



*Do you see **red**?*



*Do you see **red**?*



*Do you see **red**?*

Creating a
GREENPRINT
for London

An invitation to work with the
Environment Agency towards
a first-class environment for a
world-class city

ENVIRONMENT AGENCY



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Foreword

London is a world-class city: a world financial centre, a world cultural centre, and a world heritage centre. But its world-class status – its size, industry and wealth – is damaging the environment upon which it depends.

By working together, we can make our nation's capital one of which we can be truly proud. That means re-connecting Londoners with the city around them, acknowledging and minimising the affects our lifestyles have on the environment, and lobbying those whose decisions affect the quality of our lives.

Our vision is to create this greenprint for London in order to achieve a first-class environment for a world-class city. It's a vision for the future, and one that, in partnership, we can all achieve.

This document invites you to help achieve this vision. In it we have set out the challenges facing the nation's capital, knowing that we can only meet them by working in partnership with organisations that have a role in planning London's future.

London's environment is everyone's concern, and is a valuable part of London's sustainable development jigsaw puzzle. Without this vital piece of the puzzle, London will never achieve a sustainable framework for integrating it's economic status with a better quality of life for its people.

The Environment Agency wants to work with the Greater London Authority, London boroughs and key organisations to secure London's environment future. We believe that the Agency can provide a unique overview of all aspects affecting London's environment and is well placed to provide specialist, professional advice and research to inform policy and assist strategy development.

Working together for the benefit of the capital city is the only way to ensure true sustainability for the people who work, live and visit in London, as well as those who rely on it from afar.



Chris Birks
Regional General Manager
Environment Agency,
Thames Region

Introduction:

The United Kingdom is undergoing a period of profound constitutional change. Scotland now has its own Parliament for the first time since the Act of Union. Wales and Northern Ireland also have their own Assemblies. Eight new Regional Development Agencies will continue the trend of decentralising power away from Westminster.

Early in 2000, Londoners will directly elect their Mayor for the first time. They will also elect representatives to a new Assembly. Together, the Mayor and Assembly will form the Greater London Authority (GLA) with wide-ranging powers across the capital affecting the health of Londoners, development, transport, policing and the environment.

Growth and development are natural objectives of any administration and London must take full advantage of its new form of city government in economic, social and environmental terms. But, increasingly, people are valuing the environment and a healthy society as much as economic growth. Indeed, without taking care of its environment, London will find it difficult to maintain its status as a world city.





The Environment Agency is well placed to help the Mayor and GLA secure fundamental and lasting improvements for Londoners.

We have always believed sustainable development to be as much about the environment and society as it is about economics. The GLA's task is not to find a balance between rival

claims, but to integrate the needs of all three. This will be difficult, so London's new government needs an integrated approach to policy making.

The Agency can help this process. We want to work in partnership with others to ensure a sustainable London for present and future generations.

We want to create a Greenprint for London that will achieve the following goals:



- **Improve London's air quality;**

To achieve the Government's recommended air quality standards at all times.

- **Manage the water resources that supply London's needs;**

To ensure that the water supply needs of new developments are met by reducing leakage and managing demand.

- **Reduce, recover and recycle London's waste;**

To find a sustainable alternative to London's waste problem and to educate Londoners to reduce, reuse and recycle their waste.

- **Continue to improve the water quality in London's rivers;**

To achieve the water quality standards which have been identified in Local Environment Agency Plans (LEAPs).

- **Protect London from flooding;**

To maintain and where necessary improve the level of protection given to London against flooding from the tide or from rainfall.

- **Safely remediate contaminated land;**

To achieve the Government's target of 60 per cent of new development in brownfield sites.

- **Protect property from rising groundwater;**

To achieve the GARDIT strategy aim of increasing the amount of groundwater taken from beneath London by up to 70,000 cubic meters per day.

- **Protect and improve London's wildlife habitats and biodiversity;**

To achieve the targets for the National Biodiversity Action Plan in London and, to improve river corridors through river restoration schemes and deculverting.

- **Promote sustainable riverside development;**

To achieve best practice in riverside development through the planning process and by resisting encroachment.

- **Creating open spaces;**

To ensure that every person in London is no more than 10 minutes away from a green open space.



This list is not definitive. It aims to open the dialogue and define the crucial environmental issues for London, which will be responded to over the coming months and years.

The Environment Agency will report, year-on-year, on its commitments for London. However, we cannot achieve them in isolation. Everyone has an interest in an improved environment, so everyone has a role to play in achieving it. We want to work with the GLA, the Mayor, London's boroughs and industry, to ensure that economic growth and development stimulates urban regeneration, creating a better environment and healthier lives for Londoners. We want a high quality local environment that also strengthens the city's role in the national and global economy.

London's environmental future is the responsibility of all who live and work in London. It is also yours. We can help Londoners value their environment and its importance. We can help them reduce the waste and pollution they produce. We can help them understand how they affect the world around them. We can achieve more by working in partnership.

We hope that London's
new government will help us
meet our ten goals for the capital
by encouraging commitment to
a first-class environment
for a world-class city.



London – a world city

London is a world city. Its historical, cultural and economic influence is of global proportions. However, a London Planning Advisory Committee (LPAC) study in the early 1990s found London facing ever-increasing competition from European neighbours including Frankfurt and Paris, and from other major cities such as New York, Tokyo and Hong Kong. London's challenge is to respond to this competition and remain a pre-eminent world city.

LPAC's study concluded that world city status can only be guaranteed if the right balance is found between the generation of wealth, jobs and income, and a high quality of life, work and leisure for its residents. The state of London's



environment was identified as essential to world city status. After all, imagine living in a London where the Thames was polluted, air was unbreathable and where wildlife could not survive.

The Thames – London's artery

London's most visible natural asset is the Thames. At 100 kilometres long, the tidal Thames is a wildlife superhighway with diverse habitats including shingle, mudflats and grazing marshes. It's home to more

than 350 invertebrate species and 115 different species of fish including salmon, bass and smelt. Yet in the 1950s, the Thames was a dead river, unable to support any form of life. Over the last 40 years its abuse and neglect has been reversed. The Environment Agency has been so successful in bringing about improvements to water quality and riverside habitats that the Thames is now one of the cleanest metropolitan estuaries in the world. It's also one of London's most important settings – a tourist attraction, recreational resource and backdrop to much of the capital's rich history.

PART ONE

London – the environmental capital

A green city – rich in wildlife

Although London is a bustling city, it's home to nationally and internationally rare species of plants, insects and birds. Sixteen per cent of its area is covered by nature conservation designations. The European Otter – thought to have been lost to London since the 1950s – is now thriving in the Lee Valley. Roach, bleak and perch are abundant in most of London's rivers, and commercially-viable fish stocks of eel, sole, shrimp, whitebait, codling and whiting are good examples of the success of the capital's fisheries industry. The Thames Estuary is internationally important for wading birds and wildfowl and hosts the largest sole and bass nurseries in the UK. London's river corridors not only provide a valuable amenity for leisure and enjoyment but also play an important role in conservation of wildlife species and habitat in the city.

For most Londoners, however, common species such as garden birds are the most visible sign of the health of their city's environment. Every neighbourhood contributes to a patchwork of habitats that bring people into daily contact with wildlife. A recent survey found that London has more than six million trees – not including those in stands and woodlands – which is far more than previously realised. The city also has nearly 300 kilometres of Notable Green Corridors, an average of more than 10 kilometres per borough, helping London's wildlife move freely across the capital.

The Thames and its tributaries such as the Colne, Wandle and Lee, help link London to the surrounding countryside. Each borough is home to smaller rivers and streams, but few have escaped the influence of urbanisation. At least 15 per cent of London's watercourses are hidden in underground pipes known as culverts. The Fleet, Tyburn and Effra – rivers which played important roles in London's history – are unlikely to ever be opened again, but the Environment Agency is working to recover other rivers and streams which flow in culverts, drains and sewers.



Enjoying London's environment

Nearly a sixth of urban London is metropolitan open land or other protected open space, the vast majority of which is accessible to the public. The London Walking Forum is developing a network of long-distance walks expected to reach 2,000 kilometres by the year 2000. Waterways play an important role in this network. Over 55 per cent of the Thames riverside is accessible to the public, much of it as part of the Thames Path national trail. Other rivers and streams provide additional recreational space, including north London's Lee Valley Regional Park. But increasingly, active leisure and recreational pursuits need to be balanced against the value of these areas for peace and tranquillity.

London's environment – under stress

Strategic issues for London and beyond

London's environment is valued by Londoners and visitors alike, but it's under pressure from the lifestyles we are all leading. And the effects aren't confined to London alone. Britain's capital sucks in a vast amount of resources and pumps out waste and pollution which can have regional and even global implications. London's water, for example, comes from the River Thames catchment which stretches from the Cotswolds in the west to West Sussex in the south and Bedfordshire in the north. Such strategic issues need to be addressed both London-wide and regionally.

