



YOUR TIDAL THAMES

Tidal Thames Pilot Project

Appendix B

Final Project Report

Appendix B: Data

B.1 Introduction

As discussed in Section 2.5, transitional and coastal (TraC) water bodies are not as far advanced as fresh water bodies in WFD. However, the Thames Estuary is unique in the sense that it is one of the most studied estuaries in the world.

In terms of this project, this appendix covers the information that has been used and made available, the data generated by the project, where there are data gaps, and likely ongoing data requirements for the project in the future.

B.2 Available Data

Data sets have been made available through the Environment Agency's online portal Geostore and through the Environment Agency Catchment Coordinator on request as listed in Table B.2.1 below. The information available through the portal is tailored to the need of the catchment groups and includes information on the WFD water body classification.

Other organisations including DEFRA have also assisted by providing base mapping raster files for mapping information for the project on ArcGIS.

Data Set	Provider	Format	Use
Colour base mapping	DEFRA	Raster file	ArcGIS – data mapping
Tidal Thames Landscape Assessment and Design Guidelines	Environment Agency	Shape file	ArcGIS – data mapping
WFD Water bodies classifications	Environment Agency	Shape file	ArcGIS – data mapping
Designations	Environment Agency	Shape file	ArcGIS – data mapping

Table B.2.1: List of data that has been made available to the Your Tidal Thames project team.

B.3 Data collected

The Your Tidal Thames project has also collected data as part of its work. This includes:

- Collecting of issues on the tidal Thames
- Collecting possible opportunities on the tidal Thames
- Information on locations of consultation – events, 1-2-1 meetings, presentations and catchment plans.
- Review and analysis of all tidal Thames Management Strategies and Local Framework documents.

B.4 Data gaps

Ongoing WFD Investigations

The Environment Agency's investigation program for the majority of failing elements is due to be completed by December 2012, with the information becoming available in packs in 2013. This information will help to confirm the failures in the water body, the likely sources, and some possible solutions. The list of investigations to be completed in the tidal Thames water bodies are in Table B.4.1

WFD Water Body	Water Body ID	Investigation
Thames Lower	GB530603911401	Benzo (ghi) perelyene and indeno (123-cd) pyrene
		Dissolved Inorganic Nitrogen
		Mitigation Measures Assessment
		Tributyltin Compounds
Thames Middle	GB530603911402	Benzo (ghi) perelyene and indeno (123-cd) pyrene
		Dissolved Inorganic Nitrogen
		Dissolved Oxygen
		Hydrology
		Mitigation Measures Assessment
		Tributyltin Compounds
Thames Upper	GB530603911403	Hydrology
		Mitigation Measures Assessment

Table B.4.1: List of WFD investigation in the Your Tidal Thames Catchment

With the above investigations incomplete, it has been difficult to suggest opportunities to tackle some of the failing elements such as Benzo perelyene and Tributyltin Compounds as we do not know where the sources and hot spots of the failures are in the estuary. This can make it difficult to gain commitment from stakeholders, as they would like to know where the issues are and what the options for tackling them as part of the consultation.

The Mitigation Measure Assessments have also taken longer than initially thought. It was hoped that these would be available before the end of the Your Tidal Thames project in order to inform some of the opportunities suggested by the consultation, but due to the scale of the task this has not been possible. This is disappointing as they are vital in understanding the physical pressures on the estuary and the opportunities that may be available to the project.

Thames Estuary 2100 Flood Risk Management Plan

The TE2100 plan was only signed off by Defra in November 2012 which has meant that much of the information on the future work has not been obtainable due to restrictions for commercially sensitive reasons. The information that was provided by the TE2100 project team, though useful to understand the locations that are of greatest concern for flood defence, has to be handled with care for the same reasons. It has not been possible to use the information in detail for this version of the Tidal Thames Catchment Plan but it will help to inform future the project can continue in 2013/14.

It is planned that this information will help to inform the ideas and projects suggested for work from the consultations. It is hoped that there may be opportunities to make gains for WFD alongside the TE2100 program, but to also make sure that resource is not wasted in the short term at locations that may be programmed into longer term works by the Environment Agency.

Thames Tideway Tunnels

The construction and operation of the Thames Tideway Tunnel will significantly reduce the impact of sewage overflow into the tidal Thames from Combined Sewage Overflows. In terms of WFD, this will help to improve many of the elements, though the following points are not yet known:

- How much is WFD relying on the Thames Tideway Tunnel to improve failing elements such as Dissolved Inorganic Nitrogen and Tributyltin Compounds?
- What mitigation is going to take place for locations where the infrastructure for the Thames Tideway Tunnel will encroach into the main river channel?

It is understood that the Thames Tideway Tunnel will not deal with pollution caused by other sources such as road runoff in the city, and therefore will not solve the entire water quality issue, but it is not known what percentage of the issue/failure is the cause of the current sewage infrastructure. This information is important in order to know how to target the issues of diffuse pollution on the river.

It is also understood that the mitigation for the Thames Tideway Tunnel encroaching infrastructure has not yet been agreed, but once it has, it will be important to feed this information into the project to again make sure that where there are opportunities, partners can work together to deliver projects, and also to make sure that resource is not wasted where long term work streams are planned by Thames Water. Thames Water has stated that the data from their biodiversity investigations will be released in early 2013.

Lower Thames Operating Agreement (LTOA) AMP5 Investigation

Stage 2 of the LTOA AMP5 investigation by Thames Water is due to be released in 2013. This will provide data on whether abstraction is having an impact in the upper section of the tideway. It will also quantify the scale of the impact the abstraction is having, and try to propose some sustainable reduction on abstraction for this part of the Thames. Both Thames21 and Thames Estuary Partnership are members of the stakeholder forum for the investigation.

Due to the difference in the timelines for these two projects, the information from the LTOA AMP5 investigation has not been able to inform the work and focus for the Thames Upper water body at this stage. However, it will be an important document in the future for the Catchment Plan, confirming some of the issues that the lack of freshwater flow is having and some of the possible mitigation that needs to be done.

MCZ process

The list of proposed designation sites for Marine Conservation Zones was released by Defra in December 2012. The Thames Estuary recommended MCZ (rMCZ) was not included in the tranche of sites to be consulted on and designated in 2013. However, this does not mean that the site will not be put forward for consultation in future tranches. Should the Thames Estuary rMCZ be designated in the future, this will have a bearing on how WFD is delivered within the tidal Thames.

B.5 Ongoing Data Requirements

Future data requirements for the Your Tidal Thames project will include access to the results of the completed WFD investigations that will help to inform both work and projects that have been suggested through this process, but also other opportunities and solutions.

Information from the other large projects mentioned above that are delivering on the tidal Thames are also important in order to ensure that opportunities are made the most of. There may be opportunities to deliver improvements alongside the TE2100 programme and Tideway Tunnels mitigation work, as well as including the improvements made by these projects as delivery towards the Water Framework Directive.

Other datasets that may be useful in the ongoing project include:

LIDAR

Bathymetry survey

Flow velocity

Access will be subject to agreement and licensing with relevant parties.

The Catchment Coordinator at the Environment Agency has also brought together the Tideway Champions Group. The group is made up of officers from the different Environment Agency functions who work on the tideway, and have a good knowledge of the river and the issues. This group should be able to help with further data requirements, knowledge, and functional expertise.



YOUR TIDAL THAMES

Tidal Thames Pilot Project

Appendix C

Final Project Report

Appendix C: Literature review of existing management strategies, policies and projects to provide a baseline and set the context for YTT Pilot Project.

This appendix has regard to following Policy and Strategy documents:

- National Planning Policy Framework (2012)
- Mayor's Biodiversity Strategy (2002)
- The Revised London Plan (2012)
- Mayors Transport Strategy¹
- Mayor's Municipal Waste Management Strategy²
- Mayor's Air Quality Strategy²
- Mayor's Cultural Strategy²
- Mayor's Ambient Noise Strategy²
- London Biodiversity Action Plan
- London's Rivers Action Plan (2009)
- Management Guidance for the Thames Estuary (1999)
- Tidal Thames Habitat Action Plan (2003)
- The Tidal Thames Habitat and Species Audit (2004)
- State of the Thames Estuary (2005)
- Thames Estuary Path (2008)
- Estuary edges: ecological design guidance (2008)
- The Thames Landscape Strategy Review: Kew to Hampton (2012)
- Thames Strategy East: Tower Bridge to Tilbury (2008)
- Riverside Walk Enhancement Report (2010)
- South Fulham Riverside Supplementary Planning Document (2012)
- Inspiring and Enabling Local Communities (2011)
- TE2100 Plan (2012)

A vast consultation literature exists. This section does not aim to duplicate the work of others; instead it reviews these consultations from the past 15 years to see where progress has been made and where future resources should be allocated. The review is broken down into four context areas:

- National Planning Policy Context sets the national guidance which planning authorities must consider when developing Local Development Frameworks
- Strategic Planning Guidance – this comes in the form of the Mayor's Biodiversity Strategy, the London Rivers Action Plan and London Plan. These were reviewed to see what policies exist and how they align with existing Thames River guidance
- Additional to National and Strategic Policy Guidance, there is a range of guidance produced by other organisations such as the Environment Agency and Thames Estuary Partnership. This Additional Policy Advice represents the abovementioned Thames guidance. Six documents were reviewed for this section
- The Local Planning Context provides specific geographical context to national and strategy policy guidance. They show how policy can be shaped into practical ideas, and how local planning authorities, organisations and individuals can take direct responsibility for their reach of the river when they are provided with the appropriate guidance

¹ These documents were not subject to an in-depth review as they were already encompassed by the London Plan.

