North Somerset Local Flood Risk Management Strategy (LFRMS) Strategic Environmental Assessment (SEA)

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North Somerset LFRMS SEA: Environmental Report

North Somerset Council

September 2013
North Somerset LFRMS SEA

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**Document history**

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# Contents

1 **Introduction**  
1.1 Project Background  
1.2 Study Area  
1.3 Strategic Environmental Assessment  
1.4 SEA Directive compliance  
1.5 Habitats Regulations Assessment  
1.6 Water Framework Directive (WFD) Assessment  
1.7 Limitations  

2 **Consultation**  
2.1 Introduction  
2.2 SEA Consultation Requirements  
2.3 Partnership Working  
2.4 Scoping Report Consultation  
2.5 Environmental Report Consultation  

3 **North Somerset LFRMS**  
3.1 Overview and Purpose of Strategy  
3.2 LFRMS Strategic Objectives and Measures  
3.3 LFRMS Action Plan for the Most Vulnerable Communities  
3.4 Integration of Environmental Considerations  

4 **Baseline Information**  
4.1 Introduction to Environmental Topics in SEA  
4.2 General flood risk in North Somerset  
4.3 Policies, Plans and Programmes Review  

5 **SEA Methodology**  
5.1 SEA Objectives  
5.2 Assessment Approach  

6 **Assessment Results**  
6.1 Introduction  
6.2 Compatibility of Strategic Objectives and LFRMS Measures with SEA Objectives  
6.3 Assessment of Action Plans for the most vulnerable communities  
6.4 Duration, permanence and spatial scale of Action Plan effects  
6.5 Cumulative, synergistic, secondary and indirect effects of Action Plans  
6.6 Avoidance and Mitigation Measures
# Environmental Opportunities with Multiple Benefits

## 7.1 Introduction

## 7.2 Using Green Infrastructure to Alleviate Flood Risk

## 7.3 Use of Sustainable Drainage Systems (SuDS)

## 7.4 The Regional and North Somerset Context

# Monitoring

## 8.1 Introduction

# Next Steps

## 9.1 Summary

## 9.2 Surface Water Management Plans and Environmental Impact Assessment

# Abbreviations

# Glossary

Footnotes
Tables

1.1 SEA stages
1.2 SEA Directive compliance
5.1 LFRMS SEA objectives
7.1 Environmental opportunities within North Somerset’s National Character Areas

Figures

3.1 General procedure for integrating SEA with plans
4.1 Principal impacts of the LFRMS on the SEA topic areas and inter-relationships
7.1 Principal environmental and social benefits of SUDS
7.2 Green infrastructure benefits for surface water management

Appendix A: Plans and Programmes Review
Appendix B: Environmental Baseline
Appendix C: Scoping Report Consultation Responses
Appendix D: Assessment Matrices
Appendix E: Figures
Appendix F: Biodiversity value of SUDS
1 Introduction

1.1 Project Background

North Somerset Council (NSC), now a Lead Local Flood Authority (LLFA), is currently in the process of preparing its Local Flood Risk Management Strategy (LFRMS) for the district. Background information on the LFRMS is provided in Section 3 of this report.

NSC commissioned Halcrow to undertake a Strategic Environmental Assessment (SEA) of the LFRMS in December 2011. The SEA considers the potential impact of the strategy on the environment. This includes an assessment of various aspects of the natural and built environment. SEAs are required in order for the LFRMS to comply with EU legislation relating to the effects of plans and strategies on the natural environment, the ‘SEA Directive.’

The SEA process started with a scoping stage, which summarised the environmental baseline for North Somerset and proposed draft SEA ‘objectives’. The SEA Scoping Report was consulted on and the results of the consultation were taken into account in this second key stage in the SEA process, the Environmental Report. The consultation process is described in Chapter 2 and Appendix C. This Environmental Report documents how the SEA objectives have been used to assess the environmental performance of the LFRMS. A further description of the SEA process is provided in Section 1.3.

1.2 Study Area

The study area comprises the entire district of North Somerset, which is located in the south west of England. North Somerset borders the local government areas of Bristol, Bath and North East Somerset, Mendip and Sedgemoor.

The area covers 38,960 hectares (ha) of predominantly rural environment and has a population of approximately 200,000 people, concentrated in Weston-super-Mare, Portishead, Clevedon and Nailsea and also in the many villages such as Banwell and Claverham.

1.3 Strategic Environmental Assessment

1.3.1 Overview

SEA is the systematic appraisal of the potential environmental impacts of policies, plans, strategies and programmes, before they are approved. It ensures that any implications for the environment are fully and transparently considered before final decisions are taken and is required by an EC Directive (2001/42/EC) ‘on the assessment of the effects of certain plans and programmes on the environment’, known as the ‘SEA Directive’, which came into force in 2004.

The Directive is implemented in England through the Environmental Assessment of Plans and Programmes Regulations (SI 1633 2004), also known as the SEA Regulations. This legislation makes SEA a legal requirement for certain plans and programmes, which are likely to have significant effects on the environment.
LFRMS are statutory plans that could potentially have significant effects on the environment and are therefore subject to the requirements of SEA.

The principal steps in the SEA process in relation to the assessment of the LFRMS are shown in Table 1.1:

**Table 1.1 SEA Stages**

<table>
<thead>
<tr>
<th>SEA Stage</th>
<th>What is involved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage A: Scoping</td>
<td>Setting the context and objectives, establishing the baseline and deciding on the scope</td>
</tr>
<tr>
<td>Stage B: Interim Assessment of LFRMS Option Development</td>
<td>Developing and refining LFRMS alternative options and assessing environmental effects in SEA matrices</td>
</tr>
<tr>
<td>Stage C: Preparing the Environmental Report</td>
<td>To present the predicted environmental effects of the LFRMS, including alternatives, in a form suitable for public consultation and use by decision-makers.</td>
</tr>
<tr>
<td>Stage D: Consulting</td>
<td>Consultation on the draft LFRMS and the Environmental Report (and taking into account consultation feedback received)</td>
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### 1.3.2 Applying SEA to an LFRMS

LLFAs need to take a proportionate approach to applying SEA to local strategies, particularly when environmental effects are not evident in the early stages of strategy development. As the strategy develops more detail, the scope of the SEA needs to be reviewed. Consultation with the statutory consultees for SEA (see Chapter 2) has assisted with the methodology and scope of the SEA.

This Environmental Report summarises the environmental baseline for North Somerset (in Appendix B), focusing on potentially significant issues that are relevant to flood risk and surface water management.

The environmental effects of alternative strategic flood risk management approaches and objectives have been assessed using the SEA objectives. The results have been used to help select preferred options which are economically viable, meet environmental objectives and comply with legal requirements to protect designated sites of nature conservation, cultural heritage or landscape interest. The approach used is based on our knowledge of the area, professional judgement and supported by published literature. Further description of the methodology is provided in Appendix D.

The SEA Regulations state that the scope and level of detail of the information to be included within an SEA should be consulted upon with the statutory consultees for SEAs (English Heritage, the Environment Agency and Natural England). The statutory consultees and key stakeholders have provided comments on the SEA Scoping Report and these comments have been taken into account in this Environmental Report. Further detail on the consultation process is provided in Chapter 2.

### 1.4 SEA Directive compliance

This report incorporates the requirements for an Environmental Report as set out in the SEA Directive (Annex I). Table 1.2 summarises the requirements of the SEA Directive,
identifies how the requirements have been met and where these are located in the Environmental Report.
### Table 1.2 SEA Directive Compliance

<table>
<thead>
<tr>
<th>Requirement of SEA Directive (abridged)</th>
<th>Where addressed in this report</th>
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<tbody>
<tr>
<td>a) An outline of the contents, main objectives of the plan...</td>
<td>Chapter 3</td>
</tr>
<tr>
<td>...and its relationship with other relevant plans and programmes.</td>
<td>Appendix A</td>
</tr>
<tr>
<td>b) The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan.</td>
<td>Appendix B</td>
</tr>
<tr>
<td>c) The environmental characteristics of areas likely to be significantly affected.</td>
<td>Appendices B, D and E</td>
</tr>
<tr>
<td>d) The environmental problems which are relevant to the plan including, in particular those relating to any areas of a particular environmental importance.</td>
<td>Appendix B</td>
</tr>
<tr>
<td>e) The environmental protection objectives which are relevant to the plan...</td>
<td>Chapter 5 and Appendix D</td>
</tr>
<tr>
<td>...and the way those objectives and any environmental considerations have been taken into account during its preparation.</td>
<td>Section 3.4</td>
</tr>
<tr>
<td>f) The likely significant effects on the environment...</td>
<td>Chapter 6 and Appendix D</td>
</tr>
<tr>
<td>g) The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment...</td>
<td>See Section 6.6 and Chapter 7</td>
</tr>
<tr>
<td>h) An outline of the reasons for selecting the alternatives dealt with...</td>
<td>Chapter 3</td>
</tr>
<tr>
<td>... and a description of how the assessment was undertaken...</td>
<td>Chapter 5</td>
</tr>
<tr>
<td>...including any difficulties encountered...in compiling the required information</td>
<td>Section 1.7</td>
</tr>
<tr>
<td>A description of the measures envisaged concerning monitoring...</td>
<td>Chapter 8</td>
</tr>
<tr>
<td>j) A non-technical summary of the information provided under the above headings</td>
<td>Section 0</td>
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<td>Consultation:</td>
<td>Chapter 2</td>
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<td>• authorities with environmental responsibility, when deciding on the scope and level of detail of the information to be included in the environmental report...and on the draft</td>
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1.5 **Habitats Regulations Assessment**

Due to the potential for the LFRMS to have significant effects on sites of international nature conservation importance (Natura 2000 sites – Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites) in the North Somerset area, a Habitats Regulations Assessment (HRA) is being carried out in parallel with this SEA.

The HRA is required under the EU Habitats Directive (EU Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora) and the Birds Directive (Council Directive 2009/147/EC) and the transposing U.K. Regulations (The Conservation of Habitats and Species Regulations, SI 2010 No. 490, as amended 2012). Both strategic (in this case, county-level) and project level HRA is required when it is considered that a significant effect on a Natura 2000 is possible – for example, if the project was likely to cause a change in water levels or water quality and therefore affect the water-dependent habitats or species for which the Natura 2000 site is designated. If there is uncertainty whether or not there are likely to be any significant effects, a screening decision on the requirements for HRA should be obtained from Natural England.

The HRA has been integrated with the SEA process, with the findings used to guide the development of the alternative LFRMS strategic options. The assessment considers possible impacts on Natura 2000 sites within and outside of the study area that could be affected by the strategy. The conclusions of the HRA are as follows;

Seven designations were considered unlikely to require further assessment;

- Avon Gorge Woodlands SAC;
- Chew Valley Lake SPA;
- Mells Valley SAC;
- Mendip Limestone Grasslands SAC;
- Mendip Woodlands SAC;
- Somerset Levels and Moors SPA; and
- Somerset Levels and Moors Ramsar.

