We are the Environment Agency. It’s our job to look after your environment and make it a better place – for you, 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. Out there, making your environment a better place.
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What this booklet tells you:

This booklet tells you about the Great Ouse Draft Catchment Flood Management Plan.

We are developing a Catchment Flood Management Plan (CFMP) for the Great Ouse catchment. This will be a high level strategic plan that will assess how flood risk might change and be managed over the next 50 to 100 years. The Draft CFMP outlines our current understanding of flood risk in the Great Ouse catchment, assesses future flood risk and identifies flood risk management policies. Details of the timetable for producing the final plan are given on page 3.

This booklet aims to:

■ inform, and get responses from, interested groups or individuals on our understanding of why and how flooding might occur and the impacts of it;
■ obtain your views on which flood risk management policies might be appropriate over the life of the CFMP.

In particular we would like your comments on:

■ the proposed flood risk management policies that we have identified for particular parts of the catchment;
■ the action plan.

You have until 30th March 2007 to return your comments. If you would like to see the full Draft CFMP, you can either view this at any of the following libraries: Milton Keynes (central), Bedford (central), Hitchin, Letchworth, Royston, St Neots, Huntingdon, Saffron Walden, Cambridge (central), Newmarket, Ely, Bury St Edmunds, Brandon, Lakenheath, Mildenhall, Elmswell, Ixworth, Thurston, and King’s Lynn

Or if you would like your own copy on CD, please e-mail us at: greatousecfmp@environment-agency.gov.uk
What is a Catchment Flood Management Plan (CFMP)?

A Catchment Flood Management Plan is a plan that develops long-term policies for sustainable flood risk management within a particular catchment.

We are producing a CFMP for each major river in England and Wales. CFMPs look at flooding from all sources except for coastal flooding from the sea. This is considered in Shoreline Management Plans (SMPs).

CFMPs will identify the main factors influencing flood flows and flood risk, and will assess how these may change over time.

The final plan will outline sustainable flood risk management policies for the next 50 – 100 years. The policies will provide a balance between cost effectiveness, social needs, and demands on land use for development and the environment. The CFMP will include a Strategic Environmental Assessment (SEA). This will consider how the proposed flood risk management policies might affect the environment.

It will seek to make sure that we provide a high level of protection and enhancement, wherever possible, to safeguard the environment for the future.

The flood risk management policies will establish whether we should take action to allow flood risk to:

- increase in suitable areas;
- be reduced;
- remain at the current level.

The CFMP will not identify specific measures to manage flood risk but will identify where we should undertake further work.

Welches Dam, Counter Drain
What is the Draft CFMP Stage?

This is the stage during which we prepare our draft plan and consult the public.

The Draft CFMP Stage aims to present:
- an understanding of the sources, probability and consequences of flooding;
- a summary of past and present flood risk management measures;
- possible future changes in the catchment;
- a set of catchment objectives;
- a set of preferred policies for sustainable flood risk management;
- a proposed action plan identifying further strategies and studies.

Timetable for the Great Ouse CFMP

<table>
<thead>
<tr>
<th>When</th>
<th>Milestone</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 2005 – February 2006</td>
<td>Scoping Consultation</td>
<td>Consultation responses</td>
</tr>
<tr>
<td>January 2007 – March 2007</td>
<td>Draft CFMP Consultation</td>
<td>Consultation responses</td>
</tr>
</tbody>
</table>
Catchment overview

The Great Ouse CFMP extends from Northamptonshire in the west to Norfolk and Suffolk in the East. The southern boundary of the CFMP is defined by the catchment boundaries of the rivers: Twins, Clipstone Brook, Hiz, Cam, Granta, Kennett, Lark and Little Ouse. The northern boundary extends to The Wash.

The Great Ouse CFMP covers an area of 8,587km². The River Great Ouse is the primary river system; it starts in Northamptonshire near Brackley and then passes through Buckingham, Newport Pagnell, Bedford, St Neots, St Ives and Earith before it crosses the Fens and flows into The Wash. The main tributaries include the rivers: Tove, Ouzel, Ivel, Cam, Lark, Wissey and the Little Ouse. The CFMP area is largely rural; it supports traditional industries such as manufacturing, tourism, and agriculture. However, research and technology, finance and service sectors are becoming more important. The main towns are Milton Keynes, Bedford, Cambridge and King’s Lynn. Figure 1 shows the main features of the CFMP area.

Topography, geology, and geomorphology

The highest areas are located in the southern and western parts of the catchment where elevations are around 170m Ordnance Datum Newlyn (ODN). The Fens make up a large part of the eastern area of the catchment; here elevations are close to mean sea level. Most of the watercourses within the Great Ouse catchment have been heavily modified for flood defence, navigation, or land drainage purposes. The south eastern area of the catchment is predominantly chalk with mudstone covering much of the north west. Limestone dominates the very western boundary of the CFMP area.

Soils, land use and land management

In the west the soils mainly consist of clay, with pockets of chalk and sand to the south; sand, gravel and chalk become dominant in the east of the CFMP area. In addition, the Fens consist of large pockets of silt. Approximately 44% of the agricultural land in the Great Ouse catchment is Grade 1 and 2 (excellent to good quality). The catchment is mainly rural with 65% of the land managed as arable.

Environment and heritage

The Great Ouse CFMP area contains a range of environmental and heritage sites. We are applying a Strategic Environmental Assessment (SEA) to the CFMP. The SEA will look at the potential environmental consequences of the flood risk management polices before they are approved.

We have identified the most important environmental “receptors” that may be at risk of flooding. We have identified where these receptors may be constrained or improved by flood risk management options.
Heritage

Within the Great Ouse CFMP area there are 1,078 Scheduled Ancient Monuments (SAMs).

