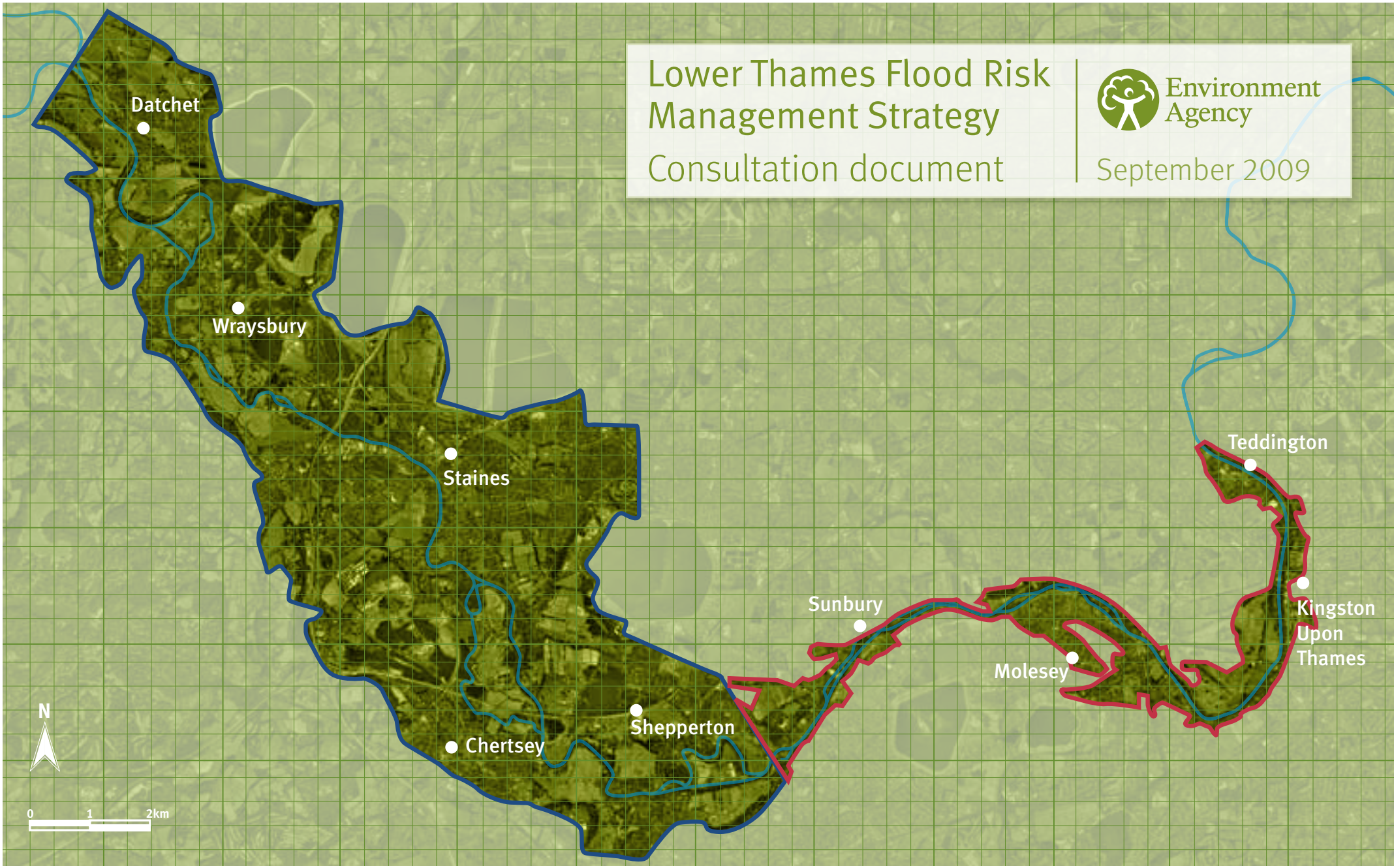
Lower Thames Flood Risk Management Strategy

Consultation document

Environment Agency

September 2009



We are the Environment Agency. It's our job to look after your environment and make it a better place – now, and for future generations.

Your environment is the air you breathe, the water you drink and the ground you walk on. Working with business, Government and society as a whole, we are making your environment cleaner and healthier.

The Environment Agency: using science to create a better place.

Published by:

Environment Agency
Swift House
Frimley Business Park
Frimley
Camberley
Surrey
GU16 7SQ

www.environment-agency.gov.uk

September 2009

What this document aims to achieve

The Environment Agency, in co-operation with various public bodies and authorities, is producing a long-term plan to manage flood risk in your area of the Lower Thames. We have called this plan the Lower Thames Flood Risk Management Strategy. This consultation document will inform you about the risk of flooding in the Lower Thames, and the work we have done to date. We would like you to read it and tell us what you think about our proposals. Your responses will be considered when we produce the final strategy.

Contents

	What is the purpose of this document	1
Chapter 1	Introduction	3
Chapter 2	What is the flood problem in the Lower Thames?	4
Chapter 3	The study area	6
Chapter 4	How we developed the draft strategy	9
Chapter 5	The draft strategy – our recommended approach	11
Chapter 6	Floodplain management	12
Chapter 7	Flood diversion channels and associated work	14
Chapter 8	Benefits and impacts	18
Chapter 9	Moving forward with the draft strategy	20
Chapter 10	Other options we have considered	21
Chapter 11	What do you think?	22

You are at risk of flooding

Land and property near the River Thames has suffered from serious flooding for many years. In January 2003, heavy rain brought flooding to many areas of the River Thames downstream of Datchet. We listened to public concern that more should be done to address the issue of flooding and have come up with a plan to reduce flood risk in your area.

We have produced a draft Flood Risk Management (FRM) Strategy for the Lower Thames from Datchet to Teddington. It sets out our preferred option for managing the risk of flooding in the area in the future. We would like to suggest a combined approach to reduce the risk of flooding. This document presents the studies we have carried out, the options we have considered and explains how we have arrived at our preferred option.

We are working with and involving people and communities that have experienced flooding or are at risk of flooding in this area. We would like to share the findings of our studies with you, so that you can tell us what you think. We welcome your views and comments, and we will take them into account in our final strategy for Government approval in 2010. You can find out how to provide us with your comments by turning to page 22.

What is a Flood Risk Management Strategy?