The three Severn Estuary designations (SAC, SPA and Ramsar) could be affected by future LFRMS schemes that would fall under the Action Plans for Clevedon East, Hutton, Pill and Portbury but these effects were thought to be either positive or *de minimis* negative.

Although at this stage the LFRMS is a strategic plan, the potential impacts from any future LFRMS measures were identified to be hydrological impacts on water levels or water flow pathways within the international sites. This could indirectly lead to habitat deterioration to grassland and woodland habitat.
In order to ensure no ‘likely significant effects’ on Natura 2000 sites occur, it is recommended that lower tier, project level assessment HRA is undertaken for any schemes in Claverham, Congresbury East, Hutton, Winscombe and Wrington, due to potential effects on the grassland and woodland qualifying interests of the North Somerset and Mendip Bats SAC.

1.6 Water Framework Directive (WFD) Assessment

The Water Framework Directive (WFD) is a European Directive which provides a strategic planning process to manage, protect and improve the water environment. It came into force on 22 December 2000 and was transposed into UK law in 2003. The Directive helps to protect and enhance the quality of:

- Surface freshwater (including lakes, streams and rivers);
- Groundwater;
- Groundwater dependant ecosystems;
- Estuaries; and
- Coastal waters out to one mile from low-water.

The WFD is aimed at protecting physical, chemical and biological water quality. Its purpose is to establish a framework for the protection of water bodies (including terrestrial ecosystems and wetlands directly dependent on them) which aims to:

- Prevent deterioration in the classification status of aquatic ecosystems, protect them and improve the ecological condition of waters;
- Achieve at least good ecological and chemical status for all waters. Where this is not possible, good status should be achieved by set deadlines ranging from 2015 to 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 floods and droughts.

The LFRMS has been assessed for WFD compliance to ensure that LFRMS strategic options help to reduce flood risk, comply with the WFD, and contribute to achieving WFD objectives. The Environment Agency has advised that ‘WFD assessment can be incorporated into the SEA’. In response to this, the SEA objective covering water quality incorporates underlying criteria to assess potential impacts on the physical, chemical or biological status of water bodies. SEA objective 6 is also aimed at assessing the strategy in terms of minimising any adverse effects of the LFRMS on water hydromorphology and natural processes. The complete list of SEA objectives is provided in Chapter 5 of this report.
In general, the spirit of the WFD is to work with natural processes or soft engineering solutions to flood management, rather than hard engineering.\textsuperscript{v} The LFRMS may therefore need to consider this in relation to its policies and action plans.

1.7 Limitations

It should be noted that there is a plethora of environmental information available. However, the information presented in this review has been selected on the basis that it may be influenced or affected by the LFRMS. Effort has been made to avoid including baseline information or plans and programmes which are of no clear relevance to the LFRMS, for example on SEA topics that have been scoped out.

The information presented in this report is the result of a desk-based review and no formal requests for records have been made. It is likely to be necessary to collect further data against which to assess the potential environmental effects of the LFRMS with regard to specific LFRMS options, as they develop, and also post-construction monitoring requirements. For example, a formal data request will need to be made to North Somerset’s Historic Environment Record (HER) team to ensure all cultural heritage assets in the study area are identified and taken account of in the assessment.
2 Consultation

2.1 Introduction

Effective stakeholder engagement is central to the development of the LFRMS and the SEA, in order to arrive at a strategy that is acceptable to as many parties as possible and to engage those parties in the process. The objectives of consultation, in relation to the LFRMS, are to:

- Meet regulatory requirements for consultation under the EU SEA and Floods Directives; and
- Contribute to the success of the strategy and improve decision-making by;
  - Raising awareness of flood risk issues within North Somerset;
  - Informing stakeholders of the strategy development process and how decisions have been made;
  - Informing the development of the LFRMS by involving and working closely with stakeholders to understand their views, concerns and values;
  - Gathering information from stakeholders to inform the development of the strategy; and
  - Minimising project risks and adverse public relations.

2.2 SEA Consultation Requirements

The methodology for the SEA was consulted upon during the SEA for similar LFRMS projects. The responses from the Environment Agency and Natural England in December 2011 gave broad suggestions regarding the scope and methodology for LFRMS SEAs generally.

For all such SEAs, the Environment Agency advised that it is…

‘up to the lead local flood authority to decide on the scope as this will depend on the local issues in the area and the scope of the local strategy. SEA should be integrated into the development of the local strategy’.

The Environment Agency also recommended reference should be made to the ODPM guidance on SEA and advice within Local Government Association guidance on developing strategies for LFRMs.

Natural England recommended following the advice provided in joint guidance produced by the Environment Agency, the former Countryside Agency, English Nature (sic) and English Heritage, ‘Environmental Quality in Spatial Planning’, in particular, Supplementary File 14 within it, which details how to protect or enhance receptors that fall under all of the SEA topics.

The statutory SEA consultees were introduced to the LFRMS and consulted on draft SEA objectives for the North Somerset LFRMS SEA in February 2012. Natural England has confirmed that they are broadly happy with the SEA objectives and reiterated the SEA topic areas that the objectives need to cover. English Heritage has also provided valuable baseline information on cultural heritage assets in North Somerset.
2.3 **Partnership Working**

The LFRMS will be developed in consultation with the Environment Agency, the North Somerset Levels and Axe-Brue Internal Drainage Boards (IDBs), the Highways Agency, Wessex Water, neighbouring local authorities and other key stakeholders.

The SEA will form part of the consultation with these stakeholders. However, informal consultation for the SEA (in addition to the formal consultation with the statutory consultees described in section 2.2) is likely to include correspondence with environmental focused consultees, such as Avon Wildlife Trust.

2.4 **Scoping Report Consultation**

This SEA Scoping Report was formally issued to statutory consultees to request their comments. The Report was subject to a three week consultation from February 25th 2013 on North Somerset Council’s ‘eConsultation Portal’. The following consultees were invited to comment during this period;

- Environment Agency: enquiries@environment-agency.gov.uk;
- English Heritage: southwest@english-heritage.org.uk; and
- Natural England: New consultation hub: consultations@naturalengland.org.uk.

Responses were received from Natural England, English Heritage and the Environment Agency. Appendix C shows the consultation responses and how they have been responded to in this Environmental Report.

As part of this consultation, the SPED Flood Risk Working Group and Strategic Flood Management Board members were also provided access to the documents in order to take into account any comments they may have. Their comments are also shown in Appendix C.

2.5 **Environmental Report Consultation**

The Environmental Report will be subject to public consultation for a period of 8 weeks. However, this date may be liable to change. The Environmental Report will also be placed on North Somerset Council’s ‘eConsultation Portal’. After this consultation period the report will be updated to take into account any consultation comments and Appendix C will be updated to describe these changes in relation to each consultation comment.
3 North Somerset LFRMS

3.1 Overview and Purpose of Strategy

In accordance with the requirements of the Flood and Water Management Act 2010 (FWM Act), NSC is now a LLFA. Under the FWM Act, NSC, as a LLFA, must... ‘develop, maintain, apply and monitor a strategy for local flood risk management in its area’.

Local flood risk management includes flooding from surface runoff, ordinary watercourses and groundwater, but does not include flooding from main rivers and the sea.

According to the Level 1 Strategic Flood Risk Assessment (SFRA) for North Somerset, significant flooding from surface water runoff and the blockages of drains and culverts has been experienced in recent years at a number of locations in North Somerset. Although not strictly under the remit of the LFRMS, as they concern river and tidal flooding, the low lying Somerset Levels and coastline of North Somerset may also be vulnerable to flooding and cumulative impacts from different flood sources could occur.

The LFRMS has built upon the work produced in the district’s Preliminary Flood Risk Assessment (PFRA), which sets out the approach to partnership working to control flood risk, assesses past and future flood information and identifies potential flood risks, including floods expected to occur as a result of climate change. Aside from the LFRMS itself, the principal data source relating to flood risk for this SEA has been the PFRA.

The purpose of the LFRMS is to identify the extent of flood risk in North Somerset, how it will be managed in partnership with others and therefore outline NSC’s approach to local flood risk management, ultimately forming a policy document.

The LFRMS will provide the framework for sustainable flood risk management in North Somerset but also refer to the actions to be taken for flood response and recovery. It will also consider the future resilience that will be required due to increasing flood risk arising from climate change and considers the role that spatial planning can play in reducing existing and future flood risk.

3.2 LFRMS Strategic Objectives and Measures

The draft LFRMS contains the following overarching objectives:

1. Improve our understanding of flood and coastal erosion risks in North Somerset;

2. Develop plans and policies to manage these risks sustainably;

3. Work in partnership with other flood risk management authorities and lead by example;

4. Maintain and improve flood and coastal erosion risk management infrastructure and systems;
5. Avoid inappropriate development in areas of flood and coastal erosion risk, and ensure that development does not increase risks elsewhere; and

6. Increase public awareness of flooding and promote individual and community level flood resilience.

The LFRMS also contains a series of overarching measures to be taken across North Somerset in order to support the objectives listed above:

- Establish asset register plus;
- Develop protocol for investigating flooding incidents;
- Develop protocol for designating structures;
- Collate historic flood data from parish councils;
- Develop protocol for consenting and enforcement on ordinary watercourses;
- Develop two-yearly implementation plan;
- Continue working with RMAs through SFMB;
- Implement policy for managing coastline near Weston-super-Mare;
- Develop risk-based approach for maintaining assets;
- Develop policy to encourage retrofit green infrastructure;
- Develop Sustainable Drainage Systems (SuDS) Approval Body role;
- Improve linkages with development management services;
- Publish up to date surface water mapping; and
- Develop information brochure to raise awareness of flooding.

These measures are described in more detail in Section 6.1 of the main LFRMS document.

### 3.3 LFRMS Action Plan for the Most Vulnerable Communities

The following communities were found to be most at risk of property flooding from local flood risk sources:

- Backwell;
- Churchill;
- Claverham;
- Clevedon East;
- Congresbury (East);
- Hutton;
- Langford;
- Long Ashton;
- Nailsea;
- Pill;
- Portbury;
- Winscombe;
- Wrington; and
- WSM (Central & West and Milton).
The strategic Action Plans for each of these communities are assessed in Appendix D and the results of the assessment are summarised in Section 6 of this report.

3.4 Integration of Environmental Considerations

The FWM Act aims to improve the sustainability of flood risk management – for example by setting new requirements and the basis for national standards for SuDS.

The Act includes a duty for local authorities, highways authorities and internal drainage boards to contribute to sustainable development in discharging their flood and coastal erosion risk management (FCERM) functions.

The Act also provides environmental powers for works that:

- a) Have a net beneficial impact;
- b) Are consistent with the national FCERM Strategy; and
- c) Are deemed by the relevant authority to be desirable for the natural environment, the historic environment, landscape, or have amenity or leisure benefits.\textsuperscript{36}

The LFRMS should in principle, therefore, have a positive impact on the environment. It can also influence and complement existing spatial planning policy and direct where development can and cannot occur and potentially the design of developments.

