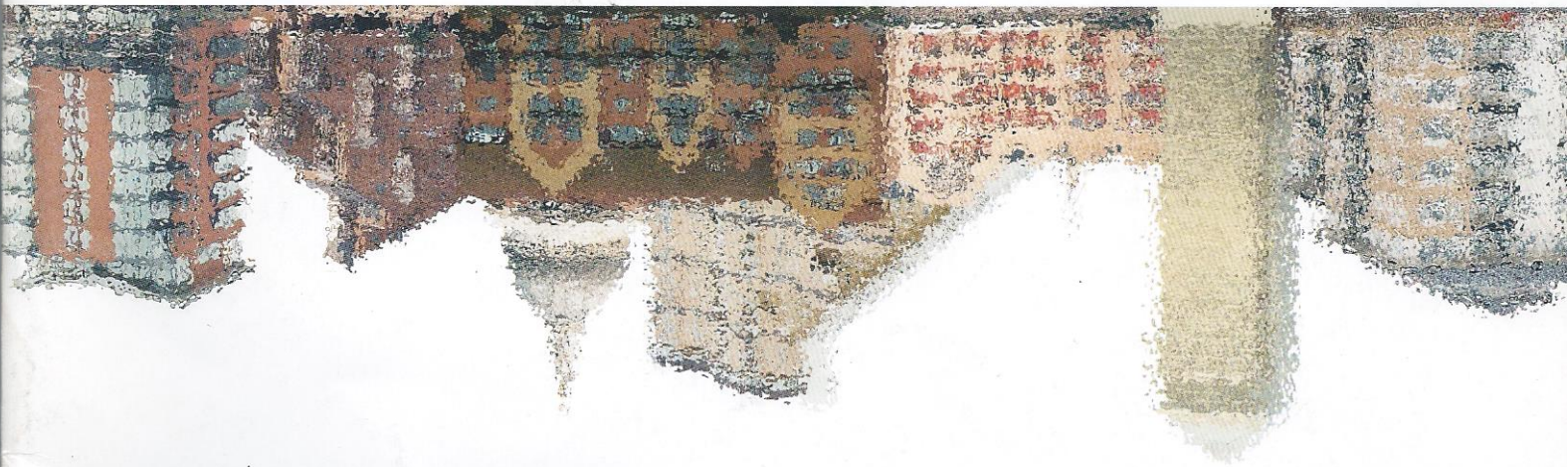


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Riverbank design guidance
for the Tidal Thames



Partnership in Planning



ENVIRONMENT
AGENCY

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The Millennium site

The River Thames

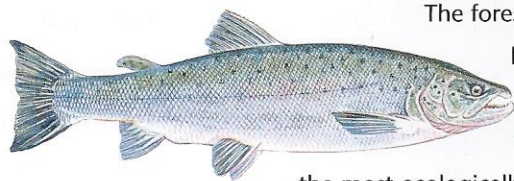
can justly be described as London's greatest natural asset. Not only as a site of great historical interest, but also as an amenity and recreational resource, and a valuable focus for riverside development. It is only in the last forty years, however, that we have really begun to appreciate the value of the river, in both ecological and financial terms. Before this, loss of habitat due to encroaching buildings and growing pollution had reduced the ecology of the river to a very low ebb. In 1957, a report to the Natural History Museum stated that "there were no resident fish populations between Kew and Gravesend".

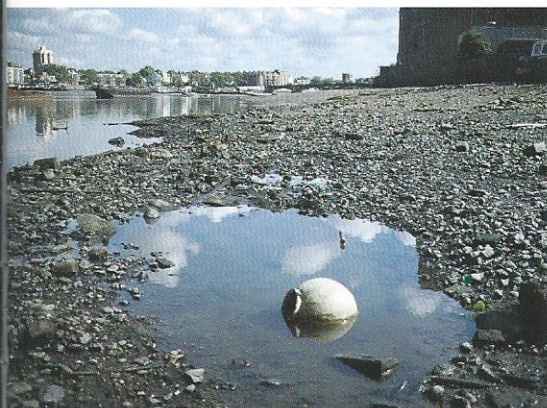
The Thames comes back to life

The dramatic recovery of the tidal Thames is a remarkable success story which began in the late 1950's with investment in sewage treatment. Continuing improvements in water quality together with the intrinsically rich diversity and continuity of habitat has meant that the Thames now supports one of the widest variety of animals of any estuary in Europe. More than 350 invertebrate species have now been recorded and a total of 115 different species of fish, including salmon, bass and smelt.

In fact, the river now supports important recreational and commercial fisheries, such as one of the largest estuarine commercial eel fisheries in the UK. It is gaining recognition as one of the most important nursery areas for young marine fish in the Southern North Sea. Indeed, it is the premier nursery ground for Dover Sole in the UK.

The foreshore (the area between Low and High Water Mark) represents the most ecologically important area, somewhere for algae to grow, a home for invertebrates, feeding grounds for birds and spawning areas for fish.





Cormorants, herring gulls and black-backed gulls are now a common sight along the tidal Thames, while oystercatchers and teals can be seen in certain locations at low tide.

Despite this apparent resilience, the river environment remains a fragile one. Encroachment of riverside development onto the foreshore still threatens life in the river through loss of habitat and changes in patterns of tidal flow. Historically, the cumulative effect has been significant, and continuation could jeopardise entire species if preferred spawning areas are affected and the migration of birds, fish, invertebrates and plants are prevented. Many modern building techniques and materials incorporate only sheer surfaces which provide minimum habitat and no refuge from the tidal flow.

The Thames foreshore is also London's most extensive archaeological site. It provides the means to trace the development of the river and its hinterland from the time of the very earliest settlement. These remains are fragile and are being constantly degraded by the

daily ebb and flow of the tides. The Agency looks for adequate measures to be taken to ensure the survival of this unique and irreplaceable archaeological resource.

The role of the Environment Agency

The Environment Agency is not trying to stand in the way of riverside development. We want to work in partnership with



developers, to promote a better understanding of the hydraulic, ecological and social issues, whilst still arriving at economic solutions. Within many riverside developments lie real opportunities for habitat protection and enhancement, including beach replenishment, reed fringes and new access to the foreshore. In fact, many developers have found that giving environmental consideration to planning can actually increase the financial value of a whole development site.

We are actively seeking opportunities to increase awareness of the value of the riverside amongst developers and local planning authorities, and as a statutory consultee in the planning process, we will seek every opportunity to further conservation and

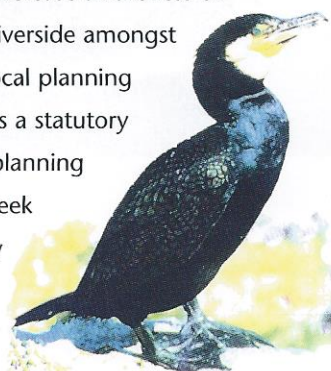
enhancement of the foreshore. In addition to any planning and building consents, permission is also needed (land drainage consent) from the Agency for any kind of structural work on or near the banks/flood defences of the River Thames.