Flood risk is the chance that a flood will take place in an area and what the consequences of that flood might be, should it occur. A Flood Risk Management strategy looks at the best ways to reduce the risk of flooding and/or manage a flood.

We use different ways to manage flood risk. For example:

- maintaining floodplains to store water during floods, which helps to protect homes and businesses in the area;
- building and maintaining defences;
- discouraging new development in areas where there is a risk of flooding;
- providing flood warnings so that people can protect themselves, their property and reduce the consequence of a flood;
- building flood diversion channels to protect towns and cities from major floods.

2010

Your views and comments will be taken into account in our final strategy due to be completed in 2010

Flooding and the River Thames

The Lower Thames has a long history of flooding with more than 15,000 homes and businesses now standing within the floodplain. Some homes and businesses are more at risk of flooding than others, but the risk is always there and is expected to increase in the future.

The Lower Thames has already experienced two significant floods this century: in 2000 and 2003, narrowly avoiding flooding again in 2007. The worst flooding in living memory was in February 1947, but it is possible that the next major flood could be even bigger.

Millions of litres of water flow down the River Thames every day from the Cotswolds and the central Thames valley and pass through the Lower Thames on their way to the tidal estuary. More water flows into the area from the River Wey, River Mole, River Colne and Colne Brook tributaries.

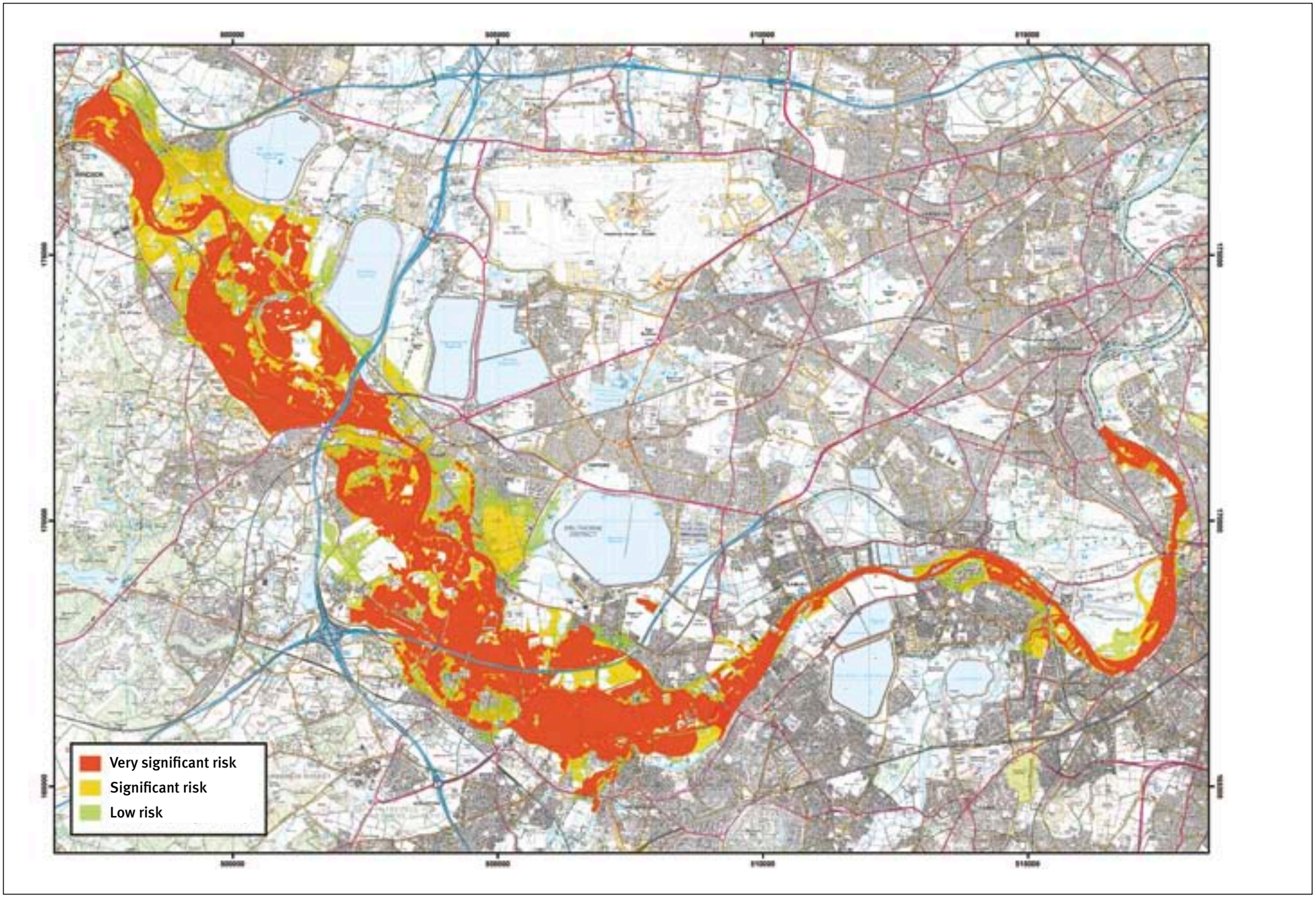
Water levels rise during heavy rainfall. In response, weir gates are opened to help prevent flooding. However, it is becoming increasingly difficult to contain the volume of water flowing downstream on some occasions. It will eventually spill over river banks and spread across the floodplain.

Although we have considerably improved the way we manage rivers over the last 100 years, some changes to the River Thames and its floodplain made by previous generations have severely limited the amount of water that is able to flow across and through the floodplain. Those changes sometimes hamper our efforts to reduce the risk of flooding. For example, in Chertsey, floodwater from both the River Thames and Chertsey Bourne is restricted by a series of bridges and other man-made obstacles as it passes through the town.