The SEA has been fully integrated into the development of the LFRMS to ensure that environmental considerations were taken into account and show how the SEA has influenced the LFRMS process at the Environmental Report and LFRMS submission stage. The integration of the SEA and LFRMS has been achieved through regular meetings with NSC and the provision of interim SEA assessment matrices of LFRMS Action Plans for the most vulnerable communities. Figure 3.1 illustrates the basic iterative process of LFRMS and SEA development.
The LFRMS now makes a commitment to work with the Highways and Streets and Open Spaces teams of NSC to develop a policy for retrofitting green infrastructure. This will set out a vision for how green infrastructure (GI) can be delivered in the future to manage surface water flooding and improve the environment within urban landscapes. As part of the implementation of the LFRMS, the LFRMS team also propose to work with NSC’s development management services team, for example by increasing the resources allocated to providing comments on planning applications. When NSC becomes a SuDS approval body, the Council will also produce local SuDS guidance and help secure resources to ensure SuDS are delivered. As a consequence, this could help to ensure environmental and amenity enhancements associated with the SuDS are also delivered.

Where possible, the Environmental Report identifies opportunities for environmental enhancement as well as mitigating any potentially adverse effects of the LFRMS. These opportunities are described in Section 7. The key findings of the SEA, including environmental opportunities for each of the vulnerable communities, have now been incorporated into Chapter 6 of the main LFRMS document for each of the Action Plans.
4 Baseline Information

4.1 Introduction to Environmental Topics in SEA

The SEA Regulations identify environmental receptors that must be initially considered for all SEAs. These include:

- Population and human health;
- Biodiversity, flora and fauna;
- Soil;
- Water;
- Air;
- Climatic factors;
- Material assets;
- Cultural, architectural and archaeological heritage;
- Landscape; and the
- Inter-relationship between the above factors.

This list served as a starting point from which issues were scoped out of, or in to, the SEA, depending on whether or not they were considered likely to affect or be affected by the LFRMS. This process is described in the SEA Scoping Report and is not repeated here. The Scoping Report also shows the inter-relationships between the SEA topics.

The Environmental Report does not address any impacts likely to occur during the implementation of any built solution, for example construction impacts that might arise during the building or raising of flood defences. These issues are more appropriately considered during project level EIA and HRA undertaken for specific schemes.

Baseline information is provided in Appendix B and maps of landscape, biodiversity and cultural heritage are provided in Appendix E.

4.2 General flood risk in North Somerset

4.2.1 Flood risk from surface water

A detailed account of flood risk is provided in the LFRMS and the preceding PFRA and is not repeated here. However, the key settlements shown to be at risk in the PFRA are as follows:

- Weston-s-Mare (including Worle);
- Wrington;
- Nailsea;
- Backwell;
- Clevedon;
- Winford;
- Portishead;
• Pill;
• Winscombe; and
• Hutton.

Based on national surface water modelling a number of residential properties were estimated to be at risk from flooding to a depth of greater than 0.3m during a rainfall event with a 1 in 200 (0.5%) annual chance of occurring. As a result of the assessment, the highest risk areas were identified to be:

• Weston-super-Mare;
• Wrington; and
• Nailsea.

4.2.2 Flood risk from main rivers and the sea (non-LFRMS sources)

The PFRA showed that there are potentially cumulative impacts of surface water flooding with tidal and/or fluvial flooding in Weston, Clevedon, Portishead, Hutton, Wrington and Pill.

According to the North and Mid Somerset Catchment Flood Management Plan (CFMP), more than half of the people and properties at risk from flooding within the catchment from a 1% annual probability river flood are located in Weston-super-Mare.

The CFMP states that in 2009 there were around 7000 people and 3000 commercial and residential properties in the catchment at risk from a 1% annual probability river flooding taking into account current flood defences, meaning that 2.5% of the total population living in the catchment are currently at risk from flooding.

According to projections in the UK Climate Projections (UKCP09), sea levels in the Severn Estuary are estimated to be 30-40cm higher by the 2080s than they are at present, based on a medium greenhouse gas emissions scenario. This in itself poses serious issues as much of the coastline around the estuary is at or close to current sea level. Extreme waves are also expected to increase in the Severn Estuary. Storm surge heights are also expected to increase by 0.8mm per year in the next 50 years.

The PFRA states that by far the most significant risk in North Somerset is the risk of tidal flooding. Sea levels generally are a contributory factor in surface water flooding as much of the North Somerset area relies on land draining into the sea.

High tides can create tide locked conditions which if combined with heavy rainfall can result in flooding from modest rainfall events. Tidal flooding and rainfall events such as those modelled by the Environment Agency Flood Map for Surface Water (FMfSW) and those used in the Weston-super-Mare SWMP are far greater than the sewerage network can manage.

For these types of flooding event it is therefore likely that the public sewerage network would be overwhelmed. This could lead to an increased risk of contamination and pollution of the urban and natural environment from foul sewers.
4.3 Policies, Plans and Programmes Review

A review of the policies, plans and programmes (PPP) most relevant to the LFRMS is provided in Appendix A.

No specifically relevant projects at a more local scale have been identified to date. The review of the PPP objectives shows that there are no policies, plans or programmes that have a direct conflict of interest with the likely objectives of the LFRMS.

The PPP review has shown that the LFRMS is unlikely to have any tangible conflicts with other plans or programmes. Through partnership working with the Environment Agency, the LFRMS should harmonise with Environment Agency plans, such as Shoreline Management Plans (SMPs) and Catchment Flood Management Plans (CFMPs).

In general the LFRMS has the potential to complement the objectives and actions of existing and proposed plans, for example the North Somerset Biodiversity Action Plan (BAP), 2005. The LFRMS will also need to harmonise with North Somerset’s development site allocations and policies.

The LFRMS has significant potential to enhance biodiversity associated with future LFRMS measures, as well as complement plans to boost local economies, for example by enhancing the recreational amenity associated with schemes.
5 SEA Methodology

5.1 SEA Objectives

A series of draft SEA objectives has been developed for the purposes of this project. The SEA objectives provide the framework against which the LFRMS is assessed. These objectives are developed from those developed previously for SEAs of surface water management plans, other LFRMS and the environmental baseline presented in Appendix B.

The SEA objectives are as follows:

1. To conserve and enhance North Somerset’s biodiversity, flora and fauna;
2. Conserve and enhance North Somerset’s historic environment and heritage assets of historic, archaeological, architectural or artistic interest and their settings;
3. Protect and enhance the unique setting and landscape character of North Somerset;
4. Minimise adverse effects of the LFRMS on the aquatic environment;
5. Minimise adverse effects on water resource availability;
6. Minimise adverse effects on water hydromorphology and natural processes;
7. Adapt new and existing development to the impacts of climate change;
8. Protect soils and geological resources in North Somerset;
9. Minimise adverse impacts of local flood risk on key infrastructure, land assets and properties;
10. Protect and enhance open spaces, recreational areas and rights of way; and

The underlying assessment criteria that have been used to assess the LFRMS under each SEA objective are shown in Appendix D.

5.2 Assessment Approach

The SEA objectives have been used to assess the potential LFRMS measures that will be used to deliver the LFRMS objectives. The assessment methodology and the results of the assessment are described in Appendix D.

Further detail on the assessment approach is provided in the SEA Scoping Report. This includes a description of cumulative, synergistic and secondary effects and examples of each. These types of effect are considered, where relevant, in Appendix D.

The SEA has also considered a ‘without plan’ scenario. This represents what would occur if no further plans were put in place beyond existing projects, government policies and statutory obligations. A description of the “without plan” scenario for
each baseline topic is shown is shown in Appendix B of this report (in discrete sections).
6 Assessment Results

6.1 Introduction

The key elements of the LFRMS that facilitated matrix assessment against SEA objectives, were:

- LFRMS measures that underlie the LFRMS objectives; and
- Action Plans.

These elements of the LFRMS are described in Section 3 of this report. Section 3 should be cross-referenced in conjunction with the results of the assessment of these elements (provided in Appendix D), which are summarised below.

6.2 Compatibility of Strategic Objectives and LFRMS Measures with SEA Objectives

The LFRMS Strategic Objectives and measures were assessed as having a neutral or positive effect for all SEA objectives. Major positive scores were attributed to all LFRMS measures for the SEA objectives covering climate change adaptation (i.e. through adapting to flood risk) and the protection of material assets (such as property and infrastructure). There are also likely to be indirect positive effects on human health, water quality and biodiversity as a result of the implementation of the LFRMS measures. The positive effects on human health are expected as a result of reduced flood risk, improved public understanding of flood risk and an improved ability of the public to respond to flooding. The positive effects on water quality are anticipated due to an expected improvement in Flood Risk Management and as a result the reduced risk of the spread of pollutants from contaminated sites. Further to this, the increased use of natural drainage systems (SuDS) will further help to improve biodiversity, water quality and soils (through improved filtration of pollutants) and also provide benefits for amenity, human health and landscape character. Positive effects on biodiversity are predicted due to an increased level of habitat management, particularly along the coast near Weston-super-Mare, and also the potential creation of additional habitat areas due to the implementation of SuDS policies.

It was not possible to attribute potential positive or negative effects on many SEA objectives as the measures are ‘high level’ at this stage, hence there are many neutral scores in the matrix.

6.3 Assessment of Action Plans for the most vulnerable communities

6.3.1 Introduction

The flood risk measures proposed for all of the most vulnerable communities in North Somerset focus on either further investigative study and awareness raising, rather than specific, detailed measures. For this reason, the Appendix D matrices show major positive impacts predicted for the material assets and human health SEA objectives for all communities. This is due to the predicted improved protection of people and properties from flooding. Additional comments in relation to each community are shown in sections 6.3.2 to 6.3.15.
For nine communities, major positive impacts were predicted for the material assets and human health SEA objectives. For all other SEA objectives the impacts are expected to be neutral. These communities are as follows:

- Backwell;
- Claverham
- Clevedon East
- Hutton
- Locking
- Long Ashton
- Nailsea
- Pill; and
- Portbury

**6.3.2 Churchill**

Major positive impacts predicted for the material assets and human health SEA objectives. For most other SEA objectives the impacts are expected to be neutral due to the strategic nature of the LFRMS measures at this stage. However, any future measures to enhance the hydraulic capacity of the watercourse will need to ensure its hydromorphology is protected; hence an uncertain score is given for the hydromorphology SEA objective for two of the Churchill measures at this strategic stage.

**6.3.3 Congresbury East**

Major positive impacts predicted for the material assets and human health SEA objectives. For most other SEA objectives the impacts are expected to be neutral due to the strategic nature of the LFRMS measures at this stage. Any future measures to enhance the drainage capacity of the rhyne/watercourse will need to ensure the natural hydromorphology of the network is protected; hence an uncertain score is given for the hydromorphology SEA objective at this strategic stage.

