

# Lincolnshire Joint Flood Risk and Drainage Management Strategy

## **Strategic Environmental Assessment Report**

October 2012

*Prepared for*  
Lincolnshire County Council



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## Abbreviations

BAP	Biodiversity Action Plan
BREEAM	Building Research Establishment Environmental Assessment Method
CEEQUAL	Civil Engineering Environmental Quality Assessment & Awards Scheme
DCLG	Department for Communities and Local Government
HRA	Habitat Regulations Assessment
LCC	Lincolnshire County Council
LJFRDMS	Lincolnshire Joint Flood Risk and Drainage Management Strategy
LLFA	Lead Local Flood Authority
LNR	Local Nature Reserve
PPP	Plans, Programmes and Policies
SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
SMP	Shoreline Management Plan
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
SUDS	Sustainable Urban Drainage Systems

## Non Technical Summary

Under the requirements of the Flood and Water Management Act (2010) Lincolnshire County Council is defined as a Lead Local Flood Authority and they are required to '*develop, maintain, apply and monitor a strategy for local flood risk management in its area*'. In Lincolnshire this has been named the Lincolnshire Joint Flood Risk and Drainage Management Strategy. A partnership of organisations has been assembled to provide strategic co-ordination of this Strategy at a county level, as well as collaborative solutions to flooding and drainage issues at the local level.

This document details the Strategic Environmental Assessment (SEA) that has been undertaken in support of the development of this Strategy. An SEA is an environmental appraisal of the predicted impacts of the Strategy against environmental objectives that have been identified following consideration of the environmental issues affecting Lincolnshire.

Environmental issues were presented within the SEA Scoping Report that was issued for consultation in July 2012. The principle issues identified were pressures upon biodiversity, water pollution and flooding, landscape, access to services, heritage, sustainable development and community engagement. The Environmental issues were used to develop 17 SEA objectives that the strategic outcomes of the Strategy were appraised against to test the potential environmental effects of implementation.

In considering the 9 strategic outcomes of the Strategy, when compared to the 17 objectives of the SEA, it has been concluded that the Lincolnshire Joint Flood Risk and Drainage Management Strategy will either lead to positive impacts upon environmental assets and interests within the county of Lincolnshire or will have neutral impacts. The SEA process has not identified any negative impacts upon the environment upon implementation of the Lincolnshire Joint Flood Risk and Drainage Management Strategy.

Internal assessment of the objectives of the SEA and internal assessment of the strategic outcomes of the Strategy has also been undertaken to assess whether they are compatible. This has identified that the internal outcomes of the Strategy could have some unclear outcomes and therefore enhancement measures have been suggested within this Environmental Report to provide opportunities for environmental improvements and additional protection of resources.

# 1 Introduction

## 1.1 Background

In June 2012 Lincolnshire County Council (LCC) commissioned Mouchel to undertake a Strategic Environmental Assessment (SEA) of the emerging Lincolnshire Joint Flood Risk and Drainage Management Strategy (LJFRDMS).

The SEA process is concerned with identifying possible effects that plans, programmes and strategies may have on the existing environment, and therefore increase the consideration of environmental issues in the decision making process.

One of the requirements of the SEA process is to prepare an Environmental Report. This document is the Environmental Report and details the SEA of the LJFRDMS. It sets out the framework for undertaking the SEA of the Strategy together with the scope of the assessment, evidence base and review of relevant plans, programmes and policies to inform the assessment. It includes a discussion of the likely significant effects of the implementation of the LJFRDMS and recommendations are made in relation to ways in which likely adverse effects on the environment can be reduced or beneficial effects can be enhanced. The report includes proposals for relevant environmental indicators to monitor the effects of the implementation of the LJFRDMS.

The findings of the SEA are being made available to stakeholders, including statutory consultees, local authorities, and the public, in order to help all those with an interest in flood risk management within Lincolnshire to understand the effects of the proposed Strategy. This report should be read alongside the LJFRDMS document.

## 1.2 Strategic Environmental Assessment

SEA is a statutory assessment process that incorporates environmental considerations into policies, plans and programmes. It ensures that significant environmental effects arising from policies, plans and programmes are identified, assessed, mitigated, communicated to decision-makers, monitored and that opportunities for public involvement are provided.

In the European Union an SEA is required for all member states on all plans and programmes by European Community Directive (2001/42/EC) 'on the assessment of the effects of certain plans and programmes on the environment', known as the 'SEA Directive'. The Directive is implemented in England through the Environmental Assessment of Plans and Programmes Regulations (Statutory Instrument 1633 2004).

Guidance released to assist the development of Local Flood Management Strategies<sup>i</sup> outlines that *'the Local Flood Risk Management Strategy is likely to require statutory SEA, but this requirement is something the Local Lead Flood*

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<sup>i</sup> Local Government Association (2011). Framework to Assist the Development of the Local Strategy for Flood Risk Management.

*Authority must consider*. LCC as the Local lead Flood Authority (LLFA) considers that its emerging LJFRDMS requires an SEA to be undertaken.

SEA is an iterative process and will ensure environmental considerations are integrated into the development of the LJFRDMS at the earliest opportunity, and that the strategy has, as far as is as is practicable, met environmental concerns.

### 1.2.1 Compliance with the SEA Directive

This Environmental Report has been prepared in accordance with the SEA Directive; Table 1.1 shows where the requirements of Directive have been addressed in this report.

Table 1.1 - SEA requirements and where they have been addressed in this report

Requirements / Where covered in Guide	(Section / Appendix / End notes)
Preparation of an environmental report in which the likely significant effects on the environment of implementing the plan or programme, and reasonable alternatives taking into account the objectives and geographical scope of the plan or programme, are identified, described and evaluated. The information to be given is (Art. 5 and Annex I)	This is the Environmental Report
a) An outline of the contents, main objectives of the plan or programme, and relationship with other relevant plans and programmes	Sections 2.3, 4.2 Appendix 3
b) The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme	Sections 4.2, 4.3, 4.4 Appendix 4
c) The environmental characteristics of areas likely to be significantly affected	Sections 4.2, 4.3, 4.4 Appendix 4
d) Any existing environmental problems which are relevant to the plan 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	Sections 4.2, 4.3, 4.4 Appendix 4
e) 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 any environmental considerations have been taken into account during its preparation	Sections 4.2
f) 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 between the above factors. (Footnote: These effects should include secondary, cumulative, synergistic, short, medium and long-term permanent and temporary, positive and negative effects)	Section 5.5
g) 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 6
h) 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	Section 5