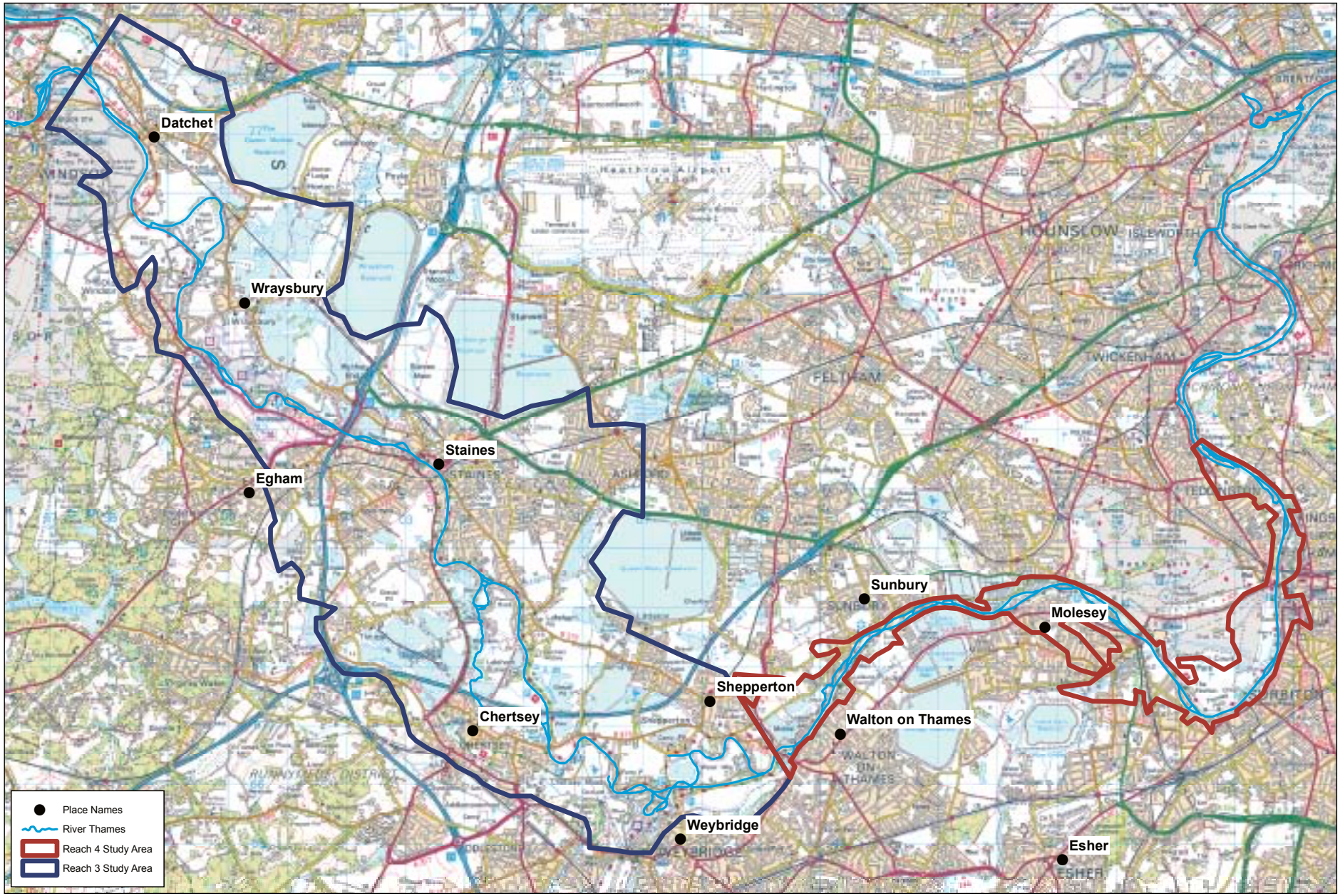
Flooding in Staines, 1947

Two Shepperton householders are brought by boat from their flooded houses to dry land by a policeman and voluntary helpers
Credit: TopFoto, TopFoto.co.uk

Flooding in Chertsey, 2003


Very significant risk
Significant risk
Low risk

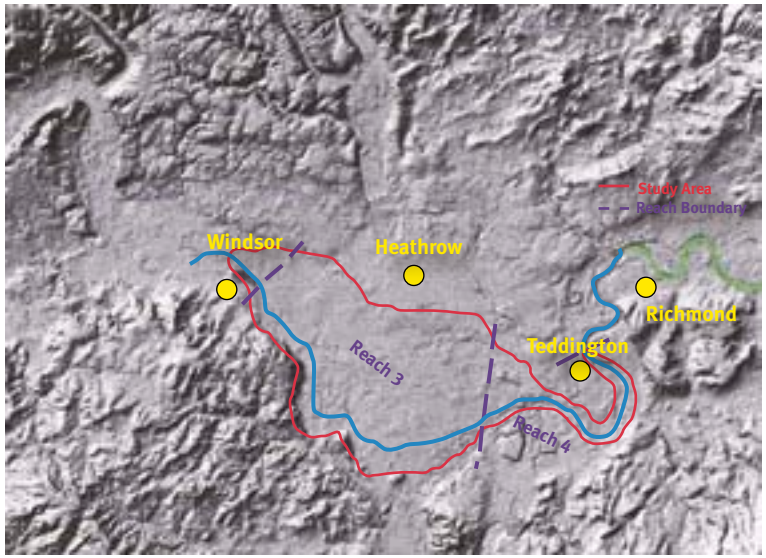
Chapter 3: The study area



Characteristics of the study area

This is the area around the Lower River Thames that broadly follows the course of the river from Datchet, in the northwest, to Teddington, in the east. We have divided this area into two distinct parts, **Reach 3** and **Reach 4**. The study area of **Reach 3** runs from Datchet to Walton Bridge, and it has a wide, open floodplain. **Reach 4** runs from Walton Bridge to Teddington, and has a much narrower floodplain. **Reach 1** (Hurley to Cookham) and **Reach 2** (Cookham to Windsor) do not form part of the strategy. Properties immediately upstream of the study area, in **Reach 2**, are protected by the Maidenhead, Windsor and Eton Flood Alleviation Scheme.

The River Thames corridor is a focal point for recreational activities such as walking, cycling, boating, angling and picnics. Important parkland areas contain mature trees that bring high landscape and ecological value to the area. Sites of national historic importance such as Windsor Great Park, Hampton Court Palace and Laleham Park lie close to the river in several locations.



Topographic map showing the broad and narrow floodplain of the Lower Thames

Major dredging works ceased over 10 years ago on this stretch of the River Thames when further dredging operations could not be justified on the basis of value for money. Since then the water quality of the River Thames has improved and is likely to continue to improve and attract more species of important fish, plant and invertebrates.