**6.3.4 Langford**

Major positive impacts predicted for the material assets and human health SEA objectives. For most other SEA objectives the impacts are expected to be neutral due to the strategic nature of the LFRMS measures at this stage. Any future measures to enhance the hydraulic capacity of Langford Brook will need to ensure the natural hydromorphology of this watercourse is protected; hence an uncertain score is given for the hydromorphology SEA objective at this strategic stage.

**6.3.5 Winscombe**

Major positive impacts predicted for the material assets and human health SEA objectives. For most other SEA objectives the impacts are expected to be neutral due to the strategic nature of the LFRMS measures at this stage. Any future measures to enhance the hydraulic capacity of culverts will need to ensure the natural hydromorphology of this watercourse is protected; hence an uncertain score is given for the hydromorphology SEA objective at this strategic stage.

**6.3.6 Wrington**
Major positive impacts predicted for the material assets and human health SEA objectives. For most other SEA objectives the impacts are expected to be neutral due to the strategic nature of the LFRMS measures at this stage. Any future measures to enhance the hydraulic capacity of Wrington’s ordinary watercourse will need to ensure the natural hydromorphology of this watercourse is protected; hence an uncertain score is given for the hydromorphology SEA objective at this strategic stage.

6.4 Duration, permanence and spatial scale of Action Plan effects

All environmental effects were considered likely to occur locally to the Action Plan area, short term and reversible. The enhancement opportunities offer the potential to create medium term positive environmental effects but the detail of these opportunities still needs to be developed.

6.5 Cumulative, synergistic, secondary and indirect effects of Action Plans

Cumulative impacts of flooding from various sources were identified for the following communities:

- Churchill;
- Claverham;
- Clevedon East;
- Congresbury East;
- Locking;
- Long Ashton;
- Nailsea;
- Pill; and
- Portbury

The sources of flood risk in these communities are shown in the assessment matrices of Appendix D and further detail is provided in Table 3.4 of the LFRMS report.

6.6 Avoidance and Mitigation Measures

Due to the strategic nature of the LFRMS objectives and the Action Plans for the most vulnerable communities focusing on further investigative study, no avoidance and mitigation measures were considered necessary. Instead, environmental enhancement opportunities were identified; these are shown for specific communities in Appendix D and are also described in Section 7 of this report.
7 Environmental Opportunities with Multiple Benefits

7.1 Introduction

The Natural Environment White Paper *The Natural Choice: securing the value of nature*, published in 2011, recognises that a healthy, properly functioning natural environment is the foundation of sustained economic growth, prospering communities and personal well-being. The National Planning Policy Framework also recognises the importance of the natural environment to wellbeing and sustainable development. Through the development of LFRMS, LLFAs can help deliver LFRMS schemes that have environmental, social and economic benefits, thereby contributing to sustainable development.

Defra’s *Making Space for Water* makes a case for flood risk management that delivers the greatest environmental, social and economic benefit, consistent with the Government’s sustainable development principles. The *National Flood and Coastal Erosion Risk Management (FCERM) Strategy for England* also includes a section entitled ‘Achieving wider environmental objectives and other benefits’, which sets out key obligations for flood risk management authorities. These obligations relate to compliance with the WFD, Habitats and Birds Directives and other domestic commitments, notably including:

- Environmental objectives under the WFD, including conservation objectives for protected areas under Article 4.1;
- SSSI conservation objectives - as public bodies, every flood authority has a duty under Section 28G of the Wildlife and Countryside Act 1981 to take reasonable steps, consistent with the proper exercise of its functions, to further the conservation and enhancement of the features for which the SSSI was designated;
- Physical restoration of lakes and rivers to meet both SSSI objectives for designated sites and Water Framework Directive objectives for other water bodies; and
- UK national and local BAP targets - Section 40(1) of the Natural Environment and Rural Communities Act 2006 places a duty on flood authorities to have regard, so far as is consistent with the proper exercise of their functions, to conserve biodiversity, including restoring or enhancing species populations or habitats. FCERM activities should involve no net loss of BAP habitat.

Potential ways in which LFRMS measures can bring biodiversity benefits are shown in Appendix F. However, the LFRMS will also look at a range of opportunities to deliver social and environmental benefits as part of the strategy and its delivery, particularly under Strategic Objective 2. Improving green or blue infrastructure, biodiversity, recreation areas or access to these areas is likely to complement schemes such as the ‘Living Landscapes’ project promoted by the Wildlife Trusts and Natural England’s ‘Access to Nature’ grant scheme, which is aimed at encouraging people from all backgrounds to understand, access and enjoy the natural environment. Delivering green infrastructure that helps link up habitats is also in line with the government’s priority of delivering biodiversity and ecosystems management that
reflects both local and larger scale priorities. This government objective is shown in Defra’s National Adaptation Programme.\textsuperscript{xxiv}

7.2 Using Green Infrastructure to Alleviate Flood Risk

Green Infrastructure (GI) is summarily defined in the glossary at the end of this report. The GI network includes parks and gardens, amenity and urban greenspace (from village greens to green roofs), green corridors (such as river, canal and rail corridors), and various other areas, including allotments, community gardens, city farms and churchyards.

The National Planning Policy Framework also highlights the importance of green infrastructure in adapting to climate change. It states that;

‘New development should be planned to avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure.’

In relation to flood risk management (including flood risk from sources outside of the scope of the LFRMS), GI networks can be used for various purposes. These include:

• Helping manage coastal (Severn Estuary) flooding. GI can help protect shoreline habitats (e.g. mudflats, salt marshes and dune systems), developed areas or coastal aquifers – for example by co-ordinating with ‘managed realignment’ type Shoreline Management Plan policies that allow increased tidal ingress;
• Providing dedicated flood water storage areas – thereby providing water for nature conservation or other purposes;
• Providing opportunities to aid a more natural and slower response to heavy rainfall - for example by developing and restoring GI to favour open water courses, through channel restoration and de-culverting;
• Helping manage surface water, by reducing flood risk from streams, rivers and sewers. Sustainable drainage systems (SuDS) can be used to recycle grey water and harvest rainwater, or, where appropriate, reduce flash flooding; and
• Make a direct contribution to improving home and community resilience to climate change, for example through green roofs that improve localised drainage.

Research by the University of Manchester\textsuperscript{xxv} has shown that:

• Increasing the green space cover in urban areas by 10 per cent reduces surface run-off by almost 5 per cent;
• Increasing tree cover in urban areas by 10 per cent reduces surface water run-off by almost 6 per cent; and
• Adding green roofs to all the buildings in town centres can reduce surface water run-off by almost 20 per cent
GI can also reduce fossil fuel consumption by providing corridors for walking and cycling, thereby potentially reducing private vehicle usage and the air pollution associated with it. Increased uptake of walking and cycling can also improve general wellbeing, health and fitness as well as help reduce obesity levels. By providing recreation opportunities, GI can also reduce visitor pressure on vulnerable habitats. Due to the many social and environmental benefits of GI, the LFRMS should maximise opportunities to either create new GI or help extend, link up or improve the condition of existing GI. Plans for GI, including any delivered by the LFRMS, should seek to mimic natural drainage processes wherever possible. This will also help to fulfil the requirements pertaining to natural processes and hydromorphology contained in the WFD. The landscape character assessment work undertaken by Natural England for North Somerset (NCA characterisation) could potentially be used to assess the suitability of land for GI creation, extension or improvement. Factors such as land cover, habitat, soil type, topography and groundwater should all be considered in planning for GI. Locating new GI features on top of groundwater source protection zones could also help to avoid risks of groundwater contamination.

It should be noted that maintenance of GI has implications in terms of staff resources and costs. However, if planned carefully according to local environmental and management requirements, the application of GI can offer a responsive system that can adapt itself to the changing climate, potentially reducing future maintenance burdens.

In addition to cost and resource implications, the longevity of GI or other flood risk measures implemented on the ground also has implications for the timescale, permanence and reversibility of any environmental impacts.

### 7.3 Use of Sustainable Drainage Systems (SuDS)

#### 7.3.1 Overview

In any LFRMS scheme design, both planting and surfacing should aim to minimise surface water run-off volume and flow rate in addition to meeting other design requirements. LFRMS schemes should aim to maximise the use of SuDS. SuDS encourage surface water to remain on site and infiltrate the ground. They have many environmental and social benefits, including:

- Providing storm water attenuation that prevents flooding downstream;
- Protecting and potentially enhancing surface water quality by filtering pollutants;
- Improving groundwater recharge;
- Providing habitats for wildlife;
- Providing landscape amenity for the community; and
- Providing potential opportunities for community engagement, management and ownership of SuDS.

The principal benefits of SuDS are summarised in Figure 7.1.
As well as planning for new GI, the LFRMS needs to protect existing wetlands due to their important role in surface water management.

Figure 7.2 summarises, in more detail, the principal environmental and social benefits that can be derived from delivering green infrastructure with a view to improving surface water management.
7.3.2 **Amenity benefits of SuDS**

Both SuDS and green infrastructure can offer multiple benefits for local communities, including increased opportunities for walking, jogging, picnicking, cycling, bird watching, green gyms and educational activities. The SuDS Manual (CIRIA, 2007) contains a chapter which focuses on community engagement; this shows the opportunities to improve public awareness of SuDS, improve community management of SuDS and alleviate health and safety risks.

7.3.3 **Biodiversity benefits of SuDS**

Appendix F contains a summary of the techniques that can be employed to maximise the wildlife value of SuDS.
7.4 The Regional and North Somerset Context

7.4.1 Overview

A Green Infrastructure Strategy for North Somerset is currently being produced and at the time of writing this report was not ready for circulation.

The South West Nature map that was produced by Biodiversity South West, a partnership of organisations, shows where there are opportunities for landscape scale habitat restoration in the south west region. These are defined as Strategic Nature areas (SNAs). The map and further information is available on: http://www.biodiversitysouthwest.org.uk/nmap.html.