Requirements / Where covered in Guide	(Section / Appendix / End notes)
i) A description of measures envisaged concerning monitoring in accordance with Article 10	Section 7
The report shall include the information that may reasonably be required taking into account current knowledge and methods of assessment, the contents and level of detail in the plan or programme, its stage in the decision-making process and the extent to which certain matters are more appropriately assessed at different levels in that process to avoid duplication of the assessment (Art. 5.2)	Included in this report
<p>Consultation:</p> <p>Authorities with environmental responsibility, when deciding on the scope and level of detail of the information to be included in the environmental report (Art. 5.4)</p>	An account on the consultation undertaken in the scoping phase is provided in Appendix 1
Authorities with environmental responsibility and the public shall be given an early and effective opportunity within appropriate time frames to express their opinion on the draft plan or programme and the accompanying environmental report before the adoption of the plan or programme (Art. 6.1, 6.2)	The schedule for consultation is outlined in Table 3.1.
Other EU Member States, where the implementation of the plan or programme is likely to have significant effects on the environment of that country (Art. 7)	N/A
Taking the environmental report and the results of the consultations into account in decision-making (Art. 8)	Pending
<p>Provision of information on the decision: When the plan or programme is adopted, the public and any countries consulted shall be informed and the following made available to those so informed:</p> <ul style="list-style-type: none"> <li>• The plan or programme as adopted;</li> <li>• A statement summarising how environmental considerations have been integrated into the plan or programme and how the environmental report pursuant to Article 5, the opinions expressed pursuant to Article 6 and the results of consultations entered into pursuant to Article 7 have been taken into account in accordance with Article 8, and the reasons for choosing the plan or programme as adopted, in the light of the other reasonable alternatives dealt with; and</li> <li>• The measures decided concerning monitoring (Art. 9 and 10).</li> </ul>	Pending
Monitoring of the significant environmental effects of the plan's or programme's implementation (Art. 10).	Proposals for monitoring outlined in Section 7.
Quality assurance: environmental reports should be of a sufficient standard to meet the requirements of the SEA Directive (Art. 12).	Complete

### 1.3 Habitats Regulations Assessment

A Habitats Regulations Assessment (HRA) is undertaken during the development of a programme or plan that is likely to have an adverse effect on any designated Natura 2000 sites. Natura 2000 sites are designated by the EC Directive on the Conservation of Wild Birds 79/409/EEC 1979 (Special Protection Areas (SPAs) and the EC Directive on the Conservation of Natural Habitats of Wild Fauna and Flora 92/43/EEC 1992 (Special Areas of Conservation (SACs)).

If an internationally protected site within or near to Lincolnshire is likely to be significantly affected by the LJFRDMS, an 'appropriate assessment' under the Conservation (Habitat, & c.) Regulations 1994 (as amended 1997, 2000) will be undertaken. This will determine whether the significant effects in the screening are likely to be 'adverse and whether mitigation is required. In order to comply with Article 6(3) of the Habitats Directive it is a requirement to ensure the LJFRDMS will not have any adverse effects on Natura 2000 sites in order for the plan to be adopted.

A HRA of the LJFRDMS is being undertaken in parallel to the SEA as the Natura 2000 sites; The Humber Estuary, The Wash Estuary, Gibraltar Point, Saltfleetby – Theddlethorpe Dunes, Baston Fen and Grimsthorpe are located within Lincolnshire.

### 1.4 Structure of this Report

This SEA Report sets out the findings of the assessment of the effects of implementing the LJFRDMS. The structure of this report follows guidance set out in the guidance '*A Practical Guide to the Strategic Environmental Assessment Directive* (ODPM, 2005)' and comprises of the following sections:

**Chapter 1** – this chapter describes the background to emergence of the LJFRDMS, the legislative requirement to undertake the SEA and how this report fulfils those requirements.

**Chapter 2** – describes the study area, background to the strategy and its aims and objectives.

**Chapter 3** – details the approach that has been used for SEA and the steps taken and tasks involved.

**Chapter 4** – develops the strategic environmental framework that is used to evaluate the environmental effects of the LJFRDMS.

**Chapter 5** – tests the objectives of the LJFRDMS compared to the SEA objectives.

**Chapter 6** – provides analysis of the findings of the SEA process.

**Chapter 7** – provides suggested monitoring to assess the implementation of the plan.

**Chapter 8** – Conclusions and next steps.

Additional to the main report, there are five appendices that provide additional information, these are:

**Appendix 1** – consultation comments received and how they have been addressed in this report.

**Appendix 2** – list of partnership organisations that form the Lincolnshire Flood Risk and Drainage Management Partnership.

**Appendix 3** – the review of the Plans, Programmes and Policies.

**Appendix 4** – updated baseline information in light of comments received on the Scoping Report.

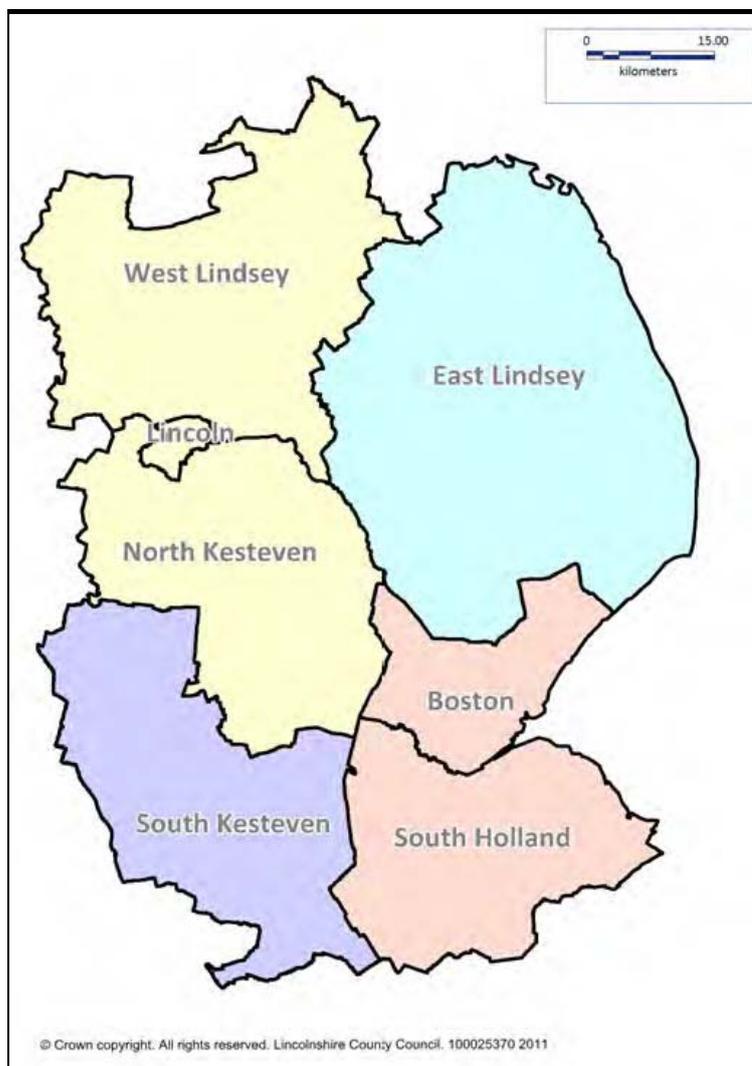
**Appendix 5** – SEA matrices.

## 2 The Lincolnshire Joint Flood Risk and Drainage Management Strategy

### 2.1 The Study Area

The study area covers the whole of the county of Lincolnshire, incorporating the districts of North Kesteven, South Kesteven, West Lindsey, East Lindsey, South Holland, the Borough of Boston and Lincoln City. The districts that comprise the county of Lincolnshire and the county border are shown in Figure 2.1.

Figure 2.1 - Lincolnshire County Districts



Source: Lincolnshire County Council, 2011. *Preliminary Flood Risk Assessment Report*.

The county is predominantly rural and has a geographical area of 2,309 sq miles. Population is centred around the cathedral city of Lincoln which has a rich history dating back to its foundation as a Roman colony. Other centres of population in the county include Gainsborough, Louth, Mablethorpe, Skegness, Boston, Sleaford, Grantham, Stamford and Spalding.

