

# Invertebrate Animals of the Tidal Thames



ENVIRONMENT AGENCY

## 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

## Pollution Prevention and Control

Pollution Prevention and Control (PPC) has a responsibility for all the functions



Pollution monitor at Hammersmith

that were previously carried out by the NRA and certain functions carried out by Her Majesty's Inspectorate of Pollution and the Waste Regulation Authorities, and certain policy functions carried out by the Department of the Environment. PPC has a wide range of duties to prevent, minimise, remedy or mitigate pollution and has developed four groups to deliver its functions.



## Flood Defence

Much of lowland England and Wales is at risk from flooding whether by rivers or the sea. The Agency has a general supervisory duty over all matters relating to flood defence, including the construction of new works and undertakes to improve or maintain existing flood defence systems, ensuring works are technically sound, economically worthwhile and conserve or enhance the environment.

From 1 September 1996, the Agency is responsible for the dissemination of flood warnings to the people at risk. The Agency advises Local Planning Authorities on development and flood risk areas in the Thames Region, the most important defence is the Thames Barrier, which protects London from flooding.

## Integrated Pollution Control (IPC)

Integrated Pollution Control (IPC) was introduced under Part 1 of the Environmental Protection Act 1990. IPC is the system for regulating the potentially most polluting industrial processes. It recognises the need for a holistic approach to the environment, whereby the effects of emissions from a polluting process on all environmental media (air, land and water) are taken into account and ensures that substances are released to the medium in which they cause the least damage.

## Radioactive Substances

Under the Radioactive Substances Act 1993 the Agency has responsibilities to regulate the disposal of radioactive waste

(on all licensed sites), the keeping and use of radioactive material and accumulation of radioactive waste (non-nuclear sites only). On nuclear licensed sites, the Agency only regulates the disposal of radioactive waste.

## Water Protection

The Agency is responsible for maintaining or improving the quality of rivers, estuaries and coastal waters through powers to regulate, prevent, mitigate or remedy pollution to water under the Water Resources Act and Water Industry Act and EC Directives. Functional responsibilities include: specification of water quality and standards and criteria, regulation of discharges to controlled waters and groundwaters and the prevention of pollution including pollution from abandoned mines.

## Waste Regulation

The Agency controls the storage, transport, exchange and disposal of wastes. This includes licensing and inspecting waste management facilities for compliance with the Agency's requirements. We also undertake environmental monitoring on and around waste disposal facilities and produce and maintain public registers containing details of all licensed facilities.

## Water Resources

The Agency balances the amount of water required to keep rivers, lakes and groundwater at satisfactory levels, with demands made by the public, agriculture and industry. To do this river flows, rainfall and groundwater levels are carefully monitored. Some rivers in the Thames Region suffer from overabstraction, where water flows have dropped, or even dried up altogether. The Agency is working on projects to restore these rivers.

## Fisheries

Part of the Agency's role is to protect and enhance fisheries and fish numbers. Monitoring the numbers and health of fish, rearing fry for

## UPPER ESTUARY (FRESHWATER) ZONE

### Water Hog-louse (*Asellus aquaticus* – up to 15mm)



Closely related to the wood-louse, this animal can be found in large numbers under stones. It emerges to feed, mainly at night.

### Leeches (typically 30-40mm)

Several species of leeches can be found in the Thames. Most are found in the upper estuary zone feeding on snails and worms. Other species feed on the blood of water birds and fish.



### Mayfly (*Caenis moesta* – up to 9mm)

Mayfly nymphs, which are normally associated with good quality water, are thought to drift downstream from the freshwater river Thames and tributaries. They have been recorded as far downstream as London Bridge during times of high river flow.



## MID ESTUARY (BRACKISH) ZONE

### Brown shrimp (*Crangon crangon* – typically 30-50mm)

The Brown Shrimp is found extensively throughout the mid and outer estuary zones. However, they have been known to penetrate as far upstream as Hammersmith during periods of low freshwater flow and high salinity. Further down the estuary towards Southend, the brown shrimp is fished commercially.