Air pollution on the increase

Levels of air pollutants in London regularly exceed the Government's recommended air quality standards. Over the last 20 years emissions have risen steadily, primarily because of traffic growth, although emissions from industrial processes have declined. The largest source of pollution is exhaust fumes from motor vehicles. Each year over 640,000 tonnes of carbon monoxide and more than 18,000 tonnes of black smoke are released into London's atmosphere by traffic, damaging both London's environment and Londoners' health. In addition, our energy needs are met by power stations from across the country which generate their own emissions such as carbon dioxide (a greenhouse gas) and sulphur dioxide (which contributes to acid rain).

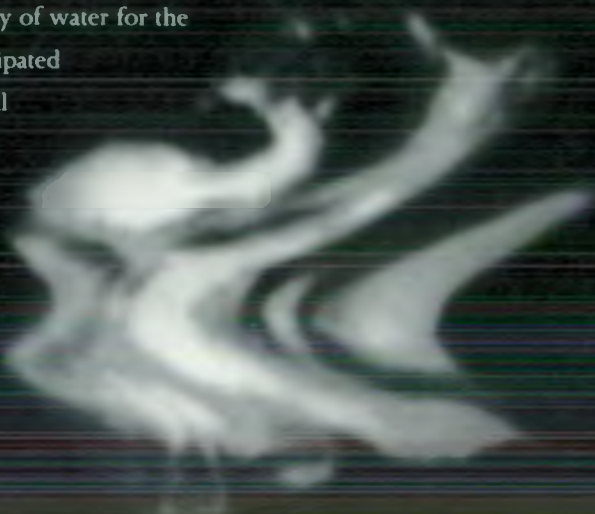


The demand for water

Most of London's water comes from outside the city. The total amount of water London uses has increased only slightly since the 1980s. This is because public water consumption has grown while the amount used by industry has fallen. However, this causes a problem for London because the water that was used by industry was collected from groundwater underneath the city. Water for public consumption comes from a different source; demand has risen steadily for over 30 years, and looks set to continue. Groundwater cannot be used for drinking and so water levels under the city are increasing. In the meantime the supply of water for the people of London will not meet anticipated levels of demand and new sources will need to be found. Water leaking from supply pipes also continues to be a problem.

PART TWO

London – the
environmental
challenge





The growing threat of climate change

Climate change is predicted to cause sea levels to rise by between 25 and 50cm by 2050, threatening

the low-lying areas of central London which are currently protected from flooding by defences such as the Thames Barrier. Other predicted changes include an increase in hot summers, and the number of heavy local storms that could affect London's ecology, air and water quality and cause flooding problems. Reducing London's greenhouse gas emissions could mitigate the short and long-term effects of climate change in the UK and elsewhere in the world.

Development puts pressure on London's nature and history

Although highly valued by Londoners and tourists, London's nature and archaeological history is under threat from development, pollution and often bad management. Competing demands for our environment often include financial gain in the case of development, whereas the natural environment and history hold no financial value. Large developments in attractive locations have often led to natural stretches of London's rivers being spoilt by insensitive and ecologically poor construction. Poor management of existing nature areas reduces their value for wildlife and biodiversity.

The blight of London's contaminated land

Much of the capital's one per cent of derelict land is contaminated by the city's industrial past, a legacy with potential implications for the health of Londoners now and in the future. Such land is difficult and costly to redevelop and is often concentrated in less prosperous areas where industries are in decline and the pressures to develop land are less. Since pressure generally to develop land in London is immense and growing, making the best of the capital's brownfield sites is important to protect greenspaces, improve the wider environment and stimulate social and economic development. The capital may need to promote and support the re-use of London's contaminated sites.

Waste disposal reaches capacity

London disposes of most of its waste in landfill sites in the Home Counties. In 1994-95, the capital threw away nearly 13.5 million tonnes of waste, much of which could have been reused or recycled. We are running out of space in which to dispose of our rubbish and will face a shortage within just a few years. The city will need to adapt its waste management strategies to tackle the problem.

Water – a quality concern

London's rivers continue to face the threat of sudden and potentially critical oxygen loss caused by overflowing sewage outlets. There are around 70 combined overflows into the Thames Tideway alone, which discharge large quantities of storm sewage following heavy rainfall. The sewage reduces the



amount of oxygen available to support aquatic life. Over the past decade the Tideway has failed to meet water quality objectives in 1990, 1991, 1992 and 1997. The Agency is concerned that the current methods of dealing with the loss of oxygen are not sustainable in the long-term and that water quality could be a major factor in the depletion of wildlife in London's rivers.

The increasing threat of flooding

London, like many world cities, began life as a maritime trading port. Much of London is built on low-lying marshland and is defended from daily flooding by an exhaustive network of walls, barriers and embankments. But large areas of central London are at risk of flooding. Such floods would threaten life, disable freshwater and sewerage systems, damage the Underground network, disrupt power, gas and telephone services and cause severe damage to thousands of homes, shops, businesses and buildings in the heart of the city.

Rising groundwater presents risk to London's deep foundations

The decreased abstraction of ground water by industry over the past 30 years has resulted in groundwater levels gradually rising to their natural levels. This has presented a growing hazard to London's foundations and Underground that needs to be addressed. Initiatives currently in place force the abstraction of groundwater for various non-domestic uses, but the scheme is dependent upon funding and on encouraging customers to use groundwater. Since groundwater is not suitable as drinking water, the capital will need to find innovative ways of utilising this copious resource.

London's environment – development driven trends

The pressure on land in London is immense, and it's growing all the time. While market forces continue to exert their own demands, the majority of development in London is influenced by Government policy, principally to promote and enable urban regeneration, and to reduce the need to travel. There are many organisations with specific environmental responsibilities working in London. It is essential that the Agency and all such organisations work together to ensure that development related issues affecting the environment are given clear, consistent expression.

The Agency already works with a range of partners, notably the Department of Environment, Transport and the Regions (DETR), the Government Office for London (GOL), the London Planning Advisory Committee (LPAC), government agencies and conservation groups. The GLA will be a further valuable partner to help tackle the environmental challenges.

Strategic regeneration along river corridors

Regional Planning Guidance for London – or RPG3 for short – has identified corridors of strategic regeneration radiating out from inner London. The Wandle Valley, Lee Valley and a broad stretch of east London linking the Docklands and the Thames Gateway are just three of the riverside areas providing critical regeneration opportunities.



Re-use of brownfield sites

Significant swathes of London lie derelict or under-used – mostly because they are contaminated, difficult to access and/or costly locations to develop. In some cases, these sites have become valuable wildlife habitats. Development of these sites needs to be mindful of the delicate balance between the environment, social and economic considerations.

Investment in London's transport infrastructure

London's transport network is under constant strain – it will be difficult to coax Londoners out of cars and onto buses, trains or tubes without significant improvements in the services offered. The decaying infrastructure and growing demand for public transport has led to a new effort to improve and extend London's transport services. Major schemes under construction include the Jubilee Line extension, the Croydon to Wimbledon tramlink and the Channel Tunnel high-speed rail link. Other proposals under consideration include new bridges across the Thames and a fifth major terminal at Heathrow.



London-wide tourism and leisure

Most tourism and leisure activities are likely to remain concentrated in parts of central London close to existing cultural and entertainment facilities. But new cultural and leisure quarters are now being encouraged across the city, especially in areas near to town centres or established visitor attractions. This policy will assist local London economies through regeneration, service employment and other local services.

Riverside developments have negative impact on river

Despite the importance of the Thames as one of the largest open spaces in London which acts as a backdrop to many of the UK's most famous sites, development along the river has often taken little account of its impact on the river and environment. Developers have all too often viewed the Thameside as an attractive development location without regard for architectural and wildlife character. As a result developments have often separated Londoners from their river, encroached onto the foreshore and into the river channel and obstructed river views. Development along the Thames should always complement and enhance the location rather than dominate it.

London – the congested city

Traffic in London is slow-moving, congested and on the increase. Traffic in the capital is predicted to increase by 60 per cent early in the next century. It is currently responsible for 90 per cent of London's air pollution, contributing strongly to climate change, local air quality decline and local health problems. Heavy goods vehicles remain responsible for most of London's freight traffic. It is the Government's intention that greater use should be made of more sustainable alternatives such as inland waterways and coastal shipping to transport cargo around the UK. In order to achieve this, the land currently used for port purposes must be preserved and expanded – a challenge on the riverside where development pressures are great.

