



# Local Flood Risk Management Strategy

## Foreword

I am sure you will agree that flooding has been an issue for many over the past few years, particularly when the country experienced the wettest two-month period on record in December 2013 to January 2014. The prolonged heavy rainfall during that time caused groundwater to rise to exceptionally high levels which led to significant flooding in some of our neighbouring boroughs.

Government legislation has provided local authorities with a number of new responsibilities in relation to flood risk management and also demands a more coordinated approach to the work we all carry out in this important area.

Flooding is often seen as a risk linked to river and coastal flood plains, but local flooding is far more widespread and can be just as damaging. Local flooding can happen when drainage systems are overwhelmed by surface water runoff or high groundwater levels. Many of us may not recognise the risk we face.

Flood risk is not a problem that one local authority or one government department can manage alone and we cannot underestimate the impact of flooding on our health, wellbeing and prosperity.

Assessing levels of risk from flooding is a difficult task. With greater development and increasingly uncertain weather patterns, houses that have never been flooded in living memory may be at risk. We recognise that residents may have concerns about using models to determine areas of flood risk, but they are crucial to making sure that limited resources are used most effectively to reduce the impact and probability of properties being flooded.

We have come together with the London boroughs of Bexley, Bromley, and Royal Greenwich to develop the South East London Local Flood Risk Management Strategy. It describes how we will work in partnership across the four boroughs and with other organisations such as the Environment Agency and Thames Water to manage local flood risk. We have also developed this document, the Lewisham Local Flood Risk Management Strategy to set out the specific actions Lewisham Council will take over the next six years and beyond to fulfil our flood risk management duties and responsibilities. By working together in this way we will share our collective experience and expertise in managing flood risk and work with residents and businesses so they recognise and value the benefits of managing their own flood risk to the best of their ability.

However the activities identified through this strategy can only manage flood risk. It would not be possible, even if we were not in an era of austerity, to protect all households from every source of flood risk. Instead efforts need to be made by all involved to reduce flood risk in practical ways. Sometimes this involves focussing not just on decreasing the probability of flooding but also its impact, making sure that properties and households can cope in the event of a flood.

Our strategy is being developed at a time of unprecedented pressures to reduce public spending and so it is essential we identify the affordable priorities for action. To get the best value from all the money spent, we will work with different departments across the council and partner organisations so that flood risk benefits are considered to reduce the impact that flooding has on the lives of our communities. Partnership working is essential to the effective delivery of this strategy, not just to raise funds for projects but also to develop our collective understanding of the risk we face. This in turn helps us in making appropriate investment decisions and improving decision making in other areas such as planning. By working collectively we can exploit national and regional funding opportunities for the benefit of local communities.

I am grateful to those who have already contributed to and influenced the development of this strategy and its approach.

A handwritten signature in black ink, appearing to read 'Alan Smith', is positioned to the right of a vertical line.

Cllr Alan Smith  
Deputy Mayor and Cabinet Member for Growth & Regeneration

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# 1 Introduction

## 1.1 Background

Following the devastating floods of 2007 the Government, with the support of all political parties, commissioned Sir Michael Pitt to undertake a review of what happened in the summer of 2007 and what could be done in the future to reduce the risk and the impacts of flooding on communities across the country. The Pitt Review<sup>1</sup> identified 92 recommendations, many of which were translated into primary legislation through the Flood and Water Management Act (FWMA), introduced in April 2010. Also at this time the Government introduced the Flood Risk Regulations (FRRs) 2009, to transpose the European Union 'Floods Directive' 2007 into English and Welsh law. Under this new legislation all London boroughs became Lead Local Flood Authorities (LLFAs). The LLFAs were given new roles, responsibilities, duties and powers to enable them to manage flood risk from localised sources across their borough. The Pitt Review stated that "the role of local authorities should be enhanced so that they take on responsibility for leading the co-ordination of flood risk management in their areas." A key component in delivering improved management is the Duty to develop, maintain, apply, and monitor a strategy for local flood risk management that encompasses all sources of flooding. The boroughs of Bexley, Bromley, Greenwich and Lewisham in south east London have come together to develop their local flood risk management strategies. This document is the London Borough of Lewisham's Local Flood Risk Management Strategy.

## 1.2 Scope and purpose of the Strategy

This Strategy outlines Lewisham's responsibilities for managing local flood risk from the following sources;-

- surface water flooding – this happens when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead.
- ground water – this is water found underground in the cracks and spaces in soil, sand and rock. It is stored in and moves slowly through formations of soil, sand and rocks called aquifers.
- ordinary watercourses – for example streams, brooks and ditches through which water flow.

The Strategy does not include flood risk from main rivers (e.g. River Ravensbourne and Quaggy) and tidal sources as this is the responsibility of the Environment Agency. It does not include flood risk from sewers, water mains and reservoirs as this is the responsibility of Thames Water

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[http://webarchive.nationalarchives.gov.uk/20100807034701/http://archive.cabinetoffice.gov.uk/pittreview/thepittreview/final\\_report.html](http://webarchive.nationalarchives.gov.uk/20100807034701/http://archive.cabinetoffice.gov.uk/pittreview/thepittreview/final_report.html)

### 1.3 What are we doing to address the risk?

The London Borough of Lewisham is working together with the three other south east London LLFAs to manage local flood risk and fulfil our duties and responsibilities under the Flood Risk Regulations 2009 (FRRs) and the FWMA 2010.

To manage flood risk Lewisham will:

- Work in partnership with other Risk Management Authorities (RMAs) for example, the Environment Agency, Transport for London, Thames Water and Network Rail
- Contribute to the preparation of the South East London Local Flood Risk Management Strategy across the boroughs of Bexley, Bromley, Greenwich and Lewisham (here after known as the South East London Strategy)
- Prepare a Local Flood Risk Management Strategy (Local Strategy) for the London Borough of Lewisham with a six year Action Plan that will be reviewed annually (see Table 1). The Strategy Action Plan will also inform the Environment Agency's Flood Risk Management Plan for London.

#### The South East London Local Flood Risk Partnership

The south east London Lead Local Flood Authorities that have contributed to the South East London Strategy are:

- London Borough of Bexley
- London Borough of Bromley
- Royal Borough of Greenwich
- London Borough of Lewisham

We started to work with the other three boroughs following the Drain London Programme in 2010 during which we participated in the production of Surface Water Management Plans and Preliminary Flood Risk Assessments as a requirement of the Flood Risk Regulations 2009. The Drain London Project was set up by the Greater London Authority (GLA) following on from the Mayor of London's Regional Flood Risk Appraisal. Its aim was to identify areas of London at risk of surface water flooding and potential solutions to reduce or manage that risk. The Drain London Forum was established and co-ordinated by the GLA and included the 33 London boroughs, the Environment Agency, Thames Water, and Transport for London. It was agreed that the working relationship be formalised and as such the South East London Flood Risk Management Partnership ('the Partnership') was formed. The Partnership meets every quarter and is made up of the following members.

- Thames Regional Flood and Coastal Committee (RFCC) Representative
- Southern RFCC Representative
- Lead Councillors from each borough
- Council Officers from each borough
- Environment Agency
- Thames Water

### 1.4 What is the Local Flood Risk Management Strategy ('Local Strategy')?

It is a statutory document which sets out how the London Borough of Lewisham as a Lead Local Flood Authority (LLFA) alongside other risk management authorities (RMAs) will monitor and respond to the identified sources of local flood risk across the borough now and into the future.

### 1.5 The Strategy specifies;

- a. the risk management authorities (RMA) in the Borough,
- b. the flood and coastal erosion risk management functions that may be exercised by the RMA's in relation to the borough,
- c. the objectives for managing local flood risk,
- d. the measures proposed to achieve those objectives,
- e. how and when the measures are expected to be implemented,
- f. the costs and benefits of those measures, and how they are to be paid for,
- g. the assessment of local flood risk for the purpose of the strategy,
- h. how and when the strategy is to be reviewed, and
- i. how the strategy contributes to the achievement of wider environmental objectives.

### 1.6 Structure of the Local Strategy

The south east London Lead Local Flood Authorities (“the four boroughs”) have produced a shared Strategy to describe our common aims and objectives, our shared approach to flood risk management and our commitment to partnership working. Lewisham has also produced an individual Local Flood Risk Management Strategy document (this document, our “Local Strategy”), which specifies Lewisham specific objectives, concerns and individual Action Plan. Links to the South East London Strategy document and each of the other borough’s Local Strategies can be found in Table 1 below.

Table 1 Links to other related Local Flood Risk Management Strategy documents (links will be live when all documents are completed)

South East London Local Strategy	London Borough of Bexley Local Strategy	London Borough of Bromley Local Strategy	Royal Borough of Greenwich Local Strategy
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### 1.7 Legislative context

Table 2 below sets out some of the key legislation which forms the backdrop to the Strategy. This is a combination of European, national, regional, and local statutory documents; of particular relevance are the Flood Risk Regulations 2009 and the Flood and Water Management Act 2010.

Table 2 Legislative context for Local Flood Risk Management Strategy

Legislation	
<a href="#">Flood and Water Management Act (2010)</a>	<p>The Flood &amp; Water Management Act (FWMA) makes provision for better, more sustainable management of flood risk for people, homes and businesses and protect water supplies to the consumer.</p> <p>The FWMA sets out the role of the Council as a Lead Local Flood Authority (LLFA) and sets out a range of powers and responsibilities for the LLFA (and others) such as the duty on all flood risk management authorities to co-operate with each other, and provides Lead Local Flood Authorities (LLFA) and the Environment Agency with a power to request information required in connection with their flood risk management functions.</p> <p>Section 9 of the FWMA requires LLFAs to develop, maintain, apply and monitor a strategy for local flood risk management in its area. This document is the Local Flood Risk Management Strategy.</p>
<a href="#">Flood Risk Regulations (2009)</a> and	The Flood Risk Regulations 2009 (FRR) transpose the European Floods

