

# River Tame Flood Risk Management Strategy

**Environmental Report  
May 2009**

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# River Tame Flood Risk Management Strategy Environmental Report

## Non Technical Summary

The Environment Agency has a vision of a rich, healthy and diverse environment for present and future generations. Part of this vision is to manage flood risk and improve the environment. Flooding is a natural process that can have a major effect on communities, the economy and the environment. We cannot prevent all floods, but we can prepare for them. This is known as 'flood risk management'. The risk of flooding is influenced by river processes as well as urban and rural land use. By managing land and river systems, we can reduce the chance of properties flooding. To reduce the impact of flooding we:

- provide flood warning systems
- influence the planning process to restrict development in areas at risk of flooding
- encourage the use of flood resilience measures
- provide flood storage areas
- maintain and construct flood defences

To plan our activities we take a wide view of flooding across a large geographical area. We call this a Flood Risk Management Strategy. For Birmingham, the Black Country and Tamworth we have produced the River Tame Flood Risk Management Strategy (Tame Strategy). The Strategy examines the options available for managing flood risk and makes proposals for our approach over the next 100 years.

Our proposals seek to balance technical constraints, cost, environmental impacts and social improvements. As part of this approach we have undertaken a Strategic Environmental Assessment (SEA) of the Tame Strategy. The SEA is the method for ensuring that we take account of the environmental consequences of flood risk management options in making our decisions for the River Tame. When making strategic decisions we consider the environmental impacts that are most significant at a catchment scale. This enables us to decide what measures the Strategy should promote. There will be more detailed impacts that are not covered in the SEA. The appropriate method for dealing with these environmental impacts will be during the Environmental Impact Assessment (EIA) that we will undertake for each of the specific projects resulting from the recommendations of the Strategy.

We have produced an Environmental Report documenting the full SEA process. This Non-Technical Summary is a summary of the Environmental Report. We have also produced a Public Engagement Document summarising the Strategy proposals. Copies of the Environmental Report and the Public Engagement Document are available from the address at the end of this summary.

## The Study Area

The Tame catchment covers an area of 1490 square kilometers with a main river length of 100 kilometers. 1.7 million people live within this area. The River Tame starts as two watercourses in the urban areas to the west of Birmingham: the Oldbury Arm and the Willenhall Arm. It then flows in a generally easterly direction through the urban conurbation of Birmingham, to its confluence with the River Blythe. After this the river begins to flow in a northerly direction. It passes through more rural areas and the town of Tamworth. The River Tame then joins the River Trent at Alrewas, approximately 15 kilometers to the north of Tamworth. An overview of the catchment is contained in Figure 2.

In order to assess the environmental impacts of the flood risk management options we split the catchment into 35 different flood cells. In the Environmental Report there is an assessment of the impacts in each cell. However to make it simpler to present the Strategy we combined the flood cells into 9 sections of river referred to as 'reaches'. We have a preferred option, or combination of options, to manage flood risk in each reach. The figure below shows the study area and the nine reaches.

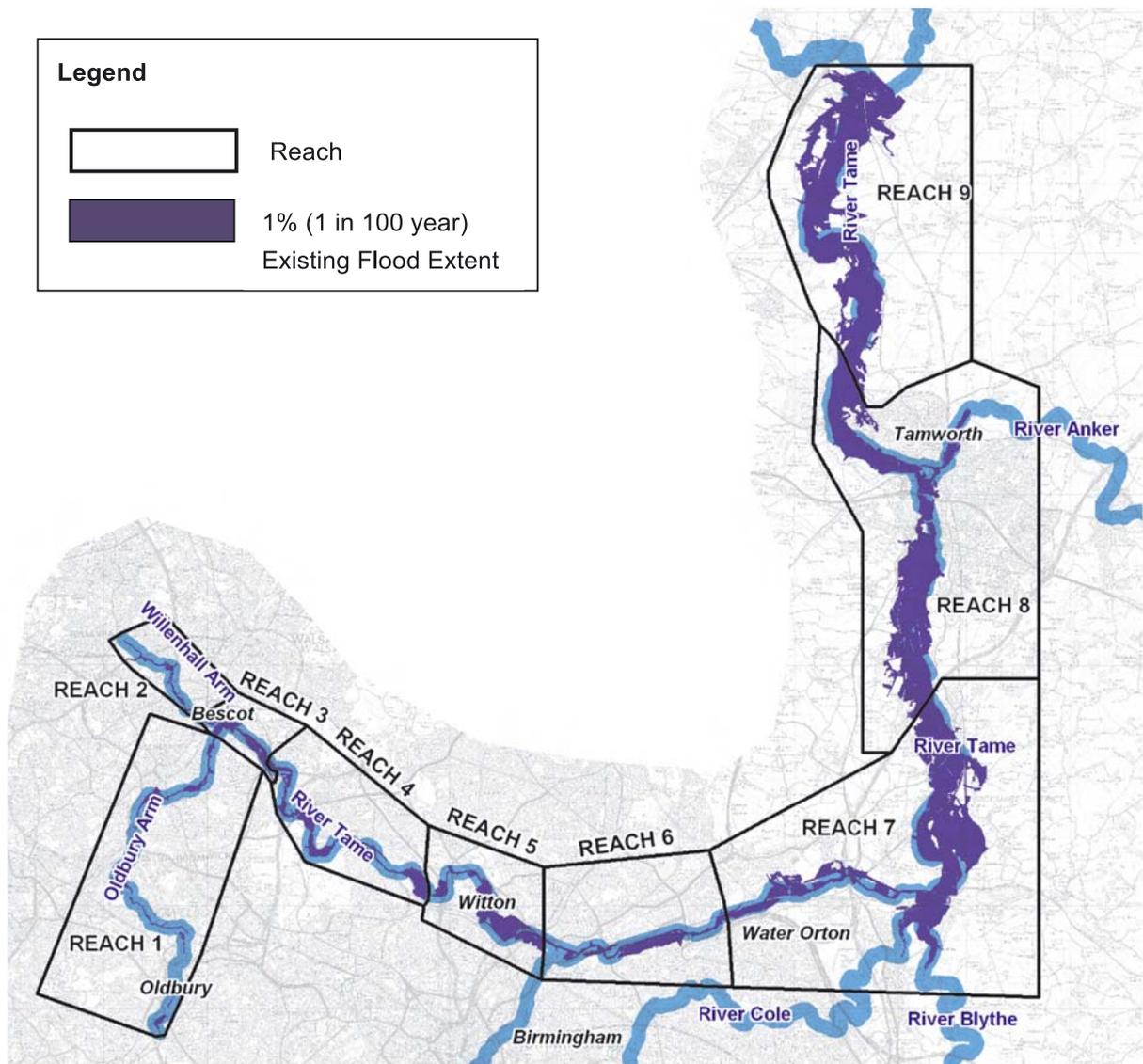


Figure A : Study area and reaches. (Detailed flood outlines are contained in Figure 1a – I)

## Existing Flood Risk

There are 3,100 residential and commercial properties at risk from flooding. In the future this could rise to 5,400 properties as a result of the impact of climate change on flood levels.

## Objectives

We have set general objectives for the Strategy and have also set more detailed environmental objectives to help guide the SEA. These were developed after consultation with stakeholders and

were devised to ensure that we consider the most significant environmental factors in the SEA process. These objectives are set out in the box below.

#### **Environmental Objectives**

- To protect and, where possible, enhance biodiversity.
- To avoid and, where possible, enhance possible effects on human health and population.
- To protect and enhance land quality.
- To protect and enhance water.
- To protect existing material assets.
- To protect and enhance cultural heritage features.
- To protect and enhance landscape character/visual amenity.

We have collected existing information about the River Tame study area. This information allows us to assess what impacts the flood risk management options may have on the environment.

### **How we developed our Strategy**

The key aim of the Strategy is to identify how we can manage flood risk. We have developed a vision which takes a holistic approach and have developed the Strategy to follow four key aims of sustainability; maximising environmental benefit; developing safe schemes; and securing value for money.

We apply a clearly defined approach to assessing flood risk management options which is set by the Department for Environment, Food and Rural Affairs (Defra).

To develop our Strategy we used a two stage process. The first stage was to identify all the possible options that were available to manage flood risk at a broad strategic level.

### **Stage 1: Strategic Options**

We identified a range of Strategic options for managing flood risk along the River Tame. We assessed each of these options against the following criteria:

1. How much each option would cost in relation to the benefits gained including the number of properties affected.
2. Whether the option would effectively manage flood risk.
3. The environmental impact of choosing the option.

We also engaged external stakeholders to ask them what suggestions and opportunities they could offer.

This process provided the following short list of proposed options that were included in the second stage of the assessment:-

#### ***Option 1: Do Nothing***

For the 'Do Nothing' option we stop all our current activities and no maintenance work is carried out in the future. Further, the existing defences will not be replaced when they reach the end of their design life. This option provides an indication of the worst case for flooding. It is a standard option that under government guidance we must use in the second stage of the assessment as a baseline for costs and benefits.

#### ***Option 2: Do Minimum***

Under Option 2, we continue with our current river maintenance activities (e.g. clearing channel blockages). However, under this option the existing defences are not replaced when they reach the end of their design life. This is also a standard option under government guidance and ensures that we do not do more than we need to for managing the flood risk.

#### ***Option 3: Maintain existing flood defences to achieve current flood risk management***

Under the third option the current river maintenance activities are continued and once existing defences reach the end of their design life, they are replaced in order to maintain the current level of flood risk management.

