

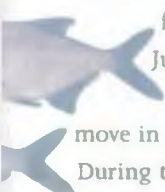


Trawling

stock. The recent appreciable increase in the sole stocks in the southern North Sea may well be related to the

increased number of sole from the Thames, the major spawning ground for this species on the East coast. The estuary has become a major nursery for bass, with large numbers of fry moving into the estuary during the summer months. Dace, smelt and sand-smelt now spawn in the upper estuary above Greenwich.

Huge seasonal migrations of fish and their fry other than salmon now occur in the river. In March, dace and smelt move to spawn near Wandsworth. Their fry then migrate right up to Teddington. Elvers (young eels) ascend the river in April. Flounder post-larvae ascend in May. Common goby fry in June. Bass fry in waves during June, July and August. Thin Lipped Grey Mullet fry in October. Most of these migrants move in dense shoals right up to Teddington. During the winter months, all of these species other than dace move down to the outer estuary again. Fry as small as 8mm in length are capable of



moving right up the estuary in a matter of days, even though they are not yet strong enough to swim against the stronger currents. Cleverly, the fry use the tidal streams to migrate. They float up on the flood tide, and find refuge in the margins of the channel during the ebb tide. At sites such as Putney in May, vast numbers of tiny flounder



Seine netting



can be seen floating up from the bottom of the river at the edge of the channel as the tide starts to push upstream. A real miracle of nature!



Bass Fry

The foreshore is the most important habitat available to the fish. It offers productive feeding and refuge areas. A continuous foreshore is vital to the migration of fish fry. Development pressures along the banks of the river are intense. Encroachment, or building on the foreshore, has been going on for thousands of years. The river at Westminster was 800m wide in Roman times, it is now less than 300m. As the river narrows, foreshore habitat is lost and flows increase. Fish fry migration becomes more difficult. Through its own flood defence works and influencing the actions of others through the planning process, the Agency is committed to resisting further encroachment into the river. Opportunities are taken to improve marginal habitats and improve foot access to the foreshore for angling and casual amenity.

Fish Found in the Tidal Thames



ENVIRONMENT AGENCY

occasionally very large specimens are caught.

Dace ▼

The dace is one of the most elegant of the British coarse fish. Adult dace rarely weigh more than 300gm and are a very lively species which dart around together in the



upper waters. The commonest freshwater fish in the Thames estuary. Dace spawn near Wandsworth in March and April.

Perch ▼

Perch are sedentary fish and do not perform any extensive migrations though they do seek out deep water in winter. Perch have five to nine vertical dark stripes along both sides of the body. Often found in the freshwater reaches, and occasionally may be found as far downriver as Dartford after heavy rainfall.



Roach ▼

Roach form large shoals on the slow-flowing stretches of the River Thames. They usually grow to a length of about 25cm and a weight of up to 1kg. The spawning season for roach is in May or early June. Like the perch they may be found a considerable distance downriver during periods of heavy rainfall.



Roach Bream Hybrid

Many carp-like fish form hybrids when shoals of fish mingle at spawning sites during spawning. Roach bream hybrids are difficult to identify with certainty, and need to be investigated by an expert, who may be able to determine the hybrid from the number and shape of the pharyngeal teeth. The body of a roach bream hybrid is more slimy than that of a roach, and is slightly less deep-bodied than the bream's. Quite common in the Thames tideway, but few are recognised and so remain unreported.

Eel ▼

The common eel differs from most other migratory fish in that it leaves the river to spawn. Eels breed in the Sargasso Sea at a point halfway between Bermuda and the



Leeward Islands. Each year in the Thames now sees a large upriver migration of eelers, which passes through the central London area in May and June, although eelers may be found in smaller numbers throughout the other summer months. The mature silver eels leave the inner Thames in the late autumn.