Wildlife

Within the Great Ouse CFMP area there are:
- 27 National Nature Reserves (NNR)
- 242 Sites of Special Scientific Interest (SSSI)
- 1,815 County Wildlife Sites
- Eight Ramsar sites (wetlands of international importance)
- Two Special Protection Areas (SPA)
- 11 Special Areas of Conservation (SACs)
- 1,300 Biodiversity Action Plan (BAP) habitats

Water quality

The majority of the Great Ouse catchment has ‘fairly good’ to ‘very good’ water quality.

The Water Framework Directive imposes a legal requirement to bring all waterbodies up to ‘good’ quality status by 2015. However, some water bodies (artificial or heavily modified) will only have to achieve ‘Good Ecological Potential.’ This will be a challenge; we will need to make sure that we do not compromise water quality when we adopt flood risk management policies for the CFMP.

Tourism and recreation

The catchment has a wealth of tourist attractions, which include scenic countryside, nature conservation sites such as the Ouse Washes, market towns and villages and the waterways of the Fens. Tourism is an important industry in the Great Ouse Catchment and plays a significant role in the local economy. The most popular recreational activities in the Great Ouse catchment are walking, bird watching, angling, horse riding, cycling, boating and water sports. It is important that the policies developed by the CFMP do not restrict the use of the environment, and where possible promote its use and value.
Current flood risks, consequences and management

We work with the Internal Drainage Boards, Local Authorities and Anglian Water in managing flood risk. Although we spend a significant amount each year on flood risk management, people, property and the environment remain at risk from flooding.

Sources of flooding

Our flood map shows the areas at risk of flooding; you can look at this map on our website: [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk). In the Great Ouse catchment the most likely source of flooding is from the rivers. The Wash Shoreline Management Plan (SMP) considers tidal flooding and will set policies to manage this. However, high tide levels limit the drainage of rivers into the sea; this CFMP will therefore consider the effects of the tide on the river system.

River flooding is usually associated with winter storms. High intensity and prolonged rainfall events overwhelm the drainage capacity of the land, which allows water to move quickly into the rivers. Most of the catchment is low lying and relies heavily on pumped drainage. This is managed by a number of Internal Drainage Boards (IDBs). Below Earith many of the watercourses are raised embanked channels that are maintained above the general level of the surrounding land. However, should the embankments fail or be overtopped, serious flooding could occur. Any failures of the pumped drainage system could also lead to flooding.

Flooding on the River Cam, October 2001
Tidal flooding during extreme surge events is a significant threat to Hunstanton and Heacham. King’s Lynn is at risk from a combination of river and tidal flooding. Within the catchment drainage from the low lying watercourses can be limited by high tide levels - a situation known as ‘tide locking’. Over the period when watercourses are tide locked floodwater is stored in the watercourse. This leads to temporary but significant rises in river levels.

Flooding can result from high groundwater levels if the water table rises above the ground level. Groundwater flooding is difficult to predict as it rarely follows a consistent pattern. The response time between rainfall and groundwater flooding is relatively long; groundwater flooding can last for a few days to a few weeks. Following the 2001 floods, groundwater flooding effected properties in Bury St Edmunds, Newmarket, and effected the A43 between Great Barton and Ixworth.

Consequences of flooding

Floods that happen with little warning, that generate fast and deep water flows, and that occur in areas of high population are of greatest risk to people. Flooding can affect people either directly or indirectly. Certain groups of people are particularly vulnerable to flooding. These include the elderly, the long-term sick, and the financially deprived. In the Great Ouse catchment the places with the highest vulnerability are Letchworth, Towcester and Whaddon.

We estimate that under existing conditions, during a 1% Annual Exceedance Probability (AEP) event, 33,172 people, and 16,843 properties are at risk of flooding within the high impact areas of the catchment.

Bedford, Biggleswade to Blunham, Huntingdon to Needingworth, St. Neots and Eaton Socon, and King’s Lynn and Downham Market have the largest number of people and properties at risk of river flooding.

There are a large number of isolated properties and small villages within the Great Ouse catchment; we have estimated that a total of 77 settlements could become completely isolated during a 1% AEP event.

Economic damages are larger where there are numerous densely populated settlements lying within the floodplain, such as within the Bedford Ouse sub-catchment, and where there are large expanses of high-grade agricultural land. We estimate that under existing conditions, during a 1% AEP event, there would be a total of £61,932,000 annual average property damages in the high risk areas of the catchment.

Flooding has an effect on the agricultural productivity of farmland, although the effect will depend on the crop and timing of the flood. We estimate that under existing conditions, during a 1% AEP event, there would be a total of £5,173,500 annual average agricultural damages in the high risk areas of the catchment and the Fens.

Changes to the flooding regime of environmental sites can have both direct impacts (such as inundation of dry habitats) and indirect impacts (such as deterioration in water quality). The impact of flooding is site specific and dependant on the habitats, species and landforms present. The number of environmental sites that we have estimated at risk of river flooding (during a 1% AEP event under present conditions) are summarised below in Table 1.

