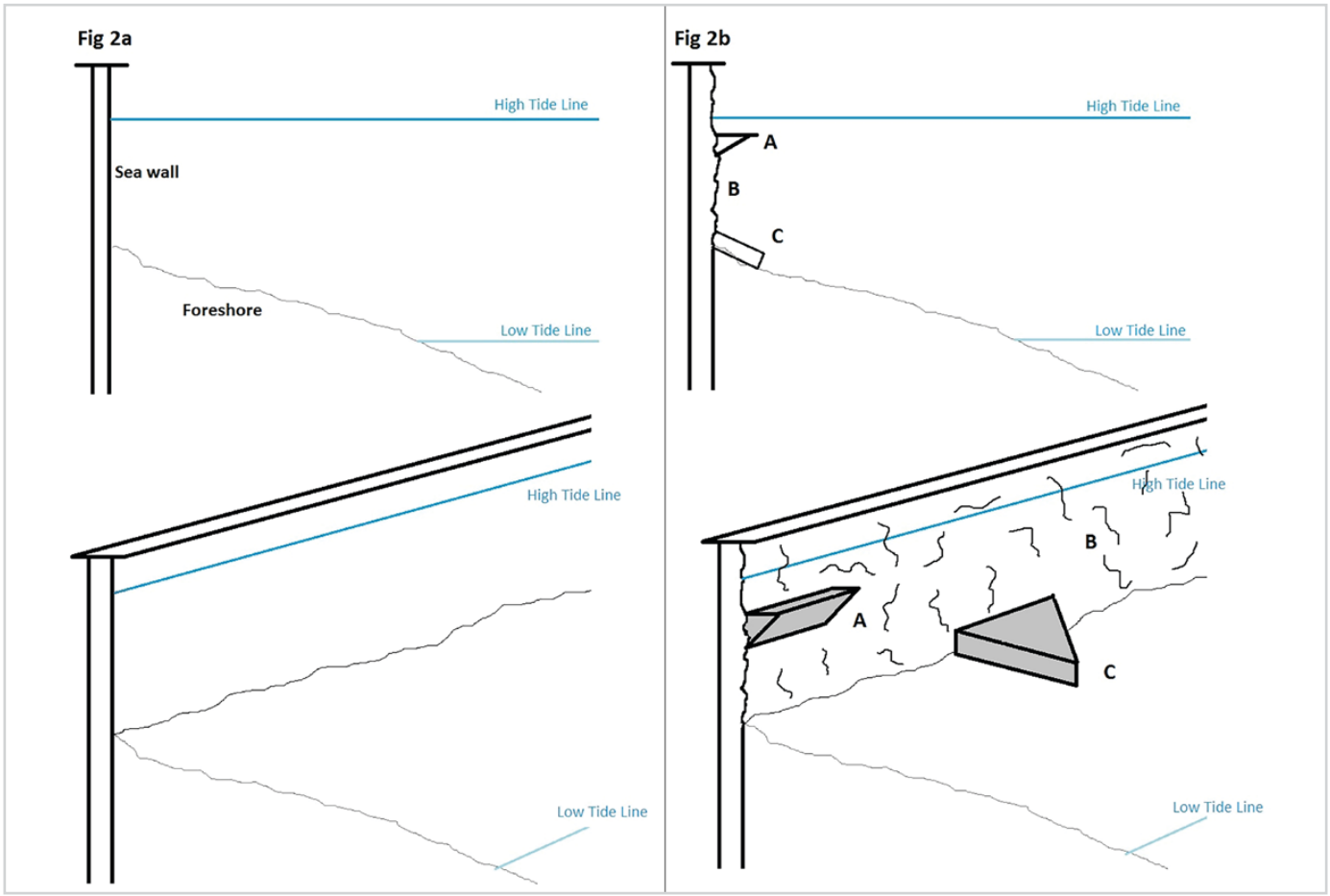



Figure 2: Examples of options that can be used to modify structures to improve habitat for fish. Fig 2a. Shows an un-modified sea wall and Fig 2b. shows a modified sea wall with A: an overhanging platform, B: increased surface complexity on seawall, C: structures to reduce water flow

