Managing flood risk in the Lower Lee catchment, today and in the future

We are the Environment Agency. We protect and improve the environment and make it a better place for people and wildlife.

We operate at the place where environmental change has its greatest impact on people's lives. We reduce the risks to people and properties from flooding; make sure there is enough water for people and wildlife; protect and improve air, land and water quality and apply the environmental standards within which industry can operate.

Acting to reduce climate change and helping people and wildlife adapt to its consequences are at the heart of all that we do.

We cannot do this alone. We work closely with a wide range of partners including government, business, local authorities, other agencies, civil society groups and the communities we serve.

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Foreword from Caroline Douglass

North East Thames Area Manager

We have adopted a strategy for managing flood risk in the Lower Lee catchment. The strategy looks ahead for the next 100 years and makes recommendations for short, medium and long term measures to manage the flood risk in the catchment. This document summarises our recommended approach. It also explains who is responsible for flood risk management and the different funding sources available.

Over the past sixty years a large number of measures have been put in place across the catchment to reduce the risk of flooding across the Lee valley, in particular the Lee Flood Relief Channel. Without maintenance, the Lee Flood Relief Channel protects 6000 properties with a 1% chance of flooding. If maintenance is continued, this protection would increase to 13,000 properties. Our recommended new measures in this strategy would protect a further 1000 properties in the catchment.

Whilst we have identified ways to improve flood protection in some areas, over 5,000 properties would remain at risk of flooding, even after our recommendations are carried out. A further 3200 properties will become at risk due to predicted climate change. We cannot protect every property at risk of flooding. In some cases, the cost outweighs the benefits. In other cases, we may not be able to find a practical solution (for instance, we would not want to simply move the risk downstream). Flooding is a natural process that we cannot prevent entirely. Climate change and urban development will affect the likelihood and consequences of flooding in the future.

We can reduce flood risk and the impact of flooding through changing behaviour and careful planning of development, as well as through structural defences. In some cases, therefore, we have proposed non-structural approaches to managing flood risk, such as individual property protection measures (flood-proof air bricks and doors for example) and sustainable development in the right places.

In preparing this strategy we have:

- Decided to continue to maintain and operate our existing system of flood defences in the Lee valley;
- Identified locations in Waltham Abbey and Edmonton where we can take action to reduce flood risk (support from communities and other bodies will be necessary to implement further schemes elsewhere);
- Identified other locations where we can potentially take action to reduce flood risk, and which we plan to investigate further;
- Determined that the careful consideration of flood risk in new development, especially redevelopment, has an important part to play in improving the resilience of communities to flooding in the future.

Although this strategy sets out how we intend to manage fluvial flood risk in the Lower Lee catchment, its approval does not guarantee funding to carry out that work. Future projects in the catchment might be funded from a combination of sources including central Government, local authorities and contributions from others, including the direct beneficiaries of fluvial flood risk management schemes. To help us to do more to manage fluvial flood risks, we will look for contributions from all who will benefit the most from our work. Contributions would support new projects and changes to services we provide, such as changes to our flood warning service.

Why you should read this document

Lead local flood authorities

Our strategy will inform the various London borough councils and two county councils that are the lead local flood authorities in the Lower Lee catchment. It will also help other organisations, such as Natural England, to understand what effect our proposals may have on the local environment.

Developers and local authority planning & development control

Our strategy will be a key consideration in our discussions with local authorities on planning and development control issues in the area. It should also be used to inform local planning and policy.

Communities and businesses affected by flooding

Our strategy identifies those areas where we hope to act to reduce the risk of flooding in the next ten years. It also identifies those where we cannot justify anything other than maintaining existing flood risk management assets. There are measures that home owners and business owners who remain at risk can take to reduce the impact of flooding on them.

River Lee Nav Stantead Abbotts

Contents

Summary of the strategy's development and of our proposals

Introduction

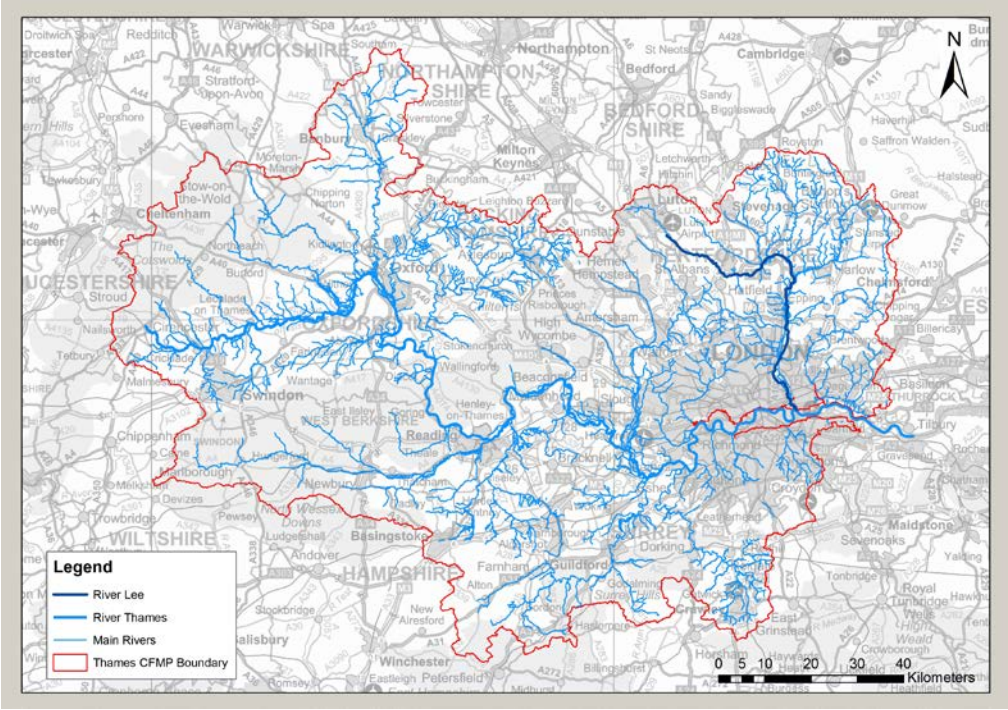
We have reviewed how we manage fluvial flood risk, the flood risk associated with rivers, in the Lower Lee catchment. Our recommendations for management actions now and over future decades have been identified by the Lower Lee Flood Risk Management Strategy that was finalised in 2011. We consulted on the proposals with local authorities and other bodies, and made them available to the public, and the ideas and responses that we received were incorporated into our final proposals.

Through this strategy we now identified ways to maintain fluvial flood protection for 5,920 homes and businesses. We have also identified ways to reduce the risk to a further 973 homes and businesses that are currently at risk from fluvial flooding as well as assets such as the M25, other major roads, and schools. This document describes the main fluvial flood risk issues, the investigations that we undertook, and the conclusions of those investigations that led to the final strategy recommendations.

Our strategy preceded the work by local authorities on local flood risk management plans associated with surface water, the drainage of rainfall, and groundwater. However, we were careful to ensure that our proposals could feed into their development of Local Flood Risk Management Strategies, required under the Flood and Water Management Act 2010, and future revisions to Surface Water Management Plans and Strategic Flood Risk Assessments.

Some of the proposed schemes in this strategy will receive partial funding from Government. This is determined by how much flood risk is reduced to properties in these proposed schemes. In some instances, the estimated costs of proposed schemes exceed central Government funding available. We will therefore require further contributions in order to deliver new flood alleviation schemes. These could come from private, public and voluntary organisations, local authorities and the communities who will benefit most from the schemes in the strategy area.

Regional guidance for the Thames catchment



Thames CFMP area with River Lee highlighted in dark blue

Regional guidance for managing flooding in the Thames catchment is set out in the 2009 Thames Catchment Flood Management Plan (CFMP)(see http://www.environment-agency.gov.uk/research/planning/127387.aspx). This considers all types of flood risk (including rivers, surface water/drainage and groundwater) in the Thames catchment and sets out policies which will lead to sustainable, long-term flood risk management.

The Thames CFMP's vision for managing flood risk in the Lower Lee catchment is:

- To maintain existing flood defences whilst they continue to be effective
- To reduce, where possible, future costs for maintaining defences by adapting them, e.g. replacing moveable structures with fixed structures such as weirs.
- To see local authorities working with us to achieve a common understanding of future land use within the floodplain, to achieve a net reduction in flood risk from redevelopment, in line with national planning policy.
- To raise public awareness of flooding and what they can do to be better prepared.
- To bring about a growing proportion of housing that is resilient or resistant to all forms of flooding.
- To respond to climate change by ensuring that the natural floodplain retains its potential to store floodwater.

Our Proposals

The strategy considered in detail how to implement the CFMP's agreed policies for fluvial flooding. It provides a basis for implementing these policies specifically in the Lower Lee catchment. When developing the strategy we also took into account:

- The need to consider options for the long term (100 years)
- The impacts of implementation on the natural environment
- Responses to our consultation carried out between 2006 and 2010
- The predicted future effects of climate change that increase flood risk

The River Lee catchment and Lower Lee Strategy study area

The River Lee catchment and Lower Lee Strategy study area.

In summary, we are recommending the following actions

- Maintain, refurbish and replace existing flood defences
- Urgently develop new areas for storing flood water to protect parts of Waltham Abbey (Cobbins Brook, completed in 2010) and Enfield / Edmonton (Salmons Brook, started in 2013)
- Investigate the feasibility of additional flood alleviation schemes that will improve flood protection in Upper Edmonton (Pymmes Brook), Chingford (Ching Brook), Leyton (Dagenham Brook & Lower Lee) and Lower Nazeing (Nazeing Brook), and seek contributions to the cost of the schemes where appropriate.
- If flood risk increases in the future with climate change, as predicted, promote additional flood alleviation schemes along the Lower Lee at Chingford, and at Turnford (Turnford Brook) and Hoddesdon (Woolens Brook).
- Manage flood risk through influencing development planning, expanded flood monitoring and warning services, and promoting individual property-level flood protection measures.

These recommended actions are explained further in the rest of this document.

Lower Lee Catchment Overview

The River System

From its source in Luton the River Lee and its tributaries drain a large rural area of Hertfordshire and parts of neighbouring counties, Essex and Bedfordshire, before passing through a densely populated part of North London as it flows for 80km towards the River Thames at Bow Creek. The Lower Lee is defined as that part of the catchment between Hoddesdon in Hertfordshire and Newham in London. Here, the river flows through an increasingly urban environment and the major settlements of Hoddesdon, Waltham Abbey, Enfield, Edmonton, Tottenham, Walthamstow, Chingford, Hackney and Stratford.

The main tributaries in the Lower Lee catchment are Nazeing Brook (Lower Nazeing), Turnford Brook (Turnford / Cheshunt), Cobbins Brook (Waltham Abbey), Salmons Brook (Enfield and Edmonton), Ching Brook (Chingford), Moselle Brook (Tottenham) and Pymmes Brook (East Barnet and Edmonton).

The waterways in the Lower Lee valley include the River Lee Navigation, Old River Lea, and the Lee Flood Relief Channel (FRC). The FRC is a largely artificial watercourse, built between 1949 and 1977. It is designed to carry flood water to reduce the likelihood of flooding in the valley. Water levels in the FRC, Navigation and the river are controlled by a system of weirs, gates and sluices. These maintain water levels for water supply, water treatment, navigation, amenity and wildlife purposes while allowing flood flows to pass during storm events. When first operational the FRC removed 13,000 properties from a 1% chance of flooding in any year. The strategy also covers the FRC from Hoddesdon to its start further north in Ware.

The Flood Relief Channel near Coppermill Lane, Walthamstow

Waterway Uses

In addition to significant flood risk management, there are important uses of the river for:

- **Water supply for 10% of London's population**. There are 13 major reservoirs in the Lower Lee valley between Waltham Abbey and Walthamstow, and a water treatment works at Coppermill Lane, Walthamstow. The FRC contributes to the water supplies for many of these. The reservoirs, treatment works, and supplies to them are owned and operated by Thames Water Utilities.
- **Treated sewage discharges**. There are regionally important sewage treatment works at Rye Meads in Hoddesdon and Deephams in Edmonton. These discharge into the Lee Navigation and Salmons Brook, respectively. They are owned and operated by Thames Water Utilities.
- **Boat movement**. The Lee Navigation is an historic navigation constructed on its current route under a 1767 Act of Parliament. It is owned and operated by the Canal & River Trust with some Environment Agency owned by-pass sluices and weirs to allow the passage of flood flows.