<p><a href="#">EU Floods Directive (2007)</a></p>	<p>Directive (2007) into UK law. The purpose of the Floods Directive is to establish a framework for assessing and managing flood risk, aimed at reducing the negative impact of flooding on human health, the environment, cultural heritage and economic activity across the European Community. The Directive was developed in response to a number of extreme flooding events suffered across the EU and aims to establish effective cross-border flood risk management to address this.</p> <p>The Directive required Member States to first carry out a preliminary assessment by 2011 to identify the river basins and associated coastal areas at risk of flooding. This is defined as “Flood Risk Area” in the FRR. For such zones they would then need to draw up flood risk maps by 2013 and establish flood risk management plans focused on prevention, protection and preparedness by 2015. The Directive applies to inland waters as well as all coastal waters across the whole territory of the EU.</p> <p>Greater London was identified as a Flood Risk Area on the basis of the national data (England and Wales) prepared by the Environment Agency. Consequently the area requires a Flood Risk Management Plan (as defined in the FRR).</p>
<p><a href="#">The Land Drainage Act (1991 and amended in 1994)</a></p>	<p>The Land Drainage Act 1991 requires that a watercourse be maintained by its owner in such a condition that the free flow of water is not impeded. The riparian owner must accept the natural flow from upstream but need not carry out work to cater for increased flows resulting from some types of works carried out upstream, for example a new housing development. If a riparian owner fails to carry out his responsibilities under the Land Drainage Act, or if anyone else causes a watercourse to become blocked or obstructed, the County and District Councils have powers of enforcement by serving a notice under the Act. If this is ignored, the Council concerned may carry out the necessary work itself and then recharge the person responsible for the full cost incurred.</p> <p>The 1994 Act amends the Land Drainage Act of 1991 in relation to the functions of internal drainage boards and local authorities.</p>
<p><a href="#">Water Resources Act (1991)</a></p>	<p>This Act aims to prevent and minimise pollution of water. The policing of this Act is the responsibility of the Environment Agency. Under the Act it is an offence to cause or knowingly permit any poisonous, noxious or polluting material, or any solid waste to enter any controlled water.</p> <p>Silt and soil from eroded areas are included in the definition of polluting material. If eroded soil is found to be polluting a water body or watercourse, the Environment Agency may prevent or clear up the pollution, and recover the damages from the landowner or responsible person.</p>
<p><a href="#">EU Water Framework Directive (2000)</a></p>	<p>This Directive sets out to establish a Community framework for the protection of surface waters and groundwater across the EU. It aims to provide a common approach with common objectives, principles and basic measures designed to prevent any further deterioration of surface and ground waters and to protect and enhance the quality and quantity of aquatic eco-systems and, with regard to their water needs, terrestrial systems.</p>
<p><a href="#">Strategic Environmental Assessment Directive (2001)</a></p>	<p>The Strategic Environmental Assessment (SEA) Directive applies to a wide range of public plans and programmes (e.g. on land use, transport, energy, waste, agriculture, etc.). The SEA Directive does not refer to policies. Plans and programmes in the sense of the SEA Directive must be prepared or adopted by an authority (at national, regional or local level) and be required by legislative, regulatory or administrative provisions. An SEA is mandatory for plans/programmes which:</p>

	<ul style="list-style-type: none"> <li>• Are prepared for agriculture, forestry, fisheries, energy, industry, transport, waste/ water management, telecommunications, tourism, town &amp; country planning or land use and which set the framework for future development consent of projects listed in the EIA Directive.</li> <li>OR</li> <li>• Have been determined to require an assessment under the Habitats Directive.</li> </ul> <p>Broadly speaking, for the plans/programmes not included above, the Member States have to carry out a screening procedure to determine whether the plans/programmes are likely to have significant environmental effects. If there are significant effects, an SEA is needed. The screening procedure is based on criteria set out in Annex II of the Directive.</p>
<a href="#">Civil Contingencies Act (2004)</a>	<p>The Civil Contingencies Act establishes a new legislative framework for civil protection in the United Kingdom. It imposes a clear set of roles and responsibilities on those organisations with a role to play in preparing for and responding to emergencies. Local authorities are a Category 1 responder under the Act, and have a key role to play in respect in discharging their duties in the legislation. The Act, and accompanying Regulations and guidance, delivers a single framework for civil protection in the United Kingdom capable of meeting the challenges of the 21<sup>st</sup> century.</p>
<a href="#">Climate Change Act (2008)</a>	<p>The Act sets up a framework for the UK to achieve its long-term goals of reducing greenhouse gas emissions and to ensure steps are taken towards adapting to the impact of climate change. Its main elements are:</p> <ul style="list-style-type: none"> <li>• Setting emissions reduction targets in statute and carbon budgeting.</li> <li>• A new reporting framework.</li> <li>• The creation of an independent advisory body.</li> <li>• Trading scheme powers</li> <li>• Adaptation</li> <li>• Policy measures which reduce emissions.</li> </ul> <p>The Act will be used to support emissions reductions through several specific policy measures: amendments to improve the operation of the Renewable Transport Fuel Obligations; a power to introduce charges for single use carrier bags; a power to pilot local authority incentive schemes to encourage household waste minimisation and recycling; amendments relating to the Certified Emissions Reductions Scheme; powers and duties relating to the reporting of emissions by companies and other persons; and a duty to make annual reports on the efficiency and contribution to sustainability of buildings on the civil estate.</p>
<a href="#">Conservation of Habitats and Species Regulations (2010)</a>	<p>The objective of the Habitats Directive is to protect biodiversity through the conservation of natural habitats and species of wild fauna and flora. The Directive lays down rules for the protection, management and exploitation of such habitats and species. The Habitats Regulations transpose the Habitats Directive in England, Wales and to a limited extent Scotland by ensuring that activities are carried out in accordance with the requirements of the Directive.</p>
<a href="#">The Localism Act (2011)</a>	<p>The Localism Act contains a wide range of measures to devolve more powers to councils and neighbourhoods and give local communities greater control over local decisions like housing and planning.</p>
<a href="#">National Planning Policy Framework (2012)</a>	<p>The National Planning Policy Framework sets out the Government's planning policies for England and how these are expected to 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.</p>
<a href="#">The London Plan (and</a>	<p>The London Plan is the overall strategic plan for London, and it sets out a</p>

<a href="#">amendments 2013)</a>	<p>fully integrated economic, environmental, transport and social framework for the development of the capital to 2031. It forms part of the development plan for Greater London. London boroughs' local plans need to be in general conformity with the London Plan, and its policies guide decisions on planning applications by councils and the Mayor.</p>
<a href="#">The Water Act (2014)</a>	<p>The Water Act will, for the first time, mean businesses, charities and public sector customers will have the freedom to switch supplier from 2017.</p> <p>The Act will:</p> <ul style="list-style-type: none"> <li>• Address growing pressure on water resources by making our supply more resilient;</li> <li>• Help join up the national water network, by making it easier for water companies to buy and sell water from each other;</li> <li>• Increase competition and encourage new entrants to the market who can offer alternative sources of water or innovative ways of treating sewerage</li> <li>• Ensure that hundreds of thousands of households in the highest flood risk areas will be able to access affordable flood insurance from 2015.</li> </ul>

### 1.8 Related documents

There are many different documents which need to be read and considered in conjunction with our Local Strategy these are set out below in Figure 1. This list is far from exhaustive.



Figure 1 Studies and Plans informing the Lewisham Local Flood Risk Management Strategy

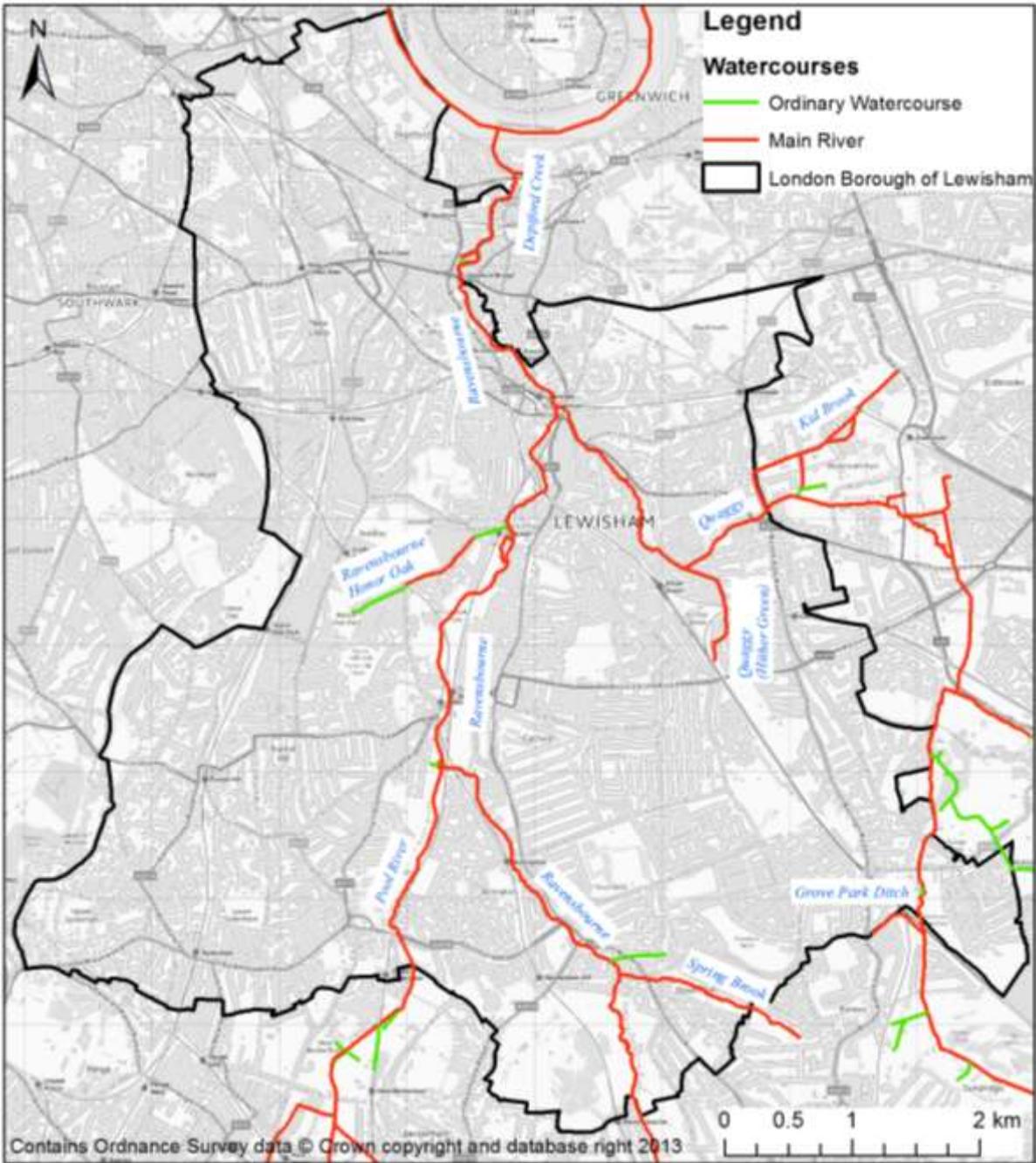


Figure 2 Watercourses within the borough

## 2 Local flood risk

### 2.1 What is a flood?

A flood is formally defined in the FWMA as including any case

*"[...] where land not normally covered by water becomes covered by water."*

It can come from a range of sources including heavy rainfall, a river overflowing or its banks being breached, a dam overflowing or being breached, tidal waters, or groundwater. It does not include a flood from any part of the sewerage system unless it is wholly or partially caused by an increase in the volume of rainwater (including snow and other precipitation) entering or otherwise affecting the system. Nor does it include flooding caused by a burst water main.