#### ***Option 4: Optimise existing storage areas***

There are a number of flood storage areas in the upper catchment which form part of a flood defence scheme designed in the 1970s. These storage areas, or balancing ponds, are located at Sheepwash, Ocker Hill, Bescot, Forge Mill Lake and Perry Hall Playing Fields. During a flood event, water is stored in these areas and once the flood event has passed the water is released slowly back into the River Tame.

Option 4 is to modify these storage areas to allow them to operate more effectively during flood events as urbanisation and the effects of climate change have altered river flows since the scheme was designed.

#### ***Option 5: Increase flood storage***

This option is to increase flood water storage by looking for new storage areas and, or extending the existing storage.

### ***Option 6: Localised improvements***

'Localised improvements' include measures such as constructing new flood defences, raising existing defences and increasing river water flow (known as conveyance) through opening culverts or either removing or redesigning bridges.

## **Stage 2: Assessment of Environmental Impacts**

The second stage looked at the flood cells within each of the reaches in the overall study to consider the most effective way to manage flood risk in these areas. This involved a detailed assessment of the likely economic costs and benefits and the likely environmental impacts. We have described the preferred option (or combination of options) for each reach and the most significant environmental impacts of implementing the option in that reach.

### ***Reach 1: Oldbury Arm***

Our preferred option along the Oldbury Arm is a combination of Option 3 and Option 6, (see Stage 1, above). We will continue to maintain the channel and existing defences in the reach. We also propose to improve a section of the river in the Titford area which run through pipes, known as culverts. Where possible we intend to remove the culvert. In other areas we will increase the size of the culvert. In addition we intend to raise the existing defences in the areas of Oldbury, Tipton Junction and The Woods.

The proposals will have positive benefits for people and property by reducing the risk of flooding for 191 properties in a flood event with a 1 % probability of occurring in a year.<sup>1</sup> The option will also have moderate positive benefits by reducing the risk of flooding to infrastructure. However raising existing defences will have moderate negative visual and landscape impacts by further reducing visibility of the watercourse and separating the river from the adjacent land. Opening the existing sections of culvert will have minor benefits for biodiversity.

### ***Reach 2: Willenhall Arm***

Our preferred option in the Willenhall Arm is Option 3. We will continue to maintain the channel and existing defences in the reach. We will also continue to provide flood warning and flood resilience advice in the area.

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<sup>1</sup> A flood event with a 1% probability of occurring is also expressed as a flood that has a 1 in 100 chance of occurring in any given year. If a flood occurs in one year the chance of it occurring the following year is the same, 1 in 100.

This option will have minor positive impacts in this reach on archaeological and historic features, through a reduction in the risk of flooding for listed buildings. However the proposed option will have a moderate negative impact on infrastructure as approximately 500 metres of railway remains at risk from flooding in a flood event with a 1 % probability of occurring in a year. This impact will be mitigated through ensuring that infrastructure owners are aware of the level of risk in order that they can develop appropriate resilience plans. No residential properties are currently at risk from flooding in a flood event with a 1 % probability of occurring in any given year. This will remain the same under our preferred option.

### ***Reach 3: Bescot Junction***

The Bescot Junction area contains a mix of residential and industrial properties, the local landmark of Walsall Football Club stadium and the nationally important rail depot. Our preferred option in this reach is a combination of Option 3 and Option 6. We will continue to maintain the channel and existing defences throughout the majority of the reach and we propose raising a short length of defence north of The Woods area of Bescot.

This option will have major negative impacts on transport infrastructure, as a significant stretch of the railway at Bescot junction will remain at risk from flooding in a flood event with a 1 % probability of occurring in a year. This impact will be mitigated through ensuring that infrastructure owners are aware of the level of risk in order that they can develop appropriate resilience plans. Raising the short stretch of existing defence will also have localised moderate negative visual impacts by further reducing visibility of the watercourse.

### ***Reach 4: Newton and Hamstead***

This section of the study area is characterised by open spaces bounded by residential properties. Important features within this reach include the Sandwell Valley Country Park (and RSPB reserve) and the Perry Hall playing fields. These areas are important for recreation and biodiversity. Forge Mill Lake in Sandwell Valley Country Park, and Perry Hall playing fields both provide existing flood storage areas.

Our proposals for this reach are a combination of Option 3 and Option 4. We will continue to maintain the channel and existing sections of defences. We also propose to alter the operation of the Forge Mill Lake and Perry Hall flood storage areas in order to make them more effective.

These proposals are an important measure for reducing flood risk downstream in key areas in Witton. Therefore, there will be a positive impact in reach 5. Further, there will be moderate positive impacts on infrastructure, by ensuring that the risk of flooding for sections of the railway, a sewage treatment works and an electricity substation is reduced to a flood event with a 1 % probability of occurring in a year.

Forge Mill Lake currently supports important numbers of breeding wildfowl which nest on the lake boundaries during the breeding season. We propose to alter the operation of the Forge Mill Lake flood storage area by allowing flood water to enter the lake earlier in a flood event. This will increase the number of occasions when the lake's water level is temporarily raised. If this occurred during spring and summer months the additional water could adversely impact on marginal habitats and any birds nesting in them. We have analysed historical water level data and this indicates that these flood events will occur infrequently and outside the most sensitive nesting periods. We have consulted the RSPB regarding these changes and identified ways of reducing this impact. Further we have identified that in partnership we can create new areas of habitat adjacent to Forge Mill Lake.

### ***Reach 5: Perry Barr and Witton***

In Perry Barr and Witton the land use is mostly commercial and industrial properties, though there are some residential areas. Our preferred option in this reach is a combination of Option 3 and Option 6. We will continue to maintain the channel and existing sections of defences. The proposed localised improvements under Option 6 include raising sections of existing defences and constructing new defences in the Regina Drive area of Perry Barr and in the vicinity of Brookvale Road, Witton. Under this option we also propose to investigate whether we can remove or alter key bridges.

These options will have significant benefits for population, as the number of properties at risk from flooding in a flood event with a 1 % probability of occurring in a year, will be reduced by 864. There will also be major and moderate flood risk benefits for infrastructure and archaeological features respectively. However, raising sections of existing defences and constructing new defences will have moderate negative visual and landscape impacts by further reducing visibility of the watercourse and separating the river from the adjacent land.

### ***Reach 6: Gravelly Hill and Bromford***

Downstream of Spaghetti Junction the River Tame flows underneath the M6 through Gravelly Hill, Bromford and Castle Vale. The Gravelly Hill area contains a high number of commercial and industrial properties. Downstream the river passes the large residential area of Bromford on the right bank and Castle Vale on the left bank.

In this area, our preferred option is a combination of Option 3 and Option 6. We will continue to maintain the channel and existing sections of defences. We propose to reduce the risk of flooding by raising the height of defences and constructing new defences on the left and right banks of the River Tame to protect the areas of Bromford and Castle Vale. We will also investigate whether we can remove a small bridge behind Star City shopping centre.

Our proposals will have significant benefits for people and property by reducing the risk of flooding in a flood event with a 1 % probability of occurring in a year for 1239 properties. The option will also ensure that the risk of flooding to Castle Bromwich Hall and Gardens, an important recreational area

and site of a Scheduled Monument, is reduced. To achieve this we intend to raise long sections of flood defences and there will be moderate adverse visual effects and reduced views of the river corridor. The option will also result in negative impacts on the landscape, as the river corridor will be further separated from the adjacent land.

### ***Reach 7: Water Orton, Lea Marston and Kingsbury***

Downstream of Birmingham, the River Tame passes through the small settlement of Water Orton. From here the river flows through a series of purification lakes at Lea Marston, which are designed to remove water pollutants that originate from the upper reaches of the catchment. Downstream of these lakes the river flows down towards Kingsbury and this area is characterised by small settlements, former gravel workings and agricultural land.

Our preferred option in this reach is a combination of Option 3 and Option 6. For the majority of the stretch we will maintain the existing defences and continue to carry out channel maintenance in order to maintain the channel flow. We also propose to reduce the risk of flooding in Whitacre Heath by raising a short section of the existing defences.

This option will have moderate positive benefits for biodiversity through ensuring no adverse impact on Whitacre Heath SSSI, a nationally important site for nature conservation. The option will also have major positive effects on archaeological features by ensuring that two Scheduled Monuments are not affected by flooding in a flood event with a 1 % probability of occurring in a year. There will also be moderate positive impacts on landscape as the valuable Tame Washlands landscape is conserved. This combination of options will also have benefits for people and property by reducing the risk of flooding in a flood event with a 1 % probability of occurring in a year for 285 properties.

The main negative impact of the option is that large areas of agricultural land will continue to remain within the floodplain.

### ***Reach 8: Fazeley and Tamworth***

Downstream of Kingsbury the River Tame continues to flow through agricultural land and former gravel workings located on the floodplain. The river flows through Fazeley and Tamworth and the river Anker meets the Tame in Tamworth.

In this reach, our preferred option is a combination of Option 3 and Option 6. We will maintain the existing defences and continue to carry out channel maintenance in order to maintain the channel flow. Proposed localised improvements comprise raising existing sections of defences on the left bank of the River Tame in the vicinity of the Mayfair Drive area of Fazeley and Coton Lane and Lichfield Road, in Tamworth.

