Appendix 5d

Strategic Environmental Assessment of the Lancashire Local Flood Risk Management Strategy

Environmental Report January 2014

Amended September 2021

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	Originated by	Checked by	Reviewed by
ORIGINAL	NAME **Dominic Flynn**	NAME **Simon Bird**	NAME **Scott Johnson**
Approved by	NAME **David Dickson**	As Project Manager I confirm that the above document(s) have been subjected to Jacobs' Check and Review procedure and that I **approve them for issue**	INITIALS
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REVISION 1	NAME	NAME	NAME
Approved by	NAME	As Project Manager I confirm that the above document(s) have been subjected to Jacobs' Check and Review procedure and that I **approve them for issue**	INITIALS
DATE	**Document status:**		

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Approved by	NAME	As Project Manager I confirm that the above document(s) have been subjected to Jacobs' Check and Review procedure and that I **approve them for issue**	INITIALS
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Contents

1. Introduction

1.1 Background

The wide-scale flooding that occurred in the summer of 2007 caused devastation across large swathes of northern and central England and south Wales. It is estimated that 55,000 homes and businesses were flooded and nearly £3 billion of insured losses occurred. Two-thirds of these properties were estimated to have been flooded not from rivers or from the sea, but from surface water flooding resulting from intense rainfall (Pitt, 2008). The flooding exposed significant gaps in the way that flood risk was assessed and managed by the Environment Agency, local authorities and water companies.

As a result of the flooding, the 2008 Pitt Review and the resulting Flood Risk Regulations 2009 and Flood and Water Management Act 2010 ('the Act') made local authorities responsible for assessing and managing flooding from local sources within their area. These local authorities include unitary authorities such as Blackpool Borough Council (BBC), and Blackburn with Darwen (BDC), also county councils such as Lancashire County Council (LCC), all of which are designated as Lead Local Flood Authorities (LLFAs).

The local sources of flooding required to be considered by LLFAs include the following.

- **Surface water runoff** – rainwater (including snow and other precipitation), which is on the surface of the ground (whether or not it is moving), and has not entered a watercourse, drainage system or public sewer. Flooding from surface runoff is sometimes called pluvial flooding. Note that the term 'surface water' is used generically to refer to water on the surface;
- **Ordinary watercourse** – any river, stream, ditch, cut, sluice, dyke, culvert which is not a main river (main rivers are watercourses legally defined and marked as such on the main rivers map. Generally, they are larger streams or rivers, but can be smaller watercourses. The Environment Agency has flood risk management responsibility for them);
- **Artificial water-bearing infrastructure** – includes reservoirs, sewers, water supply systems and canals. Flooding from sewers is not assessed unless wholly or partly caused by rainwater or other precipitation entering or otherwise affecting the system. Floods of raw sewage caused solely, for example, by a sewer blockage do not fall under the Regulations. The Regulations also do not apply to floods from water supply systems, e.g. burst water mains; and
- **Groundwater** – water which is below the surface of the ground and in direct contact with the ground or subsoil. It is most likely to occur in areas underlain by permeable rocks, called aquifers. (However as explained and discussed in Section 1.2, within Lancashire and Blackpool, it is not considered appropriate to address groundwater flooding separately to surface water flooding).

The Act places a range of new powers, duties and responsibilities on the LLFAs. One of these key new responsibilities is the requirement to prepare a Local Flood Risk Management Strategy (LFRMS), which must be subject to Strategic Environmental Assessment (SEA) (discussed further in Section 1.3).

1.2 Status and key aims of the Flood Risk Management Strategy

Alongside this SEA Environmental Report, LCC, BBC, BDC are currently producing a draft LFRMS (also referred to herein as a 'the Strategy'). The joint LFRMS addresses:

- Pluvial flooding;
- Groundwater flooding;
- Flooding from ordinary watercourse; and
- Artificial water-bearing infrastructure.

In accordance with the Act, the LFRMS contains the following:

- The risk management authorities within the study area and what functions they exercise (Section 2.6 of the LFRMS);
- The six key themes for managing local flood risk to people and property (Section of the LFRMS);
- The objectives that sit under these themes as outlined in the Business Plan (Section of the LFRMS);
- How the Business Plan is to be monitored and reviewed (Section of the LFRMS); and
- How the Strategy contributes to achieving wider environmental objectives (Appendix B of the LFRMS).

The objectives of the LFRMS are repeated in Section 2.1 of this Environmental Report. "Measures" proposed at this stage (in accordance with the Act) for achieving the LFRMS objectives are procedures and general approaches to h ow flood risk will be managed. Some of these measures are a continuation of what the Flood Risk Management Authorities (RMAs) already do e.g. inspecting and maintaining highway drainage and ordinary watercourses on council-owned land. Others are new activities which have been introduced by the Strategy. These include, for example, investigating certain flood incidents. It will not be possible to deliver all of the measures immediately due to the limited funds and availability of resources within the LLFAs also within the partner organisations. Consequently, the measures have been assigned delivery milestones.

Delivery of objectives within the Business Plan will be closely monitored through a progress report provided to the Strategic Partnership Group on a quarterly basis. The overall Strategy will have a six-year lifespan to 2027, in line with the new flood risk planning cycle and Investment Programme.

1.3 Introduction to Strategic Environmental Assessment (SEA)

SEA is a process that ensures appropriate consideration is given to the environment during development of certain plans and programmes. It is used to guide the development of the LFRMS, in terms of avoidance and reduction of negative environmental consequences and maximising opportunities for environmental benefits. Flood risk management measures are typically focused on protecting property rather than environmental features, and can have adverse effects on the environment. However, there are also opportunities for environmental benefits where the LFRMS can help improve the environment.

Carrying out an SEA in conjunction with developing the LFRMS helps influence flood risk management at an early stage, and influences the selection of preferred measures or ways forward where alternatives exist. The SEA will be produced in accordance with the SEA Regulations (S.I. 2004 No. 1633: The Environmental Assessment of Plans and Programmes Regulations 2004) which transpose the EC SEA Directive 2001/42/EC into UK legislation.

Table 1.1: Stages of the SEA

SEA stage	What is involved	Why we do this	Related strategy development tasks
Scoping	Data and other information is gathered to establish the current and future 'baseline' – i.e.the status of the environment now and as it would evolve without the LFRMS in place. Relevant environmental issues are identified to decide on the scope and approach of the SEA.	This information is used to ensure that the scope of our SEA is focused on the relevant issues for flood risk management. These include areas where the environment is sensitive to change and could be adversely affected by flood risk management measures and policies, as well as opportunities to improve the environment.	Gathering data. Review of funding arrangements. Equality Impact Assessment. Consultation and Engagement Plan.
Scoping Consultation	Consultation is carried out with the consultation bodies[1] and other key stakeholders on the scope of the SEA.	The information received during the consultation is used to improve understanding of the current baseline and refine the approach to the assessment where appropriate.	Include the results of the scoping stage in the report and communicate with key stakeholders.
Assessment	The environmental effects of the LFRMS are assessed to enable the suggestion of alternative measures and development of mitigation measures. 'Indicators' (i.e. measures of environmental performance) or activities are suggested which should be undertaken to monitor the effects of the LFRMS. This assessment has been documented in this SEA Environmental Report.	It needs to be established whether any of the flood risk management measures are likely to have adverse environmental effects so that alternative measures, or ways to mitigate the adverse effects, can be considered. This information is used to identify aspects of the LFRMS that can be changed to better protect or improve the environment. The SEA is an important element in selecting the preferred measures or policies. Monitoring is suggested in order to account for uncertainty in the SEA and allow for appropriate responses to any unforeseen effects.	Review consultation comments when developing measures. Develop an action plan to manage flood risk in specific locations. Integrate the SEA results and recommendations.

1 The Government has designated English Heritage, Natural England and the Environment Agency as 'consultation bodies' who must be consulted during the SEA process.

SEA stage	What is involved	Why we do this	Related strategy development tasks
Consultation	The consultation bodies, other key stakeholders, and the public are consulted on the LFRMS and the results of the SEA.	Comments are taken into account in finalising the LFRMS.	Include consultation comments in the LFRMS. Account for any amendments to the SEA as a result of consultation.

There are a number of stages involved in carrying out the SEA and in developing the LFRMS, as summarised in Table 1.1.

1.4 Purpose of this document

The purpose of this Environmental Report is to report the findings of the SEA of the Joint Lancashire, Blackpool, and Blackburn with Darwen LFRMS. This Environmental Report summarises:

- How the SEA has been conducted and how it informs the current emerging LFRMS;
- The likely significant effects of the emerging LFRMS on people, communities, the economy and the environment; and
- How the SEA will continue to inform the implementation of the emerging LFRMS, such as through recommended mitigation and monitoring.

This report will assist anyone participating in the consultation on the LFRMS. In order to achieve the above, this Environmental Report summarises relevant information from the SEA scoping stage, after statutory consultation on the SEA Scoping Report. The SEA Scoping Report determined the scope of the assessment, as well as the background information – the social, economic and environmental baseline – used to inform the assessment reported herein.

2. Flood Risk and Scope of the SEA

2.1 Objectives of the Flood Risk Management Strategy

The objectives of the draft LFRMS provide an indication of the scope of the Strategy in terms of the range of flood risk management measures and other actions it may lead to. This in turn has informed our consideration of the scope of the SEA.

As part of the development of the draft LFRMS, 54 objectives have been established for managing flood risk. Some of these objectives will lead to the identification and implementation of action plans and the development of flood management measures in order to achieve the objective. The objectives of the draft Strategy are detailed below in Table 2.1.

Table 2.1 - The Local Strategy Objectives by Key Themes

Themes	Objectives
Delivering Effective Flood Risk Management Locally	1.1 Maintain, apply and monitor the Lancashire Local Flood Risk Management (LFRM) Strategy 2021 – 2027 1.2 Review and revise existing Section 19 Flood Investigation Report Policy, incorporating lessons learnt since 2010. 1.3 Review and revise Consenting and Enforcement policy for regulating Ordinary Watercourses. 1.4 Work proactively with Local Planning Authorities to ensure effective local policies are in place for managing flood risk and coastal erosion through the Land and Marine Planning Processes 1.5 Address the need for a Highway Drainage Connection Policy 1.6 Consider the need for a 'Designation of Flood Risk Features' Policy 1.7 Deliver LLFA actions and engage with the delivery of actions that require partnership working contained within the National FCERM Strategy Action Plan. 1.8 Undertake a mid-term review of the Strategy.
Understanding our Local Risks and Challenges	2.1 Deliver any outstanding Surface Water Management Plans (SWMP), and identify further studies needed. 2.2 Bid for funding to install groundwater monitoring equipment to improve our understanding of groundwater flooding in targeted areas in Lancashire. 2.3 Bid for funding to map all ordinary watercourses in Lancashire, and feed this mapping and any modelling into national maps to improve all risk management authority understanding of local ordinary watercourse networks 2.3 Bid for funding to improve understanding of opportunities for natural flood management and strategic surface water management across Lancashire through sustainable drainage retrofit. 2.4 Continue to populate the Flood Risk Asset Register and Record and utilise this data in managing local flood risks. 2.5 Spatially map all historic and new known flooding incidents across Lancashire since 2013 and categorise accordingly e.g. internal / external, property / business etc. 2.6 Support development of an 'all source' flooding map for the North West, to place all sources of flood risk on an equal footing. This could be achieved through Drainage and Wastewater Management Plan (DWMP) 2.7 Consider how Council processes can be improved to make it easier to gather information from residents and businesses which are affected / have been flooded from local sources (i.e. from ordinary watercourses, from surface water, from groundwater). 2.8 Benchmark LLFA datasets to ensure all available data is utilised in understand risks

Supporting Sustainable Flood Resilient Development	3.1 Support and provide input to Local Planning Authorities during plan making to ensure evidence base documents, policies and guidance are suitable and take account of best practice, climate change, biodiversity net gain and amenity aspirations. 3.2 Work with Local Planning Authorities to encourage adoption of the SuDS Pro-forma through their Local Planning Validation Checklist for 'Major' development. 3.3 Be represented on the North West RFCC's Planning Sub-Group to ensure Lancashire is contributing to and learning from best practice across the region and nationally in relation to planning, development and SuDS. 3.4 Establish a process which ensures 'as built' SuDS assets are validated and captured in Flood Risk Asset Registers. 3.5 Support the development of a natural capital accounting / biodiversity net gain approach for Lancashire, ensuring flood and coastal matters can be valued. 3.6 Explore the feasibility of developing a Lancashire-wide 'SuDS Suitability' guide, based on mapping of ground conditions and integrated with other agendas such as the Lancashire Ecological Network and blue-green infrastructure network. 3.7 Encourage all flood risk management authorities in Lancashire to become members of the Association of SuDS Authorities (ASA). 3.8 Where appropriate, recommend to Local Planning Authorities that developers provide a contribution (S106 / CIL monies) to FCERM schemes that provide benefits to better protecting the development / community from flood risks prior to the grant of planning permission. 3.9 Produce 'LLFA Standing Advice for Minor Planning Applications' to enable Local Planning Authorities to assess minor planning applications in relation to local flood risks without direct LLFA consultation in most circumstances.
Supporting Sustainable Flood Resilient Development	4.1 Improve the 'The Lancashire Partnership' webpage on The Flood Hub, including by setting out who our flood family is. 4.2 Update Local Authority 'flooding' webpages and ensure they link to The Flood Hub to support community awareness, engagement and resilience. 4.3 Continue to support maintenance and development of The Flood Hub, including the launch of a new material. 4.4 Ensure Flood Action Groups (FLAGs) in Lancashire who consent to their 'get in touch' details being shared on The Flood Hub are published on the map and on the Partnership webpage. 4.5 Work better together to deliver more effective, targeted and partner focused asset maintenance regime for those assets owned by flood risk management authorities. 4.6 Continue to attend and work proactively with Catchment Partnerships to identify local opportunities to work together to co-fund and co-deliver natural flood management and other schemes within the community and private landownership. 4.7 Develop a Communication and Engagement Plan showing clear lines of communication and reporting, within and amongst flood risk management authorities, wider partners and the people of Lancashire. This will include proactive communications and responsive communication to, for example, flood/weather alerts. This should also include a progress for how good practice is captured from across Lancashire, including from Catchment Partnership and wider partners, and shared appropriately with our flood family and the people of Lancashire 4.8 Ensure Lancashire is represented at every North West Regional Flood and Coastal Committee's (RFCC) and its sub-groups as formed, to ensure we are working effectively with regional partners, sharing best practice and influencing any decisions or recommendations made to the RFCC and sub-regional FCERM Partnerships. 4.9 Ensure all flood risk management authorities are proactively engaged with the Lancashire Resilience Forum (LRF) to continually improve our multi-agency and operational responses to flooding incidents.

	4.10 Include separate Highway Authority and infrastructure provider representation on the Lancashire FCERM Partnership, at relevant levels, as appropriate, to ensure highway and other infrastructure flood risks are also captured. 4.11 Promote the educational resources provided on The Flood Hub and United Utilities SuDS for Schools programme via Local Authority Schools Portal / Educational Leads
Maximising Investment Opportunities to Better Protect our Businesses and Communities	5.1 Deliver schemes within the Investment Programme 2021 – 2027 to time and cost, including meeting partnership funding and efficiency requirements of grant funding. 5.2 Proactively monitor the delivery of the programme at every level of the Lancashire FCERM Partnership and hold delivery leads accountable, and ensure this is consistent with best practice established from across the region and/or other RFCC areas. 5.3 Share the programme with partners at all levels and with Catchment Partnerships to identify any collaboration opportunities. 5.4 Continue to identify opportunities / need for investment in flood risk management infrastructure and ensure these are captured in the Investment Programme 2021 – 2027 at the earliest opportunity to secure an allocation, where viable. 5.5 Develop a 'funding catalogue' of all potential sources of funding from public, private, voluntary and other sectors. Explore opportunities to collate this for the region, working with other Project Advisors to achieve this 5.6 Establish a process for the Partnership which facilitates quick allocation, approval and delivery of 'Quick Win' funding allocated annually to the Partnership. This includes governance and a re-allocation of funding if not spent as agreed. 5.7 Influence national thinking on flood insurance and grants for those affected by flooding to encourage a consistent approach from government rather than on a storm basis. 5.8 Where opportunities arise and where appropriate to do so, make government aware of funding challenges experienced in Lancashire, relating to funding duties of flood risk management authorities and investment in areas at risk of local flooding. 5.9 Ensure The Flood Hub is updated with flood risk schemes in progress and completed on a periodic basis
Contributing Towards a Sustainable, Climate Resilient Lancashire	6.1 Work with climate change action groups set up following Local Authority declaration of a climate emergency to ensure actions to address flood risk and coastal erosion are incorporated within climate change action plans. 6.2 Ensure a climate change allowance is incorporated into all proposed new sustainable drainage systems on developments consistent with national and/or local planning requirements and published guidance. 6.3 Investigate the feasibility of retrofitting SuDS in schools and other local authority owned buildings across Lancashire to improve their resilience and provide an educational resource. 6.4 Explore the feasibility of delivering a series of 'water resilient parks' in council owned parks across Lancashire to retrofit SuDS and natural flood management measures to contribute towards surface water storage where evidence shows this would be beneficial and financially viable. 6.5 In contributing towards a climate resilient highway network and economy, consider how Highway Authorities in Lancashire could adopt SuDS components under the Highways Act 1980. Work with United Utilities to share learning following introduction of the Design and Construction Guide (DCG) for Sewers. 6.6 Support Local Planning Authorities in undertaking a climate change review of Planning Policy and the Use and Management of Water in Lancashire to identify actions they can take to better manage flood risks presented by development and urban creep 6.7 Work with The Flood Hub and partner flood risk management authorities to promote property flood resilience measures and land flood resilience measures, and signpost to reputable suppliers if this is possible.