Table 1: Environmental assets at risk of flooding

<table>
<thead>
<tr>
<th>Feature</th>
<th>Total number within the catchment</th>
<th>Area (Ha)</th>
<th>Total number at risk (1% AEP)</th>
<th>Total area (Ha) at risk (1% AEP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSSI</td>
<td>242</td>
<td>87,113</td>
<td>94</td>
<td>5,444</td>
</tr>
<tr>
<td>SAC</td>
<td>11</td>
<td>110,592</td>
<td>9</td>
<td>1,270</td>
</tr>
<tr>
<td>SPA</td>
<td>2</td>
<td>64,541</td>
<td>2</td>
<td>2,837</td>
</tr>
<tr>
<td>Ramsar Site</td>
<td>8</td>
<td>65,074</td>
<td>5</td>
<td>2,921</td>
</tr>
<tr>
<td>CWS</td>
<td>1,815</td>
<td>39,702</td>
<td>601</td>
<td>23,600</td>
</tr>
<tr>
<td>NNR</td>
<td>27</td>
<td>3,299</td>
<td>9</td>
<td>1,879</td>
</tr>
<tr>
<td>BAP Habitats</td>
<td>1,300</td>
<td>26,299</td>
<td>300</td>
<td>14,027</td>
</tr>
<tr>
<td>SAM</td>
<td>1,078</td>
<td>N/D</td>
<td>118</td>
<td>N/D</td>
</tr>
</tbody>
</table>
Current flood risk management

We have permissive powers under the Water Resources Act (1991) to provide flood protection on Main Rivers within the Great Ouse catchment. We have defences at Bedford, King’s Lynn, Cambridge, Towcester, Houghton, Wyton, Swavesey, Over/Willingham, Newport Pagnell, Blunham to Tempsford, Sandy to Blunham, The Hemingfords, Biggleswade, Stonely, on the Ely Ouse river system and on the Tidal Ouse system. As well as flood defence structures, we also use flood storage areas to manage flood risk. These areas can store excess floodwater which is released once the peak flow has passed. The most important flood storage areas within the Great Ouse catchment are: the Ouse Washes, the Ely Ouse Flood Relief System, the River Nar Flood Alleviation Scheme (FAS), the Towcester FAS, Adventurer’s Fen and Milton Keynes storage lakes. We regularly maintain, monitor and operate these flood defences. We also have an annual maintenance programme, which includes channel de-silting.

Our management of flood risk does not just consider hard defences, as this is not sustainable. We also manage flood risk by issuing flood warnings. The Great Ouse CFMP area is divided into 37 Flood Warning Areas. We send tidal and river flood warning messages as Flood Warning Codes: Flood Watch, Flood Warning, Severe Flood Warning and All Clear. We use a variety of methods to disseminate our flood warning information; we use the media to broadcast warnings and send direct warnings to our professional partners and members of the public. We aim to get warnings out to those at risk at least two hours in advance of a flood.

Management of flood risk is not solely carried out by ourselves; there are other operating authorities involved, including Internal Drainage Boards (IDBs) and Local Authorities (LAs). IDBs are independent bodies created to manage land drainage in areas of special drainage need. There are 54 IDBs within the Great Ouse catchment. Each board operates within a defined area; they are empowered under the Land Drainage Act (1991) to undertake flood defence works on the network of watercourses and pumping stations which are not designated as Main River. LAs have powers to undertake flood defence works under the Land Drainage Act (1991) on watercourses which have not been designated as Main River, or on watercourses that do not flow within IDB areas.
Future flood risks and consequences of flooding

We need to understand how possible changes in climate, urban development and land use could affect current flood risk in the catchment.

Conditions in the Great Ouse catchment will not remain the same over the next 100 years. The processes and drivers that influence the way floods are generated, and the damage they cause will change in the future. We must begin to recognise what these changes are and how the Great Ouse catchment is likely to respond. We can only achieve effective and sustainable management by developing and putting in place a range of flood risk management policies that can react to change.

We have assessed how flood risk in the Great Ouse catchment may change in the future by identifying future scenarios and assessing their impact. A scenario is a possible future situation which can influence either catchment processes or flood responses, and therefore the success of flood risk management policies/measures. There are three key drivers which define each future scenario: land management, urban development and climate change. Initially we have identified how each of these drivers may change in the future. We have then carried out sensitivity testing for each driver separately, and in various combinations, to determine what the impacts of different changes might be and how sensitive the catchment is to these changes.

Climate change

Climate change scenarios provided by the United Kingdom Climate Impacts Programme (UKCIP) suggest drier summers and wetter winters. This will increase the severity and frequency of peak flows. In addition, changes in sea level could affect the drainage of watercourses into the sea and increase the frequency of tide locking.

To consider the potential impacts of climate change, we have adopted worst-case values of 6mm rise in sea level per year, and a 20% increase in peak river flows. However, because there is still some uncertainty about the accuracy of climate change predictions, we have also adopted a lower limit of 0%.

Urban development

Urban development can have a significant impact on flood risk. The creation of hard surfaces leads to an...
increase in rapid run-off and flash flooding. In order to assess future urban development within the Great Ouse catchment, we have reviewed both historic and current census data, along with future development targets stated within Regional Spatial Strategies and Local Plans. Figure 2 shows historical trends in household numbers across the Great Ouse catchment. We have estimated that there will be a total of approximately 6,940ha of new urban development in the catchment from 2001 to 2021. Beyond 2021 we have assumed the historic urban growth rate of 62ha/yr based on figures from 1920 to 2001.

To test the sensitivity of the catchment to urban development, we have also considered the impact of source control for new developments. Sustainable Drainage Systems (SuDS), which include porous surfaces and purpose built ponds and wetlands, are designed to intercept surface water and control the amount that is discharged directly to rivers.

Land use

Future land management, outside of urban areas, will depend on society’s aspirations and needs. It will be driven by policies implemented by both the UK Government and the EU. Potential changes to land use could have a significant impact on flood risk. For the Great Ouse catchment we have considered both agricultural decline and intensification.

Scenarios

We have combined the three drivers (climate change, urban development and land use) to create a range of future scenarios within the Great Ouse catchment. We have used the six combined scenarios as shown in Table 2 to assess future flood risk.

