Tidal Thames Habitat Action Plan

Produced by the Thames Estuary Partnership Biodiversity Action Group

Supported by:

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The Thames Estuary Partnership

The Thames Estuary is a valuable resource for all who live, work and play in the area. It is home to 12 million people and a diverse range of habitats and wildlife. Steeped in history and possessing a rich cultural past the Thames is still a major focus for industry, commerce, transport, agriculture and recreation.

In recognition of the diverse number of issues and organisations involved with the Thames Estuary, the Thames Estuary Partnership (TEP) was formed to involve and co-ordinate the wide range of users and interests. The TEP provides an 'umbrella' body to assist with the co-ordination of action and projects across the many different organisations and sectors involved on the Estuary.

The TEP's work is co-ordinated through the implementation of the *Management Guidance for the Thames Estuary Action Plan*, a document launched in October 1999 that provides the first blueprint for the sustainable development of the Estuary.

To help co-ordinate activities, action groups have been set up to drive forward partnership work on specific issues. Action groups include Archaeology, Biodiversity, Dredging, Education & Awareness, Fisheries, Planning and Environment, Recreation and Access, and Water Quality.

The Thames Estuary Partnership Biodiversity Action Group

The TEP Biodiversity Action Group is now established as a lead on biodiversity issues in the Thames Estuary. The action group aims to:

- Review, develop and co-ordinate the implementation of the Tidal Thames Habitat Action Plan;
- Provide a vehicle for joint working on biodiversity projects;
- Provide a biodiversity scoping mechanism for all major developments and strategic initiatives; and
- Establish and guide a biodiversity research programme for the Tidal Thames.

The Tidal Thames Habitat Action Plan - London, Kent and Essex

The TEP Biodiversity Action Group has integrated the priorities of London, Kent and Essex to produce the Tidal Thames Habitat Action Plan (TTHAP) with an aim to:

- Conserve and enhance the wildlife habitats, species diversity and local distinctiveness of the Tidal Thames;
- Adopt a strategic approach to deliver biodiversity targets for the Tidal Thames as a whole; and
- Promote public awareness and appreciation of the Tidal Thames.

Completed by the Thames Estuary Partnership during 2001, the TTHAP for London was published by the London Biodiversity Partnership in January 2002. The London TTHAP sets the agenda for future habitat conservation of the Tidal Thames across London and forms an important chapter in Volume 3 of the London Biodiversity Action Plan, further guiding the work of the London Biodiversity Partnership.

The adoption of the TTHAP and commitment made to the delivery of this document within the policy and development frameworks of the various Planning Authorities is crucial to the success of this Plan. The TTHAP offers Thameside London Boroughs, as well as Kent and Essex County Councils, the opportunity to work with the Thames Estuary Partnership and its Biodiversity Action Group in an effort to address Biodiversity issues within the Thames Estuary.

The TTHAP has been written to support those Local Biodiversity Action Plans that fall within the tidal Thames catchment, constructed to address key issues within defined areas of the Borough or Council concerned. The incorporation of the TTHAP into Local Plans allows the Thames to be dealt with in a consistent manner, throughout its tidal range.

For further information, please contact the Thames Estuary Partnership, Department of Geography, UCL (University College London), Remax House, 31/32 Alfred Place, London WC1E 7DP, tel: 020 7679 5299, fax: 020 7916 8546, email:tep@thamesweb.com or visit the TEP website at www.thamesweb.com

ABBREVIATIONS

BAG	Biodiversity Action Group (Thames Estuary Partnership)
BTCV	British Trust for Conservation Volunteers
DLG	Dredging Liaison Group (Thames Estuary Partnership)
EA	Environment Agency
EAAG	Education and Awareness Action Group (Thames Estuary Partnership)
EN	English Nature
ITMRG	Inner Thames Marshes Research Group
GLA	Greater London Authority
LA	Local Authorities
LAq	London Aquarium
LNHS	London Natural History Society
LWT	London Wildlife Trust
PLA	Port of London Authority
RAAG	Recreation and Access Action Group (Thames Estuary Partnership)
RSPB	Royal Society for the Protection of Birds
T21	Thames 21
TEN	Thames Education Network
TEP	Thames Estuary Partnership
TET	Thames Explorer Trust
TGLP	Thames Gateway London Partnership
TGSE	Thames Gateway Strategic Executive
TLS	Thames Landscape Strategy
TW	Thames Water
WT	Wildlife Trusts
WWT	Wildfowl and Wetlands Trust

CONTENTS

1. A SUSTAINABLE APPROACH TO MANAGING BIODIVERSITY

1.1 The National Context

Biodiversity conservation and environmental protection are well recognised as key indicators of sustainable development in the UK. The need to promote and enhance biodiversity through *developments that meet the needs of the present without compromising the ability of future generations to meet their own needs* (Brundtland Commission, 1987) is a message that is now embedded in national policy.

During the UN Conference on Environment and Development in 1992, the UK acknowledged the importance of sustainable development and signed up to Agenda 21 and the Biodiversity Convention. The Government published *Sustainable Development - A UK Strategy* (1994) and *Biodiversity - the UK Action Plan* (UK BAP, 1994.)

The UK Strategy promotes a sustainable approach to maintaining biodiversity through three key objectives for the protection of wildlife and habitats across the country:

- To conserve, as far as is possible, the wide variety of species of flora and fauna found in the UK, particularly those which population is of international significance;
- To ensure that the UK's objectives in landscape and wildlife conservation are given full weight in policies for other sectors;
- To ensure that commercially exploited species are managed in a sustainable way.

The UK BAP provides clear targets for the protection and enhancement of habitats and species populations. These are, in turn, translated into specific targets through costed action plans for priority species and habitats at the local level.

1.2 The Local Context

The Thames Estuary Partnership (TEP) recognises the Tidal Thames as a wildlife corridor of great importance to London, Kent, Essex and the Southern North Sea. To progress biodiversity actions and priorities on the Tidal Thames and to implement the UK plan, the TEP has produced the Tidal Thames Habitat Action Plan (TTHAP).

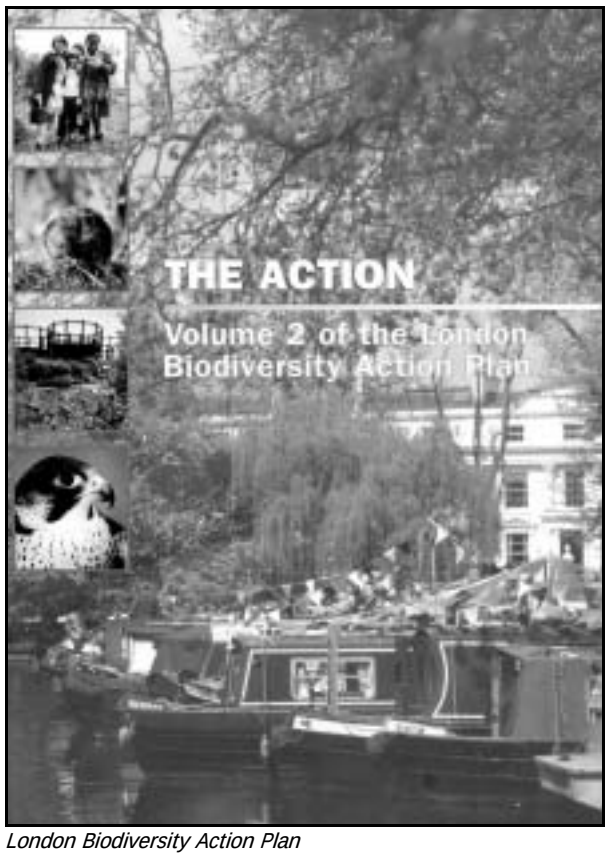
The TEP Biodiversity Action Group has developed priorities for London, Kent and Essex with an aim to:

- Conserve and enhance the wildlife habitats, species diversity and local distinctiveness of the Tidal Thames;
- Adopt a strategic approach to deliver biodiversity targets for the Tidal Thames as a whole; and
- Promote public awareness and appreciation of the Tidal Thames habitat and species diversity.

To inform prioritised actions in the TTHAP, a series of workshops were held. Attendees from local authorities, local biodiversity groups and conservation organisations have all contributed to the development of the action plan.