2.2 Current and future flood risk

2.2.1 Background

Lancashire has experienced historical incidents of flooding in the past and has also suffered the consequences of flooding several times in recent years. Some of the more recent events include February, August and September 2011 and June, September and December 2012. Prior to these, flooding has been recorded across the county, with clusters of notable incidents in Lancaster/Morecambe, Blackpool, Preston and Bacup/Rawtenstall in Rossendale.

The flooding problems were mainly caused by surface water overland flows, green field run-off and ordinary watercourse culvert surcharges with some flooding problems caused by rivers overtopping at various locations throughout the area. The flooding has resulted in impacts on homes, businesses, agricultural land as well as roads, railways and public services.

2.2.2 Current flood risk

A Preliminary Flood Risk Assessment (PFRA) was completed in 2011. For the purposes of the PFRA, Defra have defined "significant" future flood risk as affecting 30,000 or more people or 150 critical services (e.g. schools, hospitals, nursing homes, power and water services). No such flood risk meets this threshold of significance, and thus no significant flood risk areas have been identified in Lancashire, Blackpool and Blackburn with Darwen. In assessing past floods, any flood which affected 20 or more people, or one or more critical service was identified. Following an initial data gathering exercise, around 25 such flood events were identified. This excludes any past floods which have since been resolved and are therefore unlikely to re-occur.

An indicative breakdown of the numbers of properties at risk by local authority area is given in Table 2.2 below.

Table 2.2 Number of properties at risk within each local authority area

Local Authority	No. residential properties	No. non-residential properties
Lancaster	4609	1682
Wyre	2181	929
Ribble Valley	3383	1814
Preston	3217	897
Fylde	1099	625
Pendle	4011	1267
West Lancashire	4800	1377
Burnley	4058	934
Hyndburn	3885	889
South Ribble	3935	927
Chorley	3765	1122
Rossendale	7346	1852
Blackpool	3202	556
Blackburn with Darwen	2600	1400

As a result of identified flood risk from surface water runoff, Lancashire County Council has commissioned several catchment and local Surface Water Management Plans (SWMPs).

SWMPs will look at the district boundary areas (as shown in Figure 2.3) at a local scale. These plans are based on a model which shows where floods are likely to occur in high risk areas. SWMPs are the Defra-recommended way of managing local flood risk and they present a method of how these studies should be progressed. The initial strategic part of the SWMP investigations have already been carried out, involving data gathering, analysis of flow paths and preliminary site visits to over 300 locations. Consequently, a high-level knowledge of the key risk areas in Lancashire was obtained.

An important part of the Strategy will be the development of a Flood Risk Management Plan which sets out how LCC will manage local flood risks at specific locations. It also details how local flood risk will be managed over the short medium and long term, and how schemes and studies will be prioritised across Lancashire. The knowledge gained from the SWMPs is currently being used to formulate the detailed Flood Risk Management Plan for Lancashire, and an associated action plan will be developed, for which flood management measures would be considered. This process is currently on-going.

LCC have also successfully applied for funding from Defra/Environment Agency to carry out more detailed investigations in key risk areas where the initial phases of the SWMP process has identified a particularly high risk of flooding.

2.2.3 Future flood risk

The PFRA notes that climate change can affect local flood risk in several ways. Impacts will depend on local conditions and vulnerability. Wetter winters and more rain falling in wet spells may increase river flooding, especially in steep, rapidly responding catchments. More intense rainfall causes more surface runoff, increasing localised flooding and erosion. In turn, this may increase pressure on drains, sewers and water quality. While summers may become overall drier (with increased risk of drought), storm intensity could increase. Drainage systems in the river basin district have been modified to manage water levels, and could help in adapting locally to some impacts of future climate on flooding, but may also need to be managed differently.

Rising sea or river levels may also increase local flood risk inland or away from major rivers because of interactions with drains, sewers and smaller watercourses. The PFRA recognises a need for local studies to understand climate impacts in detail, including effects from other factors like land use. Sustainable development and drainage will help adapt to climate change and manage the risk of damaging floods in future (Lancashire Area Preliminary Assessment Report, 2011).

Another potential change in future flood risk is future development. Proposed development must avoid the creation of new surface and groundwater flooding issues (or increased flood risk from water-bearing structures, where relevant). It should also mitigate pre-existing flood risk wherever possible so as not to place new users of development at significant risk of flooding. Where flood risk remains, levels of flood risk must be managed in accordance with relevant planning policy. As the Strategy and SEA develop, they must take proposed allocations into account on a site-specific basis in order to assist in preparing for potential flood risk.

2.3 Detailed Environmental Baseline Information

The draft LFRMS includes a number of objectives which, will lead to the establishment of Action Plans. In turn these Action Plans will include the development of specific measures.

The local district boundaries have been ranked in order of potential flood risk to residential properties, (based on the properties at risk data shown in Table 2.2). For these areas, the key environmental information and constraints have been identified based on GIS mapping data, as set out in Appendix A and as shown in Figures 2. 2 and 2.3. Table 2.3 below summarises the outcomes of this exercise.

Table 2.3 Summary of environmental baseline for each of the District Boundary Areas

Priority based on No. of Properties at risk	Area Name / Location	Main Environmental Issues
1	Rossendale	3 SSSIs (1 Geological SSSI); 1 SPA; 1 SAC 2 Scheduled Monuments; 9 Conservation Areas.
2	West Lancashire	6 SSSIs (2 Geological SSSIs); 3 SPAs; 1 Ramsar; 1 SAC; 1 NNR; 12 Scheduled Monuments; 28 Conservation Areas
3	Lancaster	31 SSSIs (1 Geological SSSI); 3 SPAs; 2 Ramsar sites; 3 SACs; 2 AONB; 1 NNR; 37 Scheduled Monuments; 37 Conservation Areas.
4	Burnley	1 SSSI; 1 SPA; 24 Scheduled Monuments; 10 Conservation Areas.

Priority based on No. of Properties at risk	Area Name / Location	Main Environmental Issues
5	Pendle	2 SSSIs; 1 SPA; 11 Scheduled Monuments; 26 Conservation Areas.
6	South Ribble	3 SSSIs; 1 SPA; 1 Ramsar; 3 Scheduled Monuments; 8 Conservation Areas.
7	Hyndburn	1 SSSI; 1 Scheduled Monument; 10 Conservation Areas.
8	Chorley	3 SSSIs; 10 Scheduled Monuments; 9 Conservation Areas.
9	Ribble Valley	15 SSSIs (3 Geological SSSIs); 1 SPA; 29 Scheduled Monuments; 22 Conservation Areas.
10	Preston	1 SSSI; 3 Scheduled Monuments; 11 Conservation Areas.
11	Blackpool	2 SSSI; 1 SPA; 2 Ramsar sites; 2 Conservation Areas.
12	Wyre	5 SSSIs (1 Geological SSSI); 2 SPAs; 1 Ramsar; 1 SAC 1 AONB, 6 Scheduled Monuments; 6 Conservation Areas.
13	Fylde	6 SSSIs; 2 SPAs; 1 Ramsar 1 SAC; 1 NNR; 10 Conservation Areas.

Another potential change in future flood risk is future development. Proposed development must avoid the creation of new surface and groundwater flooding issues (or increased flood risk from water-bearing structures, where relevant). It should also mitigate pre-existing flood risk wherever possible so as not to place new users of development at significant risk of flooding. Where flood risk remains, levels of flood risk must be managed in accordance with relevant planning policy. As the Strategy and SEA develop, they must take proposed allocations into account on a site-specific basis in order to assist in preparing for potential flood risk.

2.4 Spatial scope of the SEA

The study area of the SEA (i.e. its spatial scope) is focused within Lancashire County Council boundary. The spatial scope of the SEA is based on the Flood Risk Areas identified in the LFRMS.

The environmental constraints and features considered for the scope are therefore focused on these areas. Figure 2.4 provides a map showing the focus areas of the SEA study area. Due to the nature and size of some of the constraints, a number of designated sites cross district boundaries for example the Ribble and Alt Estuaries, and therefore some constraints can impact on a number of local district boundaries.

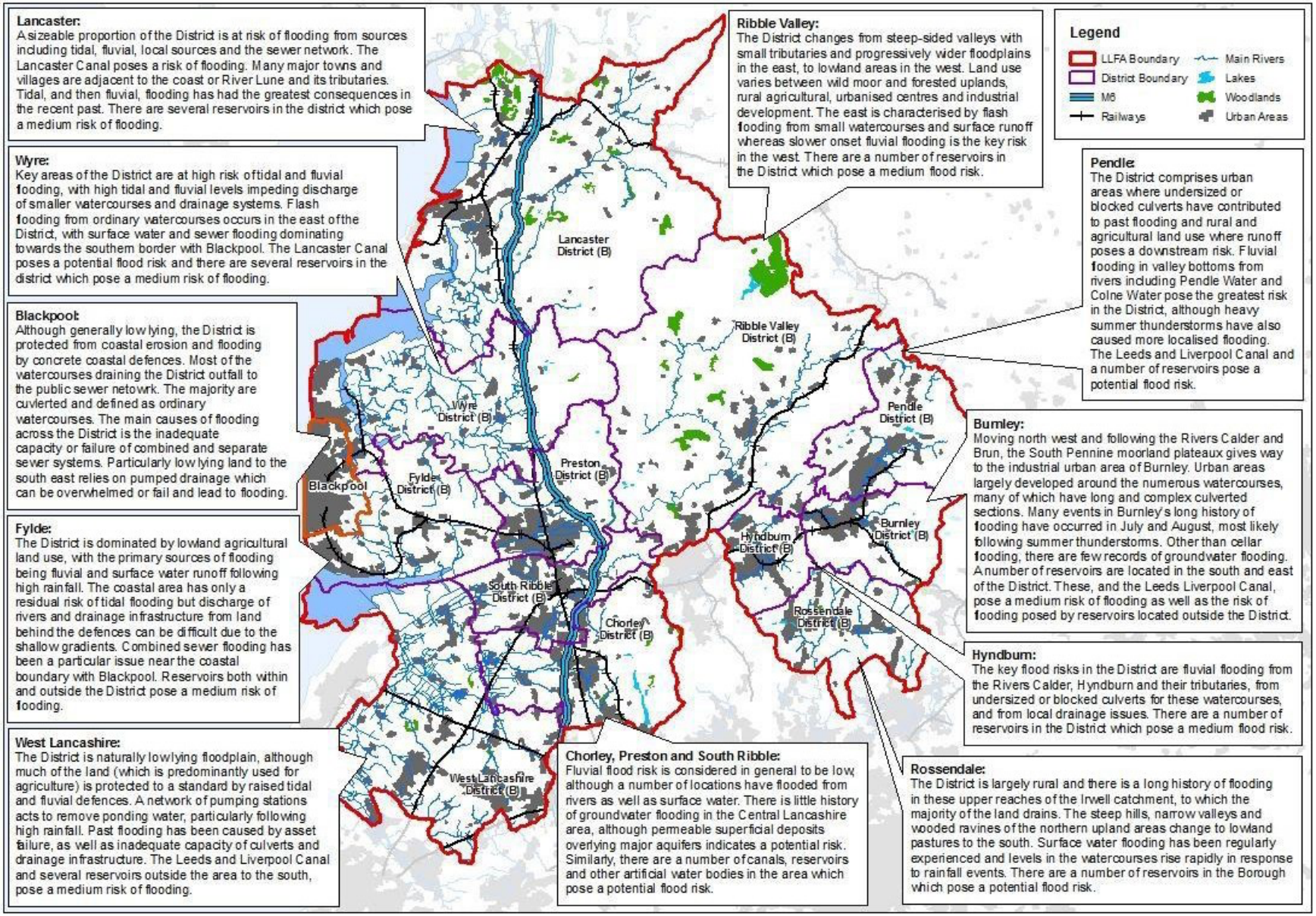

Figure 2.4: SEA study area

2.5 Temporal scope of the SEA

The assessment has considered the short, medium, and long -term effects. Both construction / implementation and operational effects have been considered within each period. The likely significant effects of each significant policy option or proposed action have been assessed over the periods of:

- Short term = 1 to 12 months
- Medium term = 1 to 3 years
- Long term = greater than 3 years

The temporal scope of the SEA was established based on the scale advised in the Strategy. These timescales were set based on predicted delivery of measures. It is not possible to deliver all of the measures immediately due to limited funds and availability of resources within the LLFAs and also within the partner organisations.

This differs from the temporal scales assumed in the scoping report, as the temporal scales to be considered for the Strategy were still being determined at that time.

2.6 Technical scope of the SEA – topics and SEA criteria

The technical scope of the SEA was established, consulted upon and agreed with the statutory consultees in November 2013. This focused the SEA on the environmental issues arising from flood risk management that are likely to be significant or are uncertain and should be included in the assessment. As a result of the scoping exercise, the following topics or elements of topics were scoped out of the SEA:

- **Biodiversity** – current and future levels of potential harm to wildlife from water pollution and spread of invasive species;
- **Local Community** - Land use conflict with properties, community facilities, businesses or transport and temporary disruption due to construction;
- **Recreation** - Land use conflict with recreational features, including green infrastructure and temporary disruption due to construction;
- **Geology and Soils** - Spread of soil contamination;
- **Air quality and Noise** – construction air emissions and construction noise; and Material Assets – Land use or design conflict with key infrastructure.

Table 2.4 below describes the SEA topics which were scoped into the assessment.

Table 2.4: Definition of environmental topics and their relevance to the LFRMS

Topic	Definition (in relation to this report)	Specific elements scoped in
Biodiversity	All individual species (e.g. plants, animals) and habitats, and the interactions amongst them, particularly in terms of eco- systems. Ecosystems are linked communities of organisms together with non-living components of their environment (such as air, water and soil)	Flood risk to designated sites, other habitats and associated species Changes to habitats and direct species mortality.
Local Community	People, communities and businesses who could be affected by flooding or the policy and actions implemented by the LFRMS. Ability of individuals to access community facilities.	Flood risk to residential and commercial properties. Flood risk to communities and deprived areas
Recreation	Recreation centres, open countryside, village greens, parks, open spaces, bridleways, public footpaths. Ability of individuals to access recreational and leisure facilities.	Flood risk to recreational facilities or features. Access to recreational routes/facilities
Geology and Soils	The variety of rocks, minerals and landforms, and the quantity and distribution of soils of various natural or societal function and quality	Flood risk to geological features. Land use conflicts with soils. Land use conflict with geological features.
Water Env-ironment	The physical presence and extent of water bodies, and the amount and movement of water in them. Hydromorphology – the shape of a river and the way in which it erodes, transports and deposits sediment in rivers. Measured levels of chemical, biological and nutrient quality indicators (e.g. nitrates, phosphates) in water bodies	Compliance with the River Basin Management Plan (RBMP). Risk of water pollution Long-term ability to achieve 'good status' or 'good potential'
Climatic Factors	<u>Climate emissions:</u> The greenhouse gases which are emitted as a result of (in general) the use of natural resources <u>Climate adaptation:</u> The measures taken in order to help society and nature adapt to future changes in our climate, thus lessening the impact of climate change	The CO2 emissions associated with construction have been considered in this SEA.
Landscape and Townscape	The local character of an area as formed by its visible features, including the natural, built and historic environment. We will consider impacts on nearby sensitive receptors at the strategy level.	Flood risk to landscape and townscape. Landscape and townscape character.
Historic Env-ironment	The surviving remains of past human activity and how people identify and value inherited assets as a reflection and expression of evolving knowledge, beliefs and traditions.	Land use or design conflict with designated or non-designated historic features. Access to historic features Flood risk to historic assets
Material Assets	Key assets, including the transport network, and the public utilities of power, gas, communications, water supply, wastewater treatment and drainage.	Flood risk to key infrastructure.

Table 2.5 sets out the environmental criteria for assessment which was established and agreed at the scoping stage.

