London Borough of Hounslow

Flood Risk Management Strategy

Environmental Protection
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Version Control

Version	Details of amendment	Page No	Amended by	Date
0.1	Draft London Borough of Hounslow Flood Risk Strategy	All	Bob Adsett	Dec 2013
0.2	Restructured draft	All	Bob Adsett	Jan 2014
0.3	Consultation Draft	All	Bob Adsett	Feb 2014
0.4	LBH Cabinet Consultation draft	All	Bob Adsett	May 2014
0.5	Addition of historic flooding and flood risk maps	All	Twm Palmer	May 2014

Contents

> *"Water management is going to become one of the biggest single challenges for our communities in the future"* (Ashley, 2014)

The London Borough of Hounslow has a new role as the Lead Local Flood Authority (LLFA) for the borough. This strategy states what actions the Council and other key stakeholders will take to manage potential flood risk in Hounslow.

The Flood Risk Regulations 2009 and the Flood and Water Management Act 2010 have increased the statutory responsibilities of unitary authorities. As a unitary authority, Hounslow is designated as a Lead Local Flood Authority and is also responsible for the preparation of a flood risk management.

This Flood Risk Management Strategy (FRMS) explains how the council and other stakeholders will manage flood risk. It builds on the Preliminary and Strategic Flood Risk Assessments, and the Multi-Agency Flooding CONOPS that identified the likelihood of flooding in the borough and the responsibilities all stakeholders have to manage it.
It also identifies specific actions to reduce the risk of flooding in areas at greatest risk. The work identified in this strategy will help to reduce the risk of flooding, while recognizing that flooding is a naturally occurring phenomenon that will continue to occur.
All stakeholders will continue to work to decrease both the probability and the impact of flooding, but it may still happen. This is why it is important that all residents, businesses and other institutions are aware of the local flood risk and their responsibilities to increase their own resilience.
With significant uncertainty regarding the flooding impact from future global warming and climate change it is important to develop a strategy that can cope with a range of different outcomes. With high levels of uncertainty, there is a greater need for flexibility in planning and policy making. As decisions taken today may have profound long-term impacts on the size of flooding risks that future generations in Hounslow will need to manage.

The Hounslow Flood Risk Management Strategy has four key objectives:

- To understand and explain the level of risk affecting the residents and businesses of Hounslow;
- To provide an action plan for areas at particular risk from surface water flooding;
- To highlight the actions that all partners, businesses and residents in Hounslow should be taking to manage flood risk;
- To take a sustainable and holistic approach to flood management, seeking to deliver wider environmental, economic and social benefits.

The Intergovernmental Panel on Climate Change (IPCC) report Climate Change 2014: Mitigation of Climate Change recognises the need for a range of policy interventions to enable the integration and optimisation of climate change policies with other priorities such as land use planning and protection of water resources, including adaptations to cope with future climate change.

Introduction

The Flood and Water Management Act gives the Council two new major responsibilities. As the Lead Local Flood Authority (LLFA) for the borough, with a range of new local flood risk management duties, as well as the SuDS Approval Body, responsible for assessing the drainage implications of new building developments.
In the role as the LLFA, the council must develop, maintain, apply and monitor a strategy so as to manage surface runoff and groundwater flooding in Hounslow. A review of this strategy will take place by December 2015 in consultation with key stakeholders. A more extensive review with public consultation will then take place to coincide with the Greater London Flood Risk Management Plan 2021. In the event of either a major flooding incident or a significant change in the legislation, the timing of these reviews may be amended.

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It also states specific actions to reduce the risk of flooding in areas at greatest risk. The activities identified in this strategy will help to reduce the risk of flooding, but recognises flooding is a naturally occurring phenomenon that will continue to occur.

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Local Flood Risk Objectives

This strategy sets the local objectives for managing flood risk in the borough of Hounslow and is aligned with the Government national flood and coastal erosion risk management strategy for England(Defra, 2011) to ensure a consistent approach to water management. The national strategy accepts that is not possible to prevent all flooding or coastal erosion, but there are actions that can be taken to manage these risks and reduce the impacts on communities.

This strategy seeks to:

- Develop and improve the understanding of flood risk across the borough
- Improve communication and co-operation between strategic partners and Risk Management Authorities, residents and businesses in Hounslow
- Prevent the increase of flood risk through inappropriate development
- Develop greater community awareness of flood risk and reducing those risks in the future
- Identify and implement flood mitigation measures in areas at risk from surface water flooding where additional funding can be secured
- To take a sustainable and holistic approach to flood management, seeking to deliver wider environmental, economic and social benefits.

Guiding Principles

The Hounslow Flood Management Risk Strategy is bounded by the following guiding principles:

- Flooding is a natural event that will sometimes occur despite all efforts to prevent it. It is important therefore to focus not just on measures taken to prevent it, but also on reducing the disruption that flooding causes;
- Effective flood risk management can reduce long-term costs and is seen as a worthwhile investment for both the public and private sector;
- Decisions on where local resources are focused should be evidence-based and made against clear criteria;
- Improving the level of knowledge about local flood risk across all stakeholders is seen as a vital process that needs to be continued;
- No single organisation can effectively manage flood risk and co-operation is needed from public agencies, the private sector and households;
- Some solutions to the borough's flood risks may require a catchment-wide approach involving other boroughs, agencies and organisations.

Flood Risk in Hounslow

Flood risk presents a major challenge for London: especially those borough's located on the River Thames, like Hounslow. As such, a proactive approach to flood risk management is required, and planning can significantly reduce the risk of flooding by ensuring development is located appropriately and by promoting design that is flood resistant and resilience.

Flooding can take various forms: tidal flooding (caused by surges in the Thames Estuary) and fluvial flooding (from other rivers, such as the rivers Brent and Crane) are the most likely flood events, however flooding from surface water, sewers and groundwater also present risks.

Of the 96,000 properties in Hounslow, approximately 16,000 (or 15%) are at risk from flooding from a one in 1,000 year event (0.1%).
Most of these properties at risk of flooding (approximately 90%) are located in Chiswick, Brentford and Isleworth.

The primary source of flood risk is these areas are tidal flooding from the River Thames. However, it should be noted that the likelihood of flooding is seen as 'low' given the established flood defences locally and downstream (including the Thames Barrier). Smaller areas of the borough were exposed to fluvial flooding in the event of overflows from the rivers Brent and Crane (flooding of the latter has occurred in 1965 and 1999).

The Strategic Flood Risk Assessment for Hounslow (SFRA)(Jacobs, 2007) maps areas at risk from tidal and fluvial flooding, and is the basis for determining whether development proposals are appropriately located.

A Surface Water Management Plan (SWMP)(Hlinovsky and Farrar, 2011) has been prepared to minimise surface water flooding, and this will be supported by the council's role as SuDS Approving Body (SAB), that will introduce a consent system for SuDS measures.

There is also the risk of water main pipes bursting, causing flooding as happened several times across the borough in recent years. These incidents are not caused by rainfall events and are the responsibility of Thames Water who maintains the water supply network in Hounslow.
Severe weather events across the country in 2014 also led to groundwater a number of flooding events across London.

Risks from Reservoirs
All large bodies of water pose a risk of flood should their retaining walls become compromised. There are a number of reservoirs to the west of the borough that pose a potential risk to Hounslow, these include: King George V and Staines Reservoirs and Donkey Wood balancing reservoir. Should a large reservoir breech a significant risk to life would arise. Regular inspection, maintenance and the creation of off-site emergency plans have been developed to protect the public.
To manage all types of flooding, the council will work with the Environment Agency, who has the statutory responsibility for flood risk management.\

Recent Historical Flooding Information

Flooding has occurred historically in Hounslow, and has taken place due to a number of causes and factors. It is important to recognise that these incidents listed below are events in which properties (residential, commercial, industrial) or infrastructure have been affected not only by flooding from local watercourses, but also from the surcharging of underground sewer systems, blockage of culverts and gullies and surface water runoff.

Flooding relating to industrial accidents or infrastructure failure, for example burst water mains; have been included in this summary.

The summary tabulated below is data collected by the London Borough of Hounslow, and is designed to be a sample of events illustrating a representation of historic flood instances that have occurred over a recent set time period in known locations. Note that some of these locations, in particular with surface water, groundwater and combined sewerage systems can occur outside of pre-defined high probability flood zones. Flooding may have occurred a number of times in the same locality.

