

# Southampton Local Flood Risk Management Strategy

## Strategic Environmental Assessment: *Environmental Report*

October 2014



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# Glossary of Acronyms

<b>Acronym</b>	<b>Meaning</b>
<b>ABP</b>	Associated British Ports
<b>BAP</b>	Biodiversity Action Plan
<b>BGS</b>	British Geological Survey
<b>CO<sub>2</sub></b>	Carbon Dioxide
<b>EA</b>	Environment Agency
<b>EU</b>	European Union
<b>FWMA</b>	Flood and Water Management Act 2010
<b>GH</b>	Global Hectares
<b>HRA</b>	Habitats Regulations Assessment
<b>ID</b>	Indices of Deprivation
<b>IMD</b>	Index of Multiple Deprivation
<b>JNCC</b>	Joint Nature Conservation Committee
<b>LA</b>	Local Authority
<b>LAAP</b>	Local Area of Archaeological Potential
<b>LFRMS</b>	Local Flood Risk Management Strategy
<b>LiDAR</b>	Light Detection and Ranging
<b>LLFA</b>	Lead Local Flood Authority
<b>LSOA</b>	Lower Super Output Area
<b>mAOD</b>	Meters Above Ordnance Datum
<b>ONS</b>	Office for National Statistics
<b>OPDM</b>	Office of the Deputy Prime Minister
<b>PFRA</b>	Preliminary Flood Risk Assessment
<b>PLP</b>	Property Level Protection
<b>PPS</b>	Planning Policy Statement
<b>SAC</b>	Special Areas of Conservation
<b>SCC</b>	Southampton City Council
<b>SEA</b>	Strategic Environmental Assessment
<b>SINCs</b>	Sites of Interest for Nature Conservation
<b>SPA</b>	Special Protection Area
<b>SSSI</b>	Site of Special Scientific Interest
<b>SuDS</b>	Sustainable Urban Drainage System
<b>SWMP</b>	Surface Water Management Plan
<b>UHI</b>	Urban Heat Island
<b>UKCP09</b>	UK Climate Projections 2009
<b>WFD</b>	Water Framework Directive

# Non-Technical Summary

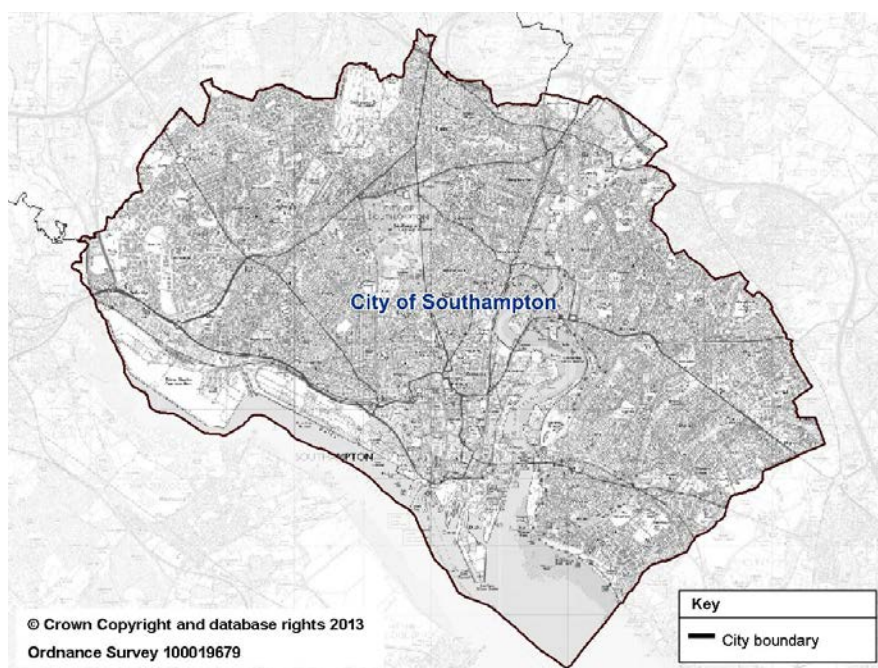
## Introduction

As a Lead Local Flood Authority (LLFA), Southampton City Council has the duty to develop a Local Flood Risk Management Strategy (LFRMS or ‘the Strategy’) outlining the approach to the management of local flood risk facing the city of Southampton. Preparation of the LFRMS began in October 2012 and was completed in draft form for public consultation in January 2014. Since the LFRMS is a plan prepared by a Local Authority for the management of water which may have effects on the environment, it is a requirement of the European Directive 2001/42/ED 2004 that a Strategic Environmental Assessment (SEA) is carried out. Work on the SEA began at the same time as the development of the LFRMS.

The SEA is the assessment of the potential likely impacts of a plan or programme on various environmental receptors, including geology, water and biodiversity. The SEA for the Southampton LFRMS has been carried out in-house by Southampton City Council’s flood risk team, who are acting as consultants for the duration of the project. Work on the SEA commenced in October 2012, with the Scoping Report published for consultation in December 2012. All comments and recommendations received during this time were incorporated into the Environmental Report, which includes the assessment of the environmental performance of the LFRMS. The Environmental Report was submitted for a further three month public consultation from January 2014 to April 2014, with comments incorporated into this final version.

## Study Area

The City of Southampton is centrally located on the south coast of England, at the most inland point of Southampton Water where the River Test and River Itchen meet. The City covers a land area of just over 50km<sup>2</sup> consisting of a mix of dockland, commercial, industrial and residential developments as well as several important natural areas and designated habitat sites. The study area for this SEA consists of all areas within Southampton City Council’s administrative boundary, as shown by the map to the right.



*Southampton City Council’s administrative boundary*



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## The Local Flood Risk Management Strategy

It is a requirement under Section 9 of the Flood and Water Management Act 2010 (FWMA) for a Lead Local Flood Authority (LLFA) to ‘develop, maintain, apply and monitor a Strategy for local flood risk management in its area’. Southampton City Council, as a LLFA, therefore has a duty to develop the LFRMS for Southampton to assess the local flood risk within the city and propose appropriated methods of management, listing the duties of risk management authorities within the area.

Local flood risk includes flooding from surface runoff, ordinary watercourses and groundwater, leaving flood risk from the sea and main rivers the responsibility of the Environment Agency. However, since the City of Southampton is at risk from all sources of flood risk, and has the issue of the interaction of flood risks, all forms of flood risk shall be considered in the Southampton LFRMS. By including all sources of flood risk, the Strategy provides a clear overview of flood risk within Southampton and the co-ordinated approach to the management of those risks.

The overarching aim of the strategy is to better the understanding, communication and management of flood risk in Southampton through viable, sustainable and coordinated approaches for the benefit of people, property, land and the environment, both now and in the future. A series of 8 objectives have been set out in the Strategy, each with a number of actions which shall be used to meet them.

## Consultation

There are three statutory consultees for SEAs in England, who must be consulted with during the scoping stage and on the Environmental Report. They are English Heritage, Natural England and the Environment Agency. These organisations were consulted with three times during the production of this SEA Environmental Report:

- Scoping report issued for consultation – 6 weeks beginning December 20<sup>th</sup> 2012
- Draft Environmental Report issued for checks – 3 weeks August 2013
- Public consultation on Draft Environmental report – 12 weeks beginning 17<sup>th</sup> January 2014

During the final 12 week consultation the Environmental Report was sent to all relevant stakeholders in Southampton, as well as various interested council departments. To ensure wider participation, consultation was open to all members of the public with the document made available on the council’s website, as well as a hard copy being made available at Central Library and Gateway Office.

All comments and recommendations received during the consultation were reviewed and where appropriate, incorporated into this final Environmental Report (this document), which has been published alongside the final LFRMS main report.

## Related Assessments

The SEA objectives have been designed to ensure they comply with other related plans, policies and programmes. To ensure that the LFRMS objectives meet the requirements of the European Union (EU) Water Framework Directive (WFD), a WFD assessment has been carried out separately to this SEA. Similarly, a separate Habitats Regulations Assessment (HRA) screening report has been completed, to



ensure compliance with the Habitats and Birds Directives, and that no negative impacts will affect the sites of national and international designated habitats importance found within the city. Both the HRA and WFD reports can be viewed separately to the LFRMS and SEA, or as a summary in the main LFRMS document.

## **Assessment Results**

In order to measure the likely environmental performance of the LFRMS, the SEA objectives have been used to assess the LFRMS objectives and the options for flood risk management that are contained within the Strategy.

Following the assessment, it is clear that each of the eight LFRMS objectives will achieve positive impacts, with no damage to either the natural or built environment. The assessment results show that the Strategy is likely to provide benefits to all of the receptors listed under each SEA topic. Although some of the benefits achieved are likely to be indirect, the effects still remain positive.

The second assessment carried out was the assessment of the actions set out in the LFRMS. For this assessment each action was taken forward and assessed against the SEA objectives alongside three alternative options for the management of flood risk. This assessment returned a mixed outcome, from severely negative environmental impacts where a 'do nothing' option was put forward, to major positive outcomes with many multiple benefits achieved, for example through the implementation of Sustainable Urban Drainage Systems (SuDS) which allow for the control of runoff within a site, whilst providing additional benefits such as habitat creation and enhancement of the local environment. Only options where positive outcomes can be achieved have been recommended by the SEA for consideration in the Southampton Local Flood Risk Management Strategy.

## **Monitoring**

It is a requirement of the SEA Directive for implementation of the LFRMS to be monitored. Monitoring of the LFRMS will enable the identification of any unforeseen adverse impacts allowing Southampton City Council to undertake any appropriate remedial works required, as well as recording the success of any enhancement schemes implemented.

Within the SEA Environmental Report, a proposed monitoring framework is included. This documents the SEA objectives alongside a number of potential and relevant indicators that can be used for the monitoring of strategy implementation, and the organisation responsible for the collection of such data. It is suggested that the monitoring framework be reviewed at the same time as the LFRMS.

## **Next Steps**

It is recommended that the Southampton LFRMS is subject to a five-yearly review process, including full public involvement to ensure it is kept up-to-date, takes account of objectives achieved, and continues to maintain a focused forward programme. To reflect this, the SEA Environmental Report will also be reviewed on a five-year cycle, with the impacts of the objectives and actions being carefully monitored to ensure impacts are kept to a minimum.

# 1. Introduction

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## 1.1 Background

Southampton City Council, as a Lead Local Flood Authority (LLFA), has the duty to develop a Local Flood Risk Management Strategy (LFRMS or 'the Strategy') outlining the approach to managing the local flood risk facing the Southampton. Preparation of the draft LFRMS began in October 2012. Alongside the preparation of the draft LFRMS, this Strategic Environmental Assessment (SEA) was carried out.

The SEA is the assessment of the potential likely impacts of a plan or programme on various environmental receptors, including geology, water and biodiversity. The SEA for the Southampton LFRMS was carried out in-house by Southampton City Council's flood risk team, who are acting as consultants for the duration of the project. Work on the SEA commenced in October 2012, with the Scoping Report published in December 2012, followed by the draft Environmental Report published for public consultation in January 2014 until April 2014. This report represents the final Environmental Report, taking into consideration all the comments and recommendations received during the consultation period.

## 1.2 Study Area

The City of Southampton is located centrally on the south coast of England, at the most inland point of Southampton Water where the River Test and River Itchen meet. The city covers a land area of just over 50km<sup>2</sup> and is divided into 16 wards. It is of mixed land use comprising of dockland, commercial, industrial and residential developments, as well as several important natural areas and habitat sites.

Southampton is bordered to the north-east by Eastleigh Borough Council, to the north-west by Test Valley Borough Council and to the south (across Southampton Water) by New Forest District Council, see figure 1. Hampshire County Council is the designated LLFA for each of these areas. As flood risk knows no boundaries we cannot ignore the potential impact that activities taking place upstream on the rivers and watercourses which cross administrative boundaries could have on flood risk within Southampton so we endeavour to continue to work closely with our neighbouring authorities. Hampshire County Council has also produced its own LFRMS providing details on how the neighbouring authorities aim to reduce flood risk.

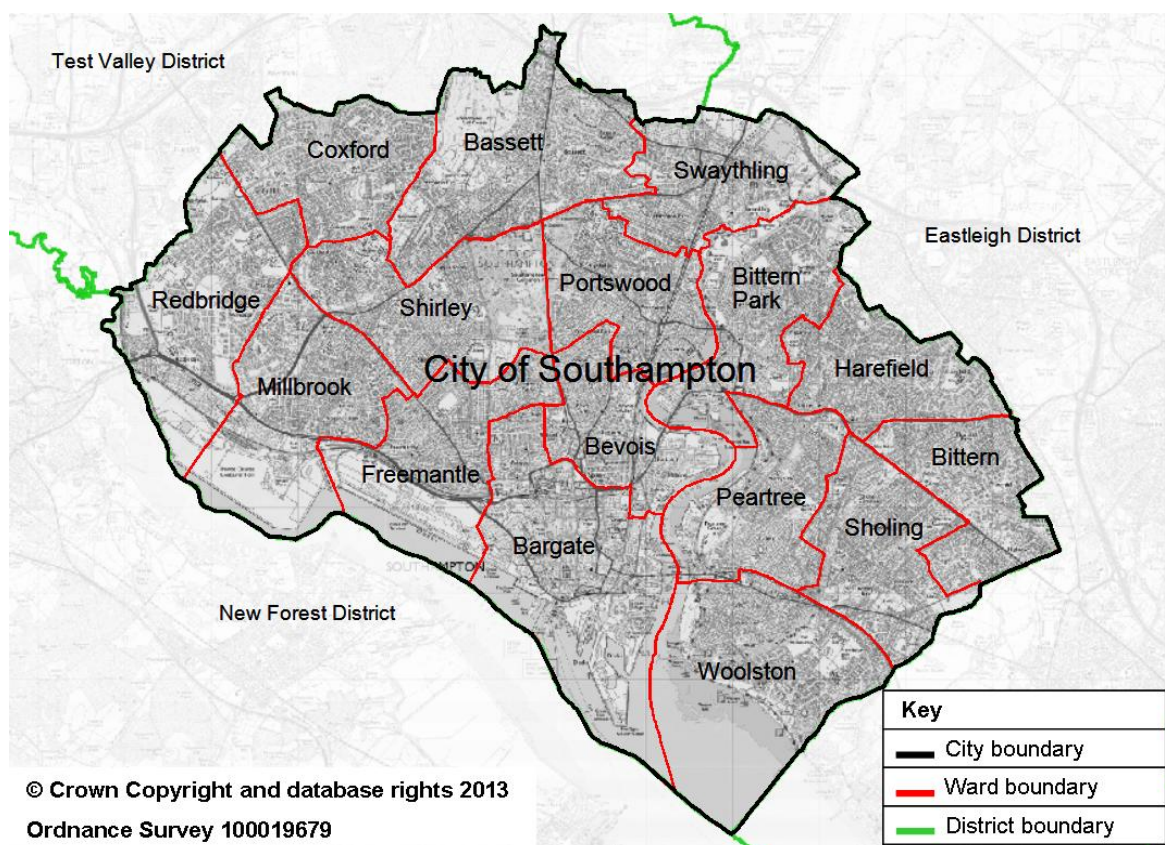


Figure 1: Southampton City Council administrative and wards boundaries

### 1.3 The Strategic Environmental Assessment

The European Directive 2001/42/ED (the 'SEA Directive') was adopted in 2001 and transposed into English legislation by the Environmental Assessment of Plans and Programmes Regulations in 2004. The purpose of the Directive is to increase the level of protection for the environment by integrating environmental considerations into the preparation and adoption of plans and programmes, with the view of promoting sustainable development.

The Directive requires a SEA to be carried out for all plans and programmes which are '*subject to preparation and/or adoption by an authority at national, regional or local level.*' The LFRMS prepared for Southampton is therefore one such document where an SEA is required.

The SEA seeks to identify and evaluate the likely environmental impacts that a plan, programme or policy may have prior to adoption and implementation. Identification of potential impacts in the early stages of the plan development allows time for alternative measures which may avoid adverse effects, to be identified and assessed.

Annex 1(f) lists the environmental receptors which are of particular interest to the SEA. They include '*biodiversity, population, human health, fauna, flora, soil, water, air, climate, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship of factors.*'

The full SEA process is explained in greater detail in section 4 of this report.

## **1.4 Habitats Regulations Assessment (HRA)**

The Habitats Regulations Assessment (HRA) is a requirement under the EU Council Directive 92/43/EEC 'the Habitats Directive' on the Conservation of Natural Habitats and Wild Fauna and Flora, the EU Birds Directive 2009/147/EC on the Conservation of Wild Birds, and the transposed UK Regulations.

There are several areas within the city that are designated sites of international nature importance (Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites). Baseline data collected during the scoping stage showed the potential for significant impacts to arise from the implementation of the LFRMS.

Because the LFRMS has the potential to cause significant impacts on internationally designated sites, a HRA assessment was carried out alongside this SEA, and is available as separate document alongside the draft LFRMS.

## **1.5 Water Framework Directive Assessment (WFD)**

The Water Framework Directive (WFD) is designed to improve and integrate the way water bodies are managed throughout Europe. It came into force on 22<sup>nd</sup> December 2000, and was transposed into UK law in 2003. The purpose of the Directive is to establish a framework for the protection of inland surface waters (rivers and lakes), transitional waters (estuaries), coastal waters and groundwater. It will ensure that all aquatic ecosystems, terrestrial ecosystems that are dependent on water and wetlands meet 'good' status by 2015, and aims to protect physical, chemical and biological water quality.

The framework for the protection of water bodies is established in the WFD. It aims to:

- Prevent deterioration in the classification of aquatic ecosystems, protect them and improve the ecological condition of water;
- Achieve at least 'good' status for all waters by 2015. Where this is not possible, 'good' status should be achieved by 2021 or 2027;
- Promote sustainable use of water as a natural resource;
- Conserve habitats and species that depend directly on water;
- Progressively reduce or phase out release of individual pollutants or groups of pollutants that present a significant threat to the aquatic environment;
- Progressively reduce the pollution of groundwater and prevent or limit the entry of pollutants; and
- Contribute to mitigating the effects of flood and droughts.

The LFRMS needs to be assessed to ensure compliance with the WFD and that the local measures to reduce flood risk contribute to the achievement of the WFD objectives. The WFD assessment will consider the impacts of the LFRMS flood reduction measures on WFD status in terms of ecological and

chemical status, and propose suitable mitigation measures where negative impacts are found. The WFD assessment had been carried out separately, alongside this SEA.

## 1.6 Aim and Structure of this Report

This Environmental Report documents the SEA process. The likely significant effects of implementing the actions put forward by the Southampton LFRMS are identified, described and assessed in this document. The SEA Directive lists the content that is required in the Environmental Report. Table 1 lists the requirements, along with a signpost to the relevant sections of this report where the requirements are met.

**Table 1: Requirements of the SEA Directive**

Requirement of the SEA Directive (Annex 1)	Section of Report
<b>(a)</b> An outline of the contents, main objectives of the plan or programme and relationship with other relevant plans and programmes	Sections 3 and 5
<b>(b)</b> The relevant aspects of the current state of the environment and the likely evolution therefore without implementation of the plan or programme.	Section 5
<b>(c)</b> The environmental characteristics of areas likely to be significantly affected.	Section 5
<b>(d)</b> Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as designated pursuant to Directives 79/409/EEC and 92/43/EEC.	Section 5
<b>(e)</b> The environmental projection objectives, established at International, Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation.	Sections 5 and 6
<b>(f)</b> The likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship of factors.	Sections 7 and 8
<b>(g)</b> The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme.	Section 9

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<b>(h)</b> An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information.	Sections 8 and 9
<b>(i)</b> A description of the measures envisaged concerning monitoring in accordance with Article 10.	Section 9
<b>(j)</b> A non-technical summary of the information provided under the above headings.	Pages v to vii

## 2. Consultation

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It is a requirement of the SEA Directive for the Environmental Report to be submitted formally for consultation. In England there are three statutory Consultation Bodies. They are:

- Natural England
- English Heritage
- The Environment Agency.

The SEA Regulations also require that stakeholders who, *'in the authority's opinion, are affected or likely to be affected by, or have an interest in the decisions involved in the assessment and adoption of the plan or programme concerned...'* are consulted with. This includes various departments within Southampton City Council.

### **2.1 Consultation on the Scoping Report**

The draft SEA Scoping Report was sent to the statutory Consultation Bodies for a period of 6 weeks, beginning Thursday 20<sup>th</sup> December 2012 and ending Thursday 31<sup>st</sup> January 2013, seeking the views on the scope and level of detail that should be included in the SEA.

During the consultation period, comments and recommendations were received from Natural England and the Environment Agency, with no comments received from English Heritage. All comments have been reviewed, considered, and where appropriate incorporated into this report. Appendix C details the full list of recommendations received during this stage.

### **2.2 Consultation on the draft Environmental Report**

The draft Environmental Report was out for public consultation for a period of 12 weeks, beginning 17<sup>th</sup> January 2014 and ending 11<sup>th</sup> April 2014. During this time it was sent to the three statutory consultees and other interested stakeholders in Southampton. It was also made available on Southampton City Council's website, and as a hard copy at Central Library and Gateway offices.

All comments and recommendations received before the consultation deadline were reviewed, considered and where necessary incorporated into this final SEA Environmental Report.



# 3. Local Flood Risk Management Strategies

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## 3.1 Background to the LFRMS

It is a statutory requirement under Section 9 of the Flood and Water Management Act 2010 (FWMA) for a Lead Local Flood Authority (LLFA) to '*develop, maintain, apply and monitor a strategy for local flood risk management in its area*'. Southampton City Council, as a LLFA, therefore has a duty to develop the LFRMS for Southampton to assess the local flood risk within the city and propose appropriated methods of management.

The term *local flood risk* is defined in Section 9(2) of the FWMA as flood risk from:

- Surface runoff,
- Groundwater, and
- Ordinary watercourses.

A further definition of ordinary watercourses is provided by the FWMA as '*a watercourse that does not form part of a main river*' including but not limited to, *all streams, ditches, culverts and ponds*. Main rivers are those which are identified on a main rivers map, and like the sea and reservoirs, remain the responsibility of the Environment Agency, and are therefore not classed as a local risk.

Where there is an interaction between local flood risk and risks which are the responsibility of the Environment Agency, it may be necessary for the LLFA to consider all sources of flood risk (to some extent) in the LFRMS. An example of flood risk occurring due to the interaction of sources is 'tidal-locking', which is the result of the tide entering an ordinary watercourse, causing a backlog of water unable to discharge.

Since the city of Southampton is at risk from all sources of flood risk mentioned above, and has the issue of the interaction of flood risks, all forms of flood risk shall be considered in the Southampton LFRMS. By including all sources of flood risk within the Strategy it provides a clear overview of flood risk within Southampton and a co-ordinated approach to managing these risks.

## 3.2 Requirements of the LFRMS

Set out in the FWMA are the statutory requirements of the LFRMS. The LFRMS must specify:

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

In addition to the above requirements, the LFRMS must also be consistent with the National Flood and Coastal Erosion Risk Management Strategy 2011.

## 3.3 Aim and Objective of the Southampton LFRMS

The purpose of the Southampton LFRMS is to help identify the extent and sources of flood risk facing the city, and outline the approach to managing the risk. It builds upon the findings of the Preliminary Flood Risk Assessment (PFRA), Surface Water Management Plan (SWMP) and the Southampton Coastal Flood and Erosion Risk Management Strategy (Coastal Strategy).

The overarching aim of the strategy is to better the understanding, communication and management of flood risk in Southampton through viable, sustainable and coordinated approaches for the benefit of people, property, land and the environment, both now and in the future.

The draft Southampton LFRMS has eight objectives, which are:

1. Improve the knowledge and understanding of all sources of flood risk across the City.
2. Work in partnership with other authorities who have a role in flood risk management, including across administrative boundaries.
3. Identify ways to increase public awareness of the flood risk across the City.
4. Identify ways of improving support for people at direct risk to promote appropriate individual and community level planning and action.
5. Ensure that planning decisions are properly informed by flooding issues so future development assists with reducing and mitigating flood risk.

6. Identify appropriate measures which reduce the likelihood of harm to people and damage to the economy and the environment.
7. Maintain, and improve where necessary, flood risk management infrastructure and systems to reduce flood risk.
8. Identify all available funding mechanisms to enable delivery of flood risk management interventions.

Within the Strategy, a series of city-wide and localised actions have been set out, each designed to meet the above objectives. It is these measures, and alternatives, that shall be assessed later in this SEA to determine the possible impacts of the Strategy on various environmental receptors.

## 4. SEA Process and Methodology

### 4.1 The SEA Directive

Article 1 of the SEA Directive describes the aim of the SEA. It states that the objectives is to *'provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes, with the view of promoting sustainable development'*.

### 4.2 SEA Screening

Prior to the start of the SEA process, a screening stage is carried out. This is to determine whether the proposed plan or programme is subject to the SEA Directive and therefore requires a full SEA to be carried out.

Article 3(1) of the Directive states that an environmental assessment *'shall be carried out for plans or programmes which are likely to have significant environmental effects'* and is followed by Article 3(2) which states *'for all plans and programmes which are prepared for (...) water management'*. Since the LFRMS is a plan carried out by Southampton City Council, which is a local authority, for the management of water, and may have significant effects on the environment, a SEA shall be required.

### 4.3 SEA Guidance

This SEA sets out the requirements of the SEA Directive and has been developed in accordance with the guidance set out in the *'Practical Guide to the Strategic Environmental Assessment Directive'* (OPDM, 2005).

### 4.4 Stages of the SEA

The SEA guidance identifies five sequential stages that should be completed to ensure the requirements of the Directive are met. Each stage and the tasks relating to it are summarised in table 2.

**Table 2: Stages and Tasks of the SEA**

SEA Stage and Purpose	Tasks
<b>Stage A:</b> Set the context and objectives, establish the baseline and decide on the scope.	<b>A1:</b> Identify other relevant plans, programmes and environmental protection objective. <b>A2:</b> Collect baseline information. <b>A3:</b> Identify environmental problems. <b>A4:</b> Develop SEA objectives <b>A5:</b> Consult on the scope of the SEA

<p><b>Stage B:</b> Develop and refine the alternatives and assess their effects.</p>	<p><b>B1:</b> Test the plan or programme objectives against the SEA objectives.  <b>B2:</b> Develop the strategic alternatives.  <b>B3:</b> Predict the effects of the draft plan or programme, including alternatives.  <b>B4:</b> Evaluate the effects of the draft plan or programme, including alternatives.  <b>B5:</b> Consider ways of mitigating any adverse effects.  <b>B6:</b> Propose measures to monitor the environmental effects of plan or programme implementation.</p>
<p><b>Stage C:</b> Environmental Report.</p>	<p><b>C1:</b> Prepare the Environmental Report.</p>
<p><b>Stage D:</b> Consultation on the draft plan or programme and the Environmental Report</p>	<p><b>D1:</b> Consult on the draft plan or programme and the Environmental Report.  <b>D2:</b> Assessment of significant changes.  <b>D3:</b> Decision making and the provision of information.</p>
<p><b>Stage E:</b> Monitor the significant effects of implementing the plan or programme.</p>	<p><b>E1:</b> Development of aims and methods for monitoring.  <b>E2:</b> Respond to adverse effects.</p>

## 4.5 The Scoping Stage and this report

Stage A and the associated tasks represent the scoping stage of the SEA process. The draft scoping report was published prior to this report. Stages B to E are completed within this report, which is the final version of the SEA Environmental Report.

# 5. The Sustainability Context and Baseline

## 5.1 Introduction

This section of the report outlines the key findings of the scoping stage and the published Scoping Report. It includes the outline review of the relevant plans, programmes and policies that inform the SEA and the LFRMS, a summary of the baseline data and the SEA objectives and how they were developed.