Table 2.5 SEA criteria

SEA Topic	Assessment Criteria	
Biodiversity	B1	Will it protect and, where possible, enhance designated nature conservation sites and associated species, including habitat connectivity where applicable?
	B2	Will it protect and, where possible, create or enhance notable, non-designated (e.g. BAP) habitats and associated species, including habitat connectivity where applicable?
Local Community	LC1	Will it reduce the number of people residing in homes and commercial properties at risk of flooding?
	LC2	Will it reduce flood risk to communities in deprived areas?
	LC3	Will it reduce disruption in access to facilities and services, such as that caused by floods?
Recreation	RC1	Will it protect and, where possible, enhance open spaces which have designations, or improve them in terms of flood risk?
	RC2	Will it protect and, where possible, create or enhance recreational facilities, or reduce their levels of flood risk?
Geology and Soils	GS1	Will it protect and, where possible, create or enhance sites valued for geodiversity?
	GS2	Will it protect 'best and most versatile' soil?
Water Environment	W1	Will it prevent the achievement of 'good status' or 'good potential' of a water body?
	W2	Does it either counteract or contribute to the delivery of the River Basin Management Plan?
	W3	Will it protect and, where possible, improve water quality?
Climatic Factors	CF1	Will it increase greenhouse gas emissions?
Landscape and Townscape	LT1	Will it protect and, where possible, enhance (including through significant and relevant flood risk reduction) landscapes and townscapes?
Historic Environment	H1	Will it protect and, where possible, enhance (including through flood risk reduction) the integrity and setting of designated historic assets?
	H2	Will it protect and, where possible, improve access to, or educational opportunity offered by, designated historic features?
Material assets	M1	Will it reduce flood risk to essential infrastructure?

The degrees of significance for an effect have been considered. Table 2.6 below lists the five significance categories that have been used to determine effects of the LFRMS, and provides a broad description of some examples of how the categories could be used hypothetically. This is only a guideline, a range of factors have been taken into account, including any multiple benefits or adverse effects to be added together, or which are complementary.

Table 2.6 SEA significance categories and examples of application

Symbol	Significance Category	Example of How Applied
++	Major Beneficial	A highly beneficial change to receptors or indicators, such as improving management of a feature or its condition (making it notably better for its intended purpose), but also where a new feature is created, or rescued from likely loss, that has only very localised value. Delivers a River Basin Management Plan (RBMP) measure.
+	Minor Beneficial	A beneficial change to receptors or indicators that is worthy of being considered "significant", but not to a high degree. Assists in meeting RBMP objectives.
0	Neutral / Negligible	No relationship between the proposal(s) being assessed and relevant receptors or indicators, or a change to receptors or indicators that is not worthy of being considered "significant", such as due to a real or assumed threshold not being passed.
–	Minor Adverse	A negative change to receptors or indicators that is worthy of being considered "significant", but not to a high degree.
– –	Major adverse	A highly negative change to receptors or indicators, such as harm to its condition (making it notably worse at performing its intended purpose), but also where a new feature is destroyed or rendered unusable, that has only very localised value.

3. Key Links between the LFRMS and Other Policy, Plans, Programmes and Strategies

3.1 Requirement and scope

The LFRMS and the SEA have been influenced by many different plans and programmes. This is recognised by the SEA Regulations, which require a review of relevant plans and programmes to be completed in the preparation of documents:

> – An outline of the contents and main objectives of the plan and programme, and of its relationships with other relevant plans and programmes
> … and…
> The environmental protection objectives, established at international, Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation.
>
> (HMSO, 2004, Schedule 2 - Part 1 and 5)

Relevant international, national, regional and local policy guidance, plans and strategies have been reviewed to:

- Ensure the LFRMS and the SEA are in line with the requirements of legislation and national policy;
- Maximise synergies between the LFRMS and the SEA and other relevant plans and policies, and identify inconsistencies or constraints to be dealt with;
- Identify sustainability objectives, and key targets and indicators, that should be reflected in the SEA; and
- Provide baseline data.

3.2 Document review for Lancashire and Blackpool

Key international, national, regional and local documents were reviewed as part of the SEA scoping stage undertaking in 2014. The full review can be found in Appendix C.

The review process has provided a valuable source of information and a framework for developing different components of the LFRMS and the SEA. In particular:

- At a high level, key legislation and national policies provided the planning context for the LFRMS; and
- Regional and local documents provided a valuable source of baseline information, and identified local priorities and objectives as well as conditions that the LFRMS and SEA should adhere to.

The National Planning Policy Framework (NPPF) is the relevant national policy for delivering sustainable development. The NPPF is supported by a document entitled, Technical Guidance to the National Planning Policy Framework. This document provides additional guidance on development in areas at risk of flooding.

3.3 Future review

As new plans, policies, programmes, or alterations to such documents become available, further review will be required to ensure the process is up-to-date. Where both new documents (and their subsequent review by the SEA) may significantly change the scope of the SEA, and additional SEA assessment is to be conducted (e.g. of future amendments to the LFRMS), the SEA will be updated and re - consulted upon in accordance with the legislation.

4. Assessment of Generic FRM Measures

4.1 Introduction

As no site-specific information is currently available, the following long list of generic Flood Risk Management measures have been identified. During the process of following the objectives identified in the strategy, a number of the generic flood management measures that have been identified may be considered further as part of the local flood risk management action plans. These generic measures are hypothetical Flood Risk Management options and include the following (which may or may not be applicable to flood risk areas in Lancashire):

- **Inspection and maintenance:** the Strategy includes for proposed increases in inspection and both proactive and reactive maintenance of open watercourses and culverts in order to attempt to prevent deterioration and restrictions to water flow through them (e.g. at trash grilles);
- **'Naturalisation' of watercourses:** measures which aim to restore any of the natural features of a watercourse which has been modified by past intervention, such as a culvert or artificial channel. For example, 'de-culverting' (or 'daylighting'2) is one possible measure, which can involve restoring the earth embankments of a watercourse and allowing more natural flow and interaction between water and land to occur. It can also restore openness of a watercourse to the air where it has been passing underground . During high rainfall, this can slow the flow of water towards areas at risk of flooding (holding more water within the watercourse), or allow less vulnerable areas next to these watercourses to store water (such as grassland areas);
- **Watercourse capacity increases:** measures which either alter or remove constraints to a watercourse (e.g. walls, bridges, culverted sections) or create a new watercourse (i.e. bypass channel) to allow more water to remain within the watercourse network, and thus reduce the amount of water leaving a watercourse. Measures can include:
  - channel / drain widening and replacement;
  - eliminating 'pinch points' – removing or modifying any structures which restrictthe flow of water from one side of the structure to the other;
  - bypass channels – constructing new channels which divert excess water flow from vulnerable areas, or improve the flow around restricted areas;
- **Flood storage:** new flood storage areas along ordinary watercourses, upstream of areas vulnerable to flooding;
- **New / raised defences:** raising, replacing or constructing flood walls or earth embankments as a line of defence of land and properties from flood waters;
- **Flood proofing and resilience:** provide users of properties at risk of flooding with flood risk management asset measures at individual properties, such as the use of door guards or portable flood barriers; and
- **Land management:** The way that land is used influences the rate at which water can run off into watercourses. For example, urban areas have

2 In relatively few circumstances, there may be a subtle distinction between de-culverting and daylighting, whereby daylighting may not always involve the removal of the entire culvert, but rather only the structure overtop of the watercourse (e.g. concrete blocks). This might occur in urban areas w here it is impossible or impractical to remove embankment structures due to existing development.

impermeable surfaces, such as concrete and tarmac, leading to greater surface water run-off (such as rainwater) into watercourses than there would be on unmade ground. Similarly, discharge from agricultural drains and ditches can also increase the volume of the receiving watercourse. These effects can increase local flood risk. Land management options traditionally considered include Sustainable Drainage Systems (SuDS) and ditch blocking.

The assessment of generic (i.e. not location-specific) potential flood risk management (FRM) measures considers their 'likely significant effects'. A high -level assessment has been undertaken because the measures may or may not be chosen for any of the Flood Risk Areas as the Strategy develops. The SEA has assessed the generic FRM measures in accordance with the method set out below.4.2 Method of assessment

4.2 Method of assessment

GIS was used in order to identify the known environmental constraints and features within the Lancashire County area and have been identified as potentially being affected by FRM measures. The features may suffer negative impacts or they could potentially benefit from flood risk management.

Once the baseline features were identified, high-level consideration of the potential effects was made and recorded. This was then compared against the SEA significance categories and examples of application which were agreed at the scoping stage, as presented in Table 2.4, in Section 2.6.

4.3 Limitations of the SEA and key assumptions

The assessment of generic measures is at a very high level, given the lack of specific flood risk locations for implementation of measures. Its main limitation, therefore, is the need to rely on a number of assumptions. The key assumptions of the SEA during the assessment of generic measures are as follows:

- Measures are implemented in isolation – combinations of measures have not been given particular consideration, and the implication of combining measures may lead to synergistic effects (greater than the sum of the individual effects);
- It is assumed that inspection and maintenance may include dredging ofwatercourses;
- The baseline for watercourses across the county is generalised (see the assessment), and thus any measure may affect any aspect of this baseline;
- Any flood risk management measures implemented to address an FRA would provide flood risk benefit to all features within the FRA;
- Surface water flooding may pick up pollutants from residential or commercial areas, and thus cause harm to soils, biodiversity or human health ; and

- Flood risk to community services / facilities, recreation or infrastructure is sufficient to cause temporary closures or render it temporarily unusable, or cause damage to the infrastructure requiring repair.

4.4 Assessment of generic flood risk management measures

The SEA has identified a range of generic risks, pre -existing mitigation which is expected (for example because it is required in existing legislation or is standard good practice), and additional mitigation measures, which can be used to info rm the identification of actions for particular District areas and settlements with flood risk.

Table 4.1 on the following pages provides a summary of the assessment. The full assessment can be found in Appendix C. The following general statements about the assessment can be noted:

- Where potential adverse effects are identified, but the residual effect is assessed as neutral / negligible ("0"), LCC is expected to be able to minimise significant effects and reduce them to negligible; and
- Where residual adverse effects remain, LCC is expected to be able to minimise significant effects, but the potential for minor adverse effects remains possible. This requires monitoring, such that any adverse effects which are later identified can be further considered and mitigated.

From the baseline data discussed in the Scoping Report, major nationally important environmentally designated sites within the Districts have been identified and used to inform the assessment of generic measures. Also identified are a number of other potentially relevant baseline features that would be appropriate at a more localised scale, such as Public Rights of Way and Tree Preservation Orders. These were not included in the baseline information in the Scoping Report which only considered the strategic and regional scale.

SEA Topic	Potential Adverse Effect(s) (w ithout m itigation)							Residual Effect w ith Mitigation (See Appendix C for list of m itigation)							Key Potential Opportunities (See Appendix C for full list)	
	Inspection and Maintenanc	Watercourse Capacity Increases	New / Raised	Naturalisation of	Flood Storage	Flood Proofing and	Land Management	Inspection and	Watercourse Capacity	New / Raised	Naturalisation of	Flood Storage	Flood Proofing and	Land Management		
Biodiversity	– –	– –	– –	–	–	0	0	–	–	–	–	–	0	0	++	Increased protection from damage by extreme flooding
Local Community	–	–	–	–	–	–	0	0	0	0	0	0	0	0	++	Protection from harm by extreme flooding
Recreation	–	–	–	–	– –	–	0	0	0	0	0	0	0	0	++	Reduction in flood risk to recreational areas / facilities
Geology and Soils	– –	– –	–	– –	– –	0	–	0	0	0	0	–	0	–	++	Reduction in flood risk to geological sites or contaminated land
Water Environment	– –	– –	– –	0	–	0	–	0	0	0	0	–	0	0	++	Reduction in flood risk and enables natural hydro-geomorphological processes.
Climatic Factors	–	–	–	–	–	0	0	0	–	–	–	–	0	0	++	Reduced flood risk can avoid greenhouse gas emissions required for post-flooding clean-up and recovery.
Landscape and Townscape	–	–	– –	–	–	–	–	0	0	–	–	–	0	0	++	Reduction in the harm done by extreme flooding can help prevent deterioration in townscape or landscape features.
Historic Environment	– –	– –	– –	–	– –	–	–	–	–	–	–	–	0	0	++	Protection of integrity and setting from damage by extreme flooding
Material Assets	–	–	0	–	–	0	0	0	0	0	0	0	0	0	++	Reduction in flood risk to any business use / land, associated infrastructure, or other important infrastructure (helping to reduce damage / maintenance)

Table 4.1: Summary of the Assessment of Generic FRM Measures

4.5 Conclusions and recommendations of the SEA

Given the baseline for the county, the main concerns for implementing FRM measures are:

- All measures: modification of watercourses and associated ecological impact via changes to riverbanks and/or the riverbed and in -watercourse flora;
- All measures: potential impact on buried archaeology;
- All measures: Water Framework Directive (WFD) compliance, and the need to ensure works do not cause deterioration of a WFD water body on a 'non - temporary' basis;
- All measures (including dredging under inspection and maintenance): potential spread of sediment / soil contamination;
- 'Naturalisation', flood storage: potential health and safety risks, recognising the potential hazards of culverts;
- Flood storage: potential landtake within designated Sites;
- Temporary construction impacts on people and ecology.

Some of the key sensitivities in the borough include fish migration and spawning, potential impact on water vole populations, the various waterside Sites of Special Scientific Interest (SSSIs), Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Biological Heritage Sites (BHSs). The county's industrial history is also relevant to the potential for contaminants buried under watercourse sediment.

There are a number of pre-existing requirements and other forms of mitigation which are likely to be implemented regardless of this SEA's input. These may avoid certain significant adverse effects from the long list of potential FRM measures. They are shown in detail in Appendix C.

Of the mitigation recommended by the SEA, as also detailed in Appendix C, the key mitigation can be summarised as:

- Appropriate ecological assessments and action planning for each measure, including ecological input into design where relevant;
- Consulting with the Council's ecologist and (where appropriate) Lancashire Wildlife Trust in the design of any flood storage within or adjacent to Local Wildlife Sites;
- Consulting with the LCC conservation section and the Specialist Advisor (archaeology) for LCC on updates to the Strategy's action plan, particularly where locations for any dredging or watercourse modification are proposed;
- Environmental action plans for ecology and archaeology, to ensure staff and contractors 'on the ground' are aware of what to look for and how to respond if relevant features are discovered;

- Appropriate consideration of health and safety risks in any design or watercourse modification, with possible provision of safety equipment and signage required;
- Project-level assessment of potential temporary construction impacts, where these may be of a significant magnitude or duration; and
- Project-level assessment of the effects on downstream watercourses, with ‘pairing up’ of flood storage measures, as may be appropriate.

5. Future Assessment of Flood Risk Management at Specific Locations

5.1 Introduction

For the local district boundaries considered in Section 2.2, more localised studies are currently being undertaken, as associated with the development of SWMPs. This would identify more specific flood risk areas. For such flood risk areas, the objectives identified in Table 2.1 would need to be considered and potential appropriate actions/measures considered and then identified in the Strategy. These actions/measures would need to be assessed for their potential effects on the environment, which may be informed by the assessment of the generic flood risk measures conducted within this SEA.

Objective Theme	Actions/measures	Timescales
Roles and Responsibilities	Further develop the Action Plan	Short Term
Understanding Risks	Create a Local Flood Risk Management Plan	Short Term
	Embed climate change into local flood risk management	
	Develop SWMPs	Medium Term
Communication and Involvement	Develop a flood awareness programme	Short Term
	Scope approaches in small communities	Medium Term
Sustainable Flood Risk Management	Raise awareness of climate change, adaptation and sustainability guidance	Short Term
	Seek expert involvement to deliver sustainability	
	Promote good surface water management principles for development	
	Establish policy for LLFA consultation on planning applications	
	Develop a Lancashire-specific SuDS guide	
	Seek pilot study opportunities	Medium Term

5.2 Method of assessment

When these actions/measures develop, an assessment of the potential effects to the environmental features would be carried out in line with the methodology discussed in Section 2.5. As part of this, the generic flood management measures identified in Section 4.1 may be considered for the required flood management. At this stage, the assumed baseline conditions should be reviewed and updated for the specific flood risk locations.

As part of the review of baseline information, GIS data should be used in order to identify the known environmental and socio-economic features. For Biodiversity aspects, consultation should be undertaken with the Council's ecologist to confirm which habitats may in fact benefit from flood risk reduction, or conversely if any may be harmed by loss of water input.

6. Cumulative Effects of the Strategy

6.1 Introduction and approach

Cumulative effects are the effects of different actions acting together on a common receptor, whether it be through strategies, plans, programmes or projects. Sometimes people distinguish 'in combination' effects as a separate type of cumulative effect, which are the effects of different actions acting together on a common receptor via different pathways.

There are also at least three different types of cumulative or 'in combination' effect, which are:

- Additive: the simple sum of all the effects (e.g. reducing flood risk in two different, disconnected residential areas);
- Neutralising: where effects counteract each other to reduce the overall effect (e.g. requiring construction within an area of habitat, but a separate green corridor project proposes to replace habitat and improve connectivity in that area); and
- Synergistic: where effects interact to produce a total effect greater than the sum of the individual effects. Negative synergistic effects often happen as habitats and resources get close to capacity: for instance, a wildlife habitat can become progressively fragmented with limited effects on a particular species until the last fragmentation makes the areas too small to support the species at all.

As per Section 2.5, effects have been considered over the short term (0 – 12 months), medium term (1 – 3 years) and long term (more than 3 years).

6.2 Effects of the Strategy acting alone

The full assessment criteria of the SEA can be found in Table 2.4 of Section 2.6.

Table 6.1 below repeats these, and outlines the assessment of the Strategy as a whole.