There are a number of large rivers and tributaries that flow through Lincolnshire including the River Witham which rises south of Grantham, passes through Lincoln and drains to The Wash at Boston. Other significant rivers include the Rivers Brant, Till, Bain and Slea.

The south-east of Lincolnshire was once dominated by the great Fens rivers and wetlands, but has now been drained for farming. This has created a vastly modified landscape with a network of drainage dykes and uniform, canalised and maintenance- dependent waterway system. Extraction of clay for brick and tile making and, more recently, of sand and gravel for the construction industry has left a series of water-filled pits.

Water resources in the study area come from both ground and surface sources. There are significant pressures on surface water resources from agriculture and industry.

Lincolnshire's coastline boasts some of the country's most versatile agricultural land, a successful tourism industry and internationally-renowned nature conservation sites.

## 2.2 Background to the Strategy

Along with other parts of the country, Lincolnshire experienced unusually high rainfall in 2007, which led to serious flooding in Louth, Horncastle and parts of Lincoln, as well as numerous locations in the north and east of the county. Following on from other similar events since 2000, the 2007 events prompted the Government to commission a review of flood risk management in England and Wales by Sir Michael Pitt, who published his final report: 'Learning Lessons from the 2007 Floods' in June 2008. Its recommendations were accepted in full by the Government in 2008, and led to a new Act of Parliament, the Flood and Water Management Act (2010).

Under the requirements of the Flood and Water Management Act (2010) LCCs position as LLFA means they must 'develop, maintain, apply and monitor a strategy for local flood risk management in its area'. LCC is required by law to develop, maintain, apply and monitor a Local Flood Risk Management Strategy. The strategy should be consistent with the national Flood and Coastal Erosion Management Strategy, but should respond to local needs and circumstances.

Local Flood Risk Management Strategies are statutorily required to include the following:

- The risk management authorities in the LLFA area and what flood and coastal erosion risk management functions they may exercise in relation to the area. If functions normally carried out by one body will be carried out by another, this also has to be specified.
- The objectives for managing local flood risk. These will be relevant to the local area and reflect the level of local risk.
- The measures proposed to achieve the objectives. This could include a wide range of measures such as sustainable drainage systems, designation of features, improvements to the sewage network and application of the planning system.

- How and when measures are expected to be implemented.
- The costs and benefits of these measures and how they are paid for.
- The assessment of local flood risk for the purpose of the strategy. The strategy may identify gaps in the understanding of local flood risk and specify the actions which could close these gaps.
- How and when the strategy is to be reviewed. The review period is not specified at the national level and it is therefore up to the LLFA to decide what is appropriate.
- How the strategy contributes to the achievement of wider environmental objectives.

In advance of Government legislation, LCC, the Environment Agency, Internal Drainage Boards, District Councils and Water Companies agreed to form a partnership to implement a more co-ordinated approach to the way flood risk is managed in Lincolnshire. This involves close joint working to deliver flood protection and prevention schemes on the ground, as well as strategic co-operation to make sure that all relevant authorities are following common, agreed aims and objectives.

The partnership was developed during 2009 and was formally established in April 2010. An overview of the partnership organisations is listed below, a full list of organisations is provided in Appendix 2.

- Lincolnshire County Council;
- The 7 District Councils in Lincolnshire;
- The Environment Agency (Anglian Region, Northern Area);
- Natural England;
- The Regional Flood & Coastal Committee (Anglian Region, Northern Area);
- The 14 Internal Drainage Boards operating in Lincolnshire;
- The 2 Water and Sewerage Companies operating in Lincolnshire; and
- The Lincolnshire Resilience Forum – made up of senior executives and policy makers from the principal organisations with responsibilities for emergency planning, emergency response and recovery.

The Partnership is organised to provide strategic co-ordination at a county level, as well as collaborative solutions to flooding and drainage issues at the local level.

## 2.3 Aims and Objectives of the Strategy

As a requirement of the Flood and Coastal Erosion Risk Management appraisal process the LLFA is responsible for outlining a number of specific objectives of the Flood Risk Management Strategy. These objectives are identified in the LJFRDMS as strategic outcomes and detail what will be in place when the Strategy's vision is achieved, these are listed below:

1. We will establish a co-ordinated programme of flood risk and drainage management, including flood risk from all sources, integrating existing strategies, plans and assessments into one Strategy by 2017.
2. Partners' resources will be used in the most efficient way possible, maximising use of externally available resources, improving the use of existing local resources, and securing new resources locally and nationally.
3. The likelihood and impact of flooding from all sources will be reduced from current levels by 2025. Any increase in the risk of flooding as a consequence of climate change will be mitigated.
4. Arrangements for responses to emergency situations are fully integrated with the way in which partners manage longer-term strategic thinking, as well as day-to-day operational delivery in normal conditions.
5. The Lincolnshire Flood Risk and Drainage Management Partnership will work with local communities to develop and deliver fully integrated flood risk and drainage management services, beginning with a common works programme in 2013.
6. Local communities will be more aware of flood risk, and in partnership with risk management authorities, will take steps to minimise that risk through individual and community action.
7. Strategic development across the county will integrate consideration of flood risk and sustainable drainage into planning and development control systems; inappropriate development which could increase flood risk will be avoided, as will inappropriate development in areas of significant flood risk.
8. Flood risk and drainage management will be more accountable to the public through local democratic process, and through more freely available information about flood risk and measures undertaken to control it.
9. Flood risk and drainage management will contribute to better water quality and wider environmental benefits.

## 3 SEA Methodology

### 3.1 Approach to the SEA

The approach to the SEA stages completed to date (A to C) has been to provide an expert judgement based system of prediction and assessment that is transparent and auditable.

Current best practice guidance has been used to inform the process:

- A Practical Guide to the Strategic Environmental Assessment Directive (Department of Communities and Local Government, previously the Office of the Deputy Prime Minister, 2005).

This guidance has been used in conjunction with other best practice guidelines that include:

- Sustainability Appraisal and the Historic Environment (English Heritage).
- Catchment Flood Management Plans and the Historic Environment (Environment Agency 2007).
- Strategic Environmental Assessment and Biodiversity: Guidance for Practitioners (Royal Society for the Protection of Birds 2004).

The SEA process is undertaken in five main stages as outlined in Table 3.1, to date Stages A to C have been completed, the table details the timescales of the work undertaken and future work to be completed.