Flooding Type	Location	Impact
River (Fluvial) Flooding	River Crane, Cranford, TW4	Localised flooding from river bursting banks
	River Brent - Brentford – Ham Dock Road and Ferry Lane TW8	Localised flooding from river bursting banks
	River Thames - Chiswick Mall, W4	Localised flooding from high tides
	River Thames – Strand-on-the Green, W4	Localised flooding from high tides
	Duke of Northumberland - Mogden Lane and Rugby Road near Twickenham Rugby Stadium, TW7	Localised flooding from river bursting banks
Surface Water Flooding	The Alders/Swan Close at Hanworth, TW13	Access issues and flooding of private properties
	Shaftsbury Avenue/Gladstone Avenue at Feltham, east of the Feltham Arena, TW14	Access issues and flooding of private properties
	Helen Avenue, Feltham TW14	Access issues and flooding of private properties
	The Gardens, Hatton Road, Bedfont TW14	Access to private properties and utility failure
	Lampton Road, Hounslow, TW3	Commercial basement flooding
	Goldhawk Road, Chiswick, W4	Residential basement flooding
	Chiswick High Road, Chiswick, W4	Access issues and flooding of private properties
Surface Water and Combined Sewers	Hounslow Road/Saxon Avenue/Pevensey Road, south east of Feltham, between Hanworth Park and the River Crane	Access issues, localised flooding and utility issues
	London Road at Isleworth Iron Bridge, north of Isleworth, between Woodlands and Spring Grove, TW7	
	Boston Manor Road, east of Brentford, TW8	
	Boston Garden, TW8	
	Manor Vale, TW8	
	Windmill Road, TW8	

Reservoir Flooding

There have been no recorded historical instances of reservoir flooding or breaches.

Flood Warning

The responsibility for issuing flood warnings rests with the Environment Agency who will ensure advance notification is given to emergency response organisations and the public as appropriate when a flood risk exists. The Mayor of London's Managing Risks and Increasing Resilience: The Mayor's Climate Change Adaptation Strategy (Nickson et al., 2011) is committed to work with the Environment Agency to increase the number of Londoners signing up to the Floodline Warning Direct scheme and to raise awareness of the measures that individuals and communities can undertake to reduce the risks and manage the consequences of flooding.

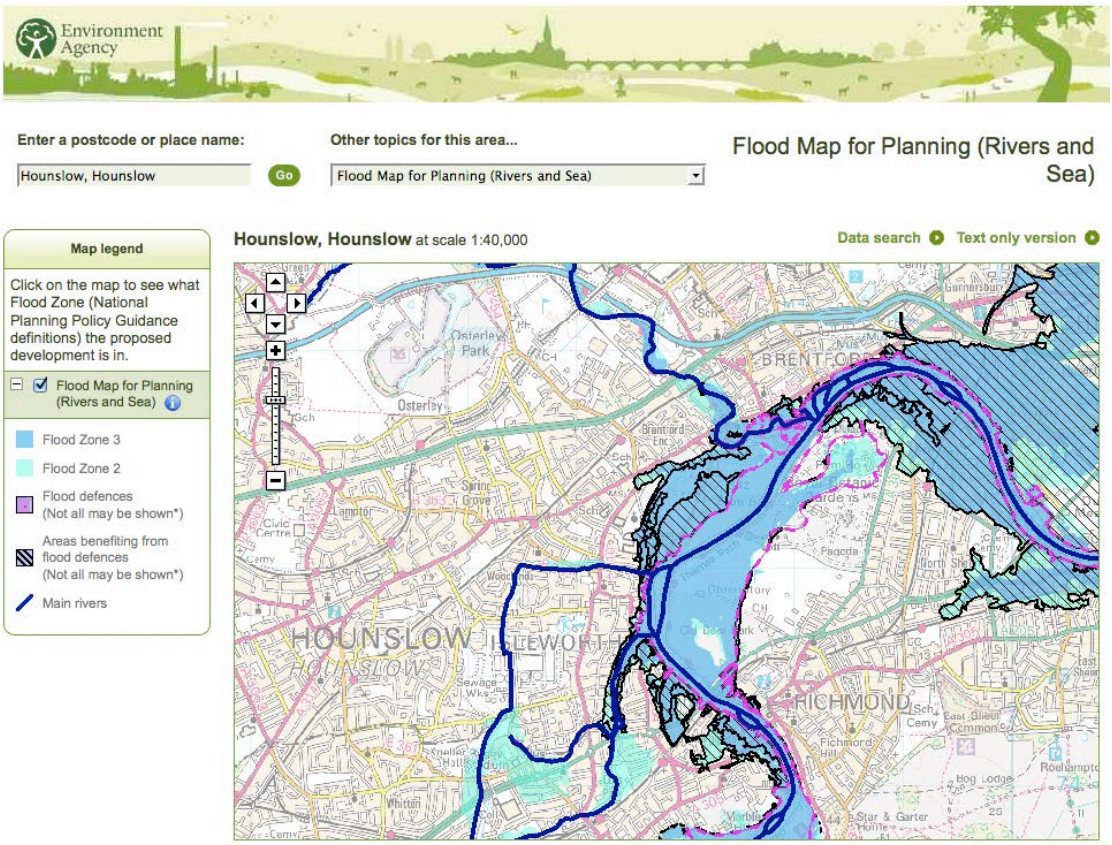
The Environment Agency has identified a number of Flood Risk Areas in Hounslow, these are listed in the table below.

Flood Warning Area Name	FWA Code
The River Crane at Cranford and Feltham	062FWF36Cranford
The River Crane at Twickenham (inc. Duke of Northumberland's River)	062FWF36Twickham
The Tidal River Crane at Isleworth,	062FWB36Islewort
The River Brent in the London Boroughs of Ealing and Hounslow	062FWF38LBEaling
The Tidal Thames from Battersea Bridge to the Hogarth Lane Roundabout	063FWT23Hammrsmh
The Tidal Thames from the Hogarth Lane Roundabout to the River Brent	063FWT23Chiswick
River Thames from the River Brent to the River Crane	063FWT23Islewrth
The River Crane at Southall	062FWF36Southall

The Environment Agency (EA) also hold detailed maps of potential Flood Risk Areas that can be viewed on their website:

http://www.environment-agency.gov.uk/

These areas are indicated using maps similar to the one below to provide public information regarding the scale and nature of the risk.



Key flood maps and flood defence maps for the London Borough of Hounslow are included in the Appendix B to this strategy.

Emergency Response

As mentioned above, there are numerous possible causes of flooding that can lead to an emergency response from multi-agency partners across the Borough. All organisations classified as Category One of Category Two responders under the Civil Contingencies Act 2004 are required to have arrangements in place to support a major incident response.

Individual Tactical and Operational responses to flooding will be co-ordinated through the Borough Emergency Control Centre (BECC) that will form part of an integrated multi-agency emergency management response.

The Local Resilience Forum has a Multi-agency Flooding Response CONOPs that details the Tactical integrated emergency management approaches that will be adopted by responding organisations to any flooding that occur in the borough.

Individual responding organisations will have their own Operational plans detailing their individual agency's responsibilities for dealing with flooding incidents.

Improving Flood Risk Management

As well as taking specific actions to remedy recognised flood risks, there are also important actions that are necessary for flood risk management such as preventing flood risk increasing, improving our understanding of flood risk and ensuring that we are ready to respond should a flood event occur.

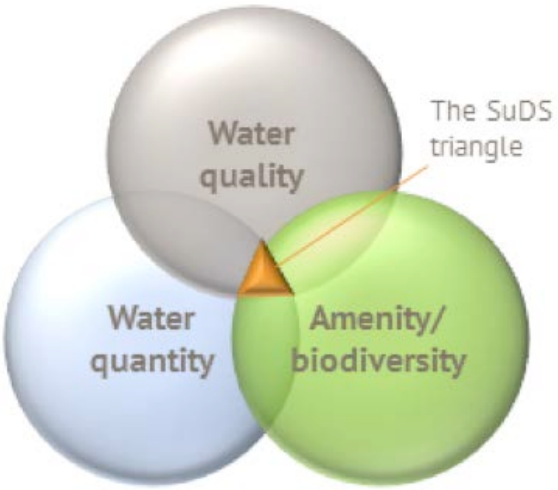
The table below highlights the key actions that have already been taken to achieve these goals and what more will be done.