Consequences of future flooding

As a result of the future changes in the catchment there will be an increase in peak river flows. Generally, an increase in peak flows will lead to an earlier onset of flooding, and for a given event (for example the 1% AEP flood), the flood extent and flood depth will be larger.

The impacts on people living and working within communities at risk of flooding will become more significant. As development within the floodplain continues, the number of people and potential for flooding of residential, commercial and industrial property is likely to increase.

We estimate that under future conditions 56,539 people, and 29,488 properties will be at risk of flooding within the high impact areas of the catchment. Bedford, Biggleswade to Blunham, Huntingdon to Needingworth, St. Neots and Eaton Socon, and King’s Lynn and Downham Market will have the largest number of people and properties at risk of river flooding. We estimate that there will be a total of £83,784,159 annual average property damages in the high risk areas.

In general terms, increased flooding/inundation associated with the future scenarios has the potential to enhance some lowland sites noted for wetland and floodplain habitats. The reconnection of the floodplain to the main watercourse will increase the extent of wetland and wet grassland habitats, thereby creating varied conditions for plants and animals. Increased flooding could also have detrimental effects on lowland sites noted/designated for drier habitats such as woodland and/or hay meadows.

Table 2: Future Scenarios

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Urbanisation</th>
<th>Urbanisation with source control</th>
<th>Agriculture as existing</th>
<th>Agricultural decline</th>
<th>Agricultural intensification</th>
<th>Climate change (10%)</th>
<th>Climate change (20%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worst Case</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture to combat climate change</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Most Likely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact of source control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Best case</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Catchment objectives

The key objective of a CFMP is to develop complementary policies for long-term management of flood risk within the catchment. This will take into account the opportunities and constraints of the catchment, along with future changes in flood risk due to climate change, urban development and changes in land use and land management practices.

Great Ouse CFMP objectives

We have developed detailed objectives for the management of flood risk in the catchment. We have used these to assess and select the most appropriate flood risk management policies for specific units of the CFMP area.

In summary, our objectives for the Great Ouse catchment are:

■ Minimise flood damage to people and property.
■ Manage flood risk to achieve development and regeneration objectives at Regional and Local Government level without increasing flooding elsewhere.
■ Ensure that prospective mineral abstraction possibilities are retained.
■ Optimise joint use of the floodplain and river corridor for flood risk management, nature conservation and recreation functions.
■ Protect and enhance where possible the nature conservation value within the catchment.
■ Maintain water quality standards and improve where feasible.
■ Preservation of heritage to protect and enhance cultural heritage and landscape character.

Catchment opportunities and constraints

The Great Ouse catchment provides many opportunities for sustainable flood risk management practices that can also deliver benefits to other functions such as habitats, heritage, landscape and recreation. We have identified opportunities from 3 sources:

■ modelling to identify locations where flood storage is physically possible;
■ existing policies and plans; and
■ catchment understanding and knowledge.

We believe that a key opportunity for catchment wide sustainable flood risk management is to reduce flood risk in the Fens by storing water in the upper areas of the catchment. We have determined the extra volume of floodwater, as a result of climate change, in the 1% AEP event that would reach the Fens from the five most important rivers. Then we have carried out a geographical analysis to determine the maximum amount of storage that would be possible within these rivers.

There are a number of general constraints that are relevant to all flood risk management responses:

■ legal and administrative;
■ economic viability;
■ availability of funding;
■ existing and planned development, environmental designations, navigation, industrial use and recreation;
■ lack of compensatory habitat; and
■ impact of flood risk elsewhere in the system.
Policy appraisal

Policies for sustainable flood risk management in the Great Ouse catchment aim to meet environmental, social and economic objectives.

The Great Ouse CFMP aims to identify the most sustainable flood risk management approaches for the catchment. This involves identifying preferred policies for different parts of the catchment. To do this, we have divided the CFMP area into smaller areas, called policy units. The policy units for the Great Ouse catchment have been divided by using our current knowledge of flood risk processes:

- drivers of future levels of flood risk;
- dominant flood producing mechanisms;
- position in the catchment;
- type of river and floodplain topography; and
- type of ‘receptor’ – economic, social or environmental.

We have selected five policy units for the Great Ouse catchment; these are shown in figure 3.

For each policy unit we can use six available flood risk management policies. They are:

- **P1** no active intervention (including flood warning and maintenance), continue to monitor and advise;
- **P2** reduce existing flood risk management actions (accepting that flood risk will increase with time);
- **P3** continue existing and alternative actions to manage flood risk at the current level (accepting that flood risk will increase over time from this baseline);
- **P4** take further action to sustain the current scale of flood risk into the future (responding to the potential increases in flood risk from urban development, land use change and climate change);
- **P5** take further action to reduce flood risk (now and/or in the future);
- **P6** take action to increase the frequency of flooding to achieve benefits locally or elsewhere (which may lead to an overall reduction in flood risk). An example of this would be the creation of wetlands or washlands upstream of a risk area, which in addition to delivering environmental benefits could reduce the frequency of flooding threatening people and property.

We selected suitable policies for each policy unit by:

- looking carefully at all the relevant environmental, social and economic objectives, and opportunities and constraints identified within the catchment;
- thinking about ways of managing flood risk within the catchment;
- reviewing the available policy options and identifying the most suitable;
- evaluating each selected policy option against the environmental, social and economic objectives within the catchment; and
- testing the robustness of the selected policies against the future scenarios.