There are numerous gravel pits in the study area. Some have been restored for agricultural use while others are filled with waste. Many have filled with water to form lakes. These lakes attract birds, among which are notable species of duck that use them during the winter. For this reason, a number of lakes have been designated a Special Protection Area (SPA) – a site of European importance for the protection of these birds. Some of these lakes have also been stocked with fish and provide popular angling facilities, attracting anglers from all over the country. There are also several Sites of Special Scientific Interest (SSSI).

Boats on the Lower Thames

North Wraysbury Lake, part of the Southwest London Water Bodies Special Protection Area

River Thames at Windsor

A four phased approach

Our aim is to take a long-term, sustainable approach to managing flood risk over the next 100 years. We looked at ways to reduce flood risk to homes, businesses, utilities and transport infrastructure while protecting historic sites, wildlife and the environment.

We looked at ways to reduce flood risk to communities through influencing planning policies, making homes more resilient to flooding and improving flood warnings. We also considered different flood diversion channel options while putting together the Flood Risk Management Strategy for the Lower Thames.

We took a staged approach to developing the Lower Thames Strategy. **Phase 1** commenced soon after the 2003 floods. It was an update of a study carried out in 1992, which looked at options for flood alleviation between Datchet and Chertsey. The findings indicated that it would be worth pursuing a Flood Risk Management Strategy in more detail.

Phase 2 began in April 2004. We looked at both engineered and non-engineered Flood Risk Management options such as flood storage, flood walls and embankments. We started **Phase 3** in July 2005 by carrying out further studies, exploring deepening the River Thames and investigating the suitability of community based measures. Surveys over the last 10 years do not show a general build up of silt in the Lower Thames, but sediment deposits do arise and need to be moved to maintain ease of navigation.

We are currently in **Phase 4**, which takes a detailed look at the findings from the previous phases to determine which collection of options gives the best value for money.

The floodplain between Walton Bridge to Teddington (**Reach 4**) is much narrower than the floodplain from Datchet to Walton Bridge (**Reach 3**), and fewer properties are at risk. This influenced how we developed the strategy and we had to look at different solutions for different areas.

We met with local authorities and interest groups such as RSPB, River Thames Society, Runnymede Flood Forum, Thames Landscape Strategy and landowners to talk about our plans. They have contributed to the draft strategy by raising concerns about matters we overlooked and they have provided valuable advice. We will continue to consult them in the future.

Q Are there any groups or organisations that we should be talking to?

Options we considered

We looked at many different options and locations for managing flood risk. We considered engineered solutions as well as measures such as making homes more resilient to flooding and improving flood warnings. We also looked at how we could influence planning policies in the area.

The main engineering option we considered was to build new sub channels of the River Thames, which can carry high flood flows and reduce the chance of the river coming out of bank. We call these flood diversion channels.

We looked at several places where we could put the flood diversion channels, and found that they were only viable in **Reach 3**. **Reach 4** is more built up, and it is hard to find enough space to fit the channels in. We assessed all of our options against a range of economic, environmental, political and social factors.

This schematic shows the three diversion channels we considered

A need for an integrated plan?

We found that widespread alleviation of flooding in the **Reach 3** area could only be achieved through large-scale flood diversion channel works. We also propose to improve weirs at Sunbury, Molesey and Teddington and widen Desborough Cut to accept higher flood flows. These will reduce the flood risk to many properties in **Reach 4**.

Our discussions with various organisations showed there could be an advantage in considering the strategy as a package of channel works and non-engineered measures. These would be undertaken in partnership with local authorities to influence planning policies and to assist in effective communication with the public in advance of any flooding occurring.

However, it is possible that the Government will require us to either phase the various parts of the strategy over a number of years, or only implement parts of the strategy.

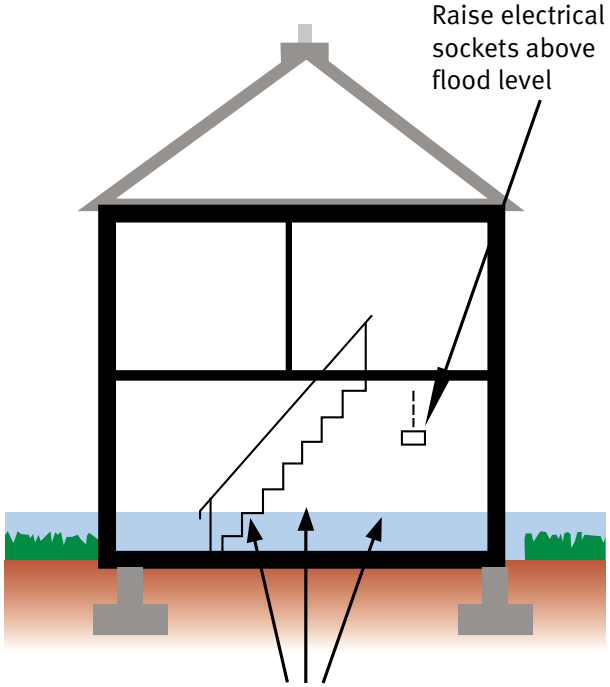
View of Desborough Cut, looking downstream

Floodplain management is central to the strategy

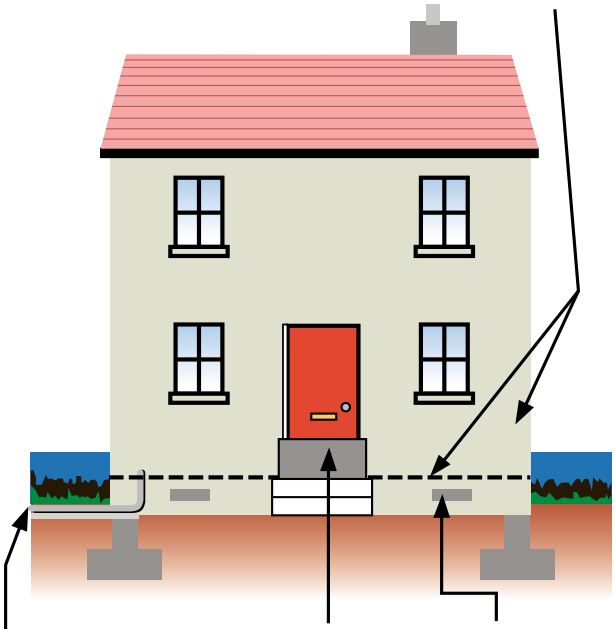
Floodplain management is a core part of our strategy and we are promoting it through **Reach 3** and **Reach 4**. The floodplain management element of the Lower Thames strategy would follow Government recommendations for managing flood risk according to national and local priorities. It would comprise measures such as land control, improved public awareness and community based options. The main areas of work would be:

- increasing public awareness of flooding, which would encourage the uptake of Floodline Warnings Direct, a free service that provides flood warnings via telephone, mobile, email and SMS text messages. We would also continue to work in partnership with local authorities and other public bodies to improve flood mapping, develop emergency plans, local flood action plans and apply the best means available to make individual properties resistant to floods;
- working through policy and planning, and encouraging increased flood storage in upstream tributaries;
- community based measures, which may include providing financial support for individual and community based flood prevention initiatives. These would include the use of demountable and temporary defences, and flood resistance schemes for individual and groups of properties. We want to protect small groups of properties, particularly between Walton Bridge and Teddington (**Reach 4**). Protecting groups of properties is not so straightforward for many areas between Datchet and Walton Bridge (**Reach 3**). They are more likely to turn into islands during a major flood because the floodplain stretches across a wide area. Protecting individual properties is most suitable in **Reach 4**, but we also aim to promote this approach where appropriate in **Reach 3** and **Reach 4**;
- floodplain management tools, which consist of interactive flood mapping tools, working with local planning authorities, new procedures to guide and promote sustainable development, and effective community evacuation plans;

Resilience



Resistance

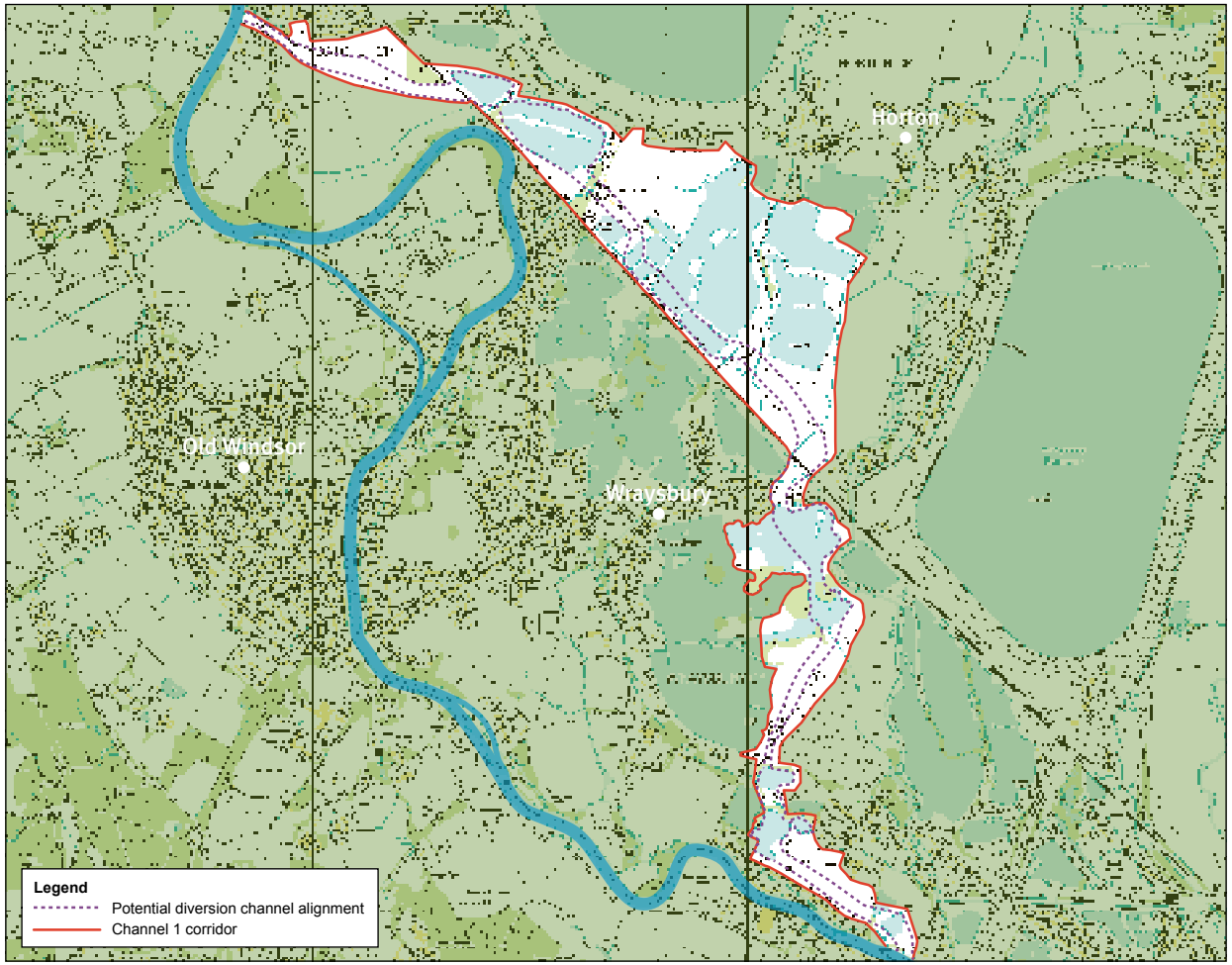


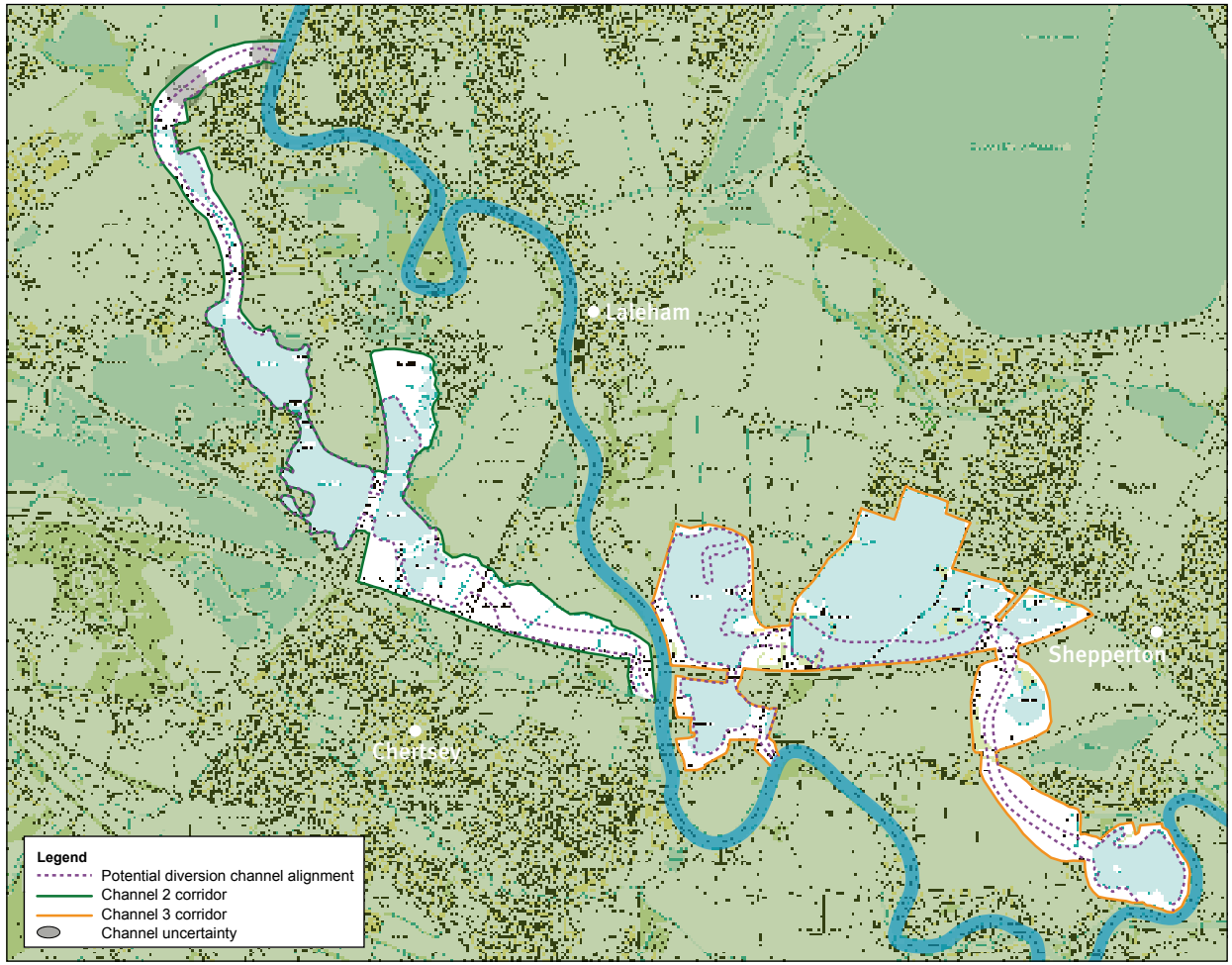
- working with local authorities to safeguard flood flow routes, which generally coincide with potential diversion channel routes. Other approaches would include continuing to control development in areas that are prone to flooding;