Activity	Actions already undertaken	Future Actions
Understanding more about flood risk	Production of Preliminary Flood Risk Assessment and Strategic Flood Risk Assessment Surface Water Management Plan for the London Borough of Hounslow	Flood investigations reports for any major new flood incidents Production of Flood Hazard and Flood Risk Maps
Recording and Maintaining flood assets	Regular maintenance of assets that affect flooding	Publication of significant flood assets in the borough Designation and maintenance of structures and features that provide flood alleviation
Responding to flood incidents	Development of Multi-Agency Flood CONOPs	
Approving new developments	Published Local Plan 2015 – 2030	Introduce SuDS Approval Body Assess need to refresh Strategic Flood Risk Assessment

Sustainable Drainage Systems (SuDS)

Surface water drainage systems developed in line with the ideals of sustainable development are collectively referred to as Sustainable Drainage Systems (SuDS). At a particular site, these systems are designed both to manage the environmental risks resulting from urban runoff and to contribute wherever possible to environmental enhancement. SuDS objectives are therefore to minimise the impacts from the development on the quantity and quality of the runoff, and maximise amenity and biodiversity opportunities.

The three-way concept set out in Figure below shows the main objectives that the approach is attempting to achieve. The objectives should all have equal standing, and the ideal solution will achieve benefits in all three categories, although the extent to which this is possible will depend on site characteristics and constraints. (Woods-Ballard et al., 2006b)



The SuDS philosophy is simply to utilise the built environment to mimic as closely as possible natural drainage systems. When construction takes place the urbanisation and development of catchments and sub-catchments occurs, and the natural hydrology is affected. This results in reduced supply of rainfall to groundwater by the interception of run-off on areas of hardstanding (e.g. roads, roofs and paved surfaces). This in turn means less supply to groundwater that feed springs and river network resulting in lower flows and increased likelihood of drought during dry periods.

In addition, by intercepting run-off and routing water through smooth conduits and piped networks, developers accelerate the passage of flow to the receiving watercourses that resulting in higher peak flows and potential flooding. This in turn creates greater erosion and damage to river banks and beds.

Good housekeeping
Underpinning the SuDS philosophy is an approach for good housekeeping that utilises best practice to reduce the prospects of pollutants reaching the environment by improving techniques that may cause pollution, or produce or use less polluting materials. E.g. consumers using more environmentally friendly materials such as phosphate free detergents.
Good housekeeping also includes measures that reduce the prospects of flooding by encouraging more natural run-off paths.
E.g. canopies over factory or shop loading bays that have their flow routed through a SuD system, rather than routing this high-risk area to the sewage works.

Source controls
Using source controls allow run-off to be absorbed into the local environment through permeable or porous surfaces such as permeable paving, grasscrete, filter trenches, or swales, thereby delaying the water's arrival into local water courses.

Site controls
Providing local facilities that will receive run-off from upstream locations, often with several inlets and only one controlled outlet from detention basins or small ponds.

Regional control
These include ponds and wetlands and are larger water features that will collect run-off from upstream controls. They should be designed not receive

significant pollutants; these should have been controlled by the upstream provisions. Where possible regional controls should be used as landscape features and provide final 'polishing' of the treatment train prior to discharge. Supporting wildlife and increased biodiversity.

Approaches to implement SuDS can be used for new development, but can equally be retrofitted to existing systems to mitigate the potential risks from flooding. (Woods-Ballard et al., 2006a)

SuDS Approval Body

Schedule 3 of the Flood and Water Management Act (FWMA), deals with Sustainable Drainage Systems. The Act calls for the establishment of a SuDS Approving Body (SAB) to be set up within Lead Local Flood Authorities (LLFAs) (London Borough of Hounslow).

The Act requires SAB approval of all new drainage systems for new and redeveloped sites and highways to be obtained before construction can commence. It also requires that the proposed drainage system meet new National Standards for Sustainable Drainage. These National Standards are concerned with the design, construction, operation and maintenance of SuDS.

If the National Standards for SuDS are met, then the SAB will be required to adopt and maintain the approved SuDS that serve more than one property. SuDS serving just one property will remain the responsibility of the property owner. The local highways authority will adopt the SuDS arrangements for highways.

The Act also amends Section 106 of Water Industry Act (1991) to make the right to connect surface water to public sewers conditional on the SAB approving the drainage system as meeting the National Standards.

The SuDS provisions in Schedule 3 of the Act make no changes to the right to connect foul water to the public sewer system.

Water and sewerage companies, the Environment Agency, Canal & River Trust, internal drainage boards and the Highways Authority are all statutory consultees to the SAB during the consultation process that should start once a SAB application is submitted. These organisations should be consulted, where relevant, before any SuDS can be approved.

If possible, SAB organisations should be consulted at the pre-application stage of the planning process in order to facilitate the SuDS approval process.

The SAB will become a statutory consultee to the local authority planning process.

Communicating Flood Risk to the public

Flood risk is an emotive issue and explaining the risk to residents and businesses has to be done sensitively. The ever present risk of flooding from the Thames is well known to local residents across the borough, but other risks from smaller water courses, sewers, burst water mains, surface water and groundwater flooding is less well understood.

Increasing understanding of potential flood risk to the community and local businesses will improve the resilience of the borough to foreseeable hazards from uncontained water.
Increasing community understanding will reduce risk, minimise harm and disruption, improve the speed of recovery when flooding occurs and increases the uptake of flood resilience measures. It is important to recognise that flood risk is based upon a probability, and detail of flood risk to an individual property level will not be possible.
Where flood alleviation or prevention measures have been identified the community will be consulted on how, or if, these actions are implemented using the usual council consultation fora. It is recognised that the public should be consulted at the earliest opportunity to enable them to shape and influence the solutions that are proposed.

As a first step this Flood Risk Management Strategy will be subject to public and professional consultation.

Sustainable Development

Current thinking on flood risk management recognises that it is an environmental activity and the strategy needs to support national, regional and local plans for sustainable development. Solutions developed to meet today's water management challenges should not compromise the opportunities of future generations.
As such, actions will be considered that have a long-term implication to support social, environment and economic benefits to ensure future generations may look forward to a better quality of life from living in the borough.

Local Sustainable Drainage System Design Guidance
The borough with the support of the SAB, will develop local design guidance for Sustainable Drainage Systems that will be applied across the catchments to ensure a consistent and regulated approach to water management.

Retrofitting existing developments
Where appropriate and cost effective to do so, land and property owners will be encourage to retro-fit SuDS to existing developments.

Flood Guidance Context

There are a number of flood guidance documents at the international, national, regional and local level that provide a policy framework on flood risk management, planning and flood alleviation and water management measures that should be considered as part of this strategy.

The following are deemed key documents, but as experience is gained to recent flood events the lessons that are identified from any responses should be considered when reviewing any future course of action.
The following table indicates the broad range of legislation and guidance that have been developed to flood risk management.

National Legislation and Policy		European and International	
Flood and Water Management Act		IPCC Climate Change 2014: Mitigation of Climate Change	
National FCERM Strategy		EU Water Framework Directive	
Flood Risk Regulations		EU Floods Directive	
Regional Legislation and Policy			
Mayor's Climate Change Adaption Strategy	Regional Flood Risk Appraisal		Thames River Basin Management Plan
The London Plan	Thames Catchment Flood Management Plan		
Local Legislation and Policy			
Hounslow Planning Policy	Biodiversity Action Plan	Flood Risk Management Strategy *(under development)*	Supporting Documentation
Hounslow Local Plan	Hounslow Strategic Flood Risk Assessment	SuDS Guidance *(under development)*	Planning Related Legislation and Policy
	Flood maps for surface water	Surface Water Management Plan	Specific Flood Based Legislation and Policy
			European Based Legislation and Policy

Trans-National

Intergovernmental Panel on Climate Change (IPCC) has concluded that:

> "It is *extremely likely* that human influence has been the dominant cause of the observed warming since the mid-20th century" p15 (Stocker et al., 2013)

Notwithstanding the actual cause of climate change, whether man is a primary contributor or not, the accepted scientific reality is that climate change and global warming is now occurring. This trend will over time lead to more extremes of weather that will result in increased rainfall. Increasing rainfall brings additional risks of flooding in many forms and the needs to accommodate and plan for increased levels of water and its effective management in the environment. From a strategic perspective action needs to be taken to support this change over the coming decades.