Natural England has also recently produced written profiles for 159 distinct natural areas in England, termed National Character Area (NCAs). Several of these areas fall partly within North Somerset; environmental opportunities that could potentially be applied in each of these areas are listed below. The text for these opportunities has been adapted from Natural England’s original text in order to make it relevant to the LFRMS.
### Table 7.1 Environmental opportunities within North Somerset's National Character Areas

<table>
<thead>
<tr>
<th>NCA</th>
<th>Environmental opportunities</th>
<th>Relevant Action Plan communities</th>
</tr>
</thead>
</table>
| 118: Bristol, Avon Valleys and Ridges | • Enhancing the many recreational opportunities offered, through active management and provision of quality infrastructure such as the development of multi-user paths, clear signposting and better interpretation, to improve understanding, appreciation and enjoyment of the natural, historic and built environment, while planning for increasing recreational pressure due to population expansion;  
• Encouraging local planning authorities and developers to incorporate landscape design into urban extensions from the start of the process, to include biodiversity, green infrastructure and access enhancements;  
• Improving the links between settlements and the surrounding countryside, to improve access to the countryside, utilising the rights of way network, river corridors and sustainable transport networks; and  
• Promoting sustainable drainage in development to increase permeable surfacing, to reduce run-off and increase water filtration in urban areas. This will slow the water entering the system. | • Backwell  
• Churchill  
• Claverham  
• Clevedon East  
• Langford  
• Long Ashton  
• Nailsea  
• Wrington |
| 141: Mendip Hills | • Considering hedgerow restoration and replacement tree planting in some of the eastern parts of the area where hedgerow removal and tree loss have produced an open landscape that is out of character; and  
• Maintaining the appropriate balance of grassland and heath, limestone exposures and farmed land in keeping with the landscape character of the area. | • Winscombe |
| 142: Somerset Levels and Moors | • Restoring and maintaining a functioning flood plain, where flooding forms a normal part of land management, which also serves to enhance flood mitigation, protect peat soils from desiccation, increase biodiversity and preserve archaeological and geological evidence. Also, reducing pumping with engines driven by fossil fuels, increasing the use of gravity drainage and restoring natural processes in strategically important places;  
• Maintaining and restoring water management infrastructure – pumps, sluices and other control mechanisms, ditches, rhynes and drains – to minimise the impact of flooding on people and property;  
• Researching and exploring innovative approaches and options to address water management that potentially benefit both the natural environment and agriculture. Also, exploring mechanisms that release land to make space for more water storage and gravity drainage, including land purchase, land swaps, payment for ecosystem services schemes and farmer early retirement schemes;  
• Mapping and quantifying ecosystem services at a holding scale, particularly in the lowest-lying parts of the area, to identify and stimulate initiatives that release land from agriculture in exchange for other benefits, principally biodiversity through the expansion of wetland habitats such as fen, bog, swamp and reedbed, water regulation, protection of heritage assets and provision of access and recreation; | • Congresbury East  
• Hutton |
- Restoring over-drained or damaged wet grasslands, and reinstating traditional water management techniques and groundwater levels, where appropriate;
- Resisting field enlargement that would result in the loss of watercourses, leading to the erosion of the strong geometric pattern in the landscape, and the abandonment of traditional channel management practices; and
- Creating, within arable and grass ley fields, grassland buffer strips alongside watercourses to reduce soil erosion and run-off, and minimise nutrient leaching.
Avon Wildlife Trust also runs a landscape-scale habitat restoration project called the North Somerset Wetland Programme. This is part of the ‘Living Landscapes’ work of the Wildlife Trusts, as described in Section 7.1. The work includes the surveying of ditches and working with farmers at a landscape scale, on a large area that covers two NCAs. A map of the Wetland Programme area is provided in the Appendix E maps. Consultation with Avon Wildlife Trust in relation to any wetland storage areas or other scheme-level measures to reduce flood risk could help to complement the objectives of the Wetland Programme.

7.4.2 Policy context

Under Strategic Objective 4 of the LFRMS the following policy is included;

*We will encourage and promote investment in drainage and flood risk management infrastructure which achieves multiple benefits (e.g. green infrastructure).*

The principal overarching policy documents which relate to the implementation of green infrastructure in North Somerset are listed in the sections below.

7.4.2.1 North Somerset Core Strategy policies

- CS9 (green infrastructure);
- CS25 (youth provision);
- CS26 (healthy living);
- CS27 (sport, recreation and community facilities); and
- CS34 (infrastructure delivery and development contributions).

Policy CS9 includes, amongst other provisions;

- The promotion of the north slopes of the Mendip Hills Area of Outstanding Natural Beauty (AONB) as sub-regional corridors for biodiversity, recreation and landscape retention;
- The promotion of the Congresbury Yeo, River Banwell, North Somerset Levels and Moors, and Grumblepill Rhyne as local corridors for biodiversity and landscape enhancement; and
- The continued development of a network of green spaces, water bodies, paths and cycleways and bridleways in and around the developed areas, recognising the value of SuDS for green infrastructure.

The Weston Villages development is the principal new strategic development area within North Somerset, as set out in the Core Strategy. This comprises two proposed new communities located generally to the south east of Weston-super-Mare; Winterstoke Village located on the former Weston Airfield and Parklands Village on the former RAF Locking and adjacent land.

The Supplementary Planning Document (SPD) for the Weston Villages development shows that green infrastructure in the development will include an interconnected and multifunctional network of spaces and wildlife corridors throughout the developments. The emerging ‘Sites and Policies Plan’ and Green Infrastructure SPD will also provide further detail on green infrastructure plans for North Somerset.
7.4.2.2 North Somerset Replacement Local Plan policies

The following North Somerset Local Plan policies are still in place, pending adoption of the Sites and Policies Development Plan Document;

- CF/1 Developer contributions;
- CF/2 Facilities within settlements;
- CF/3 Facilities in the countryside; and
- CF/4 Site safeguarding.

7.4.2.3 Internal Drainage Board policies

Under the Land Drainage Act 1994 and other legislation, specific duties are also placed on IDBs relating to environmental and nature conservation matters. For example, there is a requirement to further the conservation and enhancement of natural beauty and the conservation of flora, fauna and geological or physiological features of special interest. In some circumstances, the IDB and LLFA will also need to take fully into account and comply with the requirements of The Environmental Impact Assessment (Land Drainage Improvement Works) Regulations 1999 and The Environmental Impact Assessment (Land Drainage Improvement Works) (Amendment) Regulations 2005.

7.4.3 Biodiversity Action Plan habitats in North Somerset

When considering future environmental enhancement opportunities, Biodiversity Action Plan (BAP) habitats and species should be taken into account – for example in terms of potential improvements to the quality, quantity or interconnectedness of BAP habitats. The North Somerset Biodiversity Action Plan contains Action plans for ten key habitats in North Somerset. These are shown in Table B3 of Section 1.4.3 of Appendix B.

Avon Wildlife Trust has also emphasised the importance of maintaining or enhancing BAP habitats and species, in particular Coastal and Flood Plain Grazing Marsh BAP habitat. The design and implementation of any future green infrastructure associated with LFRMS schemes should consider the Avon Biodiversity Action Plan ‘Habitat Action Plans’ for the Avon BAP habitats also listed in Appendix B.

The Avon Biodiversity Action Plan can be found on:


Although environmental or amenity enhancement could potentially be undertaken at any of the sites shortlisted as the most vulnerable communities, there are some site-specific opportunities identified in the following sections.

7.4.4 Settlement-specific enhancement opportunities

There are some general principles regarding opportunities for each of the NCAs and these were described in Table 7.1. The following sections provide more settlement-specific opportunities, based on existing habitats within or near to each settlement.
7.4.4.1 Backwell

In the south of Backwell (Hillside Road) and north (Station Road) developed area there are traditional orchard BAP priority habitats. To the south-east of the developed area there is some deciduous woodland BAP priority habitat. Backwell is also close to a Strategic Nature Area of priority woodland habitat with secondary habitats of calcareous grassland and lowland heath. xxvii

The Bucklands Pool/Backwell Lake Local Nature Reserve is situated between the developed areas of Nailsea and Backwell. Opportunities to enhance these sites, particularly the surface water conveyance to Backwell Lake, should be explored with Natural England and Avon Wildlife Trust.

7.4.4.2 Claverham

If it is decided that attenuation basins will be constructed, it may be possible to provide biodiversity or amenity enhancements, for example through landscaping or planting. Similarly, the construction of new ditches to the south of Claverham Road and/or new culverts under Claverham Road could also offer small-scale biodiversity enhancement opportunities.

7.4.4.3 Clevedon East

There are potential landscape or biodiversity enhancement opportunities on the southern boundaries of Fir Wood and Court Wood. If there are any surface water pathways that reach Tickenham, Nailsea and Kenn Moors SSSI originating from the Clevedon east developed area, there may also be opportunities to filter out surface water contaminants through the use of SuDS.

Opportunities to enhance the biodiversity, wildlife corridors, amenity or access to the Local Nature Reserve, SSSI or other habitats should be explored.

7.4.4.4 Congresbury East

There is an area of coastal and floodplain grazing marsh BAP priority habitat to the east and west of Congresbury. This settlement is also within the project area of the North Somerset Wetland Programme and in close vicinity to two Strategic Nature Areas of Coastal and Floodplain Grazing Marsh.xxviii

There are three SSSIs in the vicinity of Congresbury; rhynes south of Dolemoor Lane (ST 419635) and Congresbury Yeo, adjacent land and rhynes (ST 4286407). King’s Wood and Urchin Wood SSSI, part of the North Somerset and Mendip Bats SAC also lies to the east and north of Congresbury.

Opportunities to enhance the extent or quality of these habitats should be explored with Natural England and Avon Wildlife Trust. It is important to protect or enhance this ancient broad-leaved woodland.

7.4.4.5 Hutton

NSC has recognised that Hutton currently has an insufficient supply of neighbourhood open space, formal park and public garden, woodland and conservation sites. This relates to the North Somerset Standard for each of these open space categories (in hectares per 1000 people). Any opportunities to improve this
provision should be explored. Hutton is also close to a Strategic Nature Area of woodland priority habitat, which lies to the south.

7.4.4.6 Long Ashton

Long Ashton is within a Strategic Nature Area with primary woodland habitat and secondary habitats of calcareous and neutral grassland. Any opportunities to increase or improve the condition of these woodland or grassland habitats through LFRMS schemes should be explored.

7.4.4.7 Nailsea

Consultation with North Somerset Council has shown there are several locations in the district that would benefit from improved pollution control. This includes Tickenham Causeway, as the ditch which conveys the majority of surface water from Nailsea to Tickenham, Nailsea and Kenn Moors SSSI (ST 444705) has high levels of phosphates and organic pollutants; any improvement to the quality of this surface water through LFRMS schemes is likely to lead to biodiversity benefits for the SSSI, particularly for invertebrate species.

Other SSSIs in the vicinity of Nailsea include West End Meadows (ST 458691), Fields along Youngwood Lane (ST 467695), Batch Farm Meadow (ST 450692) and Nursebatch Farm Fields (ST 453691).

Nailsea is close to the Strategic Nature Area of Nailsea Moor, a priority habitat of Coastal and Floodplain Grazing Marsh.

NSC has recognised that the developed area of Nailsea currently has an insufficient supply of woodland and conservation sites. Any opportunities to improve this provision or enhance designated sites or other habitats should be explored.

7.4.4.8 Pill

Priory Farm and Pill Paddock Local Nature Reserves are both close to Pill. NSC has recognised that Pill currently has an insufficient supply of woodland, formal park and public garden and conservation sites. Any opportunities to improve this provision should be explored.

Pill lies within a strategic area of coastal habitat shown on the Strategic Nature Area map of the south west.

Opportunities to enhance the biodiversity, wildlife corridors, amenity or access to the Local Nature Reserves or other habitats should be explored.