This assessment is subject to some key assumptions, associated with the assessment of generic flood management measures, which are in line with the LFRMS objectives (in particular SFRM 1) on the sustainable approach to FRM:

- The majority of the flood storage schemes achieve net benefits to nature conservation (e.g. habitat creation);
- Watercourse capacity increases will be limited to mainly urban / 'built up' areas;
- Outside of urban / 'built up' areas , watercourse capacity increases will either be to 'naturalise' or make more natural, a watercourse. They will otherwise be of very limited extent;
- Inspection and maintenance may apply limited dredging of open watercourses, and any which is applied will be subject to ecological assessment and management; and
- There will be limited use of new / raised defences in terms of extent of watercourse affected.

<table>
<tr><th>SEA Topic</th><th colspan="4">Assessment with Recommended SEA Mitigation</th><th>Description</th></tr>
<tr><td rowspan="6">Biodiversity</td><td>B1</td><td colspan="3">Will it protect and, where possible, enhance designated nature conservation sites and associated species, including habitat connectivity where applicable?</td><td rowspan="6">There is potential for negative effects during the construction of certain measures which may come forward in the short term, however with mitigation and enhancement, there is greater potential for medium-term and long-term biodiversity gains in association with flood storage or possible naturalisation, as well as land management.</td></tr>
<tr><td colspan="2">Short Term</td><td>Medium Term</td><td>Long Term</td></tr>
<tr><td colspan="2">–</td><td>+</td><td>+</td></tr>
<tr><td>B2</td><td colspan="3">Will it protect and, where possible, create or enhance notable, non-designated (e.g. BAP) habitats and associated species, including habitat connectivity where applicable?</td></tr>
<tr><td colspan="2">Short Term</td><td>Medium Term</td><td>Long Term</td></tr>
<tr><td colspan="2">–</td><td>+</td><td>+</td></tr>
<tr><td rowspan="8">Local Community</td><td>LC1</td><td colspan="3">Will it reduce the number of people residing in homes and commercial properties at risk of flooding?</td><td rowspan="3">This is a key aim of the LFRMS.</td></tr>
<tr><td colspan="2">Short Term</td><td>Medium Term</td><td>Long Term</td></tr>
<tr><td colspan="2">+</td><td>+</td><td>++</td></tr>
<tr><td>LC2</td><td colspan="3">Will it reduce flood risk to communities in deprived areas?</td><td rowspan="3">It is likely that a number of measures will be identified which benefit District areas in deprived areas, such as relevant areas of Blackpool and Burnley would be addressing Districts in economically deprived areas (relative to the national average). However, it should be noted that level of deprivation has not influenced the District arearanking.</td></tr>
<tr><td colspan="2">Short Term</td><td>Medium Term</td><td>Long Term</td></tr>
<tr><td colspan="2">+</td><td>+</td><td>+</td></tr>
<tr><td>LC3</td><td colspan="3">Will it reduce disruption in access to facilities and services, such as that caused by floods?</td><td>In the long term, it is felt likely that severity of flood risk (given climate change) may worsen its impact on the road network</td></tr>
</table>

Table 6.1: Effects of the LFRMS – Cumulative Effects Assessment

SEA Topic	Assessment with Recommended SEA Mitigation				Description
	Short Term	Medium Term	Long Term		without the LFRMS. As such, the LFRMS could greatly reduce the disruption caused by flooding.
	+	+	++		
Recreation	RC1	Will it protect and, where possible, enhance open spaces which have designations, or improve them in terms of flood risk?			There is potential for negative effects during the construction and implementation of certain measures which may come forward in the short term, however with mitigation and enhancement, there is greater potential for medium-term and long-term benefits to recreation from reduced flood risk.
	Short Term	Medium Term	Long Term		
	–	+	+		
	RC2	Will it protect and, where possible, create or enhance recreational facilities, or reduce their levels of flood risk?			
	Short Term	Medium Term	Long Term		
	–	+	+		
Geology and Soils	GS1	Will it protect and, where possible, create or enhance sites valued for geodiversity?			May be flood risk benefits to the various RIGS/SSSI (for geology) within Lancashire.
	Short Term	Medium Term	Long Term		
	0	+	+		
	GS2	Will it protect 'best and most versatile' soil?			There is potential for flood storage in all grades of ALC . The effect is unknown, and depending on the nature of FRM measures, may be neutral or even beneficial. However, the risk of adverse effects must be noted.
	Short Term	Medium Term	Long Term		
	0	–	–		
Water Environment	W1	Will it prevent the achievement of 'good status' or 'good potential' of a water body?			WFD assessment of relevant FRM measures will be required to ensure no deterioration on a non-temporary basis. FRM measures can assist in achieving the objectives of various RBMPs, including flood storage and naturalisation measures which achieve a more natural land inundation regime and / or a more natural
	Short Term	Medium Term	Long Term		
	0	+	+		
	W2	Does it either counteract or contribute to the delivery of the River Basin Management Plan?			

<table>
<tr><th>SEA Topic</th><th colspan="4">Assessment with Recommended SEA Mitigation</th><th>Description</th></tr>
<tr><td rowspan="6"></td><td>Short Term</td><td>Medium Term</td><td>Long Term</td><td rowspan="2"></td><td rowspan="2">flow regime and ecological functionality.</td></tr>
<tr><td>0</td><td>+</td><td>+</td></tr>
<tr><td>W3</td><td colspan="3">Will it protect and, where possible, improve water quality?</td><td rowspan="4">Measures are considered unlikely to affect water quality significantly, as it tends to be more strongly influenced by other factors.

Use of SuDs could improve water in the long term</td></tr>
<tr><td>Short Term</td><td>Medium Term</td><td>Long Term</td><td></td></tr>
<tr><td>0</td><td>0</td><td>+</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="4">Climatic Factors</td><td>CF1</td><td colspan="3">Will it increase greenhouse gas emissions?</td><td rowspan="4">At first, the emissions associated with construction and implementation are likely to be greater than the emissions saved through reduced flood risk (i.e. evacuations, diversions and flood recovery). By the long term (with climate change), the cumulative saved emissions may even out the 'spent' emissions.</td></tr>
<tr><td>Short Term</td><td>Medium Term</td><td>Long Term</td><td></td></tr>
<tr><td>–</td><td>–</td><td>0</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="4">Landscape and Townscape</td><td>LT1</td><td colspan="3">Will it protect and, where possible, enhance (including through significant and relevant flood risk reduction) landscapes and townscapes?</td><td rowspan="4">There is potential for negative effects during the construction and implementation of certain measures which may come forward in the short term, however with mitigation and enhancement, there is greater potential for medium-term and long-term benefits to recreation from reduced flood risk.</td></tr>
<tr><td>Short Term</td><td>Medium Term</td><td>Long Term</td><td></td></tr>
<tr><td>–</td><td>0</td><td>0</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="4">Historic Environment</td><td>H1</td><td colspan="3">Will it protect and, where possible, enhance (including through flood risk reduction) the integrity and setting of designated historic assets?</td><td rowspan="4">There are risks to buried archaeology during all time periods in which construction or dredging measures may occur (which may include the long term). However, by the long term, it is expected that the flood risk reduction to historic assets will either make up for, or even outweigh, any potential detriment.</td></tr>
<tr><td>Short Term</td><td>Medium Term</td><td>Long Term</td><td></td></tr>
<tr><td>–</td><td>–</td><td>0</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
</table>

SEA Topic	Assessment with Recommended SEA Mitigation				Description
	H2	Will it protect and, where possible, improve access to, or educational opportunity offered by, designated historic features?			There may be some benefit to access and education as a result of flood risk reduction or specific FRM schemes.
	Short Term		Medium Term	Long Term	
	0		0	0	
Material assets	M1	Will it reduce flood risk to essential infrastructure?			Benefit may be seen to material assets as flood risk is reduced in the Districts.
	Short Term		Medium Term	Long Term	
	+		++	++	

6.3 Effects of the Strategy and other plans / projects

The LFRMS will have to consider the implications on other plans and projects. These are outlined in Table 6.2, below, based on an update of the review undertaken during the scoping stage.

Title, Author, Publication Date	Influence of PPP on / Contribution to / Conflict with LFRMS	Influence of the LFRMS on / Contribution to / the Conflict with PPP
Water (General)		
The drought plans for the North West Region, 2012 Environment Agency Water Resource Management Plans United Utilities Drought Plan (draft) Dee Valley Water	These plans identify methods for dealing with droughts of different types and changing severity. They also include a system of monitoring and reporting to identify and track the onset, progress and recovery from drought. They relate to the supply of water resources and identifying deficit issues, and therefore link directly into the flood risk management strategy.	LFRMS measures may influence how droughts can be managed. It is important to note that although they both store water, water supply reservoirs and washlands are quite different. The effectiveness of a washland as a flood risk management asset can be reduced by trying to maximise its benefit to water supply (i.e. by prolonging inundation). However, there are secondary benefits of washlands to water supply which can be considered.
North West Region catchment abstraction management strategies (CAMS): - Derwent, West Cumbria and Duddon (April 2007) - Douglas (April 2003) - Eden and Esk (October 2007) - Kent (July 2007) - Leven and Crake (April 2003) - Lower Mersey and Alt (March 2008) - Lune (March 2004) - Ribble (including Crossens catchment) (June 2007) - Wyre (November 2006)	The CAMS details how the Environment Agency plans to manage water resources in the LCC area.	Measures generated for the LFRMS have the potential to have some impact on how and where water is abstracted, however this may very well not be an issue once the measures are developed further.
North West River Basin Management Plan (RBMP) 2009 Environment Agency	The RBMP implements the Water Framework Directive for the North West River Basin District, and so influences the development of the LFRMS. It reviews the current health of the water environment and sets out a plan for improvements.	LFRMS policy options and actions should align with the RBMP where possible and appropriate, and take into account the key actions for the Witham catchment.

Title, Author, Publication Date	Influence of PPP on / Contribution to / Conflict with LFRMS	Influence of the LFRMS on / Contribution to / the Conflict with PPP
The North West England and North Wales Shoreline Management Plan 2 (SMP2) (2011) - Southport Pier to Rossall Point - Rossall Point to Hodbarrow Point - Hodbarrow Point to St Bees Head Environment Agency	Sets out the risks associated with coastal processes in these areas and helps reduce these risks to people and the developed, historic and natural environments.	Measures generated for the LFRMS should consider the risks detailed in the SMPs and be consistent with the recommendations set out.
Water: Waste Water		
Waste Water National Policy Statement, 2012 Defra	Clearly sets out the need for wastewater projects and includes a robust set of policies for the Infrastructure Planning Commission (IPC) and successor bodies to use when considering applications for nationally significant projects.	Measures generated for the LFRMS should consider their effect on wastewater and also the location of any emerging wastewater projects in the study area. The potential cumulative effects of measures with proposed development should be considered.
Water: Flooding		
Floods Directive 2007/60/EC European Union	The Directive establishes a framework for assessing and managing flood risk aimed at reducing the adverse consequences for human health, the environment, cultural heritage and economic activity. This will compliment the LFRMS through the assessment and management of flood risk.	The LFRMS will compliment the requirements of the Floods Directive.
Flood and Water Management Act 2010 UK Government	The Act looks to make provision about water, including provision regarding the management of risks in connection with flooding and coastal erosion. This will therefore have a significant influence on how the strategy will deal with flood management in the study area. It states that the Environment Agency must develop, maintain, apply and monitor a strategy for flood and coastal erosion risk management in England.	The LFRMS will assist in ensuring that LCC deliver the requirements of the Act.
Regional Flood and Coastal Communities (England and Wales) Regulations 2011	These Regulations make provision for the procedure that must be followed when dividing England and Wales into regions under section 22(1)(a) of the Flood and Water	N/A

Title, Author, Publication Date	Influence of PPP on / Contribution to / Conflict with LFRMS	Influence of the LFRMS on / Contribution to / the Conflict with PPP
UK Government	Management Act 2010 (as above).	
Flood Risk Regulations 2009 UK Government	The Floods Directive is transposed into English Law by the Flood Risk Regulations. The Regulations require the development of preliminary assessment maps and reports, flood hazard maps and flood risk maps, with updates required every six years. It will be necessary to refer to these maps throughout the development of the LFRMS.	The resultant maps and reports arising from these Regulations should be considered throughout the development of the LFRMS.
Spatial Land Use Planning / Built Development		
National Planning Policy Framework (NPPF) UK Government	The NPPF is the new national planning policy addressing the Government's expectations mainly for Local Plans, but also for minerals and waste planning. It replaces former Planning Policy Statements (PPS) and Planning Policy Guidance (PPG), with only a few remaining in effect until further notice. The NPPF preserves the Sequential Test and the Exception Test of former PPS25 on flood risk. It will influence local planning, which may lead to changes to evolving local planning policy as outlined below. In particular, the NPPF includes core planning principles which include enhancing the natural environment, recognising the intrinsic character and beauty of the countryside, securing high-quality design and conserving heritage assets so that they can be enjoyed for their contribution to the quality of life of this and future generations. The NPPF requires the planning system to perform the role of 'improving biodiversity', including protection of what exists and creation of ecological networks to provide a net gain for biodiversity wherever possible. The NPPF continues to place an emphasis on the conservation of heritage assets, and any justifiable harm to heritage assets must be proven as per previous planning policy to deliver public benefits that outweigh that harm, or because the asset is demonstrably non-viable and it is better to free-up the site than keep the asset. LCC have a policy for the redevelopment of 22,200 additional homes and the newly established Enterprise	The LFRMS will support sustainable development, aim to minimise or resolve conflicts with plans, and maximise synergies.

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	Zone covering the BAE Systems sites at Samlesbury and Warton, this would need to be considered for the LFRMS, in terms of potential flood risk areas and measures.	
Communities		
Ambition Lancashire - Sustainable Community Strategy, 2008 Lancashire County Council	The aim of this strategy is to promote vibrant communities where people enjoy life, good health, become one of the healthiest and most sustainable economies in Europe, enable good connections between people, services, communities and places and provide rich diverse environments, heritage and cultures that residents and visitors enjoy. The strategy influences the LFRMS by helping to protect and enhance communities.	The LFRMS should consider how it can enhance communities close to proposed flood risk management measures.
Agriculture and Forestry		
Food 2030 (Government's sustainable food strategy), 2010 Defra	The long-term sustainability of our food system is the central concern for Food 2030. Of relevance is the aim to ensure a resilient, profitable and competitive food system and to increase food production sustainably. This helps to support farmers in helping them reach their environmental responsibilities. This can include more sustainable land management initiatives which may be an option for, and make a positive contribution to, the LFRMS.	Our LFRMS measures may lead to measures which involve temporary or permanent loss of agricultural land, however they may also increase flood risk protection of such land in other places. We will seek to minimise negative impacts to agricultural practice in exchange for meeting our wider objectives. Certain measures may be able to achieve positive impacts to agricultural land or practice.
Rural Development Programme for England, 2007 Defra	The programme aims to improve competitiveness in the agriculture and forestry sector; safeguard and enhance the rural environment; foster competitive and sustainable rural businesses and thriving rural communities. As above, this can include more sustainable land management initiatives which may be an option for, and make a positive contribution to, the LFRMS.	
Waste (incl. Hazardous Waste)		
Waste Infrastructure Delivery Programme, 2009 Defra	Established to support local authorities to accelerate investment in the large-scale infrastructure required to treat residual waste, without compromising efforts to minimise waste and increase recycling levels. The strategy may need to consider whether different forms of	Measures for flood risk management should consider the location of any proposed waste management facilities in the study area.