This option will have major positive benefits for biodiversity through ensuring no adverse impact on Middleton Pool SSSI, a nationally important site for nature conservation. There will be major positive effects on archaeological features by ensuring that four Scheduled Monuments are not affected by flooding in a flood event with a 1 % probability of occurring in a year. The options will also have benefits for people and property by reducing the risk of flooding in a flood event with a 1 % probability of occurring in a year, for 299 properties.

The main negative impact of the proposed option is that large areas of agricultural land will continue to remain within the floodplain.

### **Reach 9: Comberford to Alrewas**

Downstream of Tamworth, the river flows through a largely rural landscape with wide floodplains. The small settlements of Comberford and Elford are located on the right bank and the National Memorial Arboretum is located on the left bank immediately upstream of the confluence of the River Tame with the River Trent.

Our preferred option in this reach is Option 3. There are no existing defences in this reach, but we will continue to carry out channel maintenance in order to prevent any restrictions to flow.

This option will have major positive impacts on landscape, through ensuring that the valuable Tame Washlands landscape, with the river in continuity with its floodplain, is conserved. The valuable natural geomorphology of the river will also be conserved with this option. However under this option there will be a major negative impact as large areas of the National Memorial Arboretum and a number of scheduled monuments will continue to be in the floodplain. There will also be a minor increase in the numbers of properties at risk from flooding in a flood event with a 1 % probability of occurring in a year. 5 properties that do not flood at the moment will flood in the future. We will be undertaking measures such as individual properties protection to manage this impact. Following the likely impacts of climate change the numbers of properties at risk are predicted to increase by a further 128 properties.

### **Climate Change**

As part of the Strategy we have to take account of the likely impact of climate change on water levels in the River Tame. It is predicted that over time climate change will increase flood water levels and so we are proposing solutions to address these changes. There will be different measures in different locations throughout the catchment and these will include:-

- increasing the heights of existing defences in the future;
- where we are raising or rebuilding defences we will increase the height of the walls and embankments to allow for climate change;

- accepting an increase in the risk of flooding in the future where this is appropriate.

### **Enhancement Opportunities**

We have also identified additional opportunities for environmental enhancements that can be implemented through the Tame Strategy.

The most significant of these are:

- Encouraging future development or re-development to be set back from the river corridor and seeking opportunities at detailed design stage to set existing defences back from the river as they are replaced.
- Creating additional BAP wetland habitat adjacent to the River Tame and Forge Mill lake and improving the habitat at Forge Mill lake, within Sandwell Valley Country Park, in partnership with the RSPB.
- Creating additional wetland habitat at various sites in the mid Tame catchment, in partnership with Birmingham and Black Country and Warwickshire Wildlife Trusts.
- Improving existing BAP habitats and creating additional BAP habitat at Middleton Lakes RSPB reserve in partnership with the RSPB.
- Improving floodplain grassland habitat through control of floodplain grazing in the lower Tame in partnership with Natural England.
- Improving recreational access to the river corridor and improving sections of the Tame Valley Way footpath at various sites in the upper and lower Tame.
- Improving public information and signage for archaeological sites (scheduled monuments and listed buildings) that are located in the vicinity of the River Tame.
- Creating new landscape features e.g. waterbodies in floodplain, as part of mineral restoration plans, through the Central Rivers Initiative Partnership.

These improvements will be linked to the flood risk management projects resulting from the Strategy.

### **Commenting on the Strategy and Environmental Report**

The consultation period for the Strategy and this Environmental Report will take place from 18 May 2009 to 10 August 2009. If you have any comments on the Strategy and the Environmental Report please contact:

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# 1 Introduction and Background

This is the Strategic Environmental Assessment of a 100-year Flood Risk Management Strategy for the River Tame.

## 1.1 The River Tame Flood Risk Management Strategy

This River Tame Flood Risk Management Strategy (Tame Strategy) will set out our plan for the sustainable management of flood risk to people, property and the environment over the next 100 years. By taking a strategic approach we are able to look at the issue of flood risk management in a comprehensive way, by taking account of all associated impacts and the interests of other parties.

This document is the Environmental Report which describes the Strategic Environmental Assessment (SEA) that we have carried out on the flood risk management options considered in the Strategy. The SEA is important in helping us to select the preferred options. This report provides a methodical assessment of the potential environmental effects that may arise if these options are carried out.

## 1.2 The Study Area

The study area (Figure A) comprises the whole of the River Tame catchment to its confluence with the River Trent, (further details in Figures 1 & 2). The Tame catchment covers an area of 1490 square kilometers with a main river length of 100 kilometers. The River Tame is formed from two distinct watercourses which have their source in the urban areas to the west of Birmingham. The Oldbury Arm of the river starts in the Blackheath area, to the southeast of Dudley and the Willenhall Arm starts in Willenhall, to the west of Walsall. These two watercourses join at Bescot near Walsall, to form the River Tame.

The River Tame then flows in a generally easterly direction, through the urban conurbation of Birmingham, to its confluence with the River Blythe approximately 5 kilometers to the west of Water Orton, on the northeast edge of Birmingham. The river then begins to flow in a northerly direction, through more rural areas and the town of Tamworth, to its confluence with the River Trent at Alrewas, approximately 15 kilometers to the north of Tamworth.



### 1.2.1 *The river system*

#### *River Tame*

Within the urban areas in the upper part of the catchment, much of the River Tame has been subjected to heavy modification over the years. In many areas the river flows in a man-made channel or culvert and is overlain by an intricate canal network. This means that the river is unnatural in terms of its channel characteristics and its course.

Within the more rural areas the Tame has a more natural, meandering course. At Lea Marston, approximately 5 kilometers downstream of the confluence with the River Blythe, the Tame flows through the Lea Marston purification lakes. These are designed to remove much of the pollution that originates from the upper part of the catchment and is a legacy of heavy industry and mining activity. The Lea Marston lakes are unique. There is no other river system in the UK where the entire flow of a river passes through purification lakes.

Downstream of Lea Marston the Tame meanders through former gravel workings. It continues through Tamworth before it reaches the confluence with the River Trent near Alrewas.

#### *Tributaries*

The River Tame has four significant tributaries (see Figures 1 and 2). The **River Rea**, flows through the urban area of Birmingham, and joins the Tame approximately 15 kilometers downstream of the confluence of the Oldbury and Willenhall Arms. The **River Blythe** meets the Tame approximately 5 kilometers to the west of Water Orton, on the northeast edge of Birmingham. The **River Cole** is an important tributary of the Blythe,

which joins the Blythe less than 0.5 kilometers upstream of the Tame confluence. The River Blythe flows through a predominantly rural catchment, of north Warwickshire, whilst the river Cole flows through the much more urbanised catchment, of southeast Birmingham.

The River Anker is the most downstream major tributary of the River Tame. It joins the Tame in the centre of Tamworth, and drains a catchment which is predominantly rural, but also contains the towns of Nuneaton, Atherstone and Polesworth.

We have not specifically considered flood risk on the tributaries as part of the Tame Strategy. However, as part of the strategic approach we have considered solutions that involve management of the tributary flows in order to reduce flood risk on the Tame.

### 1.2.2 *Flood risk management terminology*

When we explain flood risk we refer to 'flood events'. Flood events are characterised by their size and how often they occur. The larger a flood event is the less often it will occur. A flood event with a 1% probability of occurring is also expressed as a flood that has a 1 in 100 chance of occurring in any given year. If a flood event of this magnitude occurs in one year the chance of it occurring the following year is still the same, 1 in 100. A flood event with 0.5% probability of occurring is also expressed as a flood that has a 1 in 200 chance of occurring in any given year. A flood of this size occurs less frequently and so it is larger than a flood event with a 1% probability. Consequently, more properties will flood. In this document we refer to numbers of properties at risk of flooding. Unless otherwise stated the figures refer to the number of properties that would be flooded in a flood event with a 1% probability of occurring.

### 1.2.3 *Existing flood risk management measures*

Flood risk management measures, including flood walls, are already present in some locations on the Tame. Flood defences were constructed at Tamworth during the 1960s, and on the upper and middle reaches of the River Tame during the 1970s and 1980s. Raised flood walls have been installed in various locations. These are located along sections of the upper Tame, including sections of the Oldbury Arm, Willenhall Arm and in areas such as Perry Barr, Gravelley Hill and Bromford. In the lower Tame, flood walls are currently present to the west of Whitacre Heath and along the Tame in the vicinity of Fazeley and Tamworth.

In other areas of the upper Tame the channel has been enlarged and a hard bed and bank protection installed to improve conveyance. Balancing areas to store excess floodwater are also an important aspect of the existing flood risk management measures. These are located in the upper Tame at Sheepwash and Ocker Hill on the Oldbury Arm

and at Bescot controlled washland, Forge Mill lake at Sandwell and Perry Hall playing fields.

The existing flood defences and the flood storage areas were designed to reduce the risk of flooding to an event with a 1 in 50 (2%) probability of occurring in one year. In the upper reaches of the Tame, the channel was designed to convey the flows which have a 1 in 10 (10%) probability of occurring in any year, with any excess water being stored in the balancing areas.

These defences and storage areas have been properly maintained and operate as planned. However, increased urbanisation and the effects of climate change mean that the scheme does not now provide the original level of flood risk protection as it was designed to. In some locations, the defences are also coming to the end of their design life. This increases the risk of flooding along the River Tame.