The policies that we have selected for each policy unit are shown in figure 3 on the next page.
Figure 3 - Policy units and proposed policies

**The Fens**
- Policy 6: Where there is opportunity to use areas as active floodplain
- Policy 4: For isolated properties and areas with major flood defences
- Policy 3: For areas where flood risk is small and sustainable
- Policy 2: For areas where flood risk management actions can be reduced

**North-West Norfolk Rivers**
- Policy 6: Where there is opportunity to use areas as active floodplain
- Policy 5: For King's Lynn, West Lynn, Downham Market and North Runcorn
- Policy 2: For smaller watercourses where flood risk management actions can be reduced

**Bedford Ouse**
- Policy 6: Where there is opportunity to use areas as active floodplain
- Policy 5: For large areas with significant risk of flooding
- Policy 4: For large urban settlements including Milton Keynes and Bedford
- Policy 3: For areas where flood risk management actions can be reduced

**Eastern Rivers**
- Policy 6: Where there is opportunity to use areas as active floodplain
- Policy 5: For Thetford and Bury St Edmunds
- Policy 3: For areas where flood risk is small and sustainable
- Policy 2: For areas where flood risk management actions can be reduced

**Southern Rivers**
- Policy 6: Where there is opportunity to use areas as active floodplain
- Policy 5: Where current flood risk measures are insufficient for both current and future flood
- Policy 3: For areas where flood risk is small and sustainable
- Policy 2: For areas where flood risk management actions can be reduced
### Action plan

The action plan represents a prioritised set of actions for future studies, strategy plans and other projects within the Great Ouse catchment.

To achieve the selected flood risk management policies in each of the policy units we have suggested actions for future studies; see table 3. This is the first step towards implementation of the CFMP.

We have worked with other authorities, organisations and groups to develop policies and actions, so that everyone can adopt the plan as a way forward for managing flood risk. Whilst most actions are our responsibility, we would like to promote and encourage a working relationship with other groups so that we can improve flood risk together. We aim to strengthen existing links and continue to work together to achieve the actions from the CFMP.

**Table 3: Action plan**

<table>
<thead>
<tr>
<th>Action proposed</th>
<th>Lead partner</th>
<th>Timescale Year(s)</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All Policy Units</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catchment wide hydrological study - Develop a high level hydrological study for</td>
<td>Environment Agency Strategic and Development Planning Team</td>
<td>2007 - 2009</td>
<td>High</td>
</tr>
<tr>
<td>the River Great Ouse and its tributaries.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liaise with Department of Culture, Media and Sport (DCMS) to identify specific</td>
<td>Environment Agency Planning Liaison Team</td>
<td>2007 - 2011</td>
<td>Medium</td>
</tr>
<tr>
<td>opportunities for flood risk management from planned Olympics 2012 developments.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liaise with planning authorities to ensure that update cycles of the Regional</td>
<td>Environment Agency Planning Liaison Team</td>
<td>2007 - 2011</td>
<td>Medium</td>
</tr>
<tr>
<td>Spatial Strategy are used in order to take specific opportunities for flood risk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>management.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liaise with planning authorities to make sure that brownfield sites within the</td>
<td>Environment Agency Planning Liaison Team</td>
<td>2007 - ongoing</td>
<td>Medium</td>
</tr>
<tr>
<td>floodplain are not automatically redeveloped.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identify opportunities to reduce runoff from landuse by future de-intensification.</td>
<td>Environment Agency Strategic and Development Planning Team</td>
<td>2007 - 2008</td>
<td>Medium</td>
</tr>
<tr>
<td>Encourage rigorous planning control to restrict new development in the floodplain.</td>
<td>Local Planning Authorities, Environment Agency Planning Liaison and Development Control teams</td>
<td>2007 - 2100</td>
<td>High</td>
</tr>
<tr>
<td>Continue to improve flood warning and emergency planning processes.</td>
<td>Environment Agency Flood Incident Planning Team, Emergency Services and County and Parish Councils across the catchment</td>
<td>2007 - 2100</td>
<td>Medium</td>
</tr>
<tr>
<td>Encourage environmental stewardship schemes to reduce flood risk to vulnerable</td>
<td>Natural England, National Farmers Union and Environment Agency Fisheries,</td>
<td>2007 - 2027</td>
<td>Low</td>
</tr>
<tr>
<td>areas.</td>
<td>Recreation and Biodiversity team</td>
<td></td>
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<tr>
<td>Action proposed</td>
<td>Lead partner</td>
<td>Timescale Year(s)</td>
<td>Priority</td>
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<tr>
<td>Undertake a study to investigate problems with surface water and sewer flooding and propose options for work to reduce this.</td>
<td>Anglian Water, County Councils and Highway Authorities</td>
<td>2008 - 2018</td>
<td>High</td>
</tr>
<tr>
<td>Promote the use of sustainable drainage systems where appropriate.</td>
<td>Local Planning Authorities, Environment Agency Planning Liaison and Development Control teams</td>
<td>2007 - 2100</td>
<td>High</td>
</tr>
<tr>
<td>Increase flood awareness and education.</td>
<td>Environment Agency Flood Incident Management and External Relation teams</td>
<td>2007 - 2027</td>
<td>Low</td>
</tr>
</tbody>
</table>

**Policy Unit 1: North West Norfolk Rivers**

- **King’s Lynn and North Runcton flood risk management study** - This study should identify what further actions can be taken to manage flood risk at King’s Lynn and North Runcton (P5).
  - **Lead partner**: Environment Agency Strategic and Development Planning Team
  - **Timescale**: 2012 - 2014
  - **Priority**: High

- **Downham Market flood risk management study** - This study should identify what further actions can be taken to manage flood risk at Downham Market (P5).
  - **Lead partner**: Environment Agency Strategic and Development Planning Team
  - **Timescale**: 2012 - 2014
  - **Priority**: Medium