Our formal policy towards

encroachment is set out below and aims to promote closer working relationships with developers wherever new riverside

developments are proposed. Early consultation with us will always be of benefit in seeking approval for planning applications and land drainage consents.

'Encroachment on the Tidal foreshore should not reduce the storage volume of the river; lead to a loss of foreshore habitat; interrupt the flow of the river or alter the velocity of water flow; reduce public access to the riverside or the foreshore; release pollutants from contaminated land into the river; impair the integrity or stability of the Tidal defences.'

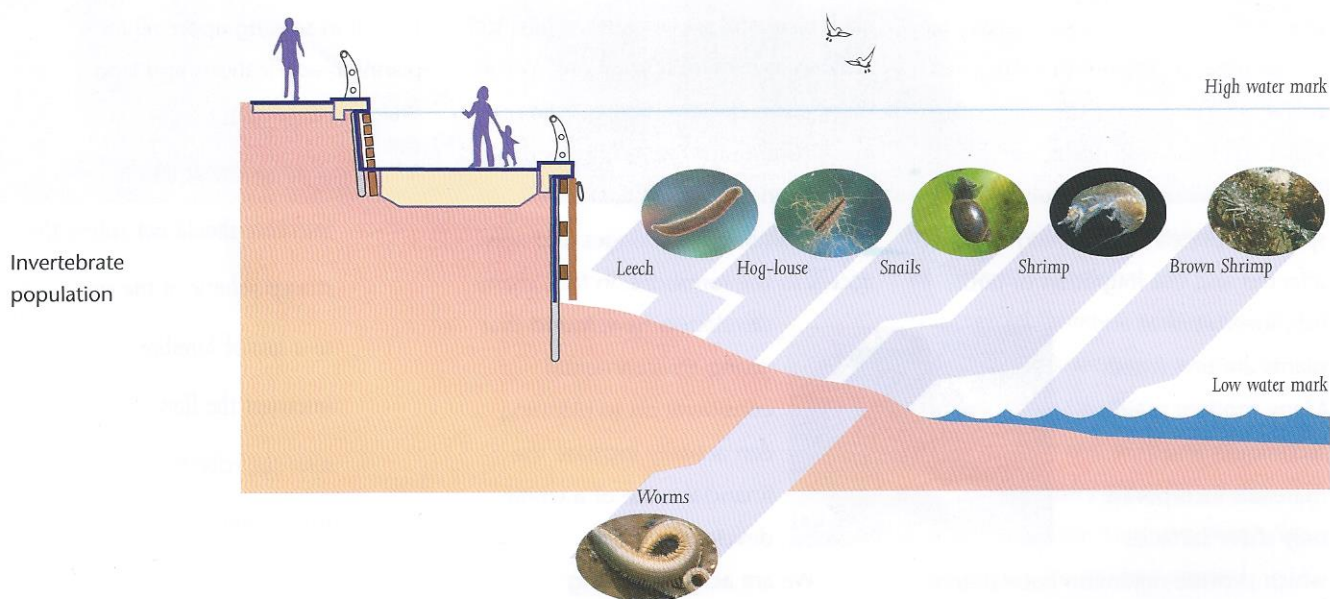


Ecology of the Tidal Thames

The Tidal Thames is now recognised internationally as one of the cleanest metropolitan estuaries in the world and a leading example of a successful clean up campaign. It provides a kind of “wildlife superhighway” through the heart of London, where the range of salinity, temperature, tidal flow and sediment type supports a wide variety of habitat conditions. The tidal foreshore is the most important as well as the most vulnerable habitat, and is essential to allow fish, birds and invertebrates to move up and downstream in fulfilment of their life cycles.

Invertebrates

Invertebrates (such as worms, shrimps, snails etc.) are an important food source for the diverse fish populations of the Thames. The recent improvements in water quality have resulted in an increase in marine fish species utilising the estuary as a nursery area. It is essential to maintain a continuous invertebrate community along the length of the tidal Thames to allow both localised and extensive migrations of the various invertebrate and fish species. If this is not maintained, reductions in the estuaries/fresh water fauna may result elsewhere in the river.



Birds

The fish, invertebrates and algae in the water and on the foreshore provide rich feeding grounds for birds. Over 10,000 waterfowl overwinter on the Thames, and four species (Cormorant, Gadwall, Teal and Lesser Black Backed Gull) are of nationally important levels of abundance. Shelduck, Lapwing, Ringed Plover, Dunlin, Redshank and Common Gull are also seen, their numbers being of regional importance.



Lapwing



Grey Heron



Herring Gull



Cormorant

Fish

The Thames estuary is the UK's premier nursery for Dover Sole and one of the Southern North Sea's most important nursery areas for a range of marine fish. Large scale migrations of the early life stages of several fish species migrate upstream during the spring and summer months. Most fish species in the Thames feed on the foreshore area, so retaining this valuable resource is vital for their continuing abundance.