Prestige projects

Major projects such as the Millennium Dome at Greenwich and the Millennium Wheel on the South Bank are constantly proposed. Lottery funding has opened up the possibility of a number of new prestige projects, each of which need to make a positive contribution to London's environment (key locations assisted areas and identified development indicated in red).



Urban regeneration is an important Government objective highlighting:

- The main structural opportunities for economic regeneration against a background of extensive deprivation, focusing particularly on east and inner south London.
- The need for local integrated development strategies, strengthening business structure, diversifying economies and the restructuring of London's employment areas to enhance their competitiveness.
- The importance of recycling London's brownfield sites as London's only significant land resource.

Regeneration areas radiate from inner London as follows:

- A broad corridor in east London embracing the Docklands and Thames Gateway.
- Along the Lea Valley in east and north London including Stratford.
- Around a series of road, rail and canal corridors underpinned by Heathrow and Park Royal in west London.
- Along the Wandle Valley in south east London.

River corridors clearly play a crucial role in providing a series of regeneration opportunities. It will be important to ensure that the conservation and amenity value of the rivers is maintained and that any development does not exacerbate flood risk or pollute the watercourse. Indeed, development can be used as a means for improving the environment of river corridors, contributing to local character, and opening up access for local people to enjoy.

London's environment – market-driven trends

The market will always exert its own pressures on London and they are often cyclical in nature. At present, market-led development pressures are being driven by:

A demand for large new offices in attractive locations

The Environment Agency is concerned about the impact of some new developments on London's cultural and natural heritage. While regeneration areas such as Stratford and the Docklands provide considerable opportunities for office developments linked to environmental improvements, pressure remains on more sensitive locations including Wandle Mouth and other locations along the Thames corridor.

The attraction of open spaces for new developments of all types

Metropolitan open land and playing fields are particularly attractive to developers. Yet these areas are crucial in providing the patchwork of habitats and amenities that make London's environment so rich. Once again the balance of the quality of people's lives, money and environment should be prime considerations.

The impacts of small scale developments are often viewed in isolation

Through a general lack of large, affordable and accessible sites within London, developers and local authorities are increasingly turning to small, piecemeal development to meet London's housing requirements. The Agency has little control over such developments unless they are sited next to a river. Viewed in isolation, the environmental impact of each small scale development may be negligible. However, when the huge number of sites are added together, the impact can severely affect London's environment.

Consumer lifestyles and throw-away attitudes

Londoners – like most Britons – live consumer lifestyles. But the throw-away society is increasing the amount of natural resources and energy we use, the waste we produce and the pollution we generate. Energy demand continues to grow: in 1991 each person used over 24,000 kilowatt hours of energy. Few boroughs have yet to achieve the Government's target of recycling or composting 25 per cent of household waste by 2000. Litter and fly-tipping continue to plague many parts of the city.



The following factsheets illustrate the thirteen main environmental issues facing London, which must be addressed if the city is to become sustainable. The objective is stated, together with the action and the partnership needed between the Agency and the GLA to protect and enhance London's environment. Examples of good practice are presented to show what is already being delivered, and to help identify the way forward.

However, everyone has a role to play in ensuring that London achieves its environmental capital status. Through working together at all levels, with general direction from the GLA through consultation with the Agency, London can realise its goal – a first-class environment for a world-class city.

PART THREE

London – facing the environmental facts





Levels of air pollution in London frequently exceed those recommended for human health. In 1996 alone, London's air quality fell below acceptable levels for health on 440 separate occasions at 37 monitoring stations around London. Statistics show that in Britain 24,000 people die prematurely each year because of air pollution and one in seven school children has asthma.

Road transport exhausts and industrial processes have a major impact on air quality, producing more than 90 per cent of air pollution in London.

The GLA:

- must establish an air quality action plan for London in consultation with the boroughs and help individual boroughs improve their air quality by implementing the Government's National Air Quality Strategy (NAQS).

The Environment Agency:

- will work with boroughs to help them implement the NAQS.
- will work with boroughs to reduce levels of air pollutants from the processes it regulates in London and along the Thames Estuary.
- can help the GLA prepare a sustainable transport strategy to be implemented by the proposed London Transport Authority.
- can help the GLA produce a London-wide strategy on air quality, and help London boroughs define Air Quality Management Areas and develop Action Plans.

Air Quality



Over the last 20 years there has been a steady rise in the amount of pollutants emitted into the air – largely due to the increase in motor vehicles. In 1995 for example, the petrol engine was responsible for more than 70 per cent of carbon monoxide pollution. This not only damages London's environment and adversely affects people's health, but also contributes to worldwide environmental problems including climate change.

Responsibility for local air quality management rests with individual London boroughs. The National Air Quality Strategy provides a basis for action at local level recommending specific air quality targets. However, a London-wide air quality action plan needs to be drawn up to co-ordinate individual air quality action plans. Without co-ordination, the plans of individual boroughs may not effectively tackle London's growing air quality problem. Local actions, such as road and traffic calming, may succeed only in exacerbating problems elsewhere.

Industrial pollution from power stations and oil refineries in the Thames Estuary to the east of London are likely to be significant contributors to the level of sulphur dioxide in the capital. It is here that the Agency will prioritise its actions towards implementing the National Air Quality Strategy. The Agency regulates the most technically complex and potentially most polluting industrial processes to prevent, minimise and render harmless potential emissions. The Agency will assist local authorities with their management of air quality and in particular with respect to sulphur dioxide.

Good practice examples

The London boroughs have aligned themselves into six 'cluster groups' sharing information and co-ordinating actions to manage air quality more effectively.

Further reading

The Environment Agency's State of the Environment Report for Thames Region.

Thames Environment 21 – The Environment Agency's strategy for land-use planning in Thames Region.



Over £10 billion worth of property in London is protected from flooding by the Thames Barrier. But climate change is predicted to cause sea levels to rise by between 25 and 50 cm by 2050, threatening the effectiveness of London's current tidal defences. The Thames Barrier currently shuts only two or three times each year. Forecasts suggest it will have to close more than 300 times a year by 2100.

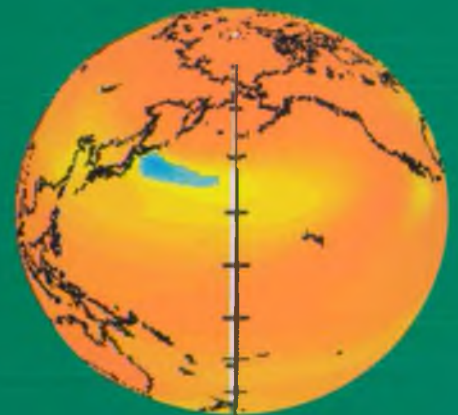
The GLA:

- must help reduce greenhouse emissions where it can by, for example, influencing a sustainable transport policy, and contribute to the UK's commitments to the Kyoto Agreement.
- must ensure that its policies will help London deal with the consequences of climate change.
- should encourage education and promotion of climate change and the way in which it could impact on the capital, and encourage Londoners to reduce greenhouse gas emissions through more sustainable lifestyles.

The Environment Agency:

- will work with others, including the UK Climate Impact Programme, to assess the likely effects on London of climate change.
- will reassess London's flood defences in the light of climate change and recommend responses in partnership with others, including MAFF.
- will regulate and educate industry and waste disposal operators to encourage a reduction in greenhouse gas emissions.
- will encourage planning policies which take into account the uncertainty of future climate change.

Climate Change



Predicting the effects of climate change upon the UK is an inexact science. But prediction models have suggested sea levels will rise and current weather patterns will change. Seasonal temperatures may be altered by up to 2 degrees centigrade in winter and up to 1.8 degrees centigrade in summer.

Water is likely to be the part of the environment most affected by the climate change. Increased temperatures may cause rivers to dry up more frequently and create problems for everyone. By 2050, hot summers like that of 1995 could occur once every three years, rather than once every century as they do now. In addition, there could be an increase in the number and frequency of heavy local storms in summer, causing local and flash flooding and storm sewer overflows. However, these storms are unlikely to help alleviate predicted droughts because they do not infiltrate the ground and recharge the groundwater.

Wetlands, coastal mudflats and salt marshes will be threatened by drought conditions, while permanent coastal flooding is predicted by climate change experts. Low-lying areas of central London will be at high risk from flooding and sea level rises will threaten the effectiveness of the Thames Barrier. An increase in the number of still, hot summer days is likely to exacerbate London's existing poor air quality: smog could once again become commonplace.

Londoners and London's economy will have to adapt and change to reduce greenhouse gas emissions. People and businesses will need to adopt more sustainable lifestyles, some of which – including reduced emissions from road transport – will improve the environment as a whole. Reducing greenhouse gas emissions in the capital will mitigate the short and long-term effects of climate change both in the UK and elsewhere in the world. This would also serve as an example to the rest of the country, showing that local action to reduce greenhouse gases can contribute to the Kyoto Agreement commitments and to wider improvements in the environment.