In summer 2007 England experienced the wettest three months since records began. The flood events in June and July 2007 caused widespread flooding on the River Tame. Areas that were significantly affected during this event include Bescot, Witton, Water Orton and Tamworth. Other notable flood events on the River Tame occurred in November 2000, August & January 1999, September 1994, December 1992, and June 1955.

There are 3,100 residential and commercial properties at risk from flooding. In the future this could rise to 5,400 properties as a result of the impact of climate change on flood levels.

## **1.3 The Purpose of Strategic Environmental Assessment**

### **1.3.1 Introduction**

Strategic Environmental Assessment (SEA) is the systematic appraisal of the potential environmental consequences of high level decision-making, such as policies, plans, strategies and programmes, before they are approved. This process is described further in Chapter 2.

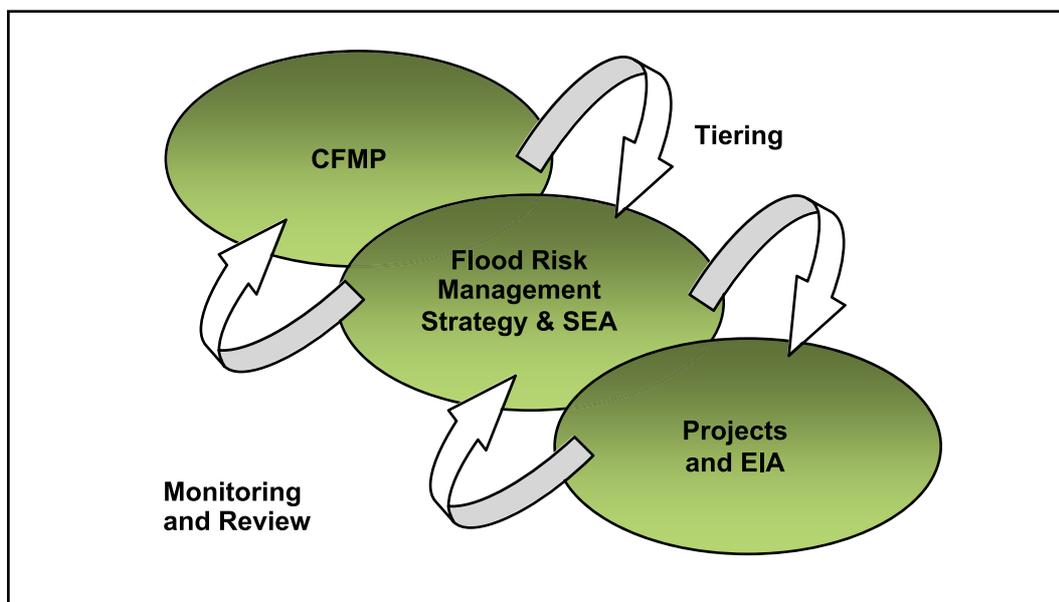
The SEA Directive (European Directive 2001/42/EC on the Assessment of Certain Plans and Programmes on the Environment) requires SEA to be undertaken as part of the development of certain plans and programmes. The Directive ensures that environmental considerations are addressed as early as possible, alongside technical and economic decisions.

We have also taken account of our Vision for 'a rich, healthy and diverse environment in England and Wales, for present and future generations', and the Government's publication *Making Space for Water*, which outlines the strategic position for addressing risks of flood and coastal erosion for England.

### 1.3.2 *The context of SEA*

SEA and EIA (Environmental Impact Assessment) are both tools for managing 'environmental risk'. It is important that we ensure that risks are considered at an appropriate level of detail to inform the decisions being made. The way this is managed is called 'tiering'. We use SEA to assess the likely environmental impacts of strategic decision making. However, any works that we recommend in our Strategy will be subject to a more detailed and project specific EIA, which will include detailed issues that we may not have considered significant at a strategic level under this SEA. The tiered approach for flood risk management is shown in Figure B and summarised as follows:

- Making Space for Water – the Government's vision for sustainable flood risk management, relevant nationally.
- River Trent Catchment Flood Management Plan (CFMP) – a high level planning tool that will set catchment-wide policies for sustainable flood risk management in the long-term (50-100 years).
- River Tame FRM Strategy – developed to provide flood management within the River Tame catchment over the next 100 years, supported by this SEA.
- Projects – as individual flood defence projects are progressed they will undergo formal EIA as required by legislation.
- Monitoring and Review – the tiering process allows for feedback loops to inform future Strategy revisions.



**Figure B:** Managing environmental risk through 'tiering'

## 1.4 SEA Report Structure

This Environmental Report is a key part of the SEA process. The report is structured as follows:

**Non-Technical Summary:** a plain language overview of the Strategy, the SEA objectives and likely significant strategic environmental effects.

**Chapter 1 - Introduction and Background:** summary of the need for and development of the River Tame Flood Risk Management Strategy, and the purpose of the SEA.

**Chapter 2 – Appraisal Process and Methodology:** description of the process and assessment methodology, including information on the scope of the SEA and the environmental objectives that are used.

**Chapter 3 - Relevant Plans and Strategies:** a review of policies, plans and strategies relevant to flood risk management within the Strategy study area.

**Chapter 4 – Consultation:** outlines the consultation that has been undertaken to date and proposed for the future.

**Chapter 5 - Key Issues, Constraints and Opportunities:** summary of the existing baseline environmental conditions and identification of key issues, including constraints and opportunities within the catchment.

**Chapter 6 - Assessment of Environmental Effects and Evaluation of Impact Significance:** presents the flood risk management options that have been considered in order to develop a short-list for more detailed study; identifies strategic environmental impacts of the options, to help inform the choice of the preferred option for the Strategy and describes the important environmental effects of the preferred option and any necessary mitigation.

**Chapter 7 - Implementation and Monitoring Plan:** summary of proposed implementation programme, monitoring and review cycles for the preferred Strategy option.

## 2 Approach to SEA

This chapter outlines the SEA process; defines the objectives against which the environmental effects of the strategic options will be assessed; describes the baseline data collection and assessment methodology; and identifies data gaps and uncertainties.

### 2.1 The SEA Process

The key stages of the SEA process for the River Tame Strategy are illustrated in figure 3

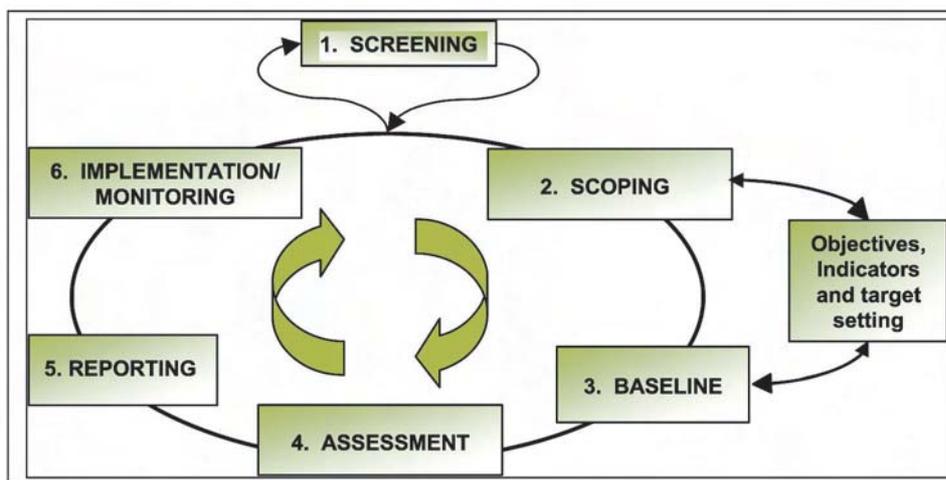


Figure C: Summary of the SEA process

In summary, the SEA process includes the following steps:

1. Screening: Deciding whether SEA is required for the Strategy.
2. Scoping: Collecting initial baseline information about a range of environmental topics (e.g. water, landscape, biodiversity etc.). Deciding which environmental receptors could be affected by our Strategy and which environmental topics are likely to be most important for our Strategy. In some cases we may decide that it is unlikely that a particular environmental topic would be affected by our Strategy options and so this topic would then be 'scoped out' of further assessment.
- 2a. Objective Setting: Developing a set of objectives, based on the environmental topics that we considered to be important and the environmental receptors which may be

affected by the Strategy. These objectives set out what we would like to achieve against each of the environmental topics. During the assessment stage we test how each of the Strategy options may affect the environment, by showing how well the option will allow us to achieve the objectives. Following the scoping stage these objectives may be revised based on any responses to consultation.

3. **Baseline Data Collection:** Collecting more detailed information about the environmental topics that we considered to be most important during the scoping stage.

4. **Environmental Assessment:** This stage allows us to identify the likely environmental impacts of the range of options that could be used to manage flood risk in the catchment. We carry out a high level assessment, in order to screen out some options and refine the range of viable options. We then undertake an assessment of the impact of implementing each option in each flood cell. This process uses the baseline environmental data to assess how each option would affect each of the environmental objectives.

5. **Reporting:** This report documents the outcome of each of the SEA stages.

6. **Implementation and Monitoring:** This stage allows the actual impact of implementing the Strategy to be monitored over the Strategy lifetime. It allows us to see whether the predicted environmental impacts actually occur, or whether there are any unforeseen impacts. At this stage we can define the parameters that we think should be monitored over the next few years.

Each of these stages is described in more detail in Sections 2.2 to 2.7 below.