Recreational boats on the Lee Navigation

- **Recreation**. The Lee Valley Regional Park extends from Ware in Hertfordshire along the Lee valley to Stratford. It includes recreational, heritage and conservation facilities, the River Lee Country Park, Lee Valley Marina, Walthamstow Nature Reserve, Lee Valley Leisure Complex & Campsite and Rye House Gatehouse.
- **Environmental interests, including internationally important Special Protection Area (SPA) and Ramsar sites for wildlife**. The valley is particularly valuable for its aquatic and wetland habitats and associated birds. Most of these are dependent on maintaining existing water management levels.

Cornmill Stream and Old River Lea Site of Special Scientific Interest

We have taken all of these uses into consideration when identifying proposals for managing fluvial flood risk in the catchment. These are important co-uses of the river system which can only be addressed through a partnership approach. For example, the management of lengths of channel which are owned and operated by Thames Water Utilities or the Canal & River Trust also serve a function to contain and convey flood waters. The following section makes a more detailed consideration of partnership requirements for advancing our strategy proposals.

Responsibilities and partnership funding for flood risk management

Responsibilities for flood risk management

In April 2008 the Environment Agency became responsible for overseeing the management of all flood risk in England. Subsequently, the Flood and Water Management Act 2010 has provided a national framework for local communities to lead the development of local partnerships and solutions to the flood risks they face.

Responsibility for flood risk management rests with a number of authorities (including sewerage companies and highways authorities). County or unitary councils take the lead for local flooding issues (known as Lead Local Flood Authorities), and the Environment Agency is responsible for managing flood risk from rivers and the sea.

The Thames Regional Flood & Coastal Committee (RFCC) provides democratic oversight of flood risk management work in the Thames catchment area, which includes the Lower Lee, and has local government Councillors and Defra appointed members.

A new national strategy for flood risk management has been developed (http://www.environment-agency.gov.uk/research/policy/130073.aspx), and requires the responsible authorities to co-operate with each other and to work consistently to achieve the targeted benefits. Lead Local Flood Authorities are responsible for developing Local Flood Risk Management Strategies for their area in line with the national strategy. Further information on the national strategy for England and supporting guidance is available from the our website www.environment-agency.gov.uk

Riparian Owners

Riparian owners have certain responsibilities for the watercourse and structures on their land, including a responsibility to pass flow downstream without obstruction, and to accept flood flows through their land, even if these are caused by inadequate capacity downstream. The bed and banks of the watercourse must be maintained, and any debris must be cleared. Further details on the rights and responsibilities of riparian owners are available on our website (see http://www.environment-agency.gov.uk/homeandleisure/floods/31626.aspx).

Greenspace providing both recreation & flood storage function (Arnos Park, Southgate)

Funding for flood risk management

Although the strategy sets out how we intend to manage fluvial flood risk in the Lower Lee catchment, its approval does not guarantee funding to carry out that work.

Future projects in the catchment might be funded from a combination of three sources: a central Government grant to the Environment Agency; a fund from local authorities in the form of a local levy; and contributions from others, including the direct beneficiaries of fluvial flood risk management schemes.

Central Government grant funding is allocated nationally. Priority is given to those schemes that most cost-effectively reduce the flood risk to households and businesses, where flooding is a significant risk and likely to cause high economic damage. Environmental benefits of schemes are also considered.

As well as funding from Central Government, The Environment Agency can seek funding from county and metropolitan councils, unitary authorities and London Boroughs in the form of a local levy. The local levy is allocated by Regional Flood and Coastal Committees with similar priorities to central Government, and on issues of particular local concern.

Other sources of funding will need to be investigated, in line with new Defra guidance which promotes a partnership funding approach (see www.gov.uk/government/policies/reducing-the-threats-of-flooding-and-coastal-changefor more information). There are likely to be more potential schemes than the available funding in any year, so prioritisation is required to ensure the most effective use of the available resources. Contributions to schemes reduce the costs to the national and local taxpayer and can improve the cost effective use of public funds.

To help us to do more to manage fluvial flood risks, we will look for contributions from all appropriate partners including private, public or voluntary organisations, local authorities and communities who will benefit the most from our work. Contributions would support new projects and changes to services we provide, such as changes to our flood warning service.

Responsibilities in the Lower Lee catchment

Responsibilities for structures

There are 21 major weirs and sluices on the main FRC as well as numerous structures on connecting channels that influence flood flows in the Lee Valley. We own and operate 17 of these major structures, and three others are owned and operated by Thames Water Utilities or the Canal & River Trust. We also own and maintain 73 bridge crossings, including six railway bridges, most of which were constructed to allow the FRC to pass under existing roads and railways. The Lee Conservancy Catchment Board Act 1938 created a duty to maintain and operate the FRC, including a duty to compensate for any damage to pre-existing railway and reservoir assets. We have inherited these duties and liabilities from our predecessor bodies.

In order to maintain the operational efficiency of the Lee Flood Relief Channel and its structures we need to maintain the system regularly, including periodic replacement of the assets. Most of these structures were constructed from the late 1960s to 1977. While concrete structures are estimated to have a 100 year life from construction, and steel gates 50 years, mechanical and electrical system need refurbishment every 25 years. It is nearly 50 years since the first sluices were constructed and some are approaching the end of their service life. We have recently completed sluice gate replacement at Newmans Sluices near Enfield Island, and other works are envisaged in coming years.

David Stoker Radial Gates on the FRC near Enfield Island – an example of an Environment Agency owned structure

In addition to structures for which we have duties, other bodies responsible for assets in the Lee valley include Thames Water Utilities (reservoirs and their supplies, sewage treatment works), the Canal & River Trust and the Lee Valley Regional Park Authority. The Strategy area also has 20km of culverts owned by others that serve a significant flood risk management purpose. These will require short-term maintenance and longer-term major refurbishment and renewals.

Lea Bridge Road Sluices on the Lee Navigation in Hackney – an example of a flood risk management structure owned by the Canal & River Trust

Current and Future Flood Risk

How do we express flood risk?

The probability or likelihood of flooding is described as the chance that a location will flood in any one year. If a location has a 1.3% chance of flooding each year, this can also be expressed as having:

- a 1 in 75 chance of flooding in that location in any year
- odds of 74 to 1 against a location being flooded in any year

However, this doesn't mean that if a location floods one year, it will definitely not flood for the next 74 years. Nor, if it has not flooded for 74 years, will it necessarily flood this year.
When we describe the chance of flooding, we give it one of three descriptions or put it into one of three categories:

- Significant: the chance of flooding in any year is greater than 1.3% (1 in 75)
- Moderate: the chance of flooding in any year is 1.3% (1 in 75) or less, but greater than 0.5% (1 in 200)
- Low: the chance of flooding in any year is 0.5% (1 in 200) or less

The lower the percentage, the less chance there is of flooding in any one year; the higher the percentage, the more chance there is of flooding in any one year.

Where is at risk of flooding?

We publish a flood map showing areas at risk of flooding on our website at: http://www.environment-agency.gov.uk/homeandleisure/floods/default.aspx This is updated regularly as new information becomes available.

Flooding in Granville Avenue, Lower Edmonton, 2000

There were major floods in the Lower Lee valley in 1856, 1926 and 1947. Since the FRC became fully operational in 1977 there have been no major flood events along the valley itself, although the system almost reached full capacity in 1987, 1993 and 2000. The FRC was designed to protect against a fluvial flood in the valley with a 1.4% chance of occurring in any year, which was the estimated probability of the 1947 flood.

Due to changes in rainfall and run-off and additional development in the catchment since the 1970s, the level of protection has fallen, increasing the chance of floodingto an estimated 3.3% in places. However, the majority of the FRC still provides a 2% standard of protection. Overall, construction of the FRC, an additional channel down the Lower Lee, has been estimated to reduce the risk of fluvial flooding for about 13,000 properties to 1% or less. Its maintenance and operation continues to benefit approximately 6000 of these which otherwise would be re-exposed to a 1% chance of flooding in any year.

Some of the tributaries, particularly Pymmes, Moselle, Cobbins, Dagenham and Nazeing Brooks, have been placed in artificial channels or culverts for parts of their lengths. There is also a large area for storing flood water at Cheshunt North, protecting Turnford. The risk of fluvial flooding along these tributaries varies, but in some places is as high as 12%. In recent years there have been major floods on Salmons, Cobbins, Nazeing and Ching Brooks, most recently in 2000, with over 350 properties affected along these four rivers.

The strategy has identified that the areas with a low standard of protection (SoP), i.e. those below 2%, include The Chine area of Grange Park and Lower Edmonton (Salmons Brook), Nazeing (Nazeing Brook), Chingford (Lower Lee and Ching Brook), Enfield Island (Lower Lee) and Walthamstow (Lower Lee and Dagenham Brook). Until 2010 Waltham Abbey (Cobbins Brook) was also one of these areas, but a new flood risk management scheme was completed in 2010 to improve the situation there to a minimum 2% SoP.

The new flood storage embankment on Cobbins Brook upstream of Waltham Abbey

How is flood risk changing?

Changing land use to less porous surfaces over recent decades has resulted in increased risk of fluvial flooding, as indicated by the declining standard of protection offered by the FRC. This trend of increasing fluvial flood risk is expected to continue into the future with the predicted affects of climate change, which include more severe storm events.

Along the FRC, the design standard of protection of 1.4% has already fallen to 3.3% in places and is likely to decline further as the predicted effects of climate change occur. Computer-based modelling has indicated that in the overall strategy area over 5000 properties are currently at risk in a 1% chance flood event. With predicted climate change more than 3,200 more properties will become at risk of fluvial flooding during the same scale flood event with a 1% chance of occurring in any year.

The problem of increasing flood risk would be exacerbated where new housing is built within the floodplain without suitable consideration of flood risk in its design. It would also become worse if existing flood management structures were not maintained, including their suitable replacement at the end of their service life.

Proposals for managing flood risk in the Lower Lee catchment

Introduction

This section presents a summary of our strategy proposals for managing fluvial flood risk in the Lower Lee catchment. The details for each river tributary, identifying the risk in each local authority area, are provided in the following detailed sections on a river-by-river basis.

Our immediate recommendations

The strategy identified measures needed in the next ten years:

- Continue maintenance of the existing FRC and associated structures
- Refurbish Newmans Sluices on the FRC, near Enfield Island [completed in summer 2011].
- Continue maintenance of the more limited flood defences along the tributary rivers, with refurbishment and replacement of these as they reach the end of their useful life.
- Implement a flood risk management scheme for Waltham Abbey along Cobbins Brook [completed in 2010].
- Implement a flood risk management scheme for Enfield and Lower Edmonton along Salmons Brook [started construction in 2013].
- Undertake detailed investigations of local flood defence measures for Nazeing (Nazeing Brook), Upper Edmonton (Pymmes Brook), Walthamstow/Leyton (Dagenham Brook) and Chingford (Ching Brook) and design and implement if justified.

The refurbished Newmans Sluices on the FRC near Enfield Island

For properties that remain at risk of fluvial flooding, individual property-level protection measures may be appropriate. These include removable boards across doors and air bricks to resist flood water entering, or installing concrete ground floors instead of wooden floorboards to minimise damage from flood water.

Just as importantly, the strategy identifies the benefits to communities throughout the Lower Lee catchment in the rigorous application of planning policy and the Thames CFMP to avoid inappropriate development in the floodplain. If new development or infrastructure within the floodplain is unavoidable, it should be resilient to flooding and not increase flood risk elsewhere. Surface water attenuation and SuDS (Sustainable Drainage Systems) should be included, where appropriate, in new developments.

More locally, measures to improve the flood warning service have been identified and implemented, specifically to provide improved flood warnings for Lower Nazeing (Nazeing Brook) and Chingford (Ching Brook).

Our long term proposals

Beyond the coming decade, recommended actions become less certain as they are largely dependent upon the realities of climate change and its effects. However, beyond 2020 we anticipate:

- The need to continue maintenance of the FRC and to replace nine of its sluices. Some reaches of the FRC will require refurbishment, which is likely to involve repairing the channel walls, replacing sheet piled banks, and other large refurbishment measures.
- The need to continue maintenance, refurbishment and replacement of defences along the tributary rivers.
- The need to continue to promote appropriate non-structural measures, such as improved flood warning and influencing development planning to minimise flood risk.
- Around 2025, we may need to implement local flood defence measures for Chingford (Lower Lee), Turnford (Turnford Brook) and Hoddesdon (Woolens Brook).