Bream



Roach bream hybrid



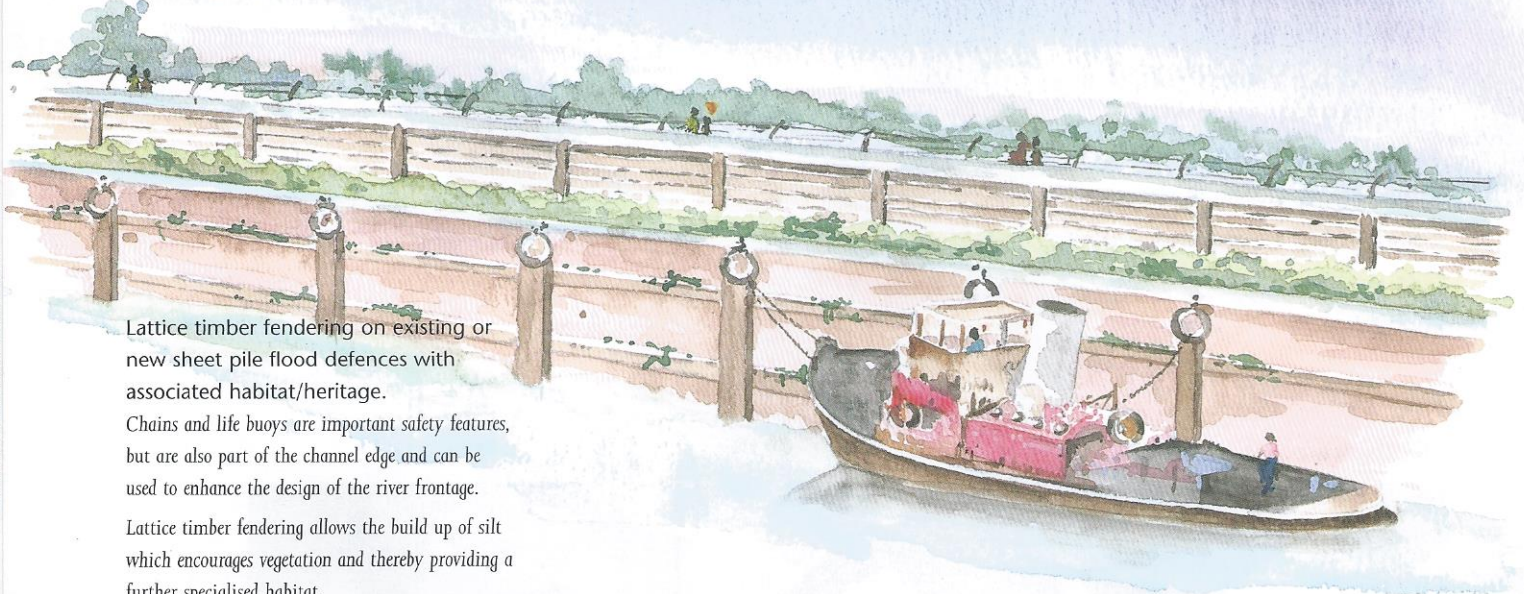
Smelt



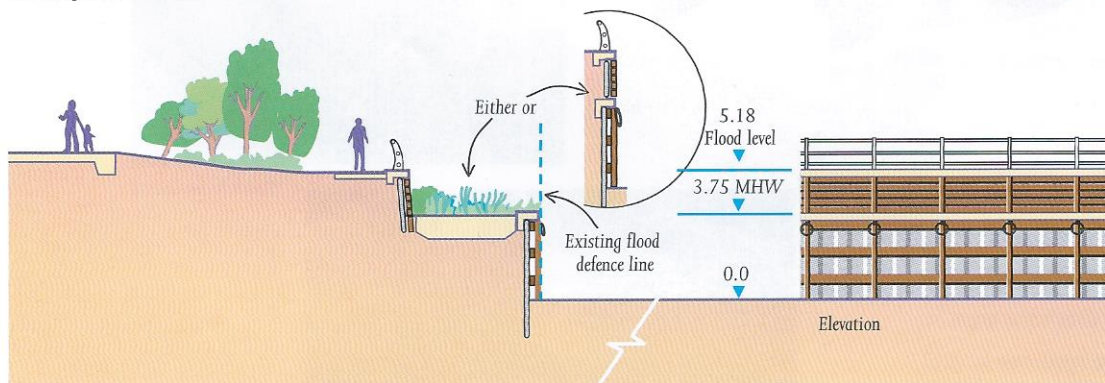
Carp

Riverbank design guidance

This brochure outlines a variety of riverside design options which will support the local ecology, landscape and recreation as well as providing effective flood defence. The designs shown can all be adapted to suit individual sites, and other alternatives can be provided through discussion with us. The Millennium Site illustrates how some of these designs could be implemented. We would also welcome your own suggestions and ideas for ecologically sound riverside design.



Lattice timber fendering on existing or new sheet pile flood defences with associated habitat/heritage. Chains and life buoys are important safety features, but are also part of the channel edge and can be used to enhance the design of the river frontage. Lattice timber fendering allows the build up of silt which encourages vegetation and thereby providing a further specialised habitat.



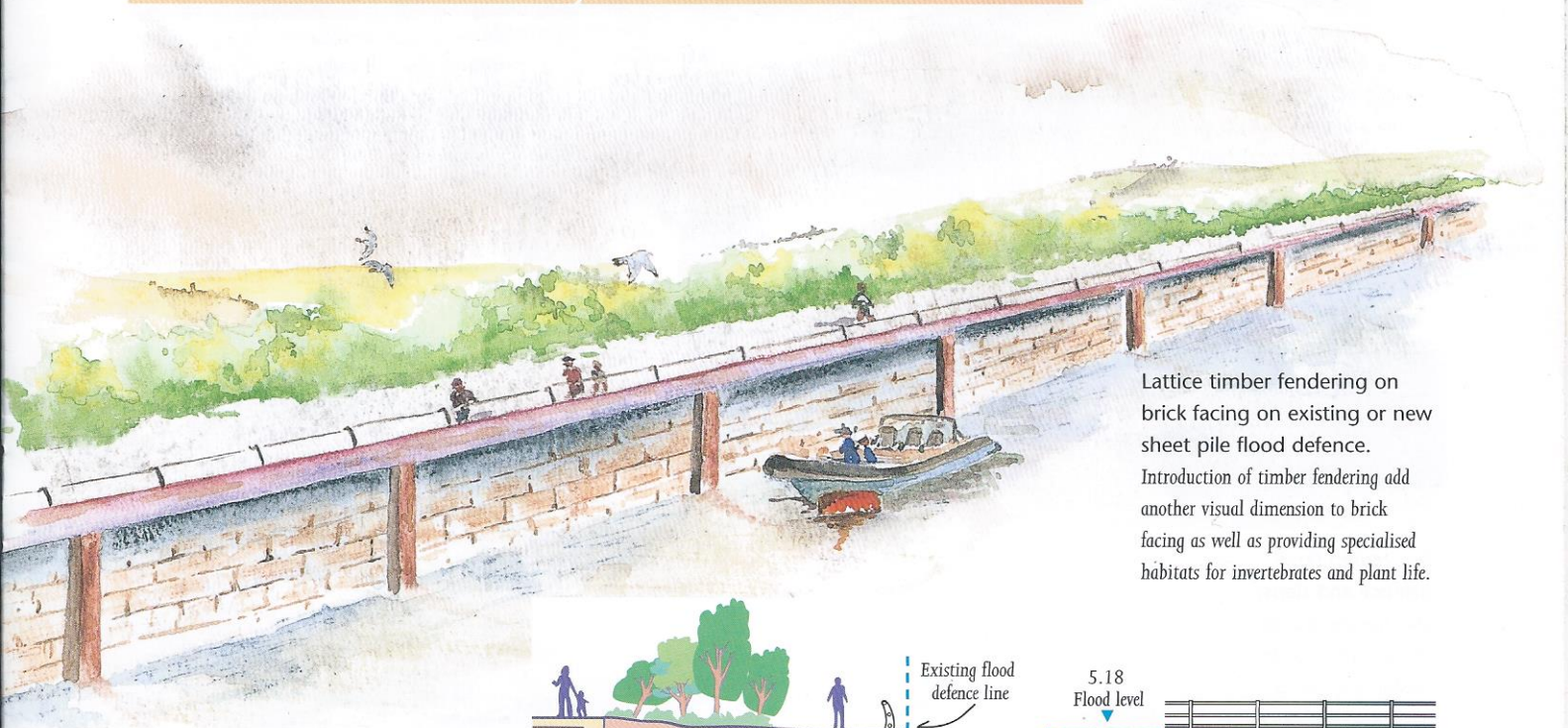
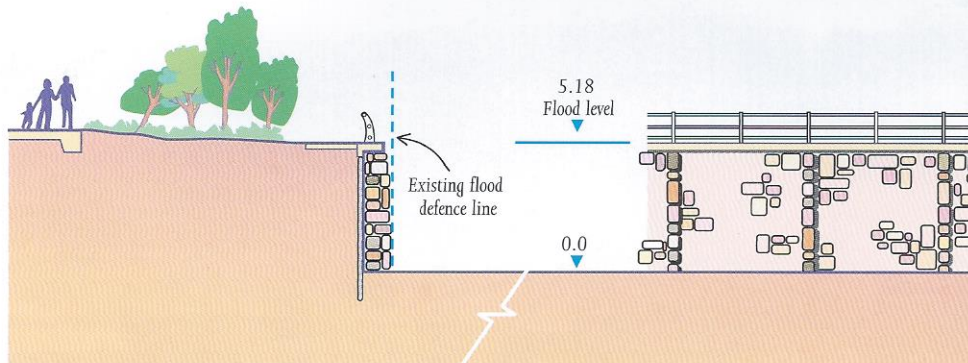
The Environment Agency believes that it is possible to have profitable development and retain the high quality ecological resource we now

have in the River Thames. By forming partnerships in planning, we can arrive at solutions to developments which generate environmental enhancement as well as commercial advantage.