## 4. Plan ways to reduce impact on fish during works

Some of the major impacts of construction that affect fish are listed below. These impacts can be caused through a variety of works, for example: dredging (capital and maintenance); piling (percussive and vibro); construction work completed in-river; development on the side of the river; run-off from a construction site; works completed on a river bank; works on slipways, river walls, abutments; general maintenance of boats etc.

| Impact of construction | Possible negative effect on fish | Suggestions of how to reduce impact |
|---|---|---|
| **Increased sediment deposition** | Smother important fish habitats, e.g. spawning grounds, which can cause reduced water flow and reduced fish egg survival. | Ensure works are carefully planned and staff are adequately trained to reduce chance of pollution from the construction site. |
| **Increased suspended sediment** | Reduce fish feeding behaviour by obscuring prey items. | Ensure in-water construction completed in dry and isolated habitat where practical (i.e. by building a coffer dam, caisson or equivalent). |
| | Reduce oxygen exchange by interacting with mucus on fish gills. | Ensure Sustainable Drainage Systems (SuDS) have been put in place during the construction period to avoid direct run off into the Tidal Thames. |
| | Reduce light levels and photosynthetic activity for plants and plankton. | Ensure any benthic grabs are completed using a closed method to avoid sediment loss. |
| | Disrupt social fish structures, migratory patterns or displace fish. | Monitor sediment/pollution/ temperature levels and stop works when an agreed threshold has been reached. |
| | Cause a stress response in fish. | |
| **Pollution of material through run off or resuspension of contaminated sediment, leading to reduced water quality (some materials can be toxic to fish; others may pollute the watercourse leading to changes in pH, salinity or oxygen content affecting fish)** | Some of the sediments in the Tidal Thames hold toxic chemicals from the industrial era, which could lead to fish mortalities if they are suspended. | |
| | Change to natural salinity levels can reduce fish growth or success of breeding. | |
| | Fish need sufficient concentrations of oxygen in the water to survive. Sudden reductions in dissolved oxygen content, caused by point source pollution, can lead to large fish kills. | |
| | Change to environmental variables can affect fish migration, key ecological events or socialisation. | |
| **Change to water temperature** | Increased temperature can reduce dissolved oxygen content. | |
| | Change to natural water temperatures may prevent some fish migrations. | |

| Impact of construction | Possible negative affect on fish | Suggestions of how to reduce impact |
|---|---|---|
| **Impulsive sound sources and vibration (e.g. pile driving)** | Can cause the swim bladder of some fish species to rupture and cause fatal internal injuries. | Use low-noise techniques whenever practicable.<br><br>Choose methods to reduce noise attenuation (e.g. sleeving, muffling, pile jackets, acoustic baffles, bubble curtains).<br><br>Have a soft start approach to allow fish to move away from the noise source.<br><br>Ensure there is a break in noise production each day to allow any fish excluded from an area to migrate further upstream or downstream in these break periods. |
| | Can cause fish to avoid a particular area which could affect fish migration and key ecological events. | |
| **Artificial light pollution** | Some fish species avoid areas with increased artificial light; others can be attracted by the light. Both of these could alter fish migration or movement in the area. | Install directional lights to minimise projection onto the water.<br><br>Build in break periods during construction, where artificial lights are turned off, to allow any fish excluded from the area to migrate further upstream or downstream. |
| **Removal of areas of low-water flow (e.g. eddies)** | Juvenile fish use areas of low water flow to rest and avoid being flushed down river during fast flows or an ebbing tide. The loss of these areas may hinder migration of a range of fish species. | Avoid permanent loss of habitat in all development. Adequately mitigate for this loss if it cannot be avoided.<br><br>Limit the levels of foreshore compaction by limiting machine use and using matting when possible.<br><br>If temporary loss of habitat is not avoidable, ensure this does not coincide with important ecological events.<br><br>Reinstate any temporary lost habitat at the end of the construction period. |
| **Temporary or permanent loss of intertidal or subtidal habitat** | Intertidal and subtidal habitats are vital for fish to spawn, to avoid predation and provide refuge during movements in a tidal ecosystem. Loss of these habitats reduces overall fish survival and production. | |
| **Change to shadow structure** | Increased shadow may lead to reduced growth of algae, with implications for fish that feed on them. | Model shadow creation in the design process and reduce the amount of shadow on the Tidal Thames where possible. |
| **Change to water movement/scour due to structure being in the river** | Fish movement depends on the flow of water. Any change to this may affect where fish are located in the Tidal Thames or provide a barrier to migration. | Model potential impact of change of water movement/scour and design development to have minimal impact. |
| **Water abstraction** | Can lead to the entrainment or impingement of fish leading to mortality. | Consult expertise in appropriate fish screening options, including the appropriate location and design of water offtake structures. |