C.1. National Planning Policy Context

National Planning Policy Framework (2012)

The National Planning Policy Framework was published by the Department for Communities and Local Government on 27th March 2012. The document replaced over a thousand pages of national policy with fifty. These provided the government's view of what sustainable development means in practice for the planning system. They provide a framework for each local planning authority to produce a plan for its area. These plans should be aspirational but realistic; at their heart a presumption in favour of sustainable development. There are several supporting objectives to achieving a sustainable pattern of land use development. These include enhancements to the natural environment, providing gains in biodiversity, and incorporating biodiversity into developments. Planning authorities are also encouraged to adopt proactive strategies for climate change¹. These should take full account of flood risk. In particular, the framework also identifies the potential use of Sustainable urban Drainage Systems (SuDS)² and inland waterways for transport and recreation.

C.2. Strategic Planning Guidance

Connecting with London's Nature: Mayor's Biodiversity Strategy (2002)

The Mayor's Biodiversity Strategy was launched in 2002. It was an important first step in establishing a London-wide framework for maintaining London's diversity of wildlife, as part of an integrated set of strategies to achieve sustainable economic growth and raise the quality of life for London's more than seven million residents. The River Thames is the largest and undoubtedly the best-known natural feature in London. Because the key to conserving London's biodiversity is the protection and enhancement of wildlife habitat, land use issues underlie many of the links with other Strategies. By safeguarding the biodiversity of the Thames and London's other waterways, a significant leap towards achieving the Mayor's other statutory Strategies can be achieved. The Mayor and boroughs have the duty to protect and enhance the biodiversity of the River Thames and London's waterways by:

- designing waterside developments in a way that increases habitat value
- ensuring rivers, brooks and streams are protected, improved and respected, taking measures to improve public amenity and wildlife habitat
- taking opportunities to open culverts and naturalise river channels
- resisting impounding of rivers and taking opportunities to remove impounding structures;
- taking measures to protect and improve water quality
- ensuring surface water run-off is managed on site, preferably with SuDS, which may provide additional wildlife habitat

These objectives come together nicely when flood risk is considered. London's rivers have been hemmed in by built development and have been engineered to accommodate flood flows. Channels have been straightened, widened and occasionally deepened, and artificial, often vertical, sides and concrete beds, leading to significant loss of biodiversity, have replaced natural habitats. Climate change is likely to increase the likelihood of flooding in the future, to the extent that

² In line with the Floods and Water Management Act 2010.

attempts to control rivers in this way are unlikely to be effective. It is now widely appreciated that the most effective way to prevent damaging flooding is to allow rivers to flood in places where it will do the least harm, such as open spaces. This has secondary benefits for biodiversity in providing opportunities for the re-creation of riverside habitats. The strategy is clear that where possible, rivers and adjacent habitats should be restored, not only to assist with flood alleviation but also to provide valuable wildlife habitat and to enhance the local environment for people. Where this is not possible, and where encroachment for flood defence works is unavoidable, development should minimise, and wherever possible mitigate, impacts on biodiversity. So called 'greening' of flood defences can bring about smaller biodiversity gains and complement a wider suite of sustainability benefits. Sustainable urban Drainage Systems (SuDS), such as permeable surfaces, storage ponds and green roofs, can provide biodiversity benefits, manage long-term flood risk and can be easily integrated with flood defence works.

London Plan: Spatial Development Strategy for Greater London (2011)

London has seen attempts to reorder its masterplans come and go. There are numerous Mayoral plans. The Mayor took care to ensure that the Biodiversity Strategy was consistent with the other seven statutory Strategies (including Transport, Economic Development, Culture, Ambient Noise, Municipal Waste Management and Air Quality). The objectives of these are not opposites. We can't achieve one without the other. Given the sheer scale of the issues concerning London's future, striking a balance is essential. Clarity and realism are essential. The revised London Plan is more focussed than its predecessor. It concentrates on things of really strategic, London-wide importance and does not try to micro-manage aspects that are better sorted out locally³. It brings together all the Mayoral strategies into one workable plan. The London Plan recognises the importance of the Thames and other London waterways in a range of policy objectives. These include:

- the mitigation of climate change
- provision of important leisure and amenity benefits
- enhancement of London's natural environment and economic development.

To reflect the strategic importance of the River Thames and its tributaries, and London's other waterways, the Mayor has established the concept of a Blue Ribbon Network. The network is considered multi functional in the London Plan, much more so than the Mayor's Biodiversity Strategy. It provides a transport corridor, drainage and flood management, a source of water, discharge of treated effluent, a series of diverse and important habitats, a valuable heritage resource, and opportunities for recreation and landscapes views. Despite its multi-functionality, the plan is clear that any consideration for development and use of the Blue Ribbon Network must account for the impact on water and recognises the need for sustainable development and a continuous foreshore. Improving water bodies to 'good ecological potential' and preventing further deterioration in the status of water bodies are key requirements of the Water Framework Directive. Recognition of the intrinsic value of water in the London Plan is a welcome revision. The London Plan puts strong emphasis on the importance of transport provision to the development of London in the future. On the navigable parts of the network, it wishes to ensure that uses of the water, and land alongside it, are prioritised for transport. By reducing demand for other forms of surface transport, the benefits of water transport can link through to climate change mitigation and

³ This important revision of localism and how local planning authorities, organisations and individuals can take direct responsibility for their reach of the river is discussed in part four of this chapter.

improving the quality of life. The Plan recognises that for effective transport a range of supporting infrastructure is required. Historic steps and slipways to the Thames foreshore are often in a poor state of repair or missing altogether. These facilities are vital for transport and for enabling access to the Thames foreshore. The plan wishes to see these facilities retained, improved and where disused, brought back into use. This could have important secondary benefits by providing education opportunities. Where development is necessary it could also take into account the greening suggestions as set out in the Mayor's Biodiversity Strategy. Greening of the river's edge through SuDS will not only reduce run-off and reduce flood risk but also provide multiple benefits to London – amenity, biodiversity and better water quality to name but three. In addition, the water management policies (5.13) on SuDS and in particular policy (5.14) on water quality and wastewater infrastructure should not be ignored. The latter provide the key recognition of WFD in the London Plan.

In all, the London Plan addresses a range of issues relating to the river including:

- improving the urban waterside
- protecting views and panoramas from waterways
- enhancing public access along and across the River (including safeguarding wharves and waterside infrastructure to increase passenger and freight use)
- protecting and enhancing the natural environment and biodiversity
- enhancing London's waterways as cultural and recreational spaces

Other Mayoral Strategies

There are numerous other mayoral strategies. The London Plan is consistent with these so an in-depth review is not necessary. A brief overview was nevertheless undertaken where appropriate.

Mayor's Transport Strategy (2010)

The Mayor's Transport Strategy sets out the transport vision for London and details how Transport for London will deliver the plan over the next twenty years. The Strategy has policies for increasing river-based transport and for the protection of linear wildlife habitats that are adjacent to London's many transport networks. As an example, Proposal 113 in the Strategy describes how there will be an additional 10,000 street trees by 2012, with the aim of additional two million trees by 2025. The Strategy prompted work including the Safeguarded Wharves on the River Thames. The Port of London Authority is actively engaged with the Mayor of London to support the safeguarding of riverside wharves from redevelopment into non-port use. This was consistent with continued moves towards sustainable development that ensure development on the Thames continues to be balanced across freight, residential and leisure uses. The report, in consultation with riparian local authorities, reviewed the existing 28 Safeguarded Wharves and the proposed 45 sites downstream of the Thames Barriers.

The Mayor's Municipal Waste Management Strategy (2011)

London's Wasted Resource sets out the Mayor's policies and proposals for reducing the amount of municipal waste produced, increasing the amount of waste reused, recycled or composted, and generating low carbon energy from waste remaining. The Strategy also sets out how the Mayor, through the London Waste and Recycling Board, will help develop more waste management infrastructure in London. This includes using river-based transport for waste, which has important ramifications for Mayoral and other policy guidance.