## 5.2 Review of Relevant Plans, Programmes and Policies

The LFRMS must comply with existing policies, plans and programmes at international, national and regional levels and strengthen and support local plans and strategies. It is therefore important to identify and review those policies, plans, programmes and environmental protection objectives which are relevant to both the LFRMS and the SEA at an early stage. This allows any inconsistencies or constraints within the LFRMS to be addressed and also helps to develop the SEA framework.

The Sea Directive states that the Environmental Report shall include information on:

- *'the relationship [of the plan or programme] with other relevant plans and programmes' – Annex 1(a)*

*And*

- *'the environmental protection objectives established at international, community or national level, which are relevant to the plan or programme and the way those objectives and environmental considerations have been taken into account during its preparation' – Annex 1(e)*

It is recognised that no list of plans or programmes can be definitive, and as a result, this report describes only the key documents which influence the LFRMS. Table 3 outlines the key documents which shall be used throughout the preparation of the LFRMS and to inform the SEA process, including the environmental baseline. For the detailed review of the plans, policies and programmes please refer to Appendix A.

**Table 3: Relevant Plans, Programmes and Policies**

<b>International Plans and Programmes</b>
<ul style="list-style-type: none"> <li>• EU Floods Directive – Directive 2007/60/EC on the assessment and management of flood risks (2007)</li> <li>• EU Water Framework Directive – Directive 2000/60/EC on the European Parliament and of the Council establishing a framework for the community action in the field of water policy (2000)</li> <li>• EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora – 92/43/EEC (1992)</li> <li>• EC Directive 2009/147/EC on the conservation of Wild Birds (2009)</li> <li>• The European Convention on the Protection of Archaeological Heritage (Valetta Convention)</li> </ul>
<b>National Plans and Programmes</b>
<ul style="list-style-type: none"> <li>• Flood and Water Management Act (2011)</li> <li>• Land Drainage Act (1991) (as amended 2004)</li> <li>• Water Act (2003)</li> <li>• Flood Risk Regulations (2009)</li> <li>• Making Space for Water (2005)</li> <li>• National Planning Policy Framework (2012)</li> <li>• Future Water: The Government's Water Strategy (2008)</li> <li>• The National Flood and Coastal Erosion Risk Management Strategy for England (2011)</li> <li>• Directing the Flow: Priorities for Future Water Policy (2002)</li> <li>• The Impact of Flooding on Urban and Rural Communities (2005)</li> <li>• Environment Agency Policy: Sustainable Urban Drainage Systems (2002)</li> <li>• Civil Contingencies Act (2004)</li> <li>• Securing the Future: Delivering the Sustainable Development Strategy (2005)</li> <li>• Countryside Rights of Way Act (2000)</li> <li>• UK Biodiversity Action Plan</li> <li>• National Heritage Protection Plan</li> </ul>



### Sub National Plans and Programmes

- River Basin Management Plan South East England River Basin District (2009)
- North Solent Shoreline Management Plan (2010)
- Test and Itchen Catchment Flood Management Plan (2008)
- Partnership for Urban South Hampshire: Strategic Flood Risk Assessment (2007)
- The South East Biodiversity Strategy (2009)
- Partnership for Urban South Hampshire Economic Development Strategy (2010)
- South Hampshire Integrated Water Management Strategy (Commissioned by PUSH) (2009)
- Hampshire Minerals and Waste Core Strategy (2007)

### Local Plans and Programmes

- Southampton Surface Water Management Plan (2011)
- Southampton Coastal Flood and Erosion Risk Management Strategy (2012)
- Southampton Preliminary Flood Risk Assessment (2011)
- Level 2 Strategic Flood Risk Assessment (2010)
- River Itchen, Weston Shore, Netley and Hamble Coastal Study (2011)
- Southampton Biodiversity Action Plan: An Update on the 1992 Conservation Strategy (2006)
- Local Development Framework Core Strategy Development Plan (2010)
- Southampton Low Carbon City Strategy 2011-2020
- Local Transport Plan

## 5.3 Summary of the Review

The main themes and objectives identified through the review of the key documents can be broadly summarised as:

- Ensuring no harm is brought to nature conservation sites designated at national and international level.
- Protecting and enhancing open spaces, recreational opportunities and improving access to the countryside.
- Protecting and enhancing the natural and historic environment.
- Sustainable consumption and use of natural resources including waste prevention and recycling.
- Promoting safer and sustainable development.
- Achieving economic prosperity.

In addition to the general themes, more specific messages for flood risk management in Southampton are:

- Reducing the vulnerability of flood events and impacts to Southampton's residents.
- Reducing the impact of flooding on economic activity throughout the city.
- Ensure flood management proposals do not have a detrimental effect on the environment.

## 5.4 Environmental Baseline

Baseline data is used to define the current and likely future state of the environment. It provides the basis for the prediction of the potential and likely significant environmental effects of a plan or programme before it has been implemented. Identification of any possible environmental impacts during the early stages of strategy preparation allows time for alternative measures to be developed and assessed in order to avoid adverse effects, before the strategy is implemented.

To allow for a more informed judgement of the current environmental situation, where possible, data should be collected where it shows either a spatial or temporal trend.

The SEA Directive states that the baseline data collected must include:

- **Annex 1(b)** - *'relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme'*
- **Annex 1(c)** - *'the environmental characteristics of areas likely to be significantly affected'*
- **Annex 1(d)** - *'any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC and 92/43/EEC'*

The SEA directive offers a list of environmental receptors which should be initially considered during the collection of the baseline data. Receptors include:

- Population and human health
- Biodiversity, including flora and fauna
- Soils, geology and geomorphology
- Water quality
- Air quality
- Material assets
- Cultural, architectural and archaeological heritage
- Landscape
- Climate change
- The interrelationship of factors.

The above list serves as a starting point for the collection of baseline data. During the scoping stage, data was collected to determine the significance of the potential impacts arising as a result of the implementation of the proposed plan. This stage also allowed for topics to be scoped in or out of the Environmental Report, depending on the significance of the impacts, providing the reason for doing so is justified.

#### 5.4.1 Summary of the Baseline

For this report, the baseline data has been summarised and included in table 4, however for completeness, the full baseline and all figures are available in Appendix B.

**Table 4: Summary of the Baseline Data**

<u>Environmental Receptor</u>	<u>Data Source</u>
<b>Population and Human Health</b>	
<p><b>Population</b></p> <ul style="list-style-type: none"> <li>• Population rose by 7.9% from 217,400 in 2001 to 236,882 in 2011.</li> <li>• Population is likely to continue to increase and could reach 252,600 by 2035.</li> <li>• The population density of Southampton is higher than the average for England and Wales at 4,752 people/km<sup>2</sup> compared to 4381 people/km<sup>2</sup></li> <li>• Southampton is in the top 20 authorities with the highest household densities with 1971 houses per km<sup>2</sup>.</li> </ul> <p><b>Health</b></p> <ul style="list-style-type: none"> <li>• Life expectancy at birth for men is 78.4 years and women 82.6 years. Deprivation can reduce life expectancy by 8 years for men and 3.4 years for women.</li> </ul>	<p>Office for National Statistics (ONS)</p> <p>Census Population Projections 2011</p> <p>Southampton NHS Health Profile 2012</p>

<ul style="list-style-type: none"> <li>• Early death rates from heart disease and stroke have fallen, however death rates from cancer, although they have fallen, still remain higher than the average for England.</li> <li>• Good access to recreational space.</li> </ul> <p><b>Deprivation</b></p> <ul style="list-style-type: none"> <li>• Ranked 81<sup>st</sup> (of 326) on the Indices of Multiple Deprivation 2010 which is worse than 2007 when the city was 91<sup>st</sup>.</li> <li>• 23% of the population live in the most deprived areas with as many as 25% of children living in poverty.</li> <li>• Most deprived areas in the city are Bevois, Redbridge, Millbrook, Weston and Thornhill (unchanged since 2007)</li> </ul> <p><b>Employment</b></p> <ul style="list-style-type: none"> <li>• 33% of the working age population out of work, which is a rise of 2.3% from March 2012</li> <li>• 3.1% of the total population claiming jobseekers allowance in October 2012 which is 152 people less than in September 2012.</li> <li>• Average worker salary £23,998</li> <li>• Health, education and retail are the largest employment sectors.</li> </ul> <p><b><u>Effects of the LFRMS on Population and Health:</u></b></p> <ul style="list-style-type: none"> <li>• LFRMS aims to reduce flooding therefore benefiting the wider population in multiple ways.</li> <li>• Community engagement and raising awareness is likely to have a positive impact on human health and property since it helps people help themselves become better prepared.</li> <li>• Worry, stress and uncertainty of flood risk reduced, benefiting human health.</li> <li>• Potential employment opportunities created for the implementation and maintenance of schemes introduced.</li> <li>• Possibility that access to green space and the waterfront may be reduced, due to the land take required to build flood defences.</li> <li>• Potential for new recreational areas or accessible green spaces to be incorporated where flood management measures are used, e.g. new footpaths or nature areas along watercourses.</li> </ul>	<p>Index of Multiple Deprivation 2010</p> <p>Southampton City Council</p> <p>Annual Digest of Statistics 2012</p> <p>Hampshire Labour Market Bulletin Oct 2012</p>
<p><b>Biodiversity, Flora and Fauna</b></p>	
<p><b>Biodiversity</b></p> <ul style="list-style-type: none"> <li>• 8 UK BAP protected habitats</li> </ul>	<p>Hampshire Biodiversity Action Plan</p>

<ul style="list-style-type: none"> <li>• 7 locally important habitats</li> <li>• 15 UK BAP priority species</li> <li>• 35 species of local importance</li> <li>• 4 sites of international importance – generally good condition.</li> <li>• 4 sites of special scientific interest – generally good condition.</li> </ul> <p><b><u>Effects of the LFRMS on Biodiversity, Flora and Fauna</u></b></p> <ul style="list-style-type: none"> <li>• Some habitats are sensitive to changes in water; therefore the LFRMS must take care to ensure flow regimes are not adversely affected.</li> <li>• Coastal squeeze on habitats may be inevitable where measures to reduce coastal flooding are required. These measures will have to be assessed on an individual basis to ensure impacts are minimal.</li> <li>• The LFRMS has great potential to enhance biodiversity by providing new habitats and improving existing ones, for example by the introduction of SuDS schemes including rain gardens and ponds.</li> <li>• Water quality can be improved through the use of SuDS schemes which naturally filter out pollutants before they reach the watercourse. This can improve the status of water dependant habitats and species.</li> </ul>	<p>Southampton Biodiversity Action Plan</p> <p>JNCC Online 2012</p> <p>Natural England Online</p>
<b>Soils, Geology and Geomorphology</b>	
<p><b>Geology</b></p> <ul style="list-style-type: none"> <li>• Geology is primarily clay with some pockets of sand. Tidal flat and river terrace deposits exist around the coastal areas and along rivers.</li> <li>• City generally slopes down to the coast, with the highest land 50-60mAOD and the lowest typically 3mAOD.</li> <li>• One geological SSSI – Itchen to Lee on Solent</li> </ul> <p><b>Soils</b></p> <ul style="list-style-type: none"> <li>• Soils are not well mapped but no high-grade agricultural land exists in the city.</li> <li>• Soils are seasonally waterlogged, and in coastal areas saturation is influenced by the tide.</li> <li>• Large areas of the city are built upon made or reclaimed land consisting of various in-fill materials – presenting an issue of possible contamination.</li> </ul> <p><b><u>Effect of the LFRMS on Soils, Geology and Geomorphology</u></b></p> <ul style="list-style-type: none"> <li>• It is unlikely for there to be any major or significant impacts on the geology or geomorphology of Southampton, including SSSIs</li> <li>• Where there is likely to be contaminated land, care must be taken when implementing LFRMS measures as to ensure the wider environment is not</li> </ul>	<p>Partnership for Urban South Hampshire: Strategic Flood Risk Assessment 2010</p> <p>British Geological Survey Online</p> <p>Contaminated Land: An Inspection Strategy for Southampton 2001</p>

<p>harmed.</p> <p>There may be opportunities to restore river channels and watercourses to their more natural state. This will have positive impacts on local geomorphology as well as reducing flood risk by slowing water down.</p>	
<b>Water and Water Quality</b>	
<p><b>Watercourses</b></p> <ul style="list-style-type: none"> <li>• There are 2 large chalk rivers and a further 6 smaller rivers, streams and several other ordinary watercourses.</li> <li>• 35km of shoreline.</li> <li>• Southampton Water has a unique double high tide system.</li> </ul> <p><b>Water Supply</b></p> <ul style="list-style-type: none"> <li>• Southern Water is the City's water supplier.</li> <li>• Water is abstracted from the River Test and River Itchen to meet public demand for water.</li> <li>• Average water usage per person is 188 litres per day which is higher than the South East average consumption of 156 litres.</li> <li>• Target to reduce water consumption to 130 litres per person per day by 2030.</li> </ul> <p><b>Water Quality</b></p> <ul style="list-style-type: none"> <li>• There are no water bodies in Southampton meeting the WFD targets.</li> <li>• River Test and River Itchen have good chemical status yet do not meet the requirements for good ecological status.</li> <li>• No designated bathing waters in the city.</li> </ul> <p><b>Flood Risk</b></p> <ul style="list-style-type: none"> <li>• 13% of land designated as high or medium flood risk from tidal and main river sources.</li> <li>• Tidal flooding presents the greatest risk to low lying coastal areas</li> <li>• Number of residential properties at risk of a 1 in 200 year tidal flood – 1,729 (2007) rising to 5,236 (2115)</li> <li>• City experiences interaction of flood risks such as 'tide locking' raising risk of localised flooding as the drainage network backs up.</li> <li>• Much of the city relies of aid of pumps to discharge surface water. Pumps located at Mayflower Park and King George V Dry Docks.</li> <li>• 23% land lies within a flood plain with 6,544 properties at risk from fluvial</li> </ul>	<p>South Hampshire: Integrated Water Management Strategy (2009)</p> <p>EA: An Environmental Summary of Southampton 2010</p> <p>The Test and Itchen Catchment Abstraction Management Strategy (March 2006)</p> <p>Southampton Preliminary Flood Risk Assessment</p> <p>Surface Water Management Plan (2011)</p> <p>Level 2 SFRA (2010)</p> <p>Southampton Coastal Erosion and Flood Risk Management</p>

<p>flooding.</p> <ul style="list-style-type: none"> <li>• Surface water flooding is high risk due to urban nature and continued development placing increased pressure on local drainage.</li> <li>• Risk from groundwater minimal yet increasing.</li> </ul> <p><b>Flood Incidents and Flood Defences</b></p> <ul style="list-style-type: none"> <li>• Records of over 164 flood incidents yet some data gaps and inaccuracies in flood event recording.</li> <li>• There are currently no formal raised coastal or fluvial flood defences.</li> </ul> <p><b><u>Effect of the LFRMS on Water and Water Quality</u></b></p> <ul style="list-style-type: none"> <li>• The LFRMS will have a significant positive impact on the reduction of flood risk.</li> <li>• Water quality can be significantly improved through the use of SuDS schemes that naturally filter pollutants from water.</li> <li>• Flood risk can be reduced by SuDS schemes that retain water and regulate the flow into the watercourse.</li> <li>• Care must be taken so that the hydrology of an area is not altered, since this could deflect the flood risk from one area to another.</li> <li>• Alteration of the hydrology could impact water quality, for example if flow is reduced pollution concentrations may rise, however many of the actions of the LFRMS aim to deal with additional water rather than reducing overall flow.</li> <li>• Improvements can be made to the recording of flood events, improving knowledge, understanding and awareness of risks, allowing more targeted use of resources.</li> </ul>	<p>Strategy.</p>
<b>Air Quality</b>	
<p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• Monitored since 1994.</li> <li>• 5 air quality monitoring stations.</li> <li>• Air quality generally good.</li> </ul> <p><b><u>Effect of the LFRMS on Air Quality</u></b></p> <ul style="list-style-type: none"> <li>• It is unlikely that there will be any significant affects on the air quality of Southampton as a result of the LFRMS</li> </ul>	<p>Air Quality Action Plan 2009</p> <p>Southampton City Council</p>
<b>Climate Change</b>	
<p><b>Climate Change</b></p> <ul style="list-style-type: none"> <li>• Ecological footprint of Southampton is 5.1 global hectares compared to UK</li> </ul>	<p>Southampton Low Carbon City 2011-</p>



<p>average of 5.4</p> <ul style="list-style-type: none"> <li>• Carbon footprint of 1,274,000 tonnes CO<sub>2</sub></li> <li>• Capital emissions reduced by 11.5% since 2005 with approximately 12,000 tonnes CO<sub>2</sub> saved via the district heating system.</li> </ul> <p><b>Climate Projections</b></p> <ul style="list-style-type: none"> <li>• Increase in summer temperature by 2.8°C and winter by 2.2°C</li> <li>• Increase in winter precipitation (+16%) and decrease in summer (-19%)</li> <li>• Sea level could rise by up to 1m</li> <li>• Possible amplification of urban heat island affect in summer months, which could harm human health, especially elderly.</li> </ul> <p><b><u>Effects of the LFRMS on Climate Change</u></b></p> <ul style="list-style-type: none"> <li>• Construction and maintenance measures carried out as a result of the LFRMS could have the potential to raise greenhouse gas emissions, however are likely to be minor.</li> <li>• SuDS systems could be used to help cope with additional rainfall and to help regulate flow to watercourses.</li> <li>• The LFRMS will have a positive impact on developments and individual properties by helping to ensure they are resilient and resistant to the impacts of climate change.</li> <li>• Community engagement as a result of the LFRMS will help to raise awareness of climate change and flood risk, which will in turn help people to help protect themselves and their property.</li> <li>• Property Level Protection (PLP) can help to protect individual properties from flooding as a result of climate change.</li> </ul>	<p>2020: The Strategy</p> <p>UK Climate Change Projections (2009)</p>
<p><b>Material Assets</b></p>	
<p><b>Critical Infrastructure</b></p> <ul style="list-style-type: none"> <li>• 4 hospitals (Royal South Hants, Southampton General, Princess Anne and Spire Southampton)</li> <li>• 4 police stations (Shirley, Portswood, Bitterne and City Centre)</li> <li>• 3 fire stations (Hightown, Redbridge and St Marys)</li> <li>• 79 education sites</li> <li>• 3 waste water treatment sites (Woolston, Millbrook and Portswood)</li> </ul> <p><b>Housing</b></p> <ul style="list-style-type: none"> <li>• 98,254 households in the city (2011)</li> </ul>	<p>Southampton City Council</p> <p>ONS Census 2011</p> <p>South Hampshire Strategy 2012</p> <p>Southampton Annual</p>

<ul style="list-style-type: none"> <li>• Demand for housing rising</li> <li>• House prices lower than (yet increasing) the national and regional averages at £143,282</li> <li>• 12,200 new homes to be built by 2026.</li> <li>• Between 2001 and 2012 9,716 new dwellings completed compared to 7,255 in Portsmouth.</li> </ul> <p><b>Economy</b></p> <ul style="list-style-type: none"> <li>• 7,025 registered businesses in the city.</li> <li>• 330 businesses lost in 2010</li> <li>• 39 millions tonnes of goods passed through the Port of Southampton in 2011</li> </ul> <p><b>Transport</b></p> <ul style="list-style-type: none"> <li>• Several important road links including the A33 and A3024 and small sections of the M27 and M271.</li> <li>• 8 railway stations with 4 train operators completing an average of 4 million rail journeys.</li> <li>• Port of Southampton is a major international deep sea dock. It is the second largest container port in Britain and the UK's premier cruise port serving 50% of the UK cruise market.</li> <li>• 2 ferry companies connecting the city to Hythe and the Isle of Wight, serving as many as 2,950,000 passenger journeys per annum.</li> </ul> <p><b>Waste and Recycling</b></p> <ul style="list-style-type: none"> <li>• 76% of household waste diverted from landfill for incineration to recover energy.</li> <li>• 25% waste recycled with 18% waste sent to landfill (compared to UK 47% recycled and 39% landfill)</li> <li>• Target to achieve 60% recycling rate and divert 95% waste from landfill by 2020.</li> </ul> <p><b>Minerals</b></p> <ul style="list-style-type: none"> <li>• Main aggregate supply is dredge material form the Solent and Southampton Water.</li> <li>• Mineral wharves are located on the River Itchen, three on the west bank near St Marys and one on the east bank.</li> </ul> <p><b><u>Effect of the LFRMS on Material Assets</u></b></p> <ul style="list-style-type: none"> <li>• The LFRMS seeks to reduce flood risk which will significantly benefit and protect Southampton's material assets and critical infrastructure.</li> <li>• Management of surface water flooding will be of particular benefit to keeping</li> </ul>	<p>Digest of Statistics 2012</p> <p>Southampton Local Transport Plan</p> <p>Southampton Low Carbon Strategy</p>
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<p>transport links clear.</p> <ul style="list-style-type: none"> <li>Industries along the coast and rivers that are at potential risk from sea level rise or tidal flooding may benefit from proposed measures to reduce flooding, however some measures may reduce access to the waterfront which could cause issues with loading and offloading vessels.</li> <li>The access needs of industry will need to be considered.</li> </ul>	
<b>Cultural, Architectural and Archaeological Heritage</b>	
<p><b>Cultural, Architectural and Archaeological Heritage</b></p> <ul style="list-style-type: none"> <li>20 conservation areas of special historic or architectural interest.</li> <li>60 scheduled monuments, including town walls, medieval vaults and cellars, the Tudor House Museum and Roman remains at Bittern Manor</li> <li>450 listed buildings</li> <li>Potential for buried archaeology in the mud of Southampton Water.</li> <li>Three registered parks and gardens.</li> </ul> <p><b><u>Effects of the LFRMS on Cultural, Architectural and Archaeological Heritage</u></b></p> <ul style="list-style-type: none"> <li>The LFRMS will aim to reduce flood risk which shall be beneficial in the protection of sites or buildings of cultural or historic heritage.</li> <li>Effective flood risk management can lead to improvements in access to historic sites whilst protecting and enhancing the environment.</li> <li>Some construction activities, land use changes or alterations may lead to adverse effects on the settings of historic or cultural sites or buildings.</li> <li>Some flood risk management measures may have a negative impact on visual appeal.</li> <li>Construction measures could potentially lead to the loss of undiscovered artefacts or buried items.</li> <li>Historic sites and the city's heritage could be preserved through LFRMS measures, since reduction of flood risk reduces the likelihood of damage to irreplaceable goods.</li> </ul>	<p>English Heritage</p> <p>Southampton City Council</p>
<b>Landscape and Land Use</b>	
<p><b>Land Use</b></p> <ul style="list-style-type: none"> <li>Predominantly urban environment.</li> <li>20% of land is open space.</li> </ul>	<p>Southampton City Council</p>

<p><b>Landscape</b></p> <ul style="list-style-type: none"> <li>• 5 city parks with green flag status.</li> <li>• 35 local parks.</li> <li>• No landscape designations</li> </ul> <p><b><u>Effects of the LFRMS on Landscape</u></b></p> <ul style="list-style-type: none"> <li>• There is unlikely to be any significant negative effects of the LFRMS on landscape since the landscape is predominantly urban.</li> <li>• Improvements to the visual landscape are possible through the LFRMS and the use of SuDS for example rain gardens, which are visually attractive.</li> <li>• Effective land use planning shall be encouraged through the LFRMS to ensure that developments do not increase flood risk</li> <li>• LFRMS may help to restore or create some new natural habitats and environments across the city.</li> </ul>	
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## 5.5 Scope of the Environmental Issues

From the review of the baseline data collected during the scoping stage, it is clear that there is the potential for some significant environmental effects, both positive and negative, to arise from the implementation of the LFRMS, however the positive impacts will be far greater than any negatives. Because of this, all but three environmental receptors have been scoped into the SEA Environmental Report. The three environmental receptors that have been scoped out are:

- **Air Quality** – The objectives of the LFRMS are unlikely to have any impacts on the quality of air in Southampton.
- **Waste and Recycling** – The LFRMS is unlikely to have an impact on the current or future waste and recycling in Southampton.
- **Geology** – the LFRMS is unlikely to have any significant impacts on geology. Any interaction between flood risk and geology would be considered at individual site Environmental Impact Assessment (EIA) level.

# 6. The SEA Approach

## 6.1 Introduction

This section of the report sets out the SEA objectives and the reason behind their development. Also within this section, the approach used for the assessment of the Strategy objectives, actions and alternatives is set and described.

## 6.2 The SEA Objectives

A total of nine SEA objectives have been developed as part of this project. The objectives have been developed through the review of relevant plans and programmes, and the collection of baseline data therefore they relate to the key environmental issues in Southampton.

The objectives are used to evaluate the nature and degree of the potential impacts, and whether significant effects are likely to arise from the strategy's objectives and actions. Table 5 lists the SEA objectives and the key sustainability issues from which they were derived.

**Table 5: The SEA Objectives**

SEA Objective	Key Sustainability Issues
<b>1. Minimise the risk of flooding (Flood Risk)</b>	<ul style="list-style-type: none"> <li>6,544 properties currently at risk of fluvial flooding.</li> <li>New developments required.</li> <li>Pressure on local drainage systems.</li> <li>Much of the city centre relies on pumps to discharge surface water.</li> <li>No formal flood defences.</li> </ul>
<b>2. Conserve and seek to enhance biodiversity, flora and fauna. (Biodiversity)</b>	<ul style="list-style-type: none"> <li>8 UK BAP protected habitats</li> <li>7 locally important habitats</li> <li>15 UK BAP priority species</li> <li>35 species of local importance</li> <li>4 sites of international importance.</li> <li>4 sites of special scientific interest.</li> <li>Pressure to develop natural/open land for housing.</li> </ul>
<b>3. Protect and enhance human health, quality of life and wellbeing. (Population)</b>	<ul style="list-style-type: none"> <li>Current population is 236,882</li> <li>Population is increasing.</li> <li>Several areas of deprivation.</li> <li>Accessibility to health and education services.</li> </ul>

<p>4. Maintain, improve and where possible create new public access to green space and rights of way. <b>(Health)</b></p>	<ul style="list-style-type: none"> <li>• Accessibility to natural open space such as parks, greenways and public footpaths.</li> <li>• Access to water for recreational activity.</li> </ul>
<p>5. Protect and enhance water quality and availability of water resources. <b>(Water)</b></p>	<ul style="list-style-type: none"> <li>• Moderate ecological and chemical status of water bodies.</li> <li>• Moderate ecological status of Southampton Water.</li> <li>• Pressure on water supply/availability.</li> <li>• Requirements to meet WFD targets.</li> </ul>
<p>6. Minimise the potential impact of flooding to transport and other critical infrastructure, both at present and in the future. <b>(Material Assets)</b></p>	<ul style="list-style-type: none"> <li>• Several important transport links into the city including road and rail.</li> <li>• Port of Southampton of national importance.</li> <li>• Accessibility of services including health and education.</li> <li>• Transport links important for economy and tourism.</li> </ul>
<p>7. Protect soils, geological resources and natural landscapes within the city. <b>(Soils and Geology)</b></p>	<ul style="list-style-type: none"> <li>• Potential contamination could arise such as former landfill sites and industrial sites.</li> <li>• Few natural landscapes require protection.</li> <li>• 5 parks with green flag status.</li> </ul>
<p>8. Adapt new and existing developments to the impacts of climate change. <b>(Climate Change)</b></p>	<ul style="list-style-type: none"> <li>• Climate change projections.</li> <li>• Sea level rise up to 1 meter.</li> <li>• Increased winter precipitation.</li> <li>• Increased risk of summer drought.</li> <li>• Carbon and ecological footprint.</li> </ul>
<p>9. Conserve and seek to enhance sites of cultural, archaeological and architectural heritage, including listed buildings. <b>(Heritage)</b></p>	<ul style="list-style-type: none"> <li>• 20 conservation areas of special historic or architectural interest.</li> <li>• 60 scheduled monuments</li> <li>• 450 listed buildings</li> <li>• Potential for buried archaeology in the mud of Southampton Water.</li> <li>• 3 registered parks and gardens</li> </ul>

### 6.2.1 Social, Environmental and Economic Impacts of the SEA Objectives

It is acknowledged that the SEA objectives will have an impact on all social, environmental and economic factors. In order to highlight the areas where they are likely to have the most significant impact, the objectives have been tabulated in table 6.