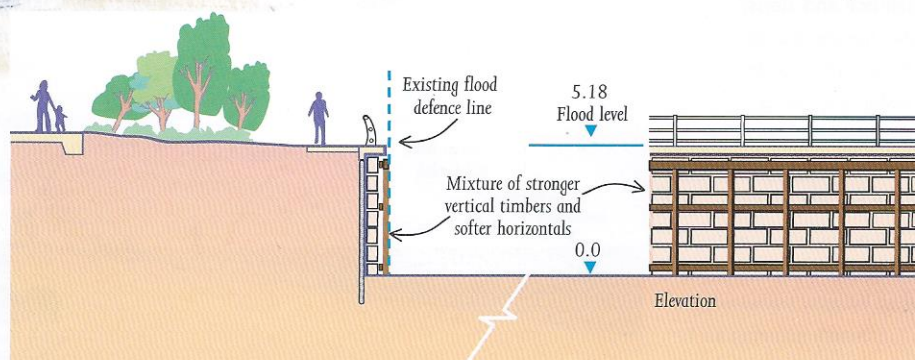
Brick facing on existing or new sheet pile flood defence.

The crevasses on the brick/rock facing provide important cryptic habitats for invertebrates and algae.

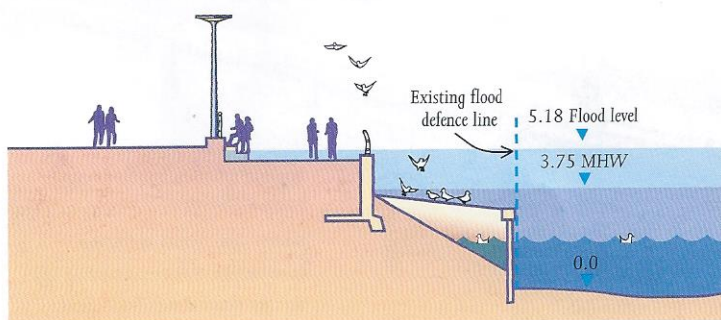
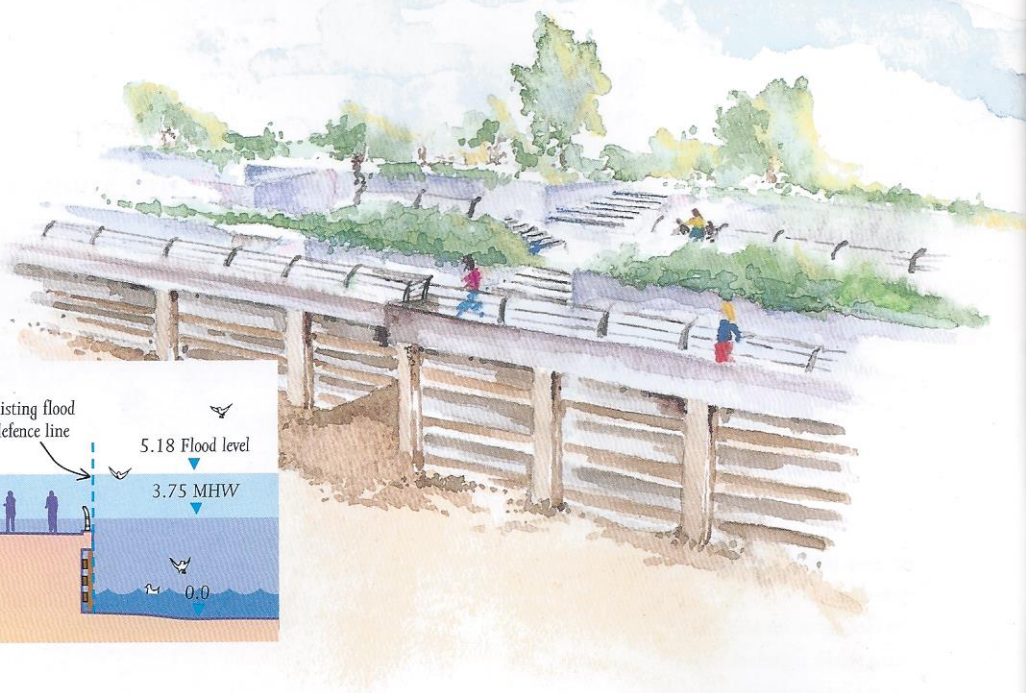
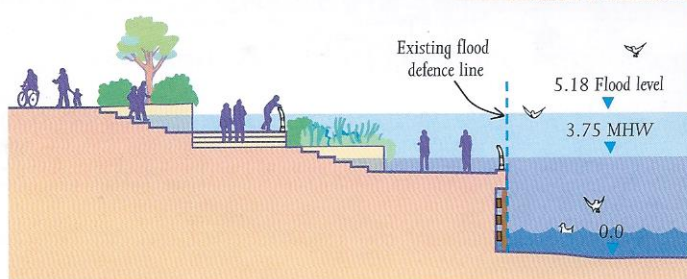


Lattice timber fendering on brick facing on existing or new sheet pile flood defence.

Introduction of timber fendering add another visual dimension to brick facing as well as providing specialised habitats for invertebrates and plant life.



Part retired flood defence terrace and steps – hard treatment. Introduction of steps and pathways and the use of planting provide spatial definition, enclosure and interest along the river frontage.

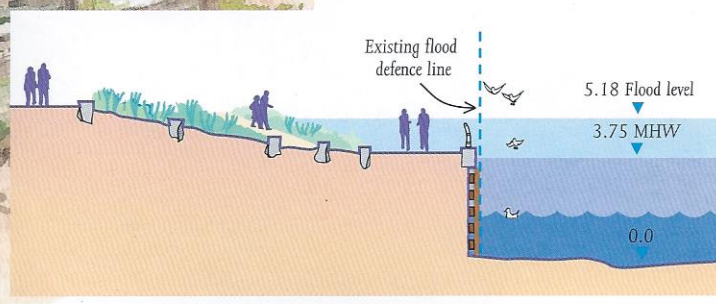


Part retired flood defence and steps. Most fish species in the Thames, feed across the foreshore area and their continuing abundance will be enhanced by the introduction of new foreshore areas.