Mayor's Air Quality Strategy (2010)

Following extensive public consultation, the Mayor published the Air Quality Strategy on 14 December 2010. Clearing London's Air details how the Mayor aims to protect Londoners' health and increase their quality of life by cleaning up the capital's air. The strategy sets out a framework for improving London's air quality and measures aimed at reducing emissions from transport, homes, offices and new developments, as well as raising awareness of air quality issues.

Mayor's Cultural Strategy (2012)

The Mayor's Cultural Strategy sets out the vision, priorities and recommendations for how to strengthen the cultural life of Londoners across the capital. It recognises the significance of the cultural and creative sectors in making London a successful world city, and puts forward a case for its continued support and investment – particularly in the run up to the 2012 Olympics and the opportunity it presents for London to undertake a step change in cultural activity and participation. The Thames is a critical component of achieving these aims. As an example, the Cultural Olympiad in the build to the Olympics staged large scale projects such as River of Music, a series of free concerts on stages by and on the River Thames with musicians from round the world, improvising and playing with each other, in many cases for the first and only time.

Mayor's Ambient Noise Strategy (2004)

The Strategy is part of a Europe-wide move towards more active management of what legislation calls 'ambient' or 'environmental noise': long term noise, mainly from transport sources. The Strategy encourages quieter vehicles. Many of the policies in the Mayor's Transport Strategy, including encouragement to river-based transport, walking and cycling, and 'Streets for People', are touted to bring about a quieter London. Greening of transportation routes can also reduce environment noise.

There are numerous non-Mayoral strategies; two of these were reviewed with a particular interest in the River Thames and other London waterways.

London Biodiversity Action Plan and London Rivers Action Plan (2009)

The London Biodiversity Action Plan identifies priority habitats that are of particular importance for biodiversity in London. Many of these habitats are covered by Habitat Action Plans. One of these is the Rivers and Streams Habitat Action Plan. It aims to enhance the ecological value of London's Rivers and associated habitats, and to increase the contribution of rivers towards quality of life. The current state of London's rivers has been greatly affected by historic and present land uses within the Thames Estuary. While issues such as waste water treatment management, and urban surface water run off, influence the quality of the habitat, historic practises used for maximum land take and flood alleviation, have arguably had a greater effect. The plan has three objectives, which include:

- increasing understanding of London's rivers by collating quantifiable data by 2007
- preventing losses in existing riparian habitat, and improving at least 100 km of riparian habitats by 2020
- establishing river catchment projects on five rivers by 2010

London Rivers Action Plan (2009)

Restoration of river edges has been impeded by land ownership boundaries. Management of adjacent land owners is not joined up. One way to tackle this issue proactively is through the promotion of river partnerships. The London Rivers Action Plan was developed to do this. It aimed to take forward river restoration strategies by providing a forum for identifying stretches of river that could be brought back to life. This could be done by improving river and riparian habitats, by removing and modifying flood defence structures where safe to do so, or by reclaiming lost rivers: all are aspects of the preceding Mayoral strategies. In all, the action plan's five objectives include:

- improving flood management using more natural processes
- reducing the likely negative impacts of climate change
- reconnecting people to the natural environment through urban regeneration
- gaining better access for recreation and improved well-being
- enhancing habitats for wildlife

The London Rivers Action Plan provides several examples of how these objectives, and those from London Biodiversity Action Plan, have been achieved.

The River Quaggy at Sutcliffe Park was lost underground in a culvert. Following the London Plan, space for floodwater through river restoration activities was initiated. A meandering channel was cut through the park following its original alignment. The culvert was retained to take excess water in times of extreme flood events and flow regulated between the two watercourses by a sluice. To provide further flood water storage, the park was lowered to create a floodplain capable of storing 85,000 cubic metres of flood water. This combination of the new open river, with the old culverts, enables the regulation of flood flows for a range of environmental conditions associated with climate change. The River Quaggy project also crosscut many policy themes including:

- Biodiversity – wetland pond areas provide a variety of habitats
- Recreation – boardwalks, pathways and viewing points increased access (recreational visits increased by 73% prior to the project)

At Cornmill Gardens, Lewisham, open space adjoining a new housing development provided residents with better access to the River Ravensbourne. The River had previously been constrained within a narrow concrete channel as part of flood defences. High steel railings and overgrown vegetation resulted in a neglected river that possessed little ecological or local community interest. Concrete river walls were removed and replaced with natural sloping banks – this provided more flood capacity. Steps and wooden platforms were interspersed to improve river bank access. Marginal areas were planted with native species such as Rush (*Juncus effusus*) and Yellow flag Iris (*Iris pseudacorus*) whilst a wildflower mix was sown along the banks. A natural river environment has created a sense of place that enables people to connect with each other and their neighbourhood. Improved flood management also helps mitigate climate change.

C.3. Additional Policy Advice

Management Guidance for the Thames Estuary (1999)

The Management Guidance for the Thames Estuary was undertaken in 1999 by the Thames Estuary Partnership. Ninety pages of guidance were developed in partnership between people who live and work on or near the Thames. This ensured that the right balance was struck between social, economic and environmental considerations when taking forward the concept of sustainable development. Issues and opportunities were translated into 101 Principles for Action across twelve themes. Some of these are discussed below.

A breath of fresh air: improving air quality

Air pollution affects biodiversity, has significant effects on soils and water, and causes ill health and premature deaths. The guidance identifies those whose responsibility it is to maintain National Air Quality Standards. Through this it aims to reduce the impact of air pollution within the Thames Estuary, whilst recognising that the impacts of air pollution extend beyond the estuary area.

Nature matters: maintain and enhance biodiversity

Valuing the estuary as a whole is dependent on providing a network of interconnected wildlife sites. Development of London's rivers has severed many wildlife connections. This fragmentation has concentrated estuarine wildlife onto remaining smaller areas and limited the ability of the Thames to function as a green corridor. To counter the effects of fragmentation and to take advantage of opportunities offered by development, the guidance recommended local authorities produce 'Green Grid' Plans. Local authorities duly delivered. The plans show how an interconnected series of sites and green corridors can be implemented as part of development proposals. It was hoped that the diversity and populations of habitats and species supported by the estuary can be maintained and enhanced as a result of this guidance.

Earning our living: sustainable commercial use

Commercial use of the River Thames has shaped settlement patterns in the south east. The estuary is commercially important. It provides a focal point for development and regeneration, port facilities and river industry, and other economic activities associated with use of the river for leisure and recreation. The importance of the Thames for transport is as prevalent in the management guidance as in its successors (see the 'Mayor's Biodiversity Strategy' and 'London Plan'). Using the river as a sustainable transport corridor could result in significant reductions in traffic on the already congested road system. However, the guidance recognises that the promotion of river transport requires that goods and people can safely alight to shore from the estuary, and that once on land, there are sufficiently well connected public transport interchanges that are accessible and convenient to enable river to rail or river to bus systems to be viable. These considerations were taken forward in the London plan. As well as developing specific Principles for Action for the above considerations, including the safeguarding of riverside areas with good navigational access for river dependant activities, the guidance has provisions for dredging. It suggests that the potentially damaging consequences of dredging can be minimised by joint working between interested parties as. Ensuring commercial activities continue to thrive and grow in harmony with valuable the nature, heritage, recreation, and landscape resources of the estuary is an overarching aim of the guidance.

In the know: promoting education and awareness

Raising awareness by creating opportunities for the public to reach the riverside is a desirable objective of the guidance. Improving public access will encourage more people to make recreational use of the Thames and its margins. This helps improve public perceptions of the high quality flora and fauna associated with the estuary, and may challenge misconceptions about the riverside environment.

Today's culture, tomorrow's history: conserving historical resources

The River Thames has a diverse heritage resource including buried archaeology, as well as, those structures visible today. Ensuring these are safeguarded, and where appropriate, enhanced for the benefit of present and future generations, is a desirable objective of the guidance. Heritage resources are important because they link through to education and awareness (see 'In the know: promoting education and awareness'). As before, public access is encouraged when recreational access routes are carefully managed to avoid erosion of sensitive archaeological sites, to sites that are interesting, stimulating and potentially a source of enjoyment to local residents and visitors. Secondary school level education is also emphasised as vital for broadening understanding of the importance of the past in the Thames estuary. It is recommended that historical resources should be linked to a range of National Curriculum subjects through concentrated study and associated visits to local sites. The Thames Learning Group, which is co-chaired by Jill Goddard, Chief Executive of TEP, is testament to the success of the management guidance in promoting the education of historical and cultural resources. Development, particularly for flood defences, impacts archaeological resources. Other than the direct impacts of development, changes in the hydrological condition of buried sites in adjacent areas to development can eliminate the waterlogging which has historically preserved organic materials of archaeological interest. The guidance encourages developers to consider the impact of their proposals on the historic environment and formulate appropriate measures for mitigation. The creation of navigational channels or the widening of existing channels by dredging for river transport can also threaten the archaeological resources of the estuary (although potential for new discoveries of archaeological deposits does exist). Consultation and communication between archaeologists and those responsible for dredging was recommended.