**Table 6: Social, Environmental and Economic Impacts of the SEA Objectives**

SEA Objective	Social	Environment	Economic
1. Minimise the risk of flooding.	✓	✓	✓
2. Conserve and seek to enhance biodiversity, flora and fauna.		✓	
3. Protect and enhance human health, quality of life and wellbeing.	✓		✓
4. Maintain, improve and where possible create new public access to green space and rights of way.	✓	✓	
5. Protect and enhance water quality and availability of water resources.		✓	
6. Minimise the potential impact of flooding to transport and other critical infrastructure, both at present and in the future.	✓		✓
7. Protect soils, geological resources and natural landscapes within the city.		✓	
8. Adapt new and existing developments to the impacts of climate change.	✓		✓
9. Conserve and seek to enhance sites of cultural, archaeological and architectural heritage, including listed buildings.		✓	

Table 6 shows that a good spread of impacts can be achieved through the SEA objectives, however the objectives still have the environment at the heart.

### 6.3 Assessment Approach

For the purpose of this SEA, an objectives based approach has been adopted. This approach uses the SEA objectives to assess the LFRMS objectives, potential management options (actions) and alternatives in order to evaluate the Strategy's potential impacts on the wider environment.

To complete the assessment, a series of matrices will be used to evaluate each action to determine how the environment will be affected by the implementation the Strategy. These matrices will show the likely impacts of the actions and objectives of the Southampton LFRMS.

The impacts will be assessed in terms of their:

- **Nature:** whether the effects are
  - *Positive (+)*
  - *Negative (-)*
  - *Neutral (n)*
  - *Uncertain (?)*
  
- **Duration:** presented in terms of the anticipated timescale of the effects
  - *Short term (S)* - expected in the next 1 to 5 years (life of the strategy)
  - *Medium term (M)* - expected in the next 6 to 10 years (beyond strategy life)
  - *Long term (L)* - expected in the next 10+ years (beyond strategy life)
  
- **Permanence and Reversibility:** whether the impacts are
  - *Permanent* - Resulting from a physical change that is predicted to last longer than 15 years.
  - *Temporary* - resulting from operational change that can be restored, such as repairable damage caused during construction.
  - *Reversible* - the effect can be reversed and the environment restored.
  - *Irreversible* - the effect cannot be reversed, such as the loss of a historic feature.
  
- **Spatial Scale:** whether the impacts are likely to be
  - *Local* - effects are restricted to a specific site and remain within the Southampton City administrative boundary.
  - *Regional* - effects are likely to cover a significant proportion of the areas surrounding the city.
  - *National* - effects are likely to cover the whole of England and/or the UK

To show the significance of the impacts resulting from the implementation of the LFRMS, a scoring criterion has been used, which is shown in table 7. It has been designed to take into account the criteria set out in Annex II of the SEA Directive, and has been colour coded for clarity and ease of use in the assessment matrices. Where a score of 'neutral' has been awarded, this does not mean that there is no potential for any impacts to occur in the future, instead the assessment is based upon the current level of detail provided by the Strategy itself, and the score has been awarded in preference to 'uncertain' which implies further baseline data is required.



Table 7: Impacts Significance Scoring Criteria

Score	Criteria
<b>++</b> <b>Major Positive</b>	Significantly beneficial to the SEA objective – Maximises opportunities for environmental enhancement or resolves existing environmental issue.
<b>+</b> <b>Minor Positive</b>	Partially beneficial (not significant) to the SEA objectives – Contributes to resolving an existing environmental issue or offers some opportunities for enhancement.
<b>N</b> <b>Neutral</b>	Neutral effect on the SEA objective and environment.
<b>?</b> <b>Uncertain</b>	Insufficient detail on the option or baseline – Cannot effectively assess the significance of the option on the SEA objectives.
<b>-</b> <b>Minor Negative</b>	Partially undermines (not significantly) the SEA objective – Option would contribute to an environmental issue or reduce opportunities for enhancement.
<b>--</b> <b>Major Negative</b>	Severely undermines the SEA objective – Will significantly contribute to an environmental problem or undermine opportunity for enhancement.

# 7. Appraisal of the LFRMS Objectives

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## 7.1 Introduction

A total of eight overarching objectives have been put forward in the draft Southampton LFRMS, each aiming to minimise and manage the flood risk of the city.

The Southampton LFRMS objectives are:

1. Improve the knowledge and understanding of all sources of flood risk across the City.
2. Work in partnership with other authorities who have a role in flood risk management, including across administrative boundaries.
3. Identify ways to increase public awareness of the flood risk across the City.
4. Identify ways of improving support for people at direct risk to promote appropriate individual and community level planning and action.
5. Ensure that planning decisions are properly informed by flooding issues so future development assists with reducing and mitigating flood risk.
6. Identify appropriate measures which reduce the likelihood of harm to people and damage to the economy and the environment.
7. Maintain, and improve where necessary, flood risk management infrastructure and systems to reduce flood risk.
8. Identify all available funding mechanisms to enable delivery of flood risk management interventions.

## 7.2 Compatibility of the LFRMS Objectives with the SEA Objectives

In order to evaluate the impacts of implementing the LFRMS, the objectives have been assessed against the SEA objectives. The purpose of this assessment is to test the Strategy objectives against the SEA objectives to evaluate the likelihood and significance of any potential environmental impacts that may arise through Strategy implementation. The results of this assessment are shown in table 8, which has been completed using the criteria set out in section 6 of this report. For simplicity, the table shows the SEA objectives as the main theme or environmental receptor represented.

Table 8: Compatibility of the LFRMS Objectives and SEA Objectives

		SEA Objectives (Main Themes)								
		1	2	3	4	5	6	7	8	9
		Flood Risk	Biodiversity	Population and Health	Recreation	Water Quality	Critical Infrastructure	Landscape	Climate Change	Heritage
LFRMS Objectives	1) Improve the knowledge and understanding of all sources of flood risk across the City.	++	+	+	+	+	+	+	++	+
	2) Work in partnership with other authorities who have a role in flood risk management, including across administrative boundaries.	++	+	+	+	+	+	+	+	+
	3) Identify ways to increase public awareness of the flood risk across the City.	++	+	+	+	+	+	+	+	+
	4) Identify ways of improving support for people at direct risk to promote appropriate individual and community level planning and action.	+	+	++	+	+	+	+	+	+

Table 8 (Continued): Compatibility of the LFRMS Objectives and SEA Objectives

		SEA Objectives (Main Themes)								
		1	2	3	4	5	6	7	8	9
		Flood Risk	Biodiversity	Population and Health	Recreation	Water Quality	Critical Infrastructure	Landscape	Climate Change	Heritage
LFRMS Objectives	5) Ensure that planning decisions are properly informed by flooding issues so future development assists with reducing and mitigating flood risk.	++	+	+	+	+	++	+	++	+
	6) Identify appropriate measures which reduce the likelihood of harm to people and damage to the economy and the environment.	+	+	++	+	+	+	+	+	+
	7) Maintain, and improve where necessary, flood risk management infrastructure and systems to reduce flood risk.	++	+	++	+	+	++	+	+	+
	8) Identify all available funding mechanisms to enable delivery of flood risk management interventions.	++	+	++	+	+	+	+	++	+

### 7.3 Assessment Summary

It is clear from the assessment of the LFRMS objectives against the SEA objectives (table 8) that it is unlikely that there will be any negative impacts on the environment, since a positive result was recorded against each objective.

Some of the LFRMS objectives are likely to have major positive impacts the SEA objectives, for example LFRMS objective 1, improving knowledge and understanding of all sources of flood risk across the city, can provide major positive benefits to the reduction of flood risk, whilst aiding the adaptation to climate change. This is because better understanding of risk helps achieve appropriate and more advanced methods of management.

Identify ways of improving support for people at direct risk to promote appropriate individual and community level planning and action (LFRMS objective 4) is likely to have a major impact on the protection and enhancement of population and human health and quality of life. By actively getting the community involved in targeted actions to reduce flood risk, fear and worry of flooding can be reduced whilst understanding of the measures helps people to help protect their own property.

LFRMS objective 7 which is to maintain, and improve where necessary, flood risk management infrastructure and systems to reduce flood risk, will significantly contribute to the reduction of flood risk (SEA objective 1) by protecting wider areas of the city. This in itself will also help to meet the requirements of SEA objective 3, by protecting human health by reducing (where possible) physical flooding, and reducing the fear and worry surrounding the risk, which can improve the quality of life of those living in flood risk areas.

Indirect impacts on the SEA objectives are possible through LFRMS objective 8, yet are still likely to be positive. The identification of available funding mechanisms to enable delivery of flood risk management interventions can have major positive impacts on the reduction of flood risk as the more funding mechanisms identified, the more possibilities there are to create flood risk reduction schemes. It then can indirectly benefit SEA 3 by helping to benefit population and human health.

### 7.4 Duration of Impacts

In order to establish the duration of the likely impacts resulting from the implementation of the LFRMS, a second assessment has been made. Table 9 shows the likely duration of impacts of the Strategy as a whole, combining the effects of each of the eight objectives. The assessment looks in terms of whether the impacts are likely to arise in the short term through the 5 year life of the Strategy or medium term (5-10 years) or long term (10+ years), both of which are beyond the life of the Strategy.

Table 9: Duration of Likely Strategy Impacts

Duration	SEA Objectives (Main Themes)								
	1	2	3	4	5	6	7	8	9
	Flood Risk	Biodiversity	Population and Health	Recreation	Water Quality	Critical Infrastructure	Landscape	Climate Change	Heritage
Short Term (0 - 5 years)	++	+	+	+	++	+	+	+	+
Medium Term (5 – 10 years)	++	+	+	+	++	+	+	+	+
Long Term (10+ years)	++	+	+	+	++	+	+	+	+

### 7.4.1 Assessment Summary

The impacts of the implementation of the LFRMS are likely to occur in the short term, within the first 5 years, as well as continuing well beyond the life of the strategy. Table 9 shows that combined, the strategy objectives will contribute positive impacts to the SEA objectives, with some major positive outcomes.

The aim and purpose of the Southampton LFRMS is to reduce and manage the risk of flooding to the city, therefore the objectives are likely to have a significant positive impact on SEA objective 1, the minimisation of flood risk, in the short, medium and long term.

Water and water quality has been assessed as having short, medium and long term major positive impacts, since the strategy aims to make use of Sustainable Urban Drainage Systems (SuDS) to minimise flood risk which immediately help to reduce the number of pollutants reaching watercourses. The use of SuDS then provides benefits to biodiversity (SEA objective 2), since there are many opportunities to create new habitats within the city through this method of management, which is also of benefit to wildlife.

Major positive impacts on SEA objective 8, the adaptation of new and existing developments to the impacts of climate change, are likely to arise long after the life of the strategy. The LFRMS provides a basis to prepare developments for the impacts that climate change will bring in the future, helping to make the city resistant.

# 8. Appraisal of the LFRMS Actions

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## 8.1 Introduction

Set out in the Southampton LFRMS are a series of actions which will be taken forward to meet the objectives and guiding principles for the management of flood risk in Southampton. The actions are divided into three types:

- Completed strategies
- City-wide strategic actions
- Localised actions

For the assessment of the city-wide actions, three alternative options have been developed and assessed to provide information on the relative performance of the options, helping to inform the decision making process. Only reasonable, realistic and relevant alternatives have been considered during this assessment since they have to be achievable. The purpose of this stage is to identify which of the options/actions will provide the most positive environmental outcomes, and therefore should be taken forward in the preferred list of actions.

The assessment of the actions has been carried out in the same way as the assessment of the objectives, using the same table showing the duration of the predicted impacts against each SEA objective, and the scoring criteria set out in section 6 of this report.

## 8.2 Completed Flood Plans and Strategies

The actions set out in the Southampton LFRMS make reference to works arising from several other flood plans and strategies, in particular the Southampton (Redbridge to Woodmill Lane) Coastal Flood and Erosion Risk Management Strategy (the Coastal Strategy) and the Southampton Surface Water Management Plan (SWMP). Schemes resulting from these plans include:

- River Itchen flood alleviation scheme
- Upper Itchen/St. Denys property level protection scheme

The schemes resulting from these two plans have already been assessed for their environmental impacts, therefore to avoid duplication, have not been included in this SEA. Each of the schemes are likely to achieve wider positive environmental benefits within the next 2 - 5 years and in to the future, however are subject approval of funding. For further detail please see the individual strategies, which can be found on the Southampton City Council website – [www.southampton.gov.uk/flooding](http://www.southampton.gov.uk/flooding)

### 8.3 Assessment of City-Wide Strategic Options

A total of six city-wide actions have been identified within the LFRMS. It is these actions that are intended to be implemented in order to meet the objectives of the Strategy, and ultimately contribute to the management of flood risk across the City of Southampton.

Each strategic action has been put forward with a series of three other measures in order to offer an alternative method of delivering the action. For each city-wide action, a 'do nothing' alternative will be included in order to show how the baseline is likely to evolve without the strategy, therefore also allowing a fairer and more informed assessment.

#### 8.3.1 City-Wide Action 1: Land Use/Spatial Planning

##### Option:

- A) Do nothing - Leave land use and spatial planning as it is at present.
- B) Produce guidance for the use of SuDS in developments.
- C) Establish a policy where new developments aim to reduce the volume of runoff by up to 30%.

**Table 10: Assessment of Land Use/Spatial Planning**

		SEA Objectives (Main Themes)								
Option	Duration	1	2	3	4	5	6	7	8	9
		Flood Risk	Biodiversity	Population and Health	Recreation	Water Quality	Critical Infrastructure	Landscape	Climate Change	Heritage
A	Short term	-	n	n	n	-	-	n	-	n
	Medium term	-	n	n	n	-	-	n	-	n
	Long term	--	n	n	n	-	--	n	--	n
B	Short term	+	+	+	+	++	+	+	++	+
	Medium term	+	+	+	+	++	+	+	++	+
	Long term	++	++	+	+	++	+	+	++	+
C	Short term	++	+	+	+	++	+	+	++	+
	Medium term	++	+	+	+	++	+	+	++	+
	Long term	++	++	++	+	++	+	+	++	+

The assessment concludes that option A would result in negative impacts in several areas. It is clear that doing nothing to incorporate the need to include flood risk in development plans will not aid the minimisation of flood risk, improvement of water quality or the adaptation to the impacts of climate change. In the long term, impacts could become major as the effect of climate change becomes more



apparent and flood risk increases. Neutral results have been recorded elsewhere since the continuation of present day standards of planning or spatial development is unlikely to see a damaging effect on receptors such as recreation and biodiversity.

Option B and C are similar in that they both encourage developers to think about methods to reduce the overall runoff from the site. Producing guidance on the use of SuDS in development (option B) is likely to improve the number of new SuDS schemes being implemented in the future. This is of significant benefit to biodiversity as a number of new habitats can be created, allowing water reliant species the opportunity to flourish in an urban setting. SuDS can also greatly improve water quality by filtering out pollutants before they reach the main watercourse, making them a good option for reducing runoff from industrial sites.

Creating a policy that required developers to reduce runoff by up to 30% encourages the use of SuDS for attenuation. SuDS can be used to create areas that can deal with or store additional runoff created as a result of climate change, therefore this option scores well against objective 8. Reducing runoff also reduces the pressure on existing drainage systems helping to minimise flood risk to the areas surrounding the development, which is a major positive benefit to objective 1. This option has the same positive outcomes on all other environmental receptors as option B, including benefits to landscape, recreation and population through the creation of open or attractive space through the incorporation of SuDS.

### 8.3.2 City-Wide Action 2: Joint Working/Duty to Co-operate

<b>Option:</b>										
A) Disband flood risk management groups and boards.										
B) Continue with the management of flood risk internally, sharing information with other together council departments.										
C) Ensure co-operation and commitment to the sharing of information between stakeholders and members of flood groups from within the city and neighbouring risk management authorities.										

Table 11: Assessment of Joint Working/Duty to Co-operate

		SEA Objectives (Main Themes)								
Option	Duration	1	2	3	4	5	6	7	8	9
		Flood Risk	Biodiversity	Population and Health	Recreation	Water Quality	Critical Infrastructure	Landscape	Climate Change	Heritage
A	Short term	- -	n	-	n	-	-	n	-	n
	Medium term	- -	n	-	n	-	-	n	-	n
	Long term	- -	n	-	n	-	-	n	-	n

<b>B</b>	Short term	++	n	+	n	+	+	n	+	n
	Medium term	++	n	+	n	+	+	n	+	n
	Long term	++	n	+	n	+	+	n	+	n
<b>C</b>	Short term	++	n	+	n	+	++	+	+	+
	Medium term	++	n	+	n	+	++	+	+	+
	Long term	++	n	+	n	+	++	+	+	+

Negative impacts are likely to arise under option A, since the disbandment of flood risk management groups would lead to a breakdown in communication, cooperation and lack of information sharing. Without a structured and coordinated approach, discussions on how to manage future flood risk and the adaptation to climate change are more difficult leading to impacts on people, water quality and critical infrastructure whilst contributing to major negative impacts on objective 1 in the long term as the risk of flooding increases.

The main difference between option B and option C is the cross boundary co-operation and working. Option B is concerned with the management of flood risk with groups and resources from within the city, whereas option C takes advantage of working in partnership with neighbouring authorities and organisations to share resources and information, which helps to strengthen objective 1, the minimisation of flood risk. Flood management groups are beneficial to the sharing of information between departments within the City Council, ensuring everyone is kept up-to-date with the risk of flooding and how each department is making a contribution to lowering the risk to people, the environment and critical infrastructure. Working together also ensures that resources are used efficiently and where they are needed the most, for example on routine maintenance and cleansing of drainage infrastructure and watercourses in flood hotspot areas.

### 8.3.3 City-Wide Action 3: Improve Knowledge and Understanding of Flood Risk

#### Option:

- A)** Do nothing – make no attempt to increase understanding or improving methods of flood recording.
- B)** Establish a network of groundwater monitoring stations, adding data to a detailed map of the city's flood risk zones.
- C)** Develop and implement an improved and consistent method for reporting, recording and investigating flood incidents.

(Please see next page for assessment table)

Table 12: Assessment of Improving Knowledge and Understanding

		SEA Objectives (Main Themes)								
Option	Duration	1	2	3	4	5	6	7	8	9
		Flood Risk	Biodiversity	Population and Health	Recreation	Water Quality	Critical Infrastructure	Landscape	Climate Change	Heritage
A	Short term	-	n	n	n	n	-	n	-	n
	Medium term	-	n	n	n	n	-	n	-	n
	Long term	-	n	n	n	n	-	n	-	n
B	Short term	++	n	+	n	+	++	n	++	+
	Medium term	++	n	+	n	+	++	n	++	+
	Long term	++	n	+	n	+	++	n	++	+
C	Short term	++	n	+	n	+	++	n	++	+
	Medium term	++	n	+	n	+	++	n	++	+
	Long term	++	n	+	n	+	++	n	++	+

Option A does not strive to improve knowledge of flood risk within the city, therefore a negative assessment for objectives 1, 6 and 8 has been received as it is likely to prevent informed flood management decisions both now and in the longer term. With the added pressures of climate change, it is important that knowledge is kept up to date. No major negative impacts have been predicted as several management strategies and plans have already been developed and the information they contain will remain valid for a number of years, therefore no knowledge is lost.

Option B focuses on the improvement of knowledge of groundwater flooding, which is not very well understood or documented. Establishing a network of groundwater monitoring stations and mapping the data recorded will give a more solid understanding of the risk facing the city, and how it can be tackled to overcome the risk effecting critical infrastructure and transport links. Identifying areas that may be at risk from groundwater reflects positively on objective 8 as it helps incorporate measures to protect against flooding into plans for new developments, with an added allowance for climate change.

Recording flood incidents in a consistent manor (option C) provides many positive benefits to the SEA objectives. A major positive is recorded for the protection of human health and wellbeing since keeping an up to date record allows the council to target resources to minimising the risk, whether it be regular drain clearance or working with communities actively to help people understand, prepare and protect themselves from the risk they face.

## 8.3.4 City-Wide Action 4: Raise Awareness of Flood Risk

**Option:**

- A) Do nothing to keep people informed of flood risk.
- B) Develop up to date, easily accessible sources of information.
- C) Improve communication and involvement with communities and landowners.

Table 13: Assessment of Awareness Raising

		SEA Objectives (Main Themes)								
Option	Duration	1	2	3	4	5	6	7	8	9
		Flood Risk	Biodiversity	Population and Health	Recreation	Water Quality	Critical Infrastructure	Landscape	Climate Change	Heritage
A	Short term	-	n	-	n	n	n	n	-	n
	Medium term	-	n	-	n	n	n	n	-	n
	Long term	-	n	-	n	n	n	n	-	n
B	Short term	+	n	+	n	n	+	n	+	+
	Medium term	+	n	+	n	n	+	n	+	+
	Long term	+	n	+	n	n	+	n	+	+
C	Short term	+	n	+	n	n	+	n	+	+
	Medium term	+	n	+	n	n	+	n	+	+
	Long term	+	n	+	n	n	+	n	+	+

Option A does not seek to improve awareness of flood risk in Southampton. Although it assumes that there is already a standard of flood awareness in the city, this option has received a negative assessment for objectives 1, 3 and 8 because without knowing of the risks and how they are likely to increase, flood risk is unlikely to be minimised or reduced. Raising awareness helps to protect human health and wellbeing (objective 3) as people are then able to make decisions to protect themselves and their property accordingly. Option A fails to notify people of the risks, therefore has received a negative assessment.

Options B and C have been assessed and have the same outcome. Both the production of awareness raising resources and material and improvement of communication directly with landowners and communities can actively aid the minimisation of flood risk as people will understand the sources of flood risk, where is at risk, what is being done already and what individuals can do to help prevent flooding, therefore receiving a positive assessment for objectives 1 and 3. A minor positive has been

received also for heritage, since any measures to reduce flooding are likely to be beneficial to the protection of heritage sites.

### 8.3.5 City Action 5: Improve Existing Drainage Infrastructure and Watercourses with Available Resources

#### Option:

- A) Do nothing – carry out maintenance and cleansing only when reported as required.
- B) Carry out regular cleansing and maintenance works to drainage infrastructure and watercourses, prioritising to flood hotspot areas.
- C) Identify opportunities to improve watercourses to reduce the risk of flooding across the city.

**Table 14: Assessment of Improving Drainage Infrastructure and Watercourses**

		SEA Objectives (Main Themes)								
Option	Duration	1	2	3	4	5	6	7	8	9
		Flood Risk	Biodiversity	Population and Health	Recreation	Water Quality	Critical Infrastructure	Landscape	Climate Change	Heritage
A	Short term	--	n	-	n	n	--	n	n	n
	Medium term	--	n	-	n	n	--	n	n	n
	Long term	--	n	-	n	n	--	n	n	n
B	Short term	++	n	+	n	n	++	n	n	+
	Medium term	++	n	+	n	n	++	n	n	+
	Long term	++	n	+	n	n	++	n	n	+
C	Short term	++	++	+	+	+	+	+	+	+
	Medium term	++	++	+	+	+	+	+	+	+
	Long term	++	++	+	+	+	+	+	+	+

The alternatives for city action 6 have been assessed range from having a largely negative result, through to an overall very positive impact. Option A proves that without regular routine maintenance, major negatives are likely to occur for objectives 1 and 6 as problems such as blockages to culverts are unlikely to be detected until flooding occurs. With the risk of flooding increased through a lack of maintenance, option A has an indirect negative impact on objective 3 by putting human health at risk, and reducing quality of life if service fail, transport routes become blocked or homes become flooded.

Option B is the opposite to option A, in that it is the regular and routine maintenance to drainage infrastructure. This means that the negative results of option A have been replaced by positive, or very

positive results as problems can be detected and resolved, preventing many flood events from occurring, protecting people and critical infrastructure.

The assessment of option C provides positive impacts on each of the environmental objectives. In particular, this option presents opportunities for the enhancement of biodiversity, flora and fauna through the improvement of habitats in watercourses, through works that take place to reduce flood risk. Restoring culverted channels to natural watercourses also enhances human health and wellbeing as the integration of new access routes and walkways along channels may be possible which also improves the visual landscape, whilst further contributing to the reduction of flood risk by slowing the passage of water down. It must be stressed that this option relies upon the available funding and resources.

### 8.3.6 City Action 6: Designation of Structures/Features

#### **Option:**

- A) Do nothing – Only action powers of designation when required.
- B) Designate features in flood hotspot areas only.
- C) Allow designation of features city-wide, mapping the designations to form a register of assets.

**Table 15: Assessment of Designation of Structures/Features**

		SEA Objectives (Main Themes)								
Option	Duration	1	2	3	4	5	6	7	8	9
		Flood Risk	Biodiversity	Population and Health	Recreation	Water Quality	Critical Infrastructure	Landscape	Climate Change	Heritage
A	Short term	n	n	n	n	n	n	n	n	n
	Medium term	n	n	n	n	n	n	n	n	n
	Long term	n	n	n	n	n	n	n	n	n
B	Short term	+	n	n	n	n	+	n	n	n
	Medium term	+	n	n	n	n	+	n	n	n
	Long term	+	n	n	n	n	+	n	n	n
C	Short term	+	n	n	n	n	+	n	n	n
	Medium term	+	n	n	n	n	+	n	n	n
	Long term	+	n	n	n	n	+	n	n	n

Action 6 taken from the LFRMS is a power introduced in the Flood and Water Management Act (FWMA) 2010. It is very unlikely that any of the three suggested alternatives will have any negative or major impact on the environment. It is a power that does not alter the physical environment therefore

neutral impacts have been recorded for each of the SEA objectives for option A, and a majority of the objectives for options B and C.

Options B and C have been assessed to have the same outcomes, benefiting both SEA objectives 1 and 6 positively, although option C would achieve a slightly higher overall assessment since it allows city-wide designation, whilst formally mapping the assets. Both of these options would provide a contribution to minimising flood risk as designation of features prevents the unauthorised removal or alteration of features that may prevent flooding. This could then lead to benefits of protecting roads and sites of critical infrastructure.

Although options B and C are similar, option C provides the added benefit of committing to the mapping of assets. This provides long term benefits to the management of flood risk as consistently records the location and condition of assets which shall provide the long term benefit to future management of flood risk.

## 8.4 Assessment of Localised Actions

As well as the city-wide actions, the LFRMS has identified 3 actions that can be implemented at specific or localised sites. Impacts on the environment will be assessed for their likely significance and duration, but since localised actions will be site specific rather than applied to the whole of the city, no alternative measures are required for this assessment.

### 8.4.1 Local Action 1: Property Level Protection (PLP) Schemes

**Table 16: Assessment of PLP Schemes**

SEA Objectives (Main Themes)									
Duration	1	2	3	4	5	6	7	8	9
	Flood Risk	Biodiversity	Population and Health	Recreation	Water Quality	Critical Infrastructure	Landscape	Climate Change	Heritage
Short term	+	n	+	n	n	n	n	+	u
Medium term	+	n	+	n	n	n	n	+	u
Long term	+	n	+	n	n	n	n	+	u

Property level protection (PLP) measures are designed to protect individual properties from flood risk, therefore reducing flood risk (objective 1) and having a direct positive impact on the protection of human health and wellbeing (objective 3). In the long term, the risk of flooding could be significantly reduced as PLP is installed in more properties. This method of flood risk reduction is assessed to have positive impacts on objective 8, which seeks to adapt developments to the impacts of climate change, however a significant assessment result cannot be given as the protection against the impact of climate change is dependent on the number of properties with PLP installed, and there is no guarantee that the measures will withstand the predicted impacts.