Title, Author, Publication Date	Influence of PPP on / Contribution to / Conflict with LFRMS	Influence of the LFRMS on / Contribution to / the Conflict with PPP
	waste management give rise to significant flood risk issues.	
The Joint Lancashire Minerals and Waste Development Framework (MWDF), 2007 Lancashire County Council	The Joint Lancashire Minerals and Waste Development Framework (MWDF) contains mineral and waste specific policies for use in determining planning applications for waste or quarry developments in Lancashire, including those areas administered by the Unitary Authorities of Blackburn with Darwen Borough Council and Blackpool Borough Council (the Joint Plan area).	Measures for flood risk management should consider the location of any proposed waste management facilities in the study area. The potential cumulative effects of measures with proposed development should be considered.
Transport		
Local Transport Plan for Lancashire (2012) Lancashire County Council	The Local Transport Plan for Lancashire presents their transport priorities for the next ten years. It sets out Lancashire's commitment to support the economy, to tackle deep-seated inequalities in people's life chances and to revitalise communities and provide safe high- quality neighbourhoods. New transport infrastructure projects may require flood risk management, which may link in with the LFRMS. They may also conflict with proposals of the LFRMS (e.g. proposing to use the same land).	As stated left, the LFRMS may consider measures which have synergies with transport projects. It may also need to consider policy or other 'soft' measures which help to guide development towards sustainable flood risk management. The potential cumulative effects of measures with proposed development should be considered.
Minerals		
The Joint Lancashire Minerals and Waste Development Framework (MWDF), 2007 Lancashire County Council	The Joint Lancashire Minerals and Waste Development Framework (MWDF) contains mineral and waste specific policies for use in determining planning applications for waste or quarry developments in Lancashire, including those areas administered by the Unitary Authorities of Blackburn with Darwen Borough Council and Blackpool Borough Council (the Joint Plan area).	The LFRMS may wish to seek synergies with the minerals industry in developing measures, and this could lead to aims to influence minerals planning. The potential cumulative effects of measures with proposed development should be considered.
Navigation / Recreation		
The Countryside and Rights of Way Act 2000 (the 'CROW Act 2000') UK Government	This Act introduced the so-called 'right to roam' which has been embodied in a land designation known as Open Access Land or Open Country. Many of these areas were already designated as Registered Common Land, however this additional provision emphasises their	The development of the LFRMS will take account of Open Access Land and the local PRoW network as potential constraints to flood risk management measures, seeking to preserve the integrity of such

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	importance as a recreational feature. They are areas which may be subject to flood risk, and should be taken into consideration. They also present a potential constraint to the construction of flood risk management measures. The Act also strengthens the management of the Public Right of Way (PRoW) network, and has led to certain new paths being created.	features. The LFRMS should seek to enhance recreational connectivity in the study area, including PRoWs and links into Open Access Land, where applicable to measures being considered and then inevitably pursued.
Biodiversity		
The Conservation of Habitats and Species Regulations 2010 (S.I. 2010 No. 490) (as amended) UK Government	Consolidates previous amended versions of The Conservation (Natural Habitats, &c.) Regulations 1994 and implements Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive). The Regulations address internationally designated sites, of which there are a large number in the study area. The Regulations also provide for the protection of 'European protected species', and the adaptation of planning and other controls for their protection. These Regulations must be abided by during the development and implementation of the LFRMS.	The development of the LFRMS will take account of the conservation of protected species, and involve regular review of the potential for indirect effects (e.g. downstream) on internationally protected sites.
Wildlife and Countryside Act 1981 (as amended) The Countryside and Rights of Way Act 2000 (the 'CROW Act 2000') UK Government	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 Council Directive 79/409/EEC on the Conservation of Wild Birds (Birds Directive) in Great Britain. The Act makes it an offence to intentionally kill, injure or take particular species that are protected under Schedules within the Act. It also provides for the notification and protection and management of Sites of Special Scientific Interest (SSSI). This Act must be abided by during the development and implementation of the LFRMS. The CROW Act 2000 made some changes regarding the Wildlife and Countryside Act. Of most significance, it	The LFRMS measures will need to respect the SSSIs in the study area and support the achievement of favourable condition status of SSSIs. The development of the LFRMS will take account of the conservation of protected species.

Title, Author, Publication Date	Influence of PPP on / Contribution to / Conflict with LFRMS	Influence of the LFRMS on / Contribution to / the Conflict with PPP
	increased penalties for infringement of the Act, introduced "wildlife inspectors" who have a range of powers under the Act, and extended offences of disturbing certain birds and animals to include reckless as well as intentional acts.	
The Natural Environment and Rural Communities (NERC) Act 2006 UK Government	This Act introduces lists of habitats and species which are of principal importance for the conservation of biodiversity in England. The lists (known as the Section 41, or S41, lists) include 56 habitats and 943 species. As we develop the LFRMS, we have an obligation to have regard to the conservation of these habitats and species of principalimportance.	LFRMS measures may be able to reduce the harm caused by flooding to S41 habitats and species. However, they may include 'hard engineered' structures which can have adverse effects on habitat and species. These and other measures may also involve habitat creation which benefits species. Measures may link in with the longer-term management of habitat, such as certain 'soft' measures relating to land management. We will seek net biodiversity gains as we develop our measures for the LFRMS.
UK Biodiversity Action Plan UK Government Lancashire Biodiversity Action Plan Lancashire Biodiversity Partnership	The Lancashire Biodiversity Action Plan (BAP) is made up of many individual species and habitat plans. Each plan gives information on the status and threats to the species or habitat. The most important section of the plan details the conservation action required and the organisations responsible. Local BAPs sets out individual action plans for particular species and habitats that reflect both local and national priorities for conservation in order to maintain and enhance the biodiversity of Lancashire. The species and habitats included in the LBAP have been afforded priority status in the UK Action Plan or are important in a Lancashire context.	LFRMS measures may include 'hard engineered' structures which can have adverse effects on habitat and species. However, these and other measures may also involve habitat creation which benefits species. Measures may link in with the longer-term management of habitat, such as certain 'soft' measures relating to land management. We will seek synergies with the LBAP as we develop our measures for the LFRMS, including seeking net biodiversity gains.
Lancashire Green Infrastructure Strategy, 2009	Green Infrastructure (GI) strategies plan for green links and spaces which interconnect and support communities and wildlife. Green Infrastructure should be able to contribute positively to flood risk management, but recreational features may also serve as a constraint to LFRMS measures which are considered (such as if they exist where we wish to allow morenatural flooding or construct	The LFRMS may consider measures which have direct synergies with GI provision, or which can link in with other initiatives to extend the GI network. Any negative effects on recreational features should be avoided, or if not possible, minimised and (where appropriate) compensated for. The potential cumulative effects of measures with proposed development should be considered, such as

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	something).	harmful levels of recreational pressure on nature conservation sites.
Natural Environment White Paper, 2011 'The Natural Choice: securing the value of nature' UK Government	The White Paper is a statement outlining the Government's vision for the natural environment. Changing and increasing pressures on our environment continue to cause degradation (which in turn has social and economic impacts) and managing these pressures is becoming more challenging. The White Paper provides new measures to tackle these challenges efficiently and effectively. It states the value of green infrastructure and healthy ecosystems at providing natural flood protection.	The LFRMS should consider measures which restore more natural ecological processes to the study area and create green infrastructure. It should consider the value that changing land use and management measures can provide, including urban green space and tree planting (if appropriate).

7. Monitoring and Next Steps

7.1 Recommended SEA monitoring measures

The SEA Regulations require that significant environmental effects resulting from the implementation of plans and programmes are monitored to identify at an early stage any unforeseen effects. Proposed monitoring is based on indicators. The monitoring proposals for the Strategy are presented below in Table 7.1.

It is suggested that progress against these indicators is reported in tandem with review of the Strategy. As a number of the actions/measures associated with the Strategy will occur during the next 1-3 years, this review would need to be undertaken on a yearly basis. As part of this, the environmental assessment of flood management measures at specific locations would be undertaken.

Table 7.1: Proposed SEA Monitoring for the LFRMS

SEA Guiding Questions / indicator)			Monitoring Recommendations Criteria (*Italic* = repeated
Biodiversity	B1	Will it protect and, where possible, enhance designated nature conservation sites and associated species, including habitat connectivity where applicable?	A number of LFRMS measures proposed in designated conservation sites (SSSIs, SPAs, BHS)s which lead to loss of vegetation / land clearance Net loss / gain in designated nature conservation sites habitat area through LFRMS measures
	B2	Will it protect and, where possible, create or enhance notable, non- designated (e.g. BAP) habitats and associated species, including habitat connectivity where applicable?	Extent and frequency of dredging % of LFRMS actions accompanied by Env. Action Plans, which include ecological issues No. flood events which reduce the extent of populations of priority species noted in the Lancashire BAP (e.g Water Vole, Otter, European Eel, Toad, West European Hedgehog, Barn Owl, Grass Snake, Bats, White-clawed Crayfish, Salmon, Trout and Lamprey) along ordinary watercourses
Local Community	LC1	Will it reduce the number of people residing in homes and commercial properties at risk of flooding?	*No. properties 'at risk' and not protected by recent flood risk management measures* No. surface water flooding events and no. properties affected No. flooding events from ordinary watercourses and no. properties affected No. flooding events from reservoirs and no. properties affected
	LC2	Will it reduce flood risk to communities in deprived areas?	*No. properties 'at risk' within 30% most deprived areas and not protected by recent flood risk management*
	LC3	Will it reduce disruption in access to facilities and services, such as that	No. local district councils still requiring additional flood risk management, including

SEA Guiding Questions / indicator)			Monitoring Recommendations Criteria (*Italic* = repeated
		caused by floods?	those that contain A Roads still requiring additional flood risk management
Recreation	RC1	Will it protect and, where possible, enhance open spaces which have designations, or improve them in terms of flood risk?	No. LFRMS measures proposed in recreational areas / green space Net loss / gain in recreational and amenity area through LFRMS measures No. flood events which reduce the use of recreational facilities near to ordinary watercourses
	RC2	Will it protect and, where possible, create or enhance recreational facilities, or reduce their levels of flood risk?	
Geology and Soils	GS1	Will it protect and, where possible, create or enhance sites valued for geodiversity?	Reported flood risk problems or benefits to RIGS or LGS
	GS2	Will it protect 'best and most versatile' soil?	Areas of ALC Grade 1, Grade 2 or Sub- Grade 3a soil lost to agricultural production as a result of LFRMS measures Area of agricultural soil benefiting from LFRMS measures (e.g. inundation likely to improve soil quality)
Water Environment	W1	Will it prevent the achievement of 'good status' or 'good potential' of a water body?	No. LFRMS measures which are flood defences / additional modification of water bodies No. and extent of flood storage schemes associated with habitat creation / restoration of natural floodplain No. and extent of watercourse 'naturalisation' measures Notices / complaints of poor function of storage or watercourse capacity increases – low / high flows *% of LFRMS actions accompanied by Env. Action Plans, which include water quality issues*
	W2	Does it either counteract or contribute to the delivery of the River Basin Management Plan?	
	W3	Will it protect and, where possible, improve water quality?	
Climatic Factors	CF1	Will it increase greenhouse gas emissions?	Estimates of carbon emissions per LFRMS measure and total emissions – carbon calculator
Landscape and Townscape	LT1	Will it protect and, where possible, enhance (including through significant and relevant flood risk reduction) landscapes and townscapes?	*No. LFRMS measures proposed in* designated nature conservation sites *which lead to loss of vegetation / land clearance* *Net loss / gain in* designated nature conservation sites *habitat area through LFRMS measures*

SEA Guiding Questions / indicator)			Monitoring Recommendations Criteria (*Italic* = repeated
Historic Environment	H1	Will it protect and, where possible, enhance (including through flood risk reduction) the integrity and setting of designated historic assets?	Adverse effects of LFRMS measures on Scheduled Monuments, Listed Buildings or Conservation Areas *% of LFRMS actions accompanied by Env. Action Plans, which include archaeology issues*
	H2	Will it protect and, where possible, improve access to, or educational opportunity offered by, designated historic features?	None.
Material assets	M1	Will it reduce flood risk to essential infrastructure?	*No. properties 'at risk' and not protected by recent flood risk management measures* No. local district councils still requiring additional flood risk management, including those that contain A Roads still requiring additional flood risk management

7.2 Consultation and next steps

This SEA Environmental Report will be consulted upon with the statutory consultees and the public (along with other stakeholder organisations) alongside the LFRMS. Consultation is an important part of developing the LFRMS and carrying out the assessment. Following this, all responses received will be collated and incorporated as appropriate into our decision-making for finalising the Strategy. The consultation on the Strategy is running concurrently, and stakeholders or the public can provide feedback on the Strategy as well as the Environmental Report.

After adoption of the Strategy, an SEA Statement must be produced in order to document how the SEA and consultation on the SEA has influenced its development. It will also set out the final monitoring commitments.

References

Flood Risk Regulations 2009 – Preliminary Flood Risk Assessment: Lancashire Area Preliminary Assessment Report, May 2011.

HMSO, 2004. Environmental Assessment of Plans and Programmes Regulations

Pitt, 2008. The Pitt Review - Learning Lessons from the 2007 floods. Sir Michael Pitt, Cabinet Office, 22 Whitehall, London, SW1A 2WH.

Figures

Appendix A - Detailed Baseline Information for the Flood Risk Areas

Introduction

Environmental baseline data has been gathered for each of the Districts. The initial ranking from the Preliminary Flood Risk Assessment (PFRA) has been based firstly on the number of residential properties, and secondarily on the number of non - residential properties, potentially at risk of surface water flooding.

It is important to note that the prioritisation of investigations, identifying schemes and addressing flood risk will not be purely based on the ranking of District areas. This is firstly because there may be simple and effective measures for addressing Districts lower down the ranking which can be funded and implemented quickly. Secondly, in certain areas, a flood risk management measure may be able to address flood risk in multiple Districts, and thus benefit more properties for less financial cost than in other, perhaps higher -ranking District areas.

Methodology

A GIS-based tool was used in order to identify the known environmental features currently within each local district boundary. As such, these features have been identified as potentially being harmed by surface water flooding, and thus potentially benefiting from flood risk management. This information is shown in Figures 2.2 and 2.3 and detailed below.

Area Ref.:	1	Area Nam e:	Lancaster
Topic		**Features**	
Biodiversity		*31 SSSIs; 3 SACs; 1 NNR; 3 SPAs; 2 Ramsar sites*	
Human Health		*61,010 residential properties, 17,201 non-residential properties*	*Properties at risk of flooding: 4609 residential; 1682 non-residential*
Recreation		*2 National Cycle Routes*	
Geology and Soils		*1 geologically important SSSI*	*Major aquifer covering a large area, upon which the majority of properties lie.*
Water Environment		*Groundwater body: Lune and Wyre carboniferous aquifers*	
Landscape and Townscape		*2 AONB*	*Landscape character areas – Coasts and Estuaries; Silverdale; Bowland and Pendle, Rural Valleys; Amounderness and Bowland Fringes.*
Historic Environment		*37 Scheduled Monuments,37 Conservation Areas*	
Material Assets		*M6 Motorway*	

Area Ref.:	2	Area Nam e:	Wyre
Topic		**Features**	
Biodiversity		*5 SSSIs; 1 Ramsar; 2 SPAs; 1 SAC*	
Human Health		*49,575 residential properties, 15,630 non-residential properties*	
Recreation		*2 National Cycle Routes*	
Geology and Soils		*1 Geologicaly important SSSI*	*Much of the area covers low lying land and has a presence of shallow sand and gravel aquifers.*
Water Environment		*Groundwater bodies: Fylde Permo-Triassic Sandstone aquifer;* *West Lancashire quaternary sand and gravel aquifer.*	
Landscape and Townscape		*1 AONB*	*Landscape character areas – Coasts and Estuaries; Bowland and Pendle; Amounderness and Bowland Fringes.*
Historic Environment		*6 Scheduled Monuments, 7 Conservation Areas*	

Area Ref.:	4	Area Nam e:	West Lancashire
Topic		**Features**	
Geology and Soils		*2 Geologicaly important SSSIs*	*Rufford aquifer covers a large area which is covered by a thin layer of clay.*
Water Environment		*Groundwater bodies: West Lancashire quaternary sand and gravel aquifer; Rufford Permo-Triassic sandstone aquifer*	
Landscape and Townscape		*Landscape Character Areas – Coasts and Estuaries; The Lancashire Plan and Leyland Hundred.*	
Historic Environment		*12 Scheduled Monuments, 28 Conservation Areas*	
Material Assets		*M58 Motorway*	

Area Ref.:	5	Area Nam e:	Blackpool
Topic		**Features**	
Biodiversity		*2 SSSI; 2 Ramsar sites; 1 SPA*	
Human Health		*68,593 residential properties, 12,246 non-residential properties*	
Recreation		*2 National Cycle Routes*	
Geology and Soils		*Much of the area covers low lying land and has a presence of shallow sand and gravel aquifers.*	
Water Environment		*Groundwater body: West Lancashire quaternary sand and gravel aquifer.*	
Landscape and Townscape		*Landscape Character Areas – Amounderness and Coasts and Estuaries.*	
Historic Environment		*2 Conservation Areas*	
Material Assets		*M55 Motorway*	

Area Ref.:	6	Area Nam e:	Fylde
Topic		**Features**	
Biodiversity		*6 SSSIs; 2 SPAs; 1 SAC; 1 NNR; 1 Ramsar*	

Area Ref.:	6	Area Nam e:	Fylde

Topic	Features
Human Health	*36,875 residential properties, 13,017 non-residential properties*
Recreation	*2 National Cycle Routes*
Geology and Soils	*Much of the area covers low lying land and has a presence of shallow sand and gravel aquifers.*
Water Environment	*Groundwater bodies:* *Fylde Permo-Triassic Sandstone aquifer;* *West Lancashire quaternary sand and gravel aquifer.*
Landscape and Townscape	*Landscape Character Areas – Amounderness and Coasts and Estuaries.*
Historic Environment	*10 Conservation Areas*
Material Assets	

Area Ref.:	7	Area Nam e:	Preston

Topic	Features	
Biodiversity	*1 SSSI*	
Human Health	*60,247 residential properties, 12,568 non-residential properties*	*Properties at risk of flooding: 3217 residential; 897 non-residential*
Recreation	*1 Strategic Recreational Area*	
Geology and Soils	*Areas of permeable bedrock at or near the land surface and some underlying aquifers, (both major and minor in terms of water resources).*	
Water Environment	*Groundwater body:* *Permo-Triassic Sandstone aquifer*	
Landscape and Townscape	*Landscape Character Areas – Amounderness; Rural Valleys and Bowland Fringes.*	
Historic Environment	*3 Scheduled Monuments, 11 Conservation Areas*	
Material Assets	*M6 Motorway;* *M55 Motorway;* *M65 Motorway*	