7.4.4.9 Portbury

Portbury Wharf, Prior’s Wood and Priory Farm Local Nature Reserves are all close to Portbury. The following SSSIs are also within the vicinity of Portbury:

- Fields between A396 and M5 Motorway, Portbury [ST 501756];
- Drove Rhyne, Portbury [ST 497765];
- Fields west of Lower Caswell House, Portbury [ST 480748];
- Portishead Quays Nature Reserve, Portbury [ST484767];
- Fields north of Upper Caswell Farm, Portbury [ST 483750];
• Fields on Caswell Moor, Portbury [ST 494753];
• Fields adjacent to M5 Motorway, Portbury [ST 494753]; and
• Fields between railway line and A369, Portbury [ST 503758].

Portbury is within a Strategic Nature Area, with primary woodland habitat and secondary habitats of calcareous and neutral grassland.

Opportunities to enhance the biodiversity, wildlife corridors, amenity or access to the Local Nature Reserves or SSSIs should be explored.

7.4.4.10 Weston-super-Mare

The Weston Woods Local Nature Reserve lies to the north of the developed area. Ellenborough Park West SSSI is close to the seafront in central Weston and Uphill Cliff SSSI/ LNR, Purn Hill and Bleadon Hill SSSIs all lie to the south of the urban area. The SWMP will be able to identify if there are likely to be any flood risk measures required in the vicinity of these schemes and, if so, whether any mitigation or enhancement is required. Weston is also within the project area of the North Somerset Wetland Programme so there may be opportunities to improve wetland habitats in the Weston area.

7.4.4.11 Winscombe

Cheddar Valley Railway Walk is a linear Local Nature Reserve lying to the west of Winscombe. Some deciduous woodland BAP priority habitat lies to the west of the developed area. The Mendip Hills AONB almost completely surrounds Winscombe. The LNR is also in close proximity to ‘The Lynch and The Green’, areas where there are known highway drainage issues. NSC has recognised that Winscombe currently has an insufficient supply of neighbourhood open space. Opportunities to enhance the LNR, BAP priority habitat or neighbourhood open space should be explored with Natural England and Avon Wildlife Trust.

7.4.4.12 Wrington

There are traditional orchard and deciduous woodland BAP priority habitats in the ‘Alburys’/High Street area in the north of Wrington. There are also larger areas of both these BAP habitats to the north of the developed area.

NSC has recognised that Wrington currently has an insufficient supply of neighbourhood open space, woodland, conservation sites and formal parks or public gardens. Any opportunities to improve this provision or enhance the LNR or BAP priority habitat should be explored with Natural England and Avon Wildlife Trust.

Wrington is close to a Strategic Nature Area with woodland priority habitat and secondary habitats of calcareous grassland and lowland heath.

If it is decided that upstream storage options will be constructed, it may be possible to provide biodiversity or amenity enhancements, for example through landscaping or planting.
8 Monitoring

8.1 Introduction

Under the SEA Directive there is a statutory requirement to monitor the environmental impacts of LFRMS implementation. Monitoring of the LFRMS will ensure that NSC continues to identify any environmental problems and issues that need resolving. These are largely based on monitoring that is already being undertaken by NSC and other organisations. It is suggested that the monitoring framework shown in Table 8.1 is reviewed in 2017 and 2023, to coincide with the review of the LFRMS. The review would provide a good opportunity to review and describe any changes to the environmental baseline from the implementation of the LFRMS, and, how NSC will work to mitigate any adverse effects identified. Monitoring the success of any enhancement schemes that are implemented as a result of the LFRMS should also be undertaken by NSC, in consultation with organisations and landowners responsible for areas where any LFRMS schemes are implemented.
Table 8.1 Proposed SEA Monitoring Framework

<table>
<thead>
<tr>
<th>SEA Objectives</th>
<th>Indicator</th>
<th>Responsible Authority for Measuring</th>
<th>Details and notes (where applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To conserve and enhance the biodiversity, flora and fauna of North Somerset</td>
<td>% area of land designated as SSSI within local authority area in favourable condition</td>
<td>Natural England</td>
<td>Condition status for all North Somerset’s SSSIs is not included in the environmental baseline of this SEA. However, the status is currently measured by Natural England; therefore NSC would need to liaise with Natural England to determine the SSSIs most relevant to the LFRMS and the condition trends relevant to these sites. The condition status of all component SSSIs with overarching international designations will also provide an indication of the condition status of the international sites.</td>
</tr>
<tr>
<td></td>
<td>Change in area of land with international, national, regional or local nature conservation designations, including loss or addition</td>
<td>Natural England</td>
<td>This should relate to the designations described in Appendix B and shown on the nature designation figures of the Appendix E maps.</td>
</tr>
<tr>
<td></td>
<td>Number of LFRMS measures that lead to a deterioration in habitat condition or require habitat compensation</td>
<td>NSC</td>
<td>It is hoped that this indicator will not be needed but it is added as a safeguard in the event of any possible future negative effects of the LFRMS on habitats.</td>
</tr>
<tr>
<td></td>
<td>Proportion of North Somerset biodiversity enhancement schemes implemented due to construction of LFRMS measures</td>
<td>NSC</td>
<td></td>
</tr>
<tr>
<td>SEA Objectives</td>
<td>Indicator</td>
<td>Responsible Authority for Measuring</td>
<td>Details and notes (where applicable)</td>
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<td>------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>1. Maintain and improve the quality of life of North Somerset’s residents</td>
<td>Number of biodiversity enhancement schemes implemented due to construction of LFRMS measures that help achieve BAP targets</td>
<td>NSC</td>
<td>Future liaison with organisations responsible for the site management of any enhancement areas will help to determine the short, medium and long-term success of the enhancement schemes in terms of BAP targets.</td>
</tr>
<tr>
<td>2. Conserve and enhance North Somerset’s historic environment and heritage assets of historic, archaeological, architectural or artistic interest and their settings</td>
<td>Number of heritage sites and Conservation Areas classified as ‘heritage at risk’</td>
<td>English Heritage</td>
<td>The definition of heritage sites in this instance is intended to include Listed Buildings (all grades), Scheduled Monuments, Registered Parks and Gardens, Registered Battlefields, Places of Worship. This list is taken from English Heritage SEA guidance. xxxiii</td>
</tr>
<tr>
<td></td>
<td>Number and condition of heritage assets and historic landscapes (e.g. flood meadows) that are actively used in flood risk management</td>
<td>NSC/ Environment Agency</td>
<td>Data for each vulnerable community to be obtained from the Historic Environment Record team of NSC or English Heritage.</td>
</tr>
<tr>
<td></td>
<td>Number of designated and undesignated cultural heritage sites at risk of flooding</td>
<td>NSC/ English Heritage</td>
<td>Data for each vulnerable community to be obtained from the Historic Environment Record team of NSC or English Heritage.</td>
</tr>
<tr>
<td></td>
<td>Number of enhancements to cultural heritage as a result of LFRMS implementation</td>
<td>NSC/ English Heritage</td>
<td>To be recorded as the LFRMS is implemented.</td>
</tr>
<tr>
<td>SEA Objectives</td>
<td>Indicator</td>
<td>Responsible Authority for Measuring</td>
<td>Details and notes (where applicable)</td>
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</tr>
<tr>
<td>3. Protect and enhance the unique setting and landscape character of North Somerset</td>
<td>Area of historic landscape characterisation type(s) which have changed as a result of the LFRMS</td>
<td>NSC</td>
<td>The key question to ask is – has the historic landscape (for each type) been influenced in any way by the LFRMS and what areas of land does this cover?</td>
</tr>
<tr>
<td>3. Protect and enhance the unique setting and landscape character of North Somerset</td>
<td>Number of visual impact assessments undertaken as part of implementation of LFRMS measures</td>
<td>NSC</td>
<td>AONB Partnership, Natural England and CPRE may also have data on visual impact assessments.</td>
</tr>
<tr>
<td>3. Protect and enhance the unique setting and landscape character of North Somerset</td>
<td>Number of LFRMS measures located within areas of high landscape sensitivity</td>
<td>NSC</td>
<td>This should include areas with landscape designations, i.e. the Mendip Hills AONB.</td>
</tr>
<tr>
<td>3. Protect and enhance the unique setting and landscape character of North Somerset</td>
<td>Number of LFRMS measures that include landscape enhancements</td>
<td>NSC</td>
<td>To be recorded as the LFRMS is implemented.</td>
</tr>
<tr>
<td>4. Minimise adverse effects of the LFRMS on the aquatic environment</td>
<td>Physical, chemical or biological status of surface freshwater (including lakes, streams and rivers), groundwaters, estuaries, or coastal waters out to one mile from low-water</td>
<td>Environment Agency</td>
<td>NSC would need to obtain this information from the Environment Agency.</td>
</tr>
<tr>
<td>4. Minimise adverse effects of the LFRMS on the aquatic environment</td>
<td>Number of planning permissions granted</td>
<td>NSC</td>
<td></td>
</tr>
<tr>
<td>SEA Objectives</td>
<td>Indicator</td>
<td>Responsible Authority for Measuring</td>
<td>Details and notes (where applicable)</td>
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</tr>
<tr>
<td>5. Minimise adverse effects on water resource availability</td>
<td>contrary to EA advice on groundwater Source Protection Zones</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Minimise adverse effects on water resource availability</td>
<td>Resource availability status for units of groundwater in Catchment Abstraction Management Strategy Areas</td>
<td>Environment Agency</td>
<td>NSC would need to obtain this information from the Environment Agency. It should be noted that causes of change in availability may be more to do with other factors than the implementation of the LFRMS.</td>
</tr>
<tr>
<td>5. Minimise adverse effects on water resource availability</td>
<td>Resource availability status at low flows for units of surface water in Catchment Abstraction Management Strategy Areas</td>
<td>Environment Agency</td>
<td>NSC would need to obtain this information from the Environment Agency. It should be noted that causes of change in availability may be more to do with other factors than the implementation of the LFRMS.</td>
</tr>
<tr>
<td>5. Minimise adverse effects on water resource availability</td>
<td>Number of incidences of environmentally unacceptable flows in rivers</td>
<td>Environment Agency</td>
<td>NSC would need to obtain this information from the Environment Agency.</td>
</tr>
<tr>
<td>6. Minimise adverse effects on water hydromorphology and natural processes</td>
<td>Number of LFRMS measures that improve or reduce the morphological status of ordinary water courses</td>
<td>Environment Agency</td>
<td>NSC would need to obtain this information from the Environment Agency.</td>
</tr>
<tr>
<td>6. Minimise adverse effects on water hydromorphology and natural processes</td>
<td>Number of LFRMS measures that help restore riparian corridors, including floodplain</td>
<td>Environment Agency</td>
<td>NSC would need to obtain this information from the Environment Agency.</td>
</tr>
<tr>
<td>SEA Objectives</td>
<td>Indicator</td>
<td>Responsible Authority for Measuring</td>
<td>Details and notes (where applicable)</td>
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</tr>
<tr>
<td>7. Adapt new and existing development to the impacts of climate change</td>
<td>Area of North Somerset land categorised as green or blue infrastructure</td>
<td>NSC</td>
<td>May need to be an approximate measure due to diverse nature of green and blue infrastructure.</td>
</tr>
<tr>
<td>7. Adapt new and existing development to the impacts of climate change</td>
<td>Indicative areas of land at risk of flooding as shown in climate change scenarios</td>
<td>NSC</td>
<td>Should include consideration of current and expected levels of development within these areas.</td>
</tr>
<tr>
<td>7. Adapt new and existing development to the impacts of climate change</td>
<td>Number of LFRMS measures implemented</td>
<td>NSC</td>
<td>To be recorded as the LFRMS is implemented.</td>
</tr>
<tr>
<td>8. Protect soils and geological resources in North Somerset</td>
<td>Permitted loss of Grade 1 and 2 agricultural land (hectares)</td>
<td>NSC</td>
<td>This data should only be collected where the LFRMS is likely to have any influence on the loss or preservation of Grade 1 and 2 agricultural land.</td>
</tr>
<tr>
<td>8. Protect soils and geological resources in North Somerset</td>
<td>Number of LFRMS measures constructed on previously undeveloped land</td>
<td>NSC</td>
<td>This should include consideration of potential enhancements to soil resources. It would help determine the prudent use of land and the protection of the North Somerset’s highest quality soils.</td>
</tr>
<tr>
<td>SEA Objectives</td>
<td>Indicator</td>
<td>Responsible Authority for Measuring</td>
<td>Details and notes (where applicable)</td>
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<td>-------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Area of North Somerset land falling under target areas of Natural England’s Higher Level Stewardship agreements</td>
<td>Defra</td>
<td></td>
<td>This needs to be related to LFRMS measures; for example, are LFRMS measures likely to have an influence on the water or soil quality of land that falls within HLS target areas?</td>
</tr>
<tr>
<td>9. Minimise adverse impacts of local flood risk on key infrastructure, land assets and properties</td>
<td>Estimated economic cost of flood damage from flood risk sources within the scope of the LFRMS</td>
<td>Defra/Environment Agency</td>
<td>Could include estimates of number of working days lost by industry due to access route disruption. NSC would need to obtain this information from the Environment Agency, if available.</td>
</tr>
<tr>
<td></td>
<td>Number and severity of flood incidents leading to disruption or damage to transport infrastructure</td>
<td>NSC</td>
<td>To be recorded as the LFRMS is implemented.</td>
</tr>
<tr>
<td></td>
<td>Number of commercial premises at risk of flooding</td>
<td>NSC</td>
<td>To be recorded as the LFRMS is implemented.</td>
</tr>
<tr>
<td></td>
<td>Number of new minerals and waste facilities in areas of flood risk</td>
<td>NSC</td>
<td>To be recorded as the LFRMS is implemented.</td>
</tr>
<tr>
<td></td>
<td>Number of planning permissions granted contrary to Environment Agency advice on flood risk</td>
<td>NSC</td>
<td>To be recorded as the LFRMS is implemented.</td>
</tr>
<tr>
<td>SEA Objectives</td>
<td>Indicator</td>
<td>Responsible Authority for Measuring</td>
<td>Details and notes (where applicable)</td>
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</tr>
<tr>
<td></td>
<td>Size of developed area provided with flood protection</td>
<td>NSC</td>
<td>To be recorded as the LFRMS is implemented.</td>
</tr>
<tr>
<td>10. Protect and enhance open spaces, recreational areas and rights of way</td>
<td>Change in area, number or quality of open spaces, recreational areas and amenity facilities as a result of LFRMS</td>
<td>NSC</td>
<td>To be recorded as the LFRMS is implemented.</td>
</tr>
<tr>
<td></td>
<td>Area/ number of recreational and amenity facilities affected by flooding incidents</td>
<td>NSC</td>
<td>To be recorded as the LFRMS is implemented.</td>
</tr>
<tr>
<td>11. Protect human health.</td>
<td>Number of properties at risk from all flood sources</td>
<td>NSC / Environment Agency</td>
<td>To be recorded as the LFRMS is implemented and compared with current figures quoted in the LFRMS for each vulnerable community.</td>
</tr>
<tr>
<td></td>
<td>Number of flood incidents reported</td>
<td>NSC / Environment Agency</td>
<td>To be recorded as the LFRMS is implemented in relation to LFRMS Strategic Objective 4.</td>
</tr>
</tbody>
</table>
9 Next Steps