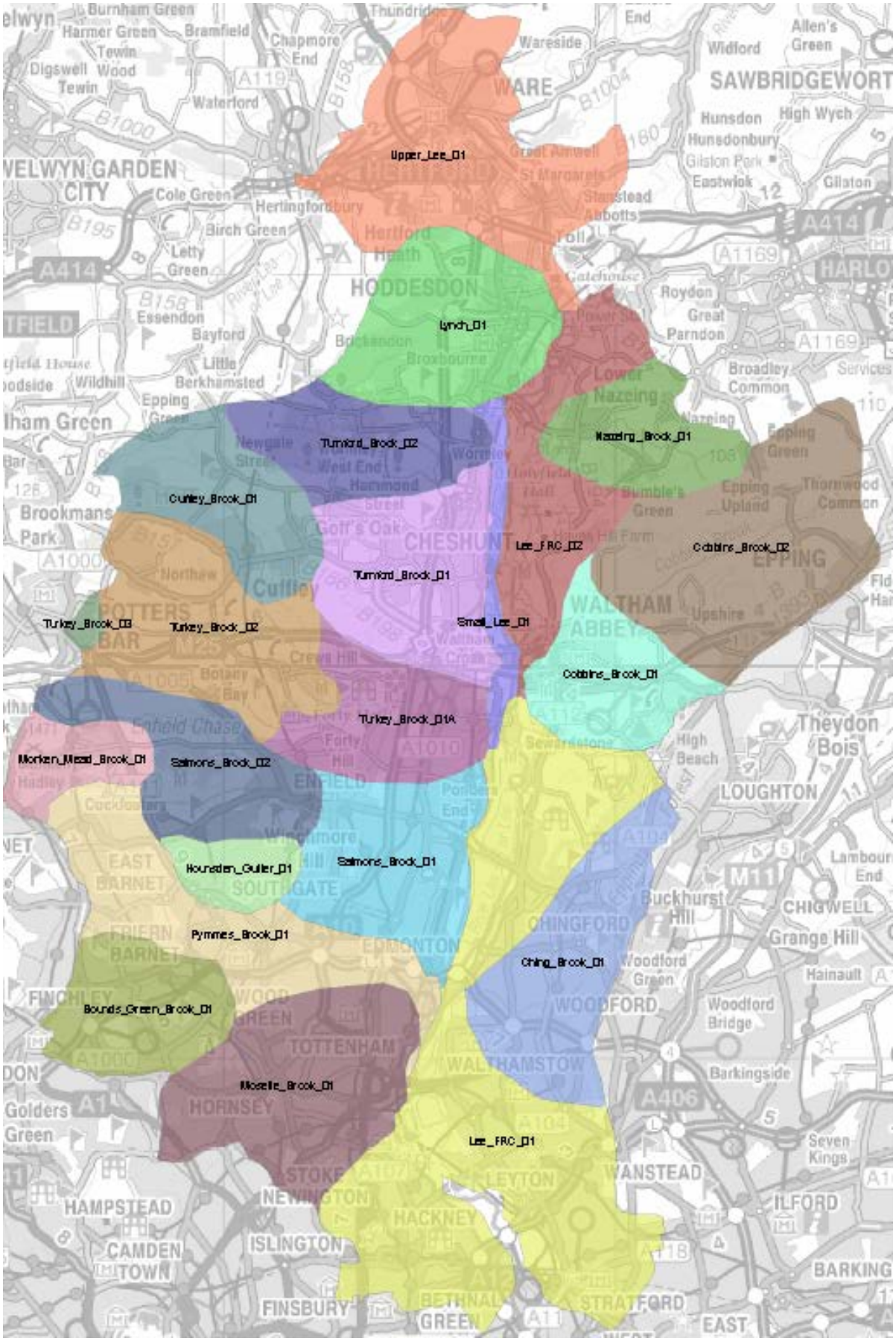
Detailed proposals

Introduction

The following sections summarise our specific proposals in each river sub-catchment running approximately from north to south, as follows (the Lee Flood Relief Channel, FRC, runs north-south through the centre of the catchment and is listed last):

- Upper Lee – within East Hertfordshire District, Hertfordshire
- Lynch Brook - within Broxbourne District, Hertfordshire
- Nazeing Brook - within Epping Forest District, Essex
- Cuffley Brook - within Welwyn Hatfield District and Broxbourne District, Hertfordshire
- Turnford Brook - within Broxbourne District, Hertfordshire
- Small Lee - within Broxbourne District, Hertfordshire, Epping Forest District, Essex, and London Borough of Enfield
- Cobbins Brook – within Epping Forest District, Essex
- Turkey Brook - within Hertsmere District, Hertfordshire, and the London Borough of Enfield
- Monken Mead Brook– within London Borough of Enfield
- Salmons Brook – within London Borough of Enfield
- Pymmes Brook – within London Boroughs of Barnet, Enfield and Haringey.
- Houndsden Gutter – within London Borough of Enfield
- Bounds Green Brook - within London Boroughs of Barnet, Haringey and Enfield
- Moselle Brook - within London Borough of Haringey
- Ching Brook - within London Borough of Waltham Forest
- Lee FRC - within East Hertfordshire District and Broxbourne District (Hertfordshire), Epping Forest District (Essex) and the London Boroughs of Enfield, Hackney, Haringey, Tower Hamlets and Waltham Forest

Each river catchment’s location is shown in the map on the next page.

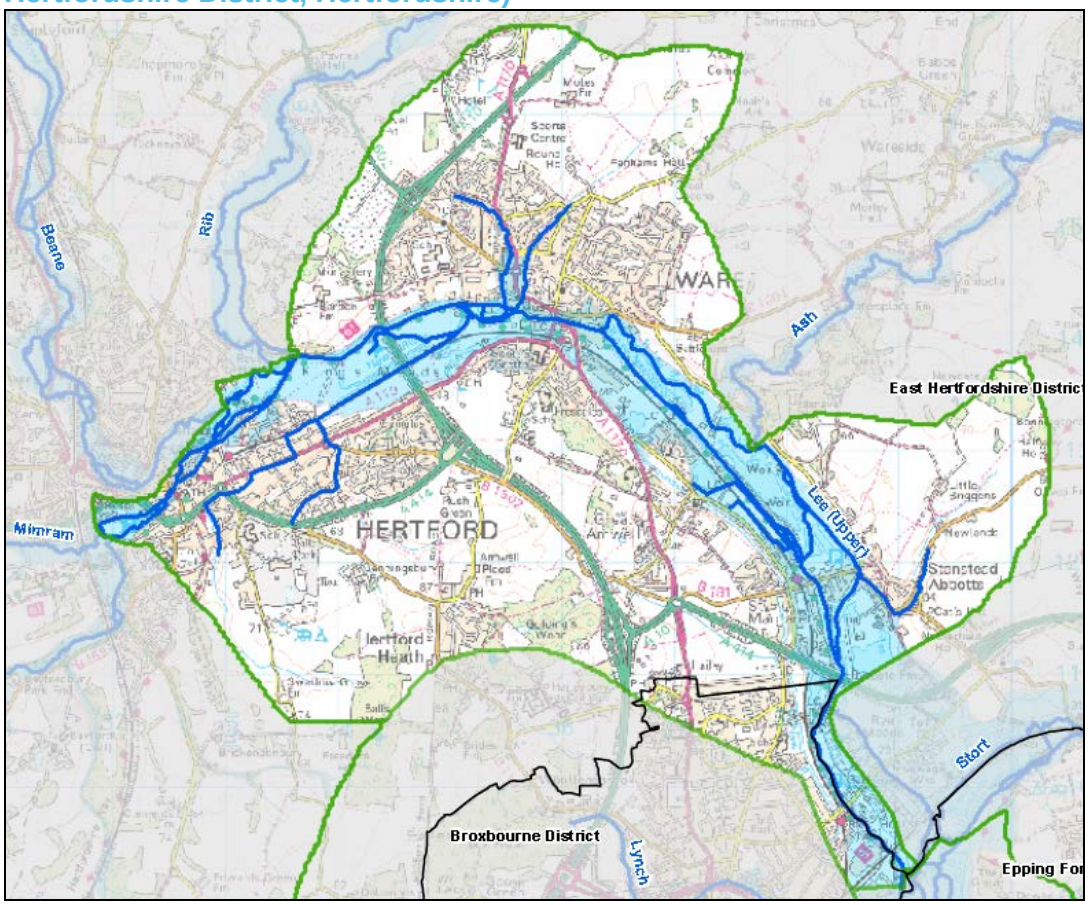


Lower Lee river catchments

**Computer models were used to assess flood risk in the Lower Lee catchment and provide evidence to support the strategy recommendations. These models are updated at periodic intervals and therefore certain information, such as the number of properties estimated to be at risk of flooding, is liable to change.

Upper River Lee

Strategy proposals for the next decade from Ware to the River Stort confluence (East Hertfordshire District, Hertfordshire)



The risks from flooding: There are an estimated 31 properties (all bar 1 residential) in Ware, Great Amwell and in particular St Margarets at risk of fluvial flooding during a 1% annual probability event.

Recommended structural measures: No specific measures have been identified in this area, but we will continue to work in partnership with local communities and organisations to find opportunities to reduce flood risk. Individual property-level protection measures could be fitted to existing properties which flood to a depth less than 0.75m.

Recommended maintenance: Continue operation and maintenance of the channel to ensure that the current standard of protection is maintained. This will include maintaining the function of Hardmead and Stanstead sluices between Hertford and Ware.

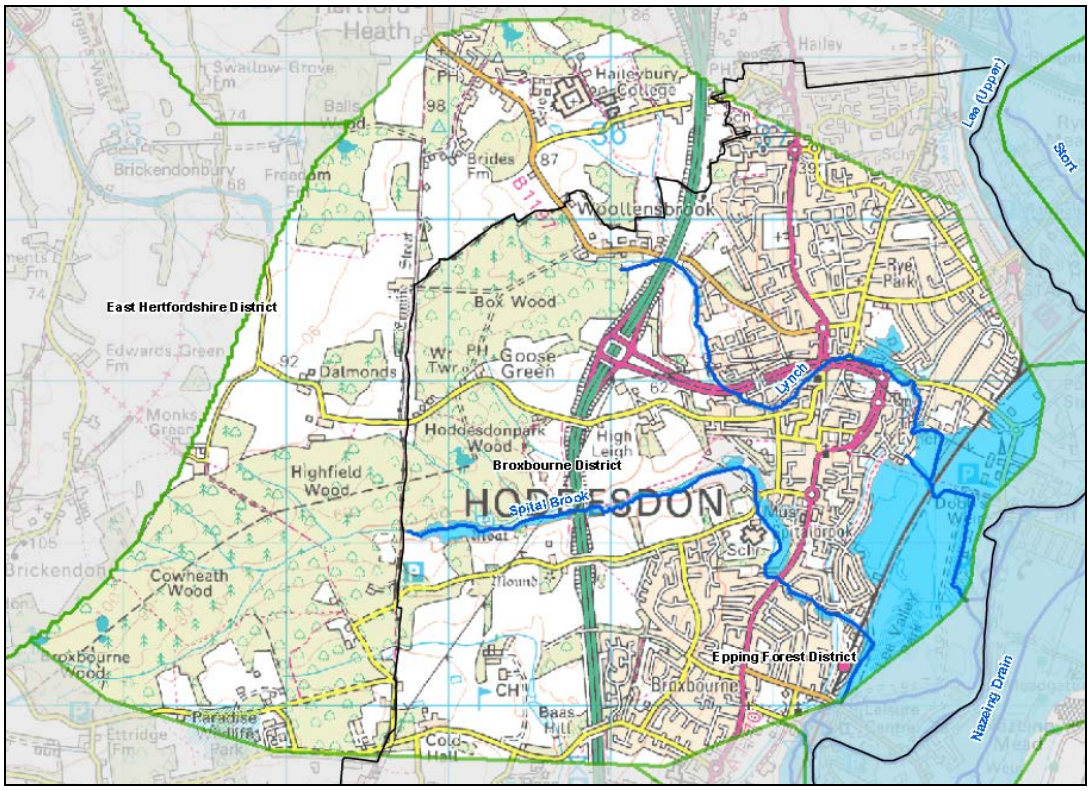
Recommended non-structural measures: Development proposals should comply with current planning policy on development and flood risk to ensure that flood risk is not increased and, where possible, reduces flood risk overall. We will continue to operate and maintain our flood warning service.

Implementing the recommendations: Our key partners will include East Hertfordshire District Council, Hertfordshire County Council (as Lead Local Flood Authority), and developers.

Looking to the future: If current predictions for climate change are borne out, the number of properties at risk of fluvial flooding during a 1% annual probability event may increase to about 143. Therefore, we plan to periodically review the strategy in future years to determine if additional intervention measures are required.