Table 3.1 - Stages in the SEA and Work Undertaken

SEA Stages	SEA Tasks	Timescales and Work Undertaken
<b>Stage A: Setting the context and objectives, establishing the baseline and deciding on the scope.</b>	<ul style="list-style-type: none"> <li>• <b>A1:</b> Identifying other relevant policies, plans and programmes, and SEA objectives.</li> </ul>	<p>The SEA Scoping Report<sup>ii</sup> was prepared and consulted upon for 5 weeks between 15 August 2012 and 21 August 2012. The Environment Agency, English Heritage and Natural England are designated as statutory consultation bodies under the SEA Regulations and must be consulted on the scope and level of detail of information to be included in the Environmental Report.</p> <p>Furthermore, to ensure public participation the Scoping Report and accompanying appendices were also made available on LCC's website.</p>
	<ul style="list-style-type: none"> <li>• <b>A2:</b> Collecting baseline information</li> </ul>	
	<ul style="list-style-type: none"> <li>• <b>A3:</b> Identifying environmental problems.</li> </ul>	
	<ul style="list-style-type: none"> <li>• <b>A4:</b> Developing the SEA objectives.</li> </ul>	
	<ul style="list-style-type: none"> <li>• <b>A5:</b> Consulting on the scope of the SEA.</li> </ul>	
<b>Stage B: Developing and refining options and assessing effects</b>	<ul style="list-style-type: none"> <li>• <b>B1:</b> Testing the plan or programme objectives against the SEA alternatives.</li> </ul>	<p>Documented consultation responses relating to the Scoping Report were reviewed and addressed. A list of comments received from consultees, along with a description of how each one has been addressed, is provided in Appendix 1.</p> <p>An internal draft of the LJFRDMS was issued to Mouchel for appraisal in June 2012. This included a full set of strategic outcomes (objectives) and a strategic programme of how they could be achieved.</p>
	<ul style="list-style-type: none"> <li>• <b>B2:</b> Developing the Strategic options.</li> </ul>	
	<ul style="list-style-type: none"> <li>• <b>B3:</b> Predicting the effects of the Draft plan or programme including alternatives.</li> </ul>	
	<ul style="list-style-type: none"> <li>• <b>B4:</b> Evaluating the effects of the Draft plan or programme including alternatives.</li> </ul>	
	<ul style="list-style-type: none"> <li>• <b>B5:</b> Considering ways of mitigating adverse effects.</li> </ul>	
	<ul style="list-style-type: none"> <li>• <b>B6:</b> Proposing measures to monitor the environmental effects of implementing the plan or programme.</li> </ul>	

<sup>ii</sup> Strategic Environmental Assessment of the Lincolnshire Joint Flood Risk and Drainage Management Strategy – Scoping Report (Mouchel 2012)

SEA Stages	SEA Tasks	Timescales and Work Undertaken
<b>Stage C: Environmental Report</b>	<ul style="list-style-type: none"> <li>• <b>C1:</b> Preparing the Environmental Report.</li> </ul>	<b>This is the Environmental Report</b>
<b>Stage D: Consulting</b>	<ul style="list-style-type: none"> <li>• <b>D1:</b> Consulting on the draft plan and the Environmental Report.</li> </ul>	<b>The SEA Environmental Report will be consulted on between October and November 2012. It will be made available to the above statutory consultees, as well as being made available to other consultees and the wider public.</b>
	<ul style="list-style-type: none"> <li>• <b>D2 (i):</b> Assessing significant changes.</li> </ul>	
	<ul style="list-style-type: none"> <li>• <b>D2 (ii):</b> Appraising significant changes resulting from representations.</li> </ul>	
	<ul style="list-style-type: none"> <li>• <b>D3:</b> Making decisions and providing information.</li> </ul>	
<b>Stage E: Monitoring the significant effects of implementing the plan on the environment</b>	<ul style="list-style-type: none"> <li>• <b>E1:</b> Finalising aims and methods for monitoring.</li> </ul>	<b>The monitoring methods are outlined in Chapter 7.</b>
	<ul style="list-style-type: none"> <li>• <b>E2:</b> Responding to adverse effects.</li> </ul>	

## 4 Developing the SEA Framework

### 4.1 Introduction

The SEA framework was prepared and consulted upon as part of the Scoping process, drawing on the review of policies and key environmental issues described in sections 4.2 and 4.4 below.

### 4.2 Relationship with other Plans, Programmes and Policies

As part of the Scoping Stage of the SEA a review was undertaken of relevant plans, policies and programmes (PPPs) in relation to their implications for the LJFRDMS and this SEA. The Strategy may be influenced in many ways by other plans and programmes and by external sustainability objectives, such as those laid down in policies and legislation.

The task is a requirement of the SEA Directive Annex 1(a) where it states the Environmental Report should contain “*an outline of the...relationship with other relevant plans or programmes*”

A wide range of PPPs have been identified during the Scoping Stage of the SEA, this has been updated further in light of consultation comments received on the Scoping Report. It is recognised that no list of PPPs can be definitive and as a result this report outlines the key documents that directly influence the LJFRDMS in

Table 4.1.

A full review of international, national, regional and local PPPs is presented in Appendix 3.

Table 4.1 - Key Plans, Programmes and Policies

<b>International</b>
EU Floods Directive 2007/60/EC
EU Water Framework Directive 2000/60/EC
<b>National</b>
Flood and Water Management Act (2010)
Flood Risk Regulations (2009)
The National Flood and Coastal Erosion Strategy (2011)
National Planning Policy Framework (2012)
<b>Sub-national</b>
River Basin Management Plan Humber River Basin District (2009)
River Basin Management Plan Anglian River Basin District (2009)
Flamborough Head to Gibraltar Point Shoreline Management Plan 2 (SMP2) (2010)
The Wash Shoreline Management Plan 2 (SMP2) (2010)

Local
River Witham Catchment Flood Management Plan (2009)
Lincolnshire Preliminary Flood Risk Assessment (2011)
East Lindsey Strategic Flood Risk Assessment (2005)
West Lindsey Strategic Flood Risk Assessment (2009)
Boston Borough Strategic Flood Risk Assessment (2010)
South Holland Update of Strategic Flood Risk Assessment (2010)
South Kesteven Strategic Flood Risk Assessment (2009)
North Kesteven Strategic Flood Risk Assessment (2009)
Lincoln Policy Area Strategic Flood Risk Assessment (2010)
Central Lincolnshire Core Strategy Issues and Options (Draft Core Strategy anticipated later in 2012)
East Lindsey Draft Core Strategy (2009)
West Lindsey Local Plan (2006)
The Boston Borough Local Plan (1999)
The South Holland Local Plan (2006)
South Kesteven District Council Core Strategy (2010)
North Kesteven Local Plan (2003)
The City of Lincoln Local Plan (1998)

### 4.3 Updated Environmental Baseline

The next task completed was the collection of baseline information to establish the current state of the study area, and to identify trends in economic, environmental and social parameters and to assess current environmental and sustainability issues that are evident in the area.

This is a requirement of the SEA Directive Annex 1(b)(c) which outlines that the Environmental Report should provide information on “*the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme*” and “*the environmental characteristics of areas likely to be significantly affected*”.

The baseline information provides a basis for predicting and monitoring the effects of the implementation of the Strategy. It also helps to identify the environmental and sustainability issues and alternative ways of dealing with them.

Updated baseline information is provided in Appendix 4, this incorporates additional information included as a result of consultation comments made on the Scoping Report.

#### 4.4 Identifying Key Environmental Issues

Environmental issues and problems have been identified from the baseline information to define the key social, environmental and economic issues that need to be taken into account when preparing the LJFRDMS. In some cases these are constraints which must be overcome, or impacts which must be avoided, in other cases these may be opportunities which should be pursued where possible, or supported indirectly by flood management policies in other instances.

The following Table 4.2 summarises the issues identified through the review of the relevant plans, policies and programmes and considering the baseline data available for Lincolnshire.

It also outlines how each identified issue is likely to develop without the implementation of LJFRDMS and opportunities for mitigation and enhancement that should be considered in the LJFRDMS.