9.1 Summary
This Environmental Report will be placed on public consultation for a period of 8 weeks. However, this date may be subject to revision. After this, the comments received will be taken into account in a revised Environmental Report.

The Scoping Report, Environmental Report and LFRMS will be placed on North Somerset Council’s ‘eConsultation Portal’.

9.2 Surface Water Management Plans and Environmental Impact Assessment
The majority of measures within the LFRMS are likely to have a positive effect on the environment and the assessment matrices of Appendix D show the ‘headline’ effects in terms of their positive, negative, uncertain or neutral nature. However, the eventual actual effects on receptors are difficult to predict at a strategic level because impacts are often specific to certain locations and design details of eventual LFRMS measures.

An SWMP has been produced for Weston-super-Mare. This SWMP will need to be subject to SEA and HRA screening.

In order to ensure positive effects of the LFRMS (and any SWMPs) on the environment, it will be necessary to ensure that project level environmental assessment or appraisal feeds into the choice of location and scheme design for any new LFRMS schemes and that detailed EIAs include measures to mitigate any adverse effects, for example through Construction Environmental Management Plans (CEMPs). An EIA screening opinion, which determines whether an EIA will be required, will need to be obtained from Natural England for any LFRMS schemes that could potentially have a significant effect on the environment.
## Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AEP</td>
<td>Annual Event Probability</td>
</tr>
<tr>
<td>ALC</td>
<td>Agricultural Land Classification</td>
</tr>
<tr>
<td>AONB</td>
<td>Area of Outstanding Natural Beauty</td>
</tr>
<tr>
<td>BAP</td>
<td>Biodiversity Action Plan</td>
</tr>
<tr>
<td>CEMP</td>
<td>Construction Environmental Management Plan</td>
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<tr>
<td>CFMP</td>
<td>Catchment Flood Management Plan</td>
</tr>
<tr>
<td>Defra</td>
<td>Department for Environment, Food and Rural Affairs</td>
</tr>
<tr>
<td>EA</td>
<td>Environment Agency</td>
</tr>
<tr>
<td>EIA</td>
<td>Environmental Impact Assessment</td>
</tr>
<tr>
<td>ESA</td>
<td>Environmentally Sensitive Area</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>HER</td>
<td>Historic Environment Register</td>
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<tr>
<td>HLC</td>
<td>Historic Landscape Characterisation</td>
</tr>
<tr>
<td>HMWB</td>
<td>Heavily Modified Water Body</td>
</tr>
<tr>
<td>HRA</td>
<td>Habitat Regulations Assessment</td>
</tr>
<tr>
<td>IUDM</td>
<td>Integrated Urban Drainage Management</td>
</tr>
<tr>
<td>JNCC</td>
<td>Joint Nature Conservation Committee</td>
</tr>
<tr>
<td>LBAP</td>
<td>Local Biodiversity Action Plan</td>
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<tr>
<td>LLFA</td>
<td>Lead Local Flood Authority</td>
</tr>
<tr>
<td>LNR</td>
<td>Local Nature Reserve</td>
</tr>
<tr>
<td>LFRMS</td>
<td>Local Flood Risk Management Strategy</td>
</tr>
<tr>
<td>MSFw</td>
<td>Making Space for Water</td>
</tr>
<tr>
<td>NCA</td>
<td>National Character Area</td>
</tr>
<tr>
<td>NVZ</td>
<td>Nitrate Vulnerable Zone</td>
</tr>
<tr>
<td>PFRA</td>
<td>Preliminary Flood Risk Assessment</td>
</tr>
<tr>
<td>RBD</td>
<td>River Basin District</td>
</tr>
<tr>
<td>RBMP</td>
<td>River Basin Management Plan</td>
</tr>
<tr>
<td>RSPB</td>
<td>Royal Society for the Protection of Birds</td>
</tr>
<tr>
<td>SAC</td>
<td>Special Area of Conservation</td>
</tr>
<tr>
<td>SEA</td>
<td>Strategic Environmental Assessment</td>
</tr>
<tr>
<td>SPA</td>
<td>Special Protection Area</td>
</tr>
<tr>
<td>SPZ</td>
<td>Source Protection Zone</td>
</tr>
<tr>
<td>SSSI</td>
<td>Site of Special Scientific Interest</td>
</tr>
<tr>
<td>SuDS</td>
<td>Sustainable Drainage Systems</td>
</tr>
<tr>
<td>SWMP</td>
<td>Surface Water Management Plan</td>
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<tr>
<td>WFD</td>
<td>Water Framework Directive</td>
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</tbody>
</table>
## Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Artificial Water Bodies (AWBs and HMWBs)</td>
<td>These water bodies have had physical alterations for a particular purpose (e.g. water storage, coast or flood defence, navigation, etc). If this purpose is still valid the Water Body may be designated as a HMWB. AWBs are Water Bodies which have been constructed only for a specific use (e.g. reservoir). Any of the surface Water Body types (rivers, coastal, lake or transitional) can be designated as HMWBs or AWBs, and have separate environmental objectives under the WFD than ordinary Water Bodies.</td>
</tr>
<tr>
<td>Asset Management Programme (AMP)</td>
<td>AMPs are produced by UK water companies in five-yearly cycles for the purposes of water resource planning.</td>
</tr>
<tr>
<td>Biodiversity Action Plan (BAP)</td>
<td>The UK Biodiversity Action Plan (UK BAP) was published in 1994, and was the UK Government’s response to the Convention on Biological Diversity (CBD), which the UK signed up to in 1992 in Rio de Janeiro. The counties of the UK have their own BAPs, relating to the most important habitats and species in each county.</td>
</tr>
<tr>
<td>Blue infrastructure</td>
<td>This includes all water bodies.</td>
</tr>
<tr>
<td>Catchment Flood Management Plan (CFMP)</td>
<td>A CFMP is a high-level strategic plan through which the Environment Agency seeks to work with other key-decision makers within a river catchment to identify and agree long-term policies for sustainable flood risk management.</td>
</tr>
<tr>
<td>Climate Change Act (2008)</td>
<td>An Act that requires a UK-wide climate change risk assessment every five years, accompanied by a national adaptation programme that is also reviewed every five years. It also requires public bodies and statutory organisations such as water companies to report on how they are adapting to climate change.</td>
</tr>
<tr>
<td>Countryside Quality Counts</td>
<td>A project sponsored by Natural England in partnership with Defra and English Heritage to develop a national indicator on how the countryside is changing.</td>
</tr>
<tr>
<td>Critical infrastructure</td>
<td>A term used to describe the assets that are essential for the functioning of a society and economy. Most commonly associated with the term are facilities for: electricity generation, transmission and distribution; gas production, transport and distribution; oil and oil products production, transport and distribution; telecommunication; water supply (drinking water, waste water/sewage, stemming of surface water (e.g. dikes and sluices)); agriculture, food production and distribution; heating (e.g. natural gas, fuel oil, district heating); public health (hospitals, ambulances); transportation</td>
</tr>
<tr>
<td><strong>Culvert</strong></td>
<td>A closed conduit used for the conveyance of surface drainage water under a roadway, railroad, canal, or other impediment.</td>
</tr>
<tr>
<td><strong>Drinking Water Protected Areas (DrWPAs)</strong></td>
<td>DrWPAs are water bodies where ‘raw’ water is abstracted for human consumption at a rate of at least 10m$^3$/day or where over 50 people are served.</td>
</tr>
<tr>
<td><strong>Environment Protection Act (1990)</strong></td>
<td>The Act defines the fundamental structure and authority for waste management and control of emissions into the environment. Part I establishes a general regime by which the Secretary of State, as of 2008 the Secretary of State for Environment, Food and Rural Affairs, can prescribe any process or substance and set limits on it in respect of emissions into the environment. Part II sets out a regime for regulating and licensing the acceptable disposal of controlled waste on land.</td>
</tr>
<tr>
<td><strong>Flood Defence Grant in Aid (FDGiA)</strong></td>
<td>Central government funding to manage flood and coastal erosion risk in England, administered by the Environment Agency.</td>
</tr>
<tr>
<td><strong>Flood Risk Management (FRM)</strong></td>
<td>A process to reduce the probability of occurrence through the management of land, river systems and flood defences and reduce the impact through influencing development on flood risk areas, flood warning and emergency response.</td>
</tr>
<tr>
<td><strong>Flood and Water Management Act (2010)</strong></td>
<td>The Act brings together the recommendations of the Pitt report and previous policies, to improve the management of water resources and create a more comprehensive and risk based regime for managing the risk of flooding from all sources. The Act states that its purpose is to “make provision about water, including provision about the management of risks in connection with flooding and coastal erosion.”</td>
</tr>
<tr>
<td><strong>Good Ecological Status (GES)</strong></td>
<td>Ecological Status is expressed in terms of five status classes – high, good, moderate, poor or bad. These classes are established on the basis of specific criteria and boundaries defined against biological, physico-chemical and hydromorphological elements, which are set out in Annex V of the WFD.</td>
</tr>
</tbody>
</table>
| **Good Ecological Potential (GEP)** | The Environment Agency has applied a separate classification process for HMWBs and AWBs as opposed to ordinary Water Bodies. The steps for identifying whether a HMWB or AWB meets its Ecological Potential or not are as follows;