Lynch Brook and Spital Brook

Strategy proposals for the next decade for Hoddesdon (Broxbourne District, Hertfordshire)



The risks from flooding: There are an estimated 73 properties (including a school and 70 homes) in Hoddesdon at risk of fluvial flooding during a 1% annual probability event, mostly in Rye Park but also a few along Spital Brook.

Recommended structural measures: No specific measures have been identified in this area, but we will continue to work in partnership with local communities and organisations to find opportunities to reduce flood risk. Individual property-level protection measures could be fitted to existing properties which flood to a depth less than 0.75m.

Recommended maintenance: Continue operation and maintenance of the channel to ensure that the current standard of protection is maintained.

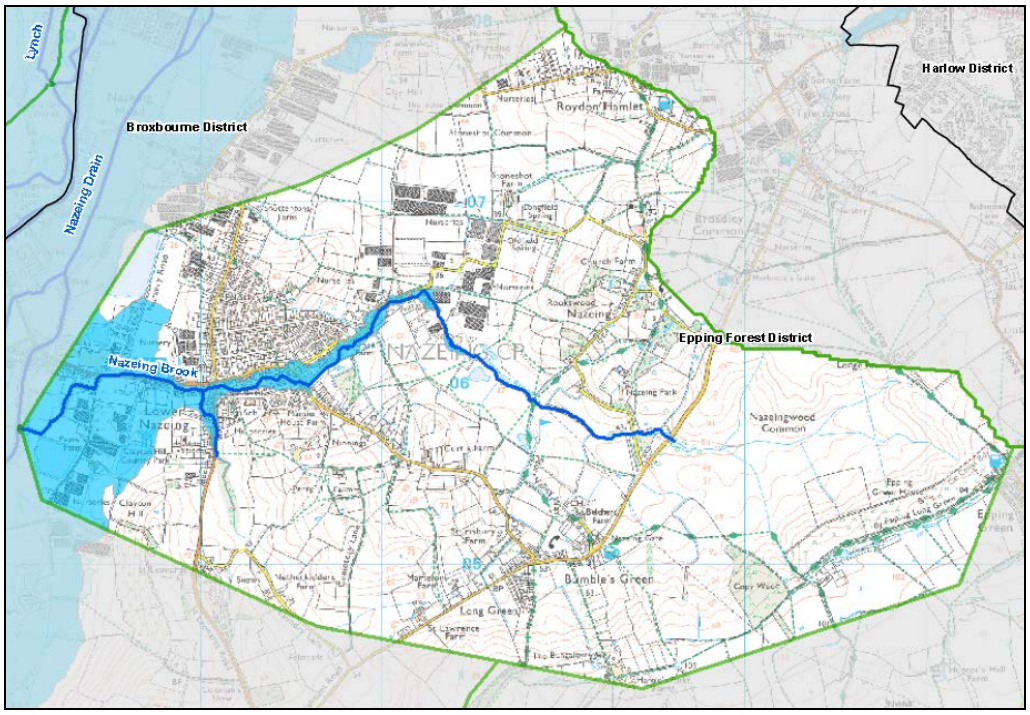
Recommended non-structural measures: Development proposals should comply with current planning policy on development and flood risk to ensure that flood risk is not increased and, where possible, reduces flood risk overall. We will continue to operate and maintain our flood warning service.

Implementing the recommendations: Our key partners will include Broxbourne District Council, Hertfordshire County Council (as Lead Local Flood Authority), and developers.

Looking to the future: If current predictions for climate change are borne out, the number of properties at risk of fluvial flooding during a 1% annual probability event will increase to about 80, and we anticipate that some local flood protection measures will be justified. Therefore, we plan to periodically review the strategy in future years to determine if additional intervention measures are required.

Nazeing Brook

Strategy proposals for the next decade for Lower Nazeing (Epping Forest District, Essex)



The risks from flooding: An estimated 183 properties in Lower Nazeing are at risk of fluvial flooding during a 1% annual probability event, 165 of which are residential. Nazeing Brook has the lowest standard of protection of all the Lower Lee tributary rivers.

Recommended structural measures: We will investigate the feasibility of a new flood alleviation scheme which is likely to consist of upstream storage of flood waters. Our proposals are in development, and could reduce the risk of flooding for up to 183 properties. Individual property-level protection measures could be fitted to those properties which flood to a depth less than 0.75m and will not benefit from a potential scheme.

Recommended maintenance: Continue operation and maintenance of the channel to ensure that the current standard of protection is maintained.

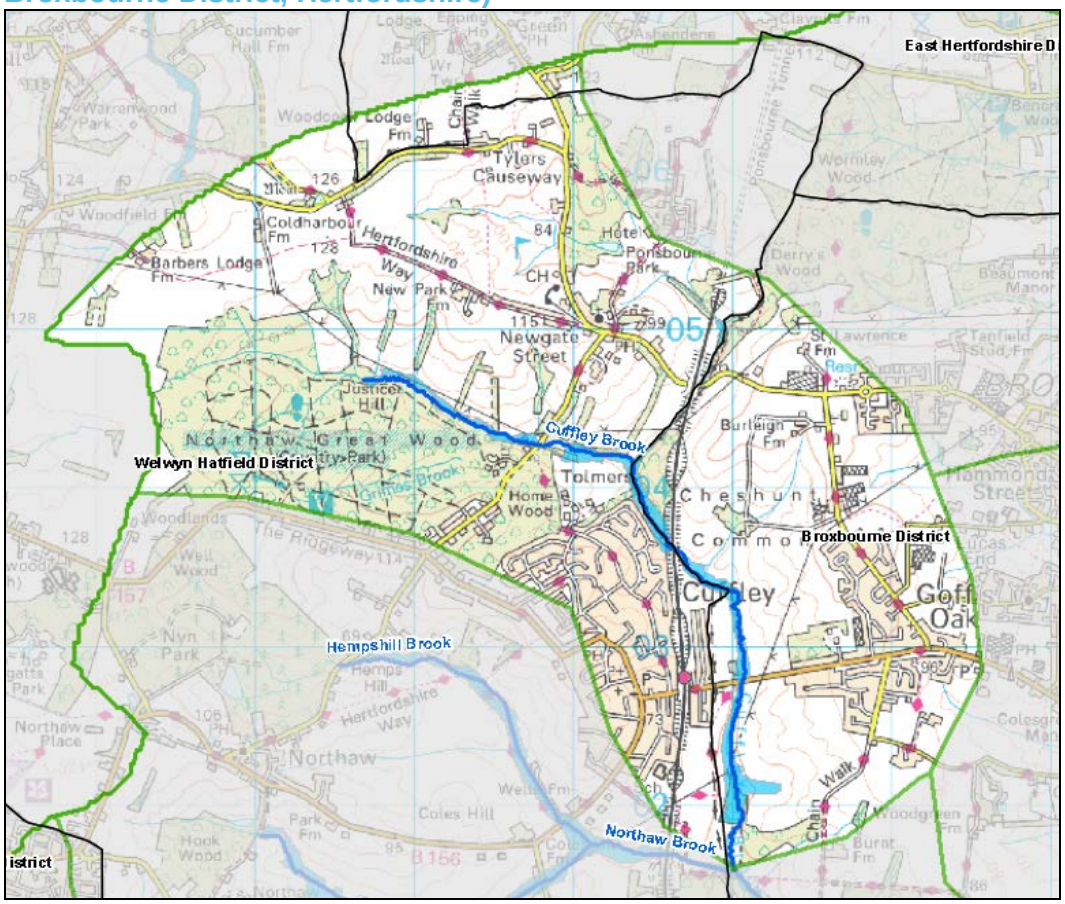
Recommended non-structural measures: We have installed a new gauging station on Nazeing Brook in order to be able to extend our flood warning service to Lower Nazeing, and will continue to operate and maintain this service. Development proposals should comply with current planning policy on development and flood risk to ensure that flood risk is not increased and, where possible, reduces flood risk overall.

Implementing the recommendations: Our key partners will include Epping Forest District Council, Essex County Council (as Lead Local Flood Authority), and other riparian owners of river structures.

Looking to the future: The standard of protection (relative to other tributary rivers) will decline further if current predictions for climate change are borne out, and the increasing flood risk is further justification for investigating a new flood alleviation scheme. We also plan to periodically review the strategy in future years to determine if any adjustments to the intervention measures are required.

Cuffley Brook

Strategy proposals for the next decade for Cuffley (Welwyn Hatfield District and Broxbourne District, Hertfordshire)



The risks from flooding: There are no properties in Cuffley at risk of fluvial flooding during a 1% annual probability event.

Recommended structural measures: We are not proposing any structural measures on Cuffley Brook.

Recommended maintenance: No river maintenance is required in this rural catchment to maintain the current standard of protection.

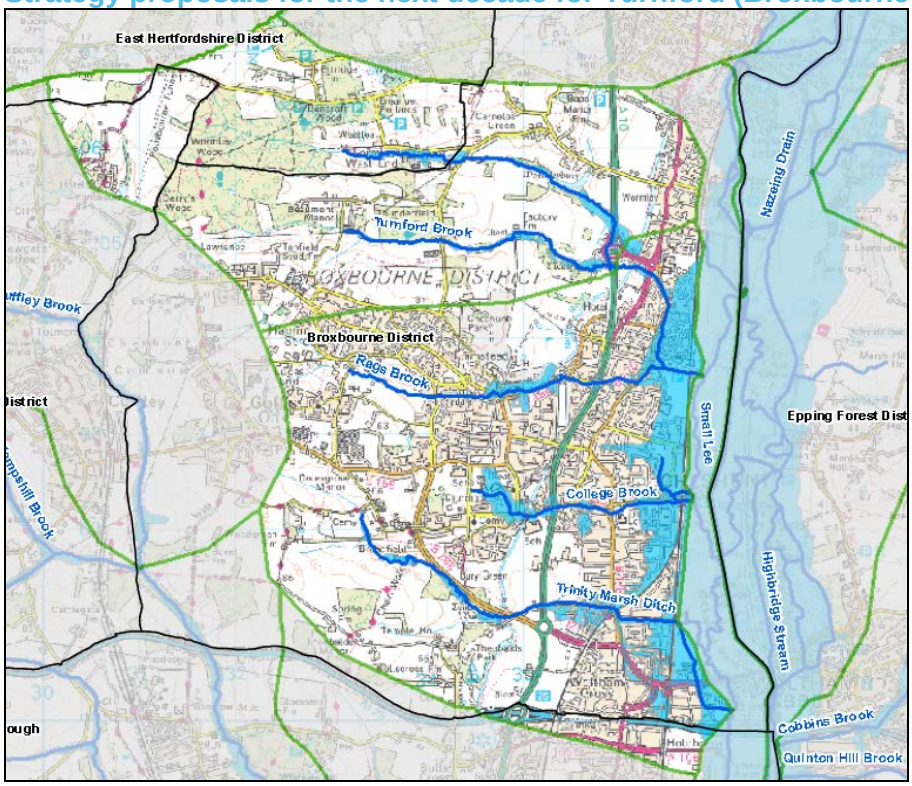
Recommended non-structural measures: Development proposals should comply with current planning policy on development and flood risk to ensure that flood risk is not increased and, where possible, reduces flood risk overall.

Implementing the recommendations: Our key partners will include Welwyn and Hatfield District Council, Broxbourne District Council, and Hertfordshire County Council (as Lead Local Flood Authority).

Looking to the future: There are no anticipated impacts from current predictions for climate change requiring flood risk management measures on the Cuffley Brook, although we will still periodically review this in future years.

Turnford Brook, Rags Brook, College Brook and Trinity Marsh Ditch

Strategy proposals for the next decade for Turnford (Broxbourne District, Hertfordshire)



The risks from flooding: There are an estimated 629 properties (621 residential) in Turnford and Waltham Cross at risk of fluvial flooding during a 1% annual probability event, but no critical infrastructure.

Recommended structural measures: No specific measures have been identified in this area, but we will continue to work in partnership with local communities and organisations to find opportunities to reduce flood risk. Individual property-level protection measures could be fitted to existing properties which flood to a depth less than 0.75m.

Recommended maintenance: It is critical to maintain the existing flood storage areas at Theobalds and Cheshunt North, including safe access to them for maintenance. We also recommend continued operation and maintenance of the channel to ensure that the current standard of protection is maintained.

Recommended non-structural measures: Development proposals should comply with current planning policy on development and flood risk to ensure that flood risk is not increased and, where possible, reduces flood risk overall. We will continue to operate and maintain our flood warning service.