## 2.2 Screening and Scoping

Screening is the stage that decides whether SEA is required. Our policy and Defra means that we carry out SEA on our Strategies. This is because in general flood risk management options that may be promoted through a Strategy have the potential to give risk to significant environmental impacts.

Through scoping, we identified the environmental topics or receptors that have the potential to be affected by the Strategy options and determined the appropriate level of detail for the SEA. We started the scoping exercise in 2004, and issued an initial Scoping Report in July 2004. Due to a revision of the modelling techniques used for the Strategy development, further scoping was carried out during 2007-2008 and a Scoping Update report was produced in May 2008. The activities we undertook during the scoping stage were:

- Collecting initial baseline environmental data (see section 2.3 below, and Chapter 5).

- Identifying key strategic issues and opportunities (see below and Chapter 5).
- Identifying draft environmental objectives (see section 2.3 below).
- Consultation with internal functions and external organisations (see Chapter 4).

The environmental topics or receptors that we identified to have the potential to be affected by the Strategy options include:

- Biodiversity;
- Human health and population;
- Land quality;
- Water (quality, quantity and geomorphology);
- Material assets and infrastructure;
- Archaeology and cultural heritage; and
- Landscape and visual amenity.

The environmental topics that we scoped out were:

- Geology – This is not significantly affected by options for flood risk management. (NB impacts on geomorphology were considered under the ‘Water’ topic).
- Contaminated land – It was considered that it would be more appropriate to consider impacts associated with contaminated land at more detailed project level environmental impact assessment.
- Air quality - This is not significantly affected by options for flood risk management.

## **2.3 Objectives**

### **2.3.1** *Environmental Objectives*

We developed environmental objectives and indicators shown in Table 1. These objectives are designed to capture the key environmental receptors that have the potential to be affected by flood risk management options (see Section 2.2). We have used these objectives to assess how the proposed flood risk management options may affect the environment. Using such objectives ensures that the Strategy considers the most relevant and significant issues and that it is sustainable.

### **2.3.2** *External Objectives*

We looked to include objectives from other parties when developing our own objectives. The way that we have considered external objectives in the development of our own objectives is described in the tables in Appendix A.

### 2.3.3 *Strategy Objectives*

In addition to the objectives that we have used for the environmental assessment process, we have developed high level objectives for the Tame Strategy. Our overall aim for the Tame Strategy is to provide sustainable flood risk management for people, properties and the environment on the River Tame catchment over the next 100 years. Our strategic objectives set out what we will do to deliver our overall aim. These are listed in the box below.

**Objectives:**

- To understand and raise the awareness of the risk of flooding on the River Tame, both now and in the future.
- To develop a plan for the management of flood risk on the River Tame that is sustainable, taking into account future changes in the environment (human, built or natural) and the climate.
- To ensure that all proposals are technically feasible, economically viable, socially acceptable and environmentally appropriate (by meeting the strategic environmental objectives).
- To seek environmental enhancement opportunities wherever possible through the recommendation of integrated flood risk management measures.
- To work in partnership with and encourage co-operation between stakeholders.

**Table 1: SEA Objectives, Indicators and Targets**

Strategic Environmental Objective	Sub-Objectives	Indicator	Target
To protect and, where possible, enhance <b>biodiversity</b>	To avoid damage to designated wildlife sites	Reported condition status of designated sites	Designated wildlife sites not inhibited from achieving favourable or unfavourable recovering condition status as a result of flood risk management activities.
	To contribute to achieving UK BAP and local BAP objectives	Reported progress against BAP objectives and targets	Contribute to achievement of BAP objectives/ targets for water related habitats / species.
	To enhance biodiversity in the urban environment	Areas of habitat and urban greenspace creation or enhancement	Increase in areas of habitat or urban greenspace created or enhanced
To avoid and, where possible, enhance possible effects on <b>human health and population</b>	To protect people and their property from the adverse effects of flooding	Numbers of people and properties affected by flooding	Increase in numbers of people and properties protected from flooding.
	To protect and enhance recreation and amenity facilities	Number and area of recreational and amenity facilities	No loss of recreational or amenity facilities as a result of flood risk management activities. Where opportunities arise, increase quantity and quality of recreation and amenity facilities.
To protect and enhance <b>land quality</b>	To protect valuable land from adverse effects of flooding and safeguard soil quality and quantity	Area of valuable agricultural land at risk from flooding	No change or reduction in area of valuable agricultural land at risk of flooding
To protect and enhance <b>water</b>	Contribute to maintaining or improving water quality standards where feasible. Support achievement of GES/GEP under the Water Framework Directive.	General Quality Assessment Classification Grade. Achievement of Water Framework Directive objectives	No deterioration in GQA classification grade as a result of flood risk management activities. Contribute, where feasible, to achievement of WFD objectives.
	Protect geomorphological features for the river and floodplain and, where possible, provide opportunities for enhancement.	Length of natural or unmodified river and area of unmodified floodplain	No deterioration in natural river and floodplain forms. Where possible, increase lengths of river and areas of floodplain allowed to behave / evolve naturally.
To protect existing <b>material assets</b>	To protect infrastructure	Critical infrastructure (rail, road, water treatment works etc.) at risk from flooding	Key strategic transport networks and infrastructure protected from adverse effects of flooding.
To protect and enhance <b>cultural heritage features</b>	To minimise adverse effects on undiscovered or buried archaeology	Area and quality of potential archaeological assets threatened	No detrimental effects to undiscovered or buried archaeology as a result of flood risk management activities.
	To protect designated archaeological and historic features within the floodplain	Number of Scheduled Monuments and other designated features at risk from adverse effects of flooding	No increase in number of Scheduled Monuments and other designated features at risk from adverse effects of flooding
To protect and enhance <b>landscape character/visual amenity</b>	To avoid detrimental effects and enhance landscape character objectives	Number of valuable landscape features protected or enhanced	No damage or loss of those landscape features which contribute to the character of the local landscape. Where opportunities arise, increase the number of valued landscape features.

### 2.3.4 *Baseline Data Collection*

We collected initial baseline data at the scoping stage, to identify key environmental issues and trends for the Strategy study area. We have now updated this for our SEA assessment (see Chapter 5). We can then assess the significant environmental effects of the Strategy against this baseline. In order to assess how the potential flood risk management options may affect the baseline, we identified all environmental receptors that are located in the current flood outline for an event with a 1 % probability of occurring in a year.

We have also reviewed existing plans, strategies and programmes to consider how these may influence the development of Strategy options and to determine the potential for significant in-combination effects with the Strategy options (see Chapter 3).

### 2.3.5 *Sources of Information*

We mainly collected data from existing sources as listed in Table 2, supplemented by information from internal and external consultation (see Chapter 4). We used Geographical Information System (GIS) data sets where available, so environmental data could be compared to areas of flooding.

We restricted our data collection to features and characteristics of international, national and regional significance that could influence decisions at a strategic level. We will undertake a detailed EIA which will also consider local designations before implementing any of the schemes recommended in the Strategy.

**Table 2: Desk based sources of baseline information**

Topic		Source
Population	Administrative Boundaries	Environment Agency Data Set & <a href="http://www.magic.gov.uk">www.magic.gov.uk</a>
Biodiversity, Flora & Fauna	Statutory Nature Conservation Designations (Ramsar, SPA, SAC, SSSI, NNR, LNR)	<a href="http://www.english-nature.org.uk/pubs/gis/gis_register.asp">www.english-nature.org.uk/pubs/gis/gis_register.asp</a>
	Natural Areas	<a href="http://www.english-nature.org.uk/pubs/gis/gis_register.asp">www.english-nature.org.uk/pubs/gis/gis_register.asp</a>
	Biodiversity Action Plans (Habitat Action Plans, Species Action plans)	<a href="http://www.ukbap.org.uk">www.ukbap.org.uk</a> <a href="http://www.english-nature.org.uk/pubs/gis/gis_register.asp">www.english-nature.org.uk/pubs/gis/gis_register.asp</a> Local BAPs
	RSPB Reserves	<a href="http://www.magic.gov.uk">www.magic.gov.uk</a>
Land Use	Agricultural Land Classification	<a href="http://www.magic.gov.uk">www.magic.gov.uk</a>
	Land Cover types	Environment Agency Data Set

Topic		Source
Landscape	Joint Character Areas	<a href="http://www.magic.gov.uk">www.magic.gov.uk</a>
	The National Forest	<a href="http://www.magic.gov.uk">www.magic.gov.uk</a>
	Rivers Blythe, Cole and Tame, Landscape Character Assessment	Ashmead Price, on behalf of National Rivers Authority (February, 1993).
Archaeology and Cultural Heritage	Statutory Cultural Heritage Designations (World Heritage Sites, Scheduled Monuments, Battlefields, Registered Parks and Gardens, Listed Buildings)	<a href="http://services.english-heritage.org.uk/NMRDataDownload/">http://services.english-heritage.org.uk/NMRDataDownload/</a>
	Archaeological finds/ areas of archaeological potential	River Tame Catchment Desk Based Archaeology Report <sup>2</sup>
Recreation & Amenity	Public Rights of Way	Ordnance Survey maps
	Public recreation and amenity areas	Ordnance Survey maps
Material Assets	Roads, Railways, Infrastructure	Ordnance Survey maps
	Critical Infrastructure	Environment Agency Data Set
Water	Chemical & Biological GQA River Quality Objectives	Environment Agency Data Set
	Discharges and Abstractions	Environment Agency Data Set
	Groundwater Source Protection Zones	Environment Agency Data Set

## 2.4 Environmental Assessment

The environmental assessment stage allows us to identify how the range of options that could be used to manage flood risk in the catchment may impact upon the existing environment.