The legally binding Kyoto Agreement seeks to reduce developed country emissions of the six principal man-made greenhouse gases to 5.2 per cent below 1990 levels between 2008 and 2012.

Good practice example

The International Council for Local Environmental Initiatives' (ICLEI) Campaign for Climate Protection gathers together the pledges and experiences of cities in eight countries worldwide in the reduction of greenhouse gas emissions. Cities focus their attentions on areas that contribute to carbon dioxide emission, such as energy production, energy consumption, transportation and waste management. Participants include: Helsinki (Finland), Copenhagen (Denmark), Toronto (Canada) and Denver (Colorado).

Further reading

The Science of Climate Change, B Summary for Policymakers and Technical Summary of the Working Group I Report, IPCC, Cambridge University Press 1996.

Climate Change Scenarios for the UK, Summary Report B, UK Climate Impacts Programme Technical Report No. 1, September 1998, Climate Research Unit, UEA, UK.

UK Climate Change Programme Consultation Paper B, DETR, 1998, HMSO.

The International Council for Local Environmental Initiatives (ICLEI) Cities for Climate Change campaign website:

HYPERLINK

<http://www.iclei.org/aplans>

<http://www.iclei.org/aplans>



Each year London produces 13.5 million tonnes of waste. That's the equivalent of two tonnes for every man, woman and child living in the capital. Most of the waste is exported to landfill sites in neighbouring counties, but South East England is running out of space where London can dispose of its rubbish, and early in the next Millennium, space could run out completely.

The GLA:

- has to produce a Municipal Waste Strategy for London, in which the Environment Agency can assist, bringing together the waste strategies of the rest of South East England and the London and South East Regional Planning Conference (SERPLAN).
- should work with existing agencies such as London Waste Action (LWA), an environmental body developing a recycling strategy for the city.

The Environment Agency:

- as the regulatory and licensing authority, can advise the GLA on the best options for waste disposal and help prepare London-wide and borough-specific waste strategies.
- will develop and use life cycle analysis, waste hierarchy and proximity principles. These tools could help individual boroughs assess the environmental impact of different options for dealing with waste, identify the best environmental option and become more self-sufficient in disposing of waste.
- will also provide information on waste management activities through, for example, the National Waste Survey.

Waste Management



Over 70 per cent of London's waste is currently disposed of in landfill sites in neighbouring counties, but by 2005 the South East will find it difficult to cope. By 2010 the region as a whole is likely to run out of space suitable for landfill disposal. Urgent changes are required in the management of London's waste.

So what can the capital do with its rubbish? London must learn to manage its waste by reducing the amount it produces and by efficiently recovering or recycling as much of the remaining waste as possible. It must consider alternative methods to landfill disposal. Waste is an important and under-exploited resource. From a strategic point of view the Agency supports the use of incineration with energy recovery as a viable waste management option. At the moment less than a fifth of London's household waste is incinerated to generate electricity in plants to the north and south east of the city. London recycles just 11 per cent of its waste and is not expected to meet the Government's target of 25 per cent by 2000.

The GLA – and London as a whole – must give priority to waste minimisation and recycling initiatives. Targets are to re-use a quarter of household waste by 2000 and reduce the amount of controlled waste sent to landfill sites from 70 per cent to 60 per cent. This could be achieved by encouraging recycling and reprocessing facilities. In this way, London could manage more of its own waste and reduce the size of its 'environmental footprint'.

London's boroughs, as waste collectors and disposal authorities, have a key role to play through urban development and waste recycling plans, and by providing facilities to collect, transport, recycle and dispose of waste.

Local manufacturing industries must look at ways to minimise, develop and make better use of waste material.

Retailers, businesses and residents must act in partnership to reduce the amount of packaging and household waste produced, and to re-use or recycle as much of the rest as possible. This year alone, the average London household will throw away 430 kilogrammes of paper and cardboard, 120 kilogrammes of glass and 93 kilogrammes of metal. We must learn to see most of what we throw away as a resource, rather than rubbish.

Good practice examples

London Waste Action seek to deliver an integrated system of facilities for increasing London's recycling rates: some as high as 35 per cent (recorded by the London Borough of Sutton) show what can be achieved. Partners in the project include London Planning Advisory Committee, the Association of London Government, the Government Office for London, Environment Agency, the boroughs, business and industry.

Further reading

Environment Agency South East
England Strategic Waste Management
Report on the 1996 survey.



London's demand for water is increasing, but its supplies are not. Without major reductions in use and leakage, the capital's water supply will be under severe strain by 2015.

Last year leakage caused a daily loss of over 900 million litres by Thames Water – enough to supply over 5.6 million households. London must learn to use its water resources properly before calling upon new supplies to meet increased demand. Rising groundwater may have become headline news in the capital, but it won't meet the everyday needs of London's businesses and residents.

The GLA:

- should be aware of water resource issues in the capital through consultation with the Environment Agency and water companies.
- should be aware of drought threats and drought contingency plans.
- should promote demand management and support leak reduction activities before new supply sources are considered.

The Environment Agency:

- believes that leaks must be reduced before new sources of supply, including reservoirs, are considered.
- will control water abstraction through the licensing system, monitor river flows and groundwater levels, and ensure that surface water and groundwater are not depleted by over-use.
- will promote demand management.
- will work with water companies to develop strategic guidance on available water resources and keep the GLA informed.
- will oppose the development of water resources which could damage the environment.

Water Resources



The average Londoner uses 160 litres of water a day, compared to 150 litres a day 5 years ago. Current forecasts suggest that water consumption is growing at such a rate that the capital will find it hard to meet demand after 2015. Demographic changes, new housing and recreational developments are all adding to the pressure.

After 2015, meeting London's water needs will depend on the success of water efficiency and demand management techniques, including leakage reduction, water metering, public awareness campaigns and potential new water resource development. The Agency is keen to work in partnership with the GLA and water companies to secure adequate water resources for the capital.

Leaking water pipes have long been a major factor in water demand, yet the issue has only recently been addressed by water companies. Although some companies have made significant reductions, others still need to deal more effectively with the problem. Leakage reduction in London presents a sizeable challenge since replacement of pipes/channels and repairs can cause significant disruption to the capital. The first step must be to improve monitoring and reporting, so that the scale of problem can be assessed accurately. Inefficient use of water resources puts a strain on wildlife and reduces the amenity value of rivers.

London's rising groundwater presents a small but unexploited water resource: this should be used to supply the city's growing demand for non drinking water, which could minimise the effects on areas outside the capital. Using groundwater will help control the threat to building foundations and tunnels from rapidly rising groundwater.

London, like anywhere, may experience droughts. Its water resources are susceptible to droughts that last two years or more, with dry winters resulting in poor groundwater recharge. Single hot, dry summers have less of an impact. Climate change may significantly affect the frequency and duration of droughts. Drought management plans will be developed by the Environment Agency in partnership with water companies to ensure that a reasonable balance is struck between maintaining adequate public water supplies and protecting our water resources.

Good practice example

An artificial recharge scheme in the Lee Valley tops up the confined aquifer beneath north London with excess treated water during normal or wet years, providing more water for abstraction during drought years.

Further reading

Maintaining Public Supplies, DETR and Welsh Office, 1999.



In 1993, one per cent of land in London, more than 1,600 hectares, was derelict. Much of it was contaminated by the city's industrial past, a legacy with potential implications for the health of Londoners today and in the future.

Although development pressures on London are huge, many of the capital's derelict sites could be re-used. However, dealing with contaminated soil can be difficult and expensive; it must be treated or disposed of elsewhere.

Contaminated Land

The GLA:

- should promote the re-use of contaminated land by developing a strategic overview for its redevelopment in partnership with local boroughs and the Environment Agency.
- should help London boroughs deal with particularly difficult areas such as 'orphan sites' where no-one is financially responsible for cleaning up. This could involve financial assistance.



The Environment Agency:

- will support the clean-up of contaminated land for re-use, particularly where it leads to improvements in the quality of the urban environment.
- can offer site-specific guidance and advice on remediation, to ensure that work is carried out in a safe and appropriate manner.
- will deal with land classified as a 'special site', although responsibility for identifying and bringing most contaminated land back into use rests primarily with the boroughs.
- will facilitate a forum to discuss land quality issues in the capital, including how brownfield sites can be prioritised and developed.

The pressure on land use in London is immense, and it is growing. Metropolitan open land and playing fields are particularly attractive to developers but are also one of the city's greatest assets.