Flounder

Young flounders migrate into fresh water and move up rivers into lakes where they remain until mature. This upriver migration occurs during May and June in the Thames, when thousands of the young flatfish, which are the size of a new five penny piece, may be caught. At about three years of age the

Tower of London

Greenwich Cruithy Park



Migrating juveniles and returning adults are now commonly taken. Over 300 adult returning fish have been recorded in one year.



Smelt ▲

The smelt is a cousin of the salmon and like the salmon moves toward fresh water to spawn. It grows rapidly to about 20cm and matures when two years old. Smelt have very large mouths and teeth which give the fish a very aggressive appearance. The smelt also has a characteristic smell of cucumbers. Like the salmon, the smelt needs good quality water to thrive, and recent

Three-spined Stickleback ▼

The upper part of the stickleback is blue-black or greenish, and paler below. In the breeding season the throat of the male turns brilliant orange/red. It rarely grows to more than 6cm and has three dorsal spines in front of the dorsal fin. The skin has no scales but there are vertical bony plates on the sides of the body. Sticklebacks are found mainly in fresh water but they are also common in salt water.



Trout

The trout is a member of the salmon family and, providing the water is clean, is adaptable to a wide range of conditions. Trout may grow to a length of over 100cm. Sea trout are now found in the river fairly regularly, especially in the region of London Bridge to Tilbury. A female sea trout kelt found in the River Colne in January 1981 was the first positive indication of a migratory salmonid spawning in the Thames catchment this century.

Sand Goby ▼

Coloured light brown, the sand goby grows to about 10cm and is found in salt water all round Britain, generally over sand. The eggs are laid in empty bivalve shells and guarded by the male.



During autumn the sand goby is abundant in the estuary. Exceptionally it has been found as far up as Chiswick, during dry summers when salt water moves further up the estuary than normal.

Common Goby

The common goby looks similar to the sand goby but is not as common. It penetrates much further upriver and may be found in freshwater creeks and intertidal pools up to Teddington, in the later summer months.

Tub Gurnard

The name gurnard is said to be derived from the French word, grogner, meaning to grunt, and gurnards have the reputation among fishermen for grunting when taken from water. The tub gurnard is a southern species,

FRESHWATER

Bream ▼

The bream is found in shoals in the slower flowing stretches of the Thames. It is the most



hump-backed of our freshwater fish and may grow to 75cm and weigh as much as 6kg. In spite of being well scaled, the bream is a very slim fish. The name dates back to the twelfth century, and some researchers suggest it derives from a Teutonic word meaning to glitter, possibly as a reference to the gleaming dull silver flanks.

Pike ▼

The pike is the most voracious fish-eating carnivore among all the British freshwater species.

The pike is olive-green or greenish-brown and sometimes has camouflaging diagonal stripes. Specimens of more than 20kg have been recorded. A common freshwater species of the Thames.



EURYHALINE (Euryhaline fish can live in both fresh and salt water)

Bass ▼

The bass is a coastal fish, but between June and October it enters the brackish estuaries and often moves right into fresh water. The bass' colour is predominantly metallic blue above and silvery on the sides and belly. Bass are carnivorous and much more common off the south coasts of Britain than the north. The name bass is said to be derived from "barse", an old English word meaning bristly or spiny. A common fish in the Thames, which is now a major bass nursery. Fish to 4kg are regularly taken by anglers as far upstream as Thamesmead.



adult flounders return to the sea to spawn and thereafter do not penetrate quite so far into fresh water as the immature youngsters. The flounder is a flatfish related to the plaice and dab and usually grows to about 50cm. These very abundant fish may be found throughout the Thames, from Tilbury to Teddington. It is the only flatfish likely to be found in the river above Wapping.

Salmon ▼

The exciting discovery in 1974 of an adult salmon, being the first for 150 years, suggested that the Thames might once again be clean enough to support its passage.

