



## FLOOD DEFENCE FACT FILE 2/9

*“Our first job is to reduce the risk of flooding. To do that, we continue to improve our defences and advise against development on land liable to flooding. When flooding looks likely, we give urgent warnings to those at risk - and work to limit the damage.”*



**ENVIRONMENT  
AGENCY**



# the environment agency

*"The Thames Regional Flood Defence Committee is especially important in our work because it has direct executive responsibilities for Flood Defence activities in our Region. Its members are drawn from outside organisations, most of them local authorities. Meetings of this Committee are open to the public."*

The Environment Agency for England and Wales is one of the most powerful environmental regulators in the world. It provides a comprehensive approach to the protection and management of the environment, emphasising prevention, education and vigorous enforcement wherever necessary. The Agency's creation on the 1st April 1996 was a major step, merging the expertise of the National Rivers Authority, Her Majesty's Inspectorate of Pollution, the Waste Regulation Authorities and several smaller units from the Department of the Environment.

## Thames Region

England and Wales are divided into eight Environment Agency regions. Thames Region is responsible for the protection of a 13,000 square km area of great diversity. The Region extends from Cirencester in the west to Southend in the east and from Luton in the north to the Surrey Downs in the south. Because this area contains a fifth of the nation's population, development pressures and demands on natural resources, particularly water, are greater than elsewhere in England and Wales. Thames Region is subdivided into three operational areas (West, North East and South East) which are the first point of contact for local issues.

Flood Defence, the subject of this leaflet, is one of our key responsibilities. The others - Conservation, Water Resources, Fisheries, Navigation, Recreation, Waste Regulation, Integrated Pollution Control and Water Quality - are covered in separate leaflets.

In reality, we can't take these responsibilities separately. Whatever we do must be done in the context of the whole catchment.

This means that the work of one specialist department is best carried out in collaboration with all the others. (So it's a good idea to read all the leaflets, and not just this one. In that way you'll get a better understanding of what we are trying to do.)

This collaboration extends well outside the Environment Agency. In Flood Defence, for instance, we work closely with all the other organisations concerned with flood defence, including:

- **Ministry of Agriculture, Fisheries and Food (MAFF).** The Ministry is responsible for determining national flood defence policy. It is also responsible for appointing the Chairmen and some members of Regional Flood Defence Committees. These Committees work closely with Environment Agency Regions. They may also set up local flood defence committees.
- **Local Authorities.** They have powers to carry out work on smaller watercourses under our general supervision. Our liaison with local authorities is critical in preventing new flood risks from being created - or

extended - as they control future building developments. Local authorities also have an important role in responding to emergencies. And they supply, from the council tax, much of the money needed to pay for flood defence.

- **The Police.** The Police headquarters receive flood warnings from the Thames Region flood warning centres, for onward transmission to the other emergency services. During a major incident, the relevant Police force will act as the co-ordinating authority.
- **The Meteorological Office** operates the weather radar network and gives warning of the onset of severe weather likely to cause flooding. Through its Storm Tide Warning Service (sponsored by the Ministry of Agriculture, Fisheries and Food) it also forecasts tidal surges.
- **Research Centres,** including those at universities, provide scientific information and insights to help us meet our flood defence challenges.

As always we can rely on the public to give us all the help they can - not least by being generally supportive of our efforts. Individual members of the public are of enormous help in giving us prior warning of flood problems, either imminent or long term. They are our eyes and ears. We continue to receive great help from the news media in alerting people to flood dangers and how they can be tackled.

## The size of the problem

Teddington weir is where the Thames becomes Tidal.

On a typical summers day, about 3000 million litres of fresh water will pass over it.

On a typical winter's day, the quantity will be at least four times as great, perhaps eight times.

But in the winter of 1947, the peak flood flow at Teddington was 61,698 million litres a day, nearly three times that of a typical winter's day and 20 times more than on a typical summers day.

The problem is made much worse when flood water from upstream meets a high surge tide coming up from the Thames Estuary.

## London exists - how do we defend it

Over the years, a comprehensive flood prevention strategy has been developed and implemented.

The Thames Barrier is the central feature. Stretching the 520 metres across the Thames at Woolwich, the barrier can hold back the incoming tide completely. Land downstream of the barrier is protected by about 32 kilometres of embankments and flood gates.