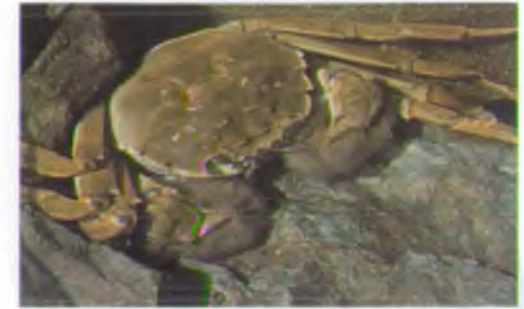
### Prawns

Although several species of prawns have been recorded from the Thames estuary, one in particular has established a large breeding population here. This is the estuarine prawn, *Palaemon longirostris* (up to 70mm). It is mainly found in the mid estuary zone, although it can penetrate as far upstream as Battersea.



### Chinese Mitten Crab (*Eriocheir sinensis* – up to 70mm across)

The Chinese Mitten Crab was introduced from the Far East into Europe almost 100 years ago. Twenty years ago, only two specimens had been caught in Britain. Since then a breeding population has been established in the Thames. They can tolerate freshwater and may travel from the sea into freshwater tributaries. The crab can cause damage to river systems as it makes burrows in the mud of the river bank, thereby increasing the rate of erosion.



### Shore crab (*Carcinus maenas* – up to 80mm across)



This well known crab is common in both the mid and outer estuary zone. They feed on a wide variety of invertebrates including worms, snails and shrimps. After moults, the outer shell is soft and in this state it is

sought after as bait by sea anglers. When disturbed, this crab may take up an aggressive stance holding its nippers up in the air ready for action.



Gardens

Greenwich

Teddington

Lower of Crutty Park

**River limpet** (*Ancylus fluviatilis* – up to 8mm wide)  
Like the marine limpet, the freshwater river limpet can be found clinging to rocks. They feed on algae.



**Oligochaete worms** (rarely greater than 20mm)  
Several species are encountered in the estuary. Different species have a different preference for levels of salinity and some can also tolerate very low levels of oxygen in the water. The number of worms in the river has declined over recent years. The improvements in water quality have increased the levels of oxygen in the water allowing a greater variety of animals to utilise the river and these have predated upon the worms. They are present throughout the estuary but can be found in large numbers in mud banks such as at Woolwich and Crossness.



**Ragworm** (*Nereis diversicolor* – up to 200mm)  
The common Ragworm is found in the mid and outer estuary zones and it is present in particularly high numbers on mud banks such as at West Thurrock. They are active scavengers and have powerful jaws for catching their prey.



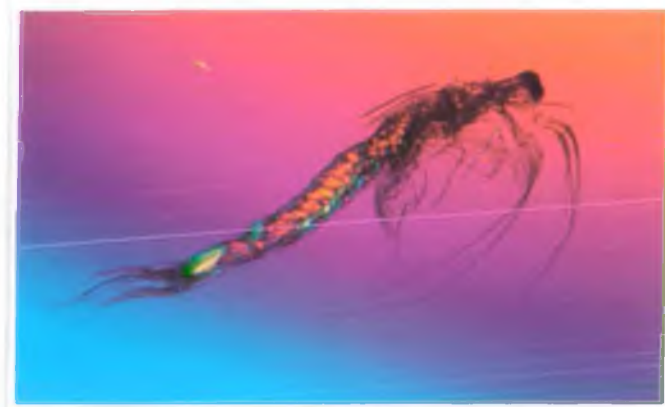
**Snails**  
The Spire shell (*Potamopyrgus jenkinsi* – up to 5mm) and the Wandering snail (*Lymnaea peregra* typically 15-20mm) are two other very common snails in the upper estuary zone. They feed on algae, plants and organic debris.



**Shrimps** (up to 15mm)  
Four species of Gammarid shrimps are present in large numbers throughout the estuary. The most common species are *Gammarus zaddachi* which live in the upper and mid estuary zones and *Gammarus salinus* which can be found in the higher salinity of the mid and outer zones.



**Opossum shrimps** (up to 18mm but generally smaller)  
These are small, transparent shrimp-like animals which are often seen in swarms "hovering" in the water. Opossum shrimps are omnivores and will feed on detritus, algae and small animals.



## OUTER ESTUARY (MARINE) ZONE

**Whiteweed** (*Sertularia* sp. – up to 350mm in height)

“Whiteweed” is abundant in the Thames estuary in the Southend area. It is found below the low water level and commercially trawled, dried, stained and sold for floral decoration. It is, in fact, not a plant but a colony of small animals related to the jellyfishes.



### Swimming crabs

Three species of swimming crabs live in the estuary. These crabs have their back legs modified into swimming paddles.