Fish for today and tomorrow: managing our fisheries

Water quality is vital to the well-being of estuary fisheries. Improvements over the past thirty years have meant that at the time of publication in 1999 there were 116 different fish species present in the estuary. Commercial fishing of these stocks provides an important economic resource and fish fry migration and foreshore continuity are recognised as essential for these and other stocks. Forty-seven commercial vessels operated within the Thames estuary in 1999. Prior to the management guidance fisheries regulation was not well co-ordinated. The very process of drawing up Principles for Action has provided a stimulus for better liaison, and has gone a long way to achieving the aim of ensuring a high quality fisheries resource, associated with the estuary, is protected and enhanced.

Living with the tide: effective flood defence

The management guidance identified four external influences on flooding in the estuary. These include the tidal cycle, surges, fluvial flows, and wind that drives waves of water into the estuary. Each of these will be impacted by climate change. A major aim of the management guidance was to ensure a technically, environmentally, and economically sound standard of defence exists to protect against flooding. The maintenance and construction of new flood defences impacts upon

the natural and the built environment. For example, the narrowing of the Thames over the years, as the tidal flood plain has been enclosed, developed and defended, has raised water levels. This means the important Thames foreshore continues to be lost. The guidance is clear that the foreshore's inherent value, due to its archaeological richness, as a location for recreation, and a habitat for spawning and feeding fish, should justify a presumption against further development. It therefore incorporates managed realignment into one of four strategic management options for dealing with flood management. Subsequent policy would suggest this concept has been successfully incorporated (see 'Mayor's Biodiversity Strategy' and 'London Plan').

Clean waters: effective water management

The Thames has suffered from the effects of pollution. Water quality improvements over the last 30 years have enabled the estuary to reach its present quality. It now supports a diverse ecosystem and the Thames is now acclaimed as a river returned from the dead. The guidance identifies twelve specific policies to ensure water improvements achieved over the last thirty years are maintained and further developed. When considering the Water Framework Directive this aim does not appear too aspirational.

Tidal Thames Habitat Action Plan (2003)

The Thames Estuary Partnership Biodiversity Action Group developed three priorities for London, Kent and Essex. These included:

- conserving wildlife habitats, species diversity and the local distinctiveness of the River Thames
- adopting a strategic approach to deliver biodiversity targets for the Thames Estuary as a whole
- promoting public awareness and appreciation of Thames Estuary habitat and species diversity

It recommends a strategic approach to habitat management and creation and supports the need to account for fish fry migration and foreshore continuity. These were encompassed in the Tidal Thames Habitat Action Plan, in which 14 factors affecting the Thames Estuary were identified.

Despite the publication of the Management Guidance for the Thames Estuary four years previous, foreshore habitat losses due to riverside development were still a problem. These losses were seen as particularly damaging for migratory fish. Fish fry use tidal transport to migrate upstream – a continuous foreshore is a prerequisite of this migration capability. Objective two of the action plan thus set out to secure the appropriate management of existing habitats by identifying habitats and locations where management guidelines are lacking and producing good practice guidelines. Objective four meanwhile set out to create new areas of riverine habitat. This included identifying sites most suitable for habitat creation and disseminating information to local planning authorities and statutory agencies. An important caveat to this objective was the promotion of new environmental approaches to flood defence design. Both were successfully integrated into subsequent Strategic Planning Guidance (e.g. habitat restoration through the 'London Rivers Action Plan').

Like its predecessor, the action plan explained how the majority of Londoners were unaware of the wildlife value of the Thames. There is still a general misconception that due to the brown colour of the river it is seen to be dirty and devoid of life. Objective five aimed to increase public understanding and appreciation of the habitats and species of the Thames. This was to be achieved by co-ordinating foreshore events, including training programmes run by Thames 21 and Thames Explorer Trust, within each reach of the Thames to promote public appreciation of Thames wildlife.

The 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. The action plan stated that the beneficial use of dredged material can offer opportunities to enhance intertidal habitats. For example, 4.5 million tonnes of excavated material from Crossrail have been used to raise land on Wallasea, creating hillocks and dips into which seawater will ebb and flow. Once complete the 1,500 acre reserve will be one of Europe's largest new wetland nature habitats.

The Tidal Thames Habitat and Species Audit (2003/4)

Land Use Consultants were commissioned by the Thames Estuary Partnership to undertake an audit of key habitats and species associated with the tidal river Thames. It lists a number of habitat types along the river of particular biodiversity importance. These were divided into naturally occurring habitats, and those created by man. The study collected data on these individual habitats and species and used Geographic Information System (GIS) to display information. As an audit no specific policy or guidance was produced but it is a good reference source for the development of a strategic habitat plan that has continuity at its heart.

State of the Thames Estuary (2005)

The Thames Estuary is constantly changing. Development pressures associated with the Thames, legislative changes associated with the Water Framework Directive, and long term environmental pressures associated with climate change and sea level rise, represent major challenges, as well as opportunities, to name but a few. Although the publication of Thames Estuary Partnership's Management Guidance in 1999 (see above) had done a great deal to improve and protect the Thames Estuary, it needs to be reviewed periodically and updated where necessary to reflect new and emerging pressures and associated management needs. The State of the Thames Estuary was the first step in this process. Unfortunately, only phase 1 of the project was finished.

The report for phase 1 of this project, produced by the Thames Estuary Partnership, aimed to identify so-called 'values', specify the threats to these and then to determine gaps in knowledge in relation to understanding or resolution of management issues associated with these values. Values were categorised in terms of their function. Some support other values, whilst others are dependent on the provision or maintenance of other values. Values have been classified as:

- Core Values – relate to specific characteristic or features of the estuary, including the fundamental physical, chemical or biological factors that support or underpin human values attached to the estuary (e.g. Water Quality)
- Applied Values – features or characteristics of the river that are supported by one or multiple Core values (e.g. Biodiversity, Historic Landscapes)
- Utility Values – these are underpinned by Core and Applied values (e.g. Transport Mechanisms, Flood Risk Management, Commercial, Recreational, Tourism, Educational Resource)

Examples of these values and how they have moved on from the Management Guidance are discussed below.

Water Quality

The Management Guidance in 1999 encouraged investigations into the distribution and source of dangerous substances in the estuary and their impact on ecology. The State of the Estuary reported that levels of dissolved oxygen occasionally still did not meet Environment Agency dissolved oxygen standards. It concluded that this affected the ability of the Thames to support a sustainable fishery and stated that further information needed to be gathered on the significance of organic and inorganic pollutants. Recommendations on this matter are seemingly a continuation of that set out in the Management Guidance.

Biodiversity

The report was fortunate to benefit from the Tidal Thames Habitat and Species Audit. This document provided detailed layers of ecological information identifying important habitats and species found in the Estuary. It helped place threats on these habitats in context, and Management Guidance could be updated where necessary. The loss of coastal habitat seaward of existing coastal structures was identified as a major threat to biodiversity. The emergence of the Environment Agency's Thames Estuary 2100 around this time further complicated the issue of coastal squeeze. The State of the Estuary added that enhancements to flood defences through the project needed to allow for space for ecology. It added that while overarching strategy documents exist on maintaining a functional green corridor (e.g. Mayor's Biodiversity Strategy, London Plan, etc.) there appears to be no focused management strategies regarding coastal squeeze and flood defences. The report reiterated the need for a mechanism to actively protect non-designated habitat if it is considered to be under threat. By contrast, there were no clear gaps in management for flood risk. The provision of flood risk management structures were a high priority for the government: developed Shoreline Management Plans provided a complete coverage for the UK including the Thames Estuary, and the TE2100 was in development. The report also showed that there had been a shift in approach in managing fluvial and tidal flooding from hard engineered defences to softer, more natural methods. This was particularly relevant to the outer Thames estuary where riparian development has not constrained the natural course of the estuary. As a result of the previous policy advice, which was the product of consultations and engagements, an understanding of soft engineering practice has been fostered at a rapid rate. Public perceptions are now accommodated within flood defence provision: a persuasive argument can now be made to communities on the benefits of natural flood defence mechanisms.

Transport

The use of the estuary as a transport route for passengers and freight was again highly prominent. River-based transport routes offer an alternative, potentially sustainable, option to road and rail transport. They include movements of passengers by river craft, boats and ferries along and across the Thames. The Thames Estuary Recreation Study (Thames Estuary Partnership, 2001) revealed significant backing for river transport: some £21 million had been committed for the improvement of London's piers including a new pier at Tate Millbank. The loss of piers, jetties and foreshore access, which restricts the potential for transportation provision, is an enduring issue. At the time it was unclear if the existing infrastructure and foreshore access

arrangements were adequate to provide viable river based transport network. There were also issues of demand: water transport may be quicker than road travel but may not to be quicker than tube or train. The manner in which a river-based transport network could be integrated with a holistic transport system for the estuary was largely unresolved, and the report wished to see an assessment of the constraints to establishing river transport. While the present Your Tidal Thames report knows of no such assessment, the prominence of river transport in the London Plan would suggest demand exists. In addition, consultation from the present study engaged public perception and attitudes towards river-based transport.