Accordingly, the Thames Water Authority instigated a Salmon Rehabilitation Programme which is outlined overleaf.



increases in the smelt population is one of our best indications of a much improved river. The smelt is now abundant in the Thames. Pre-spawning shoals congregate below Gravesend during the later winter months. In March,

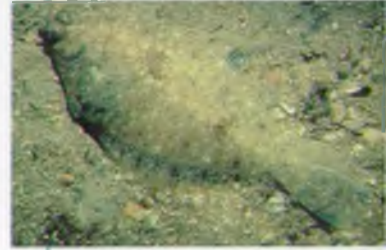
the shoals ascend to spawn near Wandsworth. Fry are then distributed throughout the estuary for the summer months.

Sand Smelt ▼

The sand smelt, or silverside, are superficially like small grey mullet. They grow to 15cm, and possess an intense silvery line running from head to tail. Now common in the river, the species spawns in the Greenwich area.



MARINE



Dab ▲

The dab is a flatfish inhabiting sandy bays and offshore banks, where it feeds on worms, crustacea and some bivalve molluscs (such as cockles). The young dab is symmetrical and changes to adult form when about four weeks old. Abundant all round Britain, the dab rarely exceed 30cm in length. Most dab caught in the Thames are much smaller than this, and are immature. The

lateral line is strongly curved above the pectoral fin, and this feature may help to distinguish the dab from the flounder, with which it is often confused.

Carp ▲

The carp is a large powerful fish and a great favourite with anglers. The species is essentially a bottom feeder but can often be spotted basking on the surface during the summer.

Our carp may be descendants of fish cultivated by monks for centuries in their stewponds. Common in the Thames,



Fish found in the Tidal Thames

The River Thames once supported commercial fisheries of considerable economic importance. Smelt from the Thames were plentiful at Billingsgate; 30 or 40 boats working between Wandsworth and Hammersmith might catch 50,000 in a day. Thames shads, flounders, eels and whitebait were caught for food and over one million lamperns were sold annually to Dutch fishermen for use as bait. Even the occasional sturgeon was taken in the tideway. Some of this fishing has been going on for a very long time as illustrated by study of the archaeology of the tidal foreshore, financially supported by the Environment Agency, which found the remains of Bronze Age fish traps at several locations.

At the beginning of the nineteenth century increased pollution and loss of habitat combined to destroy these fisheries, so in the 1950's a mammoth scheme was begun to rebuild and extend London's major sewage treatment works and improve the water quality of the river. The scheme took over 20 years to complete, during which time the Greater London Council and the Thames Water Authority carried through the project which, at present day prices cost some £200 million.

Further details of the improvement in water quality are detailed in the Environment Agency Leaflet: 'Fact File: The Tidal Thames'.

The Thames is now recognised internationally as one of the cleanest metropolitan estuaries in the world and a leading example of a successful clean-up campaign. Technical staff involved in river basin



management come from all over the world to see what has been achieved in the Thames.

The estuary now supports 115 species of fish, over 350 species of invertebrates and many important bird species.

The river now plays a major part in supporting the North Sea fish stocks.

The fish species found to date are listed in the table opposite. The majority have been found by biologists of the Environment Agency and its predecessors since 1974 during routine surveys.

The Environment Agency has a statutory duty to maintain, improve and develop all freshwater fisheries in the estuary. Since 1995, Thames Region has also acquired formal Sea Fisheries Powers downstream to Mucking. These powers are used to protect and promote all of the fish populations in the estuary. As the body responsible for water quality control in the river, through management regimes and future initiatives, the Agency is committed to protecting and improving the modern status of the tidal Thames.

How the fish are caught

Biologists and Fisheries Officers conduct a range of coordinated fish survey programmes

Power station survey



from Teddington to Southend. Four main methods are used to sample the fish populations. Beam trawling to collect benthic (bottom dwelling) species, and push netting to collect sublittoral (sub surface) fish are done throughout the estuary. Seine netting is undertaken in the reaches above Gravesend. Studies take place at Power Stations which use water from the estuary for cooling purposes.

Occasionally, rare species are found such as the sea horse illustrated right.



The Environment Agency

The Environment Agency (Agency) is working towards the vision of a better environment in England and Wales for present and future generations.