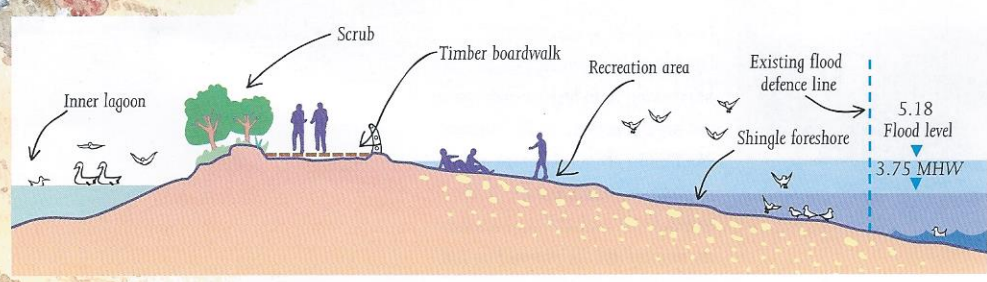
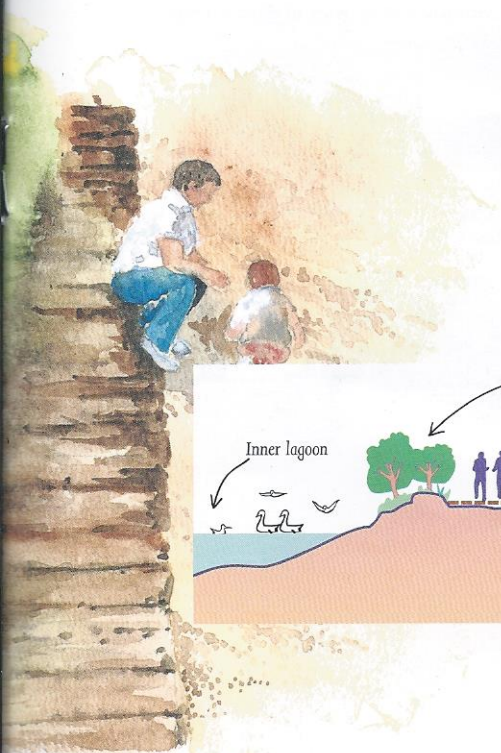
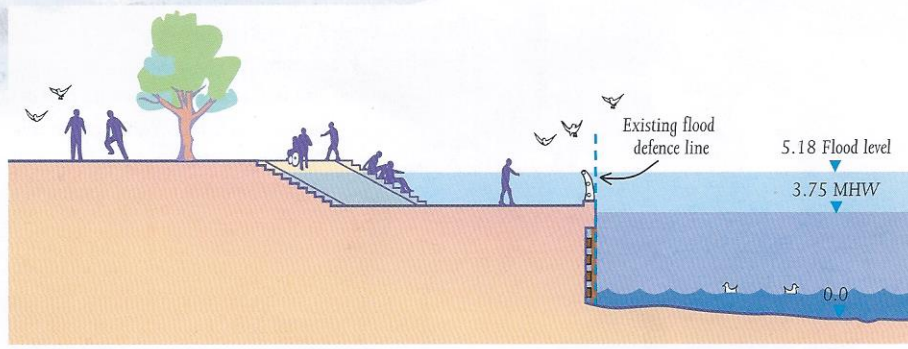




Part retired flood defence terrace and steps – soft treatment. The floodable terracing provides good open frontage to the river alongside specialised riverside planting.



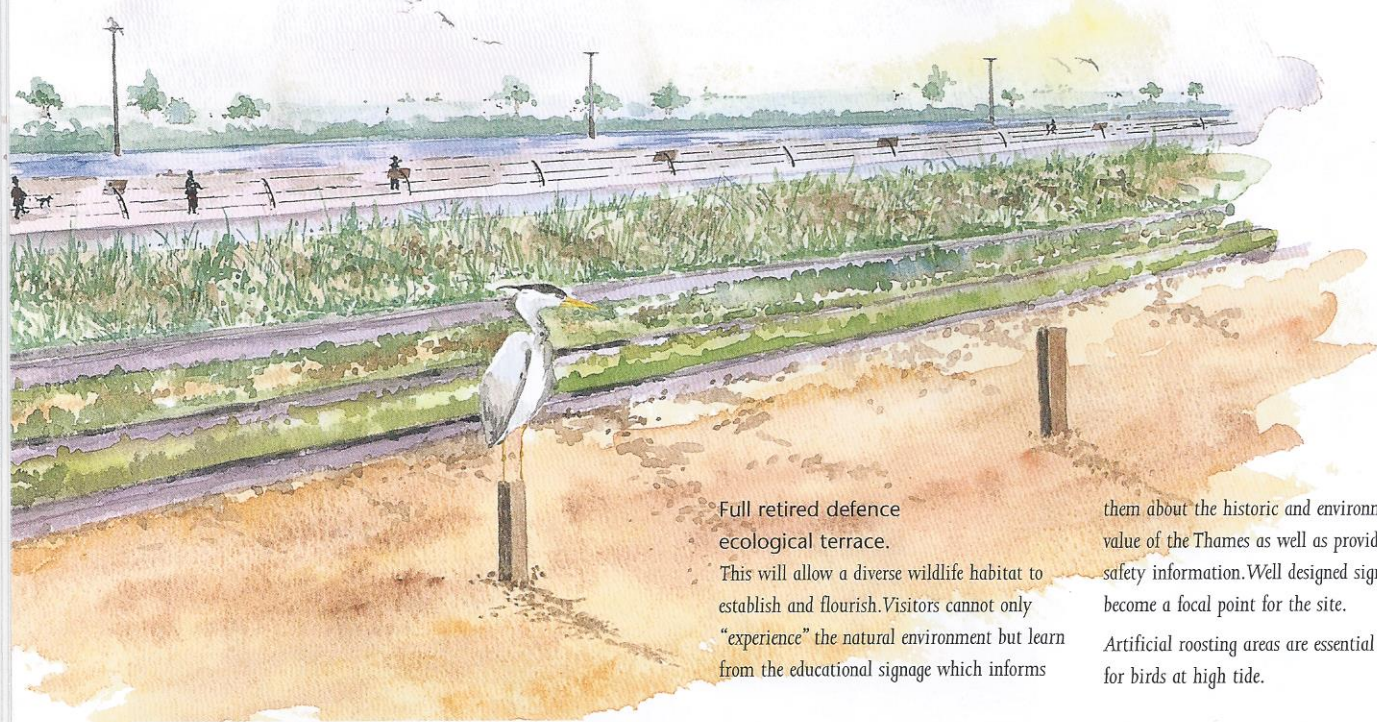
Part retired flood defence terrace and steps – hard/soft treatment. The floodable terracing will provide for specialised plant life to establish alongside a varied recreational area.