Reviewing three examples of core, applied and utility values shows that the key principles from the original Management Guidance were still relevant six years on (in 2005). The Management Guidance for the Thames Estuary was certainly a pioneering document in the respect that it identified the need for management on an estuary-wide scale. The State of the Estuary report shows throughout that the task still remains on how to focus research in such a manner. With this in mind, it should be reiterated that the Management Guidance for the Thames Estuary is perhaps the best attempt to provide such a focus and is markedly different from studies that have preceded it.

Thames Estuary Path (2008)

Thames Estuary Partnership, in conjunction with Sustrans, published the Thames Estuary Path in 2008. It was an offshoot of the State of the Estuary and Thames Strategy East. In the State of the Estuary, the actual level of recreational walking along the river was referred to as an 'unknown quantity': no estuary-wide data on the numbers of walkers or the frequency of use of specific areas of the river were available. The study nevertheless considered it a safe assumption that a walk along the river was a regular feature of visitors to and residents of, the estuary area. With no overall management approach to ensure walking along the Thames for enjoyment and public health was promoted, enabled and maintained, no assurances for this assumption could be made. The Thames Strategy East also identified that priority should be given to completing footpath and cycle paths and, in particular, the Thames Path network along both banks of the river and connections to it from the hinterland in accordance with Green Grid Strategies. The strategy went on to identify nine individual Reaches and provided an indication as to the state of the Thames Path in each and what improvements might be made. Although maps were developed for all Reaches, which include proposed footpath and cycle routes that could be included in any extension to the Thames Path, it was too short on specifics. The Communities and Local Government commissioned a survey to help deliver the Thames Estuary Path. It provided information about the current state of the waterfront path, how much it would cost to develop into a continuous route for walkers and cyclists, suggestions for link paths, what blockages there might be to development and options for how these may be solved. It was designed to facilitate development of sections of the path, providing easy access to key information which might help organisations to take decisions about whether they can undertake development. Most importantly, it took forward key recommendations of previous policy and guidance and showed where action is deliverable.

Estuary edges: ecological design guidance (2008)

Estuary Edges was developed by the Environment Agency through a project coordinated, tendered and steered by the Thames Estuary Partnership. It provided the first real guidance on developing the banks of the estuary in a way that supports biodiversity, improves public access, and educates

people about the importance of protecting the environment. These are the key themes from all the preceding studies. There are four different categories for designing estuary edges:

- Bioengineered designs rely on plants for long-term protection. Where changes in the natural estuary state have been significant bioengineering may be inappropriate. The ecological value of such designs is the closest to that of a natural tidal bank;
- Biotechnically engineered designs also incorporate plants into the design but harder engineering elements are provided for stability in the long-term (man-made elements provide root anchorage for plants). The ecological value of such designs can approach that of a natural bank;
- In structurally engineered designs any ecological elements are simply added on. The ecological value of such designs varies widely, but can be high;
- Hard engineering designs are used when hard flood defences are present and/or there is too much water energy for anything to attach, other than seaweed and very exposure-tolerant invertebrates. The ecological value of such designs is negligible.

The study explained that it is difficult to provide a simple set of rules for selecting a design as there are so many variables at any given site. Nevertheless, in all situations consideration must be given to: adjacent land use (opportunities for a landscape design that highlights the interesting estuary character), land drainage (poorly designed outfalls can lead to local erosion damage, possibly increasing flood risk or damaging habitats), flood risk management, archaeology and heritage (the entire foreshore is considered to be of high archaeological potential), and public access, to name but a few.

What follows are examples of different categories for designing estuary edges.

Bioengineered designs

In some cases there may be fast tidal currents, but vegetation can thrive and contribute significantly to overall flood risk management if initially helped to take root. In such cases the approach can be to stabilise the substrate only as long as it takes strong estuarine plant species such as Common Reed or Sea Aster to become established. This approach was illustrated at the River Severn (Longney) Gloucestershire where an anchored biodegradable coir (coconut fibre) erosion control blanket was used, which was planted with pre-grown estuary grown Common Reed.

In other cases, the environment may be considerably more saline and the water more silt-laden. Where there is not a high risk of major wave action, the main aim here may be to ensure that the river edge achieves net balance between accretion and erosion, by initially favouring the deposition of sediment. Techniques designed to achieve this were illustrated at Barking Creek where 300mm diameter bundles of cut Hazel branches were laid on the substratum to a depth of some 300–500mm. Brushwood fascines – bundles of cut branches tied with cord – are entrenched in a woven pattern between closely placed driven poles to create robust low fences. Sediment rapidly accumulated between the fascines favouring subsequent plant colonisation.

Biotechnically engineered designs

Sometimes plant material alone is not predicted to withstand the peak forces for the anticipated severe event. So the planting needs to be reinforced with structurally engineered components. Application of biotechnical engineering to tidal river edge design was shown at the River Severn

(Purton) Gloucestershire. Here it was concluded that plants could contribute to the integrity of the bank, but only when provided with significant root stabilisation. Gabion mattresses were lined with soil fines infill to the stone first and then a thick coir loop mat was laid under the lid of the basket to prevent wash out of content. Poor installation can however lead to vegetation loss and associated loss of some fine substrate material from the mattress. This may permit the remaining larger material to move around which then damages the mattress well before the term of its intended design life.

Structurally engineered designs

Where there is not room for a more gentle slope, and a steep or near-vertical solution is required, habitat can still be created by establishing plant communities on steps, terraces or 'ledges' on hard engineered walls. Where space permits, a continuous sloping beach profile at a stable angle between the new retreated flood defence wall and the truncated, capped remnant of the former wall can be considered. Such installations have considerable value for invertebrates. This was illustrated on the Greenwich Peninsula Terraces. This case study showed how dense natural colonisation (in this case of Sea Aster) can occur. When vertical or near-vertical walls are really the only option, Estuary Edges provides techniques for enhancing the ecological and visual interest of such walls. The whole wall may be panelled, as at Deptford Creek. The wooden panelling forms a relatively soft substrate for the colonisation of algae and invertebrates. A gap left between the wall and the timbers was back-filled with material of fairly similar particle size distribution as the adjacent foreshore to form a vertical beach habitat. Plastic fronds or brushes as substrates for egg laying by fish were also added.

Estuary Edges concluded that if properly designed and implemented, softer estuary edges may not require more monitoring and maintenance than traditional hard engineering solutions. The case studies provided by this and subsequent studies support this assertion.

C.4. Local Planning Context

The Thames Landscape Strategy Review: Kew to Hampton (2012)

The original Thames Landscape Strategy was a pioneering document that set out to celebrate and understand the exceptional landscape character of the Arcadian Thames, creating a 100-year strategic vision for the river corridor. The 1994 Commission that had been established to oversee the production of the report evolved into a dynamic partnership and the Strategy remains a strategic document. It has widespread support due to the tangible signs of landscape enhancements that have been seen on the ground. In 2012 the Thames Landscape Strategy Steering Group published the revised Thames Landscape Strategy. The Review aimed to:

- provide a local context that is cross-referenced to planning policy in which decisions relating to the management of the River Thames can be set;
- review the progress made toward the Thames Landscape Strategy 1994;
- identify the likely impacts of climate change;
- take into provisions for Flood Risk Management Strategies and the Thames River Basin Management Plan;
- provide detailed information on river infrastructure;
- identify opportunities for environmental and urban design improvements;
- engage local communities in practical projects concerning the Thames.

The **London Plan** contains comprehensive policies for the Blue Ribbon Network. It encourages boroughs to identify Thames policy areas within their Local Development Frameworks and prepare detailed appraisals of their stretches of the river. The **Thames Landscape Strategy** fulfils this role. The first Strategy paid little attention to Water Framework Directive and was declined funding proposals accordingly. The new strategy has been designed to address the framework and TE2100 throughout. For example, existing floodplain areas, especially Syon tide meadow and the Old Deer Park provide a critical flood alleviation resource. The Strategy is clear to point out that opportunities to reinstate floodable areas would greatly assist in the management of the river. This is consistent with previously reviewed studies. The Strategy provides examples where opportunities and landscape enhancements have been sought to accommodate flood events. Some of these are shown below.

Royal horse paddocks, Portsmouth Road - The Royal horse paddocks lie within an area at risk from a fluvial flooding. The Strategy considered it important to restore the floodplain: reconnecting the network of channels, creeks and wetlands so that water can enter and move through the area in times of flood and sustain a wet habitat during drier periods. Fortunately, much of the historic 16th century network of culverts, sluices and creeks survived although they were very much degraded. The Thames Landscape Strategy embarked on an ambitious project in 2010 to restore this network of wetland habitats.