Table 4.2 - Key Issues

Key Environmental Issues	Likely Status without Strategic Action	Opportunities for Mitigation/ Enhancement
<b>Climate</b>		
Climate change is predicted to result in more extreme weather events, increased temperatures and rises in the sea level. This is likely to increase the risk of flooding, particularly to Lincolnshire's low lying coastline.	This issue is likely to continue with or without the Strategy as the LJFRDMS does not include measures to address the causes of climate change. Instead the Strategy will be concerned with adapting to and mitigating the impacts of climate change. Without the implementation of the LJFRDMS the impacts of climate change in terms of flood risk could be more severe.	The LJFRDMS should consider the impacts of climate change in relation to flood risk and develop suitable mitigation/ adaption strategies.
<b>Biodiversity, Flora and Fauna</b>		
The County has a high value natural environment with a large number of designated sites. There has already been significant loss of biodiversity within Lincolnshire. Biodiversity needs to be protected and enhanced if possible.	Projected higher sea levels, storm surges and more frequent flood events could lead to further loss of habitats and species or temporary harm during flood events. Flood management plans in place within Lincolnshire e.g. Catchment Flood Management Plans would continue to provide protection to designated sites.	The LJFRDMS presents an opportunity to further protect the high quality natural environment within Lincolnshire by increasing the knowledge base on flood risk, particularly at a local level, and integrating communities into the flood management process. Further opportunities for the enhancement of biodiversity should be encouraged.
<b>Soil, Geology and Geomorphology</b>		
Lincolnshire has a wide variety of high quality soils that contribute to the County having some of the best quality agricultural land in the UK. Impacts associated with flood events include the erosion and/ or pollution of soils.	Without the LJFRDMS flood risk in the county is likely to increase alongside projections. This could lead to more frequent and higher magnitude flood events with associated impacts on soil and agriculture.	The LJFRDMS presents an opportunity to promote the conservation of land and protect soil quality and quantity and this should be incorporated into its objectives.
<b>Water</b>		
The WFD sets an objective to achieve at least 'good' status in all water bodies by 2015.	The requirement would need to be met without the implementation of the LJFRDMS.	Measures implemented for the LJFRDMS should not adversely affect water quality. Opportunities

Key Environmental Issues	Likely Status without Strategic Action	Opportunities for Mitigation/ Enhancement
<p>Currently the majority of Lincolnshire's surface water bodies have a 'moderate' status. Bathing water quality is also particularly important in Lincolnshire coastal areas where there are a number of popular tourist resorts.</p>		<p>to enhance water quality such as development of Sustainable Urban Drainage Systems (SUDS) should be utilised.</p>
<p>Within Lincolnshire, many communities are vulnerable to flooding. The coastal area lies within flood zone 3 and is at greater risk from flooding from river and /or the sea.</p>	<p>Projected higher sea levels, storm surges and more frequent flood events could lead to increased community vulnerability to flooding. Flood management plans in place within Lincolnshire e.g. Catchment Flood Management Plans would continue to provide protection to designated sites.</p>	<p>The LJFRDMS should build on already available knowledge to reduce community vulnerability to flood risk. Measures should be adopted that ensure that information on flooding is available to the community and that they are engaged in its management.</p>
<p><b>Population and Human Health</b></p>		
<p>The population of Lincolnshire has continued to increase (1991 census 584,538, 2010 mid year estimate 703,000). The increasing population adds pressure for new infrastructure and development.</p>	<p>The LJFRDMS is unlikely to have an effect on this issue as it will not address population growth and development, it would likely continue as present.</p>	<p>The LJFRDMS should consider the requirement for new infrastructure to meet the demands of the growing population. The LJFRDMS should ensure that new development does not increase flood risk and that new development is designed to adapt to climate change.</p>
<p>Perceived risk of flooding and its impact on the health of the local population.</p>	<p>Recent flood events in the county and projected increases in frequency of flood events could lead to a higher perception of flooding in the county and associated health impacts.</p>	<p>The LJFRDMS should provide an opportunity to involve local communities in flood risk management. This should allow them to develop a greater understanding of flood risk and how it affects them. This in turn should contribute to altering their perception of flood risk and the associated health impacts. The LJFRDMS should also seek to reduce flooding to alleviate and reduce the potential impact upon human health.</p>

Key Environmental Issues	Likely Status without Strategic Action	Opportunities for Mitigation/ Enhancement
<b>Tourism</b>		
Lincolnshire's tourism industry is a significant source of employment and revenue within the County.	There is potential for tourism to be impacted through damage to infrastructure and access from increased flood risk. Flood management plans in place within Lincolnshire e.g. Catchment Flood Management Plans would continue to provide protection.	The LJFRDMS provides an opportunity to coordinate available knowledge and manage local flood risk. Tourism should be encouraged through effective management of flood risk and mitigating and adapting to the impacts of climate change.
<b>Cultural Heritage</b>		
There are a large number of cultural heritage resources within the County including designated Scheduled Ancient Monuments, Listed Buildings, historic battlefields and conservation areas.	Projected higher sea levels, storm surges and more frequent flood events could lead to increased flood risk to the historic environment. In the absence of flood risk management achieved through the LJFRDMS other flood management plans would still apply.	The LJFRDMS presents an opportunity to manage flood risk to heritage on a more local scale.
<b>Landscape</b>		
There are high quality landscapes including the Lincolnshire Wolds Area of Outstanding Natural Beauty. These should be conserved and enhanced.	Without the LJFRDMS any development linked to the strategic programme will not have an effect on the landscapes.	The LJFRDMS presents an opportunity for the landscape of Lincolnshire to be protected and enhanced through the effective and sustainable implementation of flood management measures.

## 4.5 SEA Objectives

A total of 17 SEA objectives were developed and these are listed in Table 4.3. Schedule 2 of the SEA Regulations provides a list of specific environmental topics to be addressed in the SEA. In drawing up the objectives it was ensured that all the relevant environmental topics are covered by the objectives.

Table 4.3 - SEA Objectives

SEA Objectives	SEA Environmental Issue
1. To ensure protection of biodiversity at designated sites and European protected species	<b>Biodiversity, Flora and Fauna</b>
2. To promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations	
3. To minimise habitat changes that would adversely affect aquatic ecosystems	
4. Promote the conservation and wise use of land, reduce contamination, and protect soil quality and quantity	<b>Soil, Geology and Geomorphology</b>
5. Prevent pollution to the water environment and protect resources	<b>Water</b>
6. Reduce vulnerability to flooding	
7. Adapt to the impact of climate change	<b>Climate</b>
8. Mitigate the impact of climate change	
9. Conserve and enhance the historic environment, heritage assets and their setting	<b>Cultural Heritage &amp; Landscape</b>
10. To protect and enhance attractive landscapes in terms of both their visual quality and their character	
11. Encourage sustainable tourism	<b>Material Assets</b>
12. Reduce economic cost of flood damage	
13. To ensure that flood management related activities use natural resources more efficiently and sustainably, in particular land, mineral aggregates, water and fuel	<b>General</b>
14. To promote sustainable design and construction techniques	
15. To reduce the flood risk to population and properties within the coastal area and to contribute to flood risk management within Lincolnshire	<b>Population &amp; Human Health (includes transport)</b>
16. To safeguard and promote existing public access, navigation and recreational resources and to promote education on the environment	
17. Ensure active voluntary and community engagement in decision making in flood alleviation and management	

The SEA objectives are compared with the LJFRDMS strategic outcomes to assess whether they are compatible in Chapter 5.