### 2.4.1 Prediction and Evaluation Methodology

- We have used a source-pathway-receptor approach to identify potential environmental effects (positive and negative) and then considered whether these are strategically important. We have assessed the impacts of all options against the environmental objectives, using professional judgement to show the overall environmental performance of the options. This was carried out using the standard flood outline for a flood event with a 1 % probability of occurring.

The steps include:

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<sup>2</sup> *River Tame Catchment – Level 1 Archaeological Desk Based Assessment* (May 2008), Vista Centre, Birmingham Archaeology, University of Birmingham.

- Identify the 'source' of environmental effects i.e. a flood risk management option or the act of 'doing nothing'.
- Record the 'pathway' in the environment: i.e. the way the environmental effects might be generated (directly or indirectly).
- Identify the 'receptors' or receivers of the environmental effects – i.e. biodiversity, landscape etc.
- Determine the strategic significance of the environmental effect. This is a combination of the magnitude of effect and the importance or sensitivity of the receptor. Table 3 shows how the significance of the impact (major, moderate or minor and adverse or beneficial) is determined from the combination of the magnitude of the effect and the importance of the receptor.
  - Impact magnitude has been determined using the criteria shown in Table 3. We have used professional judgement and considered aspects such as duration of impact and spatial extent.
  - The importance of the receptor is based on the criteria shown in Table 3.
  - Impacts of potential local significance are noted for consideration during project level EIA but are not considered further in this SEA.
- Identify mitigation or risk management measures where appropriate (e.g. for detrimental effects of major and moderate significance).

**Table 3: Determination of impact significance**

		Value of Receptor/Importance of Objective		
		<b>High</b> (e.g. international /national value)	<b>Medium</b> (e.g. regional value)	<b>Low</b> (e.g. local or no value)
<b>M a g n i t u d e  o f  E f f e c t</b>	<b>High Negative</b> Serious consequences and / or large area	Major Adverse	Major Adverse	Moderate Adverse
	<b>Medium Negative</b> Undesirable consequences	Major Adverse	Moderate Adverse	Minor Adverse
	<b>Low Negative</b> Discernable negative impact and / or on a small scale	Moderate Adverse	Minor Adverse	Minor Adverse
	<b>Negligible</b> No impact or discernable impact	Neutral	Neutral	Neutral
	<b>Low Positive</b> Discernable positive impact and / or on a small area	Moderate Beneficial	Minor Beneficial	Minor Beneficial
	<b>Medium Positive</b> Favourable consequences	Major Beneficial	Moderate Beneficial	Minor Beneficial
	<b>High Positive</b> Substantial gains and / or on a large area	Major Beneficial	Major Beneficial	Moderate Beneficial

#### 2.4.2 Cumulative Assessment

We have considered cumulative effects in this SEA, where a number of small, possibly indirect effects, occur together, or over a period of time, to create an overall significant effect. Cumulative effects can occur as a result of:

- the cumulation of a range of impacts under different topics (e.g. noise, landscape etc.) leading to e.g. an overall deterioration in quality of life; and
- the combined effect of our proposals with other schemes / strategies.

## 2.5 Reporting

We have recorded the results of the SEA in this Environmental Report. The report identifies, describes and evaluates the likely significant environmental effects of the Strategy, as well as reasonable alternatives. This is the Reporting stage (stage 5 in Figure 2) of the SEA.

## 2.6 Implementation and Monitoring

The purpose of the implementation and monitoring stage is to:

- Ensure that the mitigation measures proposed are put in place and effective; and
- Check if the environmental effects (positive and negative) identified in the assessment are as predicted.

For each mitigation measure or effect, we have set a target and a measurable output so we can review whether this has been achieved (see also Table 1). This is explained in more detail in Chapter 7.

## 2.7 Data Gaps and Uncertainty

We encountered some areas where there were gaps in available data, or where we had to make assumptions during our environmental assessment. In some cases this uncertainty will be addressed by collecting further or more detailed information at project level EIA.

Potential impacts of the options in relation to contaminated land were scoped out of this SEA, for consideration in more detail at project level EIA. This was partly because data sources on locations of potentially contaminated land sites were not available on a catchment scale.

Locations of material assets at risk from flooding were identified from a combination of a database on critical infrastructure and published Ordnance Survey maps (1:10,000 scale). The critical infrastructure database includes detailed information on e.g. the locations of small electricity substations. For the SEA we only considered larger assets which appeared both on the database and the Ordnance Survey maps.

A level of uncertainty is an inherent risk in SEA because of the large temporal and geographic scales, and long cause and effect chains. We have aimed to identify where we are uncertain about the environmental implications of strategic options in the assessment.

Of particular mention here, are the uncertainties associated with climate change and the frequency of flooding at the Forge Mill lake flood storage area.

1. The specific, localised impacts of climate change on the strategy area and the timescale associated with any impacts are unknown. Section 6.6.3 describes the Strategy's approach to climate change but it should be noted that there is a great degree of uncertainty surrounding this issue, particularly in the long term.

2. Although detailed hydrological analysis has been carried out to determine the likely increase in spill frequency at Forge Mill lake if the spill is lowered, a degree of uncertainty never the less remains as to the exact frequency with which the lake will be utilised for flood storage in the future.

## 3 Relevant Plans and Strategies

This section deals with the links between the Tame Strategy and various other plans, strategies and activities undertaken by both the Environment Agency and other organisations.

### 3.1 Introduction

We have undertaken a review of plans and strategies that may be relevant to the development of the Tame Strategy i.e. those that cover or influence our study area, and in particular that:

- refer to flood protection or flood defence;
- relate to access to rivers and other water bodies;
- involve the development of land or settlements within the Tame Strategy study area;
- involve the protection of the natural environment within the Tame Strategy flood plain area;
- relate to regeneration, development or urban renaissance initiatives along the river corridor;
- contain a significant constraint or opportunity to our Strategy, such as proposed regeneration developments in the floodplain; or
- contain proposals that are at risk from our Strategy, such as flood storage areas that could impact on the land use plans of local authorities.

We acknowledge that some of the plans will be replaced or updated during the lifetime of our Strategy, but their overall long-term visions provide the best current guide to constraints and opportunities within the Tame Strategy catchment. We will aim to reflect any changes or revisions to these plans in reviews of the Tame Strategy.

The full list of all the plans that have been reviewed is given in a table in Appendix A. The table also provides an overview of the purpose of the plans and strategies, indicates how they are relevant to the Tame Strategy and how we have taken into account the external plans and strategies during the development of the Tame Strategy.

A summary of the key findings is presented below.

## 3.2 Environment Agency/ Defra plans, strategies and national policy

### 3.2.1 *Making Space for Water*

A national strategy for flood and coastal erosion management in England (**'Making Space for Water'**) was published in 2004. The overall aim of Making Space for Water is: 'To manage the risks from flooding and coastal erosion by employing an integrated portfolio of approaches so as:

- to reduce the threat to people and their property; and
- to deliver the greatest environmental, social and economic benefit, consistent with the Government's sustainable development principles'.

Amongst other things it is aimed at ensuring a holistic approach to flood risk management, and developing more flood risk management solutions that work with natural processes through, for example, use of multi-functional wetlands that provide wildlife and recreational resource.

Integrating SEA into the development of the Tame Strategy also ensures that we consider environmental, social and economic benefits in the selection of the options in line with the aims of Making Space for Water.

### 3.2.2 *River Trent Catchment Flood Management Plan*

The **River Trent Catchment Flood Management Plan (CFMP)** is our long term plan for sustainable flood risk management on a catchment scale. The CFMP is the first-tier in the strategic flood risk management process. The CFMP sets the overall policy framework for the catchment, and then more detailed assessments are carried out at the level of a Strategy, or specific scheme. The document looks at flood risk across the River Trent catchment including all of its tributaries, principally the Rivers Sow, Tame, Dove, Derwent, Soar, Erewash, Idle and Torne and covers an area of approximately 10,500 square kilometers. It develops policies for the management of flood risk now and in the future (on a 50 – 100 year timescale).

Within the Trent CFMP, policies for flood risk management have been developed for individual policy units within the catchment. Two CFMP policy units cover the area being considered in the River Tame Strategy:

Policy Unit 10 (Birmingham and the Black Country) covers the upper part of the Tame catchment, and the city of Birmingham. The preferred long term policy for the management of flood risk in this unit is to: "Take further action to reduce flood risk (now and/or in the future)." This means that our strategies that cover this area should select options that will reduce the risk of flooding in high risk areas.

Policy Unit 6 (Mid Staffs and Lower Tame) covers the area from the River Blythe and the lower Tame to its confluence with the Trent. The preferred policy for this unit is to: “Take action to increase the frequency of flooding to deliver benefits locally or elsewhere, which may constitute an overall flood risk reduction (for example for habitat inundation).” The first action in the Action Plan for this policy unit is to: “Complete strategy for the River Tame, focusing on opportunities to remove defences in rural areas and reduce flood risk in Tamworth (accepting that this will probably require some local increase in defences).”

We have developed the Tame Strategy in line with these over-arching policies for flood risk management in each unit.