In the context of a Local Strategy *local* flooding is from surface runoff, groundwater and ordinary watercourses.

### 2.2 What is flood risk?

Flood risk can be described as the combination of the statistical probability of a flood occurring and the scale of its potential consequences, whether inland or on the coast. Thus it is possible to define flood risk as:

**Flood risk = (probability of a flood) x (scale of the consequences)**

On that basis it is useful to express the definition as follows:

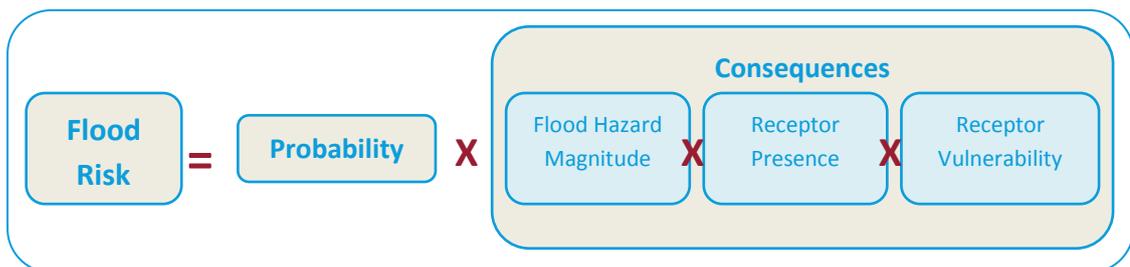


Figure 3 What is flood risk?

Using this definition it can be seen that

- **Increasing the probability or chance of a flood being experienced increases the flood risk.** In situations where the probability of a flood being experienced increases gradually over time, for example due to the effects of climate change, then the magnitude of the flood risk will increase.
- **The severity of the consequences can increase the flood risk.**
- **Flood hazard magnitude:** If the direct hazard posed by the depth of flooding, velocity (speed) of flow, the speed of onset, rate of rise in flood water or duration of inundation is increased (for example due to the effects of climate change), then the consequences of flooding, and therefore risk, is increased. New development can potentially increase the hazard if it causes an increase in surface runoff flows.
- **Receptor presence:** The consequences of a flood will be increased if there are more receptors affected. Receptors are people, property, habitat or infrastructure (electricity sub-station, pumping station, railway line). Additionally, if there is new development that increases the probability of flooding or increased density of infrastructure then consequences will also be increased.

- **Receptor vulnerability:** If the vulnerability of the people, property or infrastructure is increased then the consequences are increased. For example, older or younger people are more vulnerable if they are caught up in a flood event.

### 2.3 Local flood risk in the London Borough of Lewisham

Like many areas adjacent to the River Thames the communities to the north of the borough are at risk of tidal flooding from the River Thames estuary, particularly Evelyn and New Cross wards. The last time flooding from the River Thames estuary was recorded within the borough was in January 1928, when a storm surge tide overtopped the flood defences. However these areas benefit from flood alleviation measures to reduce this risk to the community from both tidal and fluvial flooding. These measures include the River Thames Tidal Defences incorporating the Thames Barrier which started operating in 1982. As a result over 80% of the properties at risk are in areas where the likelihood of flooding is now low.

Today around 3,700 properties remain at a moderate to significant risk of fluvial and tidal flooding within the borough. These are largely grouped along the length of the River Ravensbourne and its main tributary the Quaggy. Around 11,000 properties are at risk of surface water flooding in a 1 in 30 year event.

### 2.4 Historic flooding

As outlined in Section 3.1.1 Lewisham developed the Preliminary Flood Risk Assessment (PFRA) to address the requirement of the FRRs. The PFRA set out historic flooding across the borough. This information has not been re-produced here however a discussion of some noteworthy flood incidents has been included below to help demonstrate the importance of managing flood risk.

London has a long history of flooding. In fact the first recorded flooding event on the River Thames dates from around the year 7 AD. The source of the flood (fluvial or tidal) is not known, nor is the extent and it is worth noting that the River Thames and its catchment have changed dramatically since this time.

One of the earliest recorded instances of flooding in London as we might start to recognise it as it is today is from January 1236, when, following prolonged heavy rainfall the Palace of Westminster was inundated and people had to row around the Great Hall in boats (a feat repeated in 1816). This was shortly followed by flooding in March 1236 where a storm surge drowned many people and a great number of cattle in the Woolwich area.

On 7 January 1928 the Thames flooded when the embankment wall between Lambeth and Vauxhall Bridges gave way in three places. 14 people were drowned by the flood waters and the night-watchman at Tate Gallery (now the Tate Britain) had to escape by swimming through flooded corridors.

London escaped the worst of the 1953 floods when more than 300 people in England drowned. However 1,000 Londoners were forced from their homes during the event.

A number of areas in London suffered during the Great Floods of September 1968 including the last major flood on the River Ravensbourne and its tributaries when heavy rainfall within the catchment caused the river to burst its banks, creating widespread flooding of several hundred residential and commercial properties in the borough. Following the 1968 event the River Quaggy was enclosed in a concrete culvert. Less severe river flooding was also recorded in 1977, 1992, 1993, and 2013/2014 (although the latter not causing significant flooding within the borough compared to other reaches of the Ravensbourne and Quaggy).

In 1990 local residents opposed a plan to expand the defences in the area and pushed for the river to be released from its culvert and develop a series of moulded floodplains to create a more natural approach to flood risk management and better habitats for wildlife. The Ravensbourne and in particular the Quaggy have benefited from flood alleviation measures to reduce this risk to the community from fluvial flooding such as Ladywell Fields, Cornmill Gardens in Lewisham Town Centre and the Sutcliffe Park Flood Storage Area scheme just across the borough boundary in Eltham. This is the approach we are trying to follow in developing and delivering the Local Strategy for Lewisham.

The results from an initial consultation carried out in the early stages of preparing this Strategy (Jan-March 2013) (shown in Figure 4) identified six instances of internal property flooding (5 residential:1 commercial), 18 instances of flooding affecting travel by roads and 11 instances of flooding affecting travel by rail. More information of the results of the questionnaire can be found at Appendix C1.

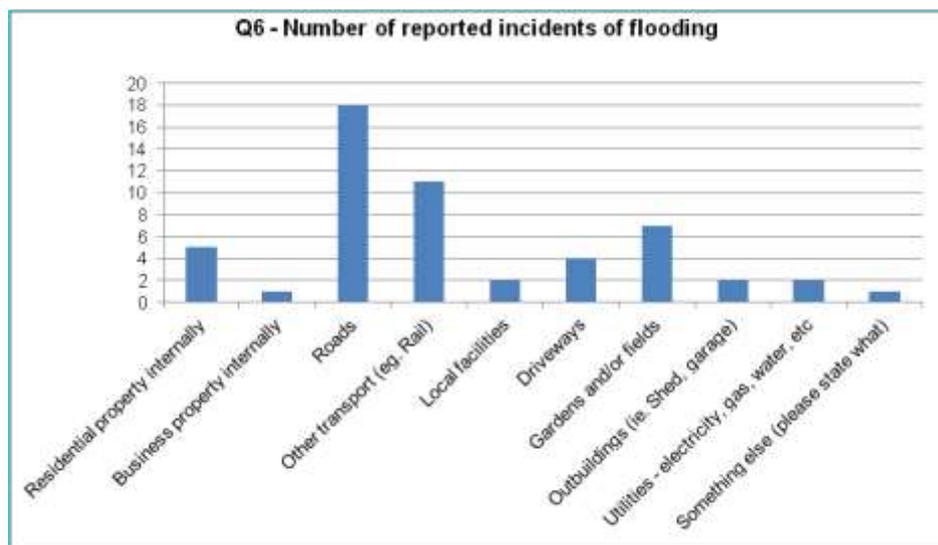


Figure 4 Flood reports from initial public consultation

Incidents of historic flooding are spread throughout the borough, but there is a greater intensity of reported events along the River Ravensbourne corridor. Hither Green is particularly highlighted within the PFRA for its historic flooding.

The Thames Barrier became operational in 1982. Since that time the Barrier was closed four times in the 1980s, 35 times in the 1990s, 75 times from 2000 to 2009 and 65 times between 2010 and March 2014. The Barrier was closed 50 times between September 2013 and July 2014 alone. It is noted that the operational procedures for the barrier have changed since 1982. Without the existence of the

Thames Barrier, if extreme storms coincided with high tide, 115 square km of London could be flooded. This would threaten the homes of around a million people as well as Whitehall, Westminster and the Isle of Dogs which would be flooded to a depth of 2.5m.

Most recently it is recognised that the winter of 2013-14 was a significant event across all boroughs as well as many other parts of South England. The current PFRA predates this event so the flooding experienced in the winter of 2013 / 14 is not captured therein. The event was caused by prolonged and extreme rainfall during the wettest December to January period in the UK since records began. This resulted in fluvial and prolonged ground water flooding events in places.

December 2013 to January 2014 was the wettest two month period on record in the South London area. The prolonged heavy rainfall caused groundwater to rise to exceptionally high levels which led to significant flooding in the Surrey and a number of south London boroughs.

Many local authorities and partner agencies worked around the clock to support residents and attempt to mitigate further flooding which was occurring in various forms (fluvial, pluvial and groundwater).

Groundwater in the south east, as measured by borehole readings, indicated the unprecedented situation that boroughs found themselves dealing with. It became clear that groundwater flood impact is often delayed, as the water moves through the chalk towards the Thames. And this was illustrated by Bromley and Bexley continuing to experience emerging groundwater in March and April 2014, following the settling of the issue in Croydon in February/ March 2014.

During the 2014 groundwater flooding event Croydon Council declared a Major Incident and, alongside other measures, established a local groundwater "Solution Cell" to monitor and the situation in Croydon. As the wave of groundwater travelled north east towards the Thames, the Solution Cell was expanded to a five borough group (Croydon, Bexley, Bromley, Greenwich and Sutton). As the other emergency response measures stood down, the five-borough groundwater flooding prevention initiative "Solution Cell" continued with the purpose to investigate and develop medium to long-term measures for managing ground and surface water flooding.