## 5 Testing the SEA Objectives

### 5.1 Introduction

Stage B1 of the SEA guidance requires the SEA to test the plan objectives against the SEA objectives. These are discussed in greater detail in Appendix 5 and are summarised in Table 5.5. The strategic outcomes (objectives) of the LJFRDMS are indicated on the vertical axis of the matrix (and also in section 2.3). The SEA objectives are indicated in the horizontal access (and also in Table 4.3).

This exercise identifies any tensions that exist between the different objectives. Testing was completed both between the LJFRDMS objectives and SEA objectives, and internally testing the LJFRDMS objectives (Section 5.2) and the SEA objectives (Section 5.3).

### 5.2 Testing the Internal Compatibility of the LJFRDMS Objectives

Testing the internal compatibility of the LJFRDMS objectives has been undertaken on a compatible, neutral or incompatible basis. This is using the key below in Table 5.1.

Table 5.1 - LJFRDMS Internal Compatibility Key

	Compatible
	Neutral
	Incompatible

Table 5.2 - Internal Compatibility Matrix of the LJFRDMS Objectives

LJFRDMS Objectives	1										
	2										
	3										
	4										
	5										
	6										
	7										
	8										
	9										
		1	2	3	4	5	6	7	8	9	
	LJFRDMS Objectives										

From a total of 36 possible results 18 scored as compatible. For example, LJFRDMS objective 5 'The Lincolnshire Flood Risk and Drainage Management Partnership will work with local communities to develop and deliver fully integrated flood risk and drainage management services, beginning with a common works programme in 2013' is compatible with LJFRDMS objective 8 'Flood risk and drainage management will be more accountable to the public through local democratic process, and through more freely available information about flood risk and measures undertaken to control it'. By working with local communities to develop and deliver flood risk and drainage services the process will be more accountable allowing the public to gain and input into flood risk management.

Eighteen results were recorded as showing no clear link between objectives.

None of the LJFRDMS objectives are fundamentally incompatible with one another; the objectives are either compatible or unrelated.

LJFRDMS objectives 1-8 have a minimum of three compatible objectives, with objectives 1 and 6 being the most compatible. These objectives involve the development of integrated strategies and services.

LJFRDMS objective 9 is unrelated to all the other objectives; this is because it focuses on water quality and environmental benefits while the other objectives focus on reducing flood risk.

### 5.3 Testing the internal compatibility of SEA objectives

The SEA objectives have been tested in relation to one another to assess their mutual compatibility. The results of this assessment are shown below in Table 5.4 and use the key shown in Table 5.3.

Table 5.3 - SEA Internal Compatibility Key

	Compatible
	Neutral
	Unclear
	Incompatible

Unclear relationships between objectives exist and have been indicated where the delivery of the two objectives cannot be said to be neutral and unrelated but where there is also no directly compatible or incompatible relationship. An example is between SEA objectives 1 and 15 where in protecting homes and properties from flooding, biodiversity impacts could potentially be realised, although it is not directly linked and therefore far from certain that it would take place. .

Table 5.4 - Internal Compatibility Matrix of the SEA Objectives

SEA Objectives	SEA Objectives																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	

None of the SEA objectives are fundamentally incompatible with each other. The majority of the objectives are unrelated to each other being neither compatible nor incompatible with one another.

SEA objective 15 (reducing the flood risk to population and properties) is considered to have an unclear relationship with 6 other SEA objectives. This is because the objective has the potential to be incompatible with objectives associated with biodiversity, soils, cultural heritage and landscape should there be a requirement to offer compensatory flood storage to reduce the flood risk to population and properties.

SEA objective 16 (safeguarding public access, navigation, and recreational resources) is considered to have an unclear relationship with 4 other SEA objectives. This is because the objective through the promotion of recreational resources could impact upon sites of environmental importance.

SEA objective 11 to promote sustainable tourism has the greatest compatibility with other SEA objectives. This is because through preserving and encouraging biodiversity, preventing pollution, and enhancing landscapes and heritage assets, then tourism will be subsequently encouraged.

#### 5.4 Testing the LJFRDMS objectives against the SEA objectives

Testing of the objectives of the LJFRDMS against the SEA objectives has been undertaken using the method and scoring methodology outlined below.

Table 5.5 - Measure of Impact between Objectives

++	<b>Major Positive Impact</b> – when the objectives are very closely allied in their purpose and intended outcome and will deliver a clear benefit.
+	<b>Minor Positive Impact</b> – when the objectives are related and are likely to deliver some benefit as a result of their implementation.
-	<b>Minor Negative Impact</b> – when the objectives will lead to a minor negative impact as a result of their implementation.
--	<b>Major Negative Impact</b> – where there is a clear and unambiguously negative relationship between the aims of the two objectives.
0	<b>'Unrelated'</b> – the aim of one of the sustainability objectives does not impact on the aim of another – this is neither positive or negative.

It is considered that all of the SEA objectives are of equal weight and that no one is more important than another. Therefore they must be achieved together to secure sustainable development.

The SEA regulations also require that consideration should be given to the short, medium and long term effects, permanent and temporary effects, positive and negative effects and secondary, cumulative and synergistic effects.

Therefore in testing the objectives we have given due consideration to all of these factors, although for the purposes of clarity have only identified when these factors

are present and when short, medium and long term effects are absent, for example, it has not been stated that this is the case. Greater detail on the justification for each test is given in Appendix 5.

Table 5.6 presents a summary of the LJFRDMS objectives compared with the SEA objectives.

Table 5.6 - LJFRDMS objectives compared with SEA objectives

	SEA 1	SEA 2	SEA 3	SEA 4	SEA 5	SEA 6	SEA 7	SEA 8	SEA 9	SEA 10	SEA 11	SEA 12	SEA 13	SEA 14	SEA 15	SEA 16	SEA 17
LJFRDMS 1	0	0	0	0	0	+	+	+	0	0	0	+	+	0	+	0	0
LJFRDMS 2	0	0	0	0	0	+	+	+	0	0	0	0	+	0	+	0	++
LJFRDMS 3	+	+	+	+	+	++	++	++	+	+	+	++	0	0	++	+	0
LJFRDMS 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	+	0	0
LJFRDMS 5	0	0	0	0	0	+	0	0	0	0	0	0	0	0	+	0	++
LJFRDMS 6	0	0	0	0	0	++	+	+	0	0	0	+	0	0	++	+	++
LJFRDMS 7	+	+	+	+	++	++	+	++	0	0	0	++	0	++	++	+	0
LJFRDMS 8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	+	+	++
LJFRDMS 9	++	++	++	++	++	0	0	0	+	+	+	0	+	0	0	+	0

None of the LJFRDMS objectives are fundamentally incompatible with the SEA objectives. In general the objectives of the LJFRDMS are either compatible (61 / 153) or unrelated (92 / 153) to the objectives of the SEA. Of the compatible objectives 38 are minor positive and 23 are major positive. LJFRDMS objective 3 which aims to 'integrate consideration of flood risk and sustainable development into planning and development control systems' is the most compatible with the SEA objectives. LJFRDMS objective 7 and objective 9 are also highly compatible with the SEA objectives.

LJFRDMS objective 4 is only compatible with one SEA objective and is otherwise unrelated to the SEA objectives. This reflects its focus on responding to emergency situation and the way in which partners manage their responsibilities during normal conditions while the SEA objectives focus on the protection and enhancement of the environment.

LJFRDMS objective 5 and 8 are also largely unrelated to the majority of SEA objectives, being compatible only with three SEA objectives and reflects their focus on engaging the community and making the flood management system more accountable and transparent.