As a first step in the biodiversity planning process, the TEP produced a TTHAP for London which was published by the London Biodiversity Partnership in January 2002. The London TTHAP has set the agenda for future habitat conservation of the Tidal Thames across London and forms an important chapter in Volume 3 of the London Biodiversity Action Plan, further guiding the work of the London Biodiversity Partnership. The document was completed to:

- Assess the status of the Tidal Thames habitat;
- Identify current work and issues impacting on the habitat; and
- Recommend actions to sustain and improve the quality and quantity of habitat in the future.



London Biodiversity Action Plan

2. CURRENT STATUS

2.1 The UK

Estuaries in the UK are characterised by a series of biologically highly productive habitats. Encompassing both terrestrial and freshwater, brackish and marine aquatic habitats, estuaries support an abundance of wildlife. Although estuaries are not recognised within national biodiversity action plans, some individual habitats and species characteristic of an estuarine ecosystem are.

The UK Biodiversity Group Tranche 2 Action Plans present a selection of marine and coastal habitats and species action plans within a redefined broad habitat classification. Developed using a logical and hierarchical structure based closely on the JNCC Marine Nature Conservation Review marine biotopes classification system, it provides an outline of the extent and character of the entire UK marine environment.

Habitat Action Plans and Species Statements have been developed to guide local targets and objectives. Whilst implementing the TTHAP it is important to be mindful of targets set in the national plans.

2.2 The Thames Estuary

The Tidal Thames ecosystem is formed by the meeting of the Thames, the North Sea and adjoining landforms of London, Kent and Essex. The TTHAP considers habitats within the tidal transition from open water to foreshore and the associated terrestrial wildlife habitats. It does not incorporate adjacent areas of open water, coastal grazing marsh, reedbed and wasteland as these are considered within the Biodiversity Action Plans of Kent, Essex and London (Table 2). However, it is recognised that these habitats can make significant contributions towards supporting biodiversity within the Thames corridor. Grazing marsh, in particular, provides essential feeding and roosting sites that are necessary to support internationally significant numbers of waterfowl. The role of this document is to co-ordinate action for the protection and enhancement of key habitats and species populations, within the Tidal Thames area. It also seeks to provide a link to related habitat and species action plans to promote an holistic approach to biodiversity gain within the Thames Estuary corridor.

Table 1. Relevant UK BAP Habitat and Species Action Plans

Habitat Action Plans	***Species Action Plans***
Coastal sand dunes Coastal vegetated shingle *Sabellaria alveolata* and *S.spinulosa* reefs Coastal saltmarsh Mudflats Seagrass beds Saline lagoons Sublittoral sands and gravels Reedbeds Coastal grazing marsh	Commercial marine fish (grouped) Common skate *Atrina fragilis* (fan shell) Native oyster Northern hatchett shell Sea-fan anemone Ivell's sea anemone Starlet sea anemone Pink sea-fan Sunset cup coral *Anotrichium barbatum* (red alga) *Ascophyllum nodosum* ecad *mackaii* (brown alga) Twaite Shad Salmon

Table 2. Associated Habitat and Species Action Plans in London, Kent and Essex BAPs

London Biodiversity Partnership	**Essex Biodiversity Partnership**	**Kent Biodiversity Partnership**
Habitats Wasteland Canals ***Species*** Bats Grey heron Sand martin Black redstart Water vole	***Habitats*** Coastal grazing marsh Seagrass beds Reedbeds Saline lagoons ***Species*** Harbour porpoise European otter Pipistrelle bat Water vole Bitten Great crested newt Allis shad & Twaite shad Shining ramshorn snail	***Habitats*** Grazing marsh - *adjacent* Reedbeds Saline lagoons Inter-tidal mud and sands Saltmarsh Sand dunes Vegetated shingle Marine habitats ***Species*** Water vole Otter Great crested newt Allis shad & Twaite shad

Table 3. Statutory nature conservation designations along the Tidal Thames in London, Kent and Essex

Site	Description	Designation
Barn Elms	Former reservoirs, now wetland nature reserve	SSSI
Benfleet and Southend Marshes	Mosaic of habitats including grazing marsh and inter-tidal areas	SPA, Ramsar, SSSI
Chiswick Eyot	Island supporting osier and reedbed	LNR
Crayford Marshes	Coastal Grazing Marsh	SSSI (p)
Crossness Nature Reserve	Grazing marsh and reedbed	LNR
Dartford Marshes	Coastal Grazing Marsh and fresh marsh	SSSI (p)
Duke's Hollow	Hydrocere flora and wet woodland supporting rare molluscs	LNR
Ham Lands	Flood Meadow	LNR
Holehaven Creek	Tidal Creek with a mosaic of habitats including mudflats and saltmarsh	SSSI (p)
Inner Thames Marshes	Grazing marsh and reedbed	SSSI
Lonsdale Road Reservoir	Former reservoir now nature reserve	LNR
Medway Estuary & Marshes	Mosaic of habitats including grazing marsh and inter-tidal areas	SPA, Ramsar, SSSI
Syon Park	Tidal Flood Meadows	SSSI
Thames Estuary and Marshes (comprises of South Thames Estuary & Marshes, and Mucking Flats & Marshes SSSIs)	Mosaic of inter-tidal habitats, saltmarsh, coastal gazing marsh, saline lagoons and chalk pits	SPA, Ramsar, SSSI
West Thurrock lagoons and Marshes SSSI	Saline lagoons and grazing marsh	SSSI

Key: LNR – Local Nature Reserve, SSSI – Site for Special Scientific Interest, SSSI (p) - proposed Site for Special Scientific Interest, SPA - Special Protection Area

3. THE THAMES ESTUARY

The Thames Estuary is one of the world's most famous estuaries. It is a rich historical and cultural resource as well as a focus for industry, commerce, transport, fisheries, agriculture and recreation.

Extending some 96 miles, the Tidal Thames is the UK's busiest and most commercially significant tideway supporting port activities, commercial fisheries, leisure and recreation as well as development and regeneration. It is home to the Port of London and the most important port in the UK serving 30% of the UK population; employs 37,000 in port activities; and generates £2.7b to local economies each year. The Thames, Medway and Swale form one of the busiest water recreation areas in the UK - recognised as an attractive location by anglers, waterfowlers, cyclists, horse riders, ramblers and bird watchers.

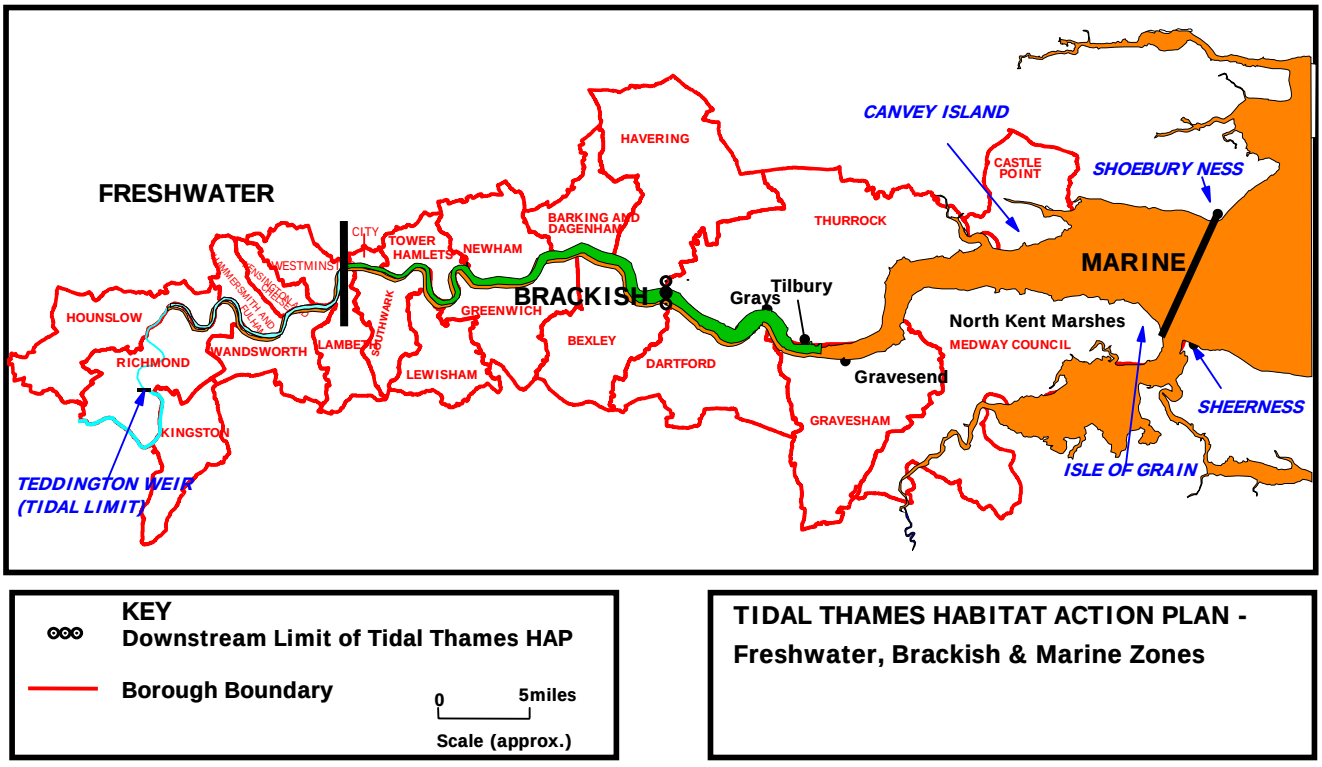
Since prehistoric times, the Thames has been an artery between the heart of England and the continental mainland. More than 500 recorded archaeological sites and features discovered above and below ground and within and below the waters of the Estuary, testifies to this rich past.