The partnership will ensure that a consistent approach is applied to the issue and should see tangible, effective outcomes for the communities in the boroughs concerned.

Lewisham are not direct members of the Solution Cell at present as they were not as significantly affected by the same February – May 2014 flooding when the group was set up. However Lewisham do and will continue to interact with the Solution Cell group through their work with the Partnership.

Appendix E1 contains maps covering Lewisham's historic flood incidents based on a number of sources.

## 2.5 Future risk of flooding

Borough maps covering Lewisham's flood risk by source based on predictive modelling are provided in Appendix D. These may include areas that have not previously experienced flooding or flooding of the magnitude presented. It is

important to highlight that just because an area has not flooded yet does not mean it will never flood in the future. It may be that the particular circumstances that would cause an area to flood have not been realised within the period of record. However, there is still a chance that flooding will occur in the future. We will continue to improve our understanding of local flood risk. We will record instances of flooding and 'near misses' to inform our overall understanding of flood risk and flood mechanisms affecting the borough. The more we know and understand, the more effectively we can manage risk into the future. We learn from every flood event and every 'near-miss'.

Lewisham has experienced severe flooding in the past and whilst much work has been undertaken by the Council, our partners and others, the risk of flooding continues into the future. In fact the probability of flooding will increase in the future as a result of factors such as:

- Climate change (increased storminess / rainfall intensity),
- Urban creep (infill development and loss of green space),
- Ageing infrastructure (increased pressure on drainage systems and other infrastructure designed for different levels and patterns of use and in deteriorating condition.
- Population growth (denser populations mean the impact of a flood for a given area will impact upon more people.

## 2.6 Future mitigation

Lewisham will continue to work with partners to improve understanding and deliver mitigation of flood risk into the future. We will continue to contribute to key mitigation projects across south east London such as the Thames Estuary 2100 Plan, the Lewisham River Corridors Improvement Plan (Supplementary Planning Document). We will support flagship programmes such as the Lewisham and Catford Flood Alleviation Scheme (See case study at Table 5) that seek to provide future mitigation measures through the utilisation of existing open space to manage risk. A key outcome of our Local Strategy is the Action Plan which sets out what we are planning to do to manage flood risk over the next six years and beyond. Our Action Plan is subject to review annually to take into account a number of factors that will influence the prioritisation of tasks and our ability to complete them. A key factor that will impact our ability to realise our plans will be the availability of flood risk management funding into the future. Funding of flood risk management is discussed further in Section 5.

### 3 Roles and Responsibilities

As a Lead Local Flood Authority (LLFA), Lewisham has a number of roles and responsibilities under the FRRs 2009 and the FWMA 2010. The ways in which we are working to respond to these new challenges both individually and in partnership across the four boroughs are discussed below.

#### 3.1.1 Preliminary Flood Risk Assessment

We produced our PFRA which was published in 2010 in accordance with the FRRs. This document was developed in co-ordination with other members of the Partnership and the Drain London project to apply a consistent approach across London. We will review these documents prior to June 2017 (as specified by the FRRs).

#### 3.1.2 Co-operation and arrangements

Under Section 13 of the FWMA, we must co-operate with other relevant authorities in the exercise of our flood and coastal erosion risk management functions.

Lewisham may share information with other relevant authorities for the purpose of discharging our duty under Section 13 of the FWMA. We are exercising this responsibility thorough our work as part of the Partnership. In working with our neighbouring LLFAs and maintaining regular contact with other relevant authorities such as the Environment Agency and Thames Water, we seek to maximise any investment in flood risk management in south east London.

#### 3.1.3 Power to request information

Under Section 14 of the FWMA, Lewisham may request a person to provide information in connection with our flood risk management functions. We will work with the Partnership to formulate a common approach to how we request this information from third parties. Our approach with regard to information requests will be developed on an individual or organisational basis, and will be dependent on the nature of the party we are requesting information from and on feedback from past information requests from that party. Where a third party extends beyond the borough we will request this information on behalf of the Partnership and disseminate to the other three south east London boroughs within the Partnership.

The Partnership will establish a common template for these information requests. Where a party fails to comply with a request for information, the Council will advise the party of the Authority's right - under Section 14 of the Flood and Water Management Act 2010 - to issue an enforcement notice. In addition the Council may by way of a penalty notice, impose a penalty on the party if that party fails to provide the information within the period specified in the notice.

#### 3.1.4 Funding

Section 16 of the FWMA sets out the Environment Agency's ability to make grants in respect of expenditure incurred or expected to be incurred in connection with flood or coastal erosion risk management in England. We will work alongside the other members of the Partnership to co-ordinate the applications for these grants within our boroughs. In establishing our Local Strategy we have undertaken a detailed review of flood risk and investment across the Borough so we can take a strategic approach to investment in flood risk management. Our approach not only considers

the available grants but also the potential investment from other sources of funding that could be used to reduce flood risk. The funding review exercise also addresses obligations for flood risk management planning under the Flood Risk Regulations 2009. Using this strategic understanding we can make decisions on the priorities and what is affordable and set these out in an action plan that will be reviewed every year. Section 5 of this document provides further detail on the approach.

### 3.1.5 Flood investigations

As a LLFA, Lewisham has a duty, under Section 19 of the FWMA, on becoming aware of a flood in its area to investigate the extent that we consider it necessary or appropriate. The investigation should assess which risk management authorities have relevant flood risk management functions and whether each of those risk management authorities has exercised, or is proposing to exercise, those functions in response to the flood. Upon completing a formal flood investigation under this duty we are required to publish the results of the investigation and notify any relevant risk management authorities.

The four boroughs have adopted a common trigger to instigate a formal flood investigation. The trigger level is set at five properties (residential or commercial) internally flooded in any one event or if one or more properties are flooded internally more than three times in a five-year period. Over and above, if five gardens or more are flooded with risk of internal property flooding which was only prevented by active intervention (e.g. pumps or other measures were used to protect the properties) within a critical drainage area (CDA) or recognised flow path, this would also trigger an investigation.

Investigation triggers apply across borough boundaries within south east London, for example if two properties flood within Lewisham and seven flood within Greenwich and they fall within the same critical drainage area, catchment or flow path this will trigger an investigation. It will be agreed by the LLFA's involved who will lead on the investigation, however findings will be published by all affected LLFA's, and will also be taken to the Partnership meeting.

Lewisham reserves the right to undertake informal flood investigations at our discretion (e.g. at a lower trigger) as we deem appropriate. Moreover we may also continue to undertake informal flood investigations and monitoring / record-keeping for purposes aside from fulfilling our Section 19 responsibilities. There would be no requirement to publish the outcome of an informal flood investigation or monitoring / record-keeping above and beyond requirements under the Freedom of Information (FOI) Act.

### 3.1.6 Duty to maintain a register

Section 21 of the FWMA requires Lewisham as a LLFA to develop and maintain a register of structures or features which, in our opinion, are likely to have a significant effect or impact on flood risk within our area.

The Council intends to use the highways asset management system CONFIRM to host its register of flood risk features. This is the system the Council already uses as a database for highway assets. The register is a live system and is updated as features are identified which, in our opinion, are likely to have a significant effect on flood risk within the borough. The register will contain information about the location, ownership, and state of repair for each asset / feature.

The register or extracts from the Register will be available through existing data request mechanisms e.g. FOI requests.

We will work together through the Partnership to identify structures or assets which have the potential to affect flood risk to or from neighbouring boroughs e.g. a trash screen in one borough which if not cleaned may increase flood risk in a neighbouring authority. These structures will also be listed on the neighbouring authority's register and any newly identified structures or features will be discussed and agreed at the quarterly Partnership meetings.

### 3.1.7 Consenting to works to ordinary watercourses

Lewisham (as a LLFA) have responsibility for authorising consent for changes to ordinary watercourses across the borough that may affect flow or flood risk. This includes the temporary or permanent erection or alteration of any mill, dam, culvert, weir, bridge or other like obstruction to the flow of an ordinary watercourse. This requirement is in addition to any other permissions or consents that may be required for the work (e.g. planning permission).

We will respond to applications for consent within two months of receipt. Consent is not approved until the applicant has received formal notification of consent. We will not unreasonably withhold consent. We may refuse consent because the proposed changes have the potential to increase flood risk to people and property, either up- or downstream.

Where works have been undertaken without consent we have various enforcement options to remedy the situation.

### 3.1.8 Flood risk management works

The Council (as a LLFA) has the power to carry out flood risk management works if we consider the work appropriate or pertinent in helping to meet the Local Strategy (this document) objectives, and:

- that the purpose of the works is to manage flood risk within the borough from surface runoff, groundwater or ordinary watercourse (including a lake, pond or other area of water which flows into an ordinary watercourse); or
- that the purpose of the works is to manage flood risk within the borough from sea and is within (a), (b) or (f) from Table 3 below; or
- the Environment Agency has consented to the work.

Table 3 Definitions of Flood Risk Management Work

<b><i>Flood Risk Management Work (after Section 14A(9) of the Land Drainage Act, as amended by Schedule 3 of the Flood and Water Management Act) means anything done:</i></b>	
(a)	to maintain existing works (including buildings and structures) including cleansing, repairing or otherwise maintaining the efficiency of an existing watercourse or drainage work;
(b)	to operate existing works (such as sluice gates or pumps);
(c)	to improve existing works (including buildings or structures) including anything done to deepen, widen, straighten or otherwise improve an existing watercourse, to remove or alter mill dams, weirs or other obstructions to watercourses, or to raise, widen or otherwise improve a drainage work;
(d)	to construct or repair new works (including buildings, structures, watercourses, drainage works and machinery);
(e)	for the purpose of maintaining or restoring natural processes;

(f)	to monitor, investigate or survey a location or a natural process;
(g)	to reduce or increase the level of water in a place;
(h)	to alter or remove works.

### 3.1.9 Sustainable development

Section 27 of the FWMA requires that in exercising a flood or coastal erosion risk management function the Council, as a LLFA, must aim to make a contribution towards the achievement of sustainable development.

We understand the need for sustainable development and the introduction of sustainable drainage, which will contribute to a reduction in surface water run-off and help alleviate and mitigate surface water flood risk within the borough.

### 3.1.10 Schedule 1 Designation of features

Under Schedule 1 of the FWMA, the Council as a 'Designating Authority' has powers to designate, where we consider appropriate, structures and features that affect flooding requiring the owner to seek consent from the Council to alter, remove or replace it. This is a permissive power, meaning that we have the 'power' rather than 'duty' and will not be liable for the failure to exercise this power.