- the Thames Barrier, which can be operated (as in 2003) to mitigate flood impacts in the downstream parts of **Reach 4**. We would look to promote its operation to provide benefits whenever this proves to be possible to properties within the Lower Thames. However, because the Thames Barrier's legal purpose is to protect against tidal flooding, it is likely that the availability of the Thames Barrier to alleviate for fluvial flooding will get less over the next 25 years, as the sea level continues to rise.

Do you agree with our proposals for floodplain management in **Reaches 3** and **4**?

We are promoting the use of flood diversion channels in Reach 3

There would be three separate but consecutive new flood diversion channels between Datchet and Shepperton. These would link up some of the lakes in the area and reconnect with the River Thames. The idea is to bypass the existing weir structures and improve the passage of water downstream. The area between Shepperton and Teddington is too built up for this type of engineering works to take place. The study area is very built up with much infrastructure, limiting the options for routing each channel. The maps opposite show the proposed corridor for the flood diversion channels. The exact routes have still to be determined.




Laleham
Shepperton
Chertsey
Legend
Potential diversion channel alignment
Channel 2 corridor
Channel 3 corridor
Channel uncertainty

What would the channels look like?

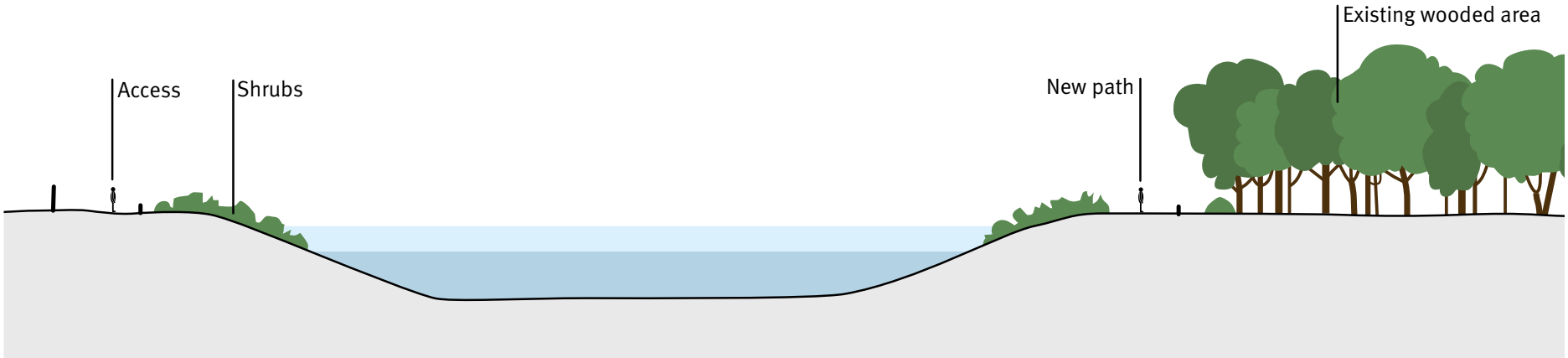
We would aim to make the flood diversion channels look, as much as possible, like a natural watercourse with gently sloping banks. New vegetation would help them blend into the existing landscape. Each flood diversion channel would be a similar width to the River Thames, between 50 and 60m wide, within a broader corridor of up to 100m. Some might have a footpath or cycle-path running alongside them, and contain attractive features such as reedbeds.

Water in the flood diversion channels would be about 3.5m deep for most of the year. We would not plan to have a continuous flow along them. Instead, the water would be still, like the water in many of the gravel pits in the area.