Twelve million people now live within a few miles of the Estuary, each day passing over, along and under it. Frequently and fondly referred to as 'London's River' or 'Old Father Thames' - the Estuary is a landscape of inspiration and central to the growth and well being of the city. It provides a transport route for some of London's waste, a drain, a view, and a site for redevelopment but ever increasingly, a playground, a classroom and a wildlife corridor.

Today, the Thames is an example of a recovering ecosystem which is of great ecological importance not only to London, Kent and Essex but also to the North Sea and upstream catchments of the upper Thames. Some of the most significant habitats in the country form part of the Thames estuarine mosaic. Large designated areas are recognised as important for their wildlife value, be they statutory sites of national or international significance or smaller non-statutory sites of local importance. Habitats and species form an integral part of London's identity and development and contribute to cultural symbols such as the view from Richmond Hill, paddling on the foreshore at Tower Beach, eating jellied eels and whitebait suppers.

It is important to consider not only the national and local habitat and species action plans relevant to the TTHAP, but also the diverse range of interests represented on the Thames Estuary and within the Tidal Thames and how they interact with each other.

Map 1. Tidal Thames



KEY
Downstream Limit of Tidal Thames HAP
Borough Boundary
0 5miles
Scale (approx.)

TIDAL THAMES HABITAT ACTION PLAN -
Freshwater, Brackish & Marine Zones

4. IMPORTANCE OF THE HABITAT

The Greater Thames Estuary

4.1 Physical and biological status

The Tidal Thames is part of the Greater Thames estuarine complex, which comprises the rivers Thames, Medway, Crouch, Roach, Blackwater and Colne. It is one of the most important sites for waterfowl in the UK, supporting an average of over 155,000 wintering waders and wildfowl (RSPB/WWT/BTO/JNCC 94/95-98/99 average was 156,424).

It forms a partially enclosed area of water and tidal shore which receives saline water from the North Sea and fresh water from the River Thames, its tributaries and land run-off.

It is London's largest continuous wildlife corridor, supporting species and habitats not found elsewhere in the Capital. It is a 'wildlife superhighway', a vital link and migration route for many species, some migrating very short distances from fresh to brackish water e.g. dace, others migrating hundreds or thousands of miles, e.g. eels, over-wintering wildfowl and waders, and summer visiting house martin and common tern.

The Tidal Thames is 96 miles in length, extending from Teddington in the west to the outer reaches of the Estuary. A diverse array of inter-connected habitats vary in relation to their physical, chemical and biological status and as a result of human impacts.

The key 'semi-natural' habitats are open water, intertidal mud, sand and shingle, and small areas of saltmarsh. There are also reedbeds scattered along the Thames and in its tidal creeks, and secondary woodland on most of the Thames' islands (Eyots or Aits). Flood defences as well as other structures along the river provide complementary habitats - many having been colonised by estuarine and riverine flora and fauna. Extensive areas of coastal flood marsh in both north Kent and south Essex are also key neighbouring habitats for flora and fauna.

Pseudo-saltmarsh communities have become established on the sloping rip-rap revetment along the Thames downstream of Tower Bridge while fringes of freshwater aquatics can be found along sloping flood defences upstream of Putney Bridge. A surprising variety of plant and invertebrate species have managed to eke out an existence on vertical flood defence walls, providing a food source for a wide variety of fish and bird species at high and low tides.

Since the 1960s, a general trend of recovery and improvement has occurred within the Tidal Thames as a result of water quality and habitat improvements. Today, the Tidal Thames supports a diverse flora and a rich population of invertebrates, fish and aquatic birds. Since 1957, 121 species of fish have been recorded with a noticeable recovery in the London reaches, with smelt spawning at Wandsworth and sea bass fry penetrating to Chiswick every year and on occasion up as far as Teddington. Improvements in water quality and the northern movement of bass populations, as a result of climate change, has seen a significant increase in number within the Thames which plays an important role as a nusery ground for this species.

The distribution of fish and other species varies in relation to the distribution of suitable habitat, water quality and salinity i.e. transition from freshwater to marine. However variations in water quality, salinity and habitat occur over both space and time, and in relation to both the daily tidal cycle and changing seasons.

Based on salinity levels the Tidal Thames is divided into three zones – freshwater, brackish and marine. Map 1 highlights these zones and the adjacent marine zone to the east. Within these zones there are characteristic species and varying habitat compositions. However, the divisions between zones are not clear-cut and each zone is inter-dependant.

4.1.1 Freshwater Zone

The Upper Tidal Thames, positioned upstream of Lambeth, can be categorised as the freshwater zone - a leafy and open reach characterised by freshwater species and habitats such as gravel foreshore, islands (Aits and Eyots), marginal vegetation, inlets, back channels, vertical and hard flood defences, scrub and over-hanging trees.

The freshwater zone also contains the largest stretch of natural riverbank between Teddington and Dartford, located at Syon Park. The plant and animal species within this zone are a reflection of both the various habitats and the fresh water dominance. Freshwater shrimps and snails provide a valuable food source for fish such as dace and roach, and summer visitors such as flounder, smelt and goby. Overhanging vegetation, backwaters and islands provide nesting and roosting sites for kingfisher, great crested grebe, moorhen, coot, mallard and heron. During the winter this reach is important for tufted duck and teal.

4.1.2 Brackish Zone

The middle zone between Lambeth and the confluence with the River Darent is an urban and industrial reach. This section of the Tidal Thames is placed under considerable stress from both the rise and fall of the tide and changing composition of fresh and saltwater.

The habitats within this reach include vertical and hard flood defence walls, creeks, docks, inlets, artificial structures (providing high tide roosts), marginal saltmarsh and grazing marsh. The zone is the transition

from the upper freshwater area to the lower saline and estuarine zone. Invertebrate diversity is the lowest out of the three zones as species must be able to withstand wide variations in salinity and a stressful environment.

The intertidal foreshore downstream from Greenwich is predominantly mud, inhabited by tubificid worms - the main food source for overwintering wildfowl and waders.

4.1.3 Marine Zone

The lower zone, below Gravesend, is marine both in relation to water quality and adjacent habitats. The river channel is wider than in the freshwater and brackish zones and there are more obvious connections between the aquatic and terrestrial habitats including saltmarsh, reedbeds, mudflats, grazing marsh, shell and shingle banks, earth flood embankments and saline lagoons.

The estuarine character and saline nature of this zone enables a wide diversity of marine invertebrates and fish to become established. Saltmarsh and the large expanses of intertidal and subtidal mud provide rich feeding grounds for birds such as oystercatcher, dunlin, shelduck, teal and wigeon. This zone is also an important breeding and nursery area for fish such as Dover sole, flounder, sea bass and mullet. The intertidal and subtidal areas are also rich shellfish grounds and provide an important commercial fishery and bird feeding ground.