As one of the most powerful regulators in the world, we provide an integrated, efficient and business-like approach to the protection and management of the environment.

Operational since April 1 1996, we were formed from the National Rivers Authority (NRA), Her Majesty's Inspectorate of Pollution (HMIP), Waste Regulation Authorities (WRA's) and units from the Department of the Environment.

The Agency's main functions are:-

- pollution prevention and control
- waste minimisation
- management of water resources
- flood defence
- improvement of salmon and freshwater fisheries
- conservation
- use of inland and coastal waters for recreation
- navigation



Silbury *Gravesend* KENT *River Medway*

Herring

Round Britain there are two main groups of herring (the largest growing to 37cm) differing in distribution, lifespan, number and size of eggs laid, spawning times, growth rate and size. Young herrings which live off planktonic crustacea, shoal in large estuaries and after six months in coastal waters take to the open sea. They do not join shoals of large herrings until they mature, at three, four or five years. A very common fish of the Thames, which together with juvenile sprat, was once caught as "whitebait", and sold in the taverns of Greenwich and Blackwall.

Sprat

The sprat is the smallest member of the herring family and rarely grows larger than 15cm. Sprats are greenish-blue above, and silvery on the sides and belly. Their diet is entirely planktonic and hugh shoals can often be found in coastal waters. Sprats often move right into rivers. Sprats are common in the Thames during most months of the year, but their numbers peak in the autumn and early winter.

Greater Pipefish ▼

The greater pipefish is one of the commonest pipefish and grows to 46cm. It lives among seaweed and eel-grass and like the other members of this species feeds on tiny crustaceans which it stalks with great deliberation. Quite common in the brackish reaches of the river.



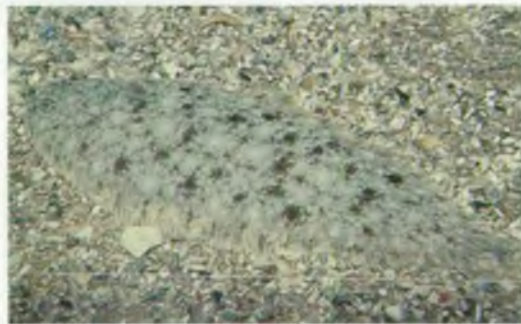
Lesser Pipefish

Also known as Nilsson's pipefish, the lesser pipefish is common, living in very shallow water between 60 and 200cm deep. It is usually found among seaweed on sandy shores, but the muddier estuary also seems to suit this species.

Sole ▼

The sole is believed to feed almost entirely by night and lie half buried in the sand during the day. The colour of the sole is usually dark brown and it grows up to 60cm long. Sole differs from other flatfish by having tongue shaped bodies. Most fish taken in the inner Thames are juveniles, but

further out at the mouth of the estuary large fish weighing 1kg are encountered. The sole is one of the commonest fish in the Thames, and is found in large numbers throughout the year. Young fish come up as far as Greenwich during the late summer.



Atlantic Salmon – The Thames Salmon Rehabilitation Scheme

Salmon spawn in the upper reaches of rivers, where they live for 1-3 years before migrating to sea as smelts. On reaching the sea, salmon grow rapidly and after 1-3 years make their return journey to their natal river to spawn. The salmon is a good indicator of a healthy river catchment requiring good water quality, flow and habitat from the estuary to the upper reaches.



There is much evidence that the River Thames once supported a healthy salmon population. However, the pollution of the tidal river brought about by the Industrial Revolution was a major cause of the extinction of the population in 1833. Happily, the population became evident in the 1970's.

In 1979, Thames Water Authority established the Thames Salmon Rehabilitation Scheme with the long term objective of restoring a self-sustaining population to the river. Good progress has been made by the bodies responsible for the Scheme:

initially Thames Water, then the National Rivers Authority and now the Environment Agency. The creation of the Thames Salmon Trust in 1986 to provide finance for the Scheme has been a great success with over £1 million raised to date.