Government policy has long advocated the re-use and regeneration of contaminated (brownfield) and derelict land. Making best use of the capital's brownfield sites will help protect green spaces and improve the wider environment. But contaminated land such as former landfill and gas works sites are often the most difficult, costly and inaccessible locations to develop. Re-use must be carefully managed to avoid pollution of both surface and groundwater. In some cases, contaminated sites have become valuable wildlife habitats which merit protection in their own right. In such cases, the clean-up may not be welcomed by local residents, a factor which must be considered when land is redeveloped.

Most of London's contaminated waste material is transported to the Home Counties for disposal. However, this costly process has increased the risk of fly-tipping from contaminated sites, increasing risk to site users and wildlife. The Environment Agency has special units to track down and prosecute those who dump waste illegally.

Difficult issues, such as remediating orphan sites, where no one is financially responsible for cleaning up, pose particular problems for local authorities and the Environment Agency. There may also be challenges reconciling the public's perception of contaminated land with the pollution risk-based approach adopted in Government guidance. Some sites may therefore remain polluted unless they are suitable for redevelopment.

Good practice example

The clearance of the former gas works at Bell Green, Lewisham, made it possible to enhance the Pool River with a winding channel, cascade and riffles, all of which helped the passage of fish along the river.

Contamination from some remaining untreatable residues and poor ground conditions meant that the channel had to be designed to be impenetrable and not allow any water from the land to enter into the river. A riverside walk has improved public access.

Further reading

Department of the Environment & Welsh Office Framework for contaminated land, 1994

DETR & Welsh Office Revised Guidance for contaminated land, 1998.



Groundwater in the chalk aquifer directly beneath London is rising and attempting to return to natural levels. Without urgent attention, the foundations of some buildings and parts of the London Underground will be under threat from rising water.

Since the mid 1960s we have been using less and less groundwater and over the last 30 years, levels under central London have risen by more than 50 metres.

The problem could be controlled by once again using more water from the aquifer beneath the capital. A groundwater management strategy was launched publicly in March 1999.

CIRIA, the Construction Industry Research and Information Association, estimates that if no preventative action is taken, putting right the damage caused by rising groundwater could cost more than £150 million.

Rising Groundwater



The GLA:

- should encourage the use of groundwater by business and industry.
- should encourage the use of groundwater to irrigate parkland and maintain water features such as fountains.

The Environment Agency:

- will monitor and report on rising groundwater levels.
- as the regulator of water resources, will manage the overall strategy for long-term management of groundwater through the licensing process.

London's demand for water is rising, but with fewer large water-dependent industries, we have been taking less water from groundwater sources. Reduced abstraction since the 1960s has led to groundwater attempting to return to natural levels. For example, at the southern end of London Underground's Northern Line it has risen to a level where the tunnels are threatened. Across the capital, deep building foundations are also at risk.

Although groundwater offers a potential new water resource, it is often unsuitable for drinking water use. The practicalities of taking more water from under central London are being explored by Thames Water.

A strategy to address the problem has been formulated by the General Aquifer Research, Development and Investigation Team, a group of interested organisations known as GARDIT. Co-ordinated by Thames Water, the strategy aims to increase the amount of groundwater taken from under London by up to 70,000 cubic metres per day – enough to meet the daily needs of 435,000 households. Although this would remove the risk of groundwater flooding, the scheme is dependent upon funding and on encouraging customers to use groundwater. This last aspect may require financial incentives.

Good practice example

Thames Water is currently implementing Phase I of the five-phase GARDIT groundwater management strategy launched in March 1999. This involves four existing groundwater boreholes in south and east London being brought back into use. Phase II will see three new boreholes in central London.

Further reading

GARDIT Strategy Proposal: controlling London's rising groundwater, March 1999.

Environment Agency: annual report on rising groundwater levels in the chalk basal sands aquifer of the central London basin, April 1999.

CIRIA special publication 69: the engineering implications of rising groundwater levels in the deep aquifer beneath London, 1989.



Only 1.7 million tonnes of freight, including 800,000 tonnes of waste, is transported along London's 95 miles of river each year. In comparison 52 million tonnes is transported via the capital's roads.

The Government wants to promote greater use of inland waterways and coastal shipping to transport cargo around the UK. Current levels of waterborne cargo in the Port of London could increase by 56 per cent by 2020, provided sufficient handling capacity is available. Around 377 additional acres of land will be required to meet projected waterborne freight increases. Land currently available for port use must be preserved.

Although river transport represents a more sustainable alternative to road-carried freight, expanding waterborne freight facilities must not happen at the expense of a river's ecological and conservation value.

The GLA:

- should help implement planning policies that balance the need to preserve riverside land for conservation and cargo-handling uses.
- should oppose any change of use for cargo-handling sites on the Thames. This includes any land suitable for port use in the future.

The Environment Agency:

- supports more sustainable forms of transport and will encourage waterborne transport to carry London's waste to disposal sites.
- will continue to work with developers to identify projects that enhance the riverside environment.
- will oppose any plans to use land of conservation importance for port use.
- will resist proposals that threaten to encroach on the river or alter tidal flood defences.

River Transport



The Government has recognised that waterborne freight can play a vital part in its integrated transport policy. The environmental and strategic benefits of using rivers and waterways to transport cargo are many and include reduced energy consumption and less pollution. Waterborne transport can also cost half that of road transport and has the potential to reduce road congestion in and outside London.

The Port of London currently handles 10 per cent of the UK's freight, the majority of which in London is aggregates and bulk cargoes, such as sugar and car parts. In the capital, 44 of the 65 cargo-handling terminals are in use. Government transport policy is likely to lead to a sizeable increase in the use of the Port of London's land and facilities. This increase should not lead to new encroachment on the river, nor threaten conservation areas such as the foreshore – a vital environment in the migration route of birds, fish and invertebrates.

The threat to the riparian environment is increased by the loss of existing and potential port sites to new housing and office developments. A 1998 study showed that out of 247 planning applications for former river-related or cargo-handling sites, 102 intended to redevelop them for other uses, reducing potential for a working river. Pressure is intensified by Government housing policy which regards vacant port land as 'brownfield', and suitable for housing development. Reducing the amount of land available for port use merely increases the pressure to develop 'greenfield' sites to meet the Government's aspirations for waterborne freight. This threatens the river's ecological value and its value for conservation and recreation.

London needs planning policies that will safeguard land for wildlife and port use. Local planning authorities along the Thames should identify suitable port and related industrial land and ensure that it is used only for these purposes in the future. London's docks should not be redeveloped unless studies show they are not needed to meet the Government's transport aspirations. The Port of London Authority is working with the Environment Agency to ensure that riverside redevelopment occurs only in appropriate places and helps improve the value of the Thames for the environment and local communities.

Good practice example

In central London 32 port sites have been protected by planning directions issued by the Secretary of State for the Environment, Transport and the Regions. These prevent the redevelopment of port land for other use.

Further reading

Port of London Development Strategy for Cargo Handling in the Port of London;

Environment Agency Tidal Thames Landscape Assessment and Design Guidelines 1996.

Thames Environment 21 – The Environment Agency's strategy for land-use planning in Thames Region.



The number of cars on London's roads will double over the next 25 years. Traffic speeds in the capital also continue to fall. The average speed in central London today is 6 miles an hour; 25 years ago it was 10 mph.

Road transport is responsible for 90 per cent of London's air pollution. It contributes strongly to climate change, local air quality decline and health problems.

The CBI estimates that congestion in London costs the British economy over £15 billion each year.

The GLA:

- must look closely at directing more public resources at an integrated mass transport system and at promoting a greater choice of transport options in areas where the car is currently the only available option.
- should consider a range of levies, incentives and charges rather than single-pricing measures, to ensure the economic burden of increased public transport investment is borne by the appropriate parts of society.
- should evaluate the environmental cost of each transport option to ensure an informed debate can be held on transport and the environment. Such an exercise must be carried out before any transport-related changes are made to the taxation system.

The Environment Agency:

- is committed to helping the Government meet its emission targets and to deliver the National Air Quality Strategy.
- recommends that the Government consider methods including traffic zoning, exclusion zones, and tighter emission controls to limit the impact of road vehicles, particularly in view of the anticipated increase in road traffic in London.

Road Transport



London is already a congested city, yet traffic is predicted to grow by a further 60 per cent by 2031. Controlling and limiting the traffic on London's roads represents a major challenge not only for the GLA, but also for national Government and the London boroughs – who are already working on local air quality plans. Limited transport options open to the public, and lack of reliable connections where choice exists, are major reasons why Londoners still love their cars. In addition, heavy goods vehicles remain responsible for most of London's freight traffic: rail, the River Thames and air transport carry less than one tenth of the city's freight between them.