All the SEA objectives have been considered by at least one of the LJFRDMS objectives. The most compatible SEA objectives are 6 and 15 which are concerned with reducing vulnerability to flooding and reducing the flood risk to population and properties.

## 5.5 Evaluating the Effects of the Strategy

The SEA regulations require that the significant environmental effects of a plan or programme are identified, described and evaluated. The likely significant effects on the environment need to be stated in the Environmental Report, and measures need to be taken to avoid, reduce or mitigate them.

In this section the likely significant environmental effects of implementing the LJFRDMS are assessed. Strategic alternatives have not been considered as in line with the SEA guidance and the regulations no reasonable alternatives to developing the LJFRDMS have been identified. The nature of the LJFRDMS document is such that no alternatives are proposed within the strategy itself and as it is a legal obligation of the LLFA to produce such a document it is not considered reasonable to consider a 'do nothing' scenario.

Furthermore, the strategy will remain an evolving document throughout its life that will be implemented through the Common Works Programme. This will be prepared on a rolling programme to adjust to the circumstances and budget that is available and necessary.

The SEA matrix in Appendix 5 presents the detailed assessment of the objectives, and a summary of each is presented below in Table 6.1.

As shown in Table 5.6 there are a number of positive effects associated with the adoption of the strategy. These have the potential to be cumulative and synergistic in nature. Synergistic positive effects are anticipated upon reducing flood risk through the various measures proposed within the LJFRDMS with cumulative

positive effects associated through encouraging sustainable tourism whilst similarly improving access and enhancing attractive landscapes and heritage assets.

## 6 SEA Analysis

The SEA matrix in Appendix 5 provides details of the compatibility assessment that has been undertaken. A summary of the key findings of the assessment is shown below in Table 6.1.

Table 6.1 - Analysis of potential effects of LJFRDMS objectives

SEA Objective	Summary
<p><b>SEA Objective 1</b> To ensure protection of biodiversity at designated sites and European protected species</p>	<p>The potential effects of the LJFRDMS objectives upon SEA Objectives 1, 2 and 3 have been summarised together as they are similar in nature as they relate to the conservation of biodiversity. They also have the same impact upon each respective LJFRDMS objective. The LJFRDMS objectives are either neutral, minor positive or in the case of Objective 9, major positive impacts.</p>
<p><b>SEA Objective 2</b> To promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations</p>	
<p><b>SEA Objective 3</b> To minimise habitat changes that would adversely affect aquatic ecosystems</p>	
<p><b>SEA Objective 4</b> Promote the conservation and wise use of land, reduce contamination, and protect soil quality and quantity</p>	<p>SEA Objective 4 is either neutral, minor positive or in the case of Objective 9 major positive with respect to the LJFRDMS objectives. The wise use of land would result from the increased use of sustainable drainage and the contributions that the LJFRDMS will make to better water quality and wider environmental benefits.</p>
<p><b>SEA Objective 5</b> Prevent pollution to the water environment and protect resources</p>	<p>SEA Objective 5 has either neutral, minor positive or major positive impacts compared to the LJFRDMS objectives. Major positive impacts are predicted for Objectives 7 and 9 which will contribute more sustainable drainage measures and better water quality and environmental benefits.</p>
<p><b>SEA Objective 6</b> Reduce vulnerability to flooding</p>	<p>SEA Objective 6 delivers 3 major and 3 minor positive impacts and 3 unrelated impacts. Major positive impacts are associated with LJFRDMS Objectives 3, 6 and 7 which all aim to reduce flooding and the public's approach to flood management.</p>
<p><b>SEA Objective 7</b> Adapt to the impact of climate change</p>	<p>SEA Objective 7 &amp; 8 is largely minor positive with a major positive impact upon LJFRDMS Objective 3 which will reduce flooding by 2025.</p>
<p><b>SEA Objective 8</b> Mitigate the impact of climate change</p>	

SEA Objective	Summary
<p><b>SEA Objective 9</b> Conserve and enhance the historic environment, heritage assets and their setting</p>	<p>SEA Objectives 9 and 10 have been considered together as they are very similar in their approach which is to protect heritage sites and landscapes. Both are largely neutral although indirect minor positive benefits are associated with LJFRDMS Objectives 3 and 9 which reduce flooding and offer environmental benefits.</p>
<p><b>SEA Objective 10</b> To protect and enhance attractive landscapes in terms of both their visual quality and their character</p>	
<p><b>SEA Objective 11</b> Encourage sustainable tourism</p>	<p>SEA Objective 11 is largely neutral when compared to the LJFRDMS Objectives. Minor benefits are noticed when compared to Objectives 3 and 9.</p>
<p><b>SEA Objective 12</b> Reduce economic cost of flood damage</p>	<p>SEA Objective 12 to reduce the economic cost of flood damage has two minor and two major benefits. Major benefits are noticed when compared to LJFRDMS strategy Objectives 3 and 7 which will reduce the impact of flooding.</p>
<p><b>SEA Objective 13</b> To ensure that flood management related activities use natural resources more efficiently and sustainably, in particular land, mineral aggregates, water and fuel.</p>	<p>SEA Objective 13 is largely neutral with three minor positive benefits associated with LJFRDMS Objectives that encourage efficient use of resources, namely 1, 2 and 9.</p>
<p><b>SEA Objective 14</b> To promote sustainable design and construction techniques</p>	<p>SEA Objective 14 is neutral with the exception of LJFRDMS Objective 7 where there is a major positive impact. This is because it specifically specifies sustainable design of flood systems in strategic developments.</p>
<p><b>SEA Objective 15</b> To reduce the flood risk to population and properties within the study area and to contribute to flood risk management within the region</p>	<p>SEA Objective 15 to reduce flood risk is clearly compatible with all LJFRDMS Objectives with the exception of 9 where neutral impacts are predicted.</p>
<p><b>SEA Objective 16</b> To safeguard and promote existing public access, navigation and recreational resources and to promote education on the environment</p>	<p>SEA Objective 16 delivers largely minor positive impacts with indirect benefits to landscape, heritage, flooding and the wider environment.</p>
<p><b>SEA Objective 17</b> Ensure active voluntary and community engagement in decision making in flood alleviation and management</p>	<p>SEA Objective 17 is neutral compared to five of the LJFRDMS Objectives and major positive on four. This is because these four objectives are associated with engaging the public in flood risk management.</p>

## 7 Monitoring

The SEA Directive requires that *'Member States shall monitor the significant environmental effects of the implementation of plans and programmes in order, inter alia, to identify at an early stage unforeseen adverse effects, and to be able to undertake appropriate remedial action'* (Article 10.1)

Monitoring allows the actual significant environmental effects of the LJFRDMS to be tested against those predicted. It also allows for any unforeseen adverse effects to be identified and appropriate remedial action to be taken

Aims and methods for SEA monitoring will be finalised during preparation of the SEA Environmental Statement which will accompany the adopted version of the LJFRDMS. The finalised monitoring arrangements will be designed to provide information that can be used to highlight specific performance issues and significant effects, and lead to more informed decision-making.

In order to monitor the effects of the LJFRDMS it is necessary to have indicators that can be assessed throughout the duration of the LJFRDMS. Table 7.1 sets out the suggested indicators at this stage. Indicators will be finalised during consultation and will be detailed in the SEA Environmental Statement.