As with the duty to maintain a register (Section 3.1.6 above), we will work together in partnership with the other three south east London boroughs to identify features which provide a benefit for neighbouring boroughs and which will not increase flood risk.

### 3.1.11 Sustainable Drainage Systems (SuDS)

Sustainable Drainage Systems are addressed in Lewisham's Core Strategy, the Strategic Flood Risk Assessment and the River Corridors Improvement Plan – Supplementary Planning Document (Draft). Readers are also directed to the London Borough of Lewisham Streetscapes Guide and CIRIA SuDS Manual.

### 3.2 Sources of flood risk

There are many different sources of flooding which may affect the borough. However not all sources of flooding are managed by one organisation:

- 3.2.1 Surface Water Flooding – Often referred to as ‘pluvial’ flooding, this occurs when there is too much rainfall for the existing drainage systems to cope with resulting in overland flows.
- The Environment Agency in partnership with LLFAs has produced the [Updated Flood Map for Surface Water](#). This is available to view on the Agency’s website. It is Lewisham’s responsibility as the Lead Local Flood Authority (LLFA) to manage surface water flood risk.
- 3.2.2 Groundwater Flooding – This can be the result of a series of complex mechanisms that are not fully understood and further work is underway at a national level to better understand the causes. It can occur when the water under the ground rises and finds a place to escape. Lead local flood authorities have a strategic responsibility to manage groundwater flood risk.
- 3.2.3 River Flooding – Often referred to as ‘fluvial’ flooding. Rivers fall into two categories:
- Main River – These are generally large rivers, such as the Thames, Ravensbourne and Quaggy and are the responsibility of the Environment Agency in terms of a strategic overview.
  - Ordinary Watercourse – These are generally the smaller rivers, brooks and streams and are the responsibility of the LLFA in terms of a strategic overview.

See Figure 2 ‘Watercourses within the borough’ and the Environment Agency’s website [Flood Map for Planning \(rivers and sea\)](#)

With both categories of river it is often the owner of the land next to a river, stream or ditch who, as a ‘Riparian Owner’ has a responsibility to manage and maintain the river running through their land. Some of these responsibilities include:

- Maintaining river beds and banks;
- Allowing the flow of water to pass without obstruction; and
- Controlling invasive alien species such as Japanese knotweed.

These are explained further in the publications [‘Living on the edge’](#).

- 3.2.4 Coastal/Tidal Flooding – This is when low lying coastal or estuary areas are inundated by the sea. In locations where raised defences are present, coastal or tidal flooding may be as the result of breaching or overtopping of a sea defence. Coastal and tidal flooding may be driven by seasonally high tides or a storm surge or a combination of the two (as was the case for the 1953 flooding).
- 3.2.5 Reservoir Flooding – This is when a reservoir fails and the water it holds inundates areas downstream of the reservoir. The responsibility for managing the risk is down to the owner of the reservoir, which could be the Environment Agency, Thames Water or a private land owner. A map highlighting the flood risk and owner is available from the Environment Agency website - Reservoir flooding
- 3.2.6 Sewer Flooding – Sewer flooding is generally caused by a lack of capacity in the sewer network. This is the responsibility, generally, of Thames Water however there are often private sewers which would be the responsibility of the landowner or surface water sewers which can be considered to be Main

River or ordinary watercourse (piped-in watercourses) in which case ownership and responsibility can often be complicated.

### 3.3 Who is responsible?

A number of risk management authorities (RMAs) operate across South East London.

The table below sets out their respective responsibilities under the 2010 Flood and Water Management Act.

Table 4 Risk Management Authorities (RMAs) operating in south east London and their responsibilities

<b>RMA</b>	<b>Responsibilities under the 2010 Flood and Water Management Act</b>
Local Council as LLFA	Responsible for managing flood risk from local sources See Section 3.1.1 for full break down.
Environment Agency	Responsible for managing flooding from main rivers or the sea. Strategic overview for all flooding sources and coastal erosion
Thames Water Utilities Limited	Responsible for maintaining, improving and extending their water mains and other pipes Duty to provide and maintain a system of public sewers so that the areas they are responsible for are effectively drained
Local Council as Highways Authority	Responsible for maintenance of all public roads Under Highways Act 1980, responsible for provision and maintenance of highways drainage and ditches
TfL	Responsible for maintaining any drainage and ditches associated with Red Routes in London
Neighbouring LLFAs	Carry out duties under FWMA within their own borough boundaries Mutual duty to co-operate with local LLFA as a neighbouring RMA in the undertaking of flood risk management functions Must work in partnership with local LLFA to address cross boundary flood management issues

### 3.4 LLFA structure

Lewisham has four service directorates which – along with the Chief Executive’s Office – operate together as one Council. The LLFA role sits mainly within the Resources and Regeneration directorate, however it has strong links with the Customer Services directorate as well as connections with the Community Services and Children & Young People directorates. Figure 5 below shows where the functional flood risk management responsibilities sit within the local authority along with selected linked services.

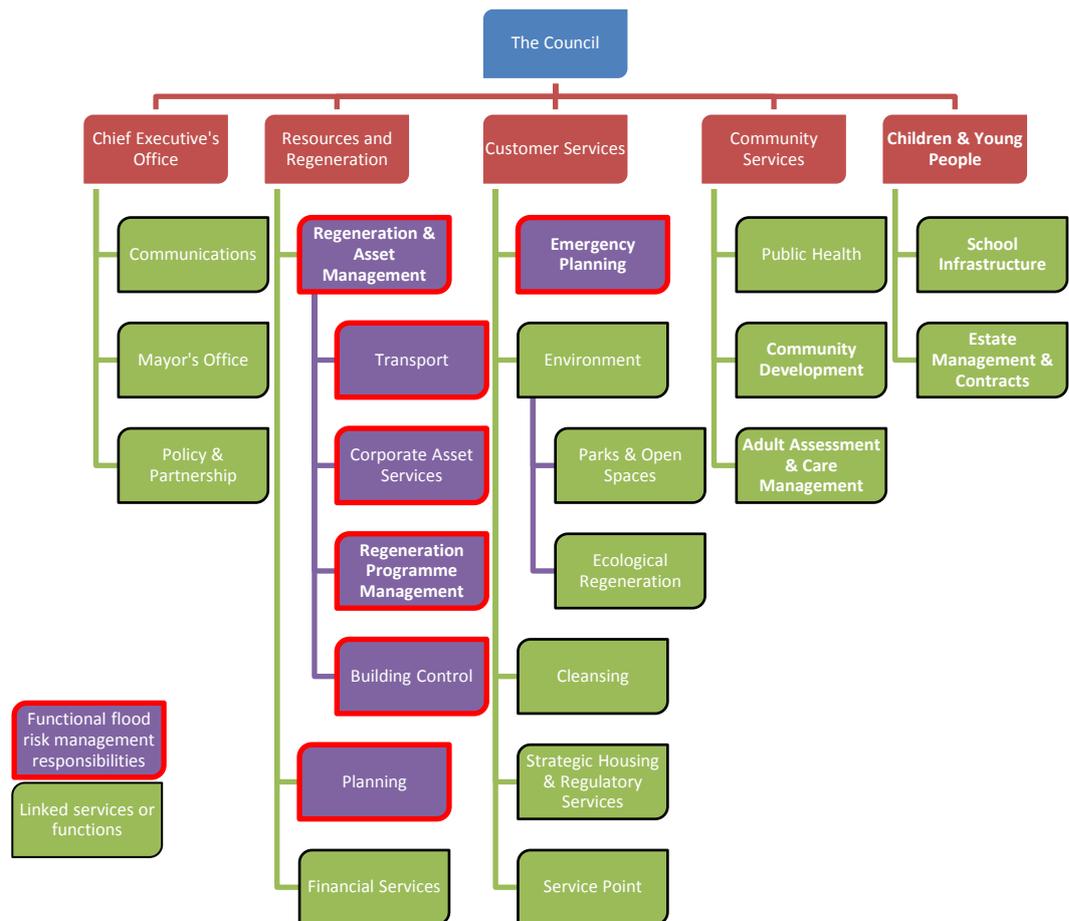


Figure 5 Organogram of Flood Risk Management responsibilities and associated services

Lewisham has set out as part of the South East London Strategy how we will interact with key stakeholders, such as the Environment Agency, Thames Water and the Regional Flood and Coastal Committees.

We have identified the following additional groups of stakeholders who we will work with in delivering our Local Strategy Action Plan:

- Neighbouring local authorities
- Statutory bodies (e.g. Natural England)
- Utility providers and operators
- Other Council departments
- Transport operators and authorities (e.g. Transport for London)
- Emergency services
- Business groups (e.g. Chamber of Commerce)
- Environmental and Wildlife Groups (e.g. Thames 21)
- Resident's Groups and Associations (e.g. Friends of Beckenham Place Park)
- Communities of interest

We will undertake an open, transparent and pragmatic approach to communications between those directly involved in flood risk management on behalf of the Council and other council departments. We will forge links with key stakeholders including elected members, community groups, local assemblies and local flood groups. We will provide a point of contact to respond to queries from members of the public. We will share this information where appropriate with the other parties through the

Partnership quarterly meetings and our lead Flood Risk Officer’s report and more frequently via less formal means as required (see Section 3.1.2).

We have identified the following potential beneficiaries of local flood risk management:

- residents
- businesses
- commuters
- visitors to the borough
- users of parks and open green spaces
- Lewisham Council and its neighbouring local authorities
- risk management bodies (TfL, Thames Water, Network Rail, UK Power Network, Environment Agency)
- insurance bodies (both domestic and commercial)
- housing providers
- developers and land owners
- providers of medical and care services
- riparian owners
- community, voluntary, amenity and river restoration groups
- fishing groups and angling clubs

Our ability to manage flood risk is significantly enhanced if alternative sources of funding can be identified and secured to reflect the local benefits that could be delivered. Therefore we will consider these beneficiaries when reviewing funding opportunities as outlined in Section 5 and encourage private investment in flood risk management in return for allowing some influence over the scope and timing of works.

### 3.5 How will we monitor our Local Strategy

The Council will monitor the Local Strategy through the use of Key Performance Indicators (KPIs). The lead Flood Risk Officer will provide reporting of borough KPIs and key information to the Partnership at the quarterly meetings. Our Local Strategy KPI monitoring will be a standing item on the agenda. The KPIs are designed to be a quick reference metrics that provide an overview for the four south east London Boroughs. They are not overly onerous to compile each quarter and are based on readily available information. KPIs are measurable so that variance can be monitored and reviewed.

#### 3.5.1 What are our KPIs?

Our provisional KPIs are set out in Table 5 below.