# Case Study: Smelt Conservation Project

## Background

The European smelt (*Osmerus eperlanus*) is a small predatory fish that inhabits cold-water estuaries including the Tidal Thames. Once common in the UK, it has suffered significant declines since the early 19th century due to water pollution, over exploitation and destructive river engineering. Improvements to water quality in the latter half of the 20th century have allowed smelt to return to 36 water courses in England including the Tidal Thames.

## Importance of Smelt

The presence of smelt in an estuary can be used as an indicator of good water quality due to their sensitivity to pollution. They are listed as a London and UK Biodiversity Action Plan species, as a Feature of Conservation Importance (FOCI) species for the Marine Conservation Zone process and as a Natural Environment and Rural Communities (NERC) Species of Principal Importance.

## Smelt Conservation Project

Although the Tidal Thames holds one of the largest-known breeding populations of smelt in the UK, the specific spawning location had not been identified. ZSL initiated the Smelt Conservation Project in 2014 to complete surveys to identify the spawning ground as well as engaging hundreds of Londoners to help with surveys and complete research on the history of smelt in the Tidal Thames. Full results can be found on the ZSL website.

## Key Results

### Timing of smelt spawning

- 2015 analysis suggests a potential spawning date of 19 March 2015 and hatching date of 2 April 2015.
- 2016 analysis suggests that spawning occurred from 1 March to 2 April 2016 and hatching occurred from 22 March to 13 April 2016.

The data indicate that smelt spawn over an elongated period of five weeks during March and the beginning of April, with a one to three week peak spawning period within that window. The specific timing and length of the smelt spawning period each year is likely to be dependent on a range of environmental factors: water temperature, tidal state, freshwater flow, salinity and lunar phase. Following spawning, juvenile smelt drift with the currents until they are large enough to swim independently. They remain in the Tidal Thames throughout the summer.

## Location of Smelt Spawning

During the ZSL ichthyoplankton surveys at Wandsworth Bridge, juvenile smelt estimated to be less than one day old were caught in 2015 and 2016 (Fig. 3a), while smelt eggs in “pre hatching” stage were also caught in 2016 (Fig. 3b). This suggested that the Wandsworth Bridge sampling site was in close proximity to where smelt spawned.

HR Wallingford completed detailed numerical modelling of ZSL’s ichthyoplankton survey dataset and their analysis showed a close match between the model results and the survey data when simulated smelt hatchlings were released at Wandsworth Bridge. When the modelled hatchlings were released at other locations, the correlation between the data and model results was not as strong. The results suggest that smelt spawn in the area between Wandsworth Bridge and 600m upstream of this point (Fig.4). However, it cannot be ruled out that the spawning area could extend further West to Barnes Bridge (Fig. 4). Full results can be found at HR Wallingford 2016.

## Conservation Advice

- ZSL advise that no development affecting the subtidal habitat of the predicted spawning ground should be permitted during the months where smelt are likely to spawn: late February, March and April.
- Any proposed development in this area should specifically evaluate the potential impact on smelt and find ways to adequately reduce and/or mitigate this impact.