In some places, it would be apparent that the flood diversion channels are man-made in spite of efforts to make them as natural looking as possible. For example, we would need to install reinforced gates (that can open and shut to control water levels) where the channels leave the River Thames. The gates at the entrance to the flood diversion channels would open and let water through in times of flood. This would raise the water level to approximately 4m deep. A number of other bridges, culverts and weirs would also be required to cross existing roads and railway lines, and to keep the water at the correct level.

The flood diversion channels would skirt around some areas of historic landfill sites. We would need to be very careful to make sure we do not cause any pollution risk. It is likely that we would need to construct heavily engineered channels in these areas, and possibly to line them. However, we would still include planting to help soften the appearance of the corridor, and try to include other natural river features.

Do you agree with our proposals for flood diversion channels in **Reach 3**?



We also want to do engineering works in Reach 4

We have studied the effects that building flood diversion channels would have on flows in the rest of the river, downstream from where flood diversion Channel 3 returns to the Thames. This shows that we would need to do some works to the river through **Reach 4** to maintain the flows at their current level to prevent any increase in flooding. These proposals would also reduce flood risk for most people in **Reach 4**.

Modifying weirs

This would involve increasing the capacity of Sunbury, Molesey and Teddington weirs to convey water during a flood.

Desborough Cut

We are proposing to widen Desborough Cut by 3 to 4m on the southern bank, between the river and the road. This would improve the flow of water. We would maintain public access along the river once the works are completed.

Local defences

Local defences would protect localised areas such as those around Teddington Studios and on the river frontage at Kingston. However, we ruled out this approach in visually sensitive locations such as around Hampton Court Palace.

Do you agree with our proposals for engineering works in **Reach 4**?

View of Teddington Lock

Aerial view of Sunbury Lock, looking upstream

Aerial view of Teddington weirs, looking upstream

What are the benefits?

We believe that building these flood diversion channels and associated works would bring major long-term benefits to the Lower Thames area. We plan to substantially reduce flood risk in **Reach 3** and **Reach 4** to 5,100 residential properties (housing about 12,800 people) experiencing the most frequent flooding. The scheme should enable some 8,200 residential properties (housing about 20,500 people) to qualify for flood insurance. This would involve moving them out of the insurance industry's significant flood risk band, for properties with more than 1.33 per cent annual chance of flooding in any one year. We expect that 7,200 residential properties (about 18,000 people) would be taken out of the flood risk envelope for the 1 in 100 year, or 1 per cent annual chance of occurrence. Flood risk would also be reduced for about 450 commercial properties, besides some public buildings and critical infrastructure within the Lower Thames area.

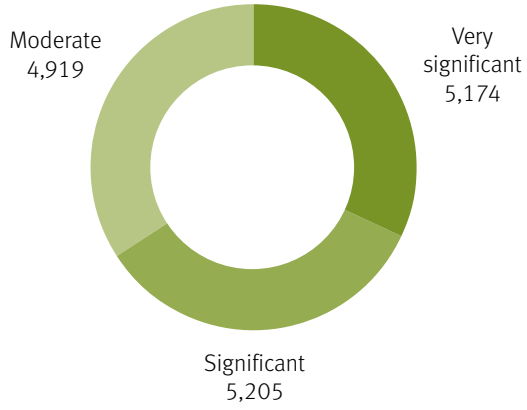
Apart from the significant reduction in flood risk, the new channels could improve the local landscape character and biodiversity of the area, including creation of important wildlife habitats such as reedbeds. They would also provide opportunities for activities such as walking, cycling, angling and canoeing.

Do you have any suggestions for other benefits the strategy could provide for your local area?

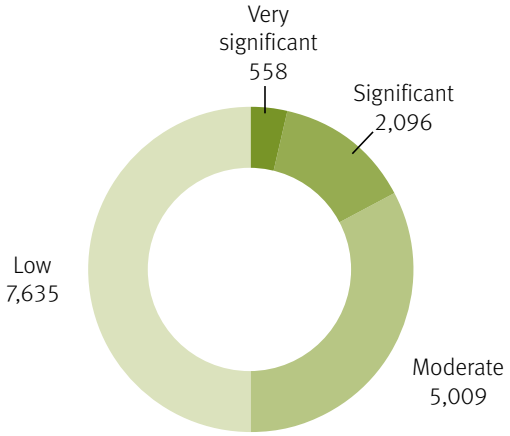
Number of households at flood risk, before and after strategy implementation

(The post-strategy figures assume the construction of all flood diversion channels 1, 2 and 3 and associated works.)

Present Day Flood Risk Bands for Reach 3 households



Post-strategy Flood Risk Bands for Reach 3 households



In addition, at least 540 households from **Reach 4** would be lifted into the Moderate band.

Flood Band Range (annual chance of occurrence)	**Risk Band**
›5%	Very significant risk
≤ 5% ›1.33%	Significant risk
≤ 1.33% ›0.5%	Moderate risk
≤ 0.5%	Low risk

What are the impacts?

We understand that building these new channels would have some impacts for local people and the environment but we would try to ensure that most of these would be temporary. The channels will bring long term benefits. We have already carried out a Strategic Environmental Assessment (SEA) of the options to identify any environmental and social impacts at this strategic stage and we will carry out a full environmental and social assessment of the various impacts at the next stage to ensure that they are reduced to a minimum.

Some of the key impacts would be:

- loss of about five properties (only considered where there is no alternative option). Owners of any such properties would be given full compensation;
- disturbing the lakes where flood diversion channels pass through, and possible changes to their water quality;
- we may need to carry out archaeological excavations if the flood diversion channels were to pass through areas of archaeological interests;
- there may be alterations to habitats for migrating bird species; some could provide benefits;
- possible loss of a small part of Thorpe Hay Meadow – although this could be mitigated through other habitat restoration projects;
- disturbance to some angling or sailing clubs using the gravel pits, although we would investigate alternatives with each interest group. All impacts would be fully mitigated at the design stage.

Do you know of any other potential impacts we have not considered?

5,100 households
Substantially reduced flood risk

8,200 households
May now qualify for flood insurance

7,200 households
Taken out of the 1 in 100 year flood risk envelope

Indicative timings at this stage

We have much to do and we are still consulting to make sure we have considered all the options and impacts. Once we have your views to help us decide, and assuming the strategy will be approved to go ahead, we would hope to launch the floodplain management elements by 2011. We would also hope to start constructing the flood diversion channels around 2017, once the floodplain management has had sufficient time to take effect and to allow us enough time to carry out the relevant assessments and get the necessary consents.