Table 5 South east London local strategy key performance indicators

KPI ID	Metric and description
FWMA 1a	<p><b>Number of (Section 19) flood investigations undertaken.</b>            Number of flood investigations undertaken under Section 19 of the Flood and Water Management Act 2010 in response to the trigger level being reached. The trigger level is five properties (residential or commercial) internally flooded in any one event or one or more properties internally flooded more than three times in a five-year period. Additionally, the trigger level is reached if five gardens or more are flooded with risk of internal property flooding which was only prevented by active intervention (e.g. pumps or other measures were</p>

	used to protect the properties) within a critical drainage area or recognised flow path. This measure also includes discretionary flood investigations for incidents below the trigger level.										
<b>FWMA 1b</b>	<b>Number of (Section 19) flood investigations published.</b> Number of flood investigations at or above the trigger level completed and published (including discretionary investigations if appropriate).										
<b>FWMA 2a</b>	<b>Number of requests for works to ordinary watercourses received.</b> Number of requests for works to ordinary watercourses under Section 23 of the Land Drainage Act 1991.										
<b>FWMA 2b</b>	<b>Number of ordinary watercourse consents granted.</b> Number of requests for works to ordinary watercourses where consent is granted.										
<b>FWMA 2c</b>	<b>Number of ordinary watercourse consents refused.</b> Number of requests for works to ordinary watercourses where consent is refused.										
<b>FWMA 3a</b>	<b>Number of structures / features added to (Section 21) register of flood risk assets.</b> Structures or features which, in the opinion of the authority, are likely to have a significant effect on a flood risk in its area, and a record of information about each of those structures or features, including information about ownership and state of repair recorded on the Section 21 register.										
<b>FWMA 3b</b>	<b>Number of structures / features considered for (Schedule 1) 'designation'.</b> Designation is a form of legal protection or status reserved for certain key structures or features that are privately owned and maintained, but which make a contribution to the flood or coastal erosion risk management of the people and property at a particular location. A designation is expressed as a legally binding notice served by the designating authority on the owner of the feature and is also protected as a local land charge. This means that the designation will 'attach' to the land and will also automatically apply to anyone dealing with the land and to successive owners or occupiers of a particular property or parcel of land. A designated structure must be associated with and, in the opinion of the designating authority, affect a flood or coastal erosion risk.										
<b>FWMA 3c</b>	<b>Number of structures / features designated (Schedule 1).</b> Number of structures / features which meet the four designation conditions and for which the four stage process of designation has been completed. There are four conditions that must be satisfied to enable a structure or feature (natural or manmade) to be designated. These are: <table border="1" data-bbox="510 1657 1324 2016"> <thead> <tr> <th>Condition</th> <th>Explanation</th> </tr> </thead> <tbody> <tr> <td>Condition 1</td> <td>that the designating authority thinks the existence of the structure or feature affects a flood or coastal erosion (or both) risk.</td> </tr> <tr> <td>Condition 2</td> <td>that the designating authority has flood or coastal erosion risk management functions in respect of the risk being affected.</td> </tr> <tr> <td>Condition 3</td> <td>that the structure or feature is not already designated by another designating authority.</td> </tr> <tr> <td>Condition 4</td> <td>that the owner of the structure or feature is not a designating authority.</td> </tr> </tbody> </table>	Condition	Explanation	Condition 1	that the designating authority thinks the existence of the structure or feature affects a flood or coastal erosion (or both) risk.	Condition 2	that the designating authority has flood or coastal erosion risk management functions in respect of the risk being affected.	Condition 3	that the structure or feature is not already designated by another designating authority.	Condition 4	that the owner of the structure or feature is not a designating authority.
Condition	Explanation										
Condition 1	that the designating authority thinks the existence of the structure or feature affects a flood or coastal erosion (or both) risk.										
Condition 2	that the designating authority has flood or coastal erosion risk management functions in respect of the risk being affected.										
Condition 3	that the structure or feature is not already designated by another designating authority.										
Condition 4	that the owner of the structure or feature is not a designating authority.										

<b>FWMA 4a</b>	<b>Number of actions from the Local Flood Risk Management Strategy Action Plan commenced or in progress.</b> The number of actions from the individual borough Local Strategy Action Plans that have been commenced. Reported against the total number of actions stated.
<b>FWMA 4b</b>	<b>Number of actions from Local Flood Risk Management Strategy Action Plan completed.</b> The number of actions from the individual borough Local Strategy Action Plans that have been completed. Reported against the total number of actions stated.

The Council will review these KPIs as part of the annual Action Plan review to ensure they are still relevant. Amendments to KPIs will be formally agreed at the quarterly Partnership meeting. We will seek to keep our KPIs consistent with other three south east London boroughs to allow benchmarking of our progress against neighbouring authorities.

We have chosen our KPIs to allow the Council to effectively monitor our progress against both the south east London strategy and local strategy objectives.

KPIs 1a and 1b are included to assess our response to our local objective to continue to improve our understanding of flood risk and flood incidents by recording and monitoring flooding incidents to inform future work programmes. It would be entirely appropriate in a period without significant flooding to report a result of zero for both 1a and 1b. Where KPIs 1a and 1b are greater than one it should be confirmed that adequate resource is available and that the threshold for investigation is set appropriately. Where 1a is greater than 1b this should be investigated to ensure that the Council's duties under Section 21 of the FWMA are being exercised properly. KPI 1b should not be greater than KPI 1a unless this is to account for flood investigation reports published that were reported as having been undertaken in a previous quarter.

KPIs 2a and 2b are included assess the Council's contribution to our local objectives to avoid inappropriate development; to work with partners to ensure local flood defences are maintained; and where appropriate to require river restoration, appropriate flood defence and mitigation as part of development proposals as part of the Ordinary Watercourse consenting process. A low KPI 2a value is not in itself a cause for concern. It may correspond with low levels of development in areas that would require Ordinary Watercourse consent. Where KPIs 2a and 2b are greater than 1 it should be confirmed that adequate resource is available. A KPI 2b value that is much higher than the 2a value should be investigated by reviewing the reasons for refusing consent. It may be found that the Council is exercising its consenting role appropriately and that poor quality or inappropriate applications are being received. If KPI 2b is consistently higher than KPI 2a then the need for the development of guidance documents should be considered. Where consent is refused the right of the applicant to appeal should be born in mind.

KPI 3a has been included to monitor the Council's duty to develop and maintain a register of structures or features which, in our opinion, are likely to have a significant effect on flood risk within our area (as defined by section 21 of the FWMA – see

Section 3.1.6). This will contribute to our objectives to work with partners to ensure local flood defences are maintained and provide open, transparent governance of flood risk management. It is expected that the value for KPI 3a may be initially high as the register is established, but will, with time, reduce down as the majority of features are known. Sudden increases in 3a should be reviewed to understand why these features have not been picked up before and the likelihood of other features of similar type not having been identified. Possible explanations of peaks in the 3a value may include those which emerge as a result of flood events / flood investigations, new flood studies, and following construction / re-development work.

KPI 3b has been included to monitor the Council's use of its powers under Schedule 1 of the FWMA as a Designating Authority (as outlined in Section 3.1.10 above). It will help us to assess the success of our local objectives to engage with and support local communities to value and care for the green infrastructure used to manage flood risk and to encourage flood risk management activities so owners of watercourses (riparian owners) and flood defence structures take action to reduce the risk to themselves, their property, and others. Similar to 3a it is expected that value for 3b may be initially high, but will, with time, reduce down as most features are designated. Sudden increases in 3b should be reviewed to understand why these features have not been picked up before and the likelihood of other features of similar type not having been identified. Possible explanations of peaks in the 3b value include following flood events / flood investigations, following new flood studies, and following construction / re-development work.

KPIs 4a and 4b have been included to measure the number of actions from our Action Plan that have been commenced (4a) and completed (4b) during the period. This is intended to contribute to our objective to provide open, transparent governance of flood risk management. It will aid in the annual review of the Action Plan. It is expected that the value for 4a would be initially high as a number of the ongoing or continuing objectives are commenced following the adoption of the strategy. These continuing objectives such as the borough wide action to seek opportunities for incorporating storage or other FRM measures alongside other activity (e.g. public realm works, works to parks and open spaces) will not have a completion date as they will be undertaken for the duration of the Strategy planned life-time and beyond. Therefore it is expected that the sum of 4a values will always be higher than 4b. The 4b value is included to highlight trends in completion of those tasks that have a more defined project lifecycle. Completion of a project will be dependent on availability of internal and external funding therefore 4b should serve as an index of funding availability.

### 3.6 How will we review our Local Strategy

Lewisham has developed the Local Strategy with the aim of reviewing the whole document every six years. Therefore in 2020 we will commence reviewing the success of our initial Local Strategy and developing plans for the next six year period.

We recognise that it is difficult to plan for, or commit to actions so far into the future. It is expected that the Action Plan will be impacted by:

- both public sector and central government budget reductions
- variability in other external funding opportunities

It may also be impacted by the response to:

- significant flooding
- changes in development pressures and plans
- shifting local priorities.

Therefore the Local Strategy is supported by an Action Plan that will be reviewed and as necessary updated annually (or following a significant flooding event). The updated Action Plan should be agreed at borough level and then presented at a Partnership quarterly meeting.

### 3.7 How have we consulted on this document

This document was consulted on in early 2015 (16 March - 26 April). Appendix C will contain the results and analysis.

## 4 Objectives and measures

### 4.1 National objectives

These are set within the National Strategy (Figure 1), the overall aim of which is to ensure the risk of flooding and coastal erosion is properly managed by using the full range of options in a co-ordinated way. The National Strategy (National flood and coastal erosion risk management strategy for England) was developed by the Environment Agency who are responsible for its maintenance, application and monitoring in accordance with the requirements of the FWMA 2010.