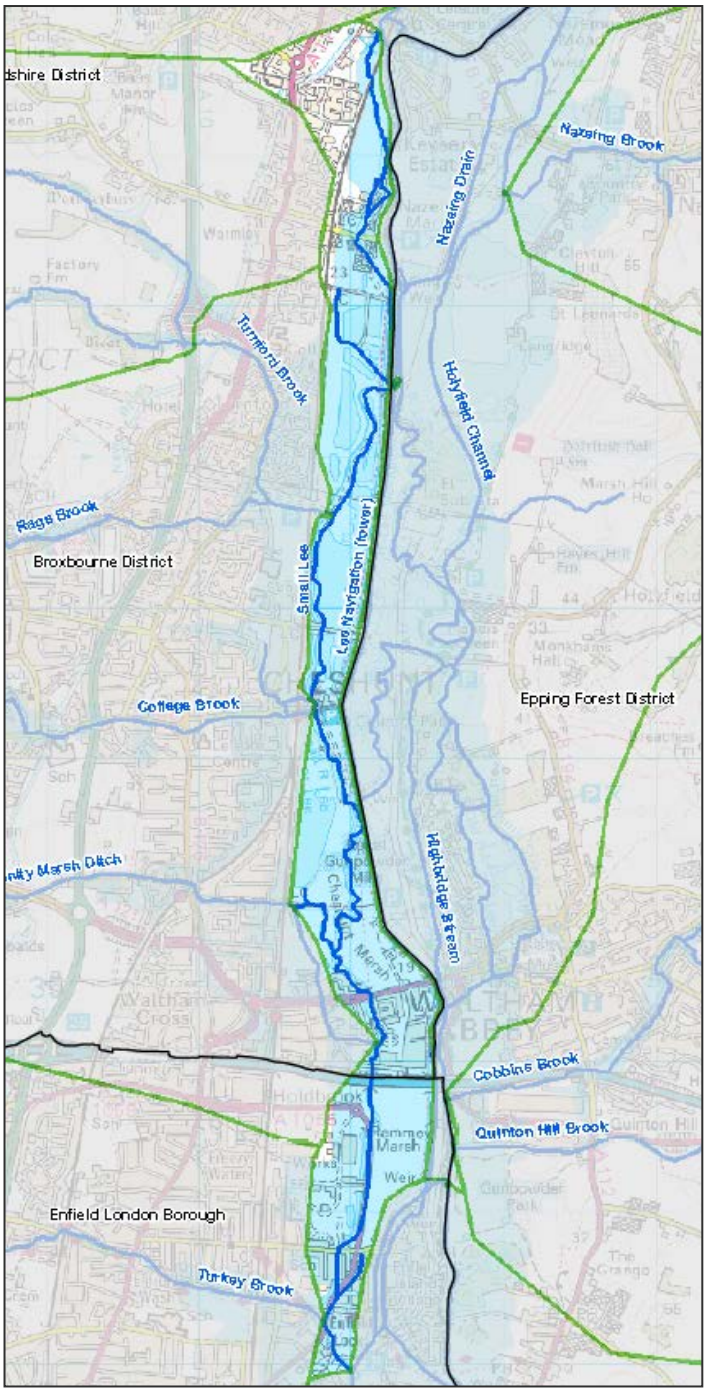
Implementing the recommendations: Our key partners will include Broxbourne District Council and Hertfordshire County Council (as Lead Local Flood Authority).

Looking to the future: If current predictions for climate change are borne out, the number of properties at risk of fluvial flooding during a 1% annual probability event will increase to about 860, and we anticipate that some local flood protection measures will be justified. Therefore, we plan to periodically review the strategy in future years to determine if additional intervention measures are required.

Small Lee (including Highbridge Stream)

Strategy proposals for the next decade between Broxbourne and Enfield Island (Broxbourne District, Hertfordshire, Epping Forest District, Essex, and London Borough of Enfield)

The risks from flooding: There are an estimated 6 residential properties around Enfield Lock at risk of fluvial flooding during a 1% annual probability event, but no critical infrastructure.



Recommended structural measures: No specific measures have been identified in this area, but we will continue to work in partnership with local communities and organisations to find opportunities to reduce flood risk. Individual property-level protection measures could be fitted to existing properties which flood to a depth less than 0.75m.

Recommended maintenance: Continue operation and maintenance of the channel and other flood risk management assets.

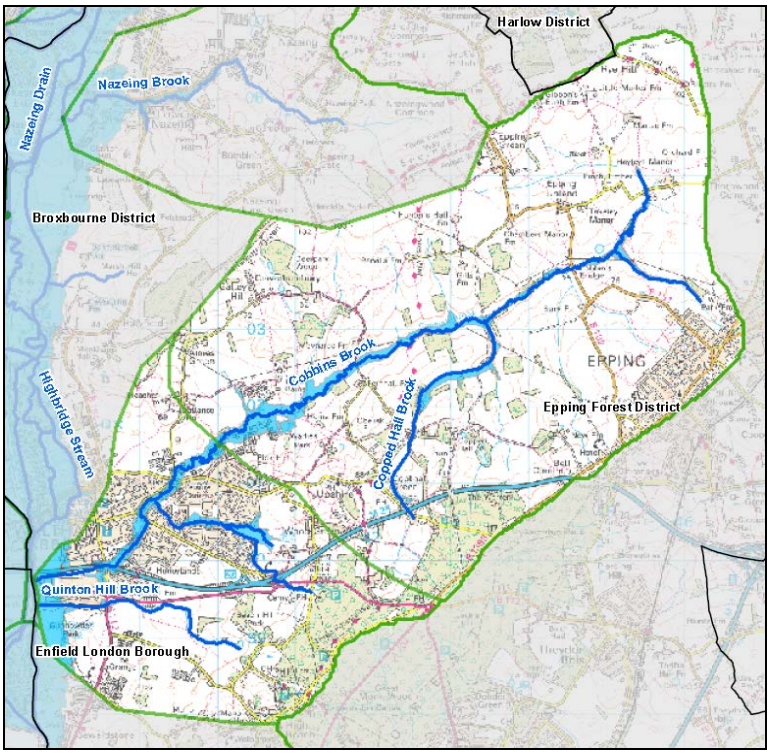
Recommended non-structural measures: Development proposals should comply with current planning policy on development and flood risk to ensure that flood risk is not increased and, where possible, reduces flood risk overall. We will continue to operate and maintain our flood warning service.

Implementing the recommendations: Our key partners in delivering the proposed flood risk management will include Broxbourne District Council, Epping Forest District Council, developers and other riparian owners of river structures. In addition, the Lead Local Flood Authorities are Hertfordshire County Council, Essex County Council and London Borough of Enfield.

Looking to the future: If current predictions for climate change are borne out, the number of properties at risk of fluvial flooding during a 1% annual probability event may increase to about 90, and we anticipate that a flood risk management scheme may be justified. We plan to periodically review the strategy in future years to determine if these or other intervention measures are required.

Cobbins Brook

Strategy proposals for the next decade for Waltham Abbey (Epping Forest District, Essex)



The risks from flooding: Before a new flood risk management scheme was put in place, an estimated 301 properties were at risk of fluvial flooding during a 1% annual probability event as well as part of the M25 motorway. The new flood alleviation scheme, completed in 2010, raised the Standard of Protection for all properties along the Cobbins Brook through Waltham Abbey to a minimum of 2%, with all but 11 properties having a 1.3% SoP. An estimated 45 properties remain at risk in a 1% annual probability event that would exceed the capacity of the current defences.

Recommended structural measures:
We have constructed a new flood al scheme, consisting of upstream floodwater storage in agricultural land near Upshire. We are not planning further new structural measures along the Cobbins Brook in the medium term, although further measures through Waltham Abbey may be viable in response to climate change in the longer term. Individual property-level protection measures could be fitted to any remaining properties which flood to a depth less than 0.75m.

Recommended maintenance: It is critical to maintain the existing flood storage area, including safe access to them for maintenance. We also recommend continued operation and maintenance of the channel to ensure that the current standard of protection is maintained.

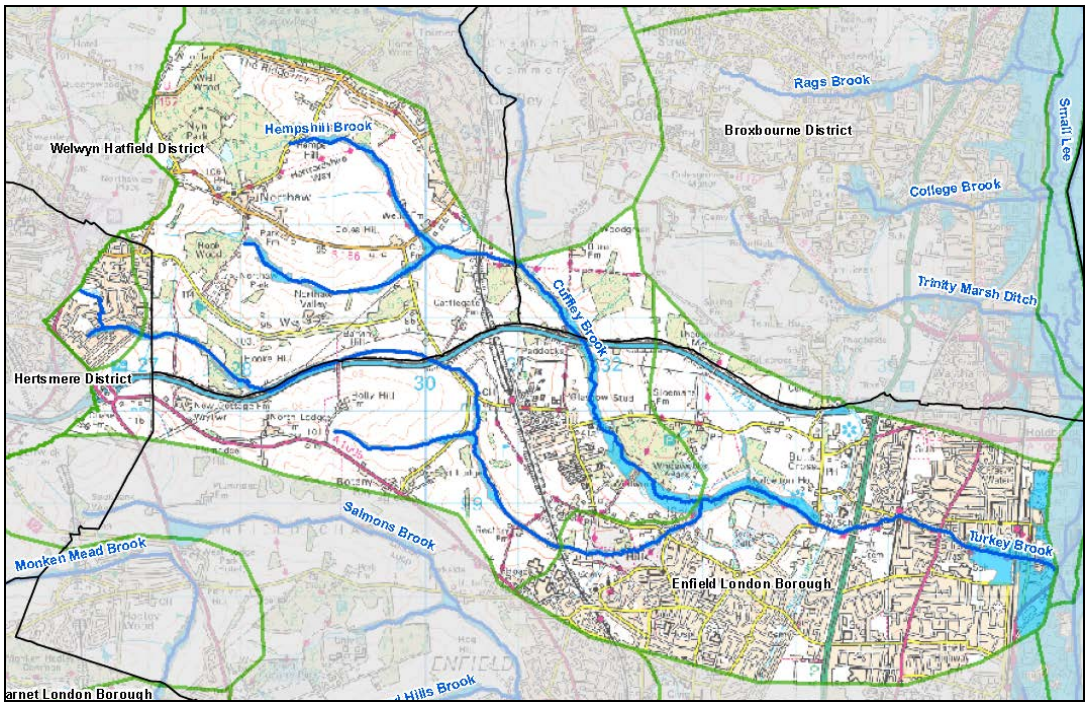
Recommended non-structural measures: Development proposals should comply with current planning policy on development and flood risk to ensure that flood risk is not increased and, where possible, reduces flood risk overall. We will continue to operate and maintain our flood warning service.

Implementing the recommendations: Our key partners in delivering the flood storage area were Epping Forest District Council, and Essex County Council (as Lead Local Flood Authority). Development proposals should comply with current planning policy on development and flood risk to ensure that flood risk is not increased and, where possible, reduces flood risk overall.

Looking to the future: If current predictions for climate change are borne out, there may be an increase in flood risk in Waltham Abbey even with the new flood storage area in place. We anticipate that this could be addressed by raising the height of parts of the river wall through the town, and we plan to periodically review the strategy in future years to determine if this is justified.

Turkey Brook

Strategy proposals for the next decade for Oakmere, Potters Bar (Hertsmere District, Hertfordshire), and Enfield Wash (London Borough of Enfield)



The risks from flooding: In total there are an estimated 92 properties in Oakmere (Potters Bar), and 3 near Enfield Wash at risk of fluvial flooding during a 1% annual probability event.

Recommended structural measures: No specific measures have been identified in this area, but we will continue to work in partnership with local communities and organisations to find opportunities to reduce flood risk. Individual property-level protection measures could be fitted to existing properties which flood to a depth less than 0.75m.

Recommended maintenance: Continue operation and maintenance of the channel to ensure that the current standard of protection is maintained.