Area Ref.:	8	Area Nam e:	Chorley
Topic		**Features**	
Biodiversity		*3 SSSIs*	
Human Health		*46,344 residential properties, 12,495 non residential properties*	
Recreation		*1 National Cycle Route*	
Geology and Soils		*Rufford aquifer covers a large area which is covered by a thin layer of clay.*	
Water Environment		*Groundwater bodies: Rufford Permo-Triassic sandstone aquifer;* *Douglas Darwen and Calder carboniferous aquifers*	
Landscape and Townscape		*Landscape Character Areas – East Lancashire Valleys; The Lancashire Plan; Leyland Hundred and South and West Pennines.*	
Historic Environment		*10 Scheduled Monuments, 9 Conservation Areas*	
Material Assets		*M61 Motorway;* *M65 Motorway*	

Area Ref.:	9	Area Nam e:	South Ribble
Topic		**Features**	
Biodiversity		*3 SSSIs; 1 SPA; 1 Ramsar*	
Human Health		*47,573 residential properties, 10,165 non-residential properties*	*Properties at risk of flooding: 3935 residential; 927 non-residential*
Recreation			
Geology and Soils		*Rufford aquifer covers a large area which is covered by a thin layer of clay.*	
Water Environment		*Groundwater bodies: Rufford Permo-Triassic sandstone aquifer;* *Douglas Darwen and Calder carboniferous aquifers*	
Landscape and Townscape		*Landscape Character Areas – Rural Valleys; The Lancashire Plan and Leyland Hundred.*	
Historic Environment		*3 Scheduled Monuments,8 Conservation Areas*	
Material Assets		*N/A*	

Area Ref.:	10	Area Nam e:	Hyndburn

Topic	Features	
Biodiversity	*1 SSSI*	
Human Health	*36,599 residential properties, 6,049 non-residential properties*	*Properties at risk of flooding: 3885 residential; 889 non-residential*
Recreation		
Geology and Soils	*Areas of permeable bedrock at or near the land surface and some underlying aquifers, (both major and minor in terms of water resources).*	
Water Environment	*Groundwater body: Douglas Darwen and Calder carboniferous aquifers*	
Landscape and Townscape	*Landscape Character Areas – Rural Valleys and East Lancashire Valleys.*	
Historic Environment	*1 Scheduled Monument; 10 Conservation Areas*	
Material Assets	*M65 Motorway*	

Area Ref.:	11	Area Nam e:	Pendle

Topic	Features	
Biodiversity	*2 SSSIs; 1 SPA*	
Human Health	*39,802 residential properties, 8,310 non-residential properties*	
Recreation	*1 Strategic Recreational Area*	*National Cycle Routes*
Geology and Soils	*Areas of permeable bedrock at or near the land surface and some underlying aquifers, (both major and minor in terms of water resources).*	
Water Environment	*Groundwater body: Douglas Darwen and Calder carboniferous aquifers*	
Landscape and Townscape	*Landscape Character Areas – Bowland and Pendle; Rural Valleys; East Lancashire Valleys and South and West Pennines.*	
Historic Environment	*11 Scheduled Monuments; 26 Conservation Areas*	
Material Assets	*M65 Motorway*	

Area Ref.:	12	Area Nam e:	Burnley

Topic	Features	
Biodiversity	*1 SSSI; 1 SPA*	
Human Health	*40,073 residential properties, 6,623 non-residential properties*	*Properties at risk of flooding: 4058 residential; 934 non-residential*
Recreation	*2 National Cycle Routes*	
Geology and Soils	*Areas of permeable bedrock at or near the land surface and some underlying aquifers, (both major and minor in terms of water resources).*	
Water Environment	*Groundwater body: Douglas Darwen and Calder carboniferous aquifers*	
Landscape and Townscape	*Landscape Character Areas – East Lancashire Valleys and South and West Pennines.*	
Historic Environment	*24 Scheduled Monuments;10 Conservation Areas*	
Material Assets	*M65 Motorway*	

Area Ref.:	13	Area Nam e:	**Rossendale**

Topic	Features	
Biodiversity	*3 SSSIs, 1 SPA, 1 SAC*	
Human Health	*30,902 residential properties, 6,760 non-residential properties*	
Recreation	*1 Strategic Recreational Area*	*1 National Cycle Route*
Geology and Soils	*1 Geologicaly important SSSI*	*A large proportion of the area's geology and soils are relatively impermeable*
Water Environment	*Groundwater body: Northern Manchester Carboniferous aquifers*	
Landscape and Townscape	*Landscape Character Areas – East Lancashire Valleys and South and West Pennines.*	
Historic Environment	*2 Scheduled Monuments; 9 Conservation Areas,*	
Material Assets		

Appendix B - Review of Relevant Policy, Plans, Programmes and Strategies

Document	Objectives and Requirements Relevant to the LFRMS	Implications for the LFRMS and the SEA
INTERNATIONAL AND NATIONAL		
General Priorities for Planning and Development		
Åarhus Convention (1998), and amendment (2005) Strategic Plan for the Convention (2008) Riga Declaration (2008) Environmental Information Regulations (2004)	The UK Environmental Information Regulations transpose the European Åarhus Convention, which establishes a number of rights of the public (citizens and their associations) with regard to the environment. Public authorities (at national, regional or local level) are to contribute to allowing these rights to become effective. The Conventio n provides for: • The right of everyone to receive environmental information that is held by public authorities. This can include information on the state of the environment, but also on policies or measures taken, or on the state of human health and safety where this can be affected by the state of the environment. Public authorities are obliged, under the Convention, to actively disseminate environmental information in their possession; • The right to participate from an early stage in environmental decision-making. Arrangements are to be made by public authorities to enable citizens and environmental organisations to comment on, for example, proposals for projects affecting the environment, or plans and programmes relating to the environment; and • The right to challenge, in a court of law, public decisions that have been made without respecting the two aforementioned rights or environmental law in general. The Convention creates obligations in three fields or 'pillars': Public access to environmental information; • Public participation in decision-making on matters related to the environment: provision; and • Access to justice (i.e. administrative or judicial review proceedings) in environmental matters. • The Strategic Plan and Riga Convention highlight current challenges and reinforce the need to address them. It includes that public authorities take responsibility for both the quality and the level of public participation.	Public consultation and access to information supporting the decision-making process must be introduced in the procedures for the drawing up of the LFRMS in respect of matters covered by the legislation and Directives mentioned. The SEA Directive requires that public consultation is carried out on the draft LFRMS and its accompanying SEA. The quality and level of participation need to be appropriate to enable the public and stakeholders to actively take part in development of the LFRMS. The SEA reports should therefore maximise transparency and readability to reach the full range of stakeholders.
Equality Equality Act (2010) Disability Discrimination Amendment Act (2005) Race Relations Amendment Act (2000)	These pieces of legislation require public authorities to take a pro-active approach to eliminating discrimination in aspects of their work. Specifically, they must promote equality of opportunity, good relations between people of different racial groups, and positive attitudes towards disabled persons, while eliminating unlawful discrimination. The named legislation is underpinned by a range of equality- and diversity-related legislation, including the Human Rights Act, Race Relations Act and amendment, Disability Discrimination Act, Gender Recognition Act, Civil Partnerships Act, Employment Equality (Religion or Belief) Regulations and Employment Equality (Sexual Orientation) Regulations.	The LFRMS will be guided by an Equalities Impact Assessment, which will inform the SEA and assessments under the topic of 'population'. Issues relating to age, disability, gender, race, religion/belief and sexual orientation will be accounted for and addressed, where required.
Health Healthy lives, healthy people (White Paper) DoH, (2010) Tackling Health Inequalities: A Programme for Action – DoH, (2003) Tackling Health Inequalities: Status Report on the Programme for Action (2007)	Sets out the Government's intention to improve health and well-being and tackle inequalities. It highlights the need to put local communities at the heart of public health to develop their own ways of impro ving public health. The Programme for Action sets out plans to tackle health inequalities over the next three years. It establishes the foundations required to achieve the challenging national target for 2010 to reduce the gap in infant mortality across social groups, and raise life expectancy in the most disadvantaged areas faster than elsewhere. The status report focuses on the steps being taken to narrow the health gap and shows signs of progress against the heath inequalities target and the set of national cross government indicators.	The LFRMS will be guided by assessment of health effects under the SEA.
Sustainability The Johannesburg Declaration of	These documents affirm the principles of commitment to sustainable development. This includes the nations undertake to strengthen and improve governance at all levels, for the effective implementation of Agenda 21. The principal aim of	The LFRMS should support the sustainability aims of Agenda 21 at the local level, and will need to reflect the

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Sustainable Development (2002) Renewed EU Sustainable Development Strategy (2006) European Spatial Development Perspective (1999) Securing the Future: The Government's Sustainable Development Strategy, Defra (2005)	the EU Sustainable Development Strategy is to ensure environmental protection (including natural resources and quality of the environment, pollution, sustainable consumption and protection), social equity (healthy, just society) and cohesion and economic prosperity. The European Spatial Development Perspective (ESDP) established common objectives and concepts for sustainable development in the European Union. The ESDP aims to ensure that the three fundamental goals of European policy are achieved equally in all the regions of the EU: Economic and social cohesion; Conservation and management of natural resources and the cultural heritage; and More balanced competitiveness of the European territory. Fundamental to this is that European cultural landscapes, cities and towns, as well as a variety of natural and historic monuments are part of the European Heritage. Its fostering should be an important part of modern architecture, urban and landscape planning in all regions of the EU. A big challenge for spatial development policy is to contribute to sustainable development whilst reducing emissions into the global ecological system. The UK Sustainable Development Strategy has the new objectives of: Living within environmental limits; Ensuring a strong healthy and just society; Achieving a sustainable economy; Promoting good governance; and Using sound science responsibly. It considers the greatest threat to be our current and projected levels of greenhouse gas emissions. The objectives above are driven by environmental improvement, equality and inclusiveness, 'polluter pays' principle and incentives for natural resource efficiency, promoting participation and applying strong scientific evidence with accounting for uncertainty, public attitudes and public values.	principles of sustainable development. The SEA will, under various topics, consider potential impacts related to the themes identified. This will include the LFRMS's influence on the historic environment, including impacts upon townscape, historic structures and features. The SEA will also address impacts on the climate via greenhouse gases (including CO_2) emissions. The contribution of the LFRMS to the form and function of the rural and urban areas of the borough should be viewed positively and the plan's objectives should reflect this. The LFRMS should reflect as far as is appropriate the first three objectives of the UK Sustainable Development Strategy. All five objectives of the strategy are reflected in the general approach to the environmental assessment.
Objectives and Priorities for the Environment, Communities and Planning for Local Economies		
The Sixth Environment Action Programme of the European Community 2002-2012 Mid-term review of the Sixth Community Environment Action Programme (2007)	The latest Environment Action Programme gives a strategic direction to the Commission's environmental policy over the next decade, as the Community prepares to expand its boundaries. The new programme identifies Climate Change as one of the environmental areas to be tackled for improvements. Recognises that land use planning and management decisions in the Member States can have a major influence on the environment, leading to fragmentation of the countryside and pressures in urban areas and the coast. The objectives that are of relevance to the LRMS include stabilisation of greenhouse gases and halting biodiversity loss. In addition, under the EAP framework, a thematic strategy on soil protection has also been developed.	These action programmes have the potential to benefit the LFRMS by reducing the adverse impacts of climate change, which can heighten flood risk. The SEA should consider the effects of the LFRMS on all nature conservation, including designated sites and other natural habitats (e.g. impacts from the construction of flood risk management assets). The SEA will recommend mitigation for any negative nature conservation impacts, considering first avoidance of impacts, and then minimisation and compensation where they cannot be avoided. Mitigation should be proactive through site selection, alternatives and timing. Under the SEA, opportunities to benefit nature conservation and biodiversity will be sought. The development of the LFRMS will take account of the conservation of protected species, and involve regular review of the potential for indirect effects (e.g. downstream) on internationally protected sites.
Climate Change United Nations Framework Convention on Climate Change, (1992 – came into force 1994)	These documents aim to mitigate the impacts of climate change, and to achieve stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. This is in order to protect the climate system for the benefit of the present and future generations by taking precautionary measures to anticipate, prevent or minimise the causes of climate change.	The impact of likely climate change on all types of infrastructure (e.g. future drainage requirements) should be considered. The SEA will consider the effect of the LFRMS on

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Kyoto Protocol (1997) Climate Change Act (2008) Climate Change: the UK Programme (2006) The UK Low Carbon Transition Plan: National strategy for climate and energy (2009)	Under the Kyoto Protocol, 38 Countries (plus the EU) have committed to individual, legally binding targets to limit or reduce their greenhouse gas emissions. These add up to a total cut in greenhouse gas emissions of at least 5% from 1990 levels in the commitment period 2008-2012. The UK has committed to an 8% reduction (base year = 1990). The Climate Change Act aims to achieve the 5% Kyoto target, setting out a legally binding framework for the UK to c ut carbon emissions. It also paves the way for the UK to adapt to climate change. The Act requires that a Climate Change Risk Assessment (CCRA) be carried out for the UK every 5 years, and that a 5 -yearly adaptation programme be put in place to address the most significant climate change issues. Public bodies including Local Authorities and other statutory bodies such as water and utilities companies are required to report on how they have assessed the risk of climate change to their work and how these risks will be managed. The Act aims to embed climate change adaptation into core planning processes. The Climate Change Programme emphasises the contribution that LPAs can make to reducing transport -related emissions of greenhouse gases, intending to cut the UK's greenhouse gases by 23% below 1990 levels by 2010. The national strategy sets out ambitious targets to reduce harmful carbon emissions over the next 50 years, with major increases in renewable energy and energy efficiency. The UK Low Carbon Transition Plan sets out how the UK will meet a 34% cut in emissions on 1990 levels (or an 18% cut on 2008 levels) by 2020 to deliver the UK's legally binding target to cut emissions by at least 80% by 2050. It will do this through a set of five-year "carbon budgets" to 2022 to keep the UK on track.	emissions.
Conservation and Biodiversity Convention on Biodiversity (1992) EC Directive on the Conservation of Wild Birds 09/147/EC (2009) EC Directive on the Conservation of Natural Habitats of Wild Fauna and Flora 92/43/EEC (1992) Amended Wildlife and Countryside Act (1981) The Conservation of Habitats and Species Regulations (2010) UK Post-2010 Biodiversity Framework, JNCC and DEFRA (July 2012) 'Working with the Grain of Nature': A Biodiversity Strategy for England (2002)	The convention requires development of strategies plans and programmes for conservation and sustainable use of biological diversity. This legislation aims to protect biodiversity - the variety of life - through the conservation of natural habitats and wild plants and animals. They create a network of 'Natura 2000' sites which include Special Areas of Conservation (SA / IIACs) and Special Protection Areas (SPAs), which, on land, are already Sites of Special Scientific Interest (SSSIs), and also aims to protect all SSSIs. The Habitats Regulations are the UK legislation transposing The Birds Directive and Habitats Directive into UK law. The Habitats Regulations also include for the protection of priority habitats and species, and SSSIs as above. Member States have the duty to sustain populations of naturally occurring wild birds by sustaining areas of habitats in order to maintain populations at ecologically and scientifically sound levels. This applies to birds, their nests and habitats. They also have a duty to maintain or restore in a favourable condition d esignated natural habitat types and habitats of designated species listed in Annexes I and II respectively of the Habitats Directive. If a project compromising one of these habitats must proceed in spite of negative conservation impacts due to it being in the public interest, compensatory measures must be provided for. Linear structures such as rivers/streams, hedgerows, field boundaries, ponds, etc., that enable movement and migration of species should be preserved. The UK Post-2010 Biodiversity Framework replaces the UK Biodiversity Action Plan (1992). The purpose of the Framework is to set a broad enabling structure for action across the UK between now and 2020. The vision for the CBD's Strategic Plan for Biodiversity 2011-2020 is: 'By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people'. The Strategy seeks to ensure biodiversity considerations become embedded in all main sectors of public policy and sets out a programme for the next five years to make the changes necessary to conserve, enhance and work with the grain of nature and ecosystems rather than against them. The Strategy aims to ensure biodiversity considerations are embedded in all main sectors of economic activity. (It is the principal means by which the Government will comply with duties under section 74 of the CRoW Act – see below).	The SEA should consider the effects of the LFRMS on all nature conservation, including designated sites and other natural habitats. Habitats Regulations Assessment (HRA) screening will be conducted in order to ensure that European sites are not affected. The SEA will recommend mitigation for any negative nature conservation impacts, considering first avoidance of impacts, and then minimisation and compensation where they cannot be avoided. Mitigation should be proactive through site selection, alternatives and timing. Under the SEA, opportunities to benefit nature conservation and biodiversity will be sought. The LFRMS and SEA should consider biodiversity impacts. The SEA should take a holistic view of ecosystems rather than focusing on 'islands' of protected species. The strategy should be consistent with the objectives of national conservation strategies and their local implementation mechanisms - e.g. the UK, Lancashire Biodiversity Action Plan.
Water The Water Framework Directive 2000/60/EC - 'The WFD'	The Water Framework Directive expands the scope of water protection to all waters, surface waters and groundwater, and aims to achieve 'good' status or potential for all waters by 2015, or under certain provisions, 2021 or 2025. The Water Act is national legislation which transposes the Water Framework Directive, and the River Basin Management Plan (RBMP) for the Humber River Basin District implements this at a regional level – see regional documents below.	The SEA should address the protection and improvement of water resources – for more specific implications; refer to the relevant RBMPs under 'Regional' below.