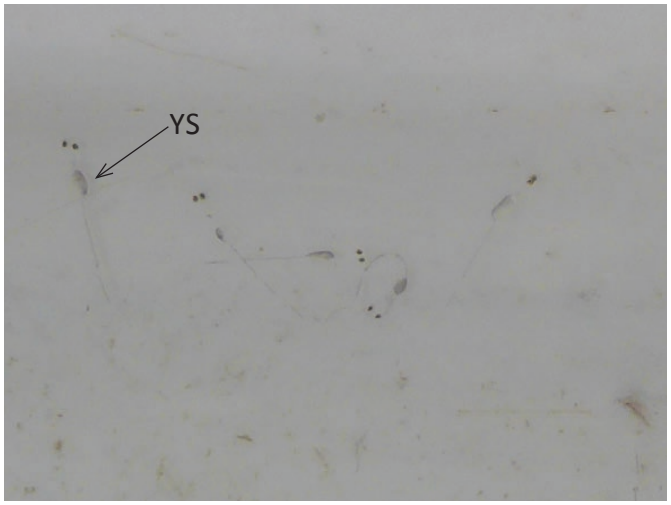



Figure 3a: Photograph of juvenile smelt caught on 2 April 2015 showing presence of yolk sac (marked YS). These are estimated to be less than one day old.

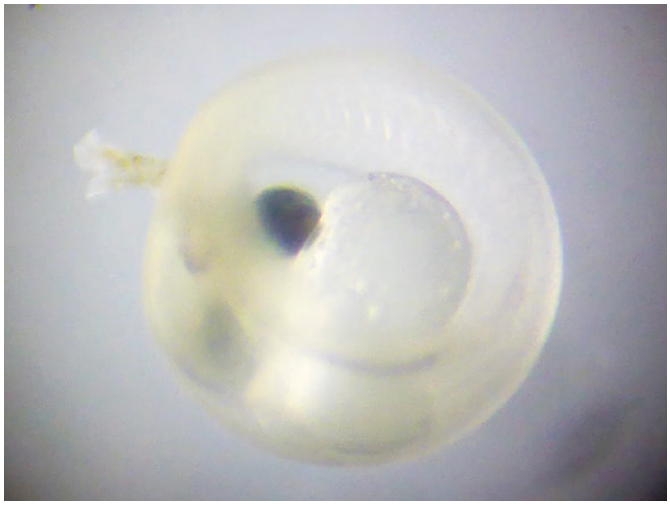


Figure 3b: Photograph of a smelt egg caught on 23 March 2016 under a light microscope. This is the "pre hatching" stage of smelt.