An uncertain assessment has been made for objective 9, which seeks to conserve and enhance sites of cultural, archaeological and architectural heritage including listed buildings, as the impact is largely unknown. PLP can reduce risk of flooding and potential damage, whilst at the same time negative impacts could occur as some PLP measures could be visually intrusive. Neutral assessments were given for the other SEA objectives, as there is unlikely to be any significant environmental impacts.

Since PLP schemes are seen more as a temporary measure and can be removed at any time, it is not likely that there will be any damage to the environment. Protecting individual properties against flood risk means that larger structures requiring construction, such as walls, are not required. This minimised the possible impact on habitats as land is not disturbed, and surrounding areas can be kept as natural as possible.

#### 8.4.2 Local Action 2: Support the Establishment of Local Community Flood Groups

**Table 17: Assessment of the Establishment of Local Community Flood Groups**

SEA Objectives (Main Themes)									
Duration	1	2	3	4	5	6	7	8	9
	Flood Risk	Biodiversity	Population and Health	Recreation	Water Quality	Critical Infrastructure	Landscape	Climate Change	Heritage
Short term	+	n	+	n	n	+	n	+	n
Medium term	+	n	+	n	n	+	n	+	n
Long term	+	n	+	n	n	+	n	+	n

The establishment of local community flood groups is a localised action with similar goals to raising community awareness of flood risk as it helps people to help themselves through the offering of advice and support. A direct positive assessment has been received for the protection of human health, quality of life and wellbeing (objective 3) since working directly to support residents who are keen to make a difference to their community helps raise awareness of flood risk, improve their knowledge of what can be done to reduce the risk and how to react to flooding, whilst also giving people the sense of achievement. This action can potentially help people protect their local schools (falling under objective 6) by preparing flood plans.

A neutral assessment has been made for the remaining objectives. Although there is the possibility that the establishment of local community groups to protect and enhance biodiversity and heritage, these are thought to be very minor since the group focus would be on preparing for and reducing flood risk, and may only be active if the threat of flooding occurs. There is little opportunity to improve access to green space and rights of way (objective 4), water quality (objective 5) or protect soils, geology and natural landscape (objective 7), however there is unlikely to be any negative impacts on these either, hence the neutral assessment.



## 8.4.3 Local Action 3: Retrofitting SuDS Schemes

Table 18: Assessment of Retrofitting SuDS Schemes

Duration	SEA Objectives (Main Themes)								
	1	2	3	4	5	6	7	8	9
	Flood Risk	Biodiversity	Population and Health	Recreation	Water Quality	Critical Infrastructure	Landscape	Climate Change	Heritage
Short term	++	++	+	+	++	+	+	+	+
Medium term	++	++	+	+	++	+	+	+	+
Long term	++	++	+	+	++	+	+	+	+

This action has the potential to achieve positive outcomes for each of the SEA objectives. The main benefits of this action are likely to be for objectives 1, 2 and 5, which are all assessed as having major positive outcomes. There are many opportunities to protect, enhance and create new and existing habitats, boosting the local biodiversity, whilst reducing the risk of flooding to an area. Water quality can be significantly improved with this action as SuDS mimic natural drainage and filter pollutants from surface water before reducing the number of contaminants reaching the watercourse.

The retrofitting of SuDS can significantly reduce the risk of flooding, since the storage of water above ground in specially designed features such as ponds or attenuation basins takes the pressure off the local drainage network, which then helps reduce flooding to transport links and other critical infrastructure sites (objective 6). This action can also help provide open space (objective 4) for local people, which is of benefit to the protection of human health, quality of life and wellbeing (objective 3) as well as improving the local natural landscape in an urban environment (objective 7).

SuDS can be incorporated into both new and existing developments which make them a useful tool in the adaptation to the impacts of climate change as they can be designed to accommodate additional runoff, which is a likely consequence of climate change. As a result this action was assessed as having a positive outcome for objective 8. Since many SuDS schemes are visually attractive, they can also be used to protect heritage sites without impacting the site in a negative manor.

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# 9. Conclusions and Monitoring

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## 9.1 Conclusions

Each of the nine overarching objectives set by the Southampton LFRMS successfully supports the themes within the SEA objectives, achieving a positive outcome for each. The assessment shows that the strategy is unlikely to have any adverse effects on the environment, and will instead work well to significantly reduce the risk of flooding to people and the city.

The LFRMS is predicted to have positive impacts on the environment in the short term and in the long term beyond the life of the strategy, for example LFRMS objective 7, maintain and improve where necessary, flood risk management infrastructure and systems to reduce flood risk. This objective will help reduce flooding immediately in areas that are at highest risk, whilst also providing longer term impacts since infrastructure is designed to last many years and will remain in place after the life of the strategy.

It is clear from the assessment of the actions and alternatives that the LFRMS will have a positive effect on the environment. By allowing the environment to evolve without the strategy, thus following the 'do nothing' alternative to the actions put forward, it is clear that there would be negative impacts on some of the SEA objectives, in particular objectives 1, 3 and 6. The reason for the negative assessment is that flood risk will increase over time and this option does not play an active part in reducing the risk.

Each of the alternative actions set out in order to meet the objectives of the strategy work well to deliver a positive outcome on the SEA objectives, in particular the protection of human health (objective 3), protection of critical infrastructure and transport (objective 6) and adaptation to the impacts of climate change (objective 8). The overall positive impact on objective 1, the minimisation of flood risk, is further strengthened through the combination of positive outcomes on the other objectives.

The 'do nothing' approaches for each of the city-wide actions has been assessed and if taken forward would result in largely negative potential outcomes for the SEA objectives. Doing nothing to improve understanding or the management of flood risk does not strive to minimise the risk of flooding, leaving many people, businesses and infrastructure at risk and without the support they may require. Over time, the impacts of doing nothing are likely to worsen due to the impacts of climate change and the inability to ensure that measures to reduce flood risk or adapt to the risk are incorporated into new and existing developments.

More beneficial outcomes can be achieved through the alternative city-wide actions, with each option delivering many positive environmental outcomes. Table 19 summarises the 'preferred' list of city-wide actions that should be taken forward in the LFRMS for Southampton. Each of the preferred options provides positive outcomes on the SEA objectives and avoids negative outcomes on the environment. Where there are two alternative options with the same or very similar outcomes, both options have been combined to strengthen the positive outcomes.

Table 19: Summary of Preferred Options

SEA Objectives (Main Themes)									
Duration	1	2	3	4	5	6	7	8	9
	Flood Risk	Biodiversity	Population and Health	Recreation	Water Quality	Critical Infrastructure	Landscape	Climate Change	Heritage
<b>Action 1:</b> Use of land use/spatial planning to reduce flood risk (Option C)	+	+	+	+	++	+	+	++	+
<b>Action 2:</b> Joint working and duty to co-operate (Option C)	++	n	+	n	+	++	+	+	+
<b>Action 3:</b> Improve knowledge and understanding of flood risk (Option B or C)	++	n	+	n	+	++	n	++	n
<b>Action 4:</b> Raise awareness of flood risk (Option B or C)	+	n	+	n	n	+	n	+	n
<b>Action 5:</b> Improve drainage infrastructure and watercourses with available funding (Option C)	++	++	+	+	+	+	+	+	+
<b>Action 6:</b> Designation of features. (Option B or C)	+	n	n	n	n	+	n	n	n

The local level actions set out in the strategy will together have a strong positive impact on the minimisation of flood risks and help reduce the impacts of flooding. Implementing property level protection (PLP) schemes and supporting local flood groups will help people in at risk communities become better prepared for flooding and help them become more resistant and resilient to flooding. By also encouraging the use of SuDS schemes, flood risk from surface water sources can be reduced, along with the creation of new habitats in predominantly urban areas and water quality improvements.

## 9.2 Avoidance and Mitigation Measures

The assessment of the LFRMS objectives and actions to manage flood risk across the city has found that no negative impacts are likely to result from the implementation of the strategy; therefore no recommendations for mitigation measures will be made at this level. Measures for mitigation should be made at individual site level as part of any EIAs required, to ensure that any potential for negative impacts to arise are avoided.

## 9.3 Monitoring

Although it is unlikely that the Southampton LFRMS will have any adverse effects on the environment, it is a requirement of the SEA Directive for all impacts to be monitored. Monitoring of the LFRMS will enable the identification of any unforeseen adverse effects and allow Southampton City Council to undertake any appropriate remedial works required, as well as recording the success of any enhancement schemes implemented.

The Southampton LFRMS has been developed to manage flood risk over the next 5 years; therefore a review of the Strategy will provide a good opportunity to also review any changes to the baseline data. Should a review of the strategy be required sooner, the environmental baseline shall also be reviewed in order to keep it up-to-date.

Table 20 shows the draft SEA monitoring framework and the potential monitoring indicators for each SEA objective. Data required for the monitoring of the LFRMS implementation can come from a number of sources with much of the data obtainable including Southampton City Council, the Environment Agency, Natural England and English Heritage. The indicators listed are suggestions for monitoring the Strategy implementation; however limited resources and data availability may cause problems with collection of data.

**Table 20: SEA Monitoring Framework**

SEA Objective	Potential Monitoring Indicators	Responsible
1. Minimise the risk of flooding (Flood Risk)	<ul style="list-style-type: none"> <li>- Number of properties and businesses at risk of flooding.</li> <li>- Number of new developments in flood risk areas.</li> <li>- Number of new flood defences/ measures implemented reducing flood risk to properties.</li> <li>- Number of new Sustainable Drainage Systems implemented</li> </ul>	SCC

<p><b>2.</b> Conserve and seek to enhance biodiversity, flora and fauna. (Biodiversity)</p>	<ul style="list-style-type: none"> <li>- Changes in condition of designated sites.</li> <li>- Chemical and ecological status of rivers and water bodies.</li> <li>- Changes in ecological potential.</li> <li>- Number of proposed flood mitigation schemes located within green spaces.</li> <li>- Achievements of Biodiversity Action Plan targets.</li> <li>- Number of SuDS schemes introduced.</li> </ul>	<p>Natural England SCC</p>
<p><b>3.</b> Protect and enhance human health, quality of life and wellbeing. (Population)</p>	<ul style="list-style-type: none"> <li>- Number of properties at risk of flooding.</li> <li>- Number of individuals at risk of flooding.</li> <li>- Number of developments in flood risk areas.</li> <li>- Number of flood related health problems or injuries.</li> </ul>	<p>SCC Environment Agency NHS Southampton</p>
<p><b>4.</b> Maintain, improve and where possible create new public access to green space and rights of way. (Health)</p>	<ul style="list-style-type: none"> <li>- Number of public open spaces, recreational and amenity facilities.</li> <li>- Number of access points to water such as public hards and slipways.</li> </ul>	<p>SCC</p>
<p><b>5.</b> Protect and enhance water quality and availability of water resources. (Water)</p>	<ul style="list-style-type: none"> <li>- Chemical and ecological status of watercourses.</li> <li>- Number of water bodies meeting the targets of the Water Framework Directive.</li> <li>- Record of low flow frequency</li> <li>- Number of water meters installed</li> </ul>	<p>Environment Agency Southern Water</p>
<p><b>6.</b> Minimise the potential impact of flooding to transport and other critical infrastructure, both at present and in the future. (Material Assets)</p>	<ul style="list-style-type: none"> <li>- Number of flood incidents causing disruption to transport.</li> <li>- Number of flood incidents causing disruption to service provision.</li> <li>- Number of schools at risk of flooding, or disrupted because of flooding.</li> <li>- Severity of flooding.</li> <li>- Estimated cost of flood damage.</li> </ul>	<p>SCC Highways Environment Agency Defra</p>
<p><b>7.</b> Protect soils, geological resources and natural landscapes within the city. (Soils and Geology)</p>	<ul style="list-style-type: none"> <li>- Number of proposed flood mitigation measures in areas where landfill sites or industry exists, or has existed.</li> <li>- Number of proposed flood alleviation schemes in green spaces.</li> </ul>	<p>Environment Agency SCC</p>

<p><b>8.</b> Adapt new and existing developments to the impacts of climate change. (Climate Change)</p>	<ul style="list-style-type: none"> <li>- Indicative floodplains under current conditions and under climate change scenario conditions.</li> <li>- Change to CO2 emissions.</li> <li>- Ecological footprint.</li> <li>- Changes in energy consumption.</li> </ul>	<p>SCC Environment Agency</p>
<p><b>9.</b> Conserve and seek to enhance sites of cultural, archaeological and architectural heritage, including listed buildings. (Heritage)</p>	<ul style="list-style-type: none"> <li>- Reduction in the number of listed buildings at risk.</li> <li>- Reduction in the number of scheduled monuments at risk.</li> <li>- Reduction in the number of registered parks at risk of flooding</li> <li>- The number of schemes implemented to protect historic or cultural sites and whether the proposed measures adversely effect the significance of risk</li> </ul>	<p>English Heritage SCC</p>

## 10. Next Steps

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It is recommended that the Southampton LFRMS is subject to a five-yearly review process, including full public involvement to ensure it is kept up-to-date, takes account of objectives achieved, and continues to maintain a focused forward programme. To reflect this, the SEA Environmental Report will also be reviewed on a five-year cycle, with the impacts of the objectives and actions being carefully monitored to ensure impacts are kept to a minimum.

# Appendices

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**Appendix A:** Plans, Programmes and Policy Review

**Appendix B:** Baseline Data

**Appendix C:** Consultation Responses



# Appendix A:

# Plans, Programmes and Policy Review

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# Introduction

Southampton City Council, as a Lead Local Flood Authority (LLFA) has a duty to develop a Local Flood Risk Management Strategy (LFRMS) which outlines the proposed options for the management of the local flood risks that face the city of Southampton. Preparation and development of the LFRMS began in October 2012.

Alongside the LFRMS, a Strategic Environmental Assessment (SEA) is being carried out to assess the potential and likely impacts of the strategy on various environmental receptors. The SEA is being carried out 'in-house' by Southampton City Council's flood risk team, with work beginning at the same time as the preparation of the LFRMS in October 2012.

This document is Appendix A of the SEA Scoping Report for the Southampton LFRMS. It includes an overview of the plans, programmes and policies that are relevant to the strategy and should be considered during the development.

## **Task A1: Review of Relevant Plans, Policies and Programmes**

The SEA Directive states that the Environmental Report shall include information on

*'the relationship [of the plan or programme] with other relevant plans and programmes'*

- Annex 1(a)

And

*'the environmental protection objectives established at international, community or national level, which are relevant to the plan or programme and the way those objectives and environmental considerations have been taken into account during its preparation'*

- Annex 1(e)

The LFRMS must comply with existing policies, plans and programmes at international, national and regional levels and strengthen and support local plans and strategies. It is therefore important to identify and review those policies, plans and programmes and environmental protection objectives which are relevant to both the LFRMS and the SEA at an early stage. This allows any inconsistencies or constraints within the LFRMS to be addressed and also to help develop the SEA framework. Plans, policies and programmes that have been identified as being of relevance to the LFRMS have been listed in table 1 over the page.

Table 1: Key Plans, Programmes and Policies

<b>International Plans and Programmes</b>
<ul style="list-style-type: none"> <li>• EU Floods Directive – Directive 2007/60/EC on the assessment and management of flood risks (2007)</li> <li>• EU Water Framework Directive – Directive 2000/60/EC on the European Parliament and of the Council establishing a framework for the community action in the field of water policy (2000)</li> <li>• EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora - 92/43/EEC (1992)</li> <li>• EC Directive 2009/147/EC on the Conservation of Wild Birds (2009)</li> </ul>
<b>National Plans and Programmes</b>
<ul style="list-style-type: none"> <li>• Flood and Water Management Act (2011)</li> <li>• Land Drainage Act (1991) (As Amended 2004)</li> <li>• Water Act (2003)</li> <li>• Flood Risk Regulations (2009)</li> <li>• Making Space for Water (2005)</li> <li>• The National Flood and Coastal Erosion Risk Management Strategy for England (2011)</li> <li>• National Planning Policy Framework (2012)</li> <li>• Future Water: The Government's Water Strategy (2008)</li> <li>• Directing the Flow: Priorities for Future Water Policy (2002)</li> <li>• The Impact of Flooding on Urban and Rural Communities (2005)</li> <li>• Environment Agency Policy: Sustainable Urban Drainage Systems (2002)</li> <li>• Civil Contingencies Act (2004)</li> <li>• Securing the Future: Delivering the Sustainable Development Strategy (2005)</li> <li>• Countryside and Rights of Way Act (2000)</li> <li>• UK Biodiversity Action Plan</li> </ul>
<b>Sub-National Plans and Programmes</b>
<ul style="list-style-type: none"> <li>• River Basin Management Plan South East River Basin District (2009)</li> </ul>

- North Solent Shoreline Management Plan (2010)
- Test and Itchen Catchment Flood Management Plan (2008)
- Partnership for Urban South Hampshire: Strategic Flood Risk Assessment (2007)
- Partnership for Urban South Hampshire Economic Development Strategy (2010)
- South Hampshire Integrated Water Management Strategy (2009) (Commissioned by PUSH)
- Hampshire Minerals and Waste Core Strategy (2007)
- The South East Biodiversity Strategy (2009)

### Local Plans and Programmes

- Southampton Surface Water Management Plan (2011)
- Southampton Coastal Flood and Erosion Risk Management Strategy (2012)
- Southampton Preliminary Flood Risk Assessment (2011)
- Level 2 Strategic Flood Risk Assessment (2010)
- River Itchen, Weston Shore, Netley and Hamble Coastal Study (2011)
- Southampton Biodiversity Action Plan: An Update on the 1992 Conservation Strategy (2006)
- Local Development Framework Core Strategy Development Plan (2010)
- Southampton Low Carbon City Strategy 2011-2020
- Local Transport Plan 3

It is recognised that no list of plans or programmes can be definitive and as a result, this report describes only the key documents which influence the LFRMS. The key documents identified are those which will be used throughout the preparation of the LFRMS and to inform the SEA process, including the environmental baseline.

The plans have been reviewed and the key messages, aims and objectives are detailed in table 2. This table also shows the relevance to the LFRMS.

Table 2: *International, National, Sub-National and Local Plans, Policies and Programmes Review*

International Plans, Programmes and Policies		
Plan or Programme	Main Aims, Objectives and Requirements	Relevance to LFRMS and SEA
<b>EU Floods Directive – Directive 2007/60/EC on the assessment and management of flood risks (2007)</b>	<ul style="list-style-type: none"> <li>• Aims to reduce and manage the risks that flooding poses to human health, the environment, cultural heritage and economic activity.</li> <li>• Requires Member States to carry out a preliminary flood risk assessment by 2011 to identify river basins and coastal areas at risk of flooding and draw up flood maps for the zones at risk by 2013. A flood risk management plan focusing on prevention, protection and preparedness must be completed by 2015.</li> </ul>	<p>The powers and duties resulting from this Directive will be accounted for during development of the LFRMS.</p> <p><b>SEA Topics:</b> Water, human health, cultural heritage, biodiversity.</p>
<b>EU Water Framework Directive – Directive 2000/60/EC on the European Parliament and of the Council establishing a framework for the community action in the field of water policy (2000)</b>	<ul style="list-style-type: none"> <li>• Aims to improve and integrate the management of water bodies across Europe. All inland and coastal waters must reach good chemical and ecological status by 2015.</li> <li>• Designed to- <ul style="list-style-type: none"> <li>- Enhance the status and prevent deterioration of aquatic ecosystems and associated wetlands</li> <li>- Promote sustainable water use</li> <li>- Reduce pollution of water</li> <li>- Reduce groundwater pollution</li> </ul> </li> </ul>	<p>The LFRMS must consider the requirements of the WFD and ensure the objectives are not compromised. It must also encourage sustainable water use and seek opportunities to improve drainage and water quality.</p> <p><b>SEA Topics:</b> Water, biodiversity, human health</p>

<p><b>EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora - 92/43/EEC (1992)</b></p> <p><b>(The Habitats Directive)</b></p>	<ul style="list-style-type: none"> <li>• Transposed into English law through the Conservation of Habitats and Species Regulations 2010.</li> <li>• Projects can only be permitted in these sites where there are no adverse effects on the site integrity.</li> <li>• Where there are no alternatives and imperative reasons for overriding public interest, projects may still be granted.</li> <li>• The Directive details a number of habitats and individual species which are to be protected by a network of sites across Europe which area known as Special Areas of Conservation (SACs).</li> <li>• Requires linear structures such as hedgerows, field boundaries, rivers/streams and ponds that enable movement and migration of species to be preserved (Article 10)</li> </ul>	<p>The LFRMS needs to avoid adverse impacts on SPAs, SACs and Ramsar sites. Where possible it should seek to enhance these sites.</p> <p>A Habitats Regulations Assessment (HRA) will be undertaken at the same time as the strategy development to assess the potential effects.</p> <p><b>SEA Topic: Biodiversity</b></p>
<p><b>EC Directive 2009/147/EC on the Conservation of Wild Birds (2009)</b></p> <p><b>(The Birds Directive)</b></p>	<ul style="list-style-type: none"> <li>• Transposed into English law through the Wildlife &amp; Countryside Act 1981 (as amended) and Conservation of Habitats and Species Regulations 2010.</li> <li>• Maintain the populations of all wild bird species across their natural range.</li> <li>• Identify and classify Special Protection Areas (SPAs) for rare or vulnerable species listed in Annex I of the Directive, as well as for all regularly occurring migratory species, paying particular attention to the protection of wetlands of international importance.</li> <li>• Establishment of a general scheme for the protection of wild bird species.</li> </ul>	<p>The LFRMS needs to avoid adverse impacts of SPAs and Ramsar sites. Where possible it should seek to enhance these sites.</p> <p>A Habitats Regulations Assessment (HRA) will be undertaken at the same time as the strategy development to assess the potential effects.</p> <p><b>SEA Topic: Biodiversity</b></p>

<p><b>The European Convention on the Protection of Archaeological Heritage (1992)</b></p> <p><b>(Valetta Convention)</b></p>	<ul style="list-style-type: none"> <li>• Adopted on 16<sup>th</sup> January 1992 and came into force 25<sup>th</sup> May 1995</li> <li>• Makes the conservation and enhancement of the archaeological heritage one of the goals of urban and regional planning policies.</li> <li>• Concerned with the co-operation among archaeologists and town regional planners in order to ensure optimum conservation or archaeological heritage.</li> <li>• The Convention sets guidelines for the funding of excavation and research work and publication of research findings. It also deals with public access, in particular to archaeological sites, and educational actions to be undertaken to develop public awareness of the value of archaeological heritage.</li> </ul>	<p>The LFRMS needs to ensure that buildings and areas of architectural or archaeological heritage are not adversely affected.</p> <p>The Strategy should seek to enhance, where possible, sites of architectural or archaeological heritage.</p> <p><b>SEA Topic:</b> Cultural, Architectural and Archaeological Heritage</p>
<p><b>The Convention for the Protection of the Architectural Heritage of Europe (1985)</b></p> <p><b>(The Granada Convention)</b></p>	<ul style="list-style-type: none"> <li>• Formally known as the European Charter of the Architectural Heritage.</li> <li>• Defines ‘architectural heritage’ and each signatory promises to maintain an inventory of it, taking statutory measures to protect it.</li> <li>• Signatories (including the UK) also promise to adopt integrated conservation policies in their planning systems and other spheres of government influence that promote the conservation and enhancement of architectural heritage and the fostering of traditional skills.</li> </ul>	<p>The LFRMS needs to ensure that buildings and areas of architectural or archaeological heritage are not adversely affected.</p> <p>The Strategy should seek to enhance, where possible, sites of architectural or archaeological heritage.</p> <p><b>SEA Topic:</b> Cultural, Architectural and Archaeological Heritage</p>

National Plans, Programmes and Policies		
Plan or Programme	Main Aims, Objectives and Requirements	Relevance to LFRMS and SEA
<b>Flood and Water Management Act (2010)</b>	<ul style="list-style-type: none"> <li>• Aims for flood and coastal erosion risk management authorities to contribute towards the achievement of sustainable development and the management of local flood risks from groundwater, surface runoff and ordinary watercourses.</li> <li>• Places a duty on flood risk management authorities to cooperate with each other and provides Lead Local Flood Authorities (LLFAs) and the Environment Agencies (EA) with a power to request information.</li> </ul>	<p>The FWMA is the driving Act behind the LFRMS, setting out the requirements and duties of LLFAs. Should be a priority.</p> <p><b>SEA Topics:</b> All</p>
<b>Land Drainage Act (1991) (As Amended 2004)</b>	<ul style="list-style-type: none"> <li>• Requires a watercourse to be maintained by its owner in such a condition that the free flow of water is not impeded.</li> <li>• Grants Local Authorities certain permissive and enforcement powers to undertake flood defence works.</li> </ul>	<p>The LFRMS should account for all responsibilities and powers designated under the Land Drainage Act.</p> <p><b>SEA Topics:</b> All</p>
<b>Water Act (2003)</b>	<ul style="list-style-type: none"> <li>• Amends the Water Resources Act 1991 to improve long term water resource management.</li> <li>• Aims to provide for the establishment and the functions of the Water Services Regulation Authority and the Consumer Council for Water to make provision in the connection with flood defence and land drainage.</li> <li>• To make provisions about contaminated land so far as it relates to the pollution of controlled waters.</li> </ul>	<p>Powers and duties resulting from this Act should be taken into account in the LFRMS.</p> <p><b>SEA Topics:</b> Water and water quality</p>



<p><b>Flood Risk Regulations (2009)</b></p>	<ul style="list-style-type: none"> <li>• Implements the requirements of the European Floods Directive which aims to provide a consistent approach to managing flood risk across Europe.</li> <li>• LLFAs and the EA have a duty to prepare a Preliminary Flood Risk Assessment (PFRA) in relation to river basin districts and local authority areas, and identify at risk areas with the creation of flood maps.</li> </ul>	<p>The LFRMS shall take on board the objectives of the Flood Risk Regulations and the information provided in the PFRA.</p> <p><b>SEA Topics:</b> Water and water quality, human health, cultural heritage and biodiversity.</p>
<p><b>Making Space for Water (2005)</b></p>	<ul style="list-style-type: none"> <li>• Takes a holistic approach to ensure adaptability to climate change becomes integral to flood and coastal erosion management decisions. Gives the EA a greater strategic role in flood risk management.</li> <li>• The strategy has an emphasis on land use planning and flood resilience measures and sets out steps to tackle flooding.</li> </ul>	<p>This strategy is a key driver to the Flood Risk Management Strategic approach. The LFRMS shall consider the measures outlined in the Making Space for Water report.</p> <p><b>SEA Topics:</b> Water, material assets and population</p>
<p><b>The National Flood and Coastal Erosion Risk Management Strategy for England (2011)</b></p>	<ul style="list-style-type: none"> <li>• Aims to help risk management authorities and communities understand their different roles and responsibilities.</li> <li>• Encourages a more effective risk management to ensure there is a clear understanding of flood and coastal erosion risks both nationally and locally.</li> <li>• Sets out clear and consistent plans for risk management so that communities and businesses can make informed decisions about the management of risk.</li> <li>• Ensures that emergency plans and responses to flood incidents are effective and that communities are able to respond effectively to flood warnings, forecasts and advice and are able to recover quickly after incidents.</li> </ul>	<p>Acts as a guidance document for LLFAs. The LFRMS must be consistent with the National Flood and Coastal Erosion Risk Management Strategy.</p> <p><b>SEA Topics:</b> All</p>

