HA10: The Tidal Thames

Definition

The Thames and its tidal creeks encompass the entire length of the river in London and the tidal limit of its tributaries. In many cases this tidal limit is artificially restricted by the operation of various barriers and weirs.

The Greater London Tidal Thames resource

The River Thames runs 42 miles through Greater London from Hampton in the west to Dartford Creek in the east. For much of its length it is tidal, the tidal influence reaching as far upriver as Teddington Lock. There are several tributaries of the Thames which enter the river within Greater London, a number of which (notably the Wandle, Ravensbourne, Lea, Roding, Darent and Ingrebourne) have tidal creeks.

The Thames in London covers an area of approximately 2400 ha, about 1.5% of London's surface area. At low tide the river comprises c2050 ha of open water (85% of the river's surface area), 310 ha of intertidal mud, sand or shingle (13% of the surface area) and 17 ha of saltmarsh (0.5%). The remaining area comprises patches of neutral grassland, woodland and scrub associated with the islands in the Thames, and remains of former river walls that are within the existing flood defence. Several areas of tidal reedbed have developed in recent years, particularly in areas such as Barking Creek and Bow Creek (see Reedbed audit, HA9).

Areas of intertidal habitat occur along the entire length of the tidal Thames, but where the flood defences have particularly restricted the natural extent of the river channel the intertidal habitat is necessarily limited - although still of importance, particularly for fish and invertebrates. The most extensive areas of intertidal habitat occur downstream of Tower Bridge where the flood defences are set further back from the main channel. The areas of intertidal habitat are identified in Table 1 and displayed in the Map.

Table 1: Extent of intertidal habitat by borough

Borough	Extent (ha)	Borough	Extent (ha)
City of London	2.5	Kensington & Chelsea	4
City of Westminster	3	Lambeth	4
Barking & Dagenham	45	Lewisham	1.5
Bexley	42	Newham	74
Greenwich	31	Richmond upon Thames	21
Hammersmith & Fulham	16	Southwark	17
Havering	27	Tower Hamlets	9
Hounslow	13	**London Total**	**310**

NB: Based on data held by LEU

The flood defences (river walls) on the Thames vary in nature and characterise the different reaches of the river. Upstream of Putney Bridge much of the flood defence is sloping revetment, often vegetated, which softens the river's edge and riverbank. Between Wandsworth Bridge and the Greenwich Peninsula the river is largely constrained between vertical concrete and sheet metal piled walls (although areas of mud, sands and gravel are exposed at low tide). Downstream of the Greenwich Peninsula, despite much of the flood defence still consisting of vertical concrete walls and sheet-metal piling, it is set further back from the main river channel thus exposing extensive areas of intertidal mud at low tide. An analysis of the composition of the river walls is provided in Table 2.

Table 2: Type and Length of River Wall by Borough

	River Wall Type				
Borough	**Natural/Earth Embankment (m)**	**Sloping (m)**	**Vertical (m)**	**Mixed (m)**	**TOTAL (km)**
City of London	-	-	2300	300	**2.6**
City of Westminster	-	-	4400	300	**4.7**
Barking & Dagenham	1200	900	5200	-	**7.3**
Bexley	3500	1300	5600	-	**10.4**
Greenwich	-	1500	13100	-	**14.6**
Hammersmith & Fulham	-	-	5600	1500	**7.1**
Havering	600	3500	1500	-	**5.6**
Hounslow	1200	3900	2400	2000	**9.5**
Kensington & Chelsea	-	-	2500	-	**2.5**
Kingston upon Thames *	-	-	-	-	**4.5**
Lambeth	-	-	3200	-	**3.2**
Lewisham	-	-	1800	-	**1.8**
Newham	1100	3900	7200	1900	**14.1**
Richmond upon Thames **	-	17500	2800	2300	**33.3**
Southwark	-	-	7100	-	**7.1**
Tower Hamlets	-	300	14800	-	**15.1**
Wandsworth	-	600	6800	-	**7.4**
TOTAL (km)	**7.6**	**33.4**	**86.3**	**8.3**	**150.8**

* river walls not included in survey
** includes 10700m where type of river wall is unknown
Based on analysis of data from *Tidal Thames: Landscape Assessment and Design Guidelines*. (1996) EA.

Management of the Thames rests primarily with two organisations; the Port of London Authority (PLA) and the Environment Agency (EA). The PLA is concerned primarily with navigation, pollution control and land-use planning issues related to the river; the EA has responsibilities

covering flood defence, pollution control, fisheries, water quality, environmental protection and nature conservation.

Nature Conservation Importance

The Thames represents the largest continuous natural habitat in Greater London. The whole of the Thames and its tidal tributaries has been identified by the London Ecology Unit as a Site of Metropolitan Importance for nature conservation.