### 3.2.3 *The Pitt Review: Lessons learned from the 2007 floods*

Following the widespread flooding in the summer of 2007, the Government commissioned an independent review of the lessons to be learned from the flooding. We have reviewed the findings and have identified the recommendations that are of relevance to the Tame Strategy. The key recommendations, which can be influenced by the Tame Strategy, are:

- the need to identify and assess the vulnerability of critical infrastructure assets; and
- the need for us to work with partners to urgently take forward work to develop tools and techniques to model surface water flooding.

National infrastructure comprises those facilities, systems, sites and networks necessary for the functioning of the country and the delivery of the essential services upon which daily life in the UK depends. These services fall with the sectors of energy, water, communications, transport, finance, government, health, food and emergency services. Within these sectors there are certain ‘critical’ elements of infrastructure, the loss or compromise of which would have a major impact on the availability or integrity of essential services leading to severe economic or social consequences or to loss of life.

Critical infrastructure is infrastructure vital for delivering an effective response to flooding includes utilities (water, energy and telecommunications), and the national strategic road and rail network. Section 5.4 identifies the critical infrastructure assets within the Tame catchment.

The Pitt Report recommended that the Environment Agency should be a national overview of all flood risk, including surface water and groundwater flood risk. However the report also acknowledges that capabilities to model and map the risk from surface water flooding are very limited.

In the development of this Strategy we have not specifically modelled flood risk from surface water. However we have used published information, including the local

authorities' strategic flood risk assessments, to identify areas at high risk from surface water flooding. We have ensured that our proposed options for managing flood risk will not result in any adverse effects on surface water problems, and will not prevent solutions to surface water flooding from being implemented in the future.

- 3.2.4 *The Government's Response to Sir Michael Pitt's Review of the Summer 2007 Floods*  
Following Sir Michael Pitt's Review, the Government published its response to the review in December 2008.

In response to the Pitt review's recommendation to improve the resilience of essential services, the Government will put in place a series of measures including providing a framework for the Environment Agency and infrastructure network owners to work together to inform and improve the operating plans and flood resilience of critical infrastructure.

The Tame Strategy will contribute to this process by providing information which can be used to inform infrastructure network owners of where and when elements of critical infrastructure may be exposed to unacceptable levels of flood risk in the future. This knowledge will then inform forward resilience planning over the life of the Strategy.

### 3.3 External Plans and Programmes

#### 3.3.1 *National Legislation, strategies and policies*

**Planning Policy Statements / Guidance:** The planning policy statement **PPS1 (Delivering Sustainability)** sets out the Government's objectives for the planning system, and how planning should facilitate and promote sustainable patterns of development, avoiding flood risk and accommodating the impacts of climate change.

PPS1 takes and encourages a spatial planning approach through the integration of policies for the development and use of land with other policies and programmes, dealing not only with development and the physical environment, but also how social, economic and environmental objectives will be achieved.

The Tame Strategy is compliant with policy contained in PPS1, as it aims to reduce the impacts of flooding on the environment, taking into account the impacts of climate change, ensuring a sustainable approach to flooding is adopted. The Strategy applies a spatial approach to the issue of flooding, by taking into account the river's whole catchment, and by considering a wide range of issues, including the integration with other policies and programmes.

**PPS25 (Development and Flood Risk)** sets out Government policy for development and flood risk. It aims to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk from flooding.

Where development is necessary, policy should aim to make it safe without increasing flood risk elsewhere, and, where possible, reduce flood risk overall.

PPS25 is particularly relevant to the Tame Strategy. The Strategy aims to safeguard land for current and future flood management schemes and reduce the causes and impacts of flooding. In line with PPS25 policy, the Tame Strategy takes account of the potential impacts of climate change to ensure a long term, sustainable and strategic approach and to provide security for wider planning initiatives.

The PPS promotes a partnership approach. We have consulted with local and regional authorities during the development of the Strategy, in order to gain their support. This will ensure a long term, sustainable and strategic approach, which considers the aspirations and needs of all stakeholders involved.

**Water Framework Directive (2000/60/EC):** The WFD requires that River Basin Management Plans (RBMP), for each River Basin District, are produced by December 2009 and are reviewed every six years thereafter. The river basin planning process involves setting environmental objectives for all groundwaters and surface waters within the river basin district and devising programmes of measures to meet those objectives.

Significant Water Management Issues identified for the River Tame, including:

- Physical modification (e.g. canalisation of rivers);
- Diffuse pollution from rural areas; and
- Urban and transport diffuse pollution (e.g. highway runoff).

Draft WFD objectives for the River Tame have been developed and were published in December 2008. The river within our study area has been divided into five reaches and objectives produced for each reach. They are summarised in the table below.

**Table 4: Draft WFD objectives for the river Tame**

River reach	Condition classification*			
	Current Ecological status	Current Chemical status	Proposed Ecological Status / Potential	Proposed Chemical Status / Potential
<b>Willenhall Arm (source to Snedy Brook)</b>	Moderate	Good	Good potential by 2027	Good status by 2015
<b>Willenhall Arm (Snedy Brook to Oldbury Arm confluence)</b>	Moderate	Not yet assessed	Good potential by 2027	Not yet assessed
<b>Oldbury Arm (source to Coseley catchment)</b>	Moderate	Good	Good potential by 2027	Good status by 2015
<b>Oldbury Arm (Coseley catchment to Willenhall Arm confluence)</b>	Moderate	Good	Good potential by 2027	Good status by 2015
<b>From confluence of two arms to R. Blythe</b>	Moderate	Not good	Good potential by 2027	Good status by 2027
<b>R. Blythe to R. Anker</b>	Bad	Good	Good status by 2027	Good status by 2015
<b>R. Anker to R. Trent</b>	Bad	Bad	Good status by 2027	Good status by 2027

\*Condition classification classes for ecological status: high, good, moderate, poor, bad.

Condition classification classes for chemical status: good, not good / bad.

The Tame Strategy will aim to contribute to the achievement of the WFD objectives for this river by looking for opportunities to address the issues that have been identified as Significant Water Management Issues.

The SEA sub-objectives under 'To protect and enhance **water**,' will ensure these requirements are considered in the development of the Strategy.

### 3.3.2 *Regional Policy*

**West Midlands Regional Spatial Strategy (WMRSS):** The Regional Spatial Strategy provides a framework for local authority development plans and local transport plans. A revised Strategy was published in January 2008, following the publication of the Phase 1 Revision for the Black Country.

The WMRSS is particularly relevant to the development of the Tame Strategy, as it sets out the long term policies for future development within the region. During development of the Strategy, it is important to know any areas where future growth will be focussed in order that the future impact of flooding on these areas can be considered.

One of the key issues identified for the region has been the continued movement of population and investment away from the Major Urban Areas (MUAs). There is therefore the need to create balanced and stable communities across the Region and urban renaissance is a key strand of the RSS. Policy UR1 seeks to implement urban renaissance in four major urban areas (MUAs). Two of these fall within the Tame catchment: Birmingham/ Solihull; and the Black Country. Within the Black Country (Policy UR1A), the primary focus for development and regeneration activity will be the four strategic centres (Wolverhampton, Walsall, Dudley and Sandwell) and the growth corridors linking these centres.

Policy UR2 considers areas outside of the four MUAs. It lists a number of local regeneration areas, where development and regeneration should be focussed. Tamworth, in the Tame catchment is one of these.

Our preferred options take account of the importance of these areas where future development will be focussed by seeking to ensure that flood risk in these areas will not increase significantly into the future, and where possible will be reduced.

**Biodiversity Action Plans (BAP):** the **West Midlands Regional Biodiversity Strategy** focuses attention on the most important priorities for biodiversity in the West Midlands region. There are also a number of **local biodiversity action plans** which cover the Tame Strategy study area: Staffordshire BAP, Birmingham & Black Country BAP and the Warwickshire, Coventry & Solihull BAP. These set out action plans for species and habitats which are a priority for the area.

The Tame Strategy seeks to identify opportunities for improving the condition of habitats, species and ecosystems throughout its development. This is achieved in two ways. The SEA objective, “To protect, and where possible enhance biodiversity” ensures the potential impacts of our potential flood risk management options on biodiversity are considered during the options assessment process. Secondly, we have looked for opportunities where additional enhancements (e.g. habitat improvement or creation) can be promoted as part of our Strategy.

The **Central Rivers’ Initiative** is a project which aims to secure a multi-functional end use for former sand & gravel extraction sites in the Tame and Trent River Valleys, downstream of Middleton Lakes at the Warwickshire border. A Strategy for the area was developed in 1999 and is currently being updated. To inform this update, a **Biodiversity Audit of the**

**Tame and Trent River Valleys** was commissioned in 2006-2007. This report covered the stretch of the River Tame downstream of Middleton Hall Quarry. As part of the study a survey of the habitats along the river corridor was carried out. A number of recommendations were made for measures that could be taken to improve BAP Habitats and Species.

In addition, 17 key sites were chosen and specific recommendations were made for these sites. Key findings and recommendations of the study, which could be influenced by this Strategy include:

- Promote river braiding works through mineral site ROMP process to benefit the strong otter population in the river corridor;
- Incorporate key otter habitat features into gravel pit restoration schemes e.g. lake islands, reedbed, reedswamp, open water, ponds, wildlife ditches, ox-bows, backwaters, etc.
- Influence mineral restoration plans to create suitable habitat and links for water vole.