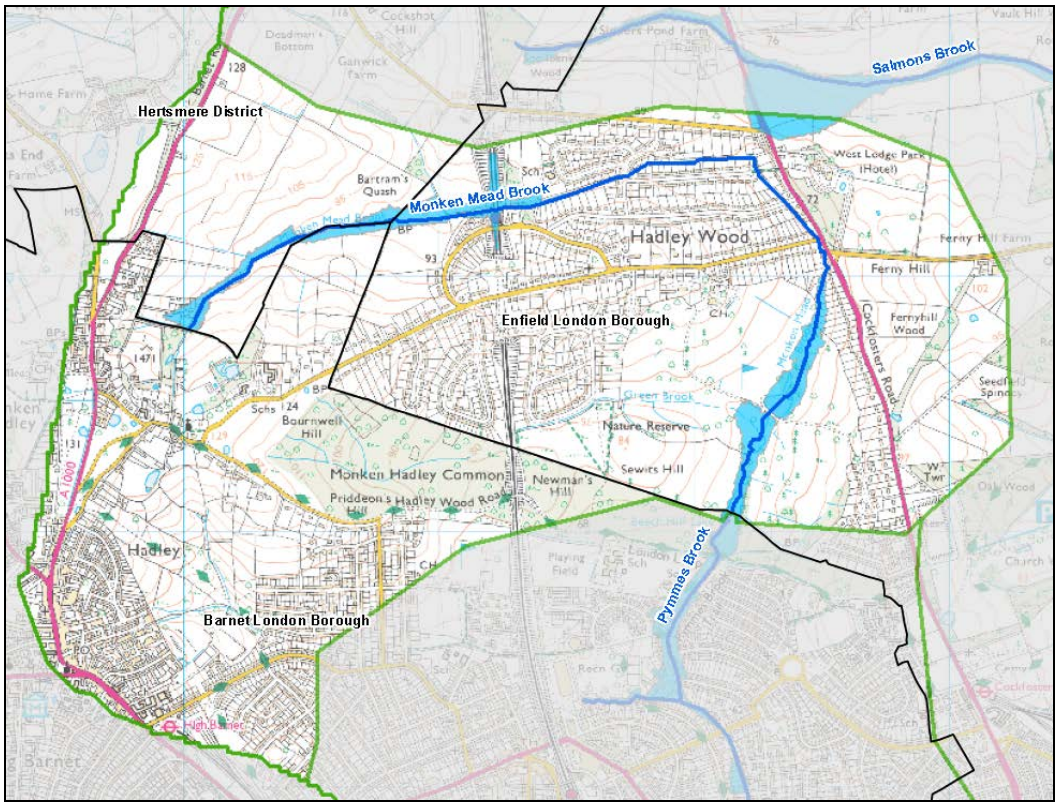
Recommended non-structural measures: Development proposals should comply with current planning policy on development and flood risk to ensure that flood risk is not increased and, where possible, reduces flood risk overall. We will continue to operate and maintain our flood warning service.

Implementing the recommendations: Key partners include Hertsmere District Council, in addition to Hertfordshire County Council and London Borough of Enfield as Lead Local Flood Authorities.

Looking to the future: If current predictions for climate change are borne out, the number of properties at risk of fluvial flooding during a 1% annual probability event may increase to about 192. We plan to periodically review the strategy in future years to determine if any intervention measures are justified.

Monken Mead Brook

Strategy proposals for the next decade for Hadley Wood (London Borough of Enfield)



The risks from flooding: Only 1 property in Hadley Wood is predicted to be at risk of fluvial flooding during a 1% annual probability event.

Recommended structural measures: Individual property-level protection measures could be fitted to the existing property.

Recommended maintenance: Continue operation and maintenance of the channel to ensure that the current standard of protection is maintained.

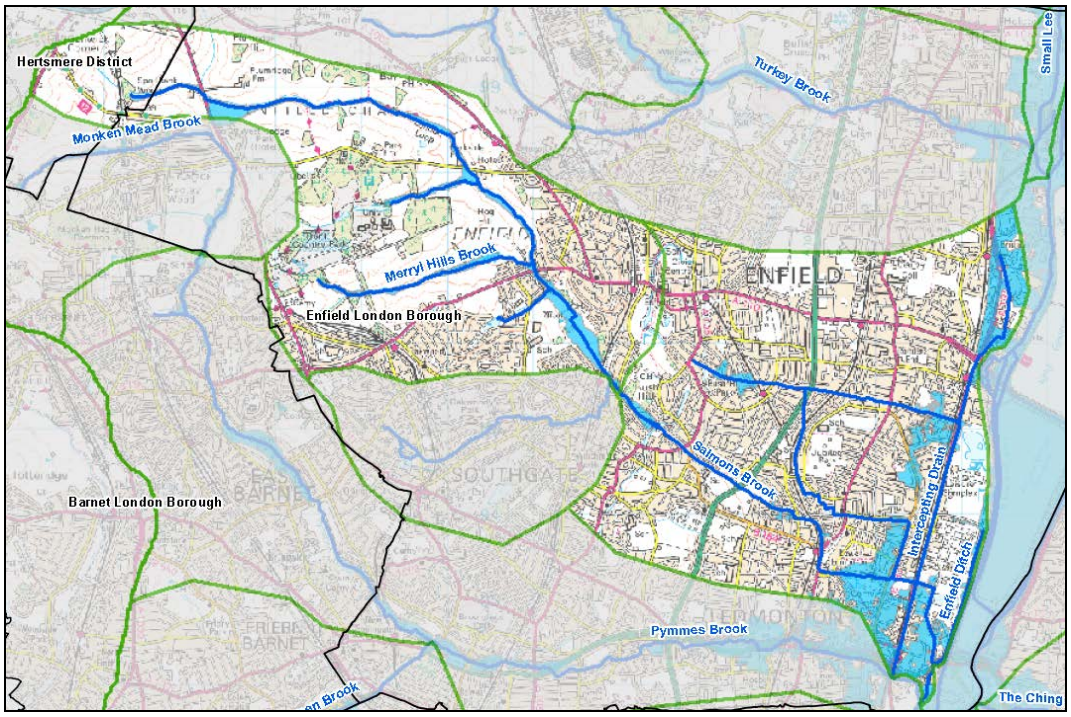
Recommended non-structural measures: Development proposals should comply with current planning policy on development and flood risk to ensure that flood risk is not increased and, where possible, reduces flood risk overall.

Implementing the recommendations: Key partners are London Borough of Enfield (as Lead Local Flood Authority) and riparian owners of river structures.

Looking to the future: There are no anticipated impacts from climate change requiring flood risk management measures on the Monken Mead Brook, although we will still periodically review this in future years (for examples to determine any increasing risk to the railway line)

Salmons Brook

Strategy proposals for the next decade for Lower Edmonton and Enfield (London Borough of Enfield)



The risks from flooding: An estimated 1,288 properties are at risk of fluvial flooding during a 1% annual probability event. Areas at risk of flooding include parts of Grange Park, Bush Hill, Bush Hill Park, Ponders End and Lower Edmonton.

Recommended structural measures: We are constructing a new flood alleviation scheme, including upstream floodwater storage at Enfield Golf Course (Grange Park), raised defences along Salmons Walk and further floodwater storage at Montagu Recreation Ground (Lower Edmonton). Additional smaller measures were completed in 2012 that will direct some more of the Saddlers Mill Stream's floodwater along the Boundary Ditch in Ponders End so that it by-passes Lower Edmonton. Our recommended scheme, together with maintenance of the existing river structures will reduce the risk of flooding to a 1.3% Standard of Protection for 1167 properties.

Recommended maintenance: Continue operation and maintenance of the channel and support others to maintain their culverts, particularly Saddlers Mill Stream culvert.

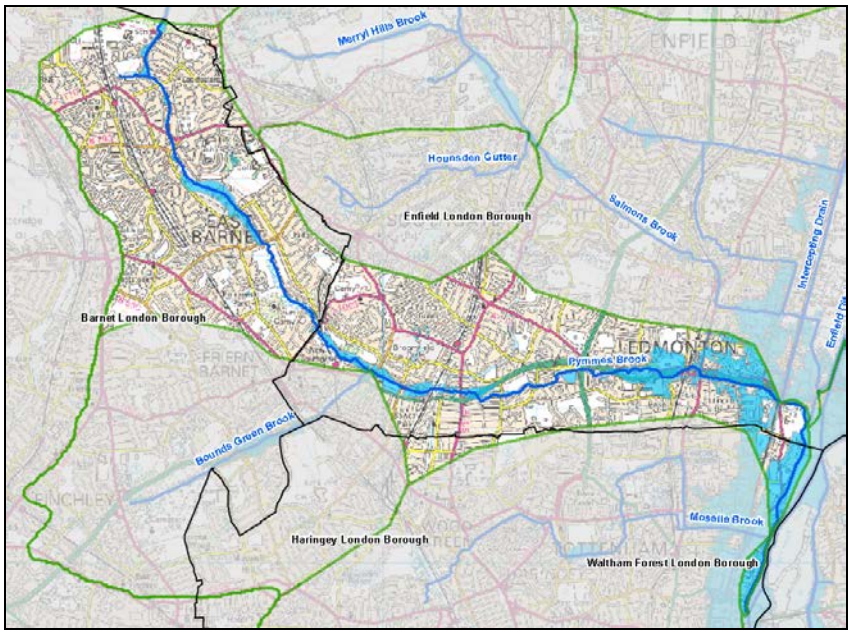
Recommended non-structural measures: Development proposals should comply with current planning policy on development and flood risk to ensure that flood risk is not increased and, where possible, reduces flood risk overall. We will continue to operate and maintain our flood warning service.

Implementing the recommendations: Our key partners will include London Borough of Enfield (as Lead Local Flood Authority), riparian owners and developers.

Looking to the future: Our proposed new flood alleviation scheme takes account of predictions for climate change and its consequences on flood risk. It will continue to provide benefit if current predictions for climate change are borne out. We anticipate that any additional properties at risk could be protected using property-level protection measures. We plan to periodically review the strategy in future years to determine if any further intervention is justified.

Pymmes Brook

Strategy proposals for the next decade for East Barnet and Edmonton (London Boroughs of Barnet and Enfield)



The risks from flooding: An estimated 367 properties and the A406 North Circular are at risk of fluvial flooding during a 1% annual probability event. Areas at risk of flooding include parts of Cockfosters, East Barnet and in particular Upper Edmonton.

Recommended structural measures: We are investigating the feasibility of a new flood risk management scheme, potentially including local defences and floodwater storage in local parks and open spaces. We have also modified a footbridge at Wilmer Way (New Southgate) which previously caused blockages that could result in flooding during high flow. We are also considering the feasibility of making repairs to the River Lee at the point where Pymmes Brook enters. Individual property-level protection measures could be fitted to existing properties which flood to a depth less than 0.75m.

Recommended maintenance: Continue operation and maintenance of the channel and support others to maintain their culverts, with major refurbishment likely to be necessary.

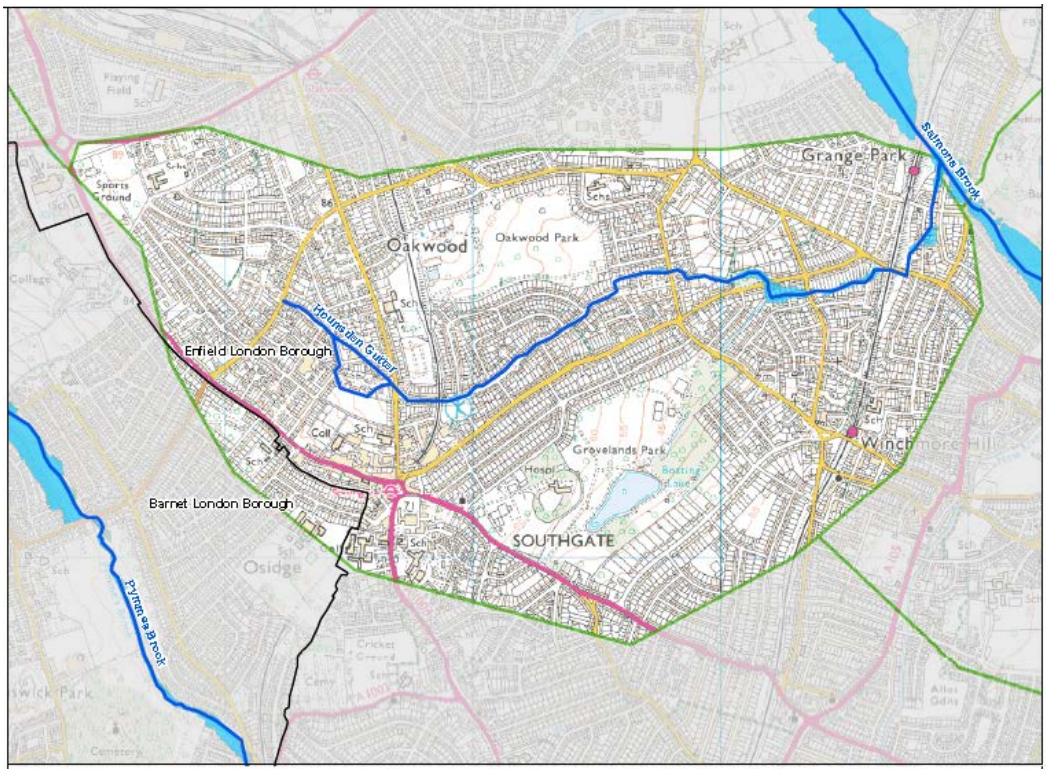
Recommended non-structural measures: Development proposals should comply with current planning policy on development and flood risk to ensure that flood risk is not increased and, where possible, reduces flood risk overall. We will continue to operate and maintain our flood warning service.