To be consistent with the National Strategy and so that all sources of risk are considered the following national objectives will be taken into consideration and where appropriate addressed in the management of local flood risk:

N1	Understanding and working together	Understanding the risks of flooding and coastal erosion, working together to put in place long-term plans to manage these risks and making sure that other plans take account of them
N2	Development control	Avoiding inappropriate development in areas of flood and coastal erosion risk and being careful to manage land elsewhere to avoid increasing risks
N3	Reducing risk	Maintaining and improving FCERM systems to reduce the likelihood of harm to people and damage to the economy, environment and society
N4	Improve public awareness	Building public awareness of the risk that remains and engaging with people at risk to encourage them to take action to manage the risks that they face
N5	Improved emergency planning and recovery	Improving the detection, forecasting and issue of warnings of flooding, co-ordinating a rapid response to flood emergencies and promoting faster recovery from flooding

### 4.2 Regional (Partnership Wide) objectives

The underpinning regional (Partnership wide) objectives are based on the terms of reference from the South East London Partnership. They cover the four borough's objectives for their Local Strategies to:

P1	Develop a robust and consistent understanding of flood risk across south east London actively sharing information where necessary
P2	Establish a common understanding of each risk management authority's roles and responsibilities
P3	Collaborate in the development of the local flood risk management strategies and other legal requirements to deliver coordinated flood risk management across south east London
P4	Develop and promote options for joint mitigation of flood risk across

	south east London to ensure that all partners are working together to reduce local flood risk
P5	Ensure that there is a common overview of the resources, skills and capabilities available to manage flood risk, alongside an understanding of where the gaps exist and how available funds can best be maximised
P6	Discuss issues and seek advice/guidance from other risk management authorities to ensure that there are robust links to other forums involved in flood risk at both a regional, London and local level to shape policy and lever funding
P7	Ensure that elected members are fully briefed as to the current progress of the Partnership, and specifically where there are projects which are likely to be put forward for funding to the Thames or Southern Regional Flood and Coastal Committees (RFCCs)

### 4.3 Local objectives

*Shaping our future*, Lewisham’s Sustainable Community Strategy for 2008-2020, sets out a vision for Lewisham;-  
‘Together, we will make Lewisham the best place in London to live, work and learn’

*Shaping our future* includes the priority outcomes:-

**Empowered and responsible** – where people can be actively involved in their local area and contribute to supportive communities.

**Clean, green and liveable** – where people live in high quality housing and can care for and enjoy their environment.

In addition, the Council has ten corporate priorities which support delivery of the Sustainable Community Strategy. The alleviation of flood risk for residents and businesses, together with the multi-agency work to prepare for, and cope with extreme weather events contributes to the achievement of three of the Council’s corporate priorities:-

- **Community leadership and empowerment** – develop opportunities for the active participation and engagement of people in the life of the community.
- **Clean, green and liveable** – environmental management, cleanliness and care for roads, pavements and a sustainable environment.
- **Inspiring efficiency, effectiveness and equity** – ensuring efficiency, effectiveness and equity in the delivery of excellent services to meet the needs of the community.

Lewisham’s local flood risk management objectives have been developed to align with the Council’s wider strategic priorities along with the Core Strategy objectives and recently updated Strategic Flood Risk Assessment. As well as environmental and flood risk related objectives, Lewisham is keen that development creates and enhances local community spaces. There is also a commitment to investigating potential alleviation schemes for areas at significant risk of local sources of flooding.

Locally we will:

L1	<b>Avoid</b> inappropriate development and <b>promote</b> new-development and
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	re-development that <b>contributes</b> to a reduction in flood risk elsewhere and creates environmental benefit (e.g. sustainable urban drainage systems, reduced CO2, increased biodiversity)
L2	Work with partners to <b>ensure</b> local flood defences are maintained
L3	<b>Require</b> river restoration, appropriate flood defence and mitigation as part of development proposals, where appropriate
L4	<b>Encourage</b> flood risk management activities so owners of watercourses (riparian owners), flood defence structures and surface water infrastructure take action to reduce the risk to themselves, their property, and others
L5	Continue to <b>improve</b> our understanding of flood risk and flood incidents by recording and monitoring flooding incidents to inform future work programmes and maintaining an up-to-date data set
L6	<b>Provide</b> open, transparent governance of flood risk management
L7	<b>Engage</b> with and support local communities to value and care for the green infrastructure used to manage flood risk
L8	<b>Deliver</b> outcomes that make best use of public resources and available sources of funding

#### 4.4 How the objectives will be achieved

Lewisham has developed a Local Strategy Action Plan to enable the delivery of these objectives. This sets out how we will seek to exercise our role and responsibilities under the FWMA 2010 and work to manage flood risk over the next six years and beyond.

The delivery of our action plan will be intrinsically linked to the availability of funding. Much of the work we have noted is dependant either partly or wholly on external funding sources (as outlined in Section 5). To manage this we have undertaken to review the action plan annually to ensure it is still relevant and achievable. As there are changes to funding availability we will review our programme and the prioritisation we place on each action to ensure it is still appropriate. It is expected that over the course of six years a number of the funding sources listed in Section 5 will dry-up, while it is hoped that new ones are introduced. In reviewing our priorities each year the availability of funding will have significant impact on an individual actions position within our programme of works.

## 5 Funding and delivery

### 5.1 Funding sources

There are many different potential funding sources available for consideration when developing flood risk management options. Some of these are listed below.

- Flood and Coastal Erosion Risk Management Grant in Aid (GiA) – this funding is specifically for risk management measures. Schemes are more likely to receive GiA funding where additional partnership funding can be found to support their delivery.
- Partnership arrangements with other risk management authorities (RMAs) – this can be sought in order to increase the likelihood of schemes seeking GiA funding e.g.
  - Thames Water – Flood alleviation projects, these projects are Thames Water’s commitment to remove all sewer flooding by 2027. It is often the case that potential surface water flooding can be linked to Thames Water’s flooding issues where both parties gain benefits.
  - Environment Agency – fund and manage a range of flood risk management projects with a fluvial / tidal focus. There are potentially opportunities to partner in a range of projects including studies to improve understanding of areas at risk of flooding, flood forecasting, flood alleviation works and flood and coastal erosion risk management.
  - Other LLFAs – partnership work with other LLFAs to deliver flood risk management works. These could be neighbouring authorities, (such as would be appropriate for flood alleviation works spanning two or more LLFA areas,) or with non-neighbouring LLFAs (who are delivering similar projects such as awareness raising or publicity campaigns around flood risk management).
- Private funding from local communities, businesses and developers may be contributions towards the range of measures delivered through the Strategy. This can be sought in order to increase the likelihood of schemes attracting GiA funding.
- Local Levy – this funding is available from the Regional Flood and Coastal Committees.
- Lewisham Council capital funds – this is used to fund one-off projects or schemes. The Council often undertakes larger major projects ranging from refurbishment of assets within the corporate estate to the introduction of large scale public realm improvements. Where possible, officers will seek to adapt or influence the design to ensure projects or schemes can reduce or mitigate flood risk.
- Community Infrastructure Levy (CIL) – CIL is a charge made against new development that can be used to fund local measures. For boroughs in London, it is composed of two elements – local CIL (optional) and Mayoral CIL (compulsory). The Mayoral CIL goes to the Greater London Authority however the local CIL can be used to invest in local infrastructure including flood defence and resilience works.
- Section 106 (S106) of the Town and Country Planning Act 1990 allows a local planning authority to enter into a legally binding agreement or planning obligations, with a land developer over a related issue. The obligation is

sometimes termed a 'Section 106 agreement'. Such agreements can cover almost any relevant issue and can include sums of money, for example, localised flood alleviation for the primary benefit of the proposed development.

- European funding – possible sources of funding include LIFE+ which is a programme providing specific support for the implementation of European environment policy; INTERREG which is a collection of funds aimed at promoting inter-regional cooperation across the EU; and the European Fisheries Fund which could fund actions to protect and develop fish habitats.
- DEFRA grants - These grants are either allocated directly to support the introduction of new legislation and practices, or made available for local authorities to submit grant applications to fund specific Government schemes.
- The Growing Places Fund – this is available for Local Enterprise Partnerships (LEPs) to make provision for investment in infrastructure which unlocks development.
- Green Investment Bank – this is a Government owned bank to set up to fund green projects on commercial terms and mobilise other private sector capital into the UK's green economy, particularly energy and waste infrastructure.
- The Catchment Restoration Fund – this is a fund administered by the Environment Agency aimed at the restoration of more natural features in and around water bodies.
- Business Rate Retention – are funds raised through retention of monies raised through the levy of local business rates.
- New Homes Bonus – this can be used to assist with funding infrastructure to support and increase the number of homes and their use.
- Communities Fund – this is available for the delivery of biodiversity projects located within proximity of waste operators.
- Big Lottery Fund (Communities Living Sustainably) – this is available for partnerships that bring together the public, private, voluntary and community sectors to build sustainable and resilient communities to help deal with the potential impact of climate change.
- Heritage Lottery Fund – provides grants to sustain and transform our heritage including parks, historic places, and natural environment.
- Health Agenda – these are budgets specifically for public health, which will allow councils to provide services that meet the health needs of their local community. This might include contributing to projects that encourage activity and exercise.
- Greater London Authority – the top-tier administrative body for Greater London which administers grants and funding for a range of cross London projects and schemes to deliver the Mayor of London and the London Assembly's objectives.
- Transport for London (TfL) – provide a range of funding streams to deliver projects which support the Mayor's Transport Strategy through a Local Implementation Plan (LIP).

The Council will work with other organisations to support their applications for funding where there will be a tangible benefit to Lewisham or its residents. The main way we will do this will be via the Partnership.

Table 6 Lewisham and Catford Flood Alleviation Scheme

<p><b>Case study</b></p> <p>Lewisham and Catford Flood Alleviation Scheme is a good local example of where a scheme has been developed through partnership working and supported using multiple funding streams.</p> <p>This scheme is set to include:</p> <ul style="list-style-type: none"><li>• re-landscaping of the area to the east of the railway line at Beckenham Place Park to provide additional capacity for storing floodwater during extreme incidents. Re-landscaping also provides an opportunity to enhance the appearance and facilities at the park,</li><li>• localised works at up to nine sites between Ladywell and Lewisham to raise river wall, or ground levels, and</li><li>• works to Honor Oak Stream in Ladywell.</li></ul> <p>This scheme has been developed by lead partners the Environment Agency and Lewisham Council.</p> <p>The proposed scheme will reduce the risk of internal flooding to approximately 400 homes and 80 businesses locally as well as key infrastructure including:</p> <ul style="list-style-type: none"><li>• nine electrical substations</li><li>• Deptford pumping station</li><li>• critical roads, the Docklands Light Railway and national rail line between Ladywell and Catford Bridge.</li></ul> <p>In total it is estimated £240 million worth of flood damages could be avoided once the scheme is complete.</p> <p>The plan for the flood storage area includes:</p> <ul style="list-style-type: none"><li>• re-routing some of the river channel to form a new natural channel contained within the flood storage reservoir at Beckenham Place Park (similar to other successful sites such as Ladywell Fields, Cornmill Gardens in Lewisham Town Centre and Sutcliffe Park in Eltham.</li><li>• creating a new vibrant space for the local community to use and a greater appreciation of the river.</li><li>• greater opportunities in the future to improve biodiversity in the river channel downstream.</li></ul> <p>This will create significant cross-benefit to both the Council's and the Environment Agency's wider objectives in addition to the flood risk reduction.</p> <p>It is estimated that the scheme will require a total of £17 million for design, construction and maintenance over its lifetime. It has attracted a range of funding sources including a contribution from the £4.9 million Heritage Lottery Fund and Big Lottery Fund as part of the Parks for People Programme. The scheme is included in</p>
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Lewisham's Community Infrastructure Levy (CIL) 2011 charging schedule which all new development in the borough has to contribute towards. Current estimates are that the scheme is eligible for £11.4 million from Flood and Coastal Risk Management Grant in Aid. A further £2.8 million contribution is expected from Regional Flood and Coastal Committee Local Levy.