- **The Tidal Great Ouse flood risk management study** - To continue to develop this study and implement its outputs.
  - **Lead partner**: Environment Agency’s National Capital Programme Management Service
  - **Timescale**: 2006 - 2008
  - **Priority**: High

- **Asset System Management Plan** - A detailed plan of works to continue with our existing or alternative actions to manage flood risk at the current level.
  - **Lead partner**: Environment Agency Asset System Management Team (North)
  - **Timescale**: 2008 - 2010
  - **Priority**: Medium

- **Asset System Management Plan** - This plan should identify specific locations where we can reduce our existing flood risk management actions.
  - **Lead partner**: Environment Agency Asset System Management Team (North)
  - **Timescale**: 2008 - 2010
  - **Priority**: Medium

**Policy Unit 2: Eastern Rivers**

- **River Lark and tributaries flood risk management study** - This study should identify what further actions can be taken to manage flood risk at Bury St Edmunds (P5).
  - **Lead partner**: Environment Agency Strategic and Development Planning Team
  - **Timescale**: 2010 - 2012
  - **Priority**: Medium

- **Little Ouse River and its tributaries flood risk management study** - This study should identify what further actions can be taken to manage flood risk at Thetford (P5).
  - **Lead partner**: Environment Agency Strategic and Development Planning Team
  - **Timescale**: 2010 - 2012
  - **Priority**: Medium

- **Asset System Management Plan** - A detailed plan of works to continue with our existing or alternative actions to manage flood risk at the current level.
  - **Lead partner**: Environment Agency Asset System Management Team (North)
  - **Timescale**: 2008 - 2010
  - **Priority**: Medium
<table>
<thead>
<tr>
<th>Action proposed</th>
<th>Lead partner</th>
<th>Timescale Year(s)</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asset System Management Plan - This plan should identify specific locations where we can reduce our existing flood risk management actions (P2).</td>
<td>Environment Agency Asset System Management Team (North)</td>
<td>2008 - 2010</td>
<td>Medium</td>
</tr>
<tr>
<td><strong>Policy Unit 3: Southern Rivers</strong></td>
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<tr>
<td>River Cam and tributaries flood risk management study - This study should identify what further actions can be taken to manage flood risk at: Great Chesterford, Sawston, Cambridge and Trumpington on the River Cam; and Cottenham and Westwick on Cottenham Lode (P5).</td>
<td>Environment Agency Strategic and Development Planning Team</td>
<td>2010 - 2012</td>
<td>Medium</td>
</tr>
<tr>
<td>Asset System Management Plan - A detailed plan of works to continue with our existing or alternative actions to manage flood risk at the current level (P3).</td>
<td>Environment Agency Asset System Management Team (North)</td>
<td>2008 - 2010</td>
<td>Medium</td>
</tr>
<tr>
<td>Asset System Management Plan - This plan should identify specific locations where we can reduce our existing flood risk management actions (P2).</td>
<td>Environment Agency Asset System Management Team (North)</td>
<td>2008 - 2010</td>
<td>Medium</td>
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<tr>
<td><strong>Policy Unit 4: Bedford Ouse</strong></td>
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<tr>
<td>River Ivel and its tributaries flood risk management study - This study should identify what further actions can be taken to manage flood risk at Biggleswade, Beeston, Sandy, Blunham, Potton and Stotfold on the River Ivel; Barton Le Clay and Clophill, on the River Flit; Henlow and Clifton on Henlow Brook; Graveley, and Stevenage-Little Wymondley on the River Hiz; and Letchworth on Pix Brook (P5).</td>
<td>Environment Agency Strategic and Development Planning Team</td>
<td>2008 - 2010</td>
<td>High</td>
</tr>
<tr>
<td>River Tove flood risk management study - This study should identify what further actions can be taken to manage flood risk at Towcester (P5).</td>
<td>Environment Agency Strategic and Development Planning Team</td>
<td>2008 - 2010</td>
<td>Medium</td>
</tr>
<tr>
<td>River Ouzel flood risk management study - This study should identify what further actions can be taken to manage flood risk at Fenny Stratford and Newport Pagnell (P5).</td>
<td>Environment Agency Strategic and Development Planning Team</td>
<td>2008 - 2010</td>
<td>Medium</td>
</tr>
<tr>
<td>The Bedford Ouse flood risk management study - This study should identify what further actions can be taken to manage flood risk at: Godmanchester, Holywell, Huntingdon, Needingworth, Eaton Socon, Swavesy, Wyton, Offord Darcy, Offord Cluny, Lower Shelton, Stewarby, Brackley, Olney, Wilden, Bromham and Kempston (P5). The study should identify further actions to sustain the current scale of flood risk into the future at Bedford (P4).</td>
<td>Environment Agency Strategic and Development Planning Team</td>
<td>2009 - 2011</td>
<td>High</td>
</tr>
<tr>
<td>Action proposed</td>
<td>Lead partner</td>
<td>Timescale Year(s)</td>
<td>Priority</td>
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<tr>
<td>Ellington and Brampton Brook flood risk management study - This study should identify what further actions can be taken to manage flood risk at Spaldwick on Ellington Brook and Brampton on Brampton Brook (P5).</td>
<td>Environment Agency Strategic and Development Planning Team</td>
<td>2008-2010</td>
<td>Low</td>
</tr>
<tr>
<td>River Kym flood risk management study - This study should identify what further actions can be taken to manage flood risk at Riseley and St Neots (P5).</td>
<td>Environment Agency Strategic and Development Planning Team</td>
<td>2008-2010</td>
<td>Medium</td>
</tr>
<tr>
<td>River Twins flood risk management study - This study should identify what further actions can be taken to manage flood risk at Thornborough (P5).</td>
<td>Environment Agency Strategic and Development Planning Team</td>
<td>2008-2010</td>
<td>Low</td>
</tr>
<tr>
<td>Alconbury Brook Asset System Management Plan - This plan should review Alconbury and Alconbury Weston schemes to assess whether they are appropriate within the context of the CFMP and strategic flood risk management.</td>
<td>Environment Agency Asset System Management Team (South)</td>
<td>2008-2010</td>
<td>Medium</td>
</tr>
<tr>
<td>Asset System Management Plan - A detailed plan of works to continue with our existing or alternative actions to manage flood risk at the current level (P3).</td>
<td>Environment Agency Asset System Management Team (South)</td>
<td>2008-2010</td>
<td>Medium</td>
</tr>
<tr>
<td>Asset System Management Plan - This plan should identify specific locations where we can reduce our existing flood risk management actions (P2).</td>
<td>Environment Agency Asset System Management Team (South)</td>
<td>2008-2010</td>
<td>Medium</td>
</tr>
<tr>
<td><strong>Policy Unit 5: The Fens</strong></td>
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<tr>
<td>The Fens flood risk management study - This study should identify further actions to sustain the current scale of flood risk into the future for some isolated settlements and areas with major defences (P4).</td>
<td>Environment Agency Strategic and Development Planning Team</td>
<td>2012-2014</td>
<td>High</td>
</tr>
<tr>
<td>Asset System Management Plan - A detailed plan of works to continue with our existing or alternative actions to manage flood risk at the current level (P3).</td>
<td>Environment Agency Asset System Management Team (North)</td>
<td>2008-2010</td>
<td>Medium</td>
</tr>
<tr>
<td>Asset System Management Plan - This plan should identify specific locations where we can reduce our existing flood risk management actions (P2).</td>
<td>Environment Agency Asset System Management Team (North)</td>
<td>2008-2010</td>
<td>Medium</td>
</tr>
</tbody>
</table>
Next steps