Implementing the recommendations: Our key partners will include London Boroughs of Enfield and Barnet (as Lead Local Flood Authorities), Transport for London, riparian owners and developers.

Looking to the future: The Pymmes Brook catchment is particularly vulnerable to changes in flood risk resulting from climate change. If current predictions are borne out, the number of properties at risk of fluvial flooding during a 1% annual probability event may increase to about 1,737. This risk is being taken into consideration when developing the proposals to promote a flood alleviation scheme. There may be sufficient justification to deliver a bigger scheme that accounts for such changes, although this could also mean that the scheme is not delivered as soon as it would be otherwise. We plan to keep the situation under review to determine the optimum design and timing of the proposed scheme.

Houndsden Gutter

Strategy proposals for the next decade for Grange Park (London Borough of Enfield)



The risks from flooding: There are an estimated 185 properties in parts of Grange Park at risk of fluvial flooding during a 1% annual probability event.

Recommended structural measures: No specific measures have been identified in this area, but we will continue to work in partnership with local communities and organisations to find opportunities to reduce flood risk. Individual property-level protection measures could be fitted to existing properties which flood to a depth less than 0.75m.

Recommended maintenance: Continue operation and maintenance of the channel, including West Enfield flood storage tank, and support others to maintain their culverts.

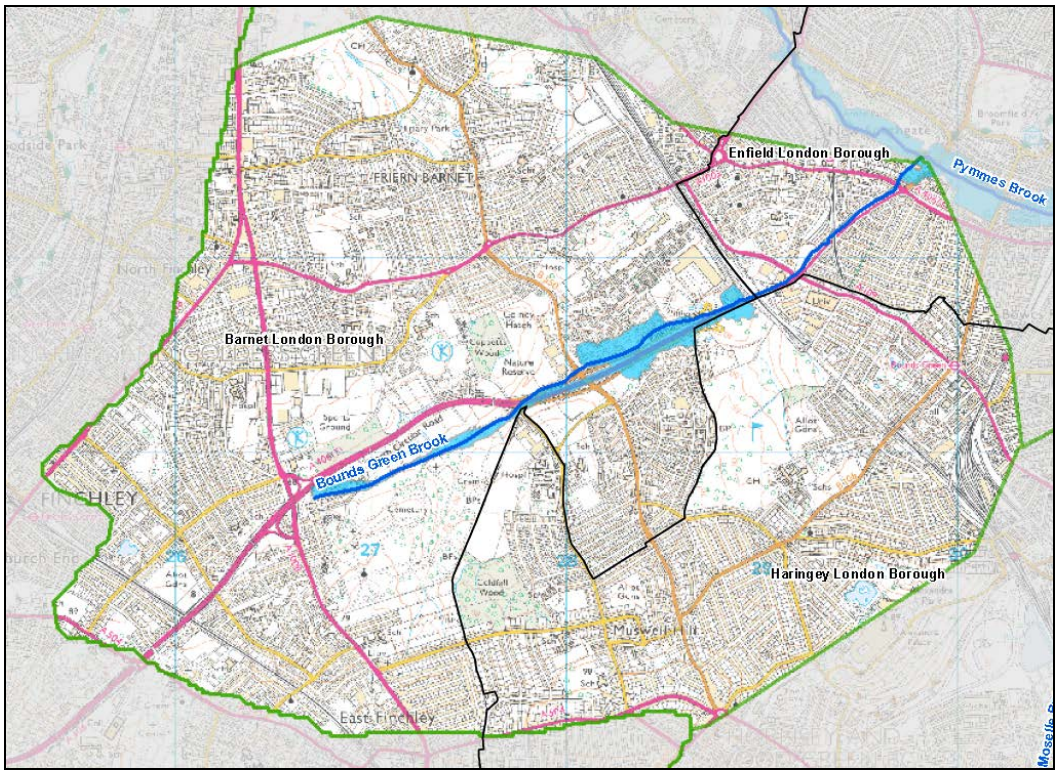
Recommended non-structural measures: Development proposals should comply with current planning policy on development and flood risk to ensure that flood risk is not increased and, where possible, reduces flood risk overall. We will continue to operate and maintain our flood warning service.

Implementing the recommendations: As culvert maintenance is so critical in this area, our key partners will include London Borough of Enfield (as Lead Local Flood Authority) and other riparian owners of river structures.

Looking to the future: If current predictions for climate change are borne out, the number of properties at risk of fluvial flooding during a 1% annual probability event may increase to about 208. However, there are no practical community scale measures that can be implemented to mitigate for predicted climate change impacts, although property-level protection measures may be appropriate. We plan to periodically review the strategy in future years to determine if there is any change in this situation.

Bounds Green Brook

Strategy proposals for the next decade for Colney Hatch and Frien Barnet (London Boroughs of Barnet, Enfield and Haringey)



The risks from flooding: There are an estimated 16 properties in Colney Hatch at risk of fluvial flooding during a 1% annual probability event.

Recommended structural measures: No specific measures have been identified in this area, but we will continue to work in partnership with local communities and organisations to find opportunities to reduce flood risk. Individual property-level protection measures could be fitted to existing properties which flood to a depth less than 0.75m.

Recommended maintenance: Continue operation and maintenance of the channel, and support others to maintain their culverts.

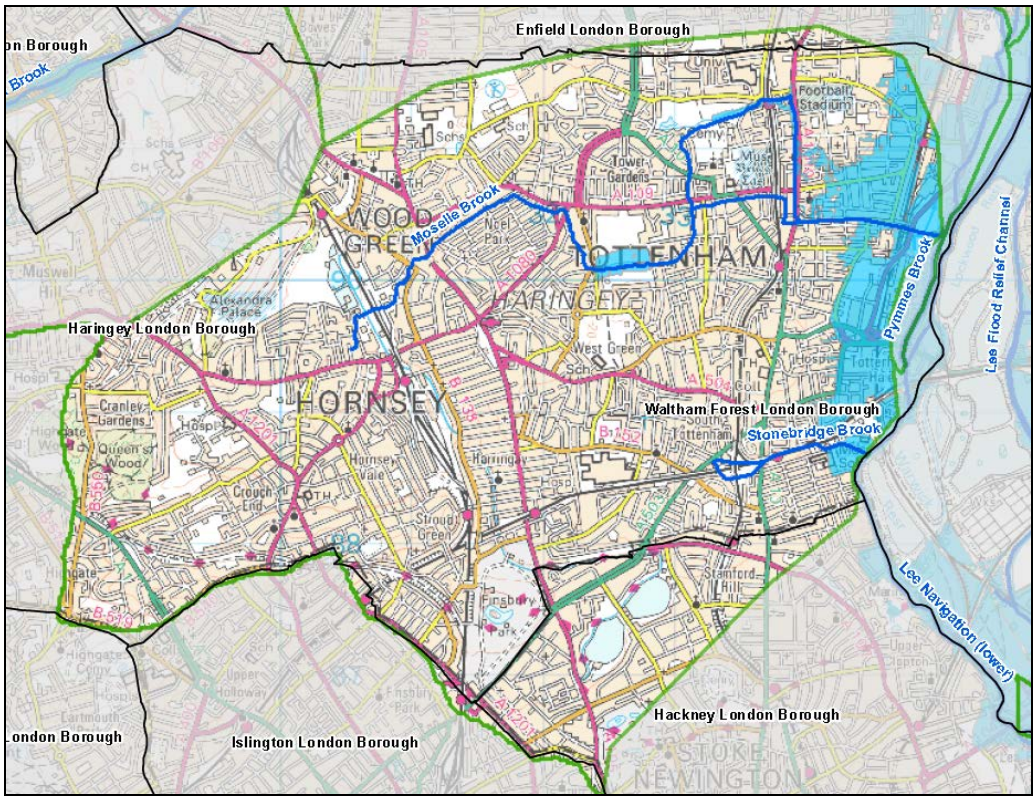
Recommended non-structural measures: Individual property-level protection measures could be fitted to existing properties which flood to a depth less than 0.75m. Development proposals should comply with current planning policy on development and flood risk to ensure that flood risk is not increased and, where possible, reduces flood risk overall. We will continue to operate and maintain our flood warning service.

Implementing the recommendations: As culvert maintenance is so important in this area, our key partners will include London Boroughs of Barnet, Enfield and Haringey (as Lead Local Flood Authorities), and other riparian owners.

Looking to the future: If current predictions for climate change are borne out, the number of properties at risk of fluvial flooding during a 1% annual probability event may increase to about 47. However, there are no practical community scale measures that can be implemented to mitigate for predicted climate change impacts, although property-level protection measures may be appropriate. We plan to periodically review the strategy in future years to determine if there is any change in this situation.

Moselle Brook

Strategy proposals for the next decade for Tottenham (London Borough of Haringey)



The risks from flooding: At present there are no properties in Tottenham considered to be at risk of fluvial flooding from the Moselle Brook during a 1% annual probability event, although there are properties with a lower risk of flooding.

Recommended structural measures: In partnership with the London Borough of Haringey, we are proposing to investigate the condition of the Moselle Brook culvert and carry out repairs to the structure where required. Where feasible, we will look to restore sections of the Moselle Brook to an open watercourse. Major culvert refurbishment is critical to ensure that flood risk does not increase in the future

Recommended maintenance: Continue operation and maintenance of the channel and support others to maintain their culverts. We have already undertaken works on a trash screen on Moselle Brook near White Hart Lane to improve safety during maintenance.

Recommended non-structural measures: Development proposals should comply with current planning policy on development and flood risk to ensure that flood risk is not increased and, where possible, reduces flood risk overall. We will continue to operate and maintain our flood warning service.

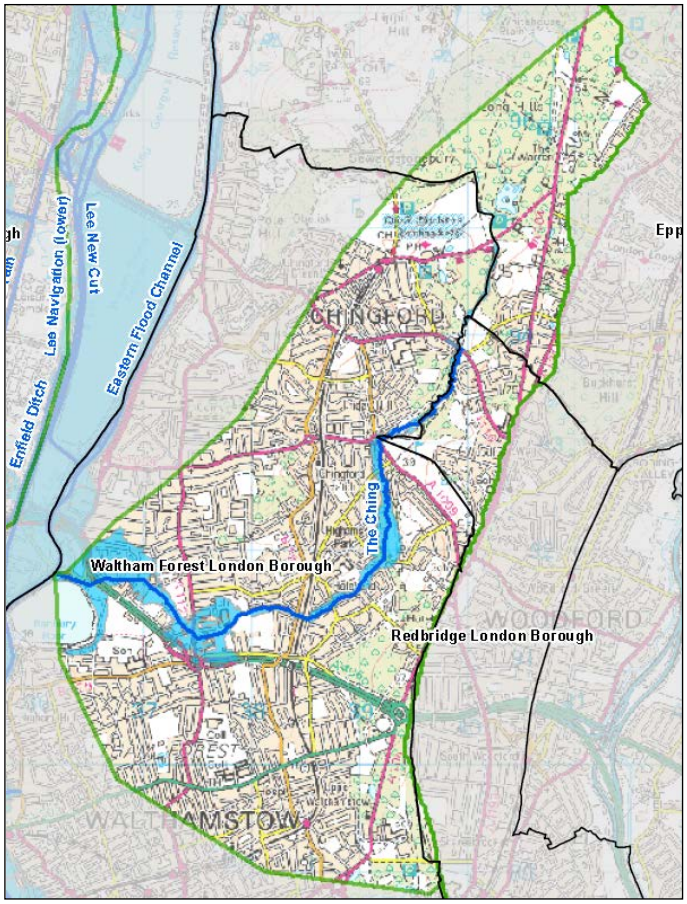
Implementing the recommendations: The brook is extensively culverted. Our key partners will include London Borough Haringey (as Lead Local Flood Authority) and other riparian (including culvert) owners.

Looking to the future: If current predictions for climate change are borne out, the number of properties at risk of fluvial flooding during a 1% annual probability event may increase to about 445. However, no practical community scale measures have been identified that could mitigate for this predicted climate change impacts, although property-level measures may be appropriate. We plan to periodically review the strategy in future years to determine if there is any change in this situation.