4.2 Flagship habitats and species

Table 4. Key habitats of the Tidal Thames in London, Kent and Essex

Habitat	Site examples	Description
Artificial Structures/ Built Areas	Concrete Barges, Rainham, LB of Havering	Redundant or low disturbance structures exposed at high tide, providing roost sites for wildfowl, and some also serve as nest sites for oystercatcher and gulls.
Flood Embankments	Dartford Marshes, South Thames Estuary and Marshes (Higham, Cliffe, Cooling, Grain and Allhallows), Dartford Creek	Vegetated earth embankments, valuable for specialised plant and insect populations.
Gravel Foreshore	Isleworth, LB of Hounslow	Intertidal substrate comprising gravel and sands
Islands	Chiswick Eyot, LB of Hounslow	Mid-channel islands, some densely vegetated with trees and scrub, others dominated by tall herbaceous vegetation. Most serve as roost sites and some wooded islands e.g. Isleworth Ait are important for nesting grey heron. Several islands also support rare molluscs.
Mudflats	Mucking Flats, Blyth Sands, Yantlet Flats, Benfleet & Southend Marshes	Intertidal substrate comprising mud and sands. Rich source of invertebrates (shellfish, worms and crustaceans) and provide feeding grounds for large numbers of wintering waterfowl. Priority habitat under the UK BAP.
Natural riverbank	Syon Park, LB of Hounslow	Inter-tidal and terrestrial habitat forming the transition between the river and land.
Open Water	Royal Docks, LB of Newham	Adjacent areas of open water, valuable for high tide roosts, breeding sites (common tern) and refuges for fish fry.
Reedbeds	LB of Newham; LB of Barking and Dagenham	Expanses of reed along the main river and within creeks.
River Walls	Strand-on-the-Green, LB of Hounslow	Vertical walls of timber, brick and concrete which can support a wide diversity of plants and invertebrates.
Saline lagoons	Cliffe Pools	Saline lagoons at Cliffe represent 10% of the English resource of this habitat. They support nationally important numbers of invertebrates and are also important for feeding and roosting waterfowl. Priority habitat under the EU Habitats Directive. Subject of HAP under the UK BAP.
Saltmarsh	Rainham, LB of Havering; Higham Saltings, Cliffe Creek, Yantlet Creek, Benfleet & Southend Marshes	Transitional mud habitat in the mid to lower river, predominantly vegetated, ranging from inter-tidal to terrestrial communities. Important feeding and roosting areas for wintering waterfowl. Priority habitat under the UK BAP.
Seagrass beds (*Zostera* spp.)	Nr. Two Tree Island close to Canvey	High to mid-shore. Support many invertebrates and are spawning grounds for fish. UK BAP and Local BAP priority habitats.
Semi-natural grasslands of Thames Terrace Sand & Gravels	Broom Hill, Northwick Road Canvey Island, West Thurrock Lagoons, Old sand & gravel extraction sites	A combination of unimproved, often flower-rich grassland areas for invertebrate foraging and hunting combined with open sandy free-draining soils, south-facing banks and slopes for nesting.
Sublittoral sands and gravels	Putney, LB of Wandsworth	Sands and gravels found below the lowest tides, continuously submerged loose sediment. Habitat for invertebrates and spawning substrate for fish e.g. smelt. Priority habitat under the UK BAP.
Tidal Creeks	Deptford Creek – LB of Lewisham/ Greenwich, Holehaven Creek (Essex), Yantlet Creek - (Kent)	Tidal areas at the mouths of tributary rivers acting as 'mini-estuaries' and providing off-line refuge for fish. Support much of the remaining saltmarsh in the lower part of the Estuary. Provide sheltered feeding and roosting habitat for waders and wildfowl.

Table 5. Species characteristic of habitats in the Tidal Thames of London, Kent and Essex

Common name	Latin name	Description
Bladder Wrack	*Fucus vesiculosus*	A seaweed found growing within the lower Estuary that has started to colonise further up the Tideway over recent decades. The spread has been attributed to changes in environmental conditions that include inreased salinity and availability of habitat.
Enteromorpha	*Enteromorpha intestinalis*	This green alga is tolerant of varying salinities growing throughout brackish and marine zones. The growth of this species can offer important habitat to sterile flood defence structures and can be found growing on a variety of porous surfaces.
Golden samphire	*Inula crithmoides*	Widespread in Kent and Essex, often occurring on the outer face of seawalls and extending a shot distance onto saltmarsh where elevations are high. A Red Data Book (RDB) species.
Hemlock water-dropwort	*Oenanthe crocata*	Large white-flowered umbellifer characteristic of Thames riverside, colonising cracks and crevices even in central London. Parsley-like leaves are highly toxic.
Purple loosestrife	*Lythrum salicaria*	A wetland plant found along the riverside particularly in the upper freshwater river. Characteristic of sloping riverbanks, it can be found wherever there is suitable habitat.
Sea Aster	*Aster tripolium*	Characteristic of saltmarshes and inter-tidal habitats. It can be found throughout the middle and lower reaches of the river wherever suitable habitat exists. An easily recognisable plant, with purple flower heads and green fleshy leaves.
Sea Barley	*Hordeum marinum*	Widespread on earthen seawall embankments, particularly in rutted saline areas on the berm and occasionally on the outer (seaward face). Nationally scarce.
Sea Clover	*Trifolium squamosum*	Widespread in short, open grassland, where grazed or trampled, often occurring on the crest of sea wall embankments. Nationally scarce.
Hornet Robberfly	Asilus crabroniformis	This spectacular fly is a UKBAP priority species on account of its significant decline over the last forty years. It is found in unimproved grassland and heathland in southern England and Wales. The larvae are believed to prey on larvae of large dung beetles and adult flies feed on a variety of insects, including grasshoppers, dung beetles and flies.
Shrill Carder Bee	*Bombus sylvarum*	This species is classed as nationally notable and recent declines have raised its profile as a UK BAP priority species. It appears to require relatively large areas of suitable flower-rich habitat for foraging.
Solitary Wasp	Cerceris fasciata	This medium-sized yellow- and-black wasp is classified as rare in UK and largely restricted to south-eastern England. It nests gregariously in areas of bare sand in places exposed to the sun and provisions its nest with weevils.
Cockles	*Cerastoderma edule*	The common or edible cockle is found throughout the marine zone. The cockle is harvested within the Southend area providing an important commercial resource. Buried but located close to the surface it provides a food source for fish and birds during high and low tide.
Freshwater Shrimp	*Gammarus zaddachi*	This amphipod is one of the most dominant crustaceans within the fresh and brakish water zones. This species colonises a mixture of substrates and provides an important food source for fish and birds.
Ragworm	*Nereis diversicolor*	The common ragworm can be found in large numbers on mudflats within brackish and marine zones. Polychaete worms are used for bio-accumulation studies within the Thames Estuary and are used as indicators of metals.
Two-lipped door snail	*Laciniaria biplicata*	This snail is associated with riverbank habitats, in particular the upper inter-tidal area normally covered with debris and litter between neap and spring tides. This specialised habitat is normally found in the upper freshwater river on inlets, backwaters, islands and seasonally flooded riverside meadow and scrub.
Bass	*Dicentrachus labrax*	An important commercial fish species that has increased significantly in number over recent years. Juveniles migrate seasonally and are recorded regularly at Chiswick and often reach as far as Teddington.
Flounder	*Platichthys flesus*	A sea fish which spends its juvenile months in the Tidal Thames. The Tidal Thames provides a nursery area for fish spawned in the southern North Sea. Warm shallow waters, backwaters, creeks and the foreshore provide fish fry with habitat and food during the spring and summer. Although a sea fish, flounder are equally at home in the upper fresh water river during their juvenile years.