The next stage is the production of the final CFMP. Before this can be done we will take into account all feedback received from the consultation on the Draft CFMP.

We will include any feedback received during this consultation period into the final CFMP. We will also make sure that we have identified all future plans and strategies before we publish it. We will inform you that we have published the CFMP by advertising in the local press.

Once we have published the Great Ouse CFMP, we will set up a system to review and monitor its implementation. We will also need to check that the CFMP is being used as we intended and that its policies and action plan are being achieved.

We will check how the CFMP is performing by using suitable indicators and targets. We will report on the progress of the CFMP through annual progress reports. During our review of the CFMP, we will consider:

- any new planning and modelling tools;
- the effects of recent flood events and urban development;
- developments in understanding climate change;
- changes in national policy guidance;
- the most up-to-date information on flood outlines, environmental data, property databases and improved flood estimates.

Following this review we may revise the CFMP’s flood risk management policies. The CFMP will be a ‘living document’ that develops as we improve our understanding of flood risk.

We look forward to receiving your feedback on this stage. However, when making your response, please keep in mind that the CFMP is a high level document that takes a strategic look at the whole catchment. The CFMP will not consider detailed local issues or flooding from the sea.
**Glossary**

*Average Annual Damage (AAD)*

Depending on its size (or severity), each flood will cause a different amount of flood damage. The average annual damage is the average damage in pounds per year that would occur in a designated area from flooding over a very long period of time. In many years there may be no flood damage, in some years there will be minor damage (caused by small, relatively frequent floods) and, in a few years, there will be major flood damage (caused by large, rare flood events). Estimation of the average annual damage provides a basis for comparing the effectiveness of different floodplain management measures (i.e. the reduction in the annual average damage).

*Annual Exceedance Probability (AEP)*

The chance of a flood of a given size happening in any one year. For example, a flood with a 1 per cent AEP will happen, on average, every 100 years. This can also be expressed as a 1/100 chance of happening in any one year or a 100-year return period. A flood with an AEP of 10 per cent will happen, on average, every 10 years and has a 1/10 chance of happening in any one year or a 10 year return period.

*Biodiversity Action Plan (BAP)*

An agreed plan for a habitat or species, which forms part of the UK’s commitment to biodiversity. For further information consult the BAP website: [http://www.ukbap.org.uk](http://www.ukbap.org.uk)

*Catchment*

A surface water catchment is the total area that drains into a river. A groundwater catchment is the total area that contributes to the groundwater component of the river flow.

*Catchment Flood Management Plan (CFMP)*

Catchment Flood Management Plans (CFMPs) are a large-scale strategic planning framework for the integrated management of flood risks to people and the developed and natural environment in a sustainable manner.

**Flood Zones**

Flood Zones have been produced by the Environment Agency in response to Planning Policy Guidance (PPG 25) and to provide planning authorities with quality assured flood risk data. The zones show the area at risk if there were no defences and are classified as follows:

- **Zone 1** - annual probability of flooding less than 1000:1 (0.1%)
- **Zone 2** - annual probability of flooding between 1000:1 (0.1%) and 100:1 (1.0%) for fluvial flooding or 200:1 (0.5%) for coastal flooding.
- **Zone 3** - annual probability of flooding greater than or equal to 100:1 (1.0%) for fluvial flooding or greater than or equal to 200:1 (0.5%) for coastal flooding.

**High Impact Areas**

Areas where there are more than 25 houses/km length of river lying in Flood Zone 3.

*Indicator*

A measure of values over time to show how we are progressing towards achieving the objective.