**The Velvet Swimming Crab** (*Liocarcinus puber* – up to 40mm across) is very aggressive and will move into an attacking pose when disturbed.



### Hermit Crabs (up to 35mm)

These are common in the outer estuary living in discarded whelk shells. When the crab becomes too big for its shell, it carefully tests out a new shell for weight and size before moving in.



### Other crabs

Several species of spider crabs (up to 150mm across) are present in the outer estuary living amongst Whiteweed and seaweed. They often drape themselves with weed, sponge and other debris as camouflage, which makes them difficult to see.



### The edible crab

(*Cancer pagurus* – up to 200mm across) is occasionally caught and is

the one often seen on fishmongers slabs. However, the bottom of the estuary is rarely the correct substrate for this particular species and it is probably quite rare in the Thames.



### Cockles (*Cerastoderma edule* – up to 50mm but generally less)

The common or edible cockle is found throughout the outer estuary

zone buried in the sand and is harvested commercially in the Southend area.

Cockles feed by drawing water in through tubes and straining out food such as plankton (small drifting animals and plants).



As the tubes are quite short, cockles need to live near the surface of the sand and are therefore easily caught by predators such as gulls, flatfish and starfish.



# Tilbury River Medway Kent

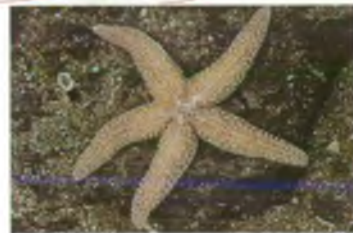
**Edible mussel** (*Mytilus edulis* – up to 100mm)

Mussels grow singly or in clumps attached to each other by byssus threads. These are secreted as a thick fluid which hardens on contact with water.



**Starfish**

The common starfish (*Asterias rubens* – up to 150mm across) are carnivores, eating invertebrates and mussels. Under each arm are strong tube feet which are very powerful and can pull apart the shells of mussels. If an arm is broken or the starfish is cut into two, new parts can quickly grow.



**The American Slipper Limpet** (up to 50mm in length)



This species, accidentally imported from America with oysters in about 1880, is common in the outer estuary. It is a pest of commercial oyster beds competing with oysters for food and smothering them

with its very prolific growth rates. Individuals are found in chains one on top the other. The younger individuals are males which change sex as they age.

**Sea Gooseberries**

The common sea gooseberry (*Pleurobranchia pileus* – spherical body up to 30mm across) looks like a small jellyfish but it actually belongs to a separate group – the comb jellies – so called due to the combs of small hairs along the body which beat to propel it along. They are voracious predators, trailing long tentacles like fishing lines to trap prey such as shrimps and young fish.



**Brittle stars**

(up to 35mm but generally smaller) are also fairly common in the outer estuary zone. They are similar to starfish and live under rocks, shells and seaweed.

**Marine bristle worms** (up to 100mm but generally less than 15mm)

There are more species of bristle worms than any other group of invertebrates. However, they are usually small and are difficult to see and identify. They are found in lots of different habitats – amongst seaweed, buried in sand, or within cases made of sand grains and mud. The ragworm and the lugworm are two of the largest bristle worms to be seen. Both are used as fishing bait. Other worms, such as the attractive sand mason, are only conspicuous by their cases sticking out of the sand such as at Southend beach.



**Jellyfish** (up to 250mm across)

One species of jellyfish, *Aurelia aurita*, is common in the estuary during the summer months. Although this jellyfish has a sting that can paralyse small prey animals such as opossum shrimps, it does not affect man and can be handled. The animal swims only weakly, usually moving with the prevailing currents. More rarely occurring is the compass jellyfish, *Chrysaora baysocella*, which, again, is only found during the summer.

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# Invertebrate Animals of the Tidal Thames

The once grossly polluted Thames has been cleaned up to such a degree that it now supports a significant fish population. The return of over 110 species of fish to the river, where in the 1950s only eels could survive at certain times of year, is explained in another Agency leaflet entitled 'Fish Found in the Tidal Thames'.

Less well known is the return of numerous small animals known as invertebrates (animals without backbones). These usually go unnoticed, living in the depths of the river, hiding under rocks, in the mud, or drifting in the surface layers as plankton. Without these animals the fish would be without food and could not survive.



*Grab sampling at Tower Bridge*

Environment Agency biologists use a variety of methods to find and record these animals. Cores are taken from the intertidal foreshore mud and sandy areas at low water. 'Kick' samples are taken from the upper reaches of the Tideway where the gravelly substrate is not suitable for cores. For the animals living in the mud below the water a mechanical grab is used. The sample is sieved and the animals present can then be identified and counted.