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Floods Directive 2007/60/EC, European Union Flood and Water Management Act 2010, UK Government Flood Risk Regulations 2009, UK Government Water Act (2003) Making Space for Water: Taking Forward a Government Strategy for Flood and Coastal Erosion Risk Management in England. First Government Response, DEFRA (2005) UK Water Strategy – Future Water (2008) Water for people and the environment: Water Resources Strategy for England and Wales (2009) Directing The Flow – A new approach to integrated water resources management EC, (2006) A Framework for River Basin Planning in England and Wales - Summary: Water for Life and Livelihoods, EA (2006) Waste Water National Policy Statement DEFRA (2012) Defra	The objectives of the directive are: Reduce pollution, prevent deterioration and improve health of aquatic ecosystems; Promote the sustainable use of water; and Help reduce the effects of floods and drought. The UK Water Strategy takes the principles of Making Space for Water to ensure a fully integrated approach to flood risk and water management to 2030. A key intention is to arrive at an improved and protected water envir onment and to deliver more sustainable management of surface water. This strategic document has various aims, including pollution limits and improvements in water quality standards. The strategy is the current thinking on how to implement key parts of the Water Framework Directive. Objectives of the Strategy are: Create a more integrated, long-term approach to river basin planning and management. Work closely with partners and provide increased opportunity for stakeholder involvement. Aim to achieve environmental, social and economic benefits concurrently. The Water Resources Strategy includes various actions to plan for sustainable, reliable water supplies for people and businesses, whilst also protecting the environment. Some of the key actions relevant to spatial planning are: Strengthen the link between energy, waste and wastewater in all sectors of abstraction; Require sustainable drainage schemes to be incorporated into new developments in England; Restore wetlands to help rare and threatened habitats and species and to preserve wetland archaeology, subject to water availability; support housing and associated development where it can be proved that the environment can cope with the additional demands placed on it; and encourage efficient use of water in homes and buildings;	The LFRMS should address climate change and water. It should not lead to a worsening – and where possible should lead to an improvement – in conditions in the water environment. The SEA will address the potential for the LFRMS to improve surface runoff quality. LFRMS policy options and actions should align with the RBMP, where possible and appropriate, and take into account the key actions for the North West River Basin District. Measures generated for the LFRMS should consider their effect on wastewater and also the location of any emerging wastewater projects in the study area. The LFRMS will compliment the requirements of the Floods Directive. The LFRMS will assist in ensuring that LCC and BBC deliver the requirements of the Flood and Water Management Act.
Soil EU Thematic Strategy for Soil Protection Safeguarding Our Soils - A Strategy for England (2009)	The EU Soil Strategy is a precursor to the development of a Soil Framework Directive to protect and ensure the sustainable use of soil. It aims to prevent further soil degradation and restoring degra ded soils in line with its current and intended use. The England Soil Strategy sets out a vision to improve the management of soil and tackle soil degradation within 20 years as part of maintaining sustainable food supplies and developing resilience to c limate change. The focus is on four main themes: the sustainable use of agricultural soils; the role of soils in mitigating and adapting to climate change; protecting soil functions during construction and development; and preventing pollution and dealing with historic contamination. It sets out the practical steps to prevent further degradation of soils. It places increased value on soils in urban areas during development and requires that construction practices maintain vital soil functions, prevent soi l pollution and that historical soils contamination issues are addressed.	The LFRMS should consider the need to conserve soil resources and improve the quality of soils. The SEA should consider the likely significant effects of the LFRMS on soil resources and quality, and aim to minimise negative effects.

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Agriculture and Forestry Food 2030 (Government's sustainable food strategy), Defra (2010) Rural Development Programme for England, Defra (2007)	The long-term sustainability of our food system is the central concern for Food 2030. Of relevance is the aim to ensure a resilient, profitable and competitive food system and to increase food production sustainably. This helps to support farmers in helping them reach their environmental responsibilities. This can include more sustainable land management initiatives which may be an option for, and make a positive contribution to, the LFRMS. The programme aims to improve competitiveness in the agriculture and forestry sector; safeguard and enhance the rural environment; foster competitive and sustainable rural businesses and thriving rural communities. As above, this can include more sustainable land management initiatives which may be an option for, and make a positive contribution to, the LFRMS.	The LFRMS may lead to measures which involve temporary or permanent loss of agricultural land; however, they may also increase flood risk protection of such land in other places. The LFRMS will seek to minimise negative impacts to agricultural practice in exchange for meeting wider objectives. Certain measures may be able to achieve positive impacts to agricultural land or practice.
Cultural Heritage The Convention for the Protection of the Architectural Heritage of Europe (Granada Convention) The European Convention on the Protection of Archaeological Heritage (Valetta Convention) Ancient Monuments and Archaeological Areas Act (1979) Planning (Listed Buildings and Conservation Areas) Act (1990)	The Conventions and this key historic environment legislation (amongst other less key legislation) sets out a framework for the protection of assets of national value, as well as archaeological assets generally. It includes for the protection o f Scheduled Monuments, Conservation Areas, Registered Parks and Gardens and Listed Buildings. The legislation directs that planning applications which may have potential effect upon their integrity or their historic setting must be referred to the statutory body for the historic environment, English Heritage.	The LFRMS should seek to protect historic environmental features. The SEA should consider and address the potential significant effects of the LFRMS upon the historic environment, offering the highest protection to nationally designated or significant features. The LFRMS could influence the historic environment in several ways, including impacts upon townscape, historic structures and other historic features. The potential contribution of the LFRMS to the historic environment should be taken into account, and the SEA should seek to identify opportunities for improvement.
Noise Environmental Noise Directive – 2002/49/EC (2002) The Environmental Noise (England) (Amendment) Regulations (2010)	The EU Noise Directive is implemented in the UK by the Environmental Noise Regulations. Amongst their provisions, they require the production of noise mapping to determine exposure to environmental noise, and the adoption of noise action plans which should respond to the identification of noise issues and effects, managing and r educing them where necessary.	The implementation of any measures proposed by the LFRMS should be undertaken using best practice construction and/or mitigation methods, where relevant.
Air Quality Air Quality Framework Directive 2008/50/EC (2008) Air Quality Strategy for the UK (2007)	This Directive involves the merging of most of existing legislation into a single directive (except for the fourth daughter directive) with no change to existing air quality objectives. The Directive seeks to define and e stablish objectives for ambient air quality to avoid, reduce or prevent harmful effects on human health and the environment as a whole The strategy sets out the framework for planning for addressing air quality issues and establishes the standards and objectives to be achieved. These include those for particulates (PM10 and PM2.5), nitrogen dioxide / nitrogen oxides, ozone, sulphur dioxide, polycyclic aromatic hydrocarbons, benzene, 1,3- butadiene, carbon monoxide and lead.	The implementation of any measures proposed by the LFRMS should be undertaken using best practice construction and/or mitigation methods, where relevant.
Waste Waste Framework Directive (2008/98/EC) and daughter directives e.g. Landfill Directive (1999/31/EC) Waste Strategy for England (2007)	Waste production should be minimised through the promotion of clean technology and reusable or recyclable products. Where the possible secondary raw materials should be recovered from waste by recycling, reuse and reclamation or any other process, as well as used to produce energy. Waste should be managed with minimal environmental impact. This directive sets the basic concepts and definitions related to waste management and lays down waste management principles such as the "polluter pays principle" or the "waste hierarchy". The Waste Strategy describes a vision for managing waste and resources better and sets out changes needed to deliver more sustainable development.	Proposals resulting from the LFRMS should seek to promote minimal use of new materials, reuse of materials, and use of recycled materials, where possible. The SEA can help to identify any potential effects on waste resulting from new development.
Landscape and Rural Issues European Landscape Convention (Florence Convention)	The European Landscape Convention defines landscape as: "An area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors." (Council of Europe 2000). As summarised by Natural England (2013), "it highlights the importance of developing landscape policies dedicated to the protection, management and creation of landscapes, and establishing procedures for the general public and other	The LFRMS and SEA should be informed by A Landscape Strategy for Lancashire - Landscape Character Assessment and consider access to recreation, human health and well-being, population, and townscape. The development of the LFRMS will take account of the

	stakeholders to participate in policy creation and implementation." Application of the existing National Character Area map of England and of local authority-level Landscape Character Assessment to inform policy-making are substantial components of implementing this Convention. The Act addresses the designations of Areas of Outstanding Natural Beauty (AONBs), Sites of Special Scientific Interest (SSSIs), Open Country and Common Land. It also adds provisions to the consideration and management of the Public Right of Way (PRoW) network.	local PRoW network as a potential constraint to flood risk management measures, seeking to preserve the integrity of such features. The LFRMS should seek to enhance recreational connectivity in the study area, including PRoWs, where this is applicable to the measures being considered.
Countryside and Rights of Way Act 2000 (CRoW)		
Transport The Future of Transport: A Network for 2030' (White Paper), DfT (2004) Delivering a Sustainable Transport System (the UK transport strategy) (2008) Britain's Transport Infrastructure Motorways and Major Trunk Roads (2009)	The strategy recognises the need for a transport network that can meet the challenges of a growing economy and the increasing demand for travel but can also achieve the Government's environmental objectives. It is a long-term strategy for a modern, efficient and sustainable transport system backed up by sustained high levels of investment over the next 15 years. The strategy builds on the progress that has already been made since th e implementation of the 10 Year Plan for transport. It is based around three central themes: • Sustained investment; • Improvements in transport management; and • Planning ahead. The UK transport strategy set out the transport shared priorities, which are: • supporting economic growth; • reducing carbon emissions; • promoting equality of opportunity; • contributing to better safety, security and health; and • improving quality of life and a healthy natural environment.	The LFRMS should take the themes of the documents into account and aim to protect current transport infrastructure and future transport investment from the negative impacts of flood risk. The SEA should consider the need to protect important infrastructure under 'material assets', and accessibility issues under other community-based topics.
Energy Energy White Paper, Meeting the Energy Challenge DTI (2007) Energy Act, DECC 2010	The white paper sets out the international and domestic energy in the shape of 4 strategic goals: • Aiming to cut CO_2 emissions by 60% by about 2050, with real progress by2020; • Maintaining the reliability of energy supplies; • Promoting competitive markets in the UK and beyond; and • Ensuring every home is heated adequately and affordably. The Act includes provisions on: • Introducing a new Carbon capture and storage incentive; • Tackling fuel poverty by lowering the energy bills of the most vulnerable consumers; • Clarifying Ofgem's Remit; and • Tackling market power exploitation.	The LFRMS and SEA should consider ways in which CO_2 emissions could be minimised during the improvement of flood risk management in the area.
National Planning Policy and Key Guidance		
National Planning Policy Framework (NPPF), DCLG 2012	On the 27th March 2012 national planning guidance in the form of topic based PPGs and PPSs was superseded by the NPPF. The NPPF is a based on a presumption in favour of sustainable development. The NPPF states that all plans should be based upon and reflect the presumption in favour of sustainable development, with clear policies that will guide how the presumption should be applied locally. The following principles outlined in the NPPF, taken as a whole, constitute the Government's view of what sustainable development in England means in practice for the planning system: • Building a strong and competitive economy • Ensuring the vitality of town centres • Supporting a prosperous rural economy • Promoting sustainable transport • Supporting high-quality communications infrastructure	The LFRMS should be linked to the emerging Local Plan in terms of guiding development to the most appropriate locations and maximising the environmental, social and economic benefits. The SEA will assist in informing the implementation of the Local Plan, and recommending appropriate mitigation for potential new development. The LFRMS should consider the impacts of flood risk on Lancashire's rural communities. The SEA and EqIA can assess how effective the LFRMS is being with raising the quality of life and environment in rural areas and put forward recommendations where appropriate. The LFRMS and SEA should seek to address flood risk which harms community facilities or the accessibility of

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	Delivering a wide choice of high-quality homes • Requiring good design • Promoting healthy communities • Protecting Green Belt land • Meeting the challenge of climate change, flooding and coastal change • Conserving and enhancing the natural environment • Conserving and enhancing the historic environment • Facilitating the sustainable use of minerals Each of the NPPF's sustainability principles shown above is accompanied by a description within the NPPF report. The key points from this description are outlined below. These are shown under the SEA issues t o which they are most relevant. <u>Population and Equality, Accessibility and Community Facilities</u> • ensure that established shops, facilities and services are able to develop and modernise in a way that is sustainable; <u>Health and Well-being</u> • facilitate social interaction and create healthy, inclusive communities; • provide access to high-quality open spaces and opportunities for sport and recreation; • protect and enhance public rights of way and access and seek opportunities to pr ovide better facilities for users; • allow local communities to identify special protection green areas of particular importance to them and designate these as Local Greenspace; • ensure that noise does not give rise to significant adverse impacts on health an d quality of life as a result of new development. <u>Economy and Employment</u> • encourage sustainable economic growth; • identify priority areas for economic regeneration, infrastructure provision and environmental enhancement; • support economic growth in rural areas in order to create jobs and prosperity by taking a positive approach to sustainable new development. <u>Biodiversity</u> • contribute to the Government's commitment to halt the overall decline in biodiversity; • establish coherent ecological networks that are more resilient to current and future pressures; • contribute to and enhance the natural and local environment; • recognise the wider benefits of ecosystem services; • minimise impacts on biodiversity and providing net gains where possible; and • create, protect, enhance and manage networks of biodiversity and green infrastructure. <u>Air Quality, Water Resources and Soil and Geology</u> • prevent both new and existing development from contributing to, being put at unacceptable risk from or being adversely affected by unacceptable levels of air, water and soil pollution or land instability; • compliance with and contribution towards EU limit values or national objectives for pollutants; • account for the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas; • ensure new developments in Air Quality Management Areas are consistent with the local air quality action plan; • protect and enhance valued geological conservation interests and soils; • remediate and mitigate despoiled, degraded, derelict, contaminated and unstable land, where appropriate;	community facilities by walking, cycling and public transport. The LFRMS should consider flood risk to economic development and access to employment. The LFRMS and SEA should seek to protect and safeguard disused railways and other, more sustainable transport infrastructure. The LFRMS should support the general intentions of the NPPF with respect to reducing emissions of greenhouse gases from new development and associated transport. The LFRMS needs to primarily avoid, and secondly minimise, adverse impacts on the natural environment, and wherever possible, consider ways in which greenspaces and habitat improvements can be made alongside flood risk management. The SEA should consider the potential for significant impacts on the conservation and also enhancement of the natural environment. The LFRMS and SEA should consider the potential impacts of pollution both when combined with flood risk and flood waters, and in terms of construction projects. The LFRMS should not lead to a worsening – and where possible should lead to an improvement – in conditions in the water environment. The SEA will address the potential for the LFRMS to improve surface runoff quality. The SEA can consider how the LFRMS prioritises flood risk management within communities, delivering the greatest environmental, social and economic benefits. The LFRMS and SEA should seek to prevent the sterilisation of mineral resources. The historic environment can be affected by changing land uses in a number of ways, including inappropriate development, vibration/noise impacts, and visual intrusion. The LFRMS should consider the likelihood of such impacts, including the impact of new development on the existing streetscape. The SEA should identify any significant effects on the historic environment, avoid and/or minimise these and seek opportunities to redress existing problems. All development has the potential to harm the integrity and setting/context of buried archaeology. The LFRMS and SEA should take account of preserving archaeological heritage as far as feasible, given the limitations of SEA-level archaeological data. Data gaps and precautions should be identified.