*Internal Drainage Board (IDB)*

IDBs are long established bodies operating predominantly under the Land Drainage Act 1991 and have permissive powers to undertake work to secure drainage and water level management of their districts and undertake flood risk management works on ordinary water courses within their districts (i.e. watercourses other than ‘main river’). Much of their work involves the maintenance of rivers, drainage channels and pumping stations, facilitating drainage of new developments and advising on planning applications. They also have statutory duties with regard to the environment and recreation when exercising their permissive powers.

*Inundation*

To cover with water - especially flood waters

*Main River*

Watercourses defined on a ‘Main River Map’ designated by Defra. We have permissive powers to carry out flood defence works, maintenance and operational activities for Main Rivers only. Responsibility for maintenance however rests with the riparian owner (the landowner).

*National Nature Reserve (NNR)*

NNRs have been established to protect the most important areas of wildlife habitat and geological formations in Britain, and as places for scientific research. They are either controlled by Natural England or held by approved bodies such as Wildlife Trusts. NNRs have Reserve Management Plans that are updated every 5 years.

*Objective*

A statement of what we want to achieve, for example to reduce flooding at a particular location, improve sustainability, etc.

*Permissive Powers*

Under the Water Resources Act 1991, we have powers to maintain and improve main rivers for the efficient passage of flood flow and the management of water levels. These powers are permissive only, so there is no obligation on us to carry out either maintenance or new works on main rivers.
Scheduled Monuments, Scheduled Ancient Monuments
To protect archaeological sites for future generations, the most valuable of them may be “scheduled”. Scheduling is the process through which nationally important sites and monuments are given legal protection by being placed on a list, or ‘schedule’. English Heritage identifies sites in England, which should be placed on the schedule by the Secretary of State for Culture, Media and Sport. The current legislation, the Ancient Monuments and Archaeological Areas Act 1979, supports a formal system of Scheduled Monument Consent for any work affecting a designated monument. Further information can be found on English Heritage’s website: [http://www.english-heritage.org.uk](http://www.english-heritage.org.uk)

Shoreline Management Plan (SMP)
Non-statutory plans to provide sustainable coastal defence policies (to prevent erosion by the sea and flooding of low-lying coastal land), and to set objectives for the future management of the shoreline. They are prepared by ourselves, or maritime local authorities acting individually or as part of coastal defence groups.

Site of Special Scientific Interest (SSSI)
Sites of Special Scientific Interest (SSSIs) are notified under the Wildlife and Countryside Act 1981 (as amended) and the Countryside and Rights of Way (CRoW) Act 2000 for their flora, fauna, geological or physiographical features. Notification of a SSSI includes a list of operations that may be harmful to the special interest of the site. The Wildlife and Countryside Act 1981 (provisions relating to SSSIs) has been replaced by a new Section 28 in Schedule 9 of the CRoW Act. The new Section 28 provides significantly enhanced protection for SSSIs. All cSACs, SPAs and Ramsar sites are designated as SSSIs. For further information refer to English Nature’s website: [http://www.english-nature.com](http://www.english-nature.com)

Social Flood Vulnerability Index (SFVI)
The SFVI is a scoring calculated with the aid of MDSF to illustrate social impacts due to flooding.

The social impact is based on assessing the population at risk together with an index of social vulnerability. The calculation is made on the basis of census Enumeration Districts, as data are available on this basis. The number of people at risk of flooding in each Enumeration District is based on the proportion of properties in each District in the flood risk area.

Special Area of Conservation (SAC), Candidate Special Area of Conservation (cSAC)
An internationally important site for habitats and/or species, designated as required under the EC Habitats Directive. A cSAC is a candidate site, but is afforded the same status as if it were confirmed. SACs are protected for their internationally important habitat and non-bird species. They also receive SSSI designation under the Countryside and Rights of Way (CRoW) Act 2000; and the Wildlife and Countryside Act 1981 (as amended). For further details refer to the Joint Nature Conservation Committee website: [http://www.jncc.gov.uk](http://www.jncc.gov.uk)

Special Protection Area (SPA), Proposed Special Protection Area (pSPA)
A site of international importance for birds, designated as required by the EC Birds Directive. A pSPA is a proposed site, but is afforded the same status as if it were confirmed. SPAs are designated for their international importance as breeding, feeding and roosting habitat for bird species. The Government is required to consider the conservation of SPAs in all planning decisions.


Storm Surge
A surge may be defined as a change in sea level resulting from causes on Earth rather than from space. Surges that result from meteorological causes are known as ‘storm surges’. There is almost always some difference between the predicted and observed tide due to meteorological factors. Within the Storm Tide Forecasting Service (STFS), this deviation is classified as a storm surge when this ‘residual' exceeds 0.6m at two or more reference ports. The main meteorological factors that can affect sea level are pressure and wind.

Strategic Environmental Assessment (SEA)
The application of environmental assessment to earlier, more strategic, tiers of decision-making policies, plans and programmes. For further details please consult Defra’s website: [http://www.defra.gov.uk](http://www.defra.gov.uk)

Sustainable Drainage Systems (SuDs)
A sequence of management practices and control structures designed to drain surface water in a more sustainable fashion than some conventional techniques (may also be referred to as sustainable drainage techniques).

Target
What we hope to achieve within a specific time.

Water Framework Directive (WFD)
European Community Directive (2000/60/EC) on integrated river basin management. The WFD sets out environmental objectives for water status based on: ecological and chemical parameters; common monitoring and assessment strategies; arrangements for river basin administration and planning; and a programme of measures in order to meet the objectives. For further details consult the European Commission website: [http://europa.eu.int](http://europa.eu.int)
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 (24hrs)
floodline 0845 988 1188