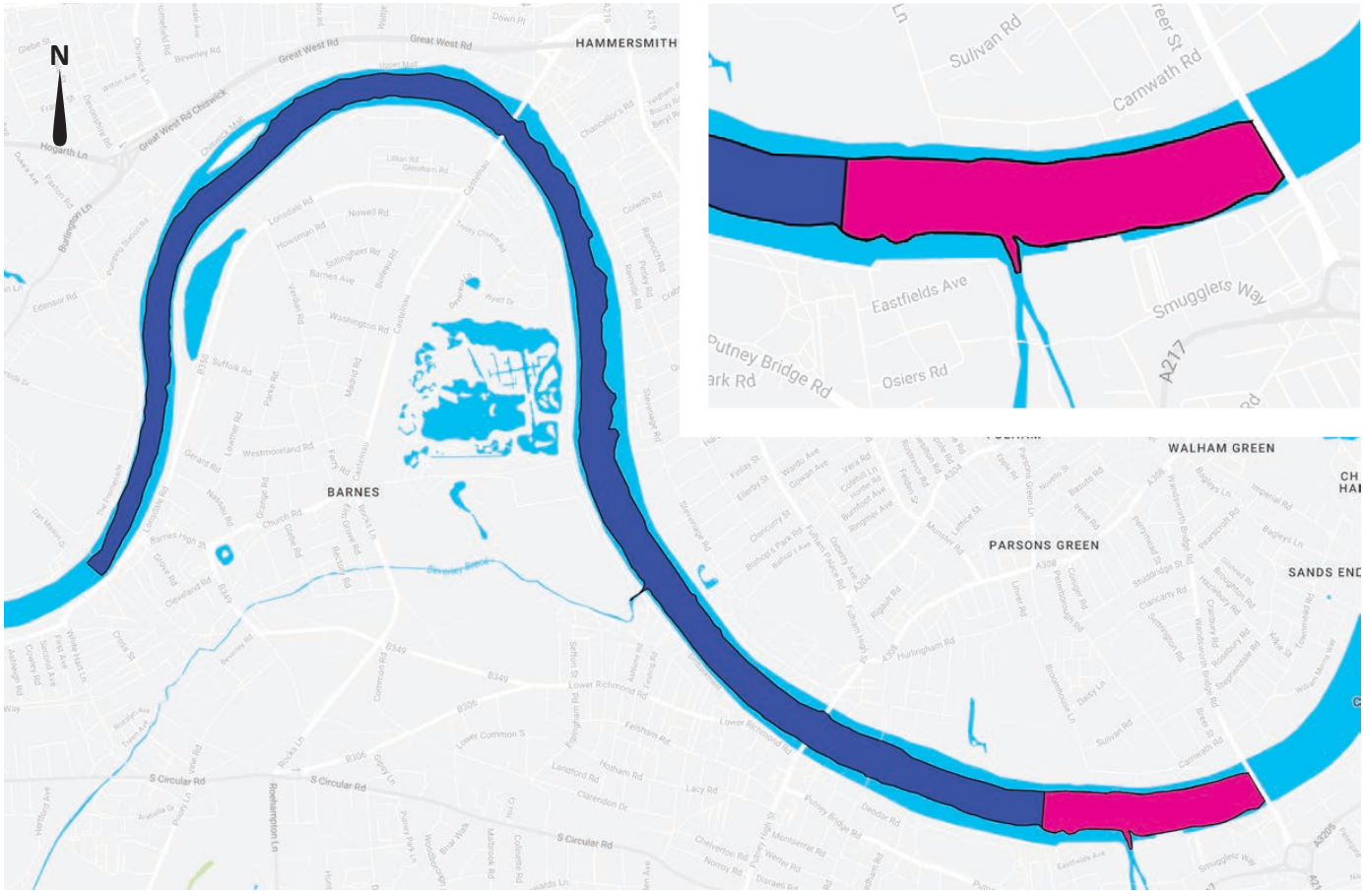



Figure 4: Location of predicted smelt spawning ground. Pink shows the most likely spawning ground and dark blue shows potential extension of this spawning ground upstream

# Regulation Relevant to Tidal Thames Fish

## Habitat focused Regulation

### Water Framework Directive (2003)

The Water Framework Directive (WFD) (Directive 2000/60/EC) became law in England and Wales in 2003 via the Water Environment (WFD) (England and Wales) Regulations. The WFD has four main goals: (1) to prevent deterioration in water status, (2) all water bodies achieve good ecological status, good chemical status and good groundwater status (or potential), (3) reduce and eliminate sources of pollution and (4) contribute to achieving objectives of sites protected by other EU legislation. The Tidal Thames is classified as a 'heavily modified water body' and transitional water under the WFD. Its current status is 'moderate ecological potential' with the aim of reaching good ecological potential by 2027.

### National Planning Policy Framework (March 2012)

The National Planning Policy Framework was published in March 2012 to make the planning system less complex, promote the use of Local Plans and help achieve sustainable development in England on an economic, social and environmental scale. Section 11 of the Framework details how planning must conserve and enhance the natural environment. This section includes policy regarding protecting landscapes, recognising ecosystem services, minimising impacts on biodiversity, reducing pollution and mitigating contaminated land. Each Borough/District has its own Local Plan. In addition, the Greater London Authority is responsible for preparing the London Plan and Kent County Council has responsibility for minerals and waste planning in Kent. The National framework and local planning policies are both subject to consultation processes and should inform the planning process.

### National Policy Statement for Ports (January 2012)

The National Policy Statement for Ports outlines the framework for assessing new port and associated infrastructure development. Section 5 identifies the key considerations regarding biodiversity and geological conservation, including: dredging, cargo handling, ballast water, erosion of habitats, noise pollution and light pollution.

### Port of London Authority Environmental Guidance (July 2016)

The Port of London Authority (PLA), as a statutory harbour authority, must comply with environmental legislation, government policy objectives and its own policy initiatives regarding the environment. The PLA also regulates any work in, on, under or over the Tidal Thames through four consents/licenses: (1) River Works License, (2) Dredging License, (3) Estates Consent, (4) Vessel License and must consider the environmental impact in all applications. The PLA's The Vision for the Tidal Thames was updated in July 2016 and states "The 20 year Vision will see the river the cleanest since the Industrial Revolution, with improved habitats and awareness of heritage".