<p><b>National Planning Policy Framework (2012)</b></p>	<ul style="list-style-type: none"> <li>• Sets out the Government’s economic, environmental and social planning policies for England.</li> <li>• Provides a framework within which local people and Councils can produce their own distinctive local and neighbourhood plans reflecting the needs and priorities of their own communities.</li> <li>• In favour of sustainable development.</li> <li>• Reinforces the requirement for sustainability appraisals stating it should be an ‘integrated part of the plan preparation process and should consider all likely significant effects on the environment, economic and social factors’.</li> </ul>	<p>The LFRMS should be prepared in line with the national sustainable development policy taking into account of the overarching aims and objectives.</p> <p><b>SEA Topics:</b> All</p>
<p><b>Future Water: The Government’s Water Strategy (2008)</b></p>	<ul style="list-style-type: none"> <li>• Sets out how the water sector should look by 2030 and the steps required to get there. It aims to see an improvement in rivers, canals, lakes and seas for people and wildlife and the continued provision of excellent quality drinking water.</li> <li>• The vision is for a sector that values and protects water resources, delivers water to customers fairly and addresses flood risk through good surface water management and a sector that is resilient to climate change and population growth with forward planning in tune with these adaptation challenges.</li> </ul>	<p>The Future Water Strategy is a prime piece of national legislation concerning water as a valuable resource. The LFRMS should consider the objectives set out in this strategy.</p> <p><b>SEA Topics:</b> All</p>

<p><b>Directing the Flow: Priorities for Future Water Policy (2002)</b></p>	<ul style="list-style-type: none"> <li>• Sets the strategic aims and summaries the proposed future priorities and direction for the water environment, water resources, water management and sewerage systems.</li> <li>• Emphasises the need to integrate the different aspects of water policy including water quality, resources and flood management, and greater integration of water policies in other areas additional to health.</li> </ul>	<p>This policy is a key driver for the LFRMS approach and should be considered in the strategy development.</p> <p><b>SEA Topics:</b> All</p>
<p><b>Environment Agency Policy: Sustainable Urban Drainage Systems (SuDS) (2002)</b></p>	<ul style="list-style-type: none"> <li>• Adopted policy that the EA will promote SuDS as a technique to manage surface and groundwater regimes sustainably through two key objectives:             <ul style="list-style-type: none"> <li>- To establish SuDS as normal drainage practice where appropriate for new developments in England and Wales.</li> <li>- Retrofitting SuDS on existing surface water drainage systems which have and adverse effect on the environment</li> </ul> </li> </ul>	<p>SuDS are considered to be a key tool in the alleviation of flood risks and impacts. The LFRMS should consider the SuDS policy when deciding upon appropriate flood alleviation measures.</p> <p><b>SEA Topics:</b> Water and water quality, population, human health, material assets, climate change and biodiversity.</p>
<p><b>Civil Contingencies Act (2004)</b></p>	<ul style="list-style-type: none"> <li>• Separated into two parts, the Act delivers a single framework for civil protection in the UK covering a range of emergencies.</li> <li>• Moves emphasis of civil protection away from just planning and response towards resilience planning arrangements.</li> <li>• Gives Local Authorities a range of new duties including assessing the risk of an emergency which requires the need to carry out a risk assessment of past incidents as well as likely future incidents.</li> </ul>	<p>The duties and powers resulting from this Act should be accounted for in the LFRMS.</p> <p><b>SEA Topics:</b> Population and human health</p>

<p><b>Securing the Future: Delivering the Sustainable Development Strategy (2005)</b></p>	<ul style="list-style-type: none"> <li>• Sets out the Government’s new approach to sustainable development and new shared priorities agreed across the UK.</li> <li>• Promotes sustainability by the involvement of people and communities.</li> <li>• Includes ways to adapt to climate change, including flooding and coastal management.</li> </ul>	<p>The LFRMS should take into account the approach set out in the Government Strategy, and consider measures to adapt to climate change.</p> <p><b>SEA Topics:</b> Climate change, population and human health, material assets, water and water quality.</p>
<p><b>Countryside and Rights of Way Act (2000)</b></p>	<ul style="list-style-type: none"> <li>• Extends the protections afforded to Sites of Special Scientific Interest (SSSI) through specific consent procedures, duties and the introduction of fines and imprisonment for damaging sites and protected wildlife.</li> </ul>	<p>Impacts that the LFRMS has on natural habitats and designated areas need to be considered.</p> <p><b>SEA Topics:</b> Biodiversity</p>
<p><b>UK Biodiversity Action Plan</b></p>	<ul style="list-style-type: none"> <li>• Represents a national strategy for the conservation of biological diversity and the sustainable use of biological resources. It is supported by Local Biodiversity Action Plans developed by Local Authorities.</li> <li>• Identifies 391 Species Action Plan and 45 Habitat Action Plans.</li> <li>• It aims to conserve, promote and enhance species and habitats whilst developing public understanding and awareness.</li> </ul>	<p>The LFRMS must ensure that developed options do not have any adverse impacts on priority UK BAP habitats or species, and where possible seek to enhance these habitats.</p> <p><b>SEA Topics:</b> Biodiversity</p>

<p><b>National Heritage Protection Plan</b></p>	<ul style="list-style-type: none"> <li>• The National Heritage Protection Plan (NHPP) sets out how English Heritage together with partners in the heritage sector will prioritise and deliver heritage protection from 2011 to 2015.</li> <li>• The objective is to make the best use of resources so that England’s vulnerable historic environment is safeguarded in the most cost-effective way at a time of massive social, environmental, economic and technological change.</li> </ul>	<p>The LFRMS must seek to enhance and protect sites of national heritage.</p> <p><b>SEA Topics:</b> Cultural, Architectural and Archaeological Heritage</p>
<p><b>Sub-National Plans, Programmes and Policies</b></p>		
<p><b>Plan or Programme</b></p>	<p><b>Key Objectives, Aims and Requirements</b></p>	<p><b>Relevance to LFRMS and SEA</b></p>
<p><b>River Basin Management Plan South East River Basin District (2009)</b></p>	<ul style="list-style-type: none"> <li>• Responsibility for the preparation of the plan for the South East River Basin District, as a requirement of the WFD 2010, falls with the EA.</li> <li>• Overarching objectives of the plan are to prevent deterioration and enhance the condition of aquatic ecosystems including wetlands and groundwater, promote sustainable water use, reduce pollution and contribute to the mitigation of floods and droughts.</li> <li>• Sets out a list of actions to improve the water environment by 2015 and the timescale for doing so.</li> </ul>	<p>The objectives and actions set out in the River Basin Management Plan should be considered during the development of the LFRMS.</p> <p><b>SEA Topics:</b> Water and water quality, biodiversity.</p>

<p><b>North Solent Shoreline Management Plan (2010)</b></p>	<ul style="list-style-type: none"> <li>• The North Solent Shoreline Management Plan (SMP) provides a large scale assessment of the risks associated with shoreline evolution, coastal flooding and erosion.</li> <li>• Presents a policy framework to address the risks to people and the developed, historic and natural environment.</li> </ul>	<p>The objectives and aims of the North Solent SMP should be considered in the LFRMS, and the potential cumulative flood risk impacts should be considered in the SEA.</p> <p><b>SEA Topics:</b> Water, climate change, population, human health and material assets.</p>
<p><b>Test and Itchen Catchment Flood Management Plan (2008)</b></p>	<ul style="list-style-type: none"> <li>• Catchment Flood Management Plans (CFMP) consider all types of flooding from inland sources (groundwater, surface water, rivers and tidal) but not coastal flooding, which is covered by the SMP.</li> <li>• The role of the CFMP is to establish flood risk management policies which will deliver sustainable flood risk management for the long term, including consideration for the impacts of climate change. It helps to target resources to areas of greatest need.</li> <li>• Gives an overview of the flood risk in the Test and Itchen catchment by breaking it down into 9 areas. It sets out the preferred plan for sustainable flood risk management over the next 50 to 100 years.</li> <li>• Identifies flood risk management policies to assist all key decision makers in the catchment and is the first step towards an integrated approach to flood risk management.</li> </ul>	<p>The overarching objectives of the strategy should be considered in the LFRMS. Where possible the LFRMS should aim to protect and enhance water resources.</p> <p><b>SEA Topics:</b> Water and water quality, biodiversity.</p>

<p><b>Partnership for Urban South Hampshire: Strategic Flood Risk Assessment (2007)</b></p>	<ul style="list-style-type: none"> <li>Partnership for Urban South Hampshire (PUSH) is a review of the flood risk facing the South Hampshire region, considering the impacts of existing and future flooding.</li> <li>Without further investment in flood protection, the SFRA indicates that Southampton may be prone to an unacceptable flood risk. PUSH recognises the need to give careful consideration to the implications of coastal/tidal and fluvial flooding in developments and is working with the EA on ways to improve flood protection to areas including those already protected but to a standard that should be improved.</li> </ul>	<p>Any flood risk areas identified in the SFRA should be accounted for in the LFRMS and SEA.</p> <p><b>SEA Topics:</b> Water, population</p>
<p><b>Partnership for Urban South Hampshire Economic Development Strategy (2010)</b></p>	<ul style="list-style-type: none"> <li>The quality of infrastructure, homes and flood defences is critical to creating a sustainable place where people want to live, invest, work and visit.</li> <li>The strategy highlights that Southampton faces very real challenges in terms of flood risk which require mitigation and wider infrastructure developments to open up sites for development.</li> </ul>	<p>Options developed by the LFRMS have the potential to improve the local economy and develop sustainable areas. The Strategy should therefore take account of the objectives set out in the PUSH Economic Development Strategy.</p> <p><b>SEA Topics:</b> All</p>
<p><b>South Hampshire Integrated Water Management Strategy (2009) (Commissioned by PUSH)</b></p>	<ul style="list-style-type: none"> <li>There are three objectives of the Integrated Water Management Strategy (IWMS). They are: <ul style="list-style-type: none"> <li>To guide and inform the level and location of development to be accommodated in South Hampshire in accordance with the Draft South East Plan.</li> <li>Identify a preferred high level strategy for water management for the period to 2026, including the general</li> </ul> </li> </ul>	<p>The objectives shall be accounted for in the LFRMS</p> <p><b>SEA Topics:</b> Water, population and human health, cultural heritage, biodiversity.</p>

	<p>location and timing of infrastructure requirements.</p> <ul style="list-style-type: none"> <li>- To identify the further work necessary to implement the preferred strategy and to monitor its effectiveness over the plan period.</li> <li>• The report sets out the relevant environmental background, the approach taken to the IWMS, key contributing organisations and the agreed issues warranting priority attention due to the nature and scale of their potential constraints on future development.</li> <li>• Three priority issues are identified as water supply, wastewater management and flood risk.</li> </ul>	
<p><b>The South East Biodiversity Strategy (2009)</b></p>	<ul style="list-style-type: none"> <li>• The South East Biodiversity Strategy (SEBS) provides a logical vision and the framework for action, seeking to encourage people to make a difference to the regions biodiversity assets. It provides guidance on the opportunities that exist for action that will make a significant difference.</li> <li>• The aims of the strategy are: <ul style="list-style-type: none"> <li>- To be a clear, consistent and inspiring vision for the south east.</li> <li>- Provide a framework for the delivery of biodiversity targets that guide and support all those who have an impact on biodiversity in the region.</li> <li>- Embed a landscape scale approach to restoring whole ecosystems in the working practices and policies of all partners.</li> <li>- Create the space needed for wildlife to respond to climate change.</li> </ul> </li> </ul>	<p>Priorities identified in the SEBS will need to be accounted for in the LFRMS and any developed schemes.</p> <p><b>SEA Topics:</b> Biodiversity</p>



	<ul style="list-style-type: none"> <li>- Enable all organisations in the south east to support and improve biodiversity across the region.</li> <li>- Be a core element within the strategies and delivery plans of organisations across the south east region.</li> </ul>	
<b>Local Plans, Policies and Programmes</b>		
<b>Plan or Programme</b>	<b>Key Objectives, Aims and Requirements</b>	<b>Relevance to LFRMS and SEA</b>
<p><b>Southampton Surface Water Management Plan (2011)</b></p>	<ul style="list-style-type: none"> <li>• Details the preferred surface water management strategy for the Southampton area based upon the analysis of all the elements contributing to or having an effect on surface water.</li> <li>• The main objective of the Southampton Surface Water Management Plan (SWMP) is to determine the causes and effects of surface water flooding which affects the city and identify the most cost effective way of managing flood risk for the long term.</li> <li>• The SWMP identifies the flooding hotspots and proposes options for flood risk management. It aims to develop a strategy which will contribute to the strategic planning of drainage provision in new developments and develop an implementation plan showing how partners and stakeholders will be affected by strategy implementation.</li> </ul>	<p>The key findings and objectives of the SWMP shall be incorporated into the LFRMS. Considerations should be made for the flooding hotspots identified.</p> <p><b>SEA Topics: All</b></p>

<p><b>Southampton Coastal Flood and Erosion Risk Management Strategy (2012)</b></p>	<ul style="list-style-type: none"> <li>• The Southampton Coastal Flood and Erosion Risk Management Strategy (CFERMS), formerly known as the Coastal Defence Strategy, is a non-statutory document providing a high level basis for decision making and action related to the management of the coastline.</li> <li>• The strategy provides more detail to a smaller geographical area within the overarching Shoreline Management Plan, appraising a range of coastal defence options to determine the most beneficial and cost effective method for managing risks such as flooding, erosion and sea level rise.</li> </ul>	<p>The objectives of the CFERMS should be considered in the LFRMS. Parts of the SEA report can be reused to inform the SEA for the LFRMS.</p> <p><b>SEA Topics:</b> Water</p>
<p><b>Southampton Preliminary Flood Risk Assessment (2011)</b></p>	<ul style="list-style-type: none"> <li>• The Preliminary Flood Risk Assessment (PFRA) is a summary of flood risk from local sources within Southampton. The assessment provides a high level summary of significant flood risk from surface water, ordinary watercourses and groundwater, and describes the probability and harmful consequences of past and future flooding.</li> <li>• The assessment takes account of topography, location and characteristics of watercourses, the location of homes and economic activity and the predicted impact of climate change.</li> </ul>	<p>The LFRMS will build on and incorporate the findings from the Southampton PFRA.</p> <p><b>SEA Topics:</b> ALL</p>

<p><b>Level 2 Strategic Flood Risk Assessment (2010)</b></p>	<ul style="list-style-type: none"> <li>• PUSH has completed a Strategic Flood Risk Assessment (SFRA) which provides essential information on flood risk, taking account of climate change to provide a greater understanding of the risks across the sub-region and individual local authority areas to allow proper application of the Sequential Test. It is a live document which is intended to be updated as new guidance and information becomes available.</li> <li>• The principle objective of the Level 2 SFRA is to facilitate the application of the Sequential and Exception Tests. There are three aims to achieve this objective which are:             <ul style="list-style-type: none"> <li>- Inform policies and plans to ensure future developments, where appropriate, have been subjected rigorously to the applications of the Sequential and Exception Tests, satisfying PPS25.</li> <li>- Identify strategies to limit flood risks and adapt to climate change.</li> <li>- Ensure the safety of new developments.</li> </ul> </li> </ul>	<p>The Level 2 SFRA shall be used to inform the LFRMS and objectives from it should be incorporated.</p> <p><b>SEA Topics:</b> Population, material assets.</p>
<p><b>Southampton Biodiversity Action Plan: An Update on the 1992 Conservation Strategy (2006)</b></p>	<ul style="list-style-type: none"> <li>• The BAP contains up-to-date information about the requirements for, and status of, nature conservation in Southampton based on legislation, other city strategies, policies and plans together with local community requirements. It establishes the policy direction for Southampton City Council's approach to natural environmental issues.</li> <li>• The Southampton BAP lists the protected habitats and species and the local priority wildlife found in the city.</li> </ul>	<p>Actions which threaten species and habitats listed within the BAP must be taken into account as to avoid damage to conservation and wildlife sites. Where possible the LFRMS should seek to enhance and improve biodiversity.</p> <p><b>SEA Topics:</b> Biodiversity</p>

<p><b>Local Development Framework Core Strategy Development Plan (2010)</b></p>	<ul style="list-style-type: none"> <li>• The Local Development Framework (LDF) is the new type of development plan for the city replacing the Local Plan Review which was adopted in March 2006.</li> <li>• It contains planning policies to guide the development and use of land and those which affect the nature of places and how they function.</li> <li>• The LDF will reflect the overall priorities of the council and help deliver the vision for a prosperous, attractive and sustainable city through the right development.</li> <li>• The LDF will consist of a number of documents, however this documents sets out the key strategic elements of the planning framework for the city until 2026.</li> </ul>	<p>All aspects of the LDF should be considered in the development of the LFRMS.</p> <p><b>SEA Topics:</b> All</p>
<p><b>Southampton Local Transport Plan 3 (2011-2031)</b></p>	<ul style="list-style-type: none"> <li>• This plan guides the development of the transport network within the city until 2031. It sets out the strategy and policies for future transport development within the city, in line with government policies and the priorities for transport projects addressing a range of current and future challenges.</li> <li>• Challenges include reducing the environmental impacts of travel and transport, whilst adapting to cope with anticipated impacts of climate change, and improving access to the city.</li> <li>• It is split into two sections: the strategy and its implementation.</li> </ul>	<p>The LFRMS options should consider the objectives of the Local Transport Plan, especially those related to the adaptation to climate change.</p> <p><b>SEA Topics:</b> Population and material assets (transport infrastructure in particular)</p>

## ***1.1 Summary of the Review***

The main themes and objectives identified through the review of the key documents can be broadly summarised as:

- Ensuring no harm is brought to nature conservation sites designated at national and international level.
- Protecting and enhancing open spaces, recreational opportunities and improving access to the countryside.
- Protecting and enhancing the natural and historic environment.
- Sustainable consumption and use of natural resources including waste prevention and recycling.
- Promoting safer and sustainable development.
- Achieving economic prosperity.

In addition to the general themes, more specific messages for flood risk management in Southampton are:

- Reducing the vulnerability of flood events and impacts to Southampton's residents.
- Reducing the impact of flooding on economic activity throughout the city.
- Ensure flood management proposals do not have a detrimental effect on the environment.

# Appendix B: Baseline Data

# 1 Introduction

**The SEA Directive states that the baseline information collected must include –**

*‘relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme’*

- Annex 1(b)

And

*‘the environmental characteristics of areas likely to be significantly affected’*

- Annex 1(c)

And

*‘any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC and 92/43/EEC’*

- Annex 1(d)

Task A2 of the SEA is the collection of baseline data. It is important to collect sufficient baseline information to define the current state, and likely future state, of the environment. It is used to provide the basis for the prediction and monitoring the potential and likely significant effects of the LFRMS once implemented. It helps to identify the environmental problems at an early stage in the development of the strategy which allows time for alternative methods of delivery to be developed and assessed, before the strategy is adopted and implemented.

Where it is possible data, should be collected where it is able to show either a spatial or temporal trend. This allows for a more informed judgement of the current situation in terms of sustainability baseline of certain areas relative to others.

## 1.1 Scope of the SEA

The assessment of the significant environmental effects of a plan or programme is a requirement of the SEA regulations. Identified within Annex 1 of the SEA Directive are a number of environmental issues which require consideration. They include:

- Population and human health
- Biodiversity including flora and fauna
- Soil, geology and geomorphology
- Water quality
- Air quality
- Climate change

- Material assets
- Cultural, architectural and archaeological heritage
- Landscape
- The inter-relationship between the above factors.

The purpose of the Scoping Stage is to identify the environmental receptors that are likely to be '*significantly affected*' by the strategy, therefore the above list serves only as a starting point when considering the data required to set the environmental baseline. Where it is unlikely to be any significant effects upon a particular receptor it is possible to scope them out of the assessment, providing a reason for doing so is provided.

## 1.2 Baseline by Topic

A section on each topic listed in this section shall be reviewed to identify the receptors where there is likely to be a significant effect, and scope out those where an effect is considered unlikely. Numerous secondary sources have been used to collect the baseline data and have been referenced in the footnotes at the bottom of each page.

Since no new investigations or surveys have been carried out, the most up to date data available has been used in this report. It is important therefore to note that the baseline may change over time as new data becomes available.

## 1.3 Population and Human Health

Protecting the population of Southampton's residents is the overarching aim of the LFRMS. This includes reducing the impact of flooding and flood risk on all aspects of a person's health, general wellbeing and quality of life, and their property.

### 1.3.1 Population

Since 2001, the population of Southampton has risen by 7.9% from 217,400 to 236,882 as recorded by the 2011 census. In this period, Southampton saw a population increase that was higher than the average increase for England and Wales, which was 7.1%<sup>1</sup>. Assuming the continuation of population growth at the current rate, the latest population projections estimate that by 2035, Southampton could have a population of almost 252,600.

According to the 2011 census, the population density of England and Wales is estimated to be 4,381 people per km<sup>2</sup>. Southampton has a density of 4,752 people per km<sup>2</sup> which is 371 more than that of England and Wales, which classes Southampton as a densely populated city. Population density is mapped in figure 1, and shows that the areas of highest density are those on the western side of the River Itchen.

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<sup>1</sup> National Office of Statistics Census 2011 (<http://www.ons.gov.uk/ons/index.html>)



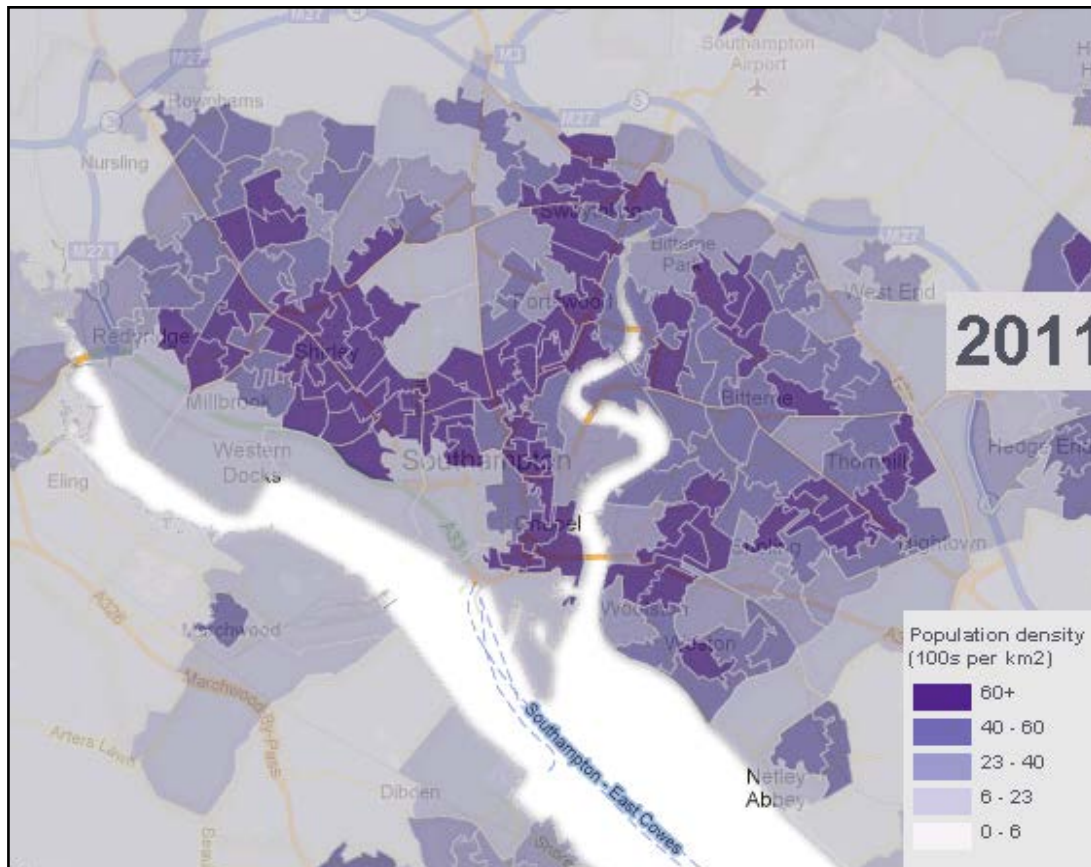


Figure 1: Population Density of Southampton (2011) (ONS)

The total number of households within Southampton has risen by 8% from 91,000 in 2001 to 98,254 in 2011 meaning each home has an average of 2.3 persons resident. Of the 20 local and unitary authorities with the highest household densities, only 2 are located outside of London, and with an average 1971 households per km<sup>2</sup> Southampton is one of them<sup>1</sup>.

The 2011 Census shows that in Southampton there are 119,453 males and 117,429 females. The percentage of population aged between 15 and 64 rose from 68.5% (2001) to 70.6% (2011) while the number of over 65's fell from 14.4% (2001) to 13% (2011). Figure 3 shows how the population has changed since 2001, and compares the population with the average for England<sup>2</sup>.

Southampton is a young city with the largest population percentage is those aged between the ages of 20 and 24, which is clearly seen in the population pyramid (figure 2). This represents the influence of the large student population, since Southampton has 2 universities.

<sup>2</sup> 2011 Census Briefing Paper

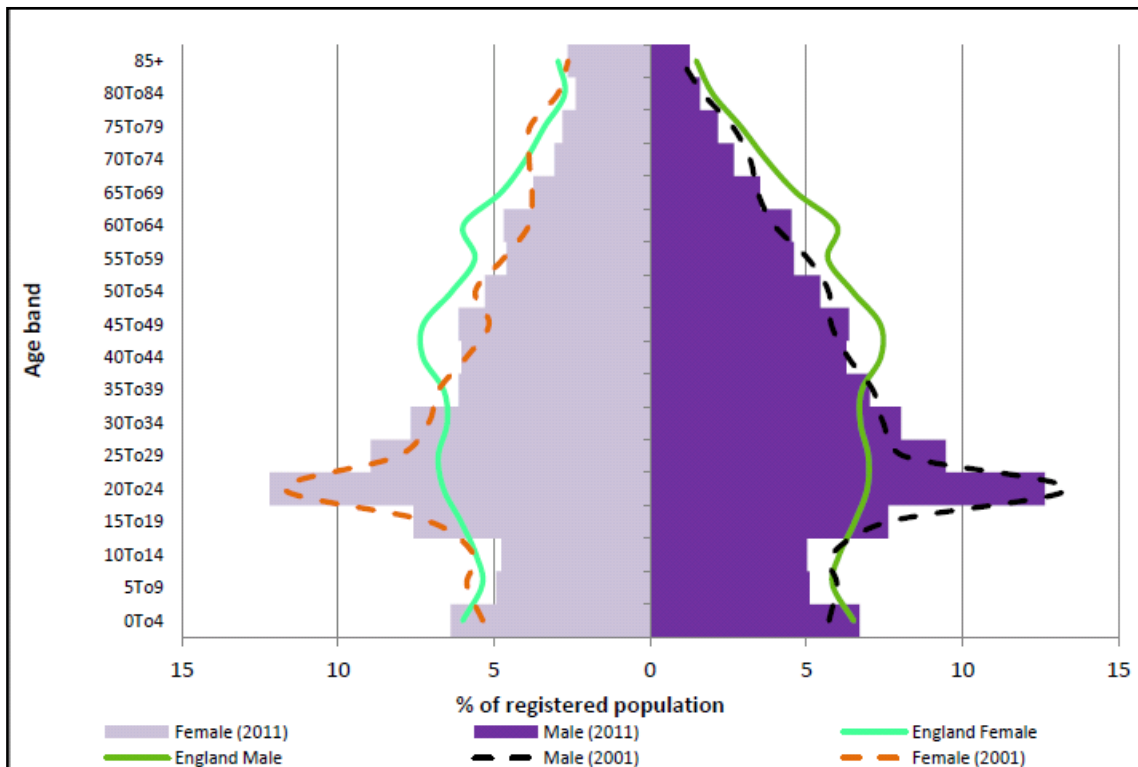


Figure 2: Population change in Southampton (2001-11) (ONS)

### 1.3.2 Index of Multiple Deprivation

Southampton is an urban city therefore it is inevitable that there are areas of deprivation. Knowing where these areas are is crucial to achievement of the LFRMS objectives as deprivation may affect the ability of communities and individuals to respond to flood events.