Landscape feature – lagoon set back from flood defence. Introducing a semi-naturalised lagoon on the landward side will provide a unique habitat to supplement and safeguard species of the main river channel.

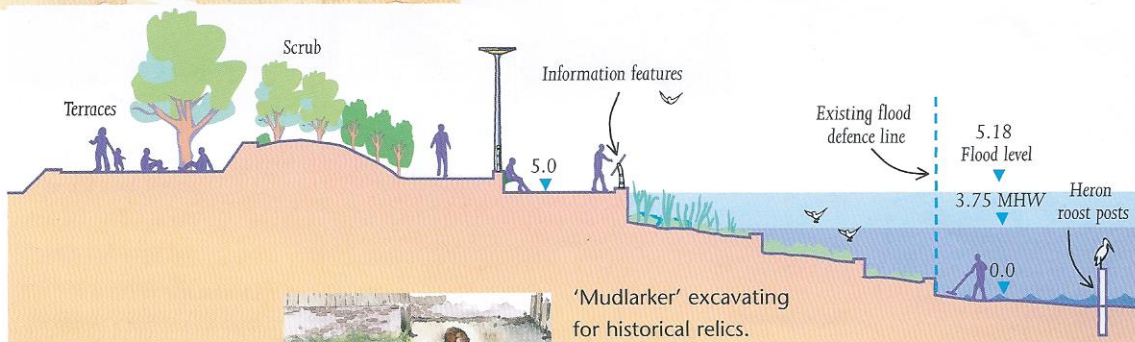


Part retired flood defence terrace and steps – hard/soft treatment



Full retired defence ecological terrace.
This will allow a diverse wildlife habitat to establish and flourish. Visitors cannot only “experience” the natural environment but learn from the educational signage which informs

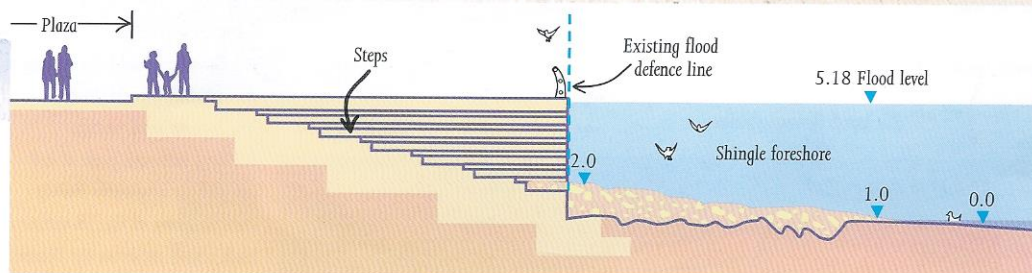
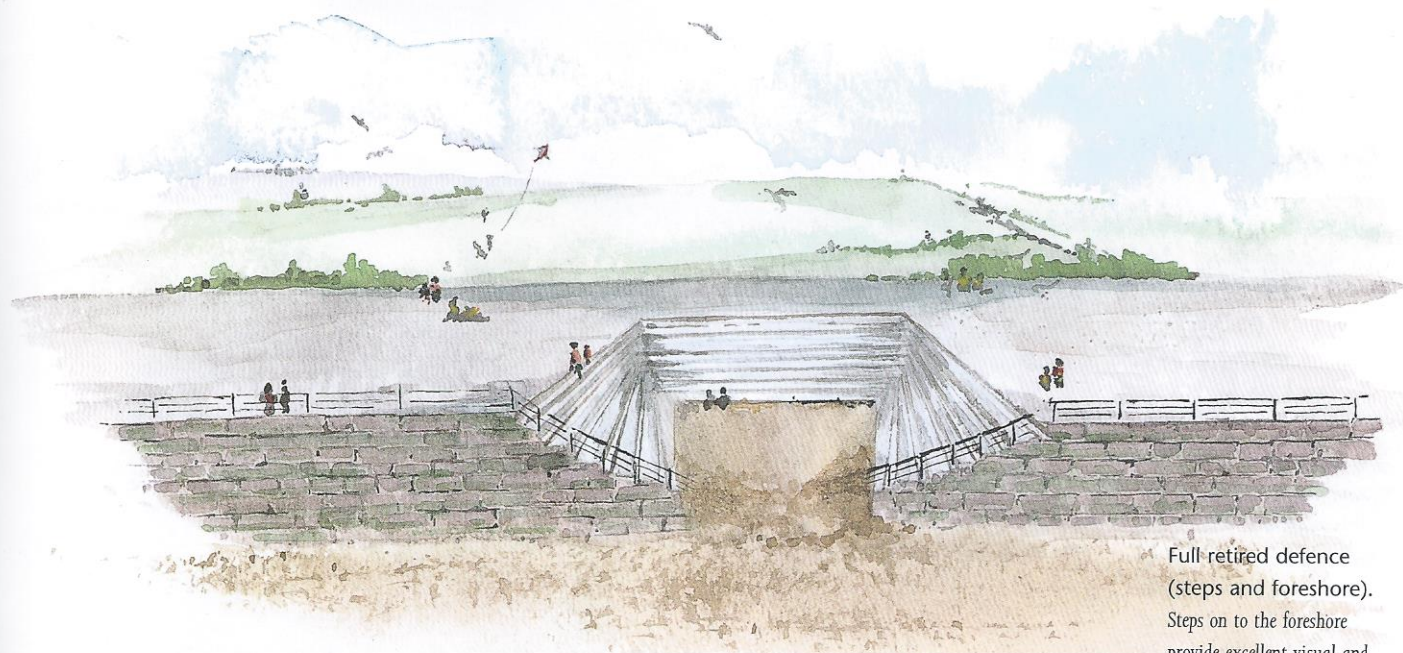
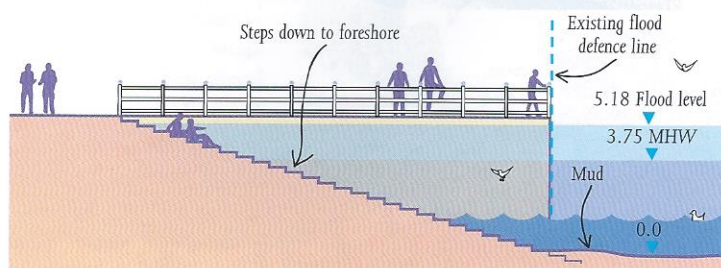
them about the historic and environmental value of the Thames as well as providing safety information. Well designed signage can become a focal point for the site.
Artificial roosting areas are essential refuge for birds at high tide.



‘Mudlarker’ excavating for historical relics.
Mudlarking is an historic and now an ever popular activity on the foreshore. The Thames shore is London’s most extensive archaeological site. It is essential that archaeological artefacts are recorded and/or preserved on site.

Full retired defence with formal steps.

Recreational fishing is a common pastime on the Thames. The river now supports important recreational and commercial fisheries. Salmon, Bass, Flounder, Dover Sole are just a few of the 115 species of fish found in the Thames.