- **Stage 1: Identifying the impacts of physical modification affecting the water Body**
- **Stage 2: Identifying possible mitigation measures necessary to ensure the hydromorphological characteristics of a water body are consistent with Good or Maximum Ecological Potential**
- **Stage 3: Assessing whether all of those measures have been taken.**

Where all applicable mitigation measures have already been taken or screened out, the Water Body can be classified as Good Ecological Potential or better.

A Water Body where one or more applicable mitigation measure(s) remain to be taken is classified as of Moderate Ecological Potential or worse. |
<p>| <strong>Green</strong> | The National Planning Policy Framework describes GI as ‘a network of...’ |
| Infrastructure (GI) | multi-functional green space, urban and rural, which is capable of delivering a wide range of environmental and quality of life benefits for local communities. North Somerset Council has also defined GI as ‘the multifunctional network of trees, parks, open spaces, green corridors, waterways, countryside and the coastal areas within and between the towns and villages across the whole of North Somerset.’ |
| Groundwater | Water located beneath the ground surface, either in soil pore spaces or fractures in rock. |
| Heavily Modified Water Bodies (HMWB) | See “Artificial Water Bodies (AWBs) and Heavily Modified water Bodies (HMWBs)” |
| Lead local flood authority (LLFA) | Under the FWM Act, LLFAs are allocated statutory powers and responsibilities for understanding and co-ordinating local flood risk management, in partnership with other organisations. Local flood risk management includes flooding from surface runoff, ordinary watercourses and groundwater, but does not include flooding from main rivers and the sea, which is the responsibility of the Environment Agency. |
| Main River | All watercourses shown on the statutory main river maps held by the Environment Agency and Defra. This can include any structure or appliance for controlling or regulating the flow of water into, in or out of the channel. The Environment Agency has permissive power to carry out works of maintenance and improvement on these rivers. |
| National Character Areas (NCAs) | Each NCA is defined by Natural England as a unique combination of landscape, biodiversity, geodiversity and cultural and economic activity. Their boundaries follow natural lines in the landscape rather than administrative boundaries. |
| Natural Environment and Rural Communities (NERC) Act, 2006 | An Act to make provision about bodies concerned with the natural environment and rural communities; to make provision in connection with wildlife, sites of special scientific interest, National Parks and the Broads; to amend the law relating to rights of way; to make provision as to the Inland Waterways Amenity Advisory Council; to provide for flexible administrative arrangements in connection with functions relating to the environment and rural affairs and certain other functions. |
| Nitrate Vulnerable Zone (NVZ) | The European Commission (EC) Nitrates Directive requires areas of land that drain into waters polluted by nitrates to be designated as Nitrate Vulnerable Zones (NVZs). Farmers with land in NVZs have to follow mandatory rules to |</p>
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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</thead>
<tbody>
<tr>
<td>Ordinary Watercourse</td>
<td>Any section of watercourse not designated as a Main River.</td>
</tr>
<tr>
<td>Pluvial</td>
<td>Relating to rainfall.</td>
</tr>
<tr>
<td>Preliminary Flood Risk Assessment (PFRA)</td>
<td>The Flood Risk Regulations (2009) require lead local flood authorities to prepare a preliminary assessment report in relation to flooding in their areas. The PFRA should assess flood risk from surface runoff, ordinary watercourses and groundwater. The Environment Agency must prepare flood hazard maps for the sea, main rivers and reservoirs and also a flood risk map.</td>
</tr>
<tr>
<td>Ramsar</td>
<td>Wetland site designated under the international Ramsar Convention</td>
</tr>
<tr>
<td>Risk Management Authority</td>
<td>Defined in the Flood and Water Management Act, they all have some responsibility for managing flood risk.</td>
</tr>
<tr>
<td>River Basin Management Plan (RBMP)</td>
<td>These plans are created by the Environment Agency for river basin districts across England and Wales under the Water Framework Directive.</td>
</tr>
<tr>
<td>SEA Directive</td>
<td>Plans and programmes must be prepared or adopted by an authority (at national, regional or local level) and are required by a variety of legislative, regulatory or administrative provisions. The SEA Directive (2001/42/EEC) applies to a wide range of these public plans and programmes. For example, an SEA is mandatory for plans/programmes which are: prepared for agriculture, forestry, fisheries, energy, industry, transport, waste/ water management, telecommunications, tourism, town &amp; country planning or land use and which set the framework for future development consent of projects listed in the EIA Directive. OR have been determined to require an assessment under the Habitats Directive.</td>
</tr>
<tr>
<td>SPED Flood Risk Working Group</td>
<td></td>
</tr>
<tr>
<td>Source Protection Zone (SPZ)</td>
<td>These zones, designated by the Environment Agency, refer to groundwater sources such as wells, boreholes and springs used for public drinking water supply. The zones show the risk of contamination from any activities that might cause pollution in the area.</td>
</tr>
<tr>
<td>Special Area of Conservation</td>
<td>Sites of international nature conservation interest designated under the EU Habitats Directive.</td>
</tr>
<tr>
<td>Special Protection Area</td>
<td>Sites designated under the EU Birds Directive</td>
</tr>
<tr>
<td>Strategic Flood Risk Assessment (SFRA)</td>
<td>An SFRA is used as a tool by a planning authority to assess flood risk for spatial planning, producing development briefs, setting constraints, informing sustainability appraisals and identifying locations of emergency planning measures and requirements for flood risk assessments.</td>
</tr>
<tr>
<td>Surface Water Management</td>
<td>A plan which outlines the preferred surface water management strategy in a given location. In this context surface water flooding describes flooding from sewers, drains, groundwater, and runoff from land, small water courses and...</td>
</tr>
<tr>
<td>Plan (SWMP)</td>
<td>ditches that occurs as a result of heavy rainfall.</td>
</tr>
<tr>
<td>SUDS are drainage systems which are designed to reduce the impact of urbanisation on the hydrology of a river system.</td>
<td></td>
</tr>
<tr>
<td>UK Climate Change Risk Assessment (CCRA), 2012</td>
<td>The Government published the first UK Climate Change Risk Assessment (CCRA) in January 2012. This will be the first in a 5 year cycle. The CCRA has reviewed the evidence for over 700 potential impacts of climate change in a UK context. Detailed analysis was undertaken for over 100 of these impacts across 11 key sectors, on the basis of their likelihood, the scale of their potential consequences and the urgency with which action may be needed to address them.</td>
</tr>
</tbody>
</table>
  - surface freshwater (including lakes, streams and rivers)  
  - groundwaters  
  - groundwater dependant ecosystems  
  - estuaries  
  - coastal waters out to one mile from low-water |
| Water Resource Management Plan (WRMP) | Water companies in England and Wales are required to produce a WRMP every five years. The plan must set out how a water company intends to maintain the balance between supply and demand for water over a 25 year period. This is complemented by a water company drought plan, which sets out the short-term operational steps a company will take as a drought progresses. WRMPs need to cover the requirements specified by the Water Industry Act 1991. |
| Water Resource Zone (WRZ) | These are defined by water companies for use in water resource planning. They represent the largest possible zone in which all water resources, excluding external transfers, can be shared. Hence, within any given zone all water customers would experience the same risk of supply failure from a resource shortfall. |
| Wildlife and Countryside Act (WCA), 1981 | The Wildlife and Countryside Act 1981 consolidates and amends existing national legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and the EU Habitats and Birds Directives. The Act provides for the notification and confirmation of Sites of Special Scientific Interest (SSSIs). |
Footnotes

4 LGA, 2011.
5 Email received from Raahil Javaheri, LFRM Capacity Building, Environment Agency, 28/3/2012.
7 Email received from Raahil Javaheri, LFRM Capacity Building, Environment Agency, 28/3/2012.
8 Email received from Sally King, Natural England, 30/12/2011.
12 Email received from Amanda Grundy, 17/2/2012.
13 Email received from Elizabeth Clare, 23/3/2012.
21 These are available on http://sd.defra.gov.uk/what/principles/, accessed on 22/10/2012.
24 Defra, 2013. The National Adaptation Programme: making the country more resilient to a changing climate.
26 Susdrain (2011); surface water management and green infrastructure
29 Source: Email from Susan Stangroom (NSC) to Halcrow, June 3rd 2013.