The Indices of Deprivation (ID) 2010 provides a relative ranking of areas across England according to their level of deprivation and is based on the concept that deprivation consists of more than just poverty. Poverty is not having enough money to get by, whereas deprivation refers to a general lack of resources and opportunities.

Deprivation is a significant issue in Southampton. The city is currently ranked 81<sup>st</sup> on the overall Indices of Multiple Deprivation (2010) out of the 326 Local Authorities (LAs) in England (where 1 equals the most deprived), which shows deprivation has worsened since 2007 when the ranking was 91<sup>st</sup> out of 354 LAs<sup>3</sup>.

The Indices of Multiple Deprivation are based on the small area geography known as Lower Super Output Areas (LSOA) rather than wards, as this allows a more detailed study and identification of smaller pockets of deprivation. The city has 146 LSOAs, each with an average population of 1,500 people. Around 23% of Southampton's population live within the most deprived LSOAs in England. The most deprived areas are in Bevois, Redbridge, Millbrook, Woolston (Weston) and Bittern (Thornhill) wards. This remains unchanged from 2007<sup>4</sup> as figure 3 shows.

<sup>3</sup> Index of Multiple Deprivation 2010

<sup>4</sup> Southampton City Council Annual Digest of Statistics 2012 - <http://www.southampton.gov.uk/living/statsresearch/keystatistics.aspx>

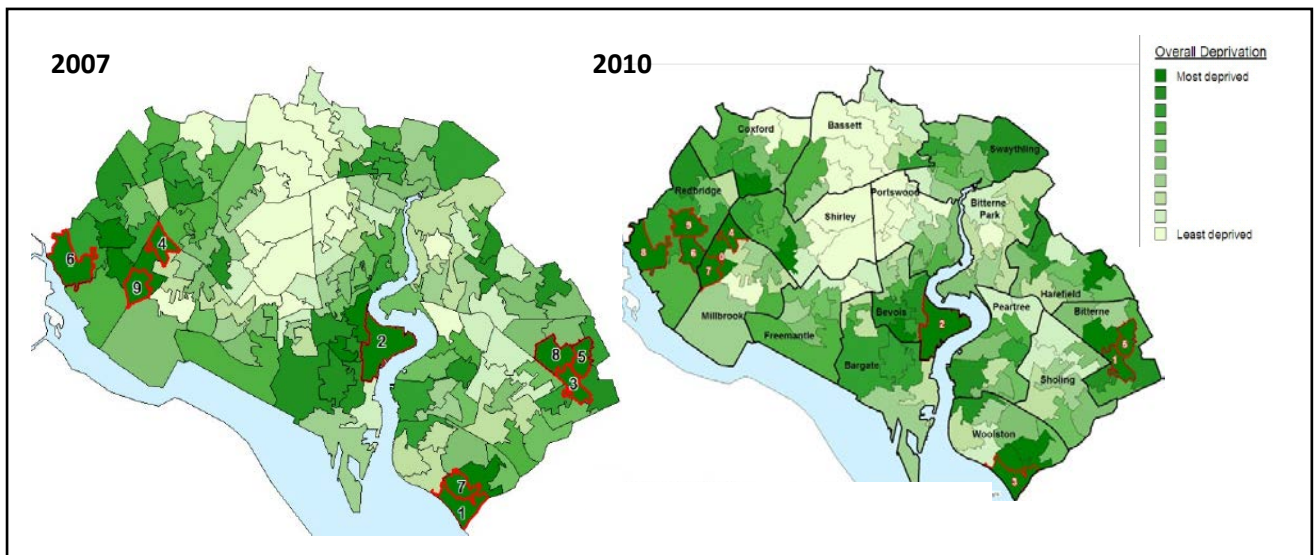


Figure 3: Spread and change of multiple deprivation across Southampton (Red areas are in the most deprived 10% LSOA's) (IMD 2010)

Around 23% of all homes in the city are in the social housing sector of which 17,000 are in the ownership and management of Southampton City Council. A significant number of these homes are in the most deprived areas of the city and in the top 10% of the most deprived in the country.

The Local Authority level scale for deprivation suggests that 35,570 people are affected by income deprivation. In 2010 the average weekly (gross) earnings for a full time employee living in Southampton was estimated to be £452.20, which is significantly lower than the average £540.70 received by those living in Hampshire. The same scale estimates there to be 13,663 in a state of employment deprivation<sup>4</sup>.

Childhood poverty affects around 12,575 children living in the city, which is approximately 26% compared to the average of 20% of children living in England. In the some wards where deprivation is highest up to 50% of children may be affected by poverty<sup>5</sup>.

### 1.3.3 Employment

Working age is deemed to be those aged between 16-64 years. In 2011 70.6% of the population were of working age, with the median age being 33. This classes Southampton as a 'young' city, with the population heavily influenced by students.

Between March 2012 and June 2012, the number of people in work fell from 69.3% to 67%. The public sector still represents the largest employment sector in the city. In 2011, the three largest employment sectors were health with 18,800 employed, education with 13,400 and retail with 11,700. The average annual salary of a person employed within the city is £23,998.

Between September 2012 and October 2012, the number of people claiming jobseekers allowance fell by 152 which amount to 3.1% of the working population. The number of people claiming jobseekers

<sup>5</sup> Office for National Statistics 2011

allowance in the city is generally better than in Portsmouth (3.5%) but worse than the average for Hampshire (2.3%)<sup>6</sup>.

### **1.3.4 Health**

Healthcare is provided by NHS Southampton City which is part of the Primary Care Trust cluster that includes NHS Hampshire, NHS Isle of Wight and NHS Portsmouth. Access to healthcare is provided across the city via a number of walk in health centres, pharmacies, doctor's surgeries and four main hospitals.

Life expectancy at birth for males in Southampton is 78.4 years and for females 82.6 years; neither of which is significantly different from the national average for England. Life expectancy in the city has risen in recent years in line with the national trend. People living in the most deprived areas of the city tend to have a lower life expectancy when compared to those from more affluent areas. For men living in Southampton's most deprived areas, life expectancy is 8 years lower and for women it is around 3.4 years lower<sup>7</sup>.

The health of the city is broadly similar to that of England as a whole, however some aspects compare unfavourably to the average. Over the last 10 years, all cause mortality rates have fallen. Early death rates from heart disease and stroke have fallen, however death rates from cancer, although they have fallen, still remain higher than the average for England.

In the under 18's, alcohol and teenage pregnancy are the biggest challenges facing the city. Between 2008 and 2010, alcohol-specific hospital stays in Southampton averaged 111.8 people per 100,000 of the population compared to 61.8 in England. Teenage pregnancy rates for the same period in Southampton was 50 per 1,000 15-17 year olds compared to 38.1 in England.

Also faring worse than the average for England (2008-2010) are smoking related deaths (236 per 100,000 age 35 and over compared to 211 in England) and early cancer deaths (123.4 per 100,000 aged 75 and under compared to 110.2 in England).

Southampton has fewer obese adults than the average for England with 22.7% of the adult population (based on an estimate using the health survey 2006-2008) being classed as obese (24.2% in England) despite having a lower healthy eating rate (25.8% compared to 28.7%). Between 2010 and 2011, the number of people diagnosed with diabetes in Southampton was lower than in England as a whole with 4.9% receiving diagnosis compared to 5.5%.

Other priorities affecting the health of the city residents are rates of violent crime and deprivation. In the year 2010/11, there were 28.3 cases of violent crime per 1000 people in Southampton compared to the average of 14.8 in England. 25.5% of the people living in Southampton fall within the 20% most deprived areas in England, compared to 19.8% for the whole of England average in 2010<sup>7</sup>.

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<sup>6</sup> Hampshire Labour Market Bulletin October 2012

<sup>7</sup> Southampton NHS Health Profile 2012

### **1.3.5 Recreation and Leisure**

Access to green space is an important factor contributing to good health. In Southampton there are several parks and coastal areas that are accessible to the public including Southampton Common, Central Parks and Weston Shore. There are also a large number of smaller parks located across the city; ensuring access to green space is available nearby to most residents.

Along with the many parks, there are 23 allotment sites providing over 1700 individual plots. These provide people with the opportunity to grow fresh food to maintain a healthy lifestyle as well as a place for leisure and recreation.

In Southampton there are eight public hard and slipways along the shoreline providing the public with the opportunity to gain access to the water for recreation and leisure purposes. Seawater fishing can be carried out at several points along the waterfront and in several freshwater ponds and lakes with a valid rod license.

### **1.3.6 Effect of the LFRMS on Population and Human Health**

The LFRMS aims to manage and reduce the risk of flooding, which is of benefit to the wider population. Negative impacts are likely to be very minimal or even non-existent.

Engagement and communication of the flood risks an area faces is likely to have a positive impact on both human health and a persons property, since helping people understand the risk helps them to help themselves and protect their own belongings. This can reduce the stress, worry and uncertainty that surround flood risks which is a significant positive impact on the health of residents.

In some options covered by the LFRMS, access to the waterfront may be reduced, for example by the construction of flood defences deemed necessary to protect the wider population. Although minimal, this could be seen as a negative impact of the LFRMS, however is unlikely to affect the health of the population since there are many other green spaces accessible for recreation and leisure.

## **1.4 Biodiversity, Flora and Fauna**

Southampton is predominantly an urban city; however it supports a rich biodiversity and range of habitats within its green spaces. Around 20% of the total area of the city is made up of green space including 49 parks, 23 allotments and 8 greenways.

### **1.4.1 Biodiversity Action Plan**

The UK Biodiversity Action Plan (BAP) identifies eight protected habitats that exist within Southampton's administrative boundaries. These are:

- Chalk Rivers
- Lowland meadows
- Coastal vegetated shingle
- Mudflats
- Reedbeds
- Wet Woodland
- Lowland dry grassland
- Lowland heathland

In addition to the above, a further seven habitats of local importance have been identified by the Hampshire BAP which include:

- Ancient semi-natural woodland
- Lowland wet grassland
- Fen, Carr, Marsh, Swamp, Reedbeds
- Coast
- Heathland, acidic grassland and bog
- Neutral grassland
- Open standing water

There are 15 UK BAP priority species identified by the Southampton BAP as being present in the city. They are:

- Otter
- Water Vole
- Dormouse
- Pipistrelle bat
- Barbastelle bat
- Linnets
- Reed bunting
- Spotted flycatcher
- Bullfinch
- Song thrush
- Great crested newt
- Stag beetle
- Silver-studded blue butterfly
- Southern damselfly
- Buttoned snout moth

As well as the above list, 35 additional species have been recognised as being of local importance in Southampton<sup>8</sup>.

#### **1.4.2 Areas of International, National and Local Importance**

Approximately 8.6% of Southampton's total area is occupied by habitats designated for their International, National or Local importance. Southampton has four areas designated as sites of international conservation importance, four areas designated nationally as Sites of Special Scientific Interest (SSSI) and thirty-six further sites recognised as Sites of Interest for Nature Conservation (SINCs). Figure 4 shows the location of the various sites of national and international importance in Southampton.

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<sup>8</sup> Southampton Biodiversity Action Plan



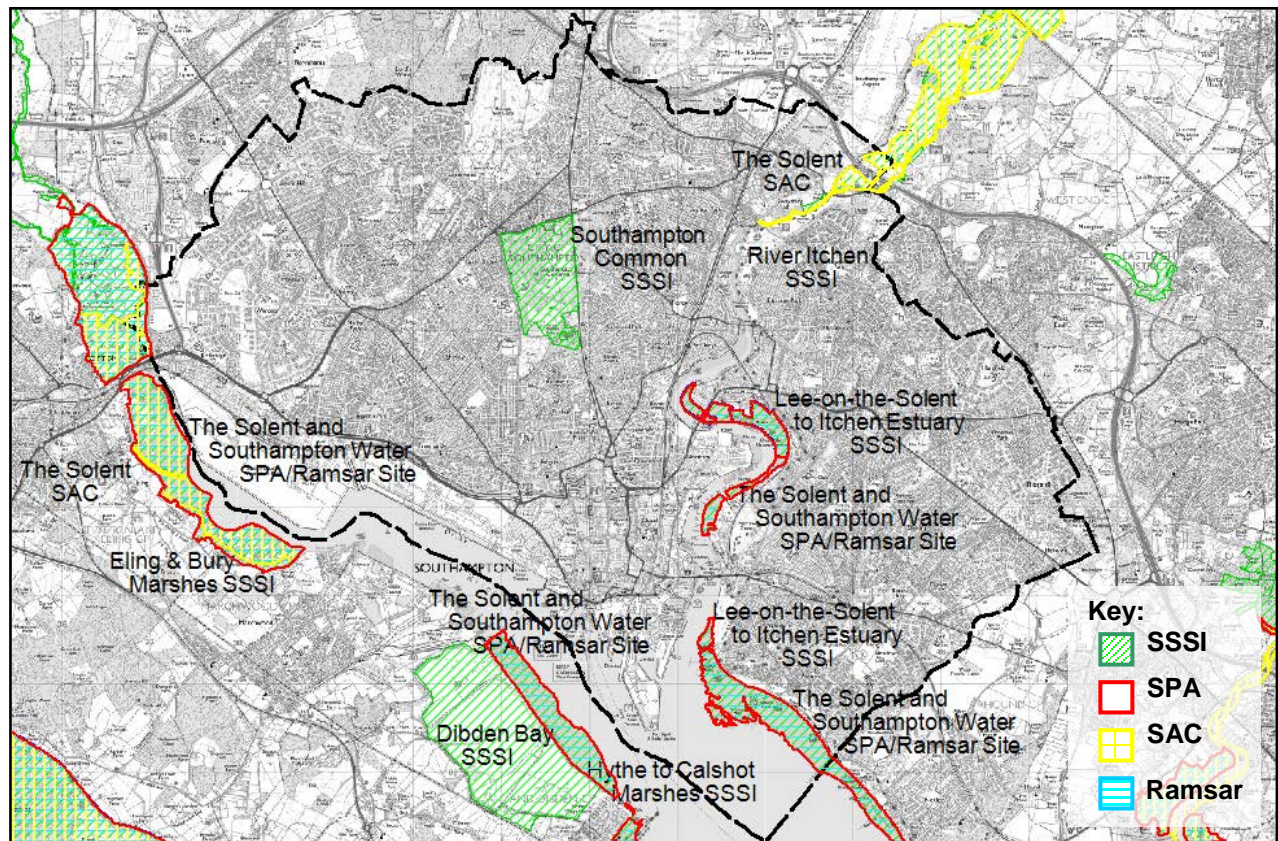


Figure 4: Location of SSSI, SPA, SAC and Ramsar Sites in Southampton

The details of the sites of international and national importance, including their condition and reason for designation are listed in table 1 below.

**Table 1: Sites of International Importance**

Site	Designation	Reason	Condition
<b>The Solent Maritime</b>	SAC	Annex I Habitat – Estuaries grade A/B <i>Spartina</i> swards grade A/B Atlantic salt meadows grade A/B/D	Grade A/B and D
<b>The Solent and Southampton Water</b>	SPA	Importance for regularly occurring Annex I species and migratory species. Importance for internationally important assemblage of waterfowl.	Classified Favourable condition
<b>The Solent and Southampton Water</b>	Ramsar Site	Criterion 1a: Internationally important wetland characteristic of the Atlantic biogeographically region. Criterion 2a: wetland hosting an assemblage of rare, vulnerable or endangered species in favourable condition.	Designated

		Criterion 3a: Wetland regularly supporting 20,000 waterfowl species. Criterion 3b: Wetland supporting 1% or more of the individuals in a population of waterfowl species.	
<b>River Itchen</b>	SAC	Annex I Habitat – Water course of plain to maintain levels with abundance of water-crowfoots. Annex II species – Southern Damselfly and Bullhead	Grade A/B Outstanding/ Excellent

(Source: JNCC Online)

Southampton has 4 Sites of Special Scientific Interest (SSSI) within its administrative boundary. These are detailed in table 2. Since there is the possibility that options from the LFRMS may impact these sites, consideration for nearby SSSIs should be taken into account. These are also listed in table 2 in green to show that they are outside of the Southampton boundary.

**Table 2: Sites of Special Scientific Interest (SSSI)**

Site	Designation	Reason	Condition
<b>Southampton Common</b>	SSSI	Important breeding ground for various amphibian species. Home to the largest recorded population of the internationally rare great crested newt.	100% = Unfavourable recovering.
<b>Lower Test Valley</b>	SSSI	Salt to freshwater conditions, extensive reed beds, unimproved meadowland intersected by tidal creeks flooded at high spring tides. Varied species rich flora. Breeding, feeding and roosting grounds for birds	20.56% = Favourable. 34.65% = Unfavourable recovering. 11.71% = Unfavourable no change. 33.08% = Unfavourable Declining.
<b>Lee-on-Solent to Itchen Estuary</b>	SSSI and Geological SSSI	Extensive intertidal muds with a littoral fringe or vegetated shingle, reed bed, saltmarsh, marshy grassland and deciduous woodland. Site of geological importance.	82.49% = Favourable. 15.98% = Unfavourable recovering. 1.35% = Unfavourable no change.



<b>River Itchen</b>	SSSI	Classic chalk stream and river, fen meadow, flood pasture and swamp habitats. Particular formations of in-channel vegetation and side channels, runnels and ditches associated with the main river and former water meadows.	6.47% = Favourable. 51.37% = Unfavourable recovering. 31.82% = Unfavourable no change. 10.35% = Unfavourable Declining.
<b>Eling and Bury Marshes</b>	SSSI	Two dissimilar salt marshes and intervening intertidal mudflats.	11.46% = Favourable 88.54% = Unfavourable Recovering
<b>Dibden Bay</b>	SSSI	Nationally important assemblage of invertebrates, rare and nationally scarce species, breeding ground for lapwing.	98% = Favourable 2% = Unfavourable Declining
<b>Hythe to Calshot Marshes</b>	SSSI	Most extensive remaining areas of saltmarsh and mudflats in Southampton Water. Supports international and nationally important migratory birds	100% = Unfavourable Recovering

(Source: <http://www.natureonthemap.naturalengland.org.uk/> (November 2012))

### 1.4.3 Effect of the LFRMS on Biodiversity, Flora and Fauna

Some habitats are very sensitive to water flow regimes and changes in water quality therefore the LFRMS needs to ensure that any measures do not adversely affect flow levels of rivers as this may affect water dependent habitats or potentially increase levels of pollution, such as highways pollution, reaching the aquatic environment. Care must be taken to ensure that measures to reduce coastal flooding do not impact the coastal environments such as by coastal squeeze.

In addition to protecting the city's wildlife sites, the LFRMS has the potential to improve biodiversity. The implementation of sustainable urban drainage systems in new developments such as ponds or rain gardens can provide new habitats whilst reducing the flood risk. These also have the opportunity to help improve water quality by naturally reducing the number of pollutants before reaching the main watercourse.

## 1.5 Soil, Geology and Geomorphology

### 1.5.1 Bedrock Geology

The underlying bedrock geology consists primarily of London Clay on the northern end of Southampton and Wittering Formation on the southern part. There are several pockets of Whitecliff Sand Member and Portsmouth Sand Member present in the northern half of the city. Along the coast there are bands of Earnley Sand, Marsh Farm and Selsey Sand Formations<sup>9</sup>.

A characteristic of clay based geology is low permeability. This is true for the northern edge of the city where permeability is low, with the rest of the city having a moderate permeability. The risk of flooding is increased in areas where the bedrock geology is of low permeability.

### 1.5.2 Superficial Geology

Superficial geology consists of Tidal Flat Deposits in the lower lying areas adjacent to the River Test and River Itchen. Away from the rivers on the higher grounds the geology is predominantly River Terrace deposits, with alluvium present in some of the smaller water courses in the catchment.

### 1.5.3 Topography

Remotely sensed topographic data (LiDAR) shows that the topography of Southampton is variable. Generally the city slopes downwards towards the River Test and River Itchen.

The highest parts of the city are in the north, along the boundaries with the Test Valley and Eastleigh where land heights are typically 50-60 meters above ordnance datum (mAOD). In contrast the lowest parts of the city have ground elevations as low as 0.5-1mAOD, but typically approximately 3mAOD<sup>10</sup>. These areas are generally along the coastal frontage and docks where much of the land has historically been reclaimed via the dredging of Southampton Water.

### 1.5.4 Soils

The soils in Southampton are not well mapped or described in great detail since the majority of the land is of urban use. There is no high grade agricultural land within the city's boundaries. The local soils surrounding Southampton are generally slowly permeable and seasonally waterlogged, which is consistent with the underlying geology.

### 1.5.5 Contaminated Land and Landfill Sites

Considerable areas of the city are built on reclaimed or made ground. The docks consist mainly of reclaimed land using dredge material from Southampton Water, built up over the natural estuarine alluvium deposits. The older parts of the city consist mainly of rubble from previous buildings. There are also pockets of in filled former gravel, sand and clay pits consisting of a range of material including

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<sup>9</sup> British Geological Survey - <http://www.bgs.ac.uk/>

<sup>10</sup> Partnership for Urban South Hampshire: Strategic Flood Risk Assessment 2010

rubble, commercial waste and domestic refuse<sup>11</sup>. Some of these sites fall within the tidal floodplain and if flooded could lead to contamination of water and surrounding soils and increased risk of erosion.

Redevelopment of former industrial sites has identified varying degrees of contamination across the city. These contaminations range from elevated heavy metal concentrations to leakage of hydrocarbons from underground storage tanks and domestic waste<sup>12</sup>. Groundwater contamination and leaching potential from such sources presents a risk to some sites, however individual site assessments shall highlight these issues. Figure 5 shows the locations of the known current and historic landfill sites across the city.

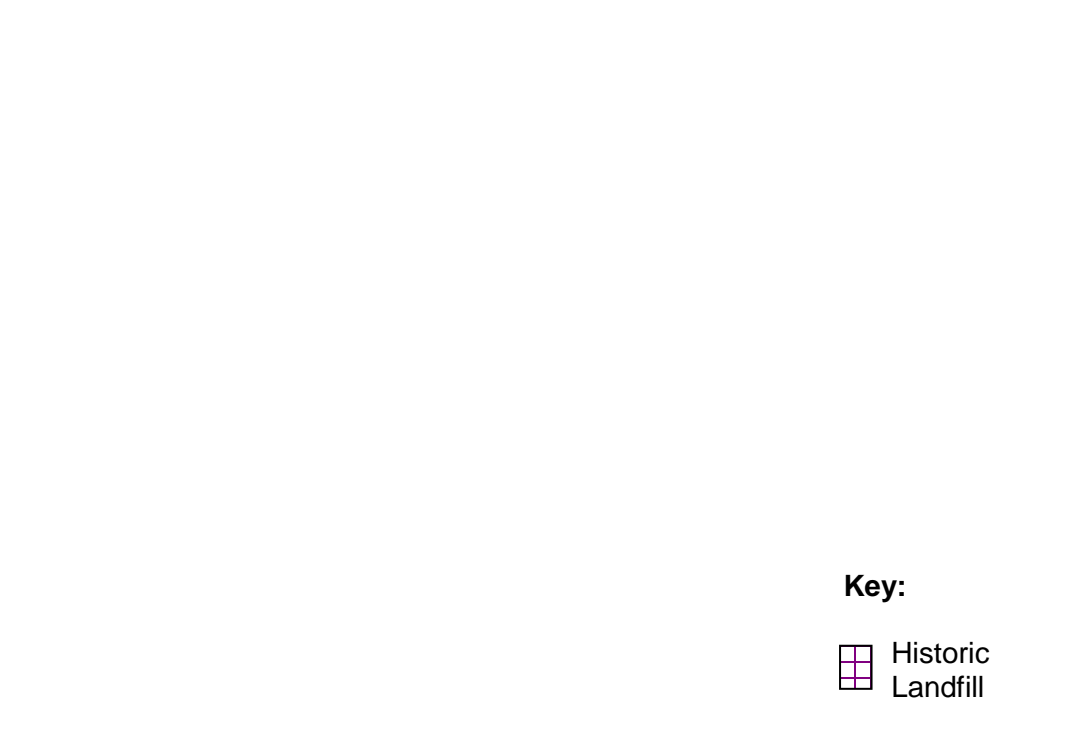


Figure 5: Sites of known historic landfill in Southampton

### 1.5.6 Effect of the LFRMS on Soil, Geology and Geomorphology

The LFRMS seeks to minimise flood risk whilst protecting the natural environment. There is unlikely to be any major significant impacts on the soil, geology or geomorphology of Southampton, however it is important to note that areas of contaminated land require special protection so the wider environment is not harmed. This is especially true if measures involving construction are required to reduce flood risk.

<sup>11</sup> Southampton Coastal Erosion and Flood Defence Strategy 2011

<sup>12</sup> Contaminated Land: An Inspection Strategy for Southampton 2001

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## 1.6 Water and Water Quality

### 1.6.1 Watercourses

There are two main rivers flowing through Southampton. The River Test flows along the southern boundary and the River Itchen flows across the city from the north to the south, joining the Test to form Southampton Water. As well as these, the city is drained by a number of smaller streams and ordinary watercourses including:

- Monks Brook
- Holly Brook
- Tanners Brook
- Rolles Brook
- Jurds Lake
- Bligmont Crescent Stream

In addition to these watercourses, Southampton has 35km of shoreline including the lower reaches of the River Test and River Itchen which are tidal.

Water is supplied to the River and Test from chalk aquifers in the north of the catchment. Chalk Rivers tend to respond slowly to periods of heavy rain with flow levels remaining fairly consistent throughout the year. In the lower catchment, the geology switches from permeable chalk to impermeable clay which promotes a more responsive flow which is seen by a more 'flashy' hydrograph. It is in the lower reaches where flood risk increases.

### 1.6.2 Water Supply

Water for domestic use in the city is supplied by Southern Water who source water from the chalk aquifer in Hampshire. The supply comes from both abstraction directly from boreholes or the interception of spring outflows, or indirectly through abstraction from rivers where the base flow is derived from the chalk, which is the case for both the River Test and Itchen<sup>13</sup>. Water is abstracted from the River Itchen at Otterbourne and the River Test at Testwood, with a licensed total of 1810 million litres a day abstracted<sup>14</sup>.

The average water use in Southampton is 188 litres per person per day, which is above the average for the south east of England which stands at 156 litres per person per day. The target is to reduce water consumption to 130 litres per person per day by 2030<sup>15</sup>, which will reduce the pressure to abstract water from the city's rivers and in turn protect the wildlife and habitats dependent on the supply.

### 1.6.3 Water Quality

Water quality is fundamental to the environment as a whole, and to the social and economic wellbeing and quality of life of the people living in the city. Water quality is evaluated on both ecological and chemical status. Under the Water Framework Directive (WFD), all water bodies must achieve good ecological and chemical status by 2015 with heavily modified watercourses having until 2027 to reach

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<sup>13</sup> South Hampshire: Integrated Water Management Strategy (Partnership for Urban South Hampshire) (2009)

<sup>14</sup> The Test and Itchen Catchment Abstraction Management Strategy (Environment Agency) (March 2006)

<sup>15</sup> An Environmental Summary of Southampton (Environment Agency Factsheet) (May 2010)

good ecological potential. Currently in Southampton, none of the water bodies have achieved good ecological status, as they are heavily modified<sup>15</sup>.

Both the River Test and River Itchen are supplied with water high quality nutrient rich water from the chalk aquifers to the north of the catchments. Chalk aquifers regulate the flow to the river meaning both the Test and Itchen have a constant flow of high quality fresh water. Runoff from urban areas and roads has a significant impact on water quality. The Itchen is failing to meet the good status required by the WFD as it does not have the diversity of fish populations required due to the modifications such as locks and mills acting as a barrier to fish. To allow the Itchen and other water bodies to reach good status, fish need to be able to move freely up and down the river therefore the water course needs to be opened up.