The transition of the Thames in London from a fresh water channel to a brackish estuary is reflected in the species that are found in the river. Plant species such as sea aster *Aster tripolium* and sea club-rush *Bolboschoenus maritimus*, which prefer the saline conditions of the estuary, occur as far upriver as Battersea but are only found in any abundance below Tower Bridge. It is also only in the downriver reaches that occasional patches of saltmarsh are able to develop, mainly on areas of sloping revetment at the base of the river walls. Upstream, in the freshwater reaches, the aquatic plant community includes species such as hemlock water-dropwort *Oenanthe crocata* and purple loosestrife *Lythrum salicaria.*

The invertebrates found in the intertidal mud of the river are also good indicators of the changes from fresh to estuarine waters. A variety of molluscs, worms, and crustacea occur in the mud and shingle along the foreshore. This diversity of species includes the German hairy snail *Perforatella rubiginosa,* which occurs in the freshwater tidal region of the Thames (between Kew and Teddington) and the brackish water-snail *Pseudamnicola confusa.* As its name suggests, this species occurs in more saline waters of the Thames and has been recorded from Barking Creek.

More than 100 fish species have been recorded in the Thames estuary over the past 30 years, many of these in the river within London. Of these species dace is the dominant freshwater fish, occurring as far downstream as Battersea. The more estuarine part of the river hosts species such as smelt (which spawn in the river at Wandsworth), sea bass (whose fry penetrate as far upstream as Chelsea) and, possibly, twaite shad, a species which historically spawned at Greenwich.

The birds of the River Thames are less influenced by the salinity gradient of the river and more by the extent of foreshore exposed at low tide. Birds such as dunlin, ringed plover and shelduck, which feed on invertebrates in the intertidal mud, are largely confined to the more extensive mudflats downstream of the Thames Barrier. Less specialised feeders such as teal and pintail (which is now rare in London) can occur on any suitable, undisturbed part of the river. Two fish-eating species, cormorant and grey heron, frequent the entire length of the river and can often be seen fishing the Thames in the centre of London.

Although there is very little natural riverbank along the Thames and its tidal tributaries (the only significant stretch being the riverbank at Syon Park), several quite large stretches of riverbank consist of earth embankment set back from the river. These sites have allowed saltmarsh, tidal reedbeds and other intertidal habitats to develop. Furthermore, the sloping revetment that forms the flood defences in certain stretches of the river provides an opportunity for aquatic vegetation to become established along the river's edge. Downstream of Tower Bridge, sloping revetment provides an opportunity for the establishment of saltmarsh.

Even the vertical walls that flank most of the river in Greater London are not totally devoid of nature conservation interest. Brick and timber-faced flood defences provide opportunities for plants to become established, which in turn provide a niche for a variety of invertebrates. Concrete walls and sheet-steel piling, on the other hand, provide few opportunities for plants and animals to become established.

Some stretches of the tidal Thames and tributaries of nature conservation value in Greater London

Chelsea Creek, LB Hammersmith and Fulham

Deptford Creek, LB Lewisham and LB Greenwich

Thames at Barking Reach, LB Barking and Dagenham

Thames at Gallions Reach and Tripcock Ness, LB Greenwich

Thames Tide Meadow, Syon Park, LB Hounslow

Threats and Opportunities

Threats

The two most significant threats to the biodiversity of the Thames in London are pollution and the loss of intertidal habitat by the encroachment of built development.

Although the severe pollution of the river in the 19th and early 20th centuries is now a thing of the past, because it flows through the largest conurbation in Europe the potential for pollution of the Thames is ever present.

Two large sewage works (Beckton and Crossness) discharge into the Thames, but these operate within discharge consents which limit any serious harm to the biodiversity of the river. The most significant potential pollutant is now the huge organic load that enters the river from storm drains during heavy summer rainfall. During severe episodes this influx of organic material can result in oxygen levels plummeting, resulting in multiple fish deaths. The 'Thames Bubbler' – a vessel operated by Thames Water - can pump oxygen directly into the river reducing the impact of these periods of oxygen deficit. A more permanent solution requires significant reconstruction or refurbishment of much of London's sewerage system which currently relies heavily on a network of Victorian sewers which combine as storm drains.