Flood Risk Regulations and Water Framework Directive

The Flood Risk Regulations 2009 are derived from the European Union Flood Directive 2007. This legislation requires the Council to produce a Preliminary Flood Risk Assessment (PRFA) based on known flood risks in 2010. These data are used to develop flood hazard and risk maps that are available on the Environment Agency Website Flood Map for Planning. The European Water Framework 2000 establishes environmental goals for member state water bodies.

National

UK Climate Change Risk Assessment (Defra, 2012b)
This report sets out the main priorities for adaptation in the UK under five key themes identified in the CCRA Evidence Report: Natural Environment; Buildings & Infrastructure; Health & Wellbeing; Business & Services; and Agriculture & Forestry and describes the policy context in each area. It highlights the constraints of the CCRA analysis and provides advice on how to take account of the uncertainty within the analysis.

National flood and coastal erosion risk management strategy for England (Defra, 2011)
Flood and coastal erosion risk in England is expected to increase due to climate change and development in areas at risk. It is not possible to prevent all flooding or coastal erosion, but there are actions that can be taken to manage these risks and reduce the impacts on communities.
This strategy builds on existing approaches to flood and coastal risk management and promotes the use of a wide range of measures to manage risk. Risk should be managed in a
co-ordinated way within catchments and along the coast and balance the needs of communities, the economy and the environment.

National Planning Policy Framework (DCLG, 2012a) and associated Technical Guidance (DCLG, 2012b)
The National Planning Policy Framework sets out the Government's planning policies for England and how these should be applied. It sets out the Government's requirements for the planning system only to the extent that it is relevant, proportionate and necessary to do so. It provides a framework within which local people and their accountable councils can produce their own distinctive local and neighbourhood plans, which reflect the needs and priorities of their communities.

The Technical Guidance document provides additional guidance to local planning authorities to ensure the effective implementation of the planning policy set out in the National Planning Policy Framework on development in areas at risk of flooding.
The Technical Guidance can be used to identify inappropriate development in areas at risk of flooding and directing development away from areas at highest risk, but where development is necessary, making it safe, without increasing flood risk elsewhere.

Designation of structures and features for flood and coastal erosion risk management purposes: Information note (Defra, 2012a)
This information note sets out recommendations on the practical considerations for designating and responsible authorities to enable designations to be made, recorded and managed effectively in the interests of flood and coastal erosion risk management.

The structures and features eligible for designation will include a wide range of things from garden walls and other structures or buildings to raised areas of land and embankments which, in the opinion of the designating authority, affects a flood or coastal erosion risk, but which were not necessarily designed or constructed for that purpose.
Once a feature is designated, the owner must seek consent from the responsible authority to alter, remove, or replace it.

Surface Water Management Plans Technical Guidance (Defra, 2010b) and **Annexes to Surface Water Management Plan Technical Guidance** (Defra, 2010a)
This SWMP technical guidance and annexes seeks to provide a simplified overarching framework that allows different organisations to work together and develop a shared understanding of the most suitable solutions to surface water flooding problems.

Foresight Project (Flood and Coastal Defence Project, 2004)
The Foresight project Flooding and Coastal Defence produced a challenging and long-term (30 - 100 years) vision for the future of flood and coastal defence in the whole of the UK that takes account of the many uncertainties, is robust, and is seen as a basis to inform future policy relating to water management.

Making Space for Water (Defra, 2005)
Following the flooding incidents in 1998 and 2000 and the publication of the Foresight Future Flooding report (above) the Government produced a comprehensive, integrated and forward-thinking strategy for managing future flood and coastal erosion risks in England. The Government published the Making space for Water consultation in July 2004. The response by Government has set the future agenda for sustainable water management for the next 20 years and beyond.

Regional

Thames Catchment Flood Management Plan
The Thames Catchment Flood Management Plan (TCFMP) consider all types of inland flooding, from rivers, ground water, surface water and tidal flooding, but not flooding directly from the sea, (coastal flooding). It also take into account the likely impacts of climate change, the effects of how we use and manage the land, and how areas could be developed to meet our present day needs without compromising the ability of future generations to meet their own needs. The TCFMP will be used to help the Environment Agency and partners to plan and agree the most effective way to manage flood risk in the future.

Thames River Basis Management Plan
The Thames River Basin Management Plan (TRBMP) developed under the Water Framework Directive 2000, aims to:

- Prevent deterioration in water quality
- Improve and protect inland waters and groundwater
- Encourage more sustainable water use as a natural resource
- Create better habitats for wildlife that live in and around water
- Help reduce the effects of floods and droughts

The TRBMP is a statutory plan produced by the Environment Agency containing a 'programme of measures' to meet the obligations of the Water Framework Directive (WFD). The Flood Risk Management Strategy will through the support for SuDS implement key WFD objectives for water quality and management.

Regional Flood Risk Appraisal for the London Plan
The Mayor has undertaken a Regional Flood Risk Appraisal (RFRA). This has given rise to the policies relating to flood risk in the draft replacement London Plan and will be an important consideration in the more detailed planning for the development of particular sites with an associated level of flood risk.

The publication of this final RFRA (October 2009) follows consultation on a draft RFRA in 2007. The RFRA makes a number of recommendations to improve understanding and management of flood risk and these will be reported annually as part of the London Plan Annual Monitoring Report.

London Strategic Flood Framework (London Resilience Partnership, 2012)
This framework relates to flooding with 'London-wide' impacts. This may be severe flooding in one location requiring a London-wide response, or a greater number of less severe flooding incidents in multiple locations within London. The framework also covers the "pre-flooding" or "potential flooding" phases, meaning that it can be activated prior to any impacts occurring on the ground, and may be activated in preparation even if impacts do not occur.

Managing Risks and Increasing Resilience (Nickson et al., 2011)
The report recognises that London is already vulnerable to extreme weather, in the form of floods, droughts, heatwaves and very cold weather. Without action, further climate change, London's population growth, and other changes (e.g. changes to make-up of London's population and land cover) will increase the risk of severe impacts. The report aims at improving the understanding of flood risk in London and how climate change will alter the risks, to identify areas at greatest current and future risk by:

- supporting collaborative working to enable a coherent cost-effective approach;
- reducing flood risk to the most vulnerable communities, to target the greatest effort on London's most critical assets;
- raising public awareness of flooding and develop individual and community capacity to cope with, and recover from a flood, to improve London's resilience to flood events.

TE2100 Managing flood risk through London and the Thames estuary (Environment Agency, 2012)
The Thames Estuary 2100 project was established by the Environment Agency in 2002 with the aim of developing a strategic flood risk management plan for London and the Thames estuary through to the end of the century.

The Plan primarily looks at tidal flooding, though other sources of flooding including high river flows as a result of heavy rainfall and surface water flooding are considered.

The key driver for the project was to consider how tidal flood risk was likely to change in response to future changes in climate and people and property in the floodplain. Additional to this there was an understanding that many of the existing flood walls, embankments and barriers were getting older and would need to be raised or replaced to manage rising water levels. The plan set out recommendations and actions that are needed to manage flood risk through this century.

Local

Preliminary Flood Risk Assessment for London Borough of Hounslow (Hlinovsky, 2011)
This document provides a high level summary of flood risk from local sources (surface water, ground water and ordinary watercourses). It provides information on significant past flood events and future flooding

Hounslow Strategic Flood Risk Assessment (Jacobs, 2007)
The London Borough of Hounslow Strategic Flood Risk Assessment (SFRA) was carried out to meet the following key objectives:

To collate all known sources of flooding, including river, surface water (local drainage), sewers and groundwater, that may affect existing and/or future development within the Borough;

To delineate areas that have a 'low', 'medium' and 'high' probability of flooding within the Borough, in accordance with Planning Policy Statement 25 (PPS25), and to map these:

Areas of 'high' probability of flooding are assessed as having a 1 in 100 or greater chance of river flooding (>1%) or 1 in 200 (>0.5%) chance of tidal flooding in any year, and are referred to as High Risk Zone 3;

Areas of 'medium' probability of flooding are assessed as having between a 1 in 100 and 1 in 1000 chance of river and/or tidal flooding (1% to 0.1%) in any year, and are referred to as Zone 2 Medium Probability;

Areas of 'low' probability of flooding are assessed as having a less than 1 in 1000 chance of flooding (<0.1%) in any year, and are referred to as Zone 1 Low Probability.