The former Dosthill and Middleton Quarries have been combined as a nature reserve and are now managed by the RSPB as their **Middleton Lakes reserve**. We designed and promoted a river braiding scheme for the quarry. The quarry company were permitted to extract from a 50m buffer strip along the river which doubled the width of the channel and left a string of river islands in place. Geomorphological processes have been activated to produce gravel shoals, sequences of riffles and pools, backwaters and deposits of mud and sand. This successful project has also helped to improve the connection between the river and its new floodplain level. Recommendations for this site include:

- Undertake further river braiding and re-profiling work at key locations;
- Carry out a hydrological assessment for Middleton Lakes Nature Reserve to model the movement of water across the site during flood events. Measure the flood storage and attenuation capacities for the area. In particular, study the contribution wet woodland and floodplain woodland makes in terms of floodplain 'roughness' and slowing the flow during inundation events.

Tameside Nature Reserve is a proposed Local Nature Reserve adjacent to the River Tame, between Fazeley and Tamworth to the south of the A5. The lake, islands, pools and ditched at the site support a host of wildlife, including otter, water vole, marsh frog and wintering birds. Recommendations for the site include:

- re-profile a 275 metre section of the inside of a meander on the River Tame. The work would have great benefit for both flood risk and biodiversity by re-profiling the river and using the spoil to create additional reedbed at the northern end of the lake.

There are also a number of other key sites, between Tamworth and the confluence with the Trent. These include Broad Meadow SBI, Hopwas Hays Woods, Comberford, Elford Quarry and Whitemore Hays Quarry. The recommendations for these sites include raising water levels in some areas in order to create areas of grazing marsh from existing arable sites and re-profiling the riverbanks and creating braided channels to increase the river habitat.

### 3.3.3 *Local Development Plans*

There are a number of local development plans which cover the Tame Strategy study area: Birmingham City Council UDP, Sandwell Metropolitan Borough Council Plan, Walsall Metropolitan Borough Council UDP, Tamworth Borough Council Local Plan, Lichfield District Council Local Plan and North Warwickshire Borough Council Local Plan.

The UDPs form part of the statutory development plans and contain policies and proposals that guide development and the use of land in each authority area. These are developed in line with the regional policies as set out in the RSS.

## 3.4 **Summary**

- The Tame Strategy is compliant with planning policy at all levels, in that it will reduce the risk of uncontrolled flooding. The Strategy should seek to protect key assets within the built and natural environment.
- Climate change is identified as an issue in many planning policy documents, and its relevance and influence on guiding planning decisions and policy making is likely to increase. The Tame Strategy therefore accounts for climate change in order to provide a sustainable Strategy for the future.
- The Tame Strategy should ensure that it is subsumed in future policy development, so there is compliance between the various planning documents and a sustainable approach to flood risk management within the river catchment.

## 4 Consultation

This section deals with:

- The approach to consultation;
- Key issues raised through consultation; and
- Future consultation requirements.

### 4.1 Consultation to date

#### 4.1.1 *Scoping Report (August 2004) and Scoping Update Report (May 2008)*

Work on the Tame Strategy originally began in 2003. Through scoping, we determined the appropriate level of detail for the SEA. We started the scoping exercise in 2004, and issued an initial Scoping Report in July 2004. Due to a revision of the modelling techniques used for the Strategy development, further scoping was carried out during 2007-2008 and a Scoping Update report was produced in May 2008. Consultation was carried out with our internal experts, and external consultees through issuing the July 2004 Scoping Report and the May 2008 Scoping Update Report and requesting comments.

A list of the persons consulted at both of these stages and a summary of responses to consultation is presented in Appendix B (Table 22 and Table 23).

#### 4.1.2 *Strategy Workshop (July 2008)*

A workshop with key external consultees was held in July 2008. The aims of this workshop were:

- To provide information on the work that the Environment Agency had undertake on the River Tame Flood Risk Management Strategy;
- To provide feedback on the comments received following the May 2008 Scoping Update Document; and
- To give stakeholders an opportunity to comment and contribute on the Strategy options which were being considered for flood risk management in the Tame catchment.

A list of the consultees that attended the workshop and the key outputs from the workshop are presented in Appendix B (Table 24).

## 4.2 Key issues raised through consultation

Appendix B provides detailed information on issues raised during the various consultation stages. The key issues raised can be summarised under four main headings (technical queries, flood risk management options, opportunities and constraints, and potential partnerships).

### 4.2.1 Technical queries

Questions were raised by consultees on technical aspects of how the modelling work and options assessment work would be carried out during the Strategy development. In particular, consultees wanted information on issues such as how canals, surface water, climate change and seasonality of flooding would be dealt with during the modelling of the flood risk management options.

Questions were also raised as to how the preferred option would be selected and how technical considerations, environmental considerations and benefit cost calculations would be used in options selection. There was a perception that too great a weight would be given to environmental issues, although it was explained that all three aspects (technical, environmental and economic) would be considered when selecting preferred options.

### 4.2.2 Flood risk management options

Consultees identified a range of options to be considered as part of the Strategy. These fell under the following headings:

#### (a) Runoff reduction / attenuation

- Promote Sustainable Urban Drainage Systems (SUDS).
- Restrict paving over gardens.
- Promote green roofs.
- Collect rainwater and use for grey water systems in all new build houses.

#### (b) Flood storage / attenuation

- Managed retreat – open up the river corridor, create further storage and allow the river to be developed as an economic asset.
- Create additional storage areas.
- Create wet woodland or other habitat to hold back and storage of water.
- Re-meander river and tributaries especially through current greenspaces and urban parks.
- Create storage or attenuation behind railway embankments.
- Investigate use of Earlswood Lakes and Edgbaston Reservoir for storage.

(c) Conveyance

- De-culvert rivers where possible.
- Dredge and maintain watercourses.

(d) Policy options

- Increase public awareness of risk of flooding in specific areas.
- Promote resilience to flooding in any new development.

#### 4.2.3 Opportunities and constraints

Consultees identified a range of constraints to the Strategy and opportunities that could be promoted through the Strategy.

(a) Constraints

- Information on drainage records held by various bodies (e.g. local authorities, Network Rail, water companies, landowners). Information also commercially sensitive. Therefore difficult to understand condition and location of drainage network.
- Flooding is complex problem, and likely to have complex solution which may not be acceptable to all affected parties.
- Government housing targets may be incompatible with reducing development in at risk areas.
- Financial constraints may prevent implementing optimum solutions.
- Unpredictability of climate change may affect preferred options in future.
- Need to engage range of stakeholders / landowners.

(b) Opportunities

Biodiversity

- Create additional wetland habitat at Middleton Lakes and Sandwell Valley RSPB reserve;
- Create flood plain storage and associated habitat and recreation (e.g. angling) facilities in the lower Tame catchment.
- Enhance existing wetland sites in the lower Tame catchment to achieve major nature conservation gains.
- Encourage further use of environmental stewardship schemes for riparian landowners.
- Take action (e.g. weir removal) to improve fish migration.

#### Archaeology and cultural heritage

- Prevent damage to historic features from flooding.
- Increase public awareness of and access to historic environment features and create linkages between existing sites and features.

#### Infrastructure

- Work with utilities owners/emergency planners to identify location of infrastructure sites at risk, potential impacts of flooding and develop contingency plans.
- Re-site at risk infrastructure during regeneration;
- Design flood defence measures into existing infrastructure when being replaced/ repaired (e.g. Network Rail).

#### Population

- Engage with at-risk communities to raise awareness of actions they can take to minimise the impact of flooding.

#### 4.2.4 Potential Partnerships

Consultees also identified a number of potential partnership opportunities:

- RSPB - for work at Sandwell Valley and Middleton Lakes;
- Network Rail;
- Water Companies;
- British Waterways;
- Warwickshire Wildlife Trust, Staffordshire Wildlife Trust and Birmingham and Black Country Wildlife Trust for specific habitat creation schemes.

### 4.3 Detailed consultation on specific issues

Where appropriate during the later stages of development of the Strategy, we held meetings with key consultees either to obtain more detailed information that would assist with the study, or to explore potential opportunities for working in partnership. Meetings were held with the following key consultees:

- Lichfield District Council and Tamworth Borough Council, to discuss interactions between the Tame Strategy, and the Lichfield, Tamworth, Stafford and Staffordshire Moorlands SFRA;
- Solihull Borough Council and North Warwickshire Borough Council to discuss interactions between the Tame Strategy, and the Coventry, Solihull and Warwickshire SFRA;

- Walsall Borough Council, Sandwell Borough Council, Wolverhampton City Council and Dudley Borough Council to discuss interactions between the Tame Strategy, and the Black Country SFRA;
- Birmingham City Council to discuss interactions between the Tame Strategy, and the Birmingham SFRA;
- Network Rail to discuss options, opportunities and constraints;
- Severn Trent Water to obtain further information on their assets and infrastructure at risk from flooding;
- RSPB and Warwickshire Wildlife Trust to discuss opportunities for biodiversity enhancement around Middleton Lakes RSPB reserve and Sandwell Valley RSPB reserve.
- Birmingham and Black Country Wildlife Trust to discuss opportunities for biodiversity enhancements at Park Hall Nature Reserve.

#### 4.4 Future consultation

Consultation will be carried out on this Environmental Report and the draft Tame Strategy between 18 May 2009 and 10 August 2009. During this consultation period we will be holding a series of workshops with local communities and stakeholder organisations.

If you have any comments on the Strategy and Environmental Report please contact:

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A post adoption statement will then be published later in 2009. This will indicate how the comments received have been taken into account during development of the Strategy.