Salmon	*Salmo salar*	The last known naturally spawned Thames salmon was caught in 1833. In 1979 the Thames Salmon Rehabilitation Scheme was established and Salmon were reintroduced to the Thames. A regular Salmon run has occurred since 1982 and in 1993 over 500 fish returned. Received additional protection under the EU Habitats Directive 1994.
Sea Lamprey	*Petromyzon maximus*	Clearly established spawning grounds in the upper estuary in June and July. Protected under the EU Habitats Directive.
Sole	*Solea solea*	The sole nursery positioned below Woolwich in now considered one of the most important strategic nurseries for its economic value in England and Wales.
Smelt	*Osmerus eperlanus*	A cousin of the salmon which has a characteristic smell of cucumber. This small fish is a particularly good indicator of water quality, and is once again spawning amongst the gravels and shallow waters near Wandsworth.
Twaite Shad	*Alosa fallax*	Twaite shad used to spawn at Greenwich. Adult and juvenile fish are now common again in the Estuary below Mucking. A priority species under the UK BAP. Received additional protection under the EU Habitats Directive 1994.
Avocet	*Recurvirostra avosetta*	This bird's preferred non-breeding habitat is an estuary where the substrate is largely composed of fine silt. Mudflats at Higham Bight and Mucking are particularly important for this species and small numbers also breed amongst the saline lagoons at Cliffe.
Black-tailed Godwit	*Limosa limosa*	Feed on mudflats of the Estuary but roost on damp pasture, often inland. Overwinter in nationally important numbers in the Thames Estuary and Marshes SPA. Internationally important numbers also occur within Holehaven Creek in Essex.
Common Tern	*Sterna hirundo*	A summer visitor to the Tidal Thames. Breeds on derelict structures and purpose built 'tern-rafts' on adjacent docks. Regularly seen fishing on the River, tributaries and dock basins.
Dunlin	*Calidris alpina*	Large flocks of this small wader can be seen feeding on the mudflats of the Tidal Thames in winter.
Grey Heron	*Ardea cinerea*	This bird can be found throughout most of the Tidal Thames at all times of the year but is particularly associated with the upper freshwater river, islands and backwaters.
Redshank	*Tringa totanus*	Overwinter in nationally important numbers within the Thames Estuary. Small numbers also breed on the wetter grazing marsh areas adjacent to the Thames.
Ringed Plover	*Charadrius dubius*	Feed on invertebrates on sand and shingle shores, sandbanks and mudflats, as well as on saltmarshes, short grassland, flooded fields and shores of artificial habitats. Roost communally, close to feeding sites along the shoreline, on sandbanks or bare arable fields and in low vegetation.
Shelduck	*Tadorna tadorna*	A bird characteristic of sand and mudflats throughout the Estuary, feeding on snails and other small invertebrates. Breeds in abandoned rabbit burrows and similar holes.
Teal	*Anas crecca*	A bird that over-winters on the Tidal Thames associated mainly with the lower river, mudflats and saltmarsh. However, it also occurs on some of the tidal inlets and small parties can be found in the freshwater river as far upstream as Brentford.
Marine mammals and reptiles **Harbour porpoise** **Bottlenose dolphin** **Common seal**	*Phocoena phocoena* *Tursiops truncatus* *Phoca vitulina*	In recent years the Tidal Thames has hosted a number of marine mammals. Dolphins, porpoises, seals and turtles are frequent visitors; however, whether these can now be treated as intrinsic is still uncertain. These animals received additional protection under the EU Habitats Directive 1994.

5. IMPORTANCE FOR PEOPLE, LOCAL COMMUNITY AND CULTURAL SIGNIFICANCE

Exploring the foreshore

Biodiversity is an unequalled entity, found to derive positive benefits from people when they are in contact with it (Rohde & Jendle, 1994). *It is the all round experience of colour, texture, smell, movement and sound of wildlife that delights* (Tyldesley, 1994). As part of our natural heritage, it is important to conserve and enhance biodiversity in order to provide future generations with the benefits we experience today.

The Tidal Thames is a recovering ecosystem of great ecological importance not only to London, Kent and Essex but also to life in the North Sea and the upstream catchments of the upper Thames. Since the 1960s there have been distinct improvements in water quality and the status and distribution of habitats in the Thames. Today the Estuary supports a diverse flora; rich populations of invertebrates; 121 species of fish and many internationally important aquatic birds.

There is, nevertheless, a frequently felt misconception that the Thames is dirty and devoid of life. This is despite a growth in recent years of initiatives aimed to raise public awareness and increase community involvement on the Estuary.

5.1 Working to improve public perception of the Thames Estuary

Several local initiatives on the Thames Estuary seek to promote sustainable development; improve public awareness; and facilitate community involvement to encourage locally-felt responsibility for the conservation of biodiversity.

- **Thames21** is a partnership organisation working to improve the environmental quality of London's rivers and canals. Together with local businesses, community groups and statutory organisations Thames21 works to clear up litter and graffiti, repair vandalism, improve access and restore wildlife habitats on London's rivers and canals.

- The **Thames Explorer Trust** (TET) is an independent educational charity working to increase an understanding of the Thames. The *River for Life* project provides an example of schools, local communities and businesses becoming involved in biodiversity surveys on the Estuary. Once information and data is collected it is entered into the national Recorder 2000 database.

- The **TEP Education and Awareness Action Group** has developed an action plan as a tool for increasing education and public awareness initiatives on the Thames and provides information on:
  - The current provision of education and awareness initiatives across the Thames Estuary;
  - The gaps in current provision and opportunities for development;
  - Key flagship initiatives which have and are taking place between 2001 to 2003; and
  - Financial management processes to implement the projects.

- The **Environment Agency** (EA) has an important role to play in the co-ordination of community outreach and awareness raising on the Tidal Thames. The EA provides educational resources and literature; facilitates educational programmes; organises foreshore events; and hosts educational boat trips. A Information and Learning Centre at the Thames Barrier is now open and has a wide schools programme. It provides working models demonstrating the impact of people on the environment and river ecology.

- The **Thames Gateway Strategic Partnership** and its **Executive** are working closely with local sub-regional partnerships in London, Essex and Kent to scope opportunities in fourteen zones of change identified in the Gateway. Underpinning the work of the Partnership is community involvement. The Partnership aims to provide a strategic context to proposals developed within each zone, developing and improving facilities for communities and delivering the following key objectives of the Partnership:
  - To develop strategies and action plans in conjunction with key players in London, Kent and Essex to secure the effective integration of new and existing communities; and
  - To address major areas of social deprivation and exclusion throughout the Gateway.

Local Authorities are also key drivers in improving community participation, public awareness and sustainable communities on the Tidal Thames, achieved through the implementation of Unitary Development Plans and local community initiatives.

5.2 The symbiosis between biodiversity and people

It is important to raise the awareness of residents, businesses and visitors in order to alter public perception and generate a greater level of support and understanding for nature conservation on the Tidal Thames both now and in the future. To deliver this, initiatives should aim to share a responsibility for conservation, biological monitoring and recording with local communities to enhance future support.

Providing the opportunity for local communities to take action on environmental issues that already concern them (i.e. litter and graffiti), offers people a strong sense of ownership over their local community. Once ownership is felt, a community may become more open to education and issues relating to biodiversity and habitat conservation. Empowerment can therefore improve local education and awareness.

Businesses are becoming increasingly aware of environmental issues, both the impact of their activities on the environment and the benefits to be derived from good practice and sustainable development. The improved environmental quality of the Thames provides a higher quality of life and, in turn, presents an attractive location for future investment and economic prosperity. Furthermore, developing innovative environmental techniques frequently brings added value to businesses due to the fact that these are often cost effective and easily maintained.

5.3 Considerations for the Tidal Thames Habitat Action Plan

It is necessary to encourage links and a partnership approach to the development of actions to raise public awareness while at the same time enhancing biodiversity in the Tidal Thames. It is for this reason that the TEP Biodiversity Action Group has members from Thames Explorer Trust and Thames21, and integrates priorities with those of the TEP Recreation & Access, TEP Fisheries, and TEP Water Quality Action Groups.

6. CURRENT FACTORS AFFECTING THE TIDAL THAMES

The Wild Thames

6.1 Sea level rise and flood defence

The daunting projection that sea level will rise in the South East by 60 – 120cm over the next 100 years demonstrates the potential for climate change to impact on the Tidal Thames and its existing flood defences. Several factors contribute to recent and projected sea level rise. The UK landmass is recovering from an Ice Age tilt and, as a result of, the surrounding oceans are becoming increasingly stormy – a phenomenon linked to global warming. Tidal surges and fluvial flows in the Tidal Thames are, in turn, a consequence of storminess.

It has been estimated that sea level rise will result in a loss of 8,000 to 10,000 ha of foreshore and mudflat in England between 1993 and 2013. Saltmarsh areas and high tide roosts along the Tidal Thames are at risk due to rising high tide levels and increased erosion. The potential loss of inter-tidal areas and associated vegetation would have serious implications for fish, invertebrate and bird species.