Within flood affected areas, to recommend appropriate land uses (in accordance with the PPS25 Sequential Test) that will not unduly place people or property at risk of flooding

Where flood risk has been identified as a potential constraint to future development, recommend possible flood mitigation solutions that may be integrated into the design (by the developer) to minimise the risk to property and life should a flood occur (in accordance with the PPS25 Exception Test).

Surface Water Management Plan for the London Borough of Hounslow (Hlinovsky and Farrar, 2011)
This document forms the Surface Water Management Plan (SWMP) for the London Borough of Hounslow that has been delivered as part of the Tier 2 package of works of the Drain London Project. This document is a plan which outlines the preferred surface water management strategy of Hounslow and includes consideration of flooding from sewers, drains, groundwater and runoff from land, small watercourses and ditches that could occur as a result of heavy rainfall.

Hounslow Local Plan 2015 – 2030

The Hounslow Local Plan is a local development framework that sets out the council's proposals for the future development of the borough over the next 15 years through a suite of new planning policies.
All local authorities are required to prepare a Local Plan with the objective of contributing to the achievement of sustainable development, addressing the spatial implications of economic, social and environmental change.

The plan recognises the importance of sustainable development and promotion of an integrated approach to water management across the borough through a number of its policies.

Policy EQ2 - Sustainable Design and Construction promotes the principles for sustainable design and construction as set out in the London Plan, including passive solar design, water efficiency standards, sustainable urban drainage, and the reuse and recycling of construction materials, green roofs and urban greening. Sustainable design and construction requires the implementation of many of the policies included in the Local Plan, including those on climate change and carbon reduction, flood risk and surface water management, waste and pollution.

Policy EQ3 - Flood Risk and Surface Water Management specifically addresses sustainable development by proposing the following approach:

> "We will ensure that developments include flood resistance and resilience measures and use the Strategic Flood Risk Assessment to inform spatial planning and development management decisions."

In addition, surface water will be managed through an increased emphasis on sustainable urban drainage.

We will achieve this by:
Using the sequential and exceptions tests to inform planning decisions in flood risk areas to ensure inappropriate development is avoided;
Promoting improved surface water drainage across the borough, by working with partners to identify, manage and reduce the risk of surface water flooding, consistent with the council's role as SUDS Approving Body
Promoting the opening up of river corridors and making space for water through the creation of buffer zones to water courses and increasing floodplain connectivity;
Providing for the maintenance of flood defences, in-line with the Infrastructure Delivery Plan and in collaboration with partners;
Encouraging the take-up of opportunities to improve flood resistance and resilience in the borough's existing built environment, including drainage improvements, flood guards and raising electrical sockets and other vulnerable fittings.
Working with the Environment Agency to implement to actions of the Thames Estuary 2100 plan.

We will expect development proposals to:
Incorporate flood resistance and resilience measures, including the preparation of flood risk assessments;
Apply the sequential test within site boundaries where the sequential test is required, to ensure flood risk is further decreased;
Include at least one 'at source' sustainable urban drainage measure where there is a net increase in impermeable surfaces to assist in reducing the peak volume of runoff discharging from the site, consistent with the SWMP Action Plan;
Reduce post development runoff rates for events up to and including the 1 in 100 year return period event with an allowance for climate change to 50% of the existing site conditions, consistent with the SWMP Action Plan;
Reduce runoff to that of a predevelopment Greenfield runoff rate where development is located in a Critical Drainage Area (CDA), consistent with the SWMP Action Plan."

Policy GB8 – Blue Ribbon Network
That recognises the role the Blue Ribbon Network plays in flood and surface water management, by safeguarding access to flood defences and working with the Environment Agency and other partners to implement the actions of the Thames Estuary 2100 plan.
(London Borough of Hounslow, 2014)

Roles, Responsibilities and Functions

Many organisations have responsibilities relating to flood risk in Hounslow. Each organisation has a different function, but all work collaboratively to support the borough.
There are four types of flood Risk Management Authorities (RMA) working in the borough, they are:

Lead Local Flood Authority (London Borough of Hounslow)
Environment Agency
Water Company (Thames Water)
Highways Authorities (Hounslow Council, Highways Authority and Transport for London)

	Risk Management Authorities				
Responsibility	**Hounslow Council**	**Environment Agency**	**Thames Water**	**Transport for London**	**Highways Agency**
Highway drainage and asset management of Major A-Roads				✓	
Highway drainage and asset management of motorways					✓
Highway drainage and asset management of other roads	✓				
Flood risk and management main rivers		✓			
Flood risk and management ordinary watercourses	✓				
Management public sewer network			✓		
Management of groundwater flooding	✓				
Management of risk of reservoir flooding	✓	✓			
Management of surface water flooding	✓				

Regardless of who has responsibility for dealing with a flood, please report flood event to the council who will co-ordinate an appropriate response. This will ensure the council develops a details understanding of the borough's flood risks.

Sustainable Approach

In keeping with the guidance and policies identified in this strategy, the Council will work with other organisations, agencies and the public to manage future flood risk, improve water quality, improve groundwater stability to reduce future drought and flooding risk and to improve biodiversity. In support of this document a Strategic Environmental Assessment, Habitats Assessment Scoping document and Equalities impact assessment will be produced.

Strategic Environmental Assessment

This document will evaluate the environmental impact of the Hounslow Flood Risk Management Strategy. The purpose of the assessment will be to ensure there are no negative impacts resulting from the adoption of this strategy.

Habitats Assessment Scoping

The Habitats Directive(European Commission, 2007) protects specific species of plants and animals that are deemed vulnerable. These can be found in Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar sites known as Natura 2000 Sites. This assess will ensure that the proposals included in this strategy are not likely to have a negative impact on any designated Natura 2000 site.

Strategy Review

This strategy will be updated from time to time, as policies, events or new guidance become available.
The triggers for the review may be any of the following:

Every six years in line with Flood Risk Management Plans
Where significant changes update knowledge relating to flooding or flood modelling
Significant changes in legislation
Following the establishment of the SuDS Approval Body

Appendix A - Flood Risk Vulnerable Assets

Suggested Assets to be recorded on the Hounslow Flooding Asset Register

Category	Linkages	Nodes	Polygons
Type of Structure or Feature	Open channel	Manhole	Reservoir, inc. Ponds and lakes
	Culvert	Inlet	Flood storage pond
	Sewer	Outlet	Swale
	Drain, inc highway drain	Pumping station	Soakaway /filter strip
	Rising main	Gully	Permeable paved area
	Flood defence bank	Inspection chamber	
	Flood defence wall	Junction	
	Permeable pavement	Change of physical character or direction	

Appendix B - Hounslow Flood Risk Maps

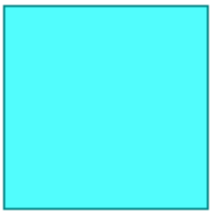
Flooding is defined as water that inundates land that is not usually covered in water. Land use significantly contributes to flooding, and it is for this reason that is a key aspect to how Hounslow's will reduce the borough's flood risk.
The high density of housing and other land use in the borough reduces the permeability of the landscape, which contributes to the speed and of surface water run-off that results in surface water flooding. This is caused by excessive surface water flows overwhelming the existing drainage system.

Through sustainable development planning controls it is anticipated that the level of permeability of the landscape can be enhanced and the rate of transit of water slowed to a level where the existing drainage infrastructure can cope with storm flows. In addition, future planning needs to consider how space can be made for water in the urban landscape.

There are a number of waterways that can pose a river (Fluvial) flooding risk to the borough. The following maps indicate those locations at highest risk. Additional risks across the borough also include flooding from surface water, canals, ground water and reservoirs.