The South East River Basin Management Plan produced under the Water Framework Directive (WFD) describes the Southampton Water estuarine system as having a good chemical status with moderate ecological potential. The city's groundwater is also classed as having a good chemical status<sup>16</sup>. Addressing point and diffuse sources of pollution will help improve the quality of water, allowing the targets of the WFD to be met.

None of the tidal foreshores within Southampton have been designated as bathing waters by the Environment Agency.

#### **1.6.4 Flood Risk**

Flood risk has a significant impact on where development can and can't be located as well as having an affect of people's lives and wellbeing. In Southampton there are a number of flood risk sources, including rivers, the sea, groundwater and surface water.

Flood zones are used to highlight the probability of flooding to an area, essentially mapping areas of the city that are at greatest risk. There are three flood zones:

- **Flood Zone 1** – lowest probability of flooding from rivers and the sea. Land has a less than 1 in 1000 year annual probability of fluvial flooding.
- **Flood Zone 2** – land has between 1 in 100 and 1 in 1000 year annual probability of flooding (fluvial) and between a 1 in 200 and 1 in 1000 year (tidal).
- **Flood Zone 3** – areas with the highest probability of flooding. Land has a 1 in 100 or greater annual probability of flooding (fluvial) or 1 in 200 year or greater (tidal).

In Southampton, as much as 13% of land is designated as at either high or medium risk (in Flood Zones 2 and 3a/3b) including areas within the city centre<sup>17</sup>. Figure 6 shows the areas in Southampton that are located in flood zones 2 and 3. Pressure for development could see many more sites within zones 2 and 3 being developed.

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<sup>16</sup> River Basin Management Plan South East River Basin District 2009 (Environment Agency)

<sup>17</sup> Local Development Framework Core Strategy Development Plan Document, Adopted Version 20 January 2010



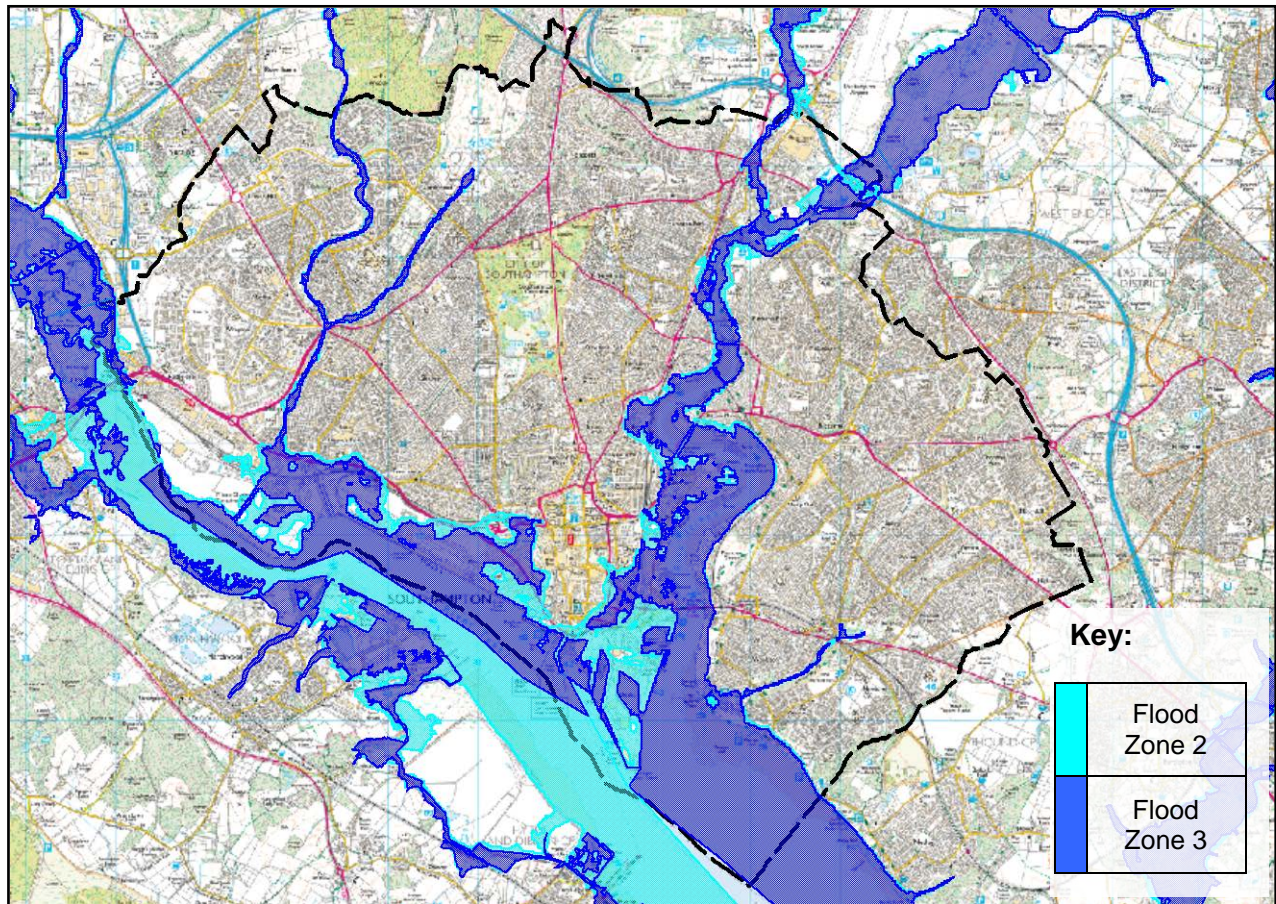


Figure 6: Environment Agency's *Flood Zones 2 and 3*

The dominating risk of flooding in the city comes from the sea. The low lying coastal and reclaimed areas of the docks, Itchen frontage, Northam, Millbrook, Bevois Valley, St Denys and Bitterne Manor are at risk from tidal flooding should a tidal surge occur within Southampton Water. To date, tidal flood events have been rare; however the frequency is expected to increase as sea level rises. Table 3 below shows the number of properties potentially at risk of flooding by a 1 in 200 year flood event assuming no further defences are built.

**Table 3: Potential number of properties at risk of flooding by a 1 in 200 year event assuming no defences<sup>18</sup>**

Property Type	2007	2115
Residential	1729	5236
Commercial	644	1345

Southampton has several rivers. Fluvial flooding can be experienced from the River Itchen, Test, Monks Brook, Rolles Brook and Tanners Brook. Of the city's total area, approximately 23% of the land lies within a floodplain with around 6,544 properties are at risk of flooding<sup>19</sup>.

<sup>18</sup> North Solent Shoreline Management Plan

<sup>19</sup> An Environmental Summary of Southampton (Environment Agency Factsheet) (May 2010)

Flooding from surface water is a great risk facing the city. Due to the urban nature there is very high potential for overland flow and therefore almost every part of the city is at high or medium risk of surface water flooding. To aid discharge of surface water much of the water drained from land is pumped by two pumping stations located at Mayflower Park and King George V Dry Docks, which are maintained and operated by the Associated of British Ports (ABP)<sup>20</sup>. Increased rainfall intensity is likely as a result of climate change and will add pressure to the city's surface water sewers, increasing the likelihood of surface water flooding.

Southampton's Preliminary Flood Risk Assessment (PFRA) identifies the number of properties at risk from a 1 in 200 year event. Approximately 16,700 properties at risk from flooding to a depth of 0.1m and a further 4,500 to depths of 0.3m<sup>21</sup> of which many are residential properties. Seven surface water flood hotspots have been identified in the Surface Water Management Plan (SWMP) and include several important transport links. They are:

- A33 Millbrook Road West
- Southampton Central Station
- City Centre – St Andrews Terrace/Solent University Site
- City Centre – Ocean Village/Queens Park
- West Quay Retail Area
- Stoneham Way (junction with Wide Lane)
- Shoreburs Greenway

At present, flooding from groundwater is thought to be minimal, however data is limited and past records are deemed unreliable. The bedrock permeability of the city is split between areas of low and medium permeability meaning that there is a potential risk of groundwater flooding. In low lying areas, the groundwater table is linked to tidal levels therefore as sea level rises as a result of climate change, flooding is likely to increase.

Interaction of the tide and the sewerage system adds further complication to the city's flood risk. To protect the drainage system from the sea entering the network, many sewer outfalls are fitted with 'non-return' valves, however this often reduces or prevents the ability of the system to discharge surface water resulting in 'tidal locking'. This results in surface water 'backing up' in the drainage network, potentially leading to flooding. The SWMP identifies the outfall culverts draining the area to the west of the River Itchen as being affected by tide locking.

At present there are no significant risks from artificial water sources, however there are a number of man-made lakes within Southampton Common which could lead to some localised flooding should a structural failure occur.

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<sup>20</sup> Southampton Surface Water Management Plan (March 2011)

<sup>21</sup> Southampton Preliminary Flood Risk Assessment (June 2011)

### **1.6.5 Flood Incidents**

Records of 194 historical flood events were collected from across Southampton City Council's administrative area. The majority of flood events record heavy rain as the source and the cause being blocked drains and gullies. The records include 60 incidents of groundwater flooding, with flood waters lasting around 2 hours and a further 7 incidents documented showing flooding as a result of tide locking<sup>20</sup>.

Historic records are thought to be unreliable to some extent, as do not provide sufficient information on all aspects of the flood event including depth of water and duration of the flood. There are several gaps in the data and some possible inaccuracies have been identified such as surface water events being logged as groundwater the cause, instead of surface water flooding from saturated ground.

### **1.6.6 Flood Defences**

Currently there are no formal raised coastal or fluvial flood defences in Southampton<sup>22</sup>. A large portion of the Southampton frontage from Redbridge to the Itchen Bridge is protected at present by the quay and dock walls; however the rest consists of mixed standard informal defences that are aimed at protecting from erosion. The effects of climate change mean that in the near future, investment in flood defences will be required.

### **1.6.7 Effect of LFRMS on Water**

The LFRMS has the potential to deliver both positive and negative impacts on the water and flood risk in the city.

Options that include the management of water above ground rather than in traditional underground pipe networks have the opportunity to significantly improve the water quality and reduce the flood risk to an area. Controlling runoff through the use of retention basins, swales, ponds and other SuDS methods reduces the number of pollutants entering the watercourse directly by mimicking natural drainage and acting as a filter aiding the improvement of water quality. SuDS slow down water entry into the main watercourse and take the pressure off the drainage system which in turn can reduce the water level within a channel and reduce the flood risk.

Whilst the LFRMS aims to reduce flood risk the city as a whole there is however, also potential for flood risk to be increased in some areas. Care must be taken when deciding upon the best options that any works carried out at a particular location do not alter the natural hydrology and deflect the flood risk to another area up or downstream of the site. Developments or options must not increase the flood risk to areas within the city's boundaries or neighbouring districts.

If any of the options considered in the strategy cause alterations to the flow of a river, water quality may reduce since the concentration of pollutants may then increase. If the flow becomes low, habitats and species relying on the water may be harmed and may damage the protected SSSI status.

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<sup>22</sup> Southampton Coastal Flood and Erosion Risk Management Strategy (May 2012)



## 1.7 Air Quality

Quality of air can significantly affect our health and wellbeing. Air pollution has been monitored since 1994 and the city now has 5 air quality monitoring stations at various locations<sup>23</sup>. In general the air quality of Southampton is good, but some parts of the city can be affected by local pollution.

The main sources of air pollution in Southampton are road transport emissions, especially heavy goods vehicles, and industrial emissions particularly from waterside and shipping activities.

### 1.7.1 The Effect of the LFRMS on Air Quality

The LFRMS focuses on managing flood risk across the city. It is very unlikely that any significant impacts on air quality will arise from the implementation of the strategy, and on that basis, air quality has been scoped out of this SEA.

## 1.8 Climate Change

Changes to our climate are inevitable. It is acknowledged by 'PPS: Planning and Climate Change' that in future it is likely that the UK will have more extreme weather events, including hotter and drier summers, warmer and wetter winters and experience flooding and coastal erosion as a result of rising sea levels.

The impact on the environment is measured by the ecological footprint which shows the amount of resources used compared to the level of resources available globally. In Southampton the ecological footprint is 5.1 global hectares (GH) per person, which is less than the UK average of 5.4 GH.

Carbon dioxide emissions are a major contributing factor to climate change. Table 4 shows the total carbon footprint for the city is 1,274,000 tonnes of CO<sub>2</sub> and gives a breakdown of the contributing factors to the total carbon footprint. Industry is the largest contributor to the carbon footprint.

**Table 4: Carbon Footprint Breakdown for Southampton**

Industry	Homes	Transport
571,000 tCO <sub>2</sub>	456,000 tCO <sub>2</sub>	247,000 tCO <sub>2</sub>
Total Carbon Footprint = 1,274,000 tonnes CO <sub>2</sub>		

**(Low Carbon Strategy 2011-2020)**

Capital emissions have been reduced by 11.5% since 2005, with approximately 12,000 tonnes of CO<sub>2</sub> saved through the city's district heating scheme<sup>24</sup>. The city performs better with fewer capital emissions than the region and the national scale, as table 5 below shows.

<sup>23</sup> Southampton Air Quality Action Plan Update (November 2009)

<sup>24</sup> Southampton Low Carbon City 2011-2020: The Strategy

**Table 5: Carbon Emissions per Capita Year (tonnes CO<sub>2</sub> per capita per year)**

Southampton	South East	National
5.4	7.8	7

(Low Carbon Strategy 2011-2020)

### 1.8.1 Climate Projections

The UK Climate Change Projections 2009 (UKCP09)<sup>25</sup> provide the most recent incite into the future climate of the UK. The report estimates that for the South East of England under a medium emissions scenario:

- Average temperatures in summer will increase by 2.8°C and increase in winter by around 2.2°C by 2050.
- Precipitation will increase in winter by approximately 16% whilst decreasing by around 19% in the summer months by 2050.
- Sea levels could rise by 1 meter by 2110.

An increase in precipitation will increase the risk of flooding. Shorter more intense rainfall events are likely to overwhelm the drainage capacity increasing surface water flooding across the city, and debris from storms could become trapped in drains and culverts adding to the risk further. Winter precipitation could cause groundwater problems in the lower lying areas, where ground is seasonally saturated and the water table is only a few meters below ground.

Drier summers could lead to more frequent droughts. This will add pressure on the city's water resources to ensure supplies are not affected, which could increase water abstraction from rivers.

The flow of rivers will be impacted by changes to precipitation. Water shortages in summer could be harmful to aquatic life and dependent habitats and wildlife, and could cause a reduction in dilution rates which could harm water quality. In turn high runoff levels in winter could cause silt to wash into watercourses.

Sea level rise is a major threat to low lying coastal areas such as Southampton. There are several areas within Southampton that are vulnerable to flooding from sea level rise including Northam, Bitterne Manor and St Denys and the Docks near Millbrook and Redbridge. Storm surges could also become more frequent.

Human health could be affected by climate change. Increased summer temperatures could be amplified by the Urban Heat Island (UHI) affect. This could be a risk to the health of elderly, young and vulnerable people across the city<sup>26</sup>.

<sup>25</sup> UK Climate Projections 2009

<sup>26</sup> Environment Agency

### **1.8.2 Impacts of the LFRMS on Climate Change**

Construction and maintenance works carried out to develop options in the LFRMS has the potential to increase greenhouse gas emissions. Sustainable approaches such implementation of sustainable urban drainage could reduce the emissions from long term maintenance, as well as reducing the pressure of rainfall on the drainage network therefore reducing flooding.

A positive impact of the LFRMS implementation is ensuring developments are adapted to the impacts of climate change. This can include controlling developments and only allowing buildings in areas where there is no flood risk, or where flood risk is low and considered safe. By engaging with communities, the LFRMS aims to raise awareness of flood risk both now and the future including what the risks will be with the added effect of climate change. This shall help reduce the flood risk as people will be equipped with the knowledge of how to protect themselves and their properties.

## **1.9 Material Assets**

For the purpose of the LFRMS SEA, the term material asset is used to describe the relation to buildings and infrastructure in the city that could potentially be at risk of flooding.

### **1.9.1 Critical Infrastructure**

Critical infrastructure includes transport networks, water supplies and sewage treatment, energy supplies, schools and hospitals. A risk of flooding to any of these would cause widespread disruption to many people, whilst having the potential to damage the economy. There are various sites of critical infrastructure across the city that are currently at risk, or may be at risk in the future, therefore there is a need to ensure these sites are protected.

There are four main hospitals in the city providing healthcare to the residents of the city as well as serving those outside of the administrative boundary. They are the Royal South Hants, Southampton General, Princess Anne and Spire Southampton Hospitals. As well as these there are a number of smaller healthcare centres, walk in surgeries and doctor's surgeries across the city. These sites are critical to the health of the city's residents and are sites where there are many vulnerable people.

Education in the city is provided by the 42 primary schools, 12 secondary schools, 5 colleges and sixth form schools as well as several schools providing specialist education. Access to higher education is via the two universities, Southampton and Southampton Solent. To protect the well being of young people in the city, sites of education require protection from the risk of flooding to keep disruption to education to a minimum.

Fresh water supplies and adequate sewage treatment are vital to the health of the wider population. Southern Water is the water company serving Southampton. They hold the responsibility for the management of flood risk from public sewers, including both foul and surface water sources. Within the city there are three waste water treatment works which are located at Millbrook, Woolston and Portswood. These sites pose a risk of contamination of water locally and potentially to the wider area should they become flooded.

Electricity sub-stations are located at many sites across the city. Damage to these sites would cause disruption to the supply of electricity to a number of households and could be costly to repair.

### 5.9.2 Housing

The last population figures showed that there were 98,254 houses in Southampton, however with the population expanding the demand for additional affordable housing will grow. Table 8 compares the average house prices for Southampton, the South East and England. It shows that the average house price for the city remains lower than the regional and national average, however prices rose between September 2012 and October 2012.

**Table 6: Average House Prices**

(October 2012)	England	South East	Southampton
Average Price	£161,605	£209,137	£143,282
Monthly Change	-0.3%	-0.3%	+0.6%
Annual Change	+1.1%	+1.4%	+1.2%

(Land Registry: October 2012)

The South Hampshire Strategy proposes a requirement for the development of 55,600 new homes in South Hampshire between 2011 and 2026. Of this total, 12,200 of these homes are proposed for development in Southampton, compared to 9,100 in Portsmouth<sup>27</sup>.

Although a majority of proposed new developments will be on Brownfield sites, pressure to build will also see development on Greenfield sites. Between 2001 and 2012 a total of 9716 new dwellings were completed, compared to 7,255 in Portsmouth<sup>28</sup>.

### 1.9.3 Economy

Southampton prides itself on being an international maritime city and is home to the second busiest port in the UK. With many attractions and large shopping district, tourism is a major contributor to the economy of the city.

In March 2012 there were 7,025 registered businesses present within Southampton, compared with 6,290 in Portsmouth. In 2010 the data showed 660 new enterprises were started whilst 990 were lost<sup>29</sup>.

The Port of Southampton saw 39 million tonnes of goods pass through in 2011, with 945,000 containers handled. In 2010, a total of 1,167,000 passengers passed through the port<sup>28</sup>.

Employment has already been covered under the population and human health section of this report.

<sup>27</sup> South Hampshire Strategy: A framework to guide sustainable development and change to 2026 (October 2012)

<sup>28</sup> Southampton Annual Digest of Statistics 2012

<sup>29</sup> Office for National Statistics 2012

### **1.9.4 Transport Infrastructure**

A reliable, well-functioning transport network plays a crucial role in supporting the wider economic prosperity and good social interaction, whilst also playing a part in reducing carbon emissions. Flooding of transport links can cause significant disruption to the city as well as potential pollution of the natural environment for example washing pollutants from the highway, such as fuel and salt, into nearby watercourses.

The primary route between Southampton and the national motorway and trunk road network is the western approach (A33) comprising of Redbridge Road, Millbrook Road and Mountbatten Way. Other major routes in and out of the city are via Bursledon Road (A3024) to the east and The Avenue (A33) to the north. There is only a very small section of motorway running through the city: the southernmost stretch of the M271 and a small section of the M27 on the northern boundary. Just outside of the city, the M27 links with the M3 providing a direct route to London. These routes are crucial for providing access to the city centre and docks helping the city's economy, and also provide access to the main hospitals which is critical to the health and well being of Southampton's residents and those living outside of the city's boundaries.

There are 8 railway stations in the city. These are served by 4 passenger train operators completing an average of 4 million rail journeys per annum. The rail network is also crucial for providing freight access to the docks, where imported and exported goods can be transported from Southampton to various locations across the UK.

The Port of Southampton is a major international deep sea port with significant global and economic importance. It is the second largest container port in Britain and is also the UK's premier cruise port serving 50% of the UK cruise market, making a vital contribution to the economy at national, regional and local scale and provides a source of employment in the city.

Two ferry companies connect the city to Hythe and the Isle of Wight. Together Red Runnel and White Horse Ferries carry as many as 2,950,000 passengers per annum from Southampton<sup>28</sup>.

### **1.9.5 Waste and Recycling**

Southampton City Council provides kerbside refuse and recycling collection services and runs a waste recycling centre at City Depot in Millbrook. Recycling and incineration to recover energy from waste diverts approximately 76% of all household waste away from landfill<sup>28</sup>.

The average household generates 400kg of waste. In the year 2010-2011 25% of all household waste was recycled, which is down 2% on the previous year. This is less than the UK recycling average of 39%. Southampton sends only 18% of its waste to landfill compared to the 47% of the UK's total waste. The target is to achieve a 60% recycling rate and divert 95% of waste from landfill by 2020<sup>28</sup>.

### **1.9.6 Minerals**

Aggregate supply for Hampshire, Portsmouth and Southampton has remained stable over the last decade at around 5 million tonnes per year. In Southampton the main source of aggregate supply is dredge material from the Solent and Southampton Water.

Southampton's mineral wharves are situated along the River Itchen, three on the west bank near St Marys and one on the east bank. Around half of South Hampshire's aggregate needs are supplied by these wharves.

### **1.9.7 Effect of the LFRMS on Material Assets**

The LFRMS seeks to significantly benefit and protect Southampton's material assets and critical infrastructure. The management of surface water flooding is likely to see a significant positive impact on local transport links which have been highlighted as being at risk from flooding.

Areas of industry along the docks and River Itchen that are at potential risk from sea level rise or tidal flooding may be considered in several options proposed by the strategy. Some options may require construction measures that reduce access to the waterfront which could present industries with difficulties such as loading and offloading vessels. The strategy options will therefore be required to consider the needs of the industries at risk.

## **1.10 Cultural, Architectural and Archaeological Heritage**

Southampton has a varied landscape of known heritage features, including some which are of protected status. Some of the coastal areas present potential for further archaeological discoveries and are considered worthy of conservation due to their historical and architectural interest. Sites of heritage and cultural interest also provide benefits to the city in the form of tourism. There are 20 conservation areas of special historic or architectural interest within the city. Figure 7 shows the spread and locations of sites of historic importance in Southampton.



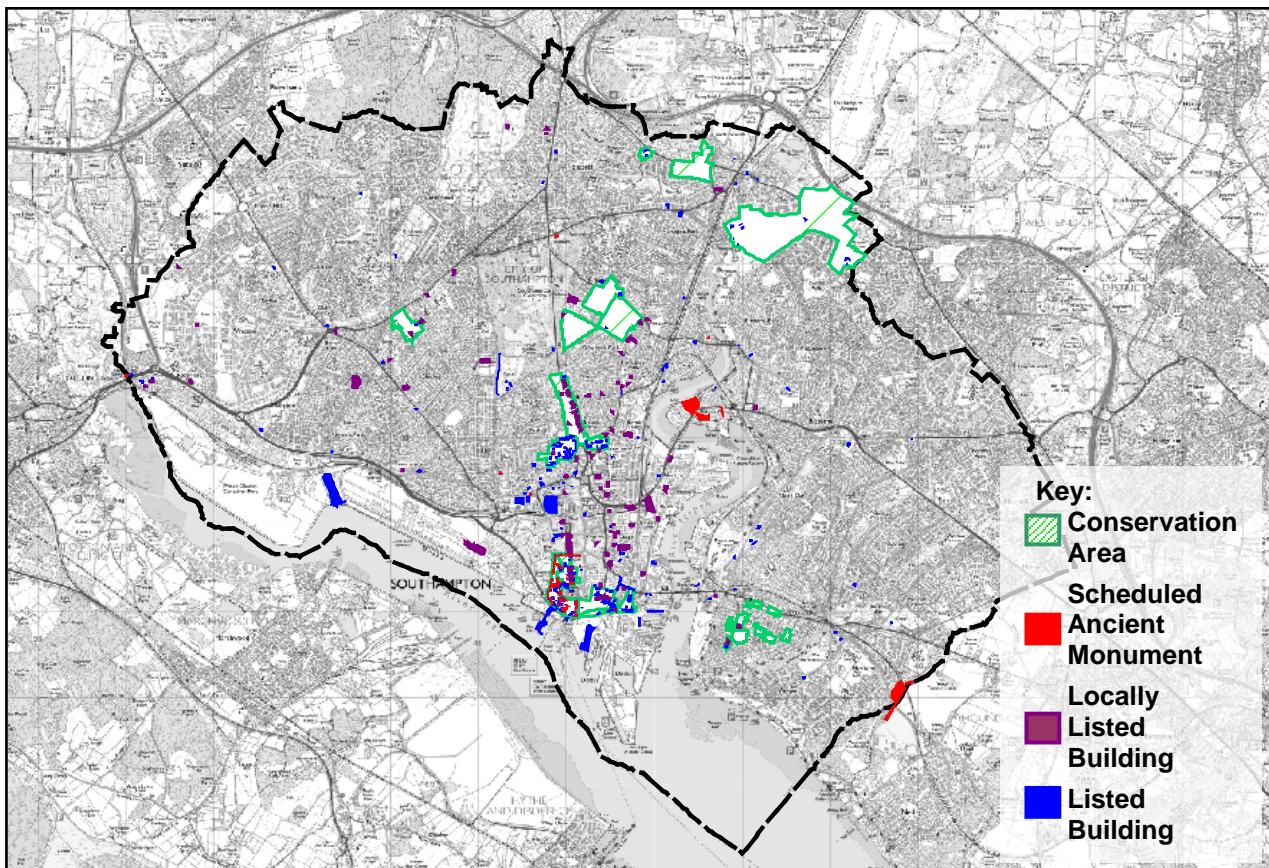


Figure 7: Southampton's Historic Environment

### 1.10.1 Listed Buildings

There are over 450 listed buildings in Southampton with more being added each year. They range from the 12<sup>th</sup> century Medieval Merchants' house on French Street, to Wyndham Court, the 1960s block of flats opposite the Central Railway Station. Several other memorials and structures also feature on the protected buildings list<sup>30</sup>.

### 1.10.2 Scheduled Monuments

There are 60 scheduled monuments located in Southampton, mainly to the south of the city. These are archaeological sites and historic buildings considered to be of national importance and are given designated status to protect their remains. These consist mainly of stone buildings dating from the medieval period and include the town walls, numerous vaults and cellars, the Tudor House Museum and the Roman remains at Bittern Manor.

To the west of the city near Redbridge is a 17<sup>th</sup> Century stone bridge over the River Test. A number of listed buildings and structures along the shoreline are at potential risk of flooding, including the Old Docks that were built on reclaimed land from the mid-19<sup>th</sup> century onwards, and the New Docks that were reclaimed and constructed in the early 20<sup>th</sup> century.