### South East Marine Plan (May 2016)

Marine plans are developed to inform and guide marine users and regulators across England, managing the sustainable development of marine industries alongside the need to conserve and protect marine species and habitats. The Marine Management Organisation (MMO) is responsible for preparing the ten marine plans in England. The Tidal Thames is encompassed within the South East Marine Plan, to be completed before 2021.

### The London Plan (March 2016)

The London Plan outlines the London Mayor's strategies dealing with housing, transport, economic development and environment, and provides an overarching framework to guide local plans in the 33 London Boroughs. Chapter 7 of the London Plan relates to the Environment and includes specific policies relating to the Tidal Thames:

**Policy 7.19: Biodiversity and Access to Nature** notes that developments should not adversely affect designated European Sites, a protected species, a priority species or habitat identified in a Biodiversity Action Plan (BAP). The Tidal Thames is listed as a London Regional BAP habitat and as a Site of Metropolitan Importance for Wildlife.

**Policies 7.24 to 7.28** states that development proposals should restore and enhance the **Blue Ribbon Network** through (a) opening culverts and naturalising river channels, (b) increasing habitat value, (c) preventing development into water spaces, (d) protecting the foreshore, (e) resisting the impounding of rivers and (f) protecting the open character of the network.

**Policy 7.29: The River Thames** specifically states that development should link with the relevant Thames Policy Area Strategies (TPAS) to ensure coordinated planning across the 16 Boroughs that border the Thames. There are three current TPAS: **Thames Strategy**

**Hampton-Kew**, **Thames Strategy Kew-Chelsea** and **Thames Strategy Tower Bridge to Gravesend**. Some London Boroughs have their own riverside strategies, which should be consulted alongside the TPAS.

### The Mayors Biodiversity Strategy (March 2015)

The Mayor's Biodiversity Strategy was published in 2002, and partly updated in 2015, to provide the framework to protect and enhance London's natural environment. The Strategy closely links with the London Plan and focuses around four major areas: (1) Protection of Sites of Importance for Nature Conservation (SINCs), (2) increasing access to the natural environment, (3) greening of the urban environment and (4) protection of the Thames and London's other waterways.

### Essex Biodiversity Action Plan (2011)

The Essex Biodiversity Action Plan was developed by the Essex Biodiversity Project and sets out the vision for the County to conserve biodiversity between 2010 and 2020. There are specific Visions for Floodplain and Coastal Grazing Marsh, and Coastal Saltmarsh, as well as a section focusing on the status of Marine Habitats in the Essex.

### Kent Biodiversity Action Plan (2009)

The Kent Biodiversity Action Plan was developed by the Kent Biodiversity Partnership in 1997 and updated in 2009. It includes 19 Kent Habitat Action Plans (HAP), including the Intertidal Sediment HAP, and 16 Biodiversity Opportunity Areas (BOA), including the Thames-side Green Corridor BOA, both of which set out specific targets to protect fish species, foreshore habitat and subtidal habitat in the Tidal Thames.

### Thames River Basin District River Basin Management Plan (December 2015)

The main tool to deliver the WFD is outlined through regional **River Basin Management Plans** (RBMP). The Thames River Basin District (TRBD) River Basin Management Plan was created by the EA in 2009 and updated in 2015. Implementation of the TRBMP is managed by the Your tidal Thames Catchment Partnership. The priority river basin management issues to tackle are outlined in page 86 of the TRBD RBMP.

### Tidal Thames Habitat Action Plan (2002)

The Tidal Thames Habitat Action Plan was developed by the Thames Estuary Partnership Biodiversity Action Group to feed into the London Biodiversity Action Plan. It assesses the state of the Tidal Thames habitat, identifies current work and issues affecting the habitat and provides recommended actions to improve the quality and quantity of habitat.

### The London Rivers Action Plan (January 2009)

The London Rivers Action Plan was developed to identify key stretches of river in need of restoration and focuses on non-tidal freshwater Tributaries of the Tidal Thames.