Fluvial and Surface Water Flood Risk Maps: 1:60,000 Scale

Fluvial Flood Risk Zones – KEY

KEY	COLOUR / LINE	EXPLANATION
ZONE 3: High Probability		**Flood Risk Zone 3: High Probability** Areas of 'high' probability of flooding are assessed as having a 1 in 100 or greater chance of river flooding (>1%) or 1 in 200 (>0.5%) chance of tidal flooding in any year, and are referred to as High Risk Zone 3;
ZONE 2: Medium Probability		**Flood Risk Zone 2 – Medium Probability** Areas of 'medium' probability of flooding are assessed as having between a 1 in 100 and 1 in 1000 chance of river and/or tidal flooding (1% to 0.1%) in any year, and are referred to as Zone 2 Medium Probability;
ZONE 1: Low Probability	**Not mapped**	**Flood Risk Zone 1 – Low Probability** Areas of 'low' probability of flooding are assessed as having a less than 1 in 1000 chance of flooding (<0.1%) in any year, and are referred to as Zone 1 Low Probability.
SURFACE WATER (LOW/MED/HIGH) COMBINED		Areas susceptible to Surface water (local drainage), sewers and groundwater flooding

FLOOD DEFENCES		The purple line shows all flood defences built in the last five years to protect against river floods with a 1per cent (1 in 100) chance of happening each year, or floods from the sea with a 0.5 per cent (1 in 200) chance of happening each year, together with some, but not all, older defences and defences which protect against smaller floods. Flood defences that are not yet shown, and the areas that benefit from them, will be gradually added.
AREAS BENEFITING FROM FLOOD DEFENCES		Hatched areas benefit from the flood defences shown, in the event of a river flood with a 1 per cent (1 in 100) chance of happening each year, or a flood from the sea with a 0.5 per cent (1 in 200) chance of happening each year. If the defences were not there, these areas would be flooded.
RIVERS		The blue line Main rivers shows the main rivers, these are usually larger streams and rivers.

Fluvial Flood Risk Maps: 1:60,000 Scale

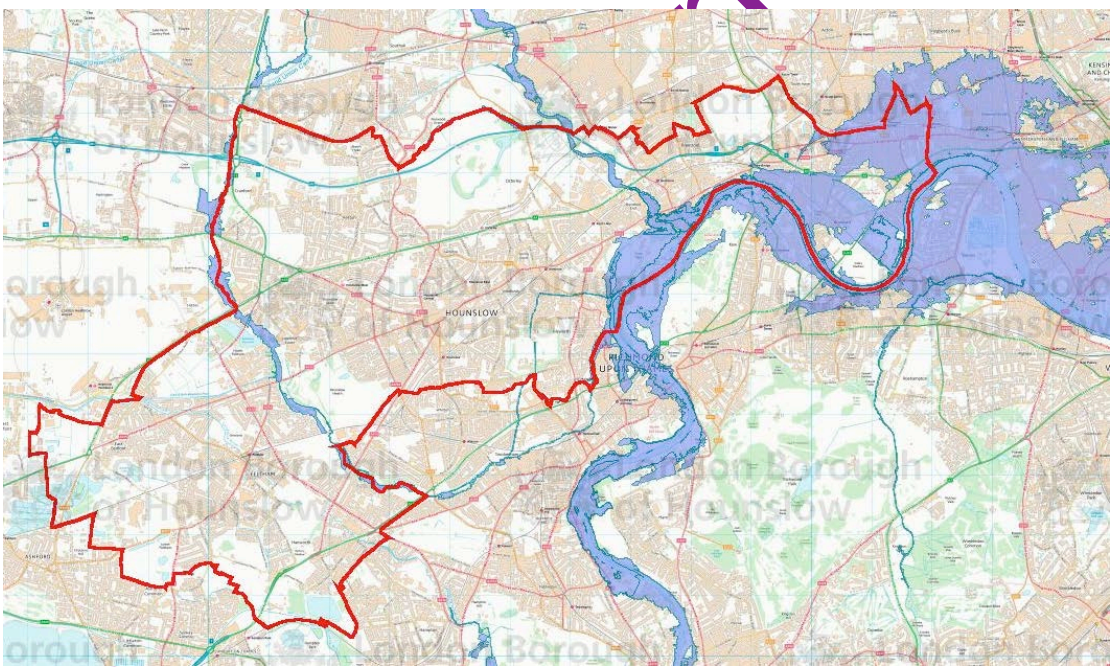


Figure 1: Fluvial Flood Risk Map: Zone 3 'High Probability'

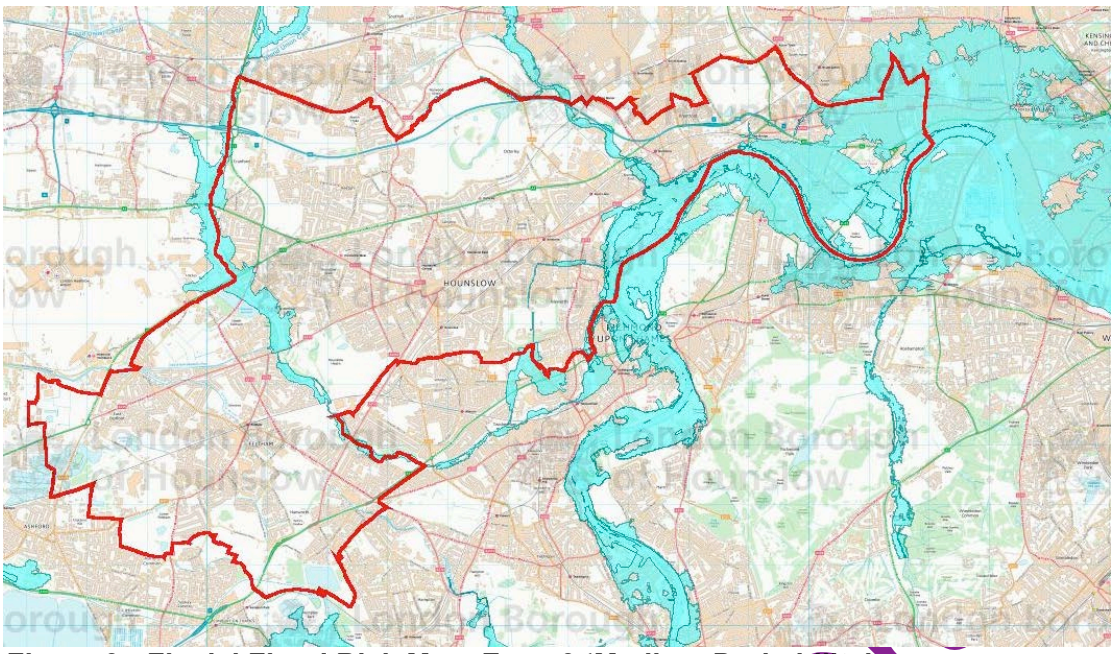


Figure 2: Fluvial Flood Risk Map: Zone 2 'Medium Probability'