A rational and fair approach to meeting air quality targets, dealing with acidifying pollutants and climate change commitments calls for the transport sector to reduce the volume of its emissions. It is clear that a shift away from inefficient forms of transport – for example, single occupancy car journeys – is needed in favour of more efficient mass-transit systems. The Government should aim to promote a wide range of integrated transport options for London and Londoners, and as in other European countries, people should be made aware of the benefits of single-payment multi-mode transport systems. People are attracted to the simplicity of such systems, as any Londoner who changes frequently between bus, underground and national railway systems will no doubt appreciate.

The true environmental impacts and costs of different forms of transport must be appreciated and considered. For example, this could be done by measuring the amount of carbon dioxide (a greenhouse gas) emitted per person per unit distance for each mode of transport. The impact for each mode of transport could then be judged. The Landfill Tax has shown that environmentally-related taxation measures can help the public accept taxation change when the benefits are clear. This form of taxation could be applied both to the form of transport used, whether public or private, and to the type of fuel used.

Waterborne traffic could be encouraged by introducing payment systems from which the cost could be regained for maintaining and improving the waterways for both navigable and environmental purposes.

The average car journey for today's Londoner is around 7½ miles: by 2031 that journey could take twice as long. London needs swift action to prevent its transport system from grinding to a halt.

Good practice example

In Germany all public transport is organised regionally, so trains, buses and light rail networks can all be used with the same ticket, greatly improving the simplicity and efficiency of the system.

Further reading

Department of Transport and London
Research Centre London Area Transport
Survey 1991



London's natural environment is at risk from development, pollution and often, bad management. However its value is priceless.

Through conservation we can take action to sustain or improve the value of the capital's natural and historical assets, its open spaces and waterside, and help make the city one worth living in.

Rivers, parks and heathland are often the areas most associated with conservation in London but we cannot afford to neglect the gardens and open land – the places where Londoners see most wildlife.

The GLA:

- must develop and implement a biodiversity action plan for London's needs.
- need to carry out a wildlife audit to help influence conservation plans.
- should recognise the Thames as a special consideration for conservation and landscaping.
- should help to create new habitats whilst protecting existing ones.
- can improve London's wildlife and people's perceptions of it by promoting improvement through education, and best practice in environmental assessment, urban development, pollution control and waste management.

The Environment Agency:

- will help deliver the UK biodiversity action plan by promoting the conservation of key water-related species and habitats.
- will reduce and prevent the pollution of land, air and water which are key factors in the protection of wildlife.
- will promote the sustainable management of wetlands for conservation benefit.

Conservation



- will promote and demonstrate through its own work best practice in protecting, restoring and improving river habitats using native plants where possible.
- will agree, with English Heritage, ways to conserve historic features that could be affected by the Agency's activities.
- will help ensure areas of European importance are preserved by reviewing procedures that grant these sites exemption from development.

London boasts a wealth of habitats for national and international rare species, as well as buildings and areas of archaeological, architectural, engineering and historic interest. Up to 16 per cent of the capital's land is covered by nature conservation designations ranging from wading birds and wildfowl habitats along the Thames Estuary, to locally important sites scattered throughout the city. The Thames forms the largest wildlife corridor through London, supporting huge dynamic movements and migrations of fish, invertebrates and birds. It is a wildlife superhighway. Throughout London more than 16,000 buildings are of listed status and important archaeological remains also lie buried below the city and river.

The city's biodiversity provides economic and social benefits. It has aesthetic, community and educational value and is a constant reminder of the capital's historic legacy. Conserving its biodiversity has become an increasingly difficult task, affected by pressures for further urban development, climate change, over-abstraction of water, sewage effluent discharges, air, land and water pollution, as well as a lack of funding and inadequate management.

Development pressures are a significant threat as many open spaces have a high financial value. But large developments in attractive locations have led to natural stretches of London's rivers being spoilt by insensitive and ecologically poor construction and design, without due consideration of the natural state of the land. This reduces the conservation value of watercourses and Londoners' opinion of their river. New developments should strengthen the diversity and character of locations and enhance the ecological, amenity and recreational value of an area.

The Environment Agency works in partnership with other groups such as the London Ecology Unit, the London Wildlife Trust and Londoners themselves to restore habitats and conservation features within and adjacent to rivers and lakes. The Agency produces advice on how to integrate nature conservation into development proposals, advising and working with planners and developers to ensure that new developments are of high quality and are sympathetic to the river and its surroundings.

To fully understand the impact of new and existing development on London's wildlife, sustainability indicators need to be developed to help assess London's wildlife value. The data collected and analysed by the Environment Agency could help and add value to such an assessment.

Good practice example

A redundant water-supply reservoir at Barn Elms in south west London has been redeveloped for housing, also allowing the development of a public wildfowl and wetlands trust reserve. The majority of the site was developed into a major new wetland habitat, which has attracted flocks of birds. The land is designated a Site of Special Scientific Interest.

Further reading

Environment Agency Thames tideway & estuary fact file - Teddington to Shoebury, 1997.

Environment Agency tidal foreshore document, 1996.

Wild in London, DA Goode, 1986, Michael Joseph Ltd.



The tidal Thames – 40 years ago little more than a dead river – is now home to more than 115 species of fish. Its remarkable transformation came about not by accident, but as a result of long-term work and investment by the Environment Agency, its predecessors, water utilities and other organisations.

Fish stocks in the Thames Estuary and other London rivers are still recovering today. And, together with fisheries found in the capital's lakes and ponds, they are enjoyed by a wide variety of Londoners including anglers and school children. Although commercial fishing for eel and sea fish is once again possible in the lower estuary, all of the city's fisheries remain threatened by development and poor water quality.

The GLA:

- should recognise the international significance of the tidal Thames recovery, with its recreational and commercial fisheries, and the importance of the river as a migration route and nursery ground for many fish species.
- should work closely with the Environment Agency and others to protect and enhance the status and ecological importance of fisheries in the estuary and in London's freshwater streams, lakes and ponds.

The Environment Agency:

- will continue to maintain, improve and develop freshwater fisheries in London through its statutory powers and through working in partnership.
- will work with others to develop a strategy to protect and enhance the status of sea fisheries in the Thames Estuary.

Fisheries



The tidal Thames is now one of the cleanest metropolitan estuaries in the world. It is home to fish including pollution-sensitive species such as salmon, smelt and bass. Anglers land freshwater fish above Battersea and sea fish below Rotherhithe, while commercial fishermen cast for eel, bass, sole, sprat and whiting in the lower estuary. Within the last two decades, the estuary has become the largest sole nursery in the UK and the largest bass nursery in the southern North Sea. Despite widespread general decline in the fisheries industry, the Thames supports the largest smelt fishery in the British Isles.

However, water quality in the Thames Estuary remains a threat to fish life. Combined sewer overflows can deoxygenate the river and kill fish stocks. There has been no major fish kill since an operating agreement with Thames Water was signed in 1986, but the possibility remains. Recent research has shown that substantial fish losses – including species with both economic (bass) and conservation (smelt) importance – may happen during storms, even when no mortalities are reported. This, combined with the growing aesthetic issue of sewage-derived litter, suggests that combined sewage overflows will need progressive attention in the future.

Vast migrations of tiny fish fry, as well as more obvious migrants such as salmon and eel, move through the Thames Estuary every spring and summer. Fry migrations are badly affected by encroachments on to the foreshore: barrage developments may stop them altogether. The Agency's flood defence strategies take habitat protection into account and encourage more sustainable development through the planning process.

The Agency will continue to protect and improve the estuary's freshwater fisheries under existing legislation, including formal Sea Fisheries Powers. It is developing management strategies and byelaws to reflect the nursery status of the estuary and not solely its commercial value. But the Agency cannot do this in isolation, so is working to develop a management regime in partnership with other concerned organisations.

London's freshwater streams and lakes – used widely by anglers – also support a wide range of fish and provide London with recreation and conservation opportunities. The Agency uses its powers and duties to protect such areas from inappropriate development and conserve them for future generations. The Agency has also secured substantial improvements to these important habitats through flood defence programmes and by influencing the planning process.

However, many lakes are poorly managed by their owners and suffer algal blooms and fish mortalities. Managing them in partnership with the Agency is the best way forward. Most damage is done out of ignorance, despite a growth in environmental awareness, so education has become a key issue. In addition, powerful pressure groups – such as the Lee Valley Anglers Consultative Committee – are making sure that the quality of London's rivers remains firmly on London's political agenda.

Good practice example

A variety of soft engineering approaches at a site on Teddington Lock Island, Middlesex – part of an Agency flood defence programme – have created a substantial new habitat for fish fry.

Further reading

Fish in the Tidal Thames, Environment Agency leaflet, 1998.

Sea Fisheries Action Plan (Environment Agency consultation document), March 1999.



A major flood in London could cost the UK more than £30 billion in damages alone. Disrupted telecommunication and transport systems could rob the city of its dominance as Europe's financial centre. Repairs could take months, even years to complete.