Planning for Flood Risk Management in the Thames Estuary is a project led by Anglian, Southern and Thames Regions of the Environment Agency to develop a 100-year strategy for flood risk management in the Thames. Strategic options are to be modelled and tested to balance flood risk against the socio-economic and environmental needs of the Thames.

Opportunities for managed realignment on the Tidal Thames in London, Kent and Essex are to be explored as part of the development of a strategy.

6.2 Development and land-use planning

Land claim has removed approximately 25% of British estuarine intertidal flats. The Tidal Thames has a long history of development-led encroachment: during the Roman period the Thames at Westminster was three times as wide as it is now. Encroachment and development of the hinterland has a direct detrimental impact on biodiversity in the Tidal Thames. To reduce further intertidal habitat loss it is important to consider the Estuary as part of a land/river interface and as an integral component of the decision making process of planning.

6.3 Habitat loss and lack of habitat

Despite stronger wildlife legislation, foreshore habitat losses are still occurring as a result of riverside redevelopment on the Tidal Thames. However, the regeneration of riverside sites can provide an opportunity to recreate habitat. Loss of historic habitat is also an issue on the Tidal Thames where there are few resting places for migratory fish or high tide roosts for birds. The breeding and roosting sites that do exist are vulnerable to disturbance.

There are also implications linked to the loss of continuous habitat. Invertebrates and fish fry use selective tidal stream transport to migrate upstream. A continuous foreshore is a pre-requisite of this migration capability. The impact of a series of small habitat encroachments can therefore be as damaging as one large encroachment.

6.4 Air quality

Air pollution can damage plant and animal life and also has significant effects on soils and water. The need for co-ordinated action to monitor air quality effectively is particularly strong within the Tidal Thames as the area is vulnerable to air pollution from road traffic, shipping and industrial emissions. Natural factors, such as the direction of the prevailing wind, along with the increasing use of the Estuary for transport also play a part. Responsibility for regulating air pollution in accordance with Nation Air Quality Standards lies with Local Authorities, the Environment Agency and the London Port Health Authority.

6.5 Water quality

Water quality standards are achieved via a management agreement between the water companies (Thames Water in London, Anglian Water in Kent, and Southern Water in Essex) and the Environment Agency. London is still

heavily dependent on its Victorian sewage network. During periods of heavy rain combined sewer overflows (CSOs) discharge diluted sewage into the Tidal Thames. Under the worst conditions (low river flow and heavy rain) this can lead to fish and invertebrate mortalities as a result of reduced dissolved oxygen levels.

The Water Framework Directive (2000/60/EC) is the most significant piece of European water legislation to be produced in over 20 years. The Directive will rationalise and update existing water legislation and introduce an integrated and co-ordinated approach to water management in Europe based on the concept of river basin management.

River Basin Management Plans will set out how the objectives for all the water bodies within each river basin are to be achieved. The plans will be based upon a detailed analysis of the pressures on the water bodies within each river basin and an assessment of their impacts.

For surface water, the Directive requires that environmental objectives are based on the chemical and, more significantly, ecological status of the water body. For groundwater, quantitative and chemical objectives must be set.

6.6 Water quantity

During summer months the Tidal Thames experiences low freshwater flows as a result of upstream abstraction. Saline tidal waters penetrate further upstream into the upper freshwater river, bringing with them marine animals but also estuarine silts. Silt deposited on areas of gravel foreshore can change the habitat and lead to a reduction in invertebrate diversity.

The Environment Agency is currently producing Catchment Abstraction Management Strategies (CAMS) for the management of water resources at a local level. They will provide information on water resources and licensing practice publicly available and also allow a balance between the needs of abstractors, other water users and the aquatic environment to be considered in consultation with the local community and interested parties.

6.7 Hydrodynamic changes

The physical hydrodynamic character of the Tidal Thames is influenced by non-natural interference from factors such as flood defence walls and encroachments. Flow changes have resulted in accelerated patterns of erosion and deposition, leading to loss of inter-tidal vegetation, erosion of exposed peat deposits and siltation of gravel foreshores.

6.8 Commercial activity

Commercial use of the Tidal Thames has largely shaped the settlement pattern of the south-east and today provides the context for a full range of commercial activities, such as port facilities and commercial fisheries. Impacts of commercial activity on biodiversity may be direct, such as the loss of an irreplaceable nature conservation site, or indirect, for instance an increase in pressure on adjacent sites of natural importance. Commercial activity must be carried out with consideration to the wider context of other users and the valuable estuarine resource. For example, the careful management of marine aggregate resources is required to achieve the sustainable extraction of minerals.

6.9 Recreation and river transport

Historically the Thames in London was more heavily used for shipping and other transport than it is today. However, following improvements in water quality there is now a trend towards increased use of the river for recreation, together with renewed interest in water-borne transport. There is potential, unless carefully managed, that an increase in activity will result in increased disturbance of wildlife habitats, including nesting birds on Thames Islands and wooded margins, together with loss of riverside and inter-tidal vegetation.

6.10 Public perception

The majority of Londoners are unaware of the wildlife value of the Tidal Thames and as a result largely unaware of lifestyle effects on biodiversity. There is a general misconception that due to the brown colour of the river it is seen to be dirty and devoid of life.

6.11 Barrages

Barrages and weir structures remove or limit the tidal range creating an impounded basin upstream of the structure for all or some of a tidal cycle. Barrages alter the ecology of the river, restricting species movement, causing submerged low tide feeding habitat upstream of the structure, and increasing siltation. Tidal barrages/weirs have been constructed at Richmond (for navigation), Barking and Wandle Creek (to promote development.)

6.12 Lack of scientific knowledge

Tidal rivers and estuaries are complex ecosystems and many are poorly researched and surveyed. The quantity and quality of habitat on the Tidal Thames is not well known and species information is not comprehensive and restricted in many cases to biological data collected for water quality analysis.

6.13 Invasive Species

A number of invasive plants and animals have become established on the Tidal Thames e.g. Chinese mitten crabs, Japanese Knotweed, Himalayan Balsam and

Floating Pennywort. Further research and management is required to determine the effect of these species on the native biodiversity. Chinese mitten crabs are now present throughout the Tidal Thames and associated tributaries and still waters. Their burrowing habit has resulted in erosion of natural banks at Syon, Chiswick Eyot, Rainham and Crayford.

6.14 Maintenance dredging

Maintenance dredging involves the removal of deposits to maintain navigation access throughout the Estuary. Removal and alteration of sands, gravels and muds can result in the loss of species and significant redistribution of sediment resulting in changes to the flows in the river. A wide range of environmental issues relevant to maintenance dredging in the Thames have been identified through stakeholder participation. Beneficial use of dredged material can offer opportunities to enhance intertidal habitats.

7. CURRENT ACTION

7.1 Legal Status – designations and species protection

The Tidal Thames and Creeks within London have been designated as a Site of Metropolitan Importance for nature conservation. This non-statutory designation, identified by the London Ecology Unit (now the Biodiversity Group at the Greater London Authority), signifies that every part of the river and its tidal tributaries are of major importance for nature conservation in the capital. The Inner Thames Marshes is a statutory designated Site of Special Scientific Interest (SSSI) and provides the last substantial roosting site for birds in London.

In Essex, Benfleet and Southend Marshes are designated Ramsar sites under the Convention on Wetlands of International Importance and Special Protection Areas (SPAs) under the EC Directive on the Conservation of Wild Birds. Other statutory designations in Essex include West Thurrock lagoons and Marshes SSSI and the Southend Foreshore, a Local Nature Reserve (LNR).

In Kent Thames-side nature conservation designations include the South Thames Estuary and Marshes SSSI/ Thames Estuary and Marshes SPA and Ramsar site.

These designations confer strict protective regimes on the sites to which they are applied and are material considerations in the planning process. These are summarised in PPG9 on nature conservation

7.2 Estuary wide biodiversity framework

The London, Kent and Essex Local Biodiversity Action Plans (LBAPs) share the UK BAP objective to: *conserve biological diversity within the UK and contribute to the conservation of global diversity through all appropriate mechanisms*. Providing a focus for local initiatives, the three LBAPs offer a regional framework important to habitat and species priorities on the Tidal Thames.

Regional strategies, co-ordinated by Thames Gateway London, Thames Gateway Kent and Thames Gateway South Essex Partnerships, identifies the regeneration and development of the Thames Gateway as a key national and regional priority. Thames Gateway seeks to achieve new development in a way which enhances and protects the special natural environment of the Tidal Thames.