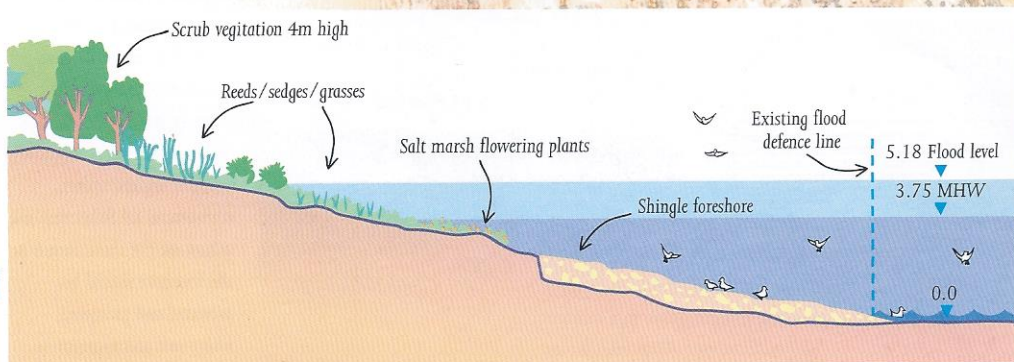
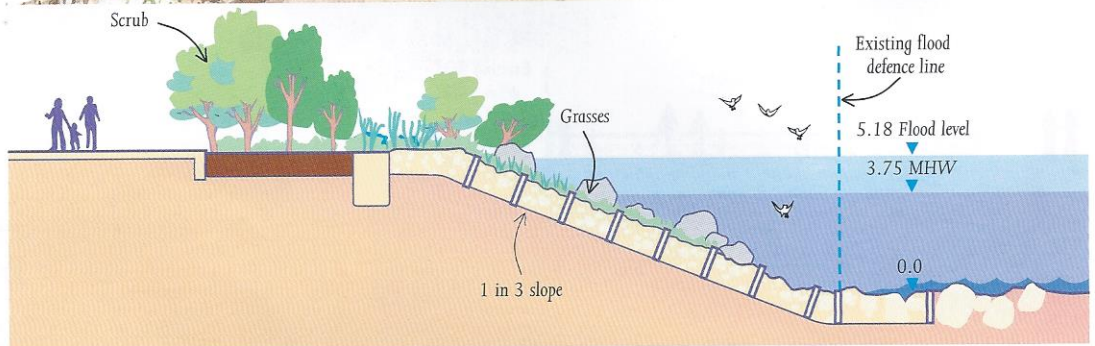


Full retired defence (steps and foreshore). Steps on to the foreshore provide excellent visual and physical access to the river whilst also promoting amenity and recreation. Today, increasing numbers of walkers, anglers, sailors, commercial eel fishermen and others use the shore. Access to the foreshore should be protected and promoted, where safe and appropriate.



Full retired defence (sloping revetted bank).

A semi naturalised bank where any marginal vegetation provides important cover for birds, invertebrates and fish.

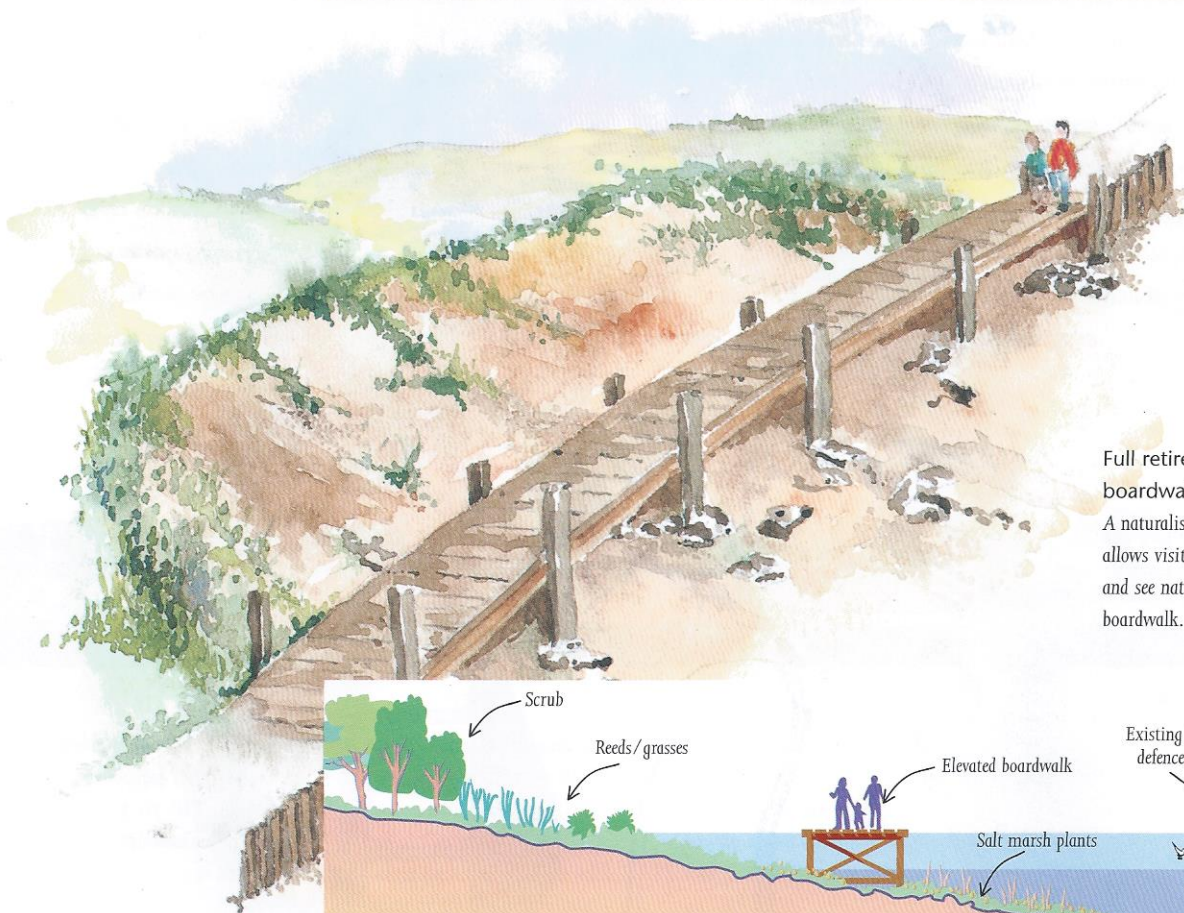
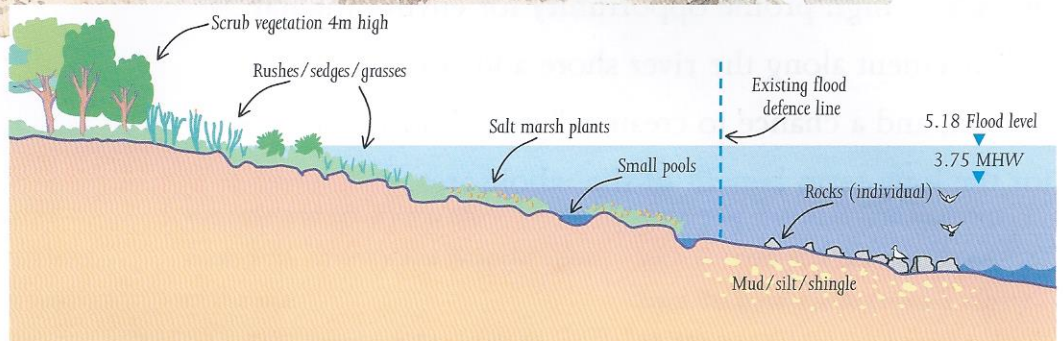


Full retired defence (sloping bank).