Table 7.1 - SEA objectives and potential indicators

SEA objective	Suggested indicators	Responsible Authority for collecting information
<b>SEA Objective 1</b> To ensure protection of biodiversity at designated sites and European protected species	Total area of sites of Special Scientific Interest (SSSI) land	Natural England
	% area of land designated as SSSI within the local authority area in favourable condition	Natural England
	Change in areas designated for their intrinsic environmental value, including sites of international, national, regional, sub-regional or local significance: a) Loss, b) Addition	
	Area of land designated as a Local Nature Reserve (LNR)	Natural England
	Area of land designated as Special Area of Conservation (SAC)	Local Authority
	Area of land designated as Special Protected Area (SPA)	Natural England
	Area of land designated as Ramsar	Natural England
Area of land designated as County Wildlife Site	Natural England	
<b>SEA Objective 2</b> To promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations	% area of land designated as County Wildlife Site within the local authority area in favourable condition	Lincolnshire Biodiversity Partnership
	Proportion of biodiversity enhancement schemes implemented due to construction of flood management schemes, for example wild-flower planting on roadside verges and street trees	Lead Local Flood Authority
	Number of biodiversity enhancement schemes implemented through flood management related activities to promote priority species/habitats in Biodiversity Action Plans	Lead Local Flood Authority / Lincolnshire Biodiversity Partnership

SEA objective	Suggested indicators	Responsible Authority for collecting information
<b>SEA Objective 3</b> To minimise habitat changes that would adversely affect aquatic ecosystems	The percentage of river length assessed as a) good biological quality b) good chemical quality	Environment Agency
	Fluvial ecological quality defined by fish population figures in movement and migration	Environment Agency
<b>SEA Objective 4</b> Promote the conservation and wise use of land, reduce contamination, and protect soil quality and quantity	Permitted loss of Grade 1 and 2 land (ha) Agricultural Land	Planning Authority
	% of Part 2A sites cleared up/ discharged	Planning Authority
	Number of new flood prevention schemes developed to protect land at risk from flooding	Lead Local Flood Authority
	Area of land provided with protection measures to protect from flooding	Lead Local Flood Authority
<b>SEA Objective 5</b> Prevent pollution to the water environment and protect resources	The percentage of river length assessed as: a) good biological quality b) good chemical quality	Environment Agency
	Bathing Water Quality	Lead Local Flood Authority
	Planning permission granted contrary to EA advice on Source Protection Zones	Planning Authority
<b>SEA Objective 6</b> Reduce vulnerability to flooding	Number of planning permissions granted contrary to Environment Agency advice on flooding and water quality grounds	Planning Authority
	Area of urban development provided with flood protection measures	Lead Local Flood Authority
	Areas provided with protection measures to protect from fluvial and coastal flooding	Environment Agency

SEA objective	Suggested indicators	Responsible Authority for collecting information
<b>SEA Objective 7</b> Adapt to the impact of climate change	Length of green infrastructure network, including greenways	Local Authority
	Number of new flood prevention schemes developed	Lead Local Flood Authority
	Number of flood incidents recorded	Environment Agency
<b>SEA Objective 8</b> Mitigate the impact of climate change	Proportion of suitable applications granted with sustainable urban drainage system (SUDS)	SUDS Approving Body
<b>SEA Objective 9</b> To conserve and enhance the historic environment, heritage assets and their setting	Number of heritage sites classified as 'heritage at risk' on national register	English Heritage
<b>SEA Objective 10</b> To protect and enhance attractive landscapes in terms of both their visual quality and their character	Number of flood related applications refused because of adverse effects on the designated landscape areas	Planning Authority
	Number of visual impact assessments undertaken as part of any flood related planning applications	Planning Authority
<b>SEA Objective 11</b> Encourage sustainable tourism	Visitor numbers	Local Authority
	Visitor spend	Local Authority
<b>SEA Objective 12</b> Reduce economic cost of flood damage	Permitted loss of Grade 1 and 2 land (ha) Agricultural Land	Planning Authority
	% of agricultural land designated for fluvial and coastal flood protection	Environment Agency
	Economic cost of flood damage	Defra/Environment Agency
<b>SEA Objective 13</b> To ensure that flood management related activities use natural resources more efficiently and	Number of planning applications approved that include aspirations for a Very Good or Excellent BREEAM or CEEQUAL rating in buildings or other civil engineering projects related to flood management	Planning Authority

SEA objective	Suggested indicators	Responsible Authority for collecting information
sustainably, in particular land, mineral aggregates, water and fuel.		
<b>SEA Objective 14</b> To promote sustainable design and construction techniques	Number of flood management related developments/projects accredited to CEEQUAL that include aspirations for a Very Good or Excellent CEEQUAL rating	Planning Authority
	Proportion of suitable applications granted with sustainable urban drainage system (SUDS)	SUDS Approving Body
<b>SEA Objective 15</b> To reduce the flood risk to population and properties within the study area and to contribute to flood risk management within the region	Number of properties at risk from fluvial and coastal flooding	Environment Agency
	Economic cost of flood damage	Defra/Environment Agency
<b>SEA Objective 16</b> To safeguard and promote existing public access, navigation and recreational resources and to promote education on the environment	Length of footpaths, cycle paths, bridleways	Local Authority
	Length of navigable river	British Waterways and Navigational Authorities
<b>SEA Objective 17</b> Ensure active voluntary and community engagement in decision making in flood alleviation and management	Attendees at stakeholder workshops	Lincolnshire Flood Risk and Drainage Management Partnership
	Number of consultation responses	Lincolnshire Flood Risk and Drainage Management Partnership

## 8 Conclusion and Next Steps

None of the objectives in the LJFRDMS are likely to have significant negative effects on any of the SEA objectives. The principle reason for this is because the overriding requirement and purpose of the LJFRDMS is to reduce the risk of fluvial flooding through more sustainable methods and more efficient working practices.

Mitigation has been provided, however, for those areas where the relationship between objectives is unclear and therefore possible negative effects could occur without due consideration of the environmental impact. This has been identified in Table 4.2 where potential enhancement measures could be incorporated within any development programme.

Likely significant positive effects of the implementation of the LJFRDMS have been identified in relation to several SEA objectives with SEA objectives 6, 15 and 17 having the greatest positive effect.

There is at least one major positive impact for seven of the nine LJFRDMS Objectives with the other two having minor positive impacts. LJFRDMS Objective 4 (arrangements for responses to emergency situations) is predominantly unrelated to the SEA objectives although is a minor positive impact when compared to Objective 15 which promotes the reduction in flood risk to population and properties.

The findings of this Environmental Report will be taken into account by LCC as it finalises the LJFRDMS. The final SEA report will be published following consultation in October and November 2012 before the final LJFRDMS is approved by the Council and adopted.

## References

Local Government Association (2011). Framework to Assist the Development of the Local Strategy for Flood Risk Management.<sup>i</sup>

Strategic Environmental Assessment of the Lincolnshire Joint Flood Risk and Drainage Management Strategy – Scoping Report (Mouchel 2012)<sup>ii</sup>

## Appendices

Appendix 1 - Comments from Statutory Consultees on the LJFRDMS SEA Scoping Report.

Appendix 2 - The Lincolnshire Flood Risk and Drainage Management Partnership Organisations.

Appendix 3 - Review of relevant Policies, Plans and Programmes.

Appendix 4 - Updated Environmental Baseline Information.

Appendix 5 - SEA Matrices