By the year 2100, London will be a hundred times more likely to flood than it is today. Rising sea levels and the tilting of South East England are increasing the threat of tidal flooding in the capital. Building on the Thames' natural floodplains has increased the risk to people, property and businesses.

The GLA:

- should help the Environment Agency lobby for funding to improve London's defences.
- should help the Agency ensure that flood risk is a major planning consideration.



Flooding

The Environment Agency:

- will work to reduce the flood risk in London by protecting, maintaining and strengthening defences against both tidal and local flooding.
- will strongly support greenhouse emission targets to reduce the threat from climate change and rising sea levels.
- will promote natural ways to treat and clean collected surface water run-off to reduce the number of times that watercourses are affected by flood-related pollution.
- will help restore floodplains and floodplain habitat in less urbanised areas of London.
- will consider habitat protection and improvement as an integral part of our flood defence work.

Much of the capital is built on low-lying marshland: it is naturally at risk from flooding. An extensive network of walls, embankments and moveable floodgates keeps the Thames and the risk of flooding at bay.

The Thames Barrier is our main defence against tidal flooding. Between 1983 and 1998, the Barrier was raised 33 times to protect central London. However, climate change, combined with the tilting of South East England, is increasing the risk of tidal surges. The Thames Barrier shuts currently only two or three times each year. Forecasts suggest it may have to close more than 300 times a year by 2100.

The Agency is researching and monitoring the potential effects of increased tide levels but present climate change forecasts suggest that the risk of flooding will start to rise after 2030. Long-term planning to reduce the risk to the city must begin now. Piecemeal short-term planning is not appropriate.

Parts of London are also prone to local flooding caused by heavy thunderstorms. The degree of flooding depends on the amount of rainfall, the permeability of the ground and river levels. High rates of rainfall run-off occur from impermeable surfaces such as roofs, roads and car parks into drains and sewers. This increases the risk of flooding and the risk of pollution in local watercourses. Pollutants including oil and rubber deposits can also be washed directly into watercourses, killing fish and damaging aquatic and riverside habitats.

The Environment Agency is working with London's boroughs and developers to advise on sustainable surface water drainage systems and promote their use. The Agency is also advising boroughs to discourage new development in the floodplain of rivers.

Good practice example

A flood alleviation scheme at Sutcliffe Park in south-east London is protecting residential and commercial parts of Lewisham from regular flooding by the River Quaggy, a highly-restricted river channel. The land level of adjacent parkland will be lowered so that in times of flood the river will flow onto the parkland instead of putting houses and businesses at risk.

Further reading

The tidal Thames flood risks to London upstream of the barrier, Association of British Insurers, April 1999

The development of a strategy for the twenty-first Century, Environment Agency, April 1999



The Thames is important to London, not just for trade and tourism, but as a natural asset and resource for wildlife habitats, and species, as well as valuable open space for people's recreational enjoyment.

Development along the Thames has historically taken little account of its impact on the river and the environment. Flood defences have separated Londoners from their river. Public access onto and alongside the river has been restricted. Insensitive office developments have encroached along the foreshore. Tall buildings have obstructed river views and damaged important skylines.

Major tributaries of the Thames, such as the rivers Lee, Wandle, Ravensbourne, Brent and Roding, have suffered even more from industrial urbanisation. Entire river reaches have been straightened and over-widened and this has led to a loss of amenity and wildlife habitats. Industrial and housing development frequently backs right onto the river banks making access difficult.

But at last, particularly with the establishment of the Thames Path, the form and pattern of riverside development has been recognised as an issue vital for London.

River Urban Form



The GLA:

- must work with the Environment Agency and other statutory bodies to influence riverside developments and ensure that they reflect the historic, environmental character and value of their location.
- should work with the Agency to promote best practice in riverside design and access for the people of London.

The Environment Agency:

- will educate riparian boroughs and developers on the commercial, visual and ecological benefits of sensitive riverside design.

- will maximise its influence over riverside developments through the land use planning system and exercise its own consenting powers.
- will object to any developments which encroach on the foreshore of the Thames and its tidal tributaries.
- will promote examples of best practice to relevant bodies and organisations at London-wide, national and international levels.
- will promote improved public access for all, to and along London's riverbanks where safe and environmentally acceptable to do so.
- will object to any development that fails to facilitate or obstructs the agreed route of the Thames Path national trail.
- Will encourage improved access onto the Thames via enhanced slipways and launching sites in areas where they will not cause undue disturbance to the landscape or the natural habitat.
- will encourage the retention of and improvements to the infrastructure that supports traditional sporting and recreational uses of the Thames.

The Thames is one of the largest open spaces in the capital. It is a valuable resource for Londoners and backdrop to many of the UK's most famous sights. The estuary is a 100 kilometre-long wildlife superhighway, providing a wide range of habitats including shingle, mudflats and grazing marshes. The river is one of the city's greatest historical and archaeological assets and is London's largest recreation ground.

Ever since London was founded as a Roman settlement, the Thames has been the focus of development pressure. For example, the area on the river's south bank now known as Bankside was once little more than a series of marshes and islands, but over centuries, building and development has reclaimed the land and narrowed the course of the river. Developers have always used the channel and the space around it for redevelopment. However, the river and its tributaries have sometimes been seen as a resource to be exploited rather than an amenity and attraction to cherish and protect.

This trend continues today and has resulted in construction which is unsympathetic to the rivers and the surrounding area. Londoners have been separated from their rivers and as a result have been unable to enjoy all they offer to the full. London's wildlife has lost valuable environmental space.

New development proposals must enhance the river environment rather than detract from it; buildings should complement rather than dominate their location. Opportunities to create improved public access and space for habitat should be pursued and promoted.

Good practice example

The Agency has worked in partnership to secure a series of innovative and environmentally-sensitive riverside designs on a former gas works on the Greenwich Peninsula. Over 1,000 metres of steel flood defences were pulled back and environmentally softer alternatives used to create a significant new ecological habitat. This area, part of the Millennium site, represents a range of best practice options in riverside design which can be replicated along the length of the Thames. They also provide visual improvements and ecological benefits to the area's redevelopment.

Further reading

Environment Agency strategic guidance for Thames.

The Environment Agency's tidal Thames landscape assessment and design guidelines.

Environment Agency – enhancing the environment – 25 case studies from Thames Region.

Space to live, space to play – A Recreation Strategy for the River Thames – Environment Agency (NRA) and Sport England (The Sports Council).



The 'Big Stink' of summer 1856 awoke Victorian London to the issue of water quality. Raw sewage, dumped directly into the River Thames, was poisoning London and Londoners. Parliament was unable to sit because of the stench arising from the river beside it.

Amazingly just 40 years ago, inadequate sewage treatment was still affecting the Thames – it was a dead river incapable of supporting aquatic life. But since the 1950s, major investments in sewage treatment have transformed the Thames into a wildlife superhighway supporting more than 115 species of fish. However, the tidal Thames is still at risk from sewage overflows which, following rainfall, discharge untreated sewage into the water. This reduces the oxygen levels in the water, which suffocates and can kill fish. It spoils the look and smell of the river. Sometimes it's hard to believe that the Thames is one of the cleanest metropolitan estuaries in the world.

Water Quality



The GLA:

- should recognise how important the re-vitalised Thames is to Londoners and their perceptions of the city.
- should help the Environment Agency and other statutory bodies to produce a sustainable solution to London's combined sewage problems to preserve the Thames for future generations.
- should monitor and promote the public's perception and expectations of water quality in the capital.

The Environment Agency:

- is currently developing a national water quality strategy to maintain and improve water quality wherever possible.
- will regulate all discharges into controlled waters, and monitor how industry implements environmental improvement schemes, particularly through the Asset Management Process.
- will protect the water environment by regularly monitoring water quality and water discharges.

- will outline its plans for water quality at river catchment level in Local Environment Action Plans.
- will combat water pollution through education, partnerships, and through legislation. We will also continue to develop risk assessment to help prevent pollution and play a part in town and country planning processes.

For 40 years, the life of the Thames has been changed by investments in sewage treatment and tighter controls on industrial discharges. However, London's water quality is still under threat from the city's high population density and water demand. Some regulated sewage and industrial effluent still causes pollution, while run-off from roads, airports and other industrial processes are more difficult to address.

The capital is so built-up that its sewage system cannot cope with the extra flows caused by even moderate rainfall. Just a few millimetres of rainfall over London generates millions of tonnes of run-off water which can overload sewage systems and lead to storm sewage discharges from any of the 70 combined sewage overflows – situated between Chiswick and Barking, and on Thames tributaries – which serve the city. Sewage overflows damage the appearance of the Thames with waste, rubbish, and even faeces.