## Species focused Regulation

There are a number of local, national and international regulations that prioritise and/or list species to aid conservation, protection and management. These lists include a number of fish species and form the basis of the majority of environmental legislation and policy regarding species-based conservation. These are embedded in planning laws and the nine regulations relevant to fish conservation in the Tidal Thames are summarised in Annex 2. In addition, there are specific regulations for the European Eel. See Annex 3 for an introduction and links to each regulation.

# Annex 1: List of Fish Species in the Tidal Thames

**The fish species listed below have been caught in the tidal River Thames between Fulham and Tilbury since 1964. It has been compiled by the Environment Agency, but is not necessarily indicative of the species currently present in the Tidal Thames**

| | | | |
|---|---|---|---|
| 10-spined Stickleback | Dab | Lumpsucker | Scaldfish |
| 3-Bearded Rockling | Dace | Mackerel | Sea Skipper |
| 3-spined Stickleback | Dory | Minnow | Sea Snail |
| 4-Bearded Rockling | Dover Sole | Montagu's Sea Snail | Sea Stickleback |
| 5-Bearded Rockling | Dragonet | Nilsson's Pipefish | Shore Rockling |
| Allis Shad | Eckstrom Topknot | Northern Rockling | Short Spined Sea Scorpion |
| Anchovy | European Eel | Norway Bullhead | Short-snouted Seahorse |
| Angler Fish | European Plaice | Painted Wrasse | Smooth Hound |
| Atlantic Cod | European Smelt | Painted Goby | Snake Pipefish |
| Atlantic Salmon | Flounder | Perch | Solenette |
| Ballan Wrasse | Garfish | Pike | Spiny Dogfish |
| Barbel | Golden Mullet | Pilchard | Sprat |
| Bass | Goldfish | Pogge | Sting Ray |
| Black Goby | Goldsinny | Pollack | Straight-nosed Pipefish |
| Black Sea Bream | Grayling | Poor-Cod | Streaked Gurnard |
| Bleak | Great Pipefish | Pouting | Tadpole-Fish |
| Blue Mouth | Greater Sand Eel | Rainbow Trout | Tench |
| Blue Whiting | Greater Weever | Raitt's Sand Eel | Thick-Lipped Mullet |
| Bream | Grey Gurnard | Red Gurnard | Thin-Lipped Mullet |
| Brill | Gudgeon | Red Mullet | Tompot Blenny |
| Broad-Nosed Pipefish | Haddock | Roach | Transparent Goby |
| Brown/Sea Trout | Hake | Roach-Bream Hybrid* | Trigger-Fish |
| Bullhead | Herring | Rock Goby | Tub Gurnard |
| Butterfish | Lampern | Roker | Turbot |
| Carp | Lemon Sole | River Lamprey | Twaite Shad |
| Channel Catfish | Leopard Spotted Goby | Rudd | Wels Catfish |
| Chub | Lesser Weever | Ruffe | Whiting |
| Coalfish | Ling | Sand Eel | Worm Pipefish |
| Common Goby | Loach | Sand Goby | Zander** |
| Conger Eel | Long Rough Dab | Sand Goby (*P.lozanoi*) | |
| Corkwing Wrasse | Long Spined Sea Scorpion | Sand-Smelt | |
| Crucian Carp | Long-snouted Seahorse | Scad (Horse Mackerel) | |

*Roach-Bream hybrid is included in this species list due to its prevalence in the Tidal Thames