The importance of industry and shipping on the Thames has declined in recent decades, but pollution in the form of accidental oil or chemical spillage (or illegal discharge) is still a potential threat to biodiversity. Even minor amounts of oil can be particularly harmful to waterbirds if their feathers become fouled or they ingest any of the material. Spills of harmful chemicals can lead to direct mortality of fish and invertebrates. The subsequent loss of the invertebrate resource can have an important adverse effect on waterfowl and waders if it occurs within important feeding areas. Both the EA and the PLA have contingency plans to deal with pollution incidents. Decline of riverside commerce has also resulted in some reaches becoming havens for birds sensitive to disturbance by people. As these areas are redeveloped for residential use or non-river related commercial use, the establishment of riverside walks can result in increased disturbance, which is a deterrent to sensitive species of wader and wildfowl.

Encroachment of built development on the river corridor is the other major threat to biodiversity in the Thames. The river, particularly in the central London reaches, has already been severely constricted so that at low tide only a very narrow fringe of foreshore is exposed. Further encroachment is likely to prevent or hinder fish movements and restrict opportunities for diversifying riverside habitats.

The river walls are subject to a cycle of repair, refurbishment and replacement to maintain their primary role as flood defences. Older river walls constructed of timber or brick provide far greater opportunities for the establishment of plants and animals; their replacement with new

concrete or sheet-piled defences results in a loss of biodiversity. Furthermore, reconstruction of river walls in front of the existing river wall results in incremental encroachment onto the tidal foreshore.

Opportunities

Opportunities exist for retreat from the river as riverside sites are redeveloped, enabling the establishment of sloping embankments. With appropriate design riverside walks can enable people to enjoy the river without undue disturbance of birdlife.

There is a significant potential for restoring and recreating some of the habitats along the Thames which were lost when flood defences were installed without due regard to biodiversity. The process of restoring river's edge habitats has already begun, with creation of shingle beaches in the central reaches of the Thames and the creation of new areas of saltmarsh on specially constructed terraces adjacent to the Millennium Dome in Greenwich. Additionally, many smaller patches of saltmarsh or marginal aquatic vegetation have established naturally at the base of sloping river walls or where some other structure sits at the appropriate level within the river channel. Other river's edge habitats have become re-established in areas where dredging has been curtailed, reduced or modified as a result of the decline in shipping – the expansion of the tidal reedbeds at Barking Creek is a prime example.

Further innovative approaches to enhancing the value of the river corridor for wildlife include installing timber cladding on concrete and sheet-steel flood defences to provide niches for plants and invertebrates and stepping back (or otherwise adapting) flood defences to enable habitat enhancement.

The Thames, as a familiar feature of London, provides great potential for raising awareness of the biodiversity of the river and beyond. Illustrating the value of the Thames and its tributaries as a nationally important corridor for migrant birds, for example, will be an important element of an Action Plan. Hundreds of thousands of people a day cross the river or travel along its banks. Some of London's major areas of open space (Kew Gardens, Battersea Park and Greenwich Park) and some of its major attractions (The Millennium Dome and the Wetland Centre - both opening in 2000 - and the Tower of London) adjoin, or lie adjacent to the river. Furthermore, the seats of both central government and the new local government for London are, or will be located alongside the Thames in central London.

Data Sources

Archer, J. & Curson, D. (1993) *Nature Conservation in Richmond upon Thames*. Ecology Handbook 21. London Ecology Unit

Archer, J. & Yarham, I. (1991) *Nature Conservation in Newham*. Ecology Handbook 17. London Ecology Unit

Curson, D., Britton, B. & Game, M. (1992). *Nature Conservation in Barking and Dagenham*. Ecology Handbook 20. London Ecology Unit

Environment Agency (1996) *Tidal Thames: Landscape Assessment and Design Guidelines (Final Report).* Compiled by Cobham Resource Consultants/Llewelyn Davies.

Environment Agency (undated) *The Thames Tideway and Estuary Fact File.*EA.

GLC Ecology Section (undated) *A Nature Conservation Strategy for London: Woodland, Wasteland, the Tidal Thames and two London Boroughs.* GLC.

London Wildlife Habitat Survey (1984/85). Held by LEU, includes habitat dot distribution maps, aggregated area figures and many individual parcel forms.

Rationale and Limitations

Data concerning the length and type of riverbank were extracted from maps identifying river channel types in the EA 'Tidal Thames Landscape Assessment and Design Guidelines Manual'. This document gives a fairly accurate assessment of river wall types but does not provide information about the nature conservation value of the different types. The assumptions made above are that natural and earth embankments will be of the most value for nature conservation, sloping banks the next most valuable and vertical banks of least value. However, some areas of intertidal habitat adjacent to vertical walls will be of value to birds and invertebrates.

The assessment of mud and intertidal habitats was based on the London Wildlife Habitat Survey in addition to work by Leona Nield at the London Ecology Unit. Due to the methodology employed by these surveys and because parts of the Thames are inaccessible, many small areas of saltmarsh, reedbed and stands of aquatic marginal vegetation may have been missed.