Social, environmental and economic issues that are key to the global action plan for sustainable development - Agenda21 - were identified in 1992 as achievable at a local level. As a result, Local Authorities have been encouraged to implement Agenda21, driving local initiatives and adopting principles of nature conservation.

7.3 Existing management

No one organisation oversees the management and regulation of the Tidal Thames. In response to this, the Thames Estuary Project was formed in 1993 to provide a focus for the range of organisations, individuals and activities linked to the Tidal Thames. The primary outputs of the Project were the preparation of *Management Guidance for the Thames Estuary* and the creation of the Thames Estuary Partnership (TEP), which plays a key role in the co-ordination of the many uses, activities and interests of the Tidal Thames downstream of Tower Bridge.

Management advice is available from a range of statutory organisations including the Environment Agency, English Nature, the Port of London Authority, Local Authorities, the Greater London Authority, and the Department for Environment, Food and Rural Affairs.

Voluntary and non-statutory organisations also provide a wealth of advice and undertake a number of management initiatives: these include the London Wildlife Trust, Kent Wildlife Trust, Essex Wildlife Trust, the Groundwork Trust, Thames 21, the BTCV, the Wildfowl and Wetlands Trust and the Royal Society for the Protection of Birds, North-west Kent Countryside Management Project, Groundwork Kent Thames-side.

Other habitat management and creation schemes include Environment Agency partnership projects, cross-river partnership schemes, Bridge House Estates Trust Fund grants and Groundwork partnership projects via the Single Regeneration Budget. The majority of projects are site specific but cover a range of habitats and involve a range of organisations and individuals.

7.4 Relevant policy and guidance

The Tidal Thames is covered by several Regional Planning Guidance (RPG) strategies. RPG9 identifies the importance of estuary and coastal management plans and local biodiversity action plans in strategic guidance for the South East. RPG3, strategic planning guidance for London, has recently been replaced by the Mayor's London Plan which develops the Blue Ribbon concept as an Annex. RPG3b/9b, produced for the River Thames, recognises the Estuary as a major leisure and recreation resource of international significance for wildlife and heritage.

The Thames Landscape Strategy – Hampton to Kew, and Thames Strategy – Kew to Chelsea are two local strategies recently produced to guide the long-term sustainable development of the Thames Estuary upstream of Tower Bridge. To deliver a shared, long-term vision for the future development, management and enhancement of the East Thames, the forthcoming Thames Strategy – East will consider biodiversity as an intregral component of a strategy.

7.5 Promotion and education

A wide range of organisations host events to raise awareness to the importance of biodiversity in the Tidal Thames. They promote and educate through a variety of educational programmes and centres, educational resources and literature, projects and events and volunteer opportunities. Examples of some of the organisations taking the lead in education initiatives in the Tidal Thames are provided in Annex 1.

7.6 Survey and research

Surveys and research on biodiversity-related issues are undertaken by a range of organisations and communities in the Tidal Thames. Research is carried out for a broad spectrum of issues. These are referred to in more detail in Annex 2 together with details of organisations leading the research.

8. OBJECTIVES, ACTIONS AND TARGETS

Objective 1: Ensure that strategic plans and initiatives recognise the biodiversity importance of the Tidal Thames

Target: Full consideration of Tidal Thames biodiversity in the 'Blue Ribbon' concept.

Action	Applies to reach	Target Date	Lead	Other Partners
Ensure that biodiversity is fully incorporated into the 'Blue Ribbon' concept	Freshwater Brackish Marine	2002	GLA	BAG, P&EAG
Prepare and advocate good practice guidance informed by policy to deliver the biodiversity objectives of the 'Blue Ribbon' concept	Freshwater Brackish Marine	2003	GLA	BAG, LA
Incorporate biodiversity objectives within the regeneration of the Thames Gateway through meetings with the Thames Gateway Strategic Executive, the Thames Gateway London Partnership and the sub-regional Partnerships of Essex and Kent	Freshwater Brackish Marine	2003	TEP	BAG, GLA, TGSE, TGLP, TGK, TGE
Ensure the Biodiversity Action Group is established as a mechanism for scoping on relevant major developments and strategic initiatives including the Tideway Strategy, Planning for Flood Risk Management Project and Thames Landscape Strategy, Thames Strategy East	Freshwater Brackish Marine	Ongoing	TEP	BAG
Ensure ecologically sensitive sites are communicated to Local Authorities and other relevant bodies to minimise environmental impacts, by developing annotated maps of sensitive locations consistent with county initiatives	Freshwater Brackish Marine	2003	TEP	BAG, PLA
Incorporate biodiversity objectives within existing river leisure and recreation guidance and strategies	Freshwater Brackish Marine	2003	TEP	BAG, RAAG

Objective 2: Secure appropriate management for existing and new habitats and species

Target: Produce and advocate guidance and management to key stakeholders by 2003

Action	Applies to reach	Target Date	Lead	Other Partners
Identify habitats (e.g. river walls, structures), and locations (e.g. buildings/paths/river interface) where management guidelines are lacking and produce and advocate good practice guidelines	Freshwater Brackish Marine	2004/5	TEP	BAG, site managers, land owners
Develop and implement an environmentally responsible approach to maintenance dredging	Freshwater Brackish Marine	2003	TEP	DLG
Develop guidance on access (footpaths, cycleways etc.)	Freshwater Brackish Marine	2003	TEP	BAG

Objective 3: Increase scientific knowledge and understanding of estuarine habitats and species

Target: Review existing knowledge and establish a research work programme by 2003

Action	Applies to reach	Target Date	Lead	Other Partners
Establish a biodiversity research programme through the Thames Estuary Research Forum and other research organisations	Freshwater Brackish Marine	Ongoing	TEP	BAG, ITMRG
Collate existing information to establish a baseline habitat and species audit	Freshwater Brackish Marine	2003	EA	BAG
Disseminate existing research and highlight gaps in knowledge	Freshwater Brackish Marine	2003	TEP	EN, ITMRG, EA, LNHS, WT GLA
Collate existing information on the impacts of recreation/river use/development and biodiversity	Freshwater Brackish Marine	2004	GLA/TEP	BAG, PLA, user groups, EA

Objective 4: To create new areas of riverine habitat

Target: Create at least five new areas of inter-tidal habitat and/or high-tide roosts within each reach by 2010

Action	Applies to reach	Target Date	Lead	Other Partners
Identify sites most suitable for habitat creation and disseminate information to local planning authorities and statutory agencies	Freshwater Brackish Marine	2004/5	TEP	BAG, PLA, FAG, EA
Identify and promote opportunities for new environmental approaches to flood defence design	Freshwater Brackish Marine	Ongoing	EA	BAG

Objective 5: Increase public understanding and appreciation of the habitats and species of the Tidal Thames

Target: Implement the Thames Estuary Partnership Education and Awareness Action Plan biodiversity projects by 2005

Action	Applies to reach	Target Date	Lead	Other Partners
Provide a biodiversity training session to advise the members of the TEP Education & Awareness Action Group and Thames Education Network	Freshwater Brackish Marine	Ongoing	TEP	BAG
Disseminate literature highlighting the wildlife value of the Tidal Thames to specific user groups	Freshwater Brackish Marine	Ongoing	TEP	TET, TEN, T21, BAG
Create a series of outdoor displays at key riverside locations to highlight the value of the Tidal Thames for wildlife	Freshwater Brackish Marine	2004	T21	EA, LA, BAG

Co-ordinate foreshore events within each reach of the Tidal Thames to promote public appreciation of the Tidal Thames wildlife	Freshwater Brackish Marine	Ongoing	T21	EA, PLA, TET, TEN
Include biodiversity in the training programmes of Thames 21 and Thames Explorer Trust	Freshwater Brackish Marine	Ongoing	T21/ TET	BAG, EA
Identify further opportunities for promoting public understanding and appreciation through education initiatives	Freshwater Brackish Marine	Ongoing	TEP EAAG	TEN

9. MONITORING AND REVIEW

The TTHAP will be implemented by the Thames Estuary Partnership (TEP) Biodiversity Officer and Biodiversity Action Group members who represent English Nature, RSPB, Greater London Authority, Thames21, London Wildlife Trust, Groundwork Kent Thameside, Kent Biodiversity Partnership, Essex Wildlife Trust, Thames Explorer Trust and Thames Landscape Strategy.