We can predict the height of incoming tides up to 12 hours before they actually arrive. To do this, we get continually updated weather

information from the Meteorological Office and details of the height of incoming tides from automatic recorders in Scotland and down the east coast of England.

We aim to close the Barrier about four hours before the danger high tide reaches it. Closure takes about 30 minutes. Before we close it, we tell the navigation service of the Port of London Authority, who in turn alert all shipping.

The Barrier took eight years to build - from 1974 to October 1982 when it became operable. It was first used in anger in February 1983, and was officially opened by H.M. The Queen on May 8, 1984.

The final cost, including all the associated flood defence works, worked out at well over £500 million. Three quarters of the money came from central government, the rest from the relevant local authorities. Operating and maintenance costs approach £4 million a year.

These are all vast sums. But the cost of just one flood in central London would be hundreds of times higher. The cost in human terms would be incalculable.

## Upstream safety

To protect London's upstream suburbs when high freshwater flows down the river meeting incoming high tides - but which are not high



enough to justify the use of the Barrier - river bank defences upstream from Putney on the south side and from Hammersmith on the north have been strengthened.

Riverside walks, open to the public, were constructed as part of the overall project.

Both regionally and nationally the Environment Agency encourages the development of information technology that will make it easier to forecast floods accurately and to alert the public more quickly.

In Thames Region in addition to the vital information received from the Meteorological Office, we use a flood forecasting and warning system for the non-tidal rivers that is particularly suited to our needs. The system called 'CASCADE' was developed in the region by the former National Rivers Authority and its predecessor authorities.



The CASCADE system works by gathering data from a network of telemetered river gauges and river level gauging stations. The telemetry facility maintains a constant and automatic check on water levels at strategic points on our rivers. Information about rainfall is also received from the London weather radar at Chenes in Buckinghamshire, and the national radar network. The London Weather Centre also supplies warnings of heavy rainfall and longer term weather forecasts.

The CASCADE system is used across the region and operated from Flood Warning Centres. Information is presented to duty staff on terminals at the centres, and the duty officers can also access the system from home. The Region is thus able to monitor the development of potential flooding events on a 24 hour basis, and give early warning to those who might be affected.

### A day in the life ...

Floods hit the headlines. The day-to-day work of our Flood Defence Inspectors rarely does. Yet without it, the risk of flooding - and of more 'flood crisis' headlines - would be greatly increased.

Our inspectors each have responsibilities for a particular catchment area, or part of one - perhaps as many as 600 kilometres of river each. They will aim to walk along the whole distance at least once every two years. Many stretches are visited every week - or even more often. Not surprisingly they come to know their rivers very well indeed. They know which stretches need special, even constant attention. By concentrating on these danger spots, they make best use of their time.



On a typical day, in addition to this river patrol, an inspector will keep appointments with a number of landowners, people whose property lies on or near a watercourse. All of them will have a specific problem to discuss. For instance ... the secretary of a golf club may think there's a risk of flooding on part of the course ... a farmer may want to put in extra drainage on part of his land ... an angling society asks what can be done about bank erosion.

Then there are the many small scale emergencies - a householder rings up about a sudden flood in his garden ... a tree has fallen across a stream causing serious obstruction ... the bank of a ditch has caved in. They all need prompt attention by the inspectors.

In addition they must supervise routine work on and around the rivers under their charge. Routine work includes dredging, keeping the channel clear, and maintenance,

not only of the banks but of all the man-made structures, including weirs and locks.

Inspectors, because of their unique familiarity with the river, have special responsibilities in assessing when major works are needed, and the form they should take. This part of their duty - to consider the long term - is quickly described but vitally important. Looking after our rivers certainly calls for careful day-to-day work. But the inspectors have to take the long view as well.

### Standby for action

We have fully equipped and trained flood defence teams on stand-by at offices around the Region. In emergencies they can be quickly mobilised. Their tasks then are to keep all river channels free of obstruction to allow flood waters to escape, and to cooperate with

the Police, Fire, Rescue and other emergency services who will also be involved.

If there is a risk that river flooding could occur, the Flood Warning Team issue colour-coded warnings to the public, emergency services, local authorities and other organisations in the area to be affected.

A yellow warning means that some low lying farm land and roads near rivers may be flooded; an amber warns of flooding to isolated properties, roads and large areas of farm land; and the most widespread flooding is indicated by a red warning which means that many properties, roads and large areas of farm land may be affected.