Petersham Meadow (Ham), Richmond, and Brentford to Kew - At Ham there are long-term considerations to replace the Petersham Meadow concrete floodwall with an earth embankment and return the meadow to a regime of flooding. There are similar proposals at Richmond and Brentford and Kew to consider more sympathetic flood defence designs and, where possible, to soften the flood wall (see Estuary Edges) alongside Cambridge Gardens.

Old Deer Park, Isleworth - Perhaps the most ambitious projects can be found at Isleworth's Old Deer Park. Flood defences here are set well back from the river's edge following a contour line that snakes its way through the landscape. This leaves large tracts of open space within an area that floods frequently and is inundated by the high spring tides. There is presently an illusion that protection is provided by high revetment walls that runs between the Old Deer Park and the river. In truth these were constructed to aid recreation and not as a defence against inundation: water makes its way around or through the walls via a system of sluices. Small incremental modifications would suffice to allow water to move in and out of the floodplain more easily. This would ensure that the land is managed in a way that is appropriate for periods of wet and dry. The Strategy stresses that whilst it is unlikely that the area could ever be returned as grazed wet meadows, it could be managed in a way that considerably enhances its diversity through the reinstatement of twice yearly hay cut replacing the monthly mow. Native wild flowers that tolerate occasional inundation could be planted whilst paths mown through the meadow during the summer months would make for a fascinating public amenity. If successful this would provide yet more evidence that policy and guidance produced over the last fifteen years has not been wasted.

Opportunities to connect green spaces along the Thames with the wider landscape are set out in various Mayoral strategies and additional policy advice. Each seeks to bring together partners to create, enhance and promote a network of interlinked and high quality green spaces that connect with town centres, public transport nodes, green space in the urban fringe and the Thames. The

Thames Landscape Strategy provides examples showing how it has put this policy into local practice.

Public access and activity

The path between Petersham Meadows and Douglas Meadow is inundated on at least 230 tides each year affecting recreational use and erosion of the riverbank. The riverside path known as the Warren Footpath was formerly spoiled by poor fencing, concrete columns with sodium lights and vandalized benches. It has now been improved as part of Arcadia and selective views have been opened up to Richmond Hill and Marble Hill House. In another example at Syon, the Thames Path between Syon House and Brentford deviates from the river via Brentford Town Lock. A proposal to create a new section of path that cuts out this 10 minute detour has been proposed. The Strategy explains that a new access point to link Syon with the existing route would be needed to re-join the path at the wooden footbridge over the Grand Union Canal to Brentford.

Education

The growing interest awareness of the environment has led to an increasing importance being placed on environmental education. The Thames Landscape Strategy now provides a wealth of formal and informal opportunities to get close and discover nature, for interpreting and learning about the landscape, the wildlife and the history, and also for taking action to manage the landscape. The River Thames Boat Project operates a specially equipped community boat, the *Venturer*, from the Barge Dock, Canbury Wharf at Kingston. It aims to give people life enhancing experiences of river and waterways environments to the benefit of their personal, social and educational development. It focuses on children, young people, older people and those with disabilities. The project provides a choice of subsidised therapeutic day trips, residential cruises and environmental education activities. On a smaller scale, at Bushy Park, the heritage trail for Molesey Riverside and Hurst Park has been improved, and in Richmond two interpretation panels now tell the story of the river – Richmond Lock and its waterman heritage. An additional map-based panel encourages visitors to explore further field.

Water-based passenger and freight transport

There are no commuter river services that provide regular journeys between Hampton to Kew for journeys to work. The up-river limit of commuter river services is Putney Pier that has services operated by Thames Executive Charters into central London. The constraints provided by locks and shallows at Kew during low spring tides lead to long journey times making it unlikely that any viable commuter river services could be provided between Hampton and Kew. Despite this there are proposals within the Strategy to reinstate the Isleworth ferry and promote the circular walk from Kew to Brentford to the Grand Union Canal and Syon. Although a boat has been purchased by the Thames Wherry Trust, negotiations and plans are on-going. In another example at Isleworth on the Middlesex side of the reach, the Thames Path diverts away from the river at Isleworth and Syon Park. The Isleworth ferry no longer runs, but there are plans to purchase it and provide a new ferry in partnership with the Thames Wherry Trust. As the Strategy explains this would be a popular link to Kew Gardens. The Thames Landscape Strategy has also proactively sought development proposals which increase the use of safeguarded wharves for waterborne freight transport and which maximise water transport for bulk materials. This is consistent with the London Plan. At present there is no regular transport of freight between Hampton and Kew but water freight has an important role in delivering

materials to islands in the River Thames and to provide deliveries to and from boatyards. However, since 1994 there have been significant losses of boatyards with demolitions affecting R J Turk and Sons, Hampton Court foreshore, R J Turk and Sons, Kingston, Tough's Teddington, Petersham Boat services, and Howlett's Boatyard, Richmond. To maximise waterborne freight transport the Thames Landscape Strategy has helped to conserve boatyards as viable enterprises. At Richmond, the former Castle Boathouses were rebuilt in the late 1990s as part of a mixed-use scheme to provide boat storage and workshops on the ground floor with a restaurant and residential area above. A similar example can be found at Brentford and Kew where the working character of the waterfront has been conserved by safeguarding and improving the cluster of boatyard facilities around Thames Lock, Johnson's Island and Lot's Ait. At Teddington the survival of the Swan Island boat repair facilities was deemed an integral part of the river landscape character and their replacement by uses not functionally related to the river has been heavily resisted by the Strategy. This staunch resistance to the loss of further boatyard infrastructure was shown by the listing of boatyards on Platt's Eyot, Bushy Park, which was placed on English Heritage's Building at Risk Register.

Thames Strategy East: Tower Bridge to Tilbury (2008)

The Thames Estuary Partnership published the Thames Strategy East in 2008. It takes the key messages of previously reviewed studies forward and promotes a holistic approach to the delivery of the necessary transport, utilities and environmental infrastructure. The strategy area extends from Tower Bridge in the City of London eastwards to the Borough of Gravesham. It provides strategic guidance on a range of themes, particularly the provision of a multi-functional infrastructure to be planned, designed, implemented, managed and maintained in conjunction with transport, utilities and flood-risk management infrastructure integrating the needs of people and wildlife. The Thames Strategy East is broken into two key parts:

- The Strategic Guidance provides a broad understanding of the river as a landscape, townscape and riverscape resource and promotes an overall guidance to achieve the Vision. It also describes an underlying framework supported by Strategic Guidance statements based on the themes of:
 - planning and design;
 - biodiversity archaeology;
 - historic and cultural resources;
 - flood risk and climate change;
 - river economy;
 - related design guidance.
- Reach Guidance is the main body of the strategy and provides detailed guidance for each of the river reaches. Some examples of how Reach Guidance has taken forward preceding policy and recommendations are provided.

Seeking opportunities to accommodate flood risk was an enduring recommendation of the Strategy. At the Pool and Limehouse Reach, which stretches from The Tower of London to Cuckold's Point, creative realignment of flood defences in all riverside development proposals, where defences are being replaced and at riverside open spaces, was recommended. Protecting the vegetation communities established on the sloping, vertical and hard river flood defence walls downstream of Tower Bridge and encouraging habitat provision on existing sterile river walls (e.g. sheet steel piling and within new flood defence installations), was another consideration.

The Strategy also had provisions for transport. At Northfleet Hope, which stretches from Grays Beach Riverside Park to the eastern extent of Tilbury Docks, jetties that had become redundant and no longer commercially viable or capable of being made viable for cargo handling, were earmarked for redevelopment. First, to incorporate water-based passenger transport, leisure, and recreation facilities and water transport support facilities before non-river related uses that do not require a riverside location. At Erith Rands, which stretches from the Havering Common Sewer to the Mar Dyke, the Strategy wishes to investigate the scope for a sustainable waste management facility at the site of the current Rainham Landfill designed to fit in with the Conservation Park which utilises river transport and existing infrastructure.

Riverside Walk Enhancement Report (2010)

The London Borough of Hammersmith and Fulham published the Riverside Walk Enhancement Report in August 2010. The document promotes the Riverside Walk and states the intention to protect and enhance the amenity of the riverside as the Thames passes through five miles of the Borough.