** Zander is included on this list, but it is a non-native species to the Tidal Thames.

# Annex 2: List of Protected Fish Species in the Tidal Thames

| Table 1: Summary of regulation relevant to fish species that have been identified as present in the Tidal Thames since 1964 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Common Name** | **Scientific Name** | **Wildlife and Countryside Act** | **NERC Species of Principal Importance** | **Bern Convention Protected Fauna** | **Habitats Directive** | **MCZ Species Features of Conservation Importance** | **London BAP Priority Species** | **UK BAP Priority Species** |
| Atlantic Cod | *Gadus morhua* | | Y | | | | | Y |
| Atlantic Salmon | *Salmo salar* | | Y | Annex III | Annex II, V | | Y | Y |
| Barbel | *Barbus barbus* | | | | Annex V | | | |
| Brown/Sea Trout | *Salmo trutta* | | Y | | | | Y | Y |
| Bullhead | *Cottus gobio* | | | | Annex II | | | |
| Common Goby | *Pomatoschistus microps* | | | Annex III | | | | |
| Dover Sole | *Solea solea* | | Y | | | | | Y |
| European Eel | *Anguilla anguilla* | | Y | | | | Y | Y |
| European Plaice | *Pleuronectes platessa* | | Y | | | | | Y |
| European Smelt | *Osmerus eperlanus* | | Y | | | Y | Y | Y |
| Herring | *Clupea harengus* | | Y | | | | | Y |
| Long-Snouted Seahorse | *Hippocampus guttulatus* | Schedule 5 | Y | | | Y | | Y |
| River Lamprey | *Lampetra fluviatilis* | | Y | Annex III | Annex II, V | | Y | Y |
| Sand Goby | *Pomatoschistus minutus* | | | Annex III | | | | |
| Short-Snouted Seahorse | *Hippocampus hippocampus* | Schedule 5 | Y | Annex II | | Y | | Y |
| Twaite Shad | *Alosa fallax* | Schedule 5 | Y | Annex III | Annex II, V | | Y | Y |
| Whiting | *Merlangius merlangus* | | Y | | | | | Y |

*See Annex 3 for an introduction to each regulation

# Annex 3: Brief introduction to species regulation

- **Wildlife and Countryside Act** - The Wildlife and Countryside Act 1981 consolidates and amends existing national legislation to implement the Bern Convention and European Birds Directive in Great Britain. The Act makes it an offence (subject to exceptions) to intentionally kill, injure or take any wild animal listed on Schedule 5, and prohibits interference with places used for shelter or protection, or intentionally disturbing animals occupying such places. The Act also prohibits certain methods of killing, injuring, or taking wild animals.
- **European Habitats Directive** - The Habitats Directive ensures the conservation of a wide range of rare, threatened or endemic animal and plant species. Adopted in 1992, the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora aims to promote the maintenance of biodiversity, taking account of economic, social, cultural and regional requirements. Over 1,000 animal and plant species listed in the directive's annexes are protected in various ways:
  - Annex II species (about 900): core areas of their habitat are designated as Sites of Community importance (SCIs) and included in the Natura 2000 network. These sites must be managed in accordance with the ecological needs of the species.
  - Annex IV species (over 400, including many Annex II species): a strict protection regime must be applied across their entire natural range within the EU, both within and outside Natura 2000 sites.
  - Annex V species (over 90): Member States must ensure that their exploitation and taking in the wild is compatible with maintaining them in a favourable conservation status.
- The **Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention)** – The UK Government ratified the Bern Convention in 1982. The principal aims of the Convention are to ensure conservation and protection of wild plant and animal species and their natural habitats (listed in Appendices I and II of the Convention), to increase cooperation between contracting parties, and to regulate the exploitation of those species (including migratory species) listed in Appendix III. To this end the Convention imposes legal obligations on contracting parties, protecting over 500 wild plant species and more than 1,000 wild animal species.
- **Natural Environment and Rural Communities (NERC) Species of Principal Importance** - There are 943 species of principal importance included on the S41 list. These are the species found in England which were identified as requiring action under the UK BAP and which continue to be regarded as conservation priorities under the UK Post-2010 Biodiversity Framework.
- **Marine Conservation Zone (MCZ) Features of Conservation Importance (FOCI)** – during the MCZ planning process it was identified that particular attention needed to be made towards protecting threatened, rare, or declining species and habitats – referred to together as Features of Conservation Importance (FOCI). These species and habitats may be more sensitive to pressures and hence need targeted protection.
- **UK Biodiversity Action Plan Priority (BAP) Priority Species** – UK BAP Priority species are those that were identified as being the most threatened and requiring conservation action under the UK Biodiversity Action Plan (UK BAP).
- **London Biodiversity Action Plan (BAP) Priority Species** – London Biodiversity Partnership identified a total of 214 priority species that are under particular threat in London and are listed under the London BAP Priority species.

## Your Notes

Animals and their habitats face increasing threats across the world. Donate to ZSL to help build a future where animals are valued and their conservation assured.
ZSL is a registered charity in England and Wales no: 208728

zsl.org