The collected information can be used to show changes in invertebrate populations caused by seasonal growth and migration. Any effect caused by pollution or development adjacent to the river can also be shown. Under normal conditions the Thames is freshwater to London Bridge and almost fully seawater beyond Southend. Between these two places there is a gradual change

in saltiness (salinity) as the freshwater mixes with water from the North Sea in what is called the brackish water (or euryhaline) zone.

Most animals avoid the brackish water zone, preferring either freshwater or fully marine environments. A minority of the 350 or so species recorded in the Thames are able to survive in brackish water, and they do so because they are specifically adapted to exist in these conditions. It should be appreciated that salinity zones move within the river according to the amount of rainfall in the region – in a



*Sorting the grab sample*

drought for example, there will be a lot less flow from the non-tidal Thames above Teddington Weir and this will allow the sea water to penetrate much further up the estuary than normal. The result will be



that marine animals can  
move further up the river



*Identifying the invertebrates*

Much of the foreshore of the  
Thames is under threat from development.

The loss of these areas will increase the pressures on an already highly  
stressed invertebrate community by reducing the habitat available.

This in turn may reduce the available food source for fish.

It is essential to maintain a continuous invertebrate community along  
the length of the tidal Thames to allow both localised and extensive  
migrations of the various invertebrate and fish species. If this is not  
maintained, reductions in the estuarine/freshwater fauna may result.



stocking depleted rivers, installing fish passes and improving fish habitats all help to protect and improve fish populations. Anyone who goes fishing needs an Agency rod licence. The money raised from this goes to help our fisheries work. In the Thames Region an important aspect of this work is the successful return of salmon to the River Thames.

### Recreation

The Agency aims to ensure the best possible use of rivers and other inland waters for all kinds of recreation. Anglers, birdwatchers, boating enthusiasts, canoeists, divers, ramblers and rowers are all provided for in the Thames Region. Facilities are managed so that recreation poses no risk to the local landscape and wildlife.

### Conservation

The Agency is entrusted with conserving and enhancing the landscape and wildlife associated with the water environment. A river may be particularly important for wildlife in urban or intensively farmed areas. Conservation staff provide advice to all those working in and around rivers to prevent destruction of habitats, and to incorporate additional conservation measures such as planting of reed beds wherever possible.

### Navigation

The Agency is responsible for regulating navigation along many rivers. On the non-tidal Thames, around 25,000 boats are registered to use 160km of river. The Agency ensures that boaters enjoy their recreation safely and without disrupting other water users by enforcing rights of way and speed limits. Thames lock and weir keepers also help to control flow along the river, to control levels for water resource purposes and control flooding



## 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

<b>ANGLIAN</b> Kingfisher House Goldhay Way Orton Goldhay Peterborough PE2 5ZR Tel: 01733 371 811 Fax: 01733 231 840	<b>SOUTHERN</b> Guildbourne House Chatsworth Road Worthing West Sussex BN11 1LD Tel: 01903 832 000 Fax: 01903 821 832
<b>NORTH EAST</b> Rivers House 21 Park Square South Leeds LS1 2QG Tel: 0113 244 0191 Fax: 0113 246 1889	<b>SOUTH WEST</b> Manley House Kestrel Way Exeter EX2 7LQ Tel: 01392 444 000 Fax: 01392 444 238
<b>NORTH WEST</b> Richard Fairclough House Knutsford Road Warrington WA4 1HG Tel: 01925 653 999 Fax: 01925 415 961	<b>THAMES</b> Kings Meadow House Kings Meadow Road Reading RG1 8DQ Tel: 0118 953 5000 Fax: 0118 950 0388
<b>MIDLANDS</b> Sapphire East 550 Streetsbrook Road Solihull B91 1QT Tel: 0121 711 2324 Fax: 0121 711 5824	<b>WELSH</b> Rivers House/Plas-yr-Afon St Mellons Business Park St Mellons Cardiff CF3 0LT Tel: 01222 770 088 Fax: 01222 798 555



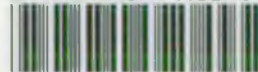
For general enquiries please call your local Environment Agency office. If you are unsure who to contact, or which is your local office, please call our general enquiry line.

**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.

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EMERGENCY HOTLINE  
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