Reduced river flows and higher temperatures during summer months make sewage overflows potentially much more damaging, as they reduce the level of oxygen in the Thames. However, the Environment Agency has helped develop measures to ensure that oxygen levels in the river remain high enough to support fish life. The Thames Bubbler and Thames Vitality boats, for example, oxygenate the river and reduce the impact of combined sewer overflows. Such proactive measures were developed after a major fish loss in the summer of 1986. No major fish kills have been reported since.

Specific measures are being introduced to monitor and develop storage solutions for the five most problematic combined sewage overflows before 2005. In the meantime, the Agency, in partnership with Thames Water, is producing a strategy to deal with London's sewerage system. However, the costs of the scheme will require support from the GLA and central Government.

Most of London's tributaries to the Thames also suffer from the impact of storm sewage and urban run-off. Watercourses such as Wealdstone Brook in north London and the Ravensbourne in south London have been polluted in this way. In some parts of London domestic waste systems that have been wrongly connected to surface water sewers are polluting smaller rivers.

Surface water outfalls, which often contain concentrations of suspended solids – almost the same levels as raw sewage – are also damaging London's rivers and are a major source of complaints. Although most sewage discharges are agreed and regulated by the Agency, some unregulated trade effluent is still discharged into surface water systems and is a major problem in summer months. The Agency continues to work with water companies to monitor, identify and prosecute those responsible.

The Agency is developing a series of water quality monitoring programmes across the capital to solve specific problems and allow effective water quality management and effluent surveillance. The 'Big Stink' of 1856 must not be allowed to return.

Good practice example

Automatic quality monitoring stations have proved to be an efficient and cost-effective way of monitoring water quality on the Thames and its tributaries – particularly on the most sensitive reaches of the tidal river between Kew and Purfleet. Data on dissolved oxygen levels, temperature and conductivity is recorded at eight sites every 15 minutes, enabling the Thames Bubbler and Thames Vitality to be launched within minutes to protect the quality of the Thames and the lives of its fish.

Further reading

Thames Tideway and Estuary factfile – Teddington to Shoeburyness, 1997.

The water quality of the Tidal Thames: a report of the Environment Agency, 1997.

Creating a greenprint for London is an agenda for partnership. London's environment is everyone's concern. Cooperation and positive partnership initiatives highlight the importance of ensuring that the environment is considered alongside social and economic factors. By working together, we can achieve a city of which we are all proud. Everybody needs to be more aware of the effects our lifestyles have on London's environment. We need to continue to educate and raise perceptions in order to put pressure on, and encourage, those who can make a difference.

Creating a Greenprint for London shows how this can be done, and underlines the Environment Agency's commitment to a first-class environment for a world-class city.

PART FOUR

Working together towards a more sustainable London



Statutory duties and responsibilities of the Environment Agency

The wide-ranging duties, powers and interests of the Environment Agency are laid down in the Environment Act 1995, the Environmental Protection Act 1990 and other legislation. They include specific powers and duties concerning water resources, flood defence, pollution prevention and control, waste regulation, fisheries and navigation. In the case of air pollution and the decontamination of land, the Agency shares a role with local authorities.

The Agency also has a general duty to promote, conserve and enhance the natural beauty and amenity of inland and coastal waters. This duty includes the conservation of flora and fauna, which depend on an aquatic environment and the supervision of the recreational use of inland waters. The Agency has a general duty to take into account archaeological and heritage issues when carrying out its work. It has an overarching duty to make a positive contribution towards achieving sustainable development and to balance costs against benefits in all its activities.

The Agency is a statutory consultee under the Town and Country Planning Acts. This role continues to provide opportunities for close partnership with local authorities, the development industry and environmental organisations, and as a result helps the Agency in the implementation of many of its policies and programmes.

Help and support from the Environment Agency

The Environment Agency works in partnership across a wide range of issues in order to achieve more sustainable patterns and forms of development in London. The Agency provides information, support and expertise to others, as well as undertaking its own environmental improvement projects, research studies and publication of advisory documents.

Implementing Regional Planning Guidance for London

The Government issues Regional Planning Guidance (RPGs) to guide planning authorities in their preparation of development plans, and in making decisions on planning applications. Close working relationships with the GLA, the Government Office for London, the riparian London boroughs, the London Rivers Association and the Port of London Authority are vital to ensure that a suitably integrated and consistent planning approach is adopted to environmental issues facing London. In March 1998, the Environment Agency produced a strategy for land-use planning in the Thames Region, 'Thames Environment 21'. This promotes the key environmental issues that the Agency wishes to see addressed through the land-use planning system in the Thames Region, and indicates the enhancement and mitigation measures that are required from developers.

London boroughs' unitary development plan reviews

Environmental appraisal techniques will help the London boroughs make decisions about the location and design of future development. This process can be used to assess the potential effects of planning policies and the impact of individual development proposals on the environment. The Agency has data and information that can help the boroughs in this process, and in monitoring the effectiveness of their policies.

Community based decision-making and Local Agenda 21 (LA21)

LA21 groups are voluntary organisations that seek to carry forward the decisions of the 1992 Rio 'Earth Summit' in local communities. The Agency's involvement with local decision-making is a responsive role but we can assist local initiatives by providing environmental information. In September 1998, the Environment Agency published a 'State of the Environment Report for the Thames Region'.

Local Environment Action Plans (LEAPs)

The Agency produces LEAPs to deal with a wide range of environmental management issues at a local level. They result in action plans for tackling problems in a practical way, often involving a wide range of partners. The Agency carries out widespread consultation with all local groups with an interest in the environment in the preparation of these action plans.

Waste management strategies and planning

The Agency has been given a key role in implementing the Government's White Paper 'Making Waste Work'. The Agency wishes to encourage local community and industrial waste management schemes that promote methods which are higher in the waste management hierarchy. There are opportunities for the Agency to work with waste planning, disposal authorities and businesses in achieving these aims. It will also work closely with the GLA and SERPLAN in the preparation of London and region-wide waste management strategies.

Air quality strategy

Responsibility for local air quality management rests with London boroughs. The National Air Quality Strategy (NAQS) sets out the basis for implementing action at a local level. It includes statutory targets that must be met for a number of substances. In addition, the European Commission has issued Directives containing limit and guide values for some of the principal air pollutants to which people are exposed. Under the Environmental Protection Act 1990, the Agency is responsible for licensing emissions from the most technically complex and potentially most polluting industrial processes. Since 1991, the Agency and its predecessor bodies have regulated many processes in London and its outskirts. Many of these have now significantly reduced their effect on the environment, especially air. The Agency can work with the boroughs by providing information and technical experience to help implement the NAQS. The Agency will consider how the processes it regulates in London and along the Thames Estuary

(particularly power stations and oil refineries) affect air quality. Nitrogen dioxides and sulphur dioxide are likely to be the substances of most interest. The Agency will work with the boroughs to reduce levels of carbon dioxide emissions from power stations and oil refineries along the Thames Estuary.

Open spaces in London

London Planning Advisory Committee (LPAC) is carrying out a study to audit and assess the function and value of open spaces in London. The study will inform the new GLA, which will be faced with pressure for the development of new sites. The Agency will assist LPAC and the boroughs in carrying out this study.

A first-class environment
for a world-class city
— by working together we can make
our nation's capital one of
which we can be truly proud.

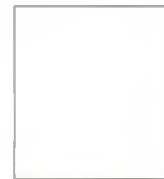


LONDON FACING THE ENVIRONMENTAL FACTS

- Each year London produces 13.5 million tonnes of waste, that's the equivalent of two tonnes for every man, woman and child living in the capital.
- The number of cars on London's roads is predicted to double over the next 25 years. Road transport is currently responsible for 90% of London's air pollution.
- A major flood in London could cost the UK £30 billion in damages alone.

The Environment Agency is working with key organisations in London to create

A FIRST-CLASS ENVIRONMENT FOR A WORLD-CLASS CITY





**ENVIRONMENT
AGENCY**



CHOKED?

The number of cars
on London's roads
will double over the next 25 years.
Road transport is currently responsible
for 90% of London's air pollution.


EA Thames



WASTED?

Each year London

produces 13.5 million tonnes of waste,
that's the equivalent of two tonnes for every
man, woman and child living in the capital. South East
England is running out of space to dispose of waste;
early in the next millennium, space could run out completely.



DROWNED?



ENVIRONMENT
AGENCY

A major flood in London could cost the UK £30 billion in damages alone. Disrupted telecommunication and transport systems could rob the city of its dominance as Europe's financial centre.

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— Area Administrative Boundaries

— Regional Boundary

● Area Office

▲ Regional Headquarters

Floodcall is a 24-hour recorded information service providing details of flooding across England and Wales. All calls are charged at local rates.

ENVIRONMENT AGENCY
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www.environment-agency.gov.uk

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



**ENVIRONMENT
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