The overarching goals for the riverside are to achieve a fully connected, high quality Riverside Walk with priority given to pedestrians. This important caveat – pedestrian access – is taken largely from the Thames Estuary Path. The goal was to encourage and promote the use of a high quality Riverside Walk, to enhance its character and to improve biodiversity and the green landscape along the length of this linear open space. Improvements to the riverside should fulfil the following objectives:

- Improve accessibility and connectivity – the Riverside Walk use and value would be enhanced by improving pedestrian permeability both along the path and in the streets and passages that lead to and from it. Connectivity can be enhanced through discreet signage that is consistent and legible;
- Create a sense of place – the use of the river and lands adjacent to the Riverside Walk largely define the local character and sense of place. Infrastructure such as wharves, piers, cranes, draw docks and steps are evidence of the important industrial heritage of the Thames. This infrastructure contributes much to the character of the Riverside Walk and the creation of a sense of place. Proposals for development and regeneration should aim to restore and maintain evidence of heritage elements;
- Improve quality of the environment – furniture, paving, signage and lighting should be high quality, consistent in design, and in keeping with local character;
- Improve safety and security – people on the Riverside Walk should feel safe and secure when using the route. Use can be maximised by ensuring the public are not deterred by poor lighting, uneven surfaces or spaces that can be perceived as unwelcoming;
- Protect and enhance biodiversity – existing mature trees add greatly to the appearance of the Riverside Walk and are much-valued features along many stretches. Additional tree planting and soft landscaping using indigenous species should be encouraged along the route, reflecting and reinforcing the character of the area. Where the Riverside Walk is restricted in width, every effort was encouraged to ensure sympathetic planting and landscape management on the landside of the walk where space allows. Biodiversity along and adjacent to the Riverside Walk was to be improved by various measures (e.g. timber fenders along the river wall will provide micro-habitats for specialist flora and invertebrates). With fewer working wharves along the Thames, there is little commercial

need for a vertical wall, thus there may be opportunities to improve biodiversity using alternative designs for flood defence, which make space for water, create habitats and encourage biodiversity.

Using these objectives, the River Riverside Walk Enhancement Report provides specific case studies where policy has been translated in action. Examples for various reaches within the Hammersmith and Fulham Borough are discussed.

The Mall - At Black Lion Lane to Oil Mill Lane there was potential to strengthen the relationship with the river, through improved landscaping, accessibility and connectivity throughout the park (Mall Open Space). Enhancement works included planting specimen native vegetation to enhance the Riverside Walk for pedestrians and wildlife, and refurbishing hard landscaping and street furniture.

At Upper Mall from Linden House to Furnivall Gardens the Riverside Walk is enclosed by a strong built frontage facing the river on one side and a high in-filled balustrade on the other. This is the oldest stretch of the river wall. Along some of this stretch the balustrade is around 1.5m high, restricting views out across the river. At Furnivall Gardens tree canopies create a sense of shelter and tranquillity. The gardens occupy land that was one of the oldest parts of historic Hammersmith known as Little Wapping. This centred on Hammersmith Creek, into which ran Stamford Brook. All that is visible of this former creek is the outfall to the river, close to the Dove Pier. Recreational and residential boats moored at the western edge of this area provide interest and activity at the water's edge, strengthening links with the river. The report suggests there are opportunities for signage and interpretation to strengthen historic links to the river. Finally, at Lower Mall, just downstream of Hammersmith Bridge, a high shingle bank has allowed trees and plants to establish, adding interest and improving biodiversity. Enhancement works encouraged the improvement plantings here.

Fulham Reach - At Chancellor's Road to Greyhound Wharf plants that have colonised the river wall add interest. Enhancement works included planting additional trees and soft landscaping to improve the Riverside Walk for pedestrians, biodiversity and views along the riverside. At Greyhound Wharf to Fulham Football Club the path reconnects with the river alongside the Crabtree pub, where a draw dock provides access to the river. Here the foreshore widens to form an amenity space (except at high tide) with willow trees growing in the shingle beach. Enhancement works included creating more flexible space with an emphasis on planting for biodiversity at Rowberry Mead.

Hurlingham - The existing river's edge which forms the most southern boundary of the Hurlingham grounds is one of the few natural tidally inundated Thames-side embankment areas in West London. It supports several mature willows and riparian ground flora species, which together with the tidal debris provide shelter for a range of invertebrates. Whilst it is clearly a direct link for the Riverside Walk, hard landscaping could permanently harm the quality of this fragile ecosystem. Enhancement works thus included preventing hard engineering where necessary and investigating opportunities to introduce the water vole to the natural banking.

Sands End - At Broomhouse Lane to Wandsworth Bridge Road enhancement works included reinstating an ecological planting scheme at Broomhouse Drawdock. Terracing could be particularly advantageous. At Wandsworth Bridge Road to Imperial Crescent enhancement works were to

secure improved biodiversity along the river wall as part of any riparian development. And finally, at Imperial Crescent to Lots Road existing mature trees have been retained along the Riverside Walk, add maturity and scale. Enhancement works were to focus on the river wall as an opportunity to encourage the infrastructure to encourage plant species to take root along the creek to invigorate the health of the Creek's flora and fauna. Estuary Edges is clearly an important document in achieving this.

South Fulham Riverside Supplementary Planning Document: Sustainability Appraisal Report (2012)

The London Borough of Hammersmith and Fulham have developed South Fulham Riverside Supplementary Planning Document as a part of its Local Development Framework. In seeking to do so the objectives were to:

- bring underused sites into use for mixed-use development optimising regeneration opportunities;
- identify limitations in the public transportation system and the required strategic transport infrastructure improvements to address these;
- promote high quality urban design and enhance the public realm;
- improve connectivity to the river by completing unfinished sections of the riverside walk;
- increase the use of the river and riverside for leisure, transport and educational uses;
- ensure physical infrastructure such as parks are adequate;
- protect and enhance biodiversity and nature conservation;
- preserve and enhance heritage assets.

The document is consistent with the London Plan. In doing so it incorporates much of the advice from the preceding studies. Examples are discussed below.

Heritage and cultural resources

The Thames foreshore at South Fulham has significant potential to yield archaeological finds and the site of the former Imperial Gas Works also has significant interest on account of its industrial archaeology. Sites positively identified as having significance in terms of archaeological interest were considered to be heritage assets and the document sets out to safeguard and enhance these.

Biodiversity and minimising flood risk

The document has the aim creating a network of interlinked public open spaces that are safe accessible and attractive. Access to the riverside is promoted in all new developments; this is complemented by improvements to be made to the Thames Estuary Path. New open space and waterside restoration, like that on a site off Imperial Road, is expected to enhance biodiversity. Additional tree planting and soft landscaping using indigenous species will be encouraged along the riverside reflecting and reinforcing the character of the area. With fewer working wharves along the River Thames there is little commercial need for a vertical river wall in places. The document, taking advice from preceding studies, namely Estuary Edges, sees this as an opportunity to either enhance the wall's ecological potential or to retreat the line of the river wall and create new space for riparian habitat. There is also regard for supporting SuDS. As the South Fulham Riverside contains flood prone areas such drainage techniques may not always be viable. Nevertheless, when many of the existing hard surfaces within South Fulham Riverside are impermeable, significant improvements in drainage and run-off should be possible. Where SUDS are not possible, increased emphasis is placed on reducing peak run-off rates as much as

possible by utilising techniques such as rainwater attenuation. Green roofs and rainwater capture are encouraged on both residential and commercial buildings where practicable.

Inspiring and Enabling Local Communities: an integrated delivery model for Localism and the Environment (2011)

Within Gloucestershire, the Farming and Wildlife Advisory Group developed an integrated local delivery model. The model utilises and enables those with local skills and environmental land management knowledge to contribute to the management of sensitive and key environmental sites. The Inspiring and Enabling Local Communities report aimed to determine the nature of the delivery model in order to identify the potential for it to be replicated in other areas and by other individuals. The report introduces eight key themes to the integrated local delivery approach:

- looks to work within the lowest appropriate National and European administrative structure (parish or ward, town, county, district, region, country)
- clarifies which statutory and non-statutory partners have an interest in the area so that they can be involved and their strategic aims and objectives identified and delivered within that administrative area
- seeks to deliver a wide range of strategic objectives within the defined area in order to maximise the wider landscape scale potential and effective use of public funds
- seeks to support and value the role and knowledge of the farming community
- promotes the use of facilitation through an independent third party to develop a local management group that acts as the collective discussion forum for the area, with clear lines of communication to those public agencies with legal responsibilities
- incorporates the Parish Council into the communication structure of the local management group to ensure continuity beyond project timescales
- provides a forum for all those within the defined area to take action and offer knowledge and resources to achieve multi objective delivery with an inclusive list of partners
- identifies funding opportunities, particularly through the Rural Development Programme for England, and match funding through joined-up partnership working

The report provides a case study of how integrated local delivery can be implemented. It is hoped that this model can be taken forward and applied to local reaches of the River Thames.

Case Study: Walmore Common- Walmore Common is part of the floodplain of the River Severn in Gloucestershire, part of a network of small catchments that are low lying and close to the main river and drain into it through a series of ditches. The area has multiple designations at international and national level due their geology and ecology. There are two areas of registered common land owned by the Crown and managed through appointed local Trustees while the surrounding area is productive agricultural land. The wider area bordering the Severn has been inhabited for many centuries suggesting that there is archaeological interest, as well established public access. All this meant there were two clear national interests in terms of flood prevention and environmental protection and that consideration towards the impact on historic, recreation and landscape aspects would also have to be taken into account meaning that 'the State' did not speak with a single voice on Walmore. Interviews with stakeholders confirmed that local interests viewed the governance as being fragmented. It was clear that there were two main strands both pursuing their own objectives, with one agency (the Internal Drainage Board) pursuing land drainage while another agency was concerned with land management for biodiversity conservation.