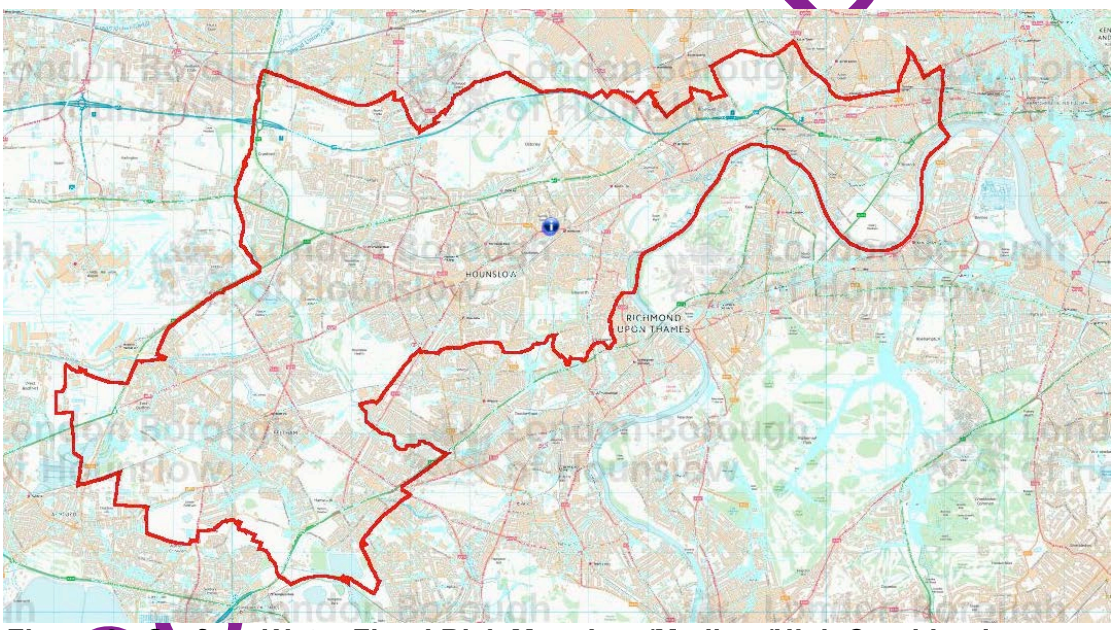


Figure 3: Surface Water Flood Risk Map: Low/Medium/High Combined

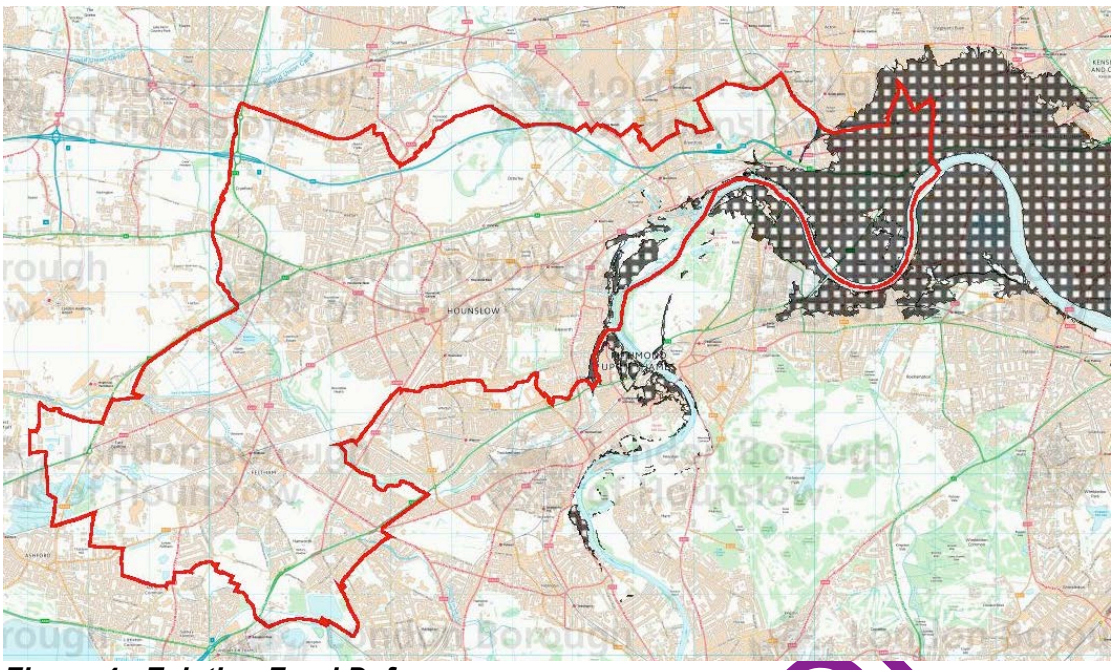


Figure 4: Existing Food Defences

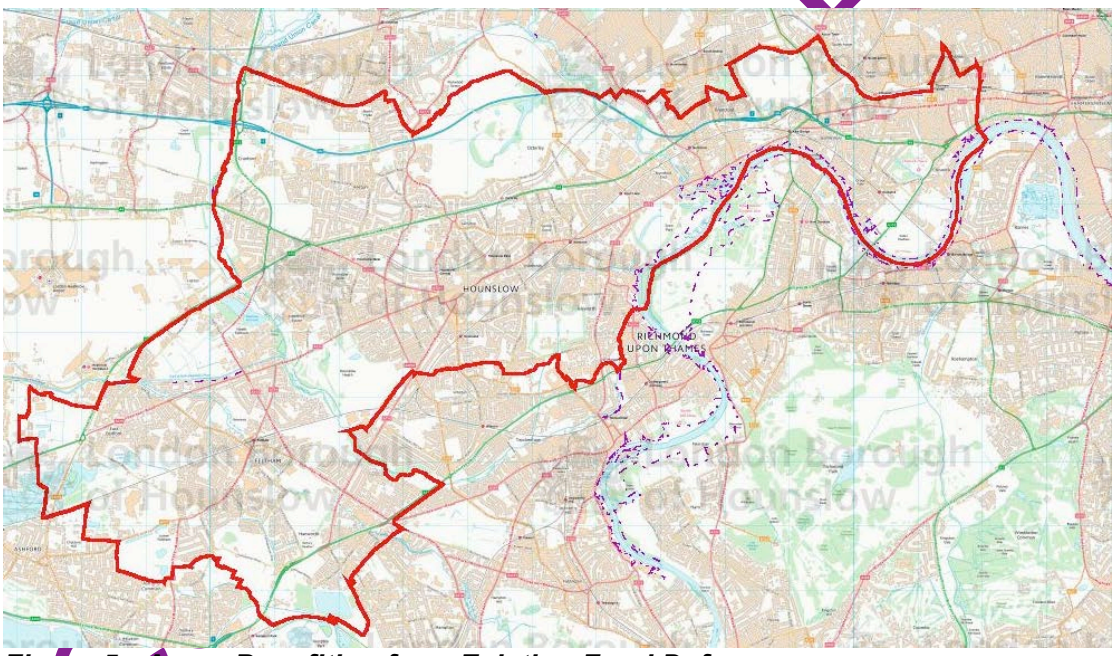


Figure 5: Areas Benefiting from Existing Food Defences

Appendix C – Legislative Context

Reservoirs Act 1975

This act focuses on the management of reservoirs and provides the following definitions:

i) a reservoir is a "raised reservoir" if it is designed to hold, or capable of holding, water above the natural level of any part of the land adjoining the reservoir; and
ii) a raised reservoir is a "large raised reservoir" if it is designed to hold, or capable of holding, more than 25,000 cubic metres of water.

The undertaker of a reservoir is the person who controls the use of the reservoir. They are obliged to produce onsite reservoir flood plans. The Environment Agency is responsible for regulating this. The Flood and Water Management Act changed the legislation so that all reservoirs over 10,000m^3 must have flood plans.

Highways Act 1980

The Highways Act covers a large range of activities and responsibilities that Highways Authorities have. In Hounslow, the two highways authorities are Transport for London for the 'red routes' and Hounslow Council for all other roads.
The Highways Act enables the highway authority may construct drains and take actions to divert surface water into them for the purpose of draining the highways. Highways have a responsibility for ensuring that the highways drain fully and can take actions to clean out drains and watercourses which prevent this happening.

Water Industry Act 1991

This act outlines the roles of Water Supply and Water and Sewerage Companies.
The relevant section for Flood Risk Management is Part IV which deals with sewerage services. It also provides general powers and duties of water companies including concerning water supply and their ability to charge for services.
The act was principally amended by The Water Industry Act 1999 and the Water Act 2003.

Land Drainage Act 1991

This act enables the management of land drainage for a number of bodies that include the Environment Agency, Internal Drainage Boards, local authorities, navigation authorities and riparian owners.

Water Framework Directive 2000

Is European Commission water legislation designed to improve and integrate the way water bodies are managed throughout Europe. The Directive seeks to achieve good chemical and ecological status in inland and coastal waters by 2015.
The Water Framework Directive establishes new ways of protecting and improving rivers, lakes, groundwater, transitional (where freshwater and sea water mix) and coastal waters.
The Directive seeks to:

- prevent deterioration in the classification status of aquatic ecosystems, protect them and improve the ecological condition of waters;
- achieve at least good status for all waters. Where this is not possible, good status should be achieved by 2021 or 2027;
- promote sustainable use of water as a natural resource;
- conserve habitats and species that depend directly on water;

• progressively reduce or phase out release of individual pollutants or groups of pollutants that present a significant threat to the aquatic environment;
• progressively reduce the pollution of groundwater and prevent or limit the entry of
pollutants; and
• contribute to mitigating the effects of floods and droughts.

To achieve this, the Environment Agency has embarked on river basin management planning with the aim to develop new and better ways of protecting and improving the water environment. It is important that measures to manage local flood risk do not cause deterioration of water bodies and should consider opportunities to improve water bodies in conjunction with local flood risk management.

Strategic Environmental Assessment (SEA) Directive 2001
This legislation aims to increase the consideration of environmental issues during decision making related to strategic documents such as plans, programmes or strategies. The SEA identifies the significant environmental effects that are likely to result due to the implementation of a plan, programme or strategy.