Ching Brook

Strategy proposals for the next decade for Chingford (London Borough of Waltham Forest)

The risks from flooding: An estimated 302 properties in Chingford are at risk of fluvial flooding during a 1% annual probability event, including a school and an industrial estate, as well as the A406 North Circular.



Recommended structural measures: The potential flood alleviation measures on the Ching Brook are complex and expensive, as a result of the built-up nature of the area. Initially our flood risk management actions will focus on flood warning and engagement, but we will continue to investigate flood alleviation measures and seek contributions towards the cost where appropriate.

Recommended maintenance: Continue operation and maintenance of the channel and support others to maintain their culverts, with major culvert refurbishment being critical to ensure that flood risk does not increase in the future.

Recommended non-structural measures: We have installed a new flood warning station on the Ching Brook in order to be able to extend our flood warning service to Chingford, and will continue to operate and maintain this service. Individual property-level protection measures could be fitted to existing properties which flood to a depth less than 0.75m. Development proposals should comply with current planning policy on development and flood risk to ensure that flood risk is not increased and, where possible, reduces flood risk overall.

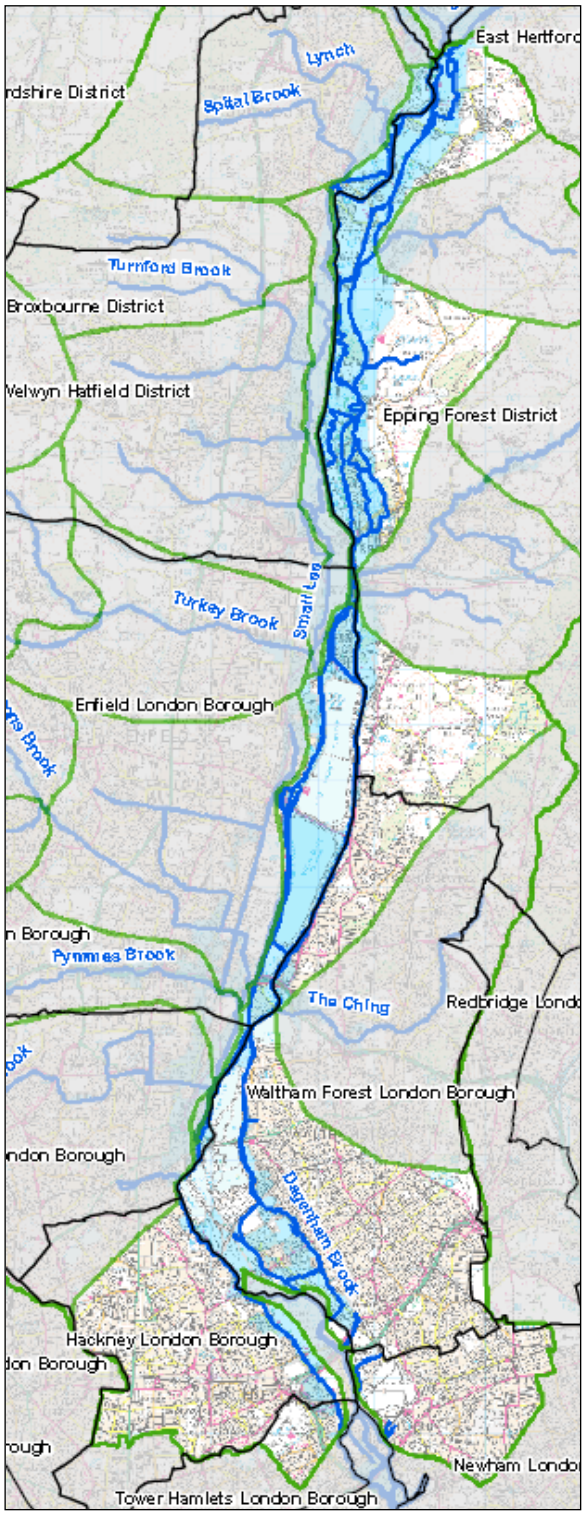
Implementing the recommendations: Our key partners will include London Borough of Waltham Forest (as Lead Local Flood Authority), other riparian (culvert) owners and developers.

Looking to the future: If current predictions for climate change are borne out, the number of properties at risk of fluvial flooding during a 1% annual probability event may increase to about 411. Our investigations into a possible flood alleviation scheme will take this into consideration. We also plan to periodically review the strategy in future years to determine if there is any change in this situation.

Lee Flood Relief Channel and Dagenham Brook

Strategy proposals for the next decade for the Lee valley between Ware and Walthamstow (East Hertfordshire District and Broxbourne District, Hertfordshire, Epping Forest District, Essex, and London Boroughs of Enfield, Haringey and Waltham Forest)

The risks from flooding: An estimated 1,618 properties are at risk of fluvial flooding during a 1% annual probability event. Although the majority are residential, there is a large number (1,390) of commercial and other buildings, and there are also risks to the railway. Areas at risk of flooding are distributed along the Lee valley at Nazeing Mead, Nazeing Marsh, Waltham Abbey, Enfield, Banbury reservoir, Walthamstow, Hackney Wick and Lower Clapton, but there are particular constraints on the FRC's capacity where it is joined by Ching Brook (Chingford) and Dagenham Brook (Walthamstow and Leyton).



Recommended structural measures: The FRC is already a significant asset for flood risk management, and about 13,000 properties and major infrastructure no longer have a 1% risk of flooding due to its construction. The number of properties remaining at risk of flooding is too small to justify significant expansion of the flood alleviation system along the Lee valley. However, the continued maintenance, refurbishment and replacement of the channel and its component control structures is strongly justified in order to sustain the current standard of protection to 6000 properties, which otherwise would be re-exposed to a 1% chance of flooding in any year. Critical works to maintain the channel include refurbishment of a number of sluices and weirs, and we have identified an appropriate programme for this and already begun to implement the works.

We will investigate the feasibility of increasing the standard of protection along Dagenham Brook in Walthamstow and Leyton, and seek contributions towards the cost where appropriate.

Recommended maintenance: Continue operation and maintenance of the channel and the assets that we own within it. Works have already been completed at Newmans Sluice and further works identified at Rammey sluice. We have also carried out some de-silting works to the channel of Dagenham Brook to maintain its flow capacity.

However, it is also critical that additional FRC structures owned by the Canal & River Trust (Newman's Weir, Dobbs Weir & Sluices, Lower Hall Sluices and Lea Bridge Roundhouse Sluices), Thames Water (Flanders Weir, Low Hall Sluices and Keids Weir & Sluices) and the Lee Valley Regional Park Authority (Abbey Sluices) are also maintained and operated. Those structures listed are considered to require maintenance in the short term.

Recommended non-structural measures: We will investigate the feasibility of installing a new gauging station on the Lower Lee near Flanders Weir, Edmonton, in order to be able to improve our flood warning service to about 600 properties. Elsewhere, we will continue to operate and maintain this service.

Individual property-level protection measures could be fitted to existing properties which flood to a depth less than 0.75m. Development proposals should comply with current planning policy on development and flood risk to ensure that flood risk is not increased and, where possible, reduces flood risk overall.

Implementing the recommendations: As indicated, we will work with the Canal & River Trust, Thames Water and Lee Valley Regional Park Authority to ensure that the FRC continues to function. Other key partners will include Hertfordshire County Council and London Boroughs of Waltham Forest, Enfield and Haringey (as Lead Local Flood Authorites). In addition, we will work with Epping Forest District Council, Broxbourne District Council, East Hertfordshire District Council, riparian owners and developers. Wherever development is proposed alongside the FRC, we will encourage improvements to the channel such as realigning its banks.

Looking to the future: If current predictions for climate change are borne out, the number of properties at risk of fluvial flooding during a 1% annual probability event will increase around Chingford. Therefore we anticipate that there will be future justification (perhaps around 2025) for improving the standard of protection in this area. We plan to periodically review the strategy in future years to determine if there is justification for such schemes.

Importance of development management

Large development proposals in the Lower Lee catchment have the potential to have an impact on fluvial flooding, due either to their location in the floodplain or from increased run-off into rivers. The strategy therefore supports the long term aspirations of the Thames CFMP to reduce flood risk by influencing the location and type of new development.

Our teams will seek to achieve this by working with local authority planners and with developers to:

- Ensure that inappropriate development in areas at risk of flooding is avoided by directing development away from areas at highest risk.
- Ensure that where development in areas at risk of flooding is necessary, occupants and users of those sites will be safe and the development does not increase flood risk elsewhere.
- Promote opportunities for river corridor improvements, e.g. naturalising river banks and setting back defences, dealing with pollution and contamination risks, all of which will contribute to the objectives of the Water Framework Directive.
- Support the development of the Community Infrastructure Levy plans to try and secure developer funding for flood risk management measures.

Property-level Protection Measures

We will offer advice and support to home owners or communities who wish to pursue property-level flood protection measures, also known as flood resistance and resilience measures, for their existing homes. Although such measures will usually need to be self-funded, some taxpayer grant aid may be available for community schemes, if we or the Lead Local Flood Authority can demonstrate benefits which make them a high priority.

Implemented property-level protection – water-tight door panels coupled with sealable air brick

What Happens Next

We are recommending actions applicable to the next decade. Completion of individual measures within the strategy plan will depend on a number of factors, including funding and contributions, planning permission, and public support.

Each measure and scheme will need to be investigated to ensure that it delivers the strategy's recommendations in the most economically, technically and environmentally viable way. Most new schemes are also likely to require planning permission and other consents. As they may be in the heart of local communities we will need to work closely with those communities, their councils, and other bodies to be able to deliver schemes that will bring long-term benefits of reduced flood risk to those communities.

The strategy is intended to be reviewed periodically to ensure that it considers changes in the catchment, climate change, public policy, investment criteria and other factors that influence flood risk management.

If You Want to Contact Us

Please contact your local Customers and Engagement Team:

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Hatfield, Herts, AL10 9EX

01707 632 2301
NETenquiries@environment-agency.gov.uk

Glossary

Climate change	Long-term variations in global temperatures and weather patterns, both natural and as a result of human activity.
Community Infrastructure Levy	A levy that local authorities can choose to charge on new developments in their area. The money can be used to support development by funding infrastructure that the council, local community and neighbourhoods want.
Flood attenuation	Reduction of peak flow and duration of a flow event.
Flood defence	Flood defence infrastructure, such as flood walls and embankments, intended to protect an area against flooding to a specified standard of protection.
Flood resilience	Constructing the building in such a way that although flood water may enter the building, its impact is minimised, structural integrity is maintained and repair, drying and cleaning are facilitated. Also known as property-level protection.
Flood resistance	Constructing a building in such a way as to prevent flood water entering the building or damaging its fabric. Also known as property-level protection.
Flood warning service	An Environment Agency service alerting local services and communities to impending flood conditions. A “Flood Alert” means that flooding is possible and that communities need to be prepared. A “Flood Warning” means that flooding is expected and communities should take immediate action. A “Severe Flood Warning” means that there is severe flooding and danger to life.
Flood (Risk) Zones, Flood Zone 1, 2, 3	Flood Zone 3 comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%); Flood Zone 2 comprises land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%); Flood Zone 1 comprises land assessed as having less than 1 in 1,000 annual probability of river or sea flooding (<0.1%).
Floodplain	An area of land that borders a watercourse, an estuary or the sea, over which water flows in time of flood, or would flow but for the presence of flood defences where they exist.
Fluvial flooding	Flooding caused by rivers.
GIS	Geographical Information System – a system of hardware and software used for storage, retrieval, mapping, and analysis of geographic data.
Naturalising (river banks)	Restoration of an engineered river bank to a more natural condition, e.g. removal of a river wall to allow riverbank habitat to develop.
Ramsar Sites	Internationally important wetland sites adopted from the Convention of Wetlands of International Importance especially as water flow habitats (1971) and ratified by the UK government in 1976.
Run-off	The flow of water from an area caused by rainfall.
SPA	Special Protection Area. An internationally important site for the conservation of wild birds, designated under the European Union Wild Birds Directive.
Standard of protection	The standard to which an area is protected against flooding, generally expressed as a probability.
Thames RFCC	Regional Flood and Coastal Committee. Raises a Levy on Council Tax across the Thames river catchment region for supporting priority local flood alleviation schemes that may not attract full or part funding from central Government funding.
Water Framework Directive	European Union legislation (Directive 2000/60/EC establishing a framework for Community action in the field of water policy) which commits member states to achieve good qualitative and quantitative status of all water bodies.

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