The Scheme includes fish rearing and stocking, construction of fish passes and monitoring programmes to evaluate progress. The Scheme has achieved a regular salmon return since 1982 with an estimated return of over 500 fish in 1993. Good progress has also been made on the construction of fish passes needed to enable upstream migration past the many weirs on the river to reach spawning grounds. Passes have been built on almost all of the 20 weirs from the tidal river to the River Kennet which is now the focus of efforts to encourage natural spawning.

Much remains to be done, and future progress is dependent on the support of many parties working towards our goal.

The Thames as a nursery ground

The Thames estuary is an important nursery ground for a wide range of species. Flounder, sole, plaice and dab thrive with the protection that the estuary affords and where abundance of food and warmer water accelerate their rate of growth. After 2 or 3 years, having reached a length of about 25cm the sole migrate out of the estuary to swell the commercial fishing



rare north of East Anglia, living over sand or gravel. Young tub gurnard eat crustacea while the larger ones live on fish such as dragonets and solenettes. The British rod-caught record for this large species is 5.195kg. The commonest gurnard in the Thames, this species is coloured red, similar to red gurnard, but can be recognised by the brilliant peacock blue-edged pectoral fins. ▼



Red Gurnard

Smallest of the three common gurnards, the red gurnard grows to 30cm and is found mainly off the west coasts. This species looks similar to the tub gurnard and occurs in the Thames at most times of the year, but never in very large numbers.

Thick-lipped Mullet

Essentially a marine fish migrating inshore in summer, the thick-lipped mullet feeds by sucking up soil and extracting small particles of plants and animals from it. Over 85% indigestible matter has been found in the stomachs of these fish which grow to a maximum of 50cm and whose intestines are five times the body length (this is longer than

those of any other fish). This can be a common fish in the Thames up to Woolwich during the summer.



Thin-lipped Mullet

The thin-lipped mullet grows faster than the thick-lipped fish and breeds in the autumn rather than the spring, and has obviously thinner lips than its thick-lipped relative. Otherwise the fish seem identical. Generally more common in the Thames than the thick-lipped mullet, it penetrates up to Chelsea. Fry penetrate as far as Chiswick.



Five-bearded Rockling

With two barbels by the nostrils, two on the upper lip and one on the chin, the five-bearded rockling is common among weeds and boulders in rocky shore pools and shallow water. It grows to 20cm and is found all round Britain. The commonest of all the rocklings in the Thames.



Whiting, Bib and Poor-Cod ▲

These are all members of the cod family with whiting being the most common in the Thames. Whiting migrates into the estuary in autumn and until spring very large catches may be made in the middle tideway. They feed principally on smaller fish such as sand goby and herring.

The whiting is distinguished from the other two species by its apparent lack of a barbel (although a very small one is present). Bib are distinguished from poor-cod by a join between its two anal fins.

X

Gannery Island

Southend

River Thames

FISHES OF THE THAMES ESTUARY

The fish species listed below have been caught in the tidal River Thames between Fulham and Tilbury since 1964. The list is not necessarily indicative of the species that are currently present.

Euryhaline

Bass
Eel
Flounder
Lampfern
Lamprey
Salmon
Shad, Allis
Shad, Twaite
Smelt
Stickleback, 3-sp.
Stickleback, 10-sp.
Trout
Trout, Rainbow

Gurnard, Grey
Gurnard, Red
Gurnard, Streaked
Gurnard, Tub
Haddock
Hake
Herring
Ling
Lumpsucker
Mackerel
Muller, Golden
Mullet, Red
Mullet, Thick-Lipped
Mullet, Thin-Lipped
Norway Bullhead
Pilchard
Pipefish, Broad-Nosed
Pipefish, Great
Pipefish, Nilsson's
Pipefish, Snake
Pipefish, Straight-nosed
Pipefish, Worm
Plaice
Pogge
Pollack
Poor-Cod
Pouting
Ray, Sting
Rockling, 5-Bearded
Rockling, 4-Bearded
Rockling, 3-Bearded
Rockling, Northern
Rockling, Shore
Sand Eel
Sand Eel, Greater
Sand Eel, Raitt's
Sand-Smelt
Scad