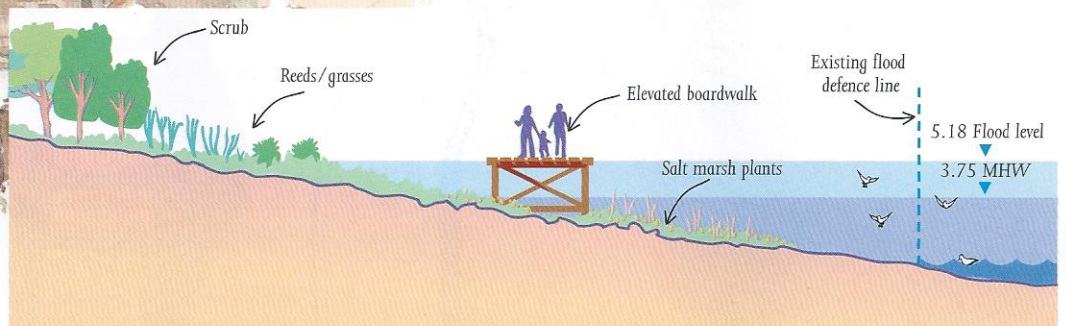
A fully naturalised bank adding to the "wildlife superhighway". The exposed mud, shingle foreshore and rock pools at low tide provide a valuable feeding area for many of the 38 species of birds which reside on the Thames for all or part of the year.



Full retired defence fully naturalised tidal lagoon. A tidal lagoon or "an estuary in miniature" will provide safe and quiet feeding ground for species and support a diversity of plants. Rock pools provide a specialised habitat for fish fry and invertebrates as well as being a feeding ground for birds.

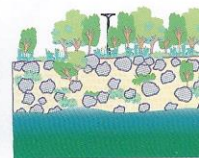


Full retired defence boardwalk and tidal lagoon. A naturalised tidal lagoon that allows visitors to "travel through and see nature at work" via a boardwalk.



The millennium site

The Millennium Exhibition will be the flagship event for Britain's celebration of the new century, and will take place on one of the largest sites fronting the Thames yet to be redeveloped. The site covers some 300 acres on East Greenwich Peninsula (between Canary Wharf and the Thames Barrier) where one of the largest gas works in Europe has now been demolished. The Exhibition is seen as a major international event which will also act as a catalyst to local redevelopment. It also provides a high profile opportunity for environmental enhancement along the river shore and adjacent fringe of land, and a chance to create a "green" infrastructure for the long term benefit of the whole area.



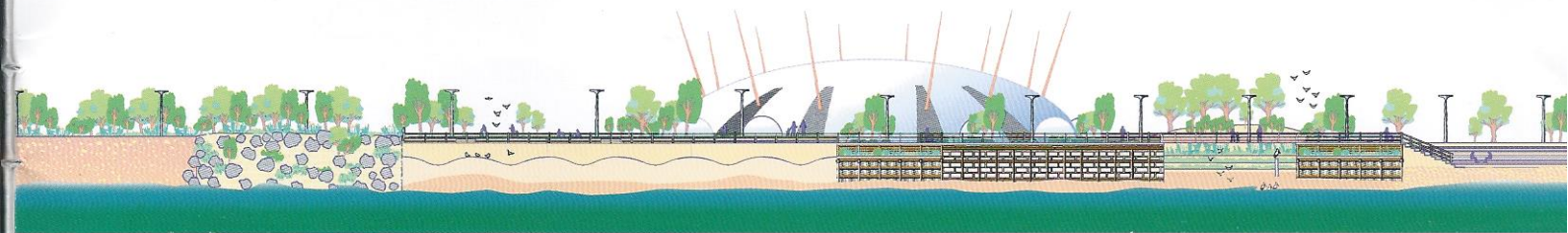


Outline plans include a domed exhibition building, river bus jetty, underground station and a walkway along the river frontage. The Environment Agency will be encouraging the use of ecologically suitable construction designs, materials and techniques. This will help to create the right conditions for colonisation by natural flora and fauna, allowing continuity of the valuable wildlife corridor provided by

the river and enhancing the ecological, amenity and financial value of the site.

The Greenwich Peninsula is already one of the best locations for bird life along the tidal Thames. However, the present flood defences are either old and crumbling, or constructed of modern steel sheet piling which provides no habitat. Around half of the current flood defences will be replaced using

Agency-approved design solutions such as ecological terraces. These have the potential to create a variety of different habitats and can be planted with naturally-occurring flora to create an immediately aesthetic river frontage. Terracing can often be one of the most cost-effective flood defence solutions, especially on a large site where loss of construction land will be small in relation to the total site area.



15

12

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11

Examples of how best practice riverbank designs could look on the Millennium site. (It should be noted that this does not reflect the actual riverbank design on the Millennium site, but shows how our best practice riverbank design options could be designed on a key riverside site in London).

1. Lattice timber fendering on existing or new sheet pile flood defences with associated habitat/heritage
3. Lattice timber fendering on brick facing on existing or new sheet pile flood defence
5. Part retired flood defence and steps
9. Full retired defence ecological
11. Full retired defence (steps and foreshore)
12. Full retired defence (sloping revetted bank)
15. Full retired defence boardwalk and tidal lagoon

It is anticipated that there will be over 10 million visits to the Millennium Exhibition. The impact of large numbers of visitors on the native bird life could be carefully managed by constructing screens along certain areas of the foreshore. Peepholes and hides could allow observation without disturbing the natural fauna. A riverside walk with educational signs could add to public interest and awareness of the ecology of the river.

The Millennium Site creates an ideal opportunity to illustrate how partnership in planning can help to make provision for riverside conservation, and how this can enhance the ecological, amenity and financial value of a site. The Environment Agency hopes that the Millennium development and the co-operation it has created at all levels will become a role model for all future schemes, as we look ahead into the next century.





Other useful Environment Agency
publications include:

Fish Found in the Tidal Thames

Invertebrate Animals of the Tidal Thames

The Tidal Foreshore

The Riverside Owners Guide

The Thames Barrier – Protecting People and Property



MANAGEMENT AND CONTACTS:

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

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

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

ENVIRONMENT AGENCY GENERAL ENQUIRY LINE

0645 333 111

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

ENVIRONMENT AGENCY EMERGENCY HOTLINE

0800 80 70 60



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