How much would it cost?

That would depend upon the final strategy. There is no guarantee that the funding will be forthcoming or over what timescale. The options being considered are a combination of new infrastructure works, preceded and supported by enhanced management measures. Some parts of the strategy would therefore cost tens of millions of pounds, others more than 200 million pounds. Implementation of all parts of the strategy is currently estimated to cost over 300 million pounds.

We will have to compete with other flood risk management initiatives elsewhere in the country to make the strategy a reality.

Every scheme has to be assessed on its impact on the economy, the effect of flooding on local people and the benefits to the environment and heritage.

Funding for this work will depend on many things, including its priority, when compared with other schemes in England and Wales. For example, the Government may only approve channels 2 and 3 in **Reach 3** and associated engineering work in **Reach 4** and not channel 1.

What are the alternatives?

Do nothing

'Do nothing' means not funding flood defence. Locks and weirs along the River Thames would not be operated or maintained. They would eventually wear out, collapse and increase the risk of flooding. This is not acceptable because it results in major increases in flooding to humans and the environment. It would probably result in almost complete loss of navigation on the river. However, it forms a benchmark against which we considered alternative approaches.

Do minimum

'Do minimum' means to carry on funding flood defence at the same level as at the moment. We looked at two alternatives that depended on whether or not locks and weirs would be replaced as they wear out. In both cases, high levels of flooding would continue to be experienced. This would get worse with climate change. These options are unsatisfactory because they do not offer any form of reduction from the current high levels of flood risk.

Deepening the river bed

Deepening the river would have negative impacts on the plants and animals living within the river, particularly on the river bed. In addition, recent studies have shown that it is not economically viable, mainly because of the high disposal costs for the dredged material. For this reason, we ruled out widespread deepening across the whole study area.

Raising banks and defences

We looked at options for raising river banks, including flood embankments. We are promoting this approach in a few places but in other places we found that it could increase flood risk.

Flood storage

This approach looked at whether we could store water in areas further upstream to prevent it from reaching the study area. We found that we would have to flood an area half the size of Oxfordshire to do this. This is obviously not an acceptable solution. However, we would like to see provisions made for additional storage as part of separate schemes on tributary rivers. This would not be a complete solution but it would add to the overall benefit of the strategy, especially with respect to moderating the impacts of climate change.

We welcome your comments on the options for managing the risk of flooding in the Lower Thames between Datchet and Teddington. We need to work together with you, local authorities and other organisations to make sure our combined approach to managing flood risk is the most effective one.

We welcome your comments

To provide your comments, please either email or write to the address below. We would like to know:

- Do you agree with our proposals for flood diversion channels in **Reach 3**?
- If Government funding was found to be severely limited, would you be happy if only part of the strategy, for example only channels 2 and 3, was implemented?
- Do you agree with our proposals for floodplain management in **Reaches 3** and **4**?
- Do you agree with our proposals for engineering works in **Reach 4**?
- Do you know of any other potential impacts we have not considered on page 19?
- Do you have any suggestions for other benefits the strategy could provide for your local area?
- Are there any groups or organisations that we should be talking to?

The deadline for comments is **4 December 2009**. Your comments will be used when we take the Lower Thames Strategy to the approval stage in 2010. We will provide you with a summary of all the responses by the end of June 2010.

Please send your comments to:

Via the internet:
http://consult.environment-agency.gov.uk/portal/re/flood/thames/lts

By email:
lts@environment-agency.gov.uk

In writing:
Lower Thames Strategy feedback
Environment Agency
Swift House
Frimley Business Park
Frimley, Camberley
Surrey
GU16 7SQ

In person:
We will be holding public exhibitions were you can come to discuss the proposals in more detail, learn more and ask any questions.

We may publish or disclose information you provide in your response to this consultation, including personal information, in accordance with the Freedom of Information Act 2000 (FOIA).

If you want us to treat the information that you provide as confidential, please be aware that, under the FOIA, there is a statutory Code of Practice with which public authorities must comply and which deals, amongst other things, with obligations of confidence.

In view of this it would be helpful if you could explain to us why you regard the information you have provided as confidential. If we receive a request to disclose the information we will take full account of your explanation, but we cannot give an assurance that we can maintain confidentiality in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not, in itself, be regarded as binding on the Environment Agency.

How we will use your information

We will use your information to help shape the Lower Thames Flood Risk Management strategy.

We will publish all responses after the consultation has closed, unless you have specifically requested that we keep your response confidential. We will not publish names of individuals who respond. We will publish the name of the organisation for those responses made on behalf of organisations. Please indicate on your response if you want us to treat it as confidential.

If you respond online or provide us with an email address, we will acknowledge your response and send you a summary of responses after the consultation has closed. We will also publish the summary of responses on our website.

Be prepared for flooding...

To find out if you are at risk of flooding visit the Environment Agency's website at www.environment-agency.gov.uk/flood or call Floodline on 0845 988 1188* and find out if you can sign up to our free Floodline Warnings direct Service.

Make sure you understand the flood warning codes and know what to do if a flood warning is issued.

Prepare a flood plan:

- Check your insurance cover;
- Know how to turn off gas, electricity and water mains supplies;
- Prepare a flood kit of essential items;
- Know who to contact and how;
- Think about what you could move to safety now and during a flood.

Find out how to make your home or business flood resilient. Visit the Environment Agency's website for contacts.

* Approximate call costs are 8p per minute for a standard landline from your home every time you call. Please note charges will vary across telephone providers.

Notes

Have your say

For comments on this consultation document and to find out more about how we are seeking to reduce flood risk on the Lower Thames:

Lower Thames Flood Risk Management strategy:
http://consult.environment-agency.gov.uk/portal/re/flood/thames/lts

Would you like to find out more about us, or about your environment?

Then call us on
08708 506 506* (Mon–Fri 8–6)

email
enquiries@environment-agency.gov.uk

or visit our website
www.environment-agency.gov.uk

incident hotline 0800 80 70 60
floodline 0845 988 1188

* Approximate call costs: 8p per minute (standard landline).
Please note charges will vary across telephone providers

Environment first: This publication is printed on paper made from 100 per cent previously used waste. By-products from making the pulp and paper are used for composting and fertiliser, for making cement and for generating energy.

GETH0909BQUS-E-E