## 5.2 Delivery

Lewisham will work with the current Flood and Coastal Erosion Risk Management Grant in Aid (FCERMGiA) process and guidance as a minimum requirement and best practice for cost / benefit assessment. We will be mindful of national processes and seek to implement at a local level. However this may vary for locally funded schemes.

When appropriate a cost / benefit appraisal will be undertaken for each measure based on the estimated cost of undertaking the measure and the potential benefits it may create. This appraisal of costs and benefits will normally be prepared during the identification, assessment, design and delivery of particular schemes to reduce flood risk.

A cost / benefit appraisal considers the total expenditure required to deliver and maintain a measure and compares it to the resulting benefits (the benefits are based on estimating the economic savings from preventing the damage and disruption that would have occurred if flooding had been allowed to continue). The total expenditure includes capital costs (such as those for studies, design and implementation) and maintenance costs (regular upkeep costs, any operational costs such as electricity and any consumable parts). The benefits should be assessed for the operational life of the measure. The potential for government funding to contribute to the cost of measures is greater at locations where the community is more vulnerable to the effects of flooding.

Wherever possible, we will try to prepare schemes and measures that provide multiple benefits and target Government funding towards to the most vulnerable communities as is consistent with our strategic approach.

The level of detail available on costs and benefits for the measures identified in the Action Plan will depend on the data and information available. At this stage in the preparation of the Strategy there is not enough information to enable the preparation of a formal appraisal of benefits and costs for many of the measures identified in the Action Plan. With the preparation and issue of subsequent action plans more information will become available and benefits and costs will be fully assessed and included.

## 5.3 Prioritisation

Lewisham is in a 'Flood Risk Area', as defined under the Flood Risk Regulations, 2009. This designation is based on the use of Flood Risk Indicators that were developed to determine the potential harmful consequences of flooding on:

- Human health
- Economic activity
- Environment (including cultural heritage).

In recognition of the focus provided by the Flood Risk Regulations the prioritisation of items within the Action Plan has incorporated the use of the Flood Risk Indicators to produce a 'Ward Risk' metric. This has been done by assessing the impact of each source of flooding on the Flood Risk Indicators for each ward within the borough. This score is then ranked by ward and assessed on a range from very low to very high ward risk. Where multiple items from the Action Plan fail within the same ward they will have the same 'Ward Risk' value.

This is then combined with an assessment of how each item within the Action Plan contributes to the Partnership and local objectives (as set out in Section 4.2 and 4.3 of this document). The score for this element is based on the number of Partnership and local objectives the Action Plan item contributes to (out of a maximum of 11).

These two values are combined into the first part of the Action Plan Prioritisation Matrix as shown on in Table below to provide an initial score of between 2 and 10.

This value is then adjusted to take into account the availability of external funding. We can do significantly more to manage flood risk if alternative sources of funding can be secured in each area to reflect the local benefits that would be delivered. Therefore we have given higher weighting to schemes that make the most efficient use of the council’s limited funds. Consequently a scheme that requires to be wholly funded by council revenue would have a lower weighting than one that attracts significant alternative investment.

The initial score is then multiplied by the weighting score based in the percentage of costs that can be met from external funding sources to provide a final prioritisation score of between 1 and 10. It is worth noting that only schemes that are largely or entirely funded from alternative funding sources would score a perfect 10. The reality is that most schemes currently score between 1 and 5.

Table 7 Action Plan Prioritisation Matrix

		Ward Risk					% of costs that can be met by external funding	
		Very Low	Low	Medium	High	Very High		
Number of Objectives	0-2	2	3	4	5	6	0-10%	0.5
	3-4	3	4	5	6	7	11-20%	0.6
	4-6	4	5	6	7	8	21-40	0.7
	7-8	5	6	7	8	9	41-60	0.8
	9-11	6	7	8	9	10	61-80	0.9
							81-100	1.0

Table below shows the application of the final prioritisation score to score items from the Action Plan and rank them in order of priority.

Table 8 Prioritisation Matrix scorecard

Action priority score									
1	2	3	4	5	6	7	8	9	10
Lowest possible score									Highest possible score

Our ability to fulfil our action plan is very dependent on securing the available funding. Therefore priorities also take into account the availability of external funding. It is anticipated that this will change in future and consequently our prioritisation will shift to take advantage of the availability of funds and our ability to make best use of alternative funding streams. It is only possible to deliver what can be afforded.

### 5.3.1 Worked example

For example an Action Plan item located in a low risk ward that contributes to 7 local objectives would gain an initial value of 6 points from the matrix. This Action Plan item is being 25% funded by local business and 25% funded by a national government grant (therefore considered that 50% of costs can be met by external funding sources)  $50\% = 0.5$

Therefore the final Action Plan Item score 3. ( $6 \text{ times } 0.5 = 3$ )

This is then compared with other Action Plan items to rank them in priority order.

## 6 Environmental assessment

### 6.1 Background

Our Local Strategy required an Environmental Assessment to fulfil our legislative requirements and assess how our strategies might impact or contribute to the achievement of wider environmental objectives (SEA Directive) alongside the Conservation of Habitats and Species Regulations 2010 (HRA) and Water Framework Directive (WFD).

The process we have followed to achieve this is set out below in Section 6.2.

### 6.2 Environmental Assessment Process



Figure 6 Environmental Assessment process flow chart

The Screening report, Scoping report and responses to Consultation SEA and HRA report and Statement of Environmental Particulars can all be found in Appendix D5.

### 6.3 Summary of conclusions

This section provides an overview of some of the key overriding conclusions from the process and the statement of environmental particulars.

#### 6.3.1 Screening

The screening reports concluded that an Environmental Assessment would be required for Lewisham's Local Strategy. The screening report can be found in Appendix D1.

#### 6.3.2 Scoping and consultation

A scoping report for Lewisham's Local Strategy was submitted to the Environment Agency, Natural England and English Heritage for statutory consultation on the 28th July 2014. The final consultation response was received 11th September 2014. All three statutory consultees provided a response. These responses can be found in Appendix D3. The updated scoping report can be found in Appendix D2.

#### 6.3.3 Statement of Environmental Particulars

A draft Statement of Environmental Particulars has been prepared prior to public consultation and can be found in Appendix D5. This should be updated following the public consultation on the main Strategy document.

## **7 Social vulnerability to the impacts of climate change**

A research study about social vulnerability to the impacts of climate change may be seen at Appendix F.

## **Appendices**

- Appendix A: Glossary and Abbreviations
- Appendix B: LFRMS Action Plan
- Appendix C1: Results of survey to inform LFRMS
- Appendix C2: Results of statutory consultation
- Appendix D1: LFRMS Strategic Environmental Analysis (SEA) Screening Report
- Appendix D2: LFRMS SEA Scoping Report
- Appendix D3.1-3: Responses to SEA Scoping Report consultation
- Appendix D4: Strategic Environmental Assessment & Habitats Regulations Assessment
- Appendix D5: Statement of Environmental Particulars
- Appendix E1: Map – Historical Flooding
- Appendix E2: Map – National Flood Risk Assessment (NaFRA)
- Appendix E3: Map – Updated Flood Map for Surface Water (uFMfSW) 1 in 30 hazard
- Appendix E4: Map – uFMfSW 1 in 30 depth
- Appendix E5: Map – uFMfSW 1 in 100 hazard
- Appendix E6: Map – uFMfSW 1 in 100 depth
- Appendix E7: Map - Areas Susceptible to Ground Water Flooding (AStGWF)
- Appendix E8: Map – Sewer Flooding
- Appendix F: Social vulnerability to the impacts of climate change

## Appendix A Glossary and Abbreviations

CDA	Critical Drainage Area
CIL	Community Infrastructure Levy
CIRIA	Construction Industry Research and Information Association
CONFIRM	Asset Management System
DCLG	Department for Communities and Local Government
DEFRA	Department for Environment, Food and Rural Affairs
Designating authority	The Council
FCERM	Flood and Coastal Erosion Risk Management
FCERMGiA	Flood and Coastal Erosion Risk Management Grant in Aid
Floods Directive	European Union Floods Directive 2007
Fluvial	Flooding attributed to river processes
FOI	Freedom of Information Act
FRM	Flood Risk Management
FRRs	Flood Risk Regulations
FWMA	Flood and Water Management Act
GiA	Grant in Aid
GLA	Greater London Authority
HRA	Conservation of Habitats and Species Regulations 2010
INTERREG	A collection of funds aimed at promoting inter-regional cooperation across the EU
KPI	Key Performance Indicator
LEPs	Local Enterprise Partnerships
LIFE+	A programme providing specific support for the implementation of European environment policy.
LLFA	Lead Local Flood Authority
Local Strategy/ LFRMS	Local Flood Risk Management Strategy
National Strategy	National flood and coastal erosion risk management strategy for England
Ordinary Watercourse	Every river, stream, ditch, drain, cut, dyke, sluice, sewer (aside from public sewers) and passage through which water flows which is not considered to be a main river.
PFRA	Preliminary Flood Risk Assessment
Pluvial	Flooding attributed to rainfall
RFCC	Thames Regional Flood and Coastal Committee
Riparian owner	Owning property next to or adjoining a river, stream or ditch grants you rights and responsibilities for that section.
RMA	Risk Management Authority
SAB	Sustainable Drainage Approving Body
SEA	The Strategic Environmental Assessment Directive
SoEP	Statement of Environmental Particulars
Solution Cell	Five-borough groundwater flooding prevention initiative (Croydon, Bexley, Bromley, Greenwich and Sutton).
SUDS	Sustainable Urban Drainage Systems
TfL	Transport for London
The Four	South East London Lead Local Flood Authorities (Bexley, Bromley, Greenwich

Boroughs	and Lewisham).
The Partnership	South East London Flood Risk Management Partnership (Bexley, Bromley, Greenwich and Lewisham, Thames Water and The Environment Agency)
TWUL	Thames Water Utilities Limited
WFD	Water Framework Directive