Civil Contingencies Act 2004
This legislation provides a single resilience framework for civil protection in the UK that supports multi-agency integrated emergency management through the Local Resilience Forum which provides co-ordination during emergency response at a local, regional and national level.

Climate Change Act 2008
This act requires a UK-wide Climate Change Risk Assessment every five years, the first of which was published in 2012. This is to be accompanied by a National Adaptation Programme to tackle the risks identified in the climate change risk assessment. The Act requires public bodies and statutory organisations such as water companies to report on how they are adapting to climate change.

Flood Risk Regulations 2009
The Flood Risk Regulations requires the production of the following:

Preliminary Flood Risk Assessment (PFRA) (Reynolds, 2012) – This involves collecting information on past and future floods from surface water, groundwater and small watercourses and identifying Indicative Flood Risk Areas. There is an Indicative Flood Risk Area that covers the whole of Greater London.

Flood Hazard and Flood Risk Maps – Following the identification of Flood Risk Areas the Environment Agency and Lead Local Flood Authority are required to produce hazard and risk maps for Indicative Flood Risk Areas.

Flood Risk Management Plans – The Council is required to produce a Flood Risk Management Plan for the Indicative Flood Risk Areas by December 2015. This will be based on the Local Flood Risk Management Strategy and the Surface Water Management Plan.

Flood and Water Management Act 2010
The Flood and Water Management Act 2010 was passed to provide for better management of flood risk, help safeguard community groups from unaffordable rises in surface water drainage charges and protect water supplies to the customer.

Appendix D - Stakeholder Responsibilities

Risk Management Authorities
The Flood and Water Management Act 2010 recognises the following organisations to be risk management authorities:

Lead Local Flood Authorities
Water Companies – Thames Water
The Environment Agency
Highways Authorities – London Borough of Hounslow, Transport for London
Internal Drainage Boards
District and Borough Councils

In Hounslow, the four organisations that are risk management authorities are the London Borough of Hounslow, Thames Water, the Environment Agency and Transport for London.

All risk management authorities have the following duties and powers:

1. Duty to be subject to scrutiny from lead local flood authorities' democratic processes;
2. Duty to co-operate with other risk management authorities in the exercise of their flood and coastal erosion risk management functions, including sharing flood risk management data;
3. Power to take on flood risk functions from another risk management authority when agreed by both sides

Lead Local Flood Risk Authority
The Flood and Water Management Act 2010 identified Hounslow as the Lead Local Flood Authority for its administrative area. This gives Hounslow the strategic role in overseeing the management of surface water runoff and groundwater flood risk as well as the following new powers to:

- do works to manage flood risk from surface runoff or groundwater;
- designate structures and features that affect flooding;
- request information from any person in connection with the authority's flood and coastal erosion risk management functions;

It also gives the Lead Local Flood Authority new responsibilities that include:

- Strategic Leadership- bringing together stakeholders and leading on developing a strategy to manage flood risk in the borough.

Comply with the Flood Risk Regulations:

- Producing Flood Investigation Reports
- Maintaining Register and Record of Assets
- Designating Assets
- Recording Flood Incidents
- Implementing the SuDS Approval Body

Water Company - Thames Water
Thames Water is responsible for both the supply and drainage of water in the borough. It has responsibility around flood risk management, specifically to:

Provide, maintain and operate systems of public sewers and works for the purpose of effectively draining an area, including maintenance of all drains which serve more than one property or which extend beyond the property boundary;

Respond to flooding incidents involving their assets;

Undertake capacity improvements to alleviate sewer flooding problems with priority being given to more frequent internal flooding problems;

Adopt all new lateral drains and sewers that are to connect to a public sewer from April 2013;

Act as a Statutory consultee to the SuDS (Sustainable Drainage System) Approval Body when the drainage system is proposed to communicate with the public sewer;

Maintain its reservoirs according to the standards of the reservoir act.

Environment Agency
The Environment Agency has an important strategic role in flood risk management across England. It is required to:

Publishing the National Strategy which provides a clear national framework for all forms of flood risk management;
Managing the Regional Flood and Coastal Committees (RFCCs) and support their decisions in allocating funding for flood defence and flood resilience schemes;
Reviewing and supporting Lead Local Flood Authority activities;
Providing the data, information and tools to inform government policy and aid risk management authorities in delivering their responsibilities;
Reporting and monitoring flood and coastal erosion risk management;
The Environment Agency also has a large operational role that mainly focuses on flooding from main rivers and the sea,
Statutory consultee for all planning applications in areas where there is a risk of flooding and for any site greater than 1 hectare in size.
Provide advice on Flood Risk and help the local planning authority to technically interpret developer's flood risk assessments that have been submitted as part of the evidence base in support of a planning application.
Enforcement authority for reservoirs that are greater than 10,000m3 ensuring they have flood plans although reservoir owners are responsible for carrying out work to manage reservoir safety.

The Environment Agency is also responsible for establishing and maintaining a register of reservoirs, and making this information available to the public.

Transport for London
Transport for London (TfL) is the local government body responsible for most aspects of the transport system in Greater London. It is responsible for the London Underground and its gullies and culverts and for ensuring that these assets do not cause flood risk. TfL are undertaking a climate risk assessment of its assets and operations and develop a prioritized action plans for key climate risks.

Residents and businesses
It is the responsibility of residents and businesses to look after their homes and properties, including protecting them from flooding.

While in some circumstances other organisations or property owners may be liable due to neglect of their own responsibilities, there will be many occasions when flooding occurs despite all parties meeting their responsibilities.

The Greater London Authority
The Greater London Authority (GLA) is the strategic regional authority with powers over transport, policing, economic development and fire and emergency planning. Transport for London is a delivery agency of the GLA.

The GLA is not a lead local flood authority and has no statutory role in flood risk management. However it developed the Drain London Project(Greater London Authority, 2007) that helps to predict and manage surface water flood risk in London. The project is a direct response to the Mayor's Regional Flood Risk Appraisal, which identified surface water flood risk as the most likely cause of flooding in London, rather than river, tidal or groundwater sources.

Drain London has progressed in three stages. The first stage focused on data collection and establishing the standards and framework for flood risk modelling. Stage two undertook this modelling, identifying the areas at risk of flooding and producing a Surface Water Management Plan for each London Borough, with a prioritised list of areas needing attention.

The final stage, still underway, involves detailed modelling of high priority flood risk areas such as schools and emergency services, as well as the installation of sustainable drainage demonstration projects in London.

Canal & River Trust
The Canal & River Trust, formerly British Waterways,
It is the responsibility of the Canal & River Trust to ensure that no flooding occurs from the canal network.

Network Rail
Network Rail is responsible for mainline stations and railways.
They are not risk management authorities but are responsible for ensuring that their assets are maintained and does not increase flood risk.

Neighbouring London Boroughs
All London boroughs are Lead Local Flood Authorities for their area, with the same responsibilities as Hounslow. However water, of course, flows across organizational boundaries and so it is crucial to work closely with neighbouring boroughs to recognise where flooding issues arise in Hounslow they may be caused by situations outside the borough.

The borough therefore has a responsibility to co-operate with neighbouring boroughs both upstream and downstream to support sustainable water management across the whole catchment.

Appendix E – Glossary

ABDs	Areas Benefiting from Defences
AONB	Area of Outstanding Natural Beauty
CFMP	Catchment Flood Management Plan
DEM	Digital Elevation Model
DTLR	Department of Transport, Local Government and Regions
EA	Environment Agency
FRA	Flood Risk Assessment
FRIS	Flood Reconnaissance Information System
GIS	Geographical Information Systems
IDB	Internal Drainage Board
LBH	London Borough of Hounslow
LDD	Local Development Document
LDS	Local Development Scheme
LiDAR	Light Detection and Ranging
LPA	Local Planning Authority
LPD	Local Planning Documents
mOD	Meters Ordnance Datum
PCPA 2004	Planning and Compulsory Purchase Act 2004
PPG 25	Planning Policy Guidance Note 25: Development and Flood Risk
RFRA	Regional Flood Risk Appraisal
RPG	Regional Planning Guidance
RSS	Regional Spatial Strategy
SAC	Special Area of Conservation
SA	Sustainability Appraisal
SAB	SuDS Approval Body
SFRA	Strategic Flood Risk Assessment
SPA	Special Protection Area
SPG	Supplementary Planning Guidance
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage Systems (previously SUDS -Sustainable Urban Drainage Systems)

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