There are several existing mechanisms established by the TEP for monitoring and reviewing progress on the Thames Estuary. To review implementation of the TTHAP, the following will be used:

- The *TEP Action Plan Annual Review* provides a co-ordinated overview of new and continuing projects and initiatives across the Estuary. It delivers an update on implementation progress, problems encountered and ideas and opportunities for the future.

- The *TEP Annual Report* describes the work of the TEP, its work programmes and successes

- The *TEP Annual Forum* brings together the individuals and organisations with an interest in the Thames Estuary to review the progress of the TEP and to identify new issues and opportunities on the Estuary.

- The TEP bi-annual newsletter *'Talk of the Thames'* communicates the TEP's progress and shares 'Estuary news' about the wide range of projects and initiatives under way.

- *ThamesWEB,* the TEP's website, is regularly updated and maintained to communicate information on the Estuary providing a valuable mechanism for monitoring and disseminating progress on the TTHAP.

ANNEX 1. PROMOTION AND EDUCATION ON THE TIDAL THAMES

Promotion and education	Examples of lead organisation and event
Educational Programmes	- Bexley Education Business Park - Thames Barrier teacher placement, school visits, junior citizen element water safety - Environment Agency - training days, Thames Barrier Learning and Education Centre - Golden Hinde - Lea Rivers Trust - London Borough of Havering - London Aquarium - educational programmes and tours - Museum of London - Pumphouse Educational Centre - Royal Society for the Protection of Birds - Southend Museum - short courses on marine life - Thames Explorer Trust - fieldwork led by experienced teachers, workshops in archaeology and ecology - Thames Water - Tilbury Energy and Environmental Centre - Watt Tyler Country Park - residential and non-residential group visits - Kent Wildlife Trust - Dartford Borough Council - Gravesham Borough Council - Medway Council - Groundwork - Managing the Marshes
Educational Resources/Literature	- Environment Agency - Thames Barrier Learning and Education Centre: working models to illustrate the impact of people on the environment and river ecology - Environment Agency – 'Fish of the Tidal Thames,' 'Invertebrates of the Tidal Thames,' 'Tidal Thames Fact File,' 'South Essex Local Environment Action Plan (LEAP),' 'Kent Area LEAP' and 'Medway LEAP.' - Institute of Education, Earth Science Technology Centre - London Ecology Unit - ecology handbooks for London Boroughs - Southend Borough Council - Thames Education Network - Thames Explorer Trust - 'Investigating the Foreshore of the River Thames' - Thames Estuary Partnership - 'Health & Safety Guidelines for the Thames & its Foreshore' - Thames Water - Groundwork - Managing the Marshes
Community Projects/Events	- Bexley Education Business Park - environmental day, Erith River Festival - Creekside Education Trust - improvements to access in Deptford Creek - London Borough of Southwark - London Bridge Environs Scheme - Museum of London - Thames Living History Project - Pumphouse Educational Centre - Thames21 - litter clearance and prevention - Groundwork - Managing the Marshes
Visitor Centre/Nature Reserve/Trails	- Creekside Education Trust - Royal Society For The Protection Of Birds - Environment Agency - Thames Barrier Learning and Education Centre - Watt Tyler Country Park - Two-tree Island - Hadleigh Castle Country Park - Crossness Nature Reserve - Barn Elms, The Wetland Centre - Greenwich Peninsula Ecology Park - Groundwork - Managing the Marshes
Foreshore Events	- Environment Agency - Golden Hinde - London Aquarium - exploration days to promote interest, knowledge and appreciation of the world's aquatic life and underwater environments - Southend Museum - shore life survey work

Boat Trips	- Environment Agency - 'Educate the Educators' boat trip in association with Thames21 and the TEP - Southend Museum - plankton netting offshore
Volunteer Opportunities	- Lea Rivers Trust - improving the environment of the Lower Lea valley - Thames Explorer Trust - biodiversity surveys - Groundwork - Managing the Marshes
Interpretation / Information Displays	- Greenwich Borough Museum - Museum of London - National Maritime Museum - Thames Water - Watt Tyler Country Park - London Aquarium - Groundwork - Managing the Marshes

NB Organisations involved in education and promotion on the Tidal Thames are not exclusively confined to these examples

ANNEX 2. SURVEY AND RESEARCH ON THE TIDAL THAMES

Survey and/or research	Examples of organisation
Biodiversity	- London Biodiversity Partnership - London Biodiversity Action Plan - River Thames Society - biodiversity survey data - Scott Wilson & Associates - biodiversity survey data for Twin Tumps and Tripcock Park - Thames Estuary Research Forum - TERF student research bursaries for biodiversity priorities for action - Kent Biodiversity Partnership - Essex Biodiversity Partnership - Groundwork - Managing the Marshes
Botanical survey data	- Environment Agency - botanical river corridor survey - Deptford Creek, Greening and Cleaning Project - Inner Thames Marshes Research Group (University of East London) - survey data for Inner Thames Marshes SSSI - Lea Rivers Trust - survey data for walls and reedbeds - London Natural History Society - survey data to inform the London area Atlas 2000 project organised by the Botanical Society of the British Isles and Biological Records Centre - Kent Wildlife Habitat Survey (Kent County Council) - Kent Wildlife Trust - Wandle Creek river wall surveys (London Borough of Wandsworth) - Groundwork - Managing the Marshes
Environmental survey data	- Thames Strategy - Kew to Chelsea - review of environmental survey data - Wandsworth Borough Council - environmental survey data collated for former Shell oil terminal site on the river at Point Pleasant - Local authorities
Fish survey data	- Environment Agency - extensive survey data - Deptford Creek, Greening and Cleaning Project
Foreshore and access	- Port of London Authority - 'Steps & Stairs' - established to define the location of all access points on the Tidal Thames , their condition and appropriate level of use - Thames21 - survey data on foreshore debris; an assessment of the condition of Thames Path; Hammersmith foreshore walks and informal surveys
Habitat mapping/survey/ appraisal	- Environment Agency - aerial photography and habitat mapping for the Tidal Thames. - Friends of Dukes Meadows - habitat appraisal for Dukes Meadows - London Ecology Unit - London Wildlife Habitat Survey (1984/5) - habitat distribution maps - Royal Society for the Protection of Birds – Cliffe Pools, Rainham Marshes - Kent Wildlife Habitat Survey (Kent County Council) - Groundwork - Managing the Marshes
Invertebrate survey data	- Environment Agency - extensive survey data - Deptford Creek, Greening and Cleaning Project - Inner Thames Marshes Research Group (University of East London) - survey data for Inner Thames Marshes SSSI - London Borough of Newham - survey data for River Lea - London Borough of Richmond/ English Nature - survey data for Thames' Islands Lea Rivers Trust - survey data for walls and reedbeds - Natural History Museum - Mitten Crab survey data (PhD Thesis) - Thames Explorer Trust - 'River for Life' - invertebrate survey data to record annual rhythms of river - Groundwork - Managing the Marshes
Landscape	- Friends of Dukes Meadows - Landscape Plan for Dukes Meadows - Thames Landscape Strategy - Hampton to Kew - Thames Landscape Strategy Island Management Plan Report (1997) - Thames Strategy – Kew to Chelsea - Thames Strategy - East
Mammal survey data	- Inner Thames Marshes Research Group (University of East London) - survey data for Inner Thames Marshes SSSI

	- Southend Borough Council - water vole survey data - London Water Vole Project (Groundwork Kent Thameside) - Herpetofauna surveys (Groundwork Kent Thameside)
Ornithological survey data	- British Trust for Ornithology/Royal Society for the Protection of Birds/Joint Nature Conservation Committee/Wildlife and Wetlands Trust - 'WeBS' - Wetland Bird Survey detailing the ecology, biology, population dynamics and behaviour of waterbirds and their wetland habitats. - Deptford Creek, Greening and Cleaning Project - Inner Thames Marshes Research Group (University of East London) - survey data for Inner Thames Marshes - London Natural History Society - bird counts to inform 'WeBS' - Kent Ornithological Society - Environment Agency Ornithological Survey – low/hide tide 1994/85 (Ecoscope)

NB Organisations involved in research and survey on the Tidal Thames are not exclusively confined to these examples