The teams are also called on to help with other emergencies on or near the river, where their knowledge and experience of river conditions are particularly valuable.

You can find out about any flood risk to your area by:

- phoning **FLOODCALL (0645 881188)** the Agency's 24-hour recorded information service (all calls are charged at local rates).
- listening to weather bulletins on your local radio station and regional television station.
- checking the regional weather pages on Teletext, on ITV page 105.

If you live near a river, you should be aware of how flood warnings will be issued and know what to do if a flood ever occurs.

Being prepared helps you to protect yourself, your family and your most valued possessions from the harm that flooding can cause.

### An artist's impression of the Maidenhead, Eton and Windsor Flood Alleviation Scheme



## Minimising the risk

"We gather data which helps us to define flood plain areas at risk from river or tidal flooding in our Region."

In Thames Region, flood defence is an important part of the Environment Agency's business, accounting for nearly half our expenditure and our workforce.

We have four principal duties:

1. We must be aware of possible new building developments on land liable to flooding and alert local planning authorities of the risks.

- removing reeds and weeds that could also cause blockages.
  - dredging watercourses to remove the build up of silt.
  - making sure that sluices, pumps, weirs and other essential structures work properly.
3. We have to assess where new flood defence works are needed - then design and build them. This could involve: strengthening river walls and embankments, realigning water courses, digging flood relief channels and building new weirs and sluices.

## Down from the heavens, in from the sea

The Thames Estuary is particularly vulnerable to flooding - for a combination of reasons. The southeastern corner of the British Isles is slowly tilting downwards and sea levels are rising. As a result, the height of high tide in central London is rising at a rate of about 75cm per century.

There is another reason, more potent than the others. When a depression of low pressure, perhaps hundreds of miles across, moves eastwards across the Atlantic towards the British Isles, it raises the level of seawater



We gather data which helps us define flood plain areas at risk from river or tidal flooding in our Region. Our specialists are continually carrying out studies to give us a better understanding of why floods happen and how their effects can be minimised.

This task is made more complex by the changing pattern of land use - which is why our advisory role in new building development is so critical.

2. We carry out works to maintain rivers in good condition. These include:
  - removing obstructions. (The photograph to the right shows rubbish removed from a watercourse in Thames Region).
  - cutting back dead or dying trees that might fall and block the channel

4. We are committed to providing effective flood warnings and emergency services. These are perhaps our highest profile tasks - they are often the ones that make the biggest impact on the news media.

## Eye on the environment

At all times, and in whatever we do in flood defence, we keep a firm eye on the needs of wildlife and of the environment as a whole. This is not just a negative, no harm approach. The aim is to enhance the environment as we build better flood defences. Working with our conservation specialists, we take every opportunity to create new wildlife habitats as well as preserve existing ones.

beneath it by up to a third of a metre. If this 'plateau' of seawater passes north of Scotland and then down into the comparatively shallow basin of the North Sea, perhaps further heightened by strong winds from the North, it can cause excessive high surge tides in the Thames Estuary of up to four metres, leading towards London.

When a surge tide also coincides with a high 'spring' tide (which occur twice monthly), flooding becomes a serious possibility.



### The complete solution is impossible!

The complete solution to flooding might be to abandon any land liable to flooding. Rivers can then do precisely what they like without harm to human beings or their property.

But that's impossible - and undesirable. On the other hand total flood prevention is not economically viable. The best we can do is to discourage, as far as possible, any new buildings on threatened land. In the Environment Agency, we are vigilant in

keeping a check on any proposed developments. We advise planning authorities about flooding dangers, and encourage the development of sites away from high flood risk areas. We also assess the other demands new developments make on the environment. For instance, new housing estates need water - which our water resources management has to provide. There may additionally be implications for wildlife conservation. An example of how our functions work together with Flood Defence

is shown (previous page) in the Maidenhead, Windsor and Eton Flood Alleviation Scheme Plan. On completion the scheme will protect an area prone to severe flooding, support a habitat for wildlife, enhance the local environment and provide an amenity for all to enjoy.

We manage our different functions in an integrated way - and that is to everyone's advantage.

## MANAGEMENT AND CONTACTS:

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

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

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

**ENVIRONMENT AGENCY  
GENERAL ENQUIRY LINE**

**0645 333 111**

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

**ENVIRONMENT AGENCY  
EMERGENCY HOTLINE**

**0800 80 70 60**



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