<sup>30</sup> Southampton City Council <http://www.southampton.gov.uk/s-environment/historicenvironment/>

### 1.10.3 Archaeological Interest

The sands, gravels and mud of the foreshore river beds of the Itchen and Test and their confluence with Southampton Water offer the potential for buried archaeology. Southampton, as a historical port settlement has seen a considerable volume of merchant vessels as well as seaborne raids from enemy nations. Losses associated with maritime traffic have the potential to be very well preserves in the river and coastal sediments, therefore offer sites of archaeological interest.

To highlight the heritage landscape of the city, Southampton City Council has divided sections of the city into 'Local Areas of Archaeological Potential' (LAAP) according to the known heritage record of that particular area and the potential for further discoveries.

### 1.10.4 Registered Parks and Gardens

English Heritage maintains a register of parks and gardens which are of special historic interest. In Southampton there are three parks on the register, where development that would detract from the character or historic value is not permitted. The parks are listed below and their locations are shown in figure 8:

- Central Parks – (Grade II) Comprises of West Park, East Park, Palmerston Park, Houndwell and Hoglands Park which together form a chain of open space through the city centre. Laid out between 1846 and 1861.
- Southampton Old Cemetery- (Grade II) One of the earliest municipal cemeteries in England. Land was acquired from Southampton Common in 1843 and currently covers 27 acres.
- Townhill Park – (Grade II) Consists of a sunken garden, woodland and a series of interconnected formal terraces, laid out between 1910 and 1912.

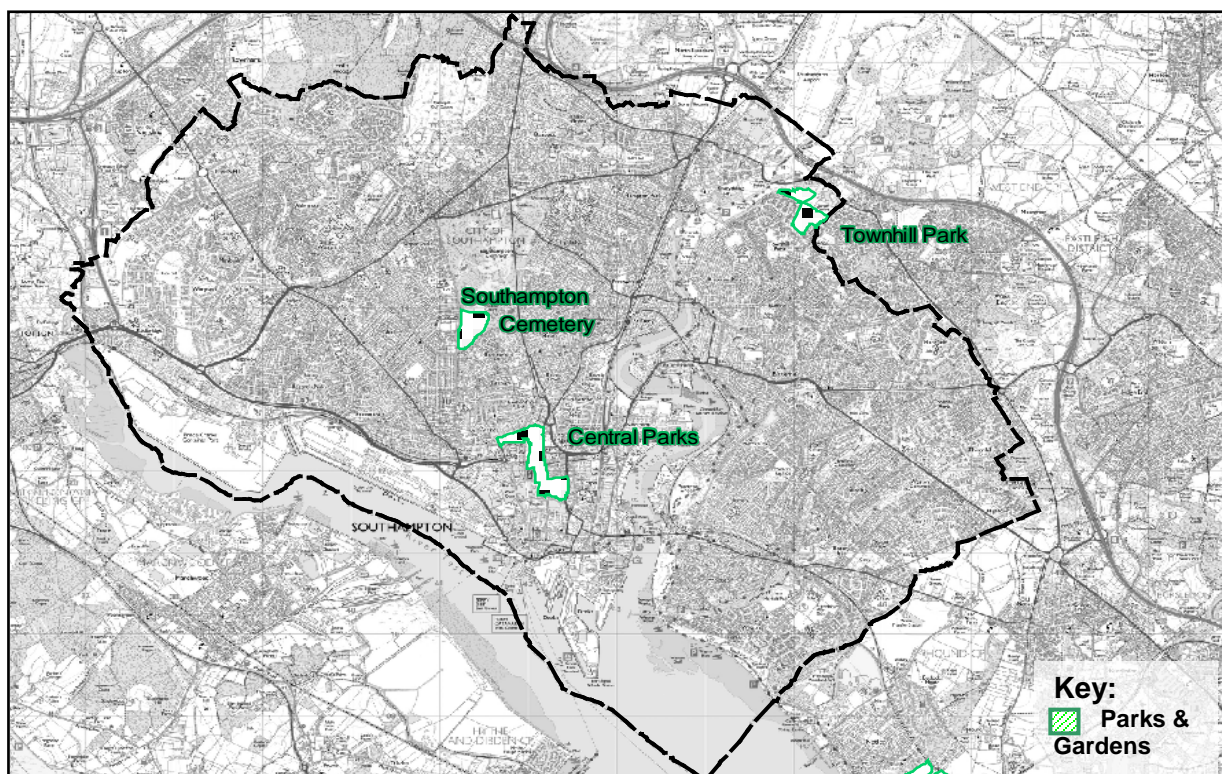


Figure 9: Registered Parks and Gardens in Southampton



### ***1.10.5 Effect of the LFRMS on Cultural Heritage***

The LFRMS provides great potential to reduce flood risk to sites or buildings of cultural or archaeological interest. Effective management of flood risk can lead to improved access to the historic sites whilst protecting and enhancing the environment.

Some LFRMS options may involve construction activities, land use changes or alterations potentially leading to adverse effects on historic sites and their settings. The visual appeal of buildings may be impacted negatively. The incorporation of modern flood defences will need to be done in a way that does not cause visual disturbance or damage to these sites.

Construction options could potentially lead to the loss of undiscovered artefacts and items of historic value. Alterations that impact nearby hydrological regimes could also cause damage to sites of Cultural, Architectural and Archaeological Heritage by shifting flood patterns and increasing flood risk.

## **1.11 Landscape and Land Use**

Land use in Southampton is predominantly an urban, on what is described as the South Hampshire Lowland character area. Only around 20% of the land is open space, comprising of a number of parks, playing fields, allotment areas and greenways. These areas are distributed through the city and contribute to the overall character. There are no landscape designations in Southampton.

Several parks within the city have received green flag status. Of the 5 city parks, the Central Parks, Southampton Common and Weston Shore have green flag status along with Mayfield Park and Mansel Park. Out of the 35 local parks used by smaller communities, Hinkler Green has green flag status.

### ***1.11.1 Effects of the LFRMS on Landscape***

It is not likely that there will be any major negative impacts of LFRMS implementation on the landscape within Southampton since it is an urban city. Care will need to be taken to ensure negative impacts do not occur in any of the green spaces should options or flood prevention schemes be required.

Effective land use planning shall be encouraged through the LFRMS to ensure that new development is steered away from areas of flood risk. Allocations for flood prevention measures such as SuDS may have to be incorporated into new developments to aid the risk of flooding to local and more widespread areas.

## **1.12 Summary of the Scope**

Since not all the SEA topics are relevant to the LFRMS or where there is unlikely to be any significant impacts due to the implementation of the strategy, some topics have been 'scoped out' of the SEA. Table 7 summaries the baseline information and the scope of the SEA giving reasons as to why each topic will, or will not be included in the Environmental Report.

Table 7: Scope of the SEA

Receptor	Topic	Scope	Justification
<b>Population and Human Health</b>	<i>Population and properties at risk of flooding</i>	<b>In</b>	Actions in the LFRMS will affect the wider population and properties within the flood risk areas. A positive impact is likely
	<i>Social deprivation / quality of life</i>	<b>In</b>	Many of the most deprived areas are in areas of highest flood risk. The LFRMS must consider the needs of those living in these areas.
	<i>Employment</i>	<b>In</b>	Flood risk may have an impact on existing employment and future opportunities, such as the possible provision of jobs during the implementation stage.
	<i>Health</i>	<b>In</b>	Both physical and mental health can be affected by the risk of flooding and contaminated water resulting from flooding. A positive impact on health is likely.
	<i>Recreation and leisure</i>	<b>In</b>	Access to open space may be impacted by some LFRMS options. Although minor, it is a negative impact.
<b>Biodiversity, Flora and Fauna.</b>	<i>Sites of international, national and local importance</i>	<b>In</b>	Southampton has several sites of international, national and local importance which support a wide range of biodiversity. At the same time as providing opportunities for enhancement, some LFRMS options may alter the natural hydrology of an area which could damage habitats reliant on water.
<b>Water and Water Quality</b>	<i>Water Quality</i>	<b>In</b>	Water quality can be affected by flooding such as surface water runoff from highways. The LFMRS may include options to improve the water quality.

	<i>Flood risk</i>	<b>In</b>	The LFRMS aims to mitigate flood risk; however care must be taken to ensure problems are not shifted elsewhere.
<b>Air</b>	<i>Air quality</i>	<b>Out</b>	The LFRMS will have no significant impacts on the air quality in Southampton.
<b>Climate and Energy</b>	<i>Climate Change</i>	<b>In</b>	Options in the LFRMS must be adapted to include the impact of climate change and in particular sea level rise. Opportunities to improve climate change adaptation and resilience are likely through the strategy.
<b>Material Assets</b>	<i>Critical Infrastructure</i>	<b>In</b>	The LFRMS aims to manage flooding and protect critical infrastructure. Positive impacts are likely.
	<i>Housing</i>	<b>In</b>	The LFRMS may impact the future location of housing, whilst reducing flood risk to the current properties.
	<i>Economy</i>	<b>In</b>	By minimising flood risk, businesses and industries can continue to operate; therefore loss of earnings is less likely to be significant.
	<i>Transport infrastructure</i>	<b>In</b>	Actions within the LFRMS have the potential to improve key transport links by reducing flood risk.
	<i>Waste and recycling</i>	<b>Out</b>	The LFRMS is unlikely to impact the waste and recycling in the city.
	<i>Minerals</i>	<b>In</b>	The LFRMS is unlikely to have significant impacts on mineral supply, but impacts to the mineral wharves may arise from some management options.

<b>Soils, Geology and Geomorphology</b>	<i>Geology</i>	<b>Out</b>	The LFRMS is unlikely to have any significant affect on geology. Any interaction between flood risk and geology would be considered at EIA stage.
	<i>Geomorphology</i>	<b>In</b>	The LFRMS has the potential to improve geomorphology through the restoration of watercourses.
	<i>Soils</i>	<b>In</b>	Some management options may alter the saturation periods of local soils. However with no agricultural land, impacts on soil quality should be minor.
	<i>Contaminated land</i>	<b>In</b>	Flooding to areas of contaminated land could cause pollution of water bodies and conservation sites. The LFRMS needs to ensure areas of possible contamination are not put at increased risk of flooding.
<b>Cultural, Architectural and Archaeological Heritage</b>	<i>Listed Buildings</i>	<b>In</b>	Measures in the LFRMS may directly affect listed buildings however it is intended that flood risk will be reduced. The views and settings may be indirectly affected.
	<i>Historic Environment</i>	<b>In</b>	Options from the LFRMS may influence the flood regime and could potentially put areas of historic value at risk.
<b>Landscape and Land Use</b>	<i>Landscape</i>	<b>In</b>	There are no likely negative impacts of implementing the LFRMS since the city is of urban character. Opportunities may arise from the LFRMS for the significant improvement of the landscape.
	<i>Land use</i>	<b>In</b>	Strategic LFRMS measures could be affected by, and have direct or indirect effects on land use, such as allocation for development or flood risk management measures.

From the review of the baseline data collected during the scoping stage, it is clear that there is the potential for significant environmental effects, both positive and negative, to arise from the implementation of the LFRMS. Because of this, all but three environmental receptors have been scoped into the SEA Environmental Report. The three environmental receptors that have been scoped out are:

- **Air Quality** – The objectives of the LFRMS are unlikely to have any impacts on the quality of air in Southampton.
- **Waste and Recycling** – The LFRMS is unlikely to have an impact on the current of future waste and recycling in Southampton.
- **Geology** – the LFRMS is unlikely to have any significant impacts on geology. Any interaction between flood risk and geology would be considered at individual site Environmental Impact Assessment (EIA) level.

# Appendix C: Consultation Responses to the Scoping Report

# 1. Introduction

This document is Appendix C to the Southampton LFRMS SEA Environmental Report. It is the summary of the responses received from the three statutory consultees, and displays how the comments have been reviewed and where necessary, incorporated into the Environmental Report.

The draft SEA Scoping Report was sent out to the statutory Consultation Bodies for a period of 6 weeks, beginning Thursday 20<sup>th</sup> December 2012 and ending Thursday 31<sup>st</sup> January 2013, seeking the views on the scope and level of detail that should be included in the SEA.

## 1.1 Consultation Responses

During the consultation period comments and recommendations were received from Natural England and the Environment Agency, with no comments were received from English Heritage. The comments received are detailed in table 1, which also shows how the comments have been taken into account.

**Table 1: Consultation Responses**

Consultee	Comment	How Comment Has Been Taken Into Account
Environment Agency	<p><b>Section 1.1</b> It would be prudent to consider whether or not the zone of influence of the LFRMS extends beyond the administrative boundary of Southampton.</p>	Southampton City Council will continue to work closely with the neighbouring authorities to ensure that any actions carried out do not have an adverse effect outside the city boundary. Hampshire County Council has produced its own LFRMS covering the neighbouring authorities.
	<p><b>Section 2.3</b> To better reflect the general aim of the LFRMS, consider amending objective 6 to include the aspiration to seek opportunities for environmental improvements where feasible.</p>	Section 2.3 refers to the objectives of the LFRMS. The comment has been noted and shall be considered for the development of the Strategy itself, rather than amendment during the SEA.
	<p><b>Section 5.5.6</b> We are in agreement with the statement that major significant impacts on soils, geology and geomorphology are unlikely.</p>	Comment noted.

	<p><b>Section 5.6.3</b> Water quality can be affected by erosion and geomorphology can be improved by the removal of barriers for fish passage.</p>	Impacts on water quality and geomorphology have been considered in the SEA.
	<p><b>Section 5.8</b> The salt marshes in the estuary are already affected by increased usage in the Southampton Water ports in the form of erosion etc. it would therefore be favourable to try and focus on their protection/management.</p>	Comment noted.
	<p><b>Section 5.12</b> Geology has been scoped out. Lee on Solent to Itchen does contain a foreshore geological SSSI however it is quite possible to scope the topic out if the impacts are thought to be minor. We would recommend that justification for doing so is set out further in the SEA.</p>	Impacts on geology, including the Lee on Solent to Itchen foreshore, are likely to be very minor since the Strategy does not contain any actions which are likely to physically alter the environment, or cause cumulative impacts that result in damage to geology. Any interaction between flood risk and geology should be considered at individual
	<p><b>Section 5.12</b> It is not clear from table 9 whether geomorphology has been scoped in or out.</p>	Table 9 has been revisited. Geomorphology has been scoped into the assessment due to the possibility of improvements being made to watercourses and river channels.
	<p><b>Recommendation for the WFD</b> We welcome the recognition of the Water Framework Directive.</p>	A WFD shall be carried out alongside the LFRMS and presented as a separate document. Please refer to the Southampton LFRMS for further details.
<p><b>Natural England</b></p>	<p>In order to demonstrate that designated site impacts have been fully considered within the SEA it will be necessary to consider any sites with hydrological links to the study area.</p>	Comment noted.



	Any flood risk management options that will affect water levels or flows within or to/from designated sites should also be assessed with the site's conservation objectives.	Where any flood risk management options may alter the flow or water levels within watercourses, impacts shall be assessed within an individual site level EIA.
	Natural England welcomes the intention to carry out a Habitats Regulations Assessment (HRA) alongside the SEA to consider impacts upon internationally designated sites.	The HRA has been carried out alongside the SEA and shall be presented alongside the LFRMS as a separate document. Comments can be made during the consultation period.
	Natural England encourages any proposals to incorporate measures to help encourage people to access nature for quiet enjoyment. Measures such as reinstating existing footpaths together with the creation of new footpaths and bridleways are to be encouraged.	Several options of the LFRMS aim to reduce flood risk whilst achieving wider benefits for the community, such as improving access to the watercourse by reinstating footpaths, where funding is available.
	Opportunities for habitat creation and enhancement should be maximised.	Opportunities for habitat creation shall be explored in many options put forward by the LFRMS, where funding is available.
	The SEA should consider how it might contribute to environmental initiatives and priorities.	Comment noted for consideration.
<b>English Heritage</b>	No comments/recommendations received during consultation period	N/A

## 1.2 Email Responses

The following pages are copies of the email responses received from the Environment Agency and Natural England. They have been included for reference and to add completeness to this document.

creating a better place



**Sam Foulds**

Planning and Sustainability Division  
Southampton City Council  
Civic Centre  
SO14 7LY

Our ref:  
Your ref:  
Date: 01 February 2013

Dear Sam,

**CONSULTATION ON THE STRATEGIC ENVIRONMENTAL ASSESSMENT DRAFT SCOPING REPORT FOR THE SOUTHAMPTON LOCAL FLOOD RISK MANAGEMENT STRATEGY**

Please accept our comments on the above document as follows.

**Section 1.1**

It would be prudent to consider whether or not the zone of influence of the LFRMS extends beyond the administrative boundary of Southampton.

**Section 2.3**

To better reflect the general aim of the LFRMS to promote sustainable development, you may wish to consider amending Objective 6 to include the aspiration to seek opportunities for environmental improvements where feasible.

**Section 5.5.6**

We are in agreement with the statement that major significant impacts on soils, geology and geomorphology are unlikely. However, it is likely that there will be a link between flood risk and geomorphology, particularly in watercourses. Rivers/water bodies can be modified to attenuate flood risk. Additionally, the tidal courses can be managed such that the mudflats/salt marshes do not suffer erosion and continue to provide protection against sea level rise.

**Section 5.6.3**

Water quality can also be affected by erosion in watercourses.  
Removing barriers for fish passage would also improve geomorphology.

**Section 5.8**

The salt marshes in the estuary are already affected by increased usage in the Southampton Water ports in the form of erosion etc. It would therefore be favourable to try and focus on their protection/management. They are also good at protecting adjacent shorelines from erosion – but only if in a good state.

**Section 5.12**

Geology has been scoped out of the SEA. However, Lee on Solent to Itchen does contain a foreshore geological SSSI. It is quite possible to scope this topic out if the impacts are thought to be minor, but we would recommend that the justification for doing so is set out within the SEA.

It is not clear within Table 9 under Section 5.12 if geomorphology has been scoped in or out.

There are a couple of topics listed within Table 9 (Soils and Economy) where the overall impact is considered likely to be minor. If this is the case, and their consideration is unlikely to make a fundamental change to the preferred environmental options, perhaps they could be scoped out. This would make the SEA more focussed and 'readable'.

The issues scoped 'in' within Section 5.12 which relate to economy/humans/infrastructure total 12 in number, as opposed to 11 that are impacts not related to human receptors. When balancing the positives and negatives of the LFRMS, this emphasis on economic topics could have the potential to skew the overall environmental assessment.

### **Recommended Water Framework Directive considerations**

We welcome the recognition of the Water Framework Directive (WFD) as a relevant policy in this report (Chapter 4). We are aware that you will be undertaking a WFD compliance assessment of the LFRMS, which is needed at this stage to avoid compliance issues of individual schemes within the LFRMS later on.

Article 4.7 of WFD stipulates that any new modification with the potential to alter the hydromorphology or other characteristics of a water body should not cause deterioration in the ecological status or potential of a water body, or prevent it from achieving its objectives as outlined in the River Basin Management Plan (RBMP). Where feasible, the Strategy should contribute to the achievement of objectives, and identify opportunities to enhance the water body.

Our main concern would be loss of intertidal area, in particular where it supports salt marsh and seagrass habitats. Habitat loss through coastal squeeze will also need to be assessed. Since WFD requires assessment on a water body scale, losses/gains of such areas would need to be specified per water body in order to enable assessment of WFD compliance. An indication of the location of predicted impacts will be required for the assessment of deterioration of any of the biological quality elements. Where negative environmental impacts are likely, measures should be identified to mitigate for these. Unlike the Habitats Directive, WFD does not allow for mitigation or compensation outside the boundaries of a water body.

In terms of WFD Protected Areas, 'Southampton Water' is designated under the EU Shellfish Waters Directive (2006/113/EC). The directive requires compliance with mandatory standards for parameters including dissolved oxygen, suspended solids, metals and other contaminants. Potential risks to compliance resulting from the strategy should be discussed.

### **Suggested Approach to the WFD Assessment**

The WFD assessment should consider potential implications of the suggested options for the overall status and status objectives of the affected WFD water bodies. As such, it would need to address the following WFD components:

- List WFD Water bodies, current status and status objectives.
- Consider impact of options on WFD status in terms of:

- 1) Ecological status (Biological quality elements, and supporting physico-chemical and hydromorphological quality elements), and
- 2) Chemical status (Priority substances and other EU-level dangerous substances).

- List the protected areas under WFD and consider any impacts the Strategy could have on them (this will include waters designated under the Shellfish Waters Directive, in addition to the sites already mentioned in section 4.5).
- Should negative impacts of the Strategy on any of the above be identified, possible mitigation measures will need to be suggested.
- Identify any contributions the Strategy could make towards achieving the water body objectives outlined in the SE RBMP.

We recommend following the existing guidance for WFD assessment of Shoreline Management Plans. The Porchester to Emsworth Strategy is accompanied by a WFD assessment, which could be used as an example.

If you require any further information or clarification, please do not hesitate to contact me.

Yours sincerely,

**Jemma Colwell**

Partnership & Strategic Overview team  
Hampshire & Isle of Wight  
01794 834593

Romsey Depot, Canal Walk, Romsey, Hampshire, SO51 8DU

Date: 28 January 2013  
Our ref: 73692  
Your ref



**Sam Foulds**  
Planning and Sustainability Division  
Southampton City Council

Customer Services  
Hornbeam House  
Crewe Business Park  
Electra Way  
Crewe  
Cheshire  
CW1 6GJ  
T 0300 060 3900

**BY EMAIL ONLY**

Dear Miss Foulds

**Consultation: Strategic Environmental Assessment (SEA) Draft Scoping Report for the Southampton Local Flood Risk Management Strategy (LFRMS).**

**Location: City of Southampton**

Thank you for your consultation on the above dated 20 December 2012 which was received by Natural England on the same date.

Natural England is a non-departmental public body. Our statutory purpose is to ensure that the natural environment is conserved, enhanced, and managed for the benefit of present and future generations, thereby contributing to sustainable development.

We are providing this advice under the Environmental Assessment of Plans and Programmes Regulations (the SEA Regulations, Statutory Instrument 2004, No 1633) which transposes into UK law the European Directive 2001/42/EC for 'the assessment of the effects of certain plans and programmes on the environment' the SEA Directive.

**1 Sites of Special Scientific Interest (SSSIs) and sites of European or international importance (Special Areas of Conservation, Special Protection Areas and Ramsar sites)**

The study area for the SEA includes the following designated nature conservation sites:

- Southampton Common SSSI
- Lower Test Valley SSSI
- Lee-on-the-Solent to Itchen Estuary SSSI
- River Itchen SSSI
- Solent and Southampton Water SPA/Ramsar
- Solent Maritime SAC
- River Itchen SAC

The following designated nature conservation sites have been identified by the scoping report as being outside the study area but still within the scope of consideration under the SEA:

- Eling and Bury Marshes SSSI
- Dibden Bay SSSI
- Hythe to Calcot Marshes SSSI
  
- Further information on the above listed SSSIs and their special interest features can be found at [www.natureonthemap.naturalengland.org.uk](http://www.natureonthemap.naturalengland.org.uk) . The SEA should include a full assessment of the direct and indirect effects of the FRMS on the features of special interest within these sites and should identify such mitigation measures as may be required in order to avoid, minimise or reduce any adverse significant effects.
  
- Natura 2000 network site conservation objectives are available on our internet site [here](#)

In order to demonstrate that designated site impacts have been fully considered within the SEA it will be necessary to consider any sites with hydrological links to the study area. It will not be sufficient to consider sites within a certain radius of the area as hydrological links may be further away (e.g. via river, stream or groundwater). The SEA should consider whether there is a potential impact pathway with each SSSI and, if there is, consider the impact on conservation objectives and targets for favourable condition. Any flood risk management options that will affect water levels or flows within or to/from designated sites should also be assessed in line with the site's conservation objectives.

European sites (eg designated Special Areas or Conservation and Special Protection Areas) fall within the scope of the Conservation of Habitats and Species Regulations 2010. In addition paragraph 169 of the National Planning Policy Framework requires that potential Special Protection Areas, possible Special Areas of Conservation, listed or proposed Ramsar sites, and any site identified as being necessary to compensate for adverse impacts on classified, potential or possible SPAs, SACs and Ramsar sites be treated in the same way as classified sites.

Under Regulation 61 of the Conservation of Habitats and Species Regulations 2010 an appropriate assessment needs to be undertaken in respect of any plan or project which is (a) likely to have a significant effect on a European site (either alone or in combination with other plans or projects) and (b) not directly connected with or necessary to the management of the site.

Should a Likely Significant Effect on a European/Internationally designated site be identified or be uncertain, the competent authority (in this case the Local Planning Authority) may need to prepare an Appropriate Assessment, in addition to consideration of impacts through the EIA process.

Natural England welcomes the intention to carry out a Habitats Regulations Assessment (HRA) alongside the SEA to consider impacts upon internationally designated sites.

## 2. Access and Recreation

Natural England encourages any proposal to incorporate measures to help encourage people to access the nature for quiet enjoyment. Measures such as reinstating existing footpaths together with the creation of new footpaths and bridleways are to be encouraged. Links to other green networks and, where appropriate, urban fringe areas should also be explored to help promote the creation of wider green infrastructure. Relevant aspects of local authority green infrastructure strategies should be incorporated where appropriate.

Flood storage and attenuation of surface water runoff in carefully selected locations will provide multiple benefits – including biodiversity, water quality improvements and green infrastructure. Solutions that incorporate the creation of green infrastructure and its multiple benefits should be considered.

### **3. Local Wildlife or Geological Sites**

The SEA will need to consider any impacts upon local wildlife and geological sites. Local Sites are identified by the County Ecologist, Local Record Centre or Local Wildlife Trust. The SEA should therefore include an assessment of the likely impacts on the wildlife interests of the sites identified. The assessment should include proposals for mitigation of any impacts and if appropriate, compensation measures.

### **4. Other features of nature conservation interest, e.g. habitats and species identified within the UK and City Biodiversity Action Plans**

Opportunities for habitat creation and enhancement should be maximised, particularly in relation to BAP habitat. This might include new/existing wetlands, or river restoration (restoring more natural flows, bankside vegetation, and removing structures and impoundments where feasible).

Please note that the reference to plans and policies with regard to Biodiversity Strategy for England should now make reference to the Biodiversity 2020: A strategy for England's wildlife and ecosystem services rather than Working with the Grain of Nature: A Biodiversity Strategy for England (2011) Defra – see [weblink Biodiversity 2020: A strategy for England's wildlife and ecosystem services](#)

### **5 Contribution to local environmental initiatives and priorities**

The SEA should consider how it might contribute to local environmental initiatives and priorities such as the objectives of Local Nature Partnerships encouraged by the Government through last year's Environment White Paper: The Natural Choice.

### **6 Cumulative and in-combination effects**

The SEA should include an assessment to identify, describe and evaluate the effects that are likely to result from the LFRMS in combination with other projects and activities that are being, have been or will be carried out. It will be important to consider the Hampshire LFRMS and other neighbouring Local Flood Risk Management Plans. The following types of projects should be included in such an assessment. (Subject to available information):

- a. Existing completed projects

- b. Approved but uncompleted projects
- c. Ongoing activities
- d. Plans or projects for which an application has been made and which are under consideration by the consenting authorities
- e. Plans and projects which are reasonably foreseeable, i.e. projects for which an application has not yet been submitted, but which are likely to progress before completion of the development and for which sufficient information is available to assess the likelihood of cumulative and in-combination effects.

We would be happy to comment further should the need arise but if in the meantime you have any queries please do not hesitate to contact us.

For any queries relating to the specific advice in this letter only please contact Sarah Armstrong-Stacey on 0300 060 2734. For any new consultations, or to provide further information on this consultation please send your correspondences to [consultations@naturalengland.org.uk](mailto:consultations@naturalengland.org.uk).

We really value your feedback to help us improve the service we offer. We have attached a feedback form to this letter and welcome any comments you might have about our service.

Yours faithfully

**Sarah Armstrong-Stacey**

Land Use Operations- Winchester Team

**[End of Report]**