This combination led to a fragmented management of ditches and an overall deterioration of the site to the extent that in recent years the access to some properties flooded increasing the local community voice that something needed to change. It was agreed that there was no shared vision for Walmore. Therefore, in 2008, a series of discussions, open meetings, site walks and other examples of direct communication between the Farming and Wildlife Advisory Group and the local farmers were introduced. This established the full range of assets on the wider Walmore area. Further site visits and subsequent discussions resulted in the development of the Walmore Common Management group. The report concluded that as the Lawton review (2010) had acknowledged –biodiversity adaptation will only become a reality if there is an effective and positive engagement with landowners and land managers, the model outlined in the report should be seriously considered by the appropriate bodies as a means of developing landscape-scale management.

Timeline Documents

In order to summarise and visually display this work, YTT developed an example ‘timeline’ document for two of the 12 principles for action – Biodiversity and Sustainable Commercial Use. These documents along with an explanation as to how to use them can be downloaded from our websites.



YOUR TIDAL THAMES

Tidal Thames Pilot Project

Appendix D

Final Project Report

Appendix D: WFD Thames estuary historic good practice case studies (from a fisheries perspective) provided by Steve Colclough, SC2 Ltd and IFM National Specialist Section - Estuarine & Marine

There is a long history of collaboration and partnership, well integrated with local high quality environmental science, in Thames Estuary management themes, a history beginning well before the advent of WFD. Yet examples from that time, still very relevant today, remain as quite unique examples of good practice under WFD and should be promoted widely as worthwhile models for uptake elsewhere. In three examples described here, organizations such as TEP and Thames 21 have played key roles, building communications, trust and consensus which has in turn led to more sustainable management regimes based upon strong stakeholder engagement. Not only do these examples meet WFD objectives very well, but they are also the kinds of measures that one would expect to see in Marine Conservation Zones. Two of the examples also fit well with the Red Tape Challenge, based on consensus management and a high degree of stakeholder commitment and self-regulation.

Estuaries provide some of the most dynamic and productive yet fragile aquatic environments. They have long been regarded as important sites for fish, both as spawning, nursery and overwintering sites and as migration routes. In contrast to established international positions, the nursery function of estuaries in Europe has only recently received attention. Vital new fish monitoring work conducted by the Environment Agency (EA) as part of a national pioneering project in the development of WFD itself, provided new information on the fish ecology of the Thames estuary. This information has been used actively since 1992 in a variety of ways to promote more sustainable management and development solutions. Today, Cefas recognize the estuary as the largest new bass nursery on the East Coast and one of the largest sole nurseries in England & Wales.

D.1 Fisheries Management in the Inner Estuary

Until 1995, the Port of London Authority (PLA) acted as the sea fisheries committee in the estuary above Southend. Derelict powers and byelaws related to fisheries existing prior to the worst pollution. As recovery began in the 1970's, precursor bodies to the EA began to regulate a commercial eel fishery which by the late 1980's was the third largest such fishery in an estuary in England and Wales. Recreational fishing for both freshwater and marine fish became well established. Inshore trawlers were operating into the estuary to Gravesend and beyond without effective regulation. In 1995, MAFF providing the Kent & Essex SFC with an extended district into the estuary to a new line at Mucking and made Thames Region of the EA the local sea fisheries committee above this point. The division reflected the balance of commercial activity in the estuary.

Given the wealth of data on local juvenile fish, Thames Region began to develop management strategies which later formed the Tidal Thames Fisheries Action Plan, based around promoting the nursery status of the estuary. This incorporated the principle of a "low take zone", balancing a low level of sustainable exploitation against nursery protection. Exploitation would include recreational fishing, hand picking of shellfish, potting, with drift netting operating under net length and location

restrictions. Trawling would not be permitted above Mucking. Part of the rationale was to protect the nursery to promote improved recruitment to fisheries elsewhere.

Early dialogues with commercial fishermen met with strong protest. As dialogue through the neutral forum of TEP developed, fishermen began to understand the quality of the local data and contributed to the database directly. By 2000, an agreement had been reached that trawling would not take place above a new line at Coalhouse Point. The fishermen had become convinced that the inner estuary was very important as a nursery ground and that it was not in their interests to exploit stocks given the consequential damage to nursery stocks. Formal sea fisheries byelaws, including the trawling ban were formally published in 2009. During the interim period all parties stuck to the voluntary agreement, with fishermen demonstrating a high degree of commitment and self-enforcement.

As part of the Marine & Coastal Access Act , 2009 (M & CAA, 2009), sea fisheries powers in the inner estuary up to the GLA boundary at Dartford Creek were transferred to the new Kent & Essex Inshore Fisheries and Conservation Authority (IFCA) in April, 2011. Fisheries in the inner estuary are actively observed by joint surveillance by the IFCA and the EA together with the Thames River Police, PLA, London Port of Health Authority and commercial and recreational fishermen. All of these parties work closely together, sitting on the TEP Fisheries Action Group.

This case study illustrates how “low take zones” could be developed in estuaries, with multiple use conditions applied as locally appropriate. It also demonstrates the value of organisations such as TEP in the establishment of such sites.

D.2 Dredging Liaison Group

Prior to the M & CAA, 2009, as the local regulator of maintenance dredging, there was no requirement for the PLA to consult widely over either its own operational plans or those of whom it regulated. A number of parties approached the PLA through TEP and pressed for a new dialogue in the late 1990's. The DLG became a regular group meeting facilitated through TEP. As trust built up, environmental data and dredging proposals were shared across the group. Today, all dredging proposals are discussed through the DLG. Spatial and temporal environmental sensitivities such as local fish spawning and nursery use, are fully reflected in management options, wherever possible. A more sustainable maintenance dredging regime has been developed over the past decade, built entirely upon consensus management and a high degree of stakeholder engagement. In UK terms, the DLG remains as a unique example of good practice and the process has been formally recognized within the EA as a worthwhile example of WFD good practice. The process also gels with MCZ objectives and the Red Tape Challenge. The marine licensing arrangements brought in by M & CAA, 2009 will change regulation of maintenance dredging, but the DLG remains as a class leading example for others to follow.

D.3 Encroachment Policy

We have long lived and worked close to our rivers and estuaries, the legacy of which can be seen in central London today, where the river at Tower Bridge is only ¼ of its width in Roman times. A

steady process of building out onto the foreshore, called encroachment, has been going on as long as man has been here. By the mid 1990's the EA had developed a planning policy to resist further encroachment unless it was for a genuine river related purpose, based on concerns including ecology and flood risk management. The foreshore provides vital feeding grounds for birds as well as specialized feeding and refuge habitats for invertebrates and fish. Active promotion of the policy to developers, local authorities and the general public through environmental education initiatives, often facilitated or supported through TEP and Thames 21, has led to a robust and more sustainable position.

Maintaining ecological functioning of an estuary is part of good ecological status under WFD. Even in HMWB's such as the Thames, the "no deterioration" clause inherent in the directive means we should protect the current functionality, given the socio-economic constraints that apply.

One of the prime functions of estuaries for fish life is to act as migration corridors. Many would recognize the traditional migratory species such as salmon or eels. What is much less known is that millions of young fish in their first year of life have to migrate in and out of estuaries in order to complete their life cycles. These fish are too small to swim strongly, but they do understand the tidal cycle very well! They simply float up in the water column as the tide begins to flood, surf along for 13km (the Thames tidal excursion) or so, and then hug the bottom or margins on the ebb, waiting for the next flood. This behaviour, known as Selective Tidal Stream Transport, has received little scientific attention globally, but has been well studied on the Thames. What these fish need is a continuous foreshore as conveyor belt. That belt takes them right through the heart of the city in the summer months. 8mm long flounder post-larvae take only 4/5 days to get from a spawning site in the outer estuary up to Teddington from May. 12mm bass fry arrive in multiple waves from different spawning sites in the southern North Sea from June onwards and go at least as far as Richmond.

The banks of the Thames will always be under pressure from development. The aggregate impacts of even small encroachments continue to make these vast migrations more difficult. Eventually they may become impossible. Maintaining the existing continuity is part of GEP in a HMWB such as the Thames. A new and exciting science base is now emerging from a development project on the Thames which should permit some evolution of the current Encroachment Policy to fully take on board that issue of continuity.

We are now beginning to evaluate the goods and services that ecosystems provide for society, in economic terms. That process will be a vital element in future moves to balance all those issues operating in HMWBs such as the Thames. One valuation that has yet to be attempted is the socio-economic value to the UK of estuarine nursery grounds. Given the background described above, this must be very substantial, particularly in the case of the Thames estuary. This factor should be recognized in its own right as we try to strike the right GEP balance.