Scadfish
Sea Bream, Black
Sea Horse
(*H. hippocampus*)
Sea Horse
(*H. ramulosus*)
Sea Scorpion, Long Spined
Sea Scorpion, Short Spined
Sea Snail
Sea Snail, Montagu's
Sea Stickleback
Sea Skipper
Smooth Hound
Sole, Dover
Sole, Lemon
Solenette
Sprat
Tadpole-Fish
Trigger-Fish
Weever, Lesser
Whiting
Whiting, Blue
Wrasse, Ballan
Wrasse, Corkwing

Marine

Anchovy
Angler Fish
Blue Mouth
Brill
Butterfish
Catfish, Channel
Cod
Conger Eel
Dab
Dab, Long Rough (unconfirmed)
Dory
Dragonet
Eckstrom Topknot
Garfish
Goby, Black
Goby, Common
Goby, Leopard
Spotted
Goby, Painted
Goby, Rock
Goby, Sand
Goby, Sand (*P. lozanoi*)
Goby, Transparent
Goldsinny

Freshwater

Barbel
Bleak
Bream
Bluehead
Carp
Carp, Crucian
Chub
Dace
Goldfish
Grayling
Gudgeon
Loach
Minnow
Perch
Pike
Roach
Rudd
Ruffe
Tench

Hybrid

Roach x Bream

MANAGEMENT AND CONTACTS:

The Environment Agency delivers a service to its customers, with the emphasis on authority and accountability at the most local level possible. It aims to be cost-effective and efficient and to offer the best service and value for money.

Head Office is responsible for overall policy and relationships with national bodies including Government.

Rio House, Waterside Drive, Aztec West,
Almondsbury, Bristol BS12 4UD
Tel: 01454 624 400 Fax: 01454 624 409

ENVIRONMENT AGENCY REGIONAL OFFICES

ANGLIAN
Kingfisher House
Goldney Way
Orton Goldhay
Peterborough PE2 5ZR
Tel: 01733 371 811
Fax: 01733 231 840

SOUTHERN
Guildbourne House
Chatsworth Road
Worthing
West Sussex BN11 1LD
Tel: 01903 832 000
Fax: 01903 821 832

NORTH EAST
Rivers House
21 Park Square South
Leeds LS1 2QG
Tel: 0113 244 0191
Fax: 0113 246 1889

SOUTH WEST
Manley House
Kestrel Way
Exeter EX2 7LQ
Tel: 01392 444 000
Fax: 01392 444 238

NORTH WEST
Richard Fairclough House
Knutstrod Road
Warrington WA4 1HG
Tel: 01925 653 999
Fax: 01925 415 961

THAMES
Kings Meadow House
Kings Meadow Road
Reading RG1 8DQ
Tel: 0118 953 5000
Fax: 0118 950 0388

MIDLANDS
Sapphire East
550 Streetsbrook Road
Solihull B91 1QT
Tel: 0121 711 2324
Fax: 0121 711 5824

WELSH
Rivers House/Plas-yr-Afon
St Mellons Business Park
St Mellons
Cardiff CF3 0LT
Tel: 01222 770 088
Fax: 01222 798 555



For general enquiries please call your local Environment Agency office. If you are unsure who to contact, or which is your local office, please call our general enquiry line.

**ENVIRONMENT AGENCY
GENERAL ENQUIRY LINE**

0645 333 111

The 24-hour emergency hotline number for reporting all environmental incidents relating to air, land and water.

**ENVIRONMENT AGENCY
EMERGENCY HOTLINE**

0800 80 70 60

115 species +
1 hybrid
In addition the following species have been caught between Tilbury and Sea Reach
No.1 Buoy:
Undulate Ray,
Roker, Sun Fish,
Turbot and
Viviparous
Blenny.

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EA- THAMES REGION