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	and • distinguish between the hierarchy of international, national and locally designated geological sites. <u>Flood Risk</u> • Direct development away from areas at highest risk, but where development is necessary, make it safe without increasing flood risk elsewhere; • develop policies to manage flood risk from all sources. <u>Waste and Mineral Resources</u> • Ensure make best use of minerals to secure their long-term conservation; • account of the contribution that substitute or secondary and recycled materials and minerals waste would make to the supply of materials; • define Minerals Safeguarding Areas and adopt appropriate policies; and • set out policies to encourage the prior extraction of minerals, where practicable and environmentally feasible, if it is necessary for non-mineral development to take place. <u>Landscape and Townscape</u> • achieve high-quality and inclusive design for all development; • respond to local character and history, and reflect the identity of local surroundings and materials, while not preventing or discouraging appropriate innovation; • ensure development is visually attractive through good architecture and appropriate landscaping; • ensure that adverse impacts are addressed satisfactorily, including cumulative landscape and visual impacts; • conserve and enhance the natural and historic environment, including landscape; <u>Historic Environment</u> • conserve the historic environment, including heritage assets most at risk through neglect, decay or other threats; • recognise that heritage assets are an irreplaceable resource and conserve them in a manner appropriate to their significance; • recognise opportunities to draw on the contribution made by the historic environment to the character of a place; • sustain and enhance heritage assets and put them to viable uses consistent with their conservation, where practical; • identify land where development would be inappropriate because of its historic significance; • identify a clear strategy for enhancing the natural, built and historic environment. and • subject non-designated heritage assets of archaeological interest that are demonstrably of equivalent significance to scheduled monuments to the policies for designated heritage. The NPPF also states that 'where a site on which development is proposed includes or has the potential to include heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation.'	
Technical Guidance to the National Planning Policy Framework, DCLG 2012	The Technical Guidance to the NPPF provides additional guidance to ensure the effective implementation of the planning policy set out in the NPPF on development in areas at risk of flooding. This guidance reta ins key elements of Planning Policy Statement 25, which is considered necessary and helpful in relation to this policy area. The retention of this guidance is an interim measure pending a wider review of guidance to support planning policy. The guidance suggests that local planning authorities should steer new development to areas with the lowest probability of flooding (i.e. flood zone 1). Where there are no reasonably available sites in Flood Zone 1, local planning authorities should take into account the flood risk vulnerability of land uses and consider reasonably available sites in Flood Zone 2, applying the Exception Test if required. Only where there are no reasonably available sites in Flood Zones 1 or 2 should the suitability of sites in Flood Zone 3 be considered, taking into account the flood risk vulnerability of land uses and applying the Exception Test if required.	The LFRMS should direct development away from areas of flood risk. The SEA can consider how the LFRMS can reduce the threat of flooding to communities, delivering the greatest environmental, social and economic benefits.

Document	Objectives and Requirements Relevant to the LFRMS	Implications for the LFRMS and the SEA
PPS10: Planning for Sustainable Waste Management, DCLG (2005)	PPS10 is still in effect until the new National Waste Strategy and an annex to the NPPF to replace PPS10 are prepared and adopted. PPS10 principally aims to drive waste management up the waste hierarchy, addressing waste as a resource and looking to disposal as the last option, but one which must be adequately catered for. It requires that planning authorities consider the capacity of existing and potential transportation infrastructure to support the sustainable movement of waste and products arising from resource recovery and to use where practicable, other transport modes than roads .	The LFRMS should consider the impact new infrastructure may have on surface water flood risk.
Good Practice Guidance Strategic Housing Land Availability Assessment, DCLG (2007)	One of the key priorities for the Government is to ensure that land availability is not a constraint on the delivery of more homes. The guidance requires local authorities to: • identify specific, deliverable sites for the first 5 years of a plan that are ready for development; • identify specific, developable sites for years 6 -10; • indicate broad locations for future growth; and • not include an allowance for windfall sites in the first 10 years of the plan.	The LFRMS should consider the impact new housing development may have on surface water flood risk.
REGIONAL (Lancashire)		
River Basin Management Plan (RBMP) North West River Basin District (2009)	Sets out actions to address issues facing the water environment in the North West River Basin District. The plan describes the river basin district, and the pressures that the water environment faces. It shows what this means for the current state of the water environment, and what actions will be taken to address the pressures. It sets out what improvements are possible by 2015 and how the actions will make a difference to the local environment – the catchments, the estuaries and coasts, and the groundwater. The RBMP suggests that by implementing the RBMP the Environment Agency will work with partners to improve water bodies through promoting habitat creation schemes for both flood risk and biodiversity purposes which will result in environmental improvements.	The LFRMS needs to take into account any effects that new flood risk management assets may have on the surrounding water environment and aim to ensure that no adverse effects on water quality will occur. The SEA will assess the potential effects of the LFRMS on Lancashire's waterways and suggest mitigation or enhancements where appropriate. The SEA should consider how flood risk management can lead to environmental improvements. LFRMS policy options and actions should align with the RBMP where possible and appropriate, and take into account the key actions for the North West River Basin District.
Lancashire Biodiversity Action Plan Lancashire Biodiversity Partnership	The Lancashire Biodiversity Action Plan (BAP) is made up of many individual species and habitat plans. Each plan gives information on the status and threats to the species or habitat. The most important section of the plan details the conservation action required and the organisations responsible. Local BAPs sets out individual action plans for particular species and habitats that reflect both local and national priorities for conservation in order to maintain and enhance the biodiversity of Lancashire. The species and habitats included in the LBAP have been afforded priority status in the UK Action Plan or are important in a Lancashire context.	LFRMS measures may include 'hard engineered' structures which can have adverse effects on habitat and species. However, these and other measures may also involve habitat creation which benefits species. Measures may link in with the longer-term management of habitat, such as certain 'soft' measures relating to land management. We will seek synergies with the LBAP as we develop our measures for the LFRMS, including seeking net biodiversity gains.
Lancashire Green Infrastructure Strategy, 2009	Green Infrastructure (GI) strategies plan for green links and spaces which interconnect and support communities and wildlife. Green Infrastructure should be able to contribute positively to flood risk management, but recreational features may also serve as a constraint to LFRMS measures which are considered (such as if they exist where we wish to allow more natural flooding or construct something).	The LFRMS may consider measures which have direct synergies with GI provision, or which can link in with other initiatives to extend the GI network. Any negative effects on recreational features should be avoided, or if not possible, minimised and (where appropriate) compensated for. The potential cumulative effects of measures with proposed development should be considered, such as harmful levels of recreational pressure on nature conservation sites.
The Joint Lancashire Minerals and Waste Development Framework (MWDF), 2007	The Joint Lancashire Minerals and Waste Development Framework (MWDF) contains mineral and waste specific policies for use in determining planning applications for waste or quarry developments in Lancashire, including those areas administered by the Unitary Authorities of Blackburn with Darwen Borough Council and Blackpool Borough Council (the Joint Plan area).	The LFRMS may wish to seek synergies with the minerals industry in developing measures, and this could lead to aims to influence minerals planning. The potential cumulative effects of measures with

Document	Objectives and Requirements Relevant to the LFRMS	Implications for the LFRMS and the SEA
Lancashire County Council		proposed development should be considered.
Local Transport Plan for Lancashire (2012) Lancashire County Council	The Local Transport Plan for Lancashire presents their transport priorities for the next ten y ears. It sets out Lancashire's commitment to support the economy, to tackle deep-seated inequalities in people's life chances and to revitalise communities and provide safe high-quality neighbourhoods. New transport infrastructure projects may require floo d risk management, which may link in with the LFRMS. They may also conflict with proposals of the LFRMS (e.g. proposing to use the same land).	As stated left, the LFRMS may consider measures which have synergies with transport projects. It may also need to consider policy or other 'soft' measures which help to guide development towards sustainable flood risk management. The potential cumulative effects of measures with proposed development should be considered.

Appendix C - Assessment of Generic FRM Measures

Inspection and Maintenance						
Potentially Relevant Baseline Features within Lancashire & Blackpool	**Potential Significant Adverse Effect(s)**		**Pre-Existing Mitigation / Requirements**	**Recommended Mitigation**		**Potential Opportunities / Benefits**
Biodiversity						
Sites of Special Scientific Interest (SSSI)	–	Hydrological changes - e.g. Improving flow of water downstream could lead indirectly to erosion of riverbanks or deposition of sediment in or near designated sites, which in turn can harm habitat. May also accelerate the spread of invasive species, if present.	1. Legislative protection - Natural England intervention is possible to help protect SSSI condition.	1. Ecological assessment 2. Invasive species survey prior to works 3. Training for inspectors 4. Environmental Action / Management Plan for works informed by the assessment	++	Increased protection from damage by extreme flooding
			Residual effect with mitigation:			
Special Areas of Conservation (SAC) Special Protection Areas (SPA) Ramsar sites - wetlands of international importance National Nature Reserve (NNR)			0	Can minimise effects and reduce to negligible.	+	Invasive species removal and reduction
Local Wildlife Sites and candidate sites Local Nature Reserves and candidate reserves Ancient Woodlands BAP Priority Habitats Council Woodlands	– –	As above for SSSIs (hydrological changes and spread of invasive species), however some of these sites are more strongly associated with aquatic habitats and species, so potential 'worst case' magnitude of harm is greater.	None relevant.	As above: Ecological assessment, invasive species survey and environmental action plan.	++	Increased protection from damage by extreme flooding
			Residual effect with mitigation:			Invasive species removal and reduction
			–	Can minimise significant effects, but minor adverse effects remain possible - *requires monitoring* .		
Trees with Tree Preservation Orders Fisheries (fish spawning areas) Aquatic habitats within ordinary watercourses Vegetation and terrestrial habitat suitable for protected species	–	Direct removal of habitat - dredging and removal of trapped vegetation and silt may lead to loss of habitat or foraging area building up behind a flow restriction	None relevant.	As above: Ecological assessment and environmental action plan. Also - see potential enhancement measures.	+	Creation of purpose-built debris 'build-up' areas (e.g. anchored debris) away from flow restrictions where these may be beneficial to wildlife. (Natural debris removed can possibly be shifted to defined areas.)
			Residual effect with mitigation:			
			–	Can minimise significant effects, but minor adverse effects remain possible - *requires monitoring* .		
Protected and other species Fisheries Aquatic species which rely upon these resources	– –	In addition to the above: Increased predation risk following removal of vegetation	1. Legislative protection - a Natural England license is required to disturb protected species	1. Obtain ecologist consent prior to removal of any substantial vegetation 2. As above, environmental action plan ensure recognise conditions / features which warrant contacting an ecologist 3. See potential enhancement measures	+	Opportunity to remove surface vegetation that is causing eutrophication during maintenance
			Residual effect with mitigation:			Invasive species removal and reduction
	– –	Increased turbidity in the water column leading to a reduction in the ability of underwater plants to photosynthesise	–	Can minimise significant effects, but minor adverse effects remain possible - *requires monitoring* .	+	As above, creation of purpose-built debris 'build-up' areas, and potential for translocation of species.
Local Community						

Inspection and Maintenance						
Potentially Relevant Baseline Features within Lancashire & Blackpool	**Potential Significant Adverse Effect(s)**		**Pre-Existing Mitigation / Requirements**	**Recommended Mitigation**	**Potential Opportunities / Benefits**	
Local residents	–	Downstream cumulative effects - removing too many restrictions to flow having an adverse impact on flood risk further downstream.	None relevant - impact must be managed by LFRMS.	1. Where this is used as a strategy for numerous sections of the same catchment area, use modelling to predict downstream impact.	++	Reduced flood risk would improve safety and mental health of local communities and visitors
Local workers /				2. Assess history of restrictions to flow before removing, and consider historic flood events and the potential positive impact restriction may have had.		
Commuters				3. Investigate downstream actions which may be required (e.g. partner with flood storage)		
Other visitors					+	Reduced flood risk can improve the reliability of access to recreation, community services and facilities
(See also 'Community Services / Facilities')			**Residual effect with mitigation:**			
(See also 'Recreation')			0	Can minimise significant effects and reduce to negligible.		
Town and local centres	–		As above.	As above.	++	Protection from harm by extreme flooding
Other retail areas						
Community facilities (e.g. education, places of worship, health facilities, post offices)						
Public Rights of Way						
Cycle routes			**Residual effect with mitigation:**		+	Improved reliability of access.
Road and rail network			0	Can minimise significant effects and reduce to negligible.		
Recreation						
Watercourses (angling / fishing, kayaking / canoeing, etc.)	–	As for 'Local Community'	As for 'Local Community' and 'Biodiversity'	As for 'Local Community' and 'Biodiversity'	++	Reduction in flood risk to recreational areas / facilities
Doorstep Green		(See also 'Biodiversity', as relates to recreation combined with nature.)				
Village Greens						
Country Parks						
Allotments						
Green space						
Public Rights of Way		As for 'Local Community'	**Residual effect with mitigation:**			Dredging could make a watercourse more navigable to kayak / canoe (etc.)
Cycle routes	–	If dredging, temporary loss of access to watercourse (e.g. to anglers or kayak / canoe).	0	Can minimise significant effects and reduce to negligible.	+	Alongside habitat creation, can create information points to help residents and others to value nature and the outdoors.
Road and rail network						
Geology and Soils						
Local Geological Site	–	As for 'Local Community', noting that flooding of contaminated land can spread pollutants and harm soil quality elsewhere.	As for 'Local Community'	As for 'Local Community'	++	Reduction in flood risk to geological sites or contaminated land
Regionally Important Geological Sites (RIGS) and candidate sites			**Residual effect with mitigation:**			
Contaminated land (various types)			0	Can minimise significant effects and reduce to negligible.		
Agricultural Land	0	Consideration given to reduction in soil fertility / quality due to loss of periodic inundation, but likely negligible a) from ordinary watercourses and b) from a limited set of measures.	N/A	N/A		

Inspection and Maintenance

Potentially Relevant Baseline Features within Lancashire & Blackpool	Potential Significant Adverse Effect(s)		Pre-Existing Mitigation / Requirements	Recommended Mitigation	Potential Opportunities / Benefits	
Soil quality (unknown)	– –	Dredging can raise, disturb and spread contaminants if watercourse has historic pollution - this can spread to land at high-flow conditions	None relevant.	Prior to any dredging activity, carry out testing of watercourse sediment for potential pollutants. If found, must liaise with the Environment Agency and either avoid dredging those areas, or create an appropriate dredging strategy.	+	Potential reduction in soil erosion from flooding
			Residual effect with mitigation:			
			0	Can minimise significant effects and reduce to negligible.		
Water Environment						
WFD water bodies and ordinary watercourses or linked directly to them	– –	Non-compliance with legal requirements of the WFD / deterioration in water quality. This may include physical modification and removal of woody debris outside of urban areas.	Legislation requires no cause of deterioration of a WFD water body on a 'non-temporary' basis.	1. Avoid / minimise removal of woody debris outside of urban areas.	0	Potential to help implement or contribute towards the measures and objectives defined in the RBMPs - see 'Biodiversity'.
Ordinary watercourses				2. If dredging of ordinary watercourses involved, create a 'Dredging Strategy' for the specified area and conduct WFD assessment of the strategy.		
Flood Risk Areas		Changes in hydrology and disturbance of sediment can result in siltation of watercourses and movement of contaminants within them	**Residual effect with mitigation:**			
			0	The LFRMS must ensure compliance with the WFD.		
Main rivers			As above.	As above and as for 'Geology and Soils'	+	Potential benefits to flow, hydrology and pollution by inspecting and maintaining artificial structures such as grilles.
			Residual effect with mitigation:			
		Changes in the flow and hydrology of ordinary watercourses can cumulatively affect main rivers downstream.	0	The LFRMS must ensure compliance with the WFD.		
Climatic Factors						
Buildings and infrastructure	–	Minor increase in emissions of greenhouse gases as part of inspection and maintenance activities.	None identified	None identified	++	Reduced flood risk can avoid greenhouse gas emissions required for post-flooding clean-up and recovery.
Landscape and Townscape						
Built environment - residential and non-residential properties	–	Negative effects on vegetation (see 'Biodiversity') or water bodies (see 'Water Environment')	As for 'Biodiversity' and 'Water Environment'	As for 'Biodiversity' and 'Water Environment'	++	Reduction in the harm done by extreme flooding can help prevent deterioration in townscape or landscape features.
Recreational features						
Area of High Landscape Value			**Residual effect with mitigation:**			
Historic environment features (see below)			0	The mitigation identified is likely to avoid a significant townscape / landscape effect.		
Other open countryside						
Historic Environment						
Scheduled Monuments	–	Downstream cumulative effects - removing too many restrictions to flow having an adverse impact on flood risk further downstream.	As for 'Local Community'	As for 'Local Community'	++	Protection of integrity and setting from damage by extreme flooding
Listed Buildings			**Residual effect with mitigation:**			
Conservation Areas			0	Can minimise significant effects and reduce to negligible.		
			Legislation should lead to the Scheduling of any nationally important	1. Environmental Action Plan (see above)		
			Legislation requires the reporting of finds of 'treasure'	2. Any finds should be recorded immediately, with as precise a location as possible, and reported to the HER database		

Inspection and Maintenance						
Potentially Relevant Baseline Features within Lancashire & Blackpool	**Potential Significant Adverse Effect(s)**		**Pre-Existing Mitigation / Requirements**	**Recommended Mitigation**	**Potential Opportunities / Benefits**	
Potential buried / undiscovered archaeological remains	– –	If dredging, can lead to loss of, or harm to, buried archaeology within watercourse.		3. Any buried archaeology encountered should result in cessation of activity and appropriate archaeological investigation, consultation with English Heritage, followed by review of the activity	+	Potential research / educational benefits if discovered.
			Residual effect with mitigation:			
			–	Any effects to nationally significant archaeology would be expected to be limited, as if nationally significant archaeology were discovered (via the mitigation identified above), detailed investigation would be expected as a *minimum* end result (up to preservation *in situ* and Scheduling). Effects to regionally or locally significant archaeology may include loss or partial loss, but achieving preservation by record.		
Material Assets						
Business / commercial properties, including retail	–	Downstream cumulative effects - removing too many restrictions to flow having an adverse impact on flood risk further downstream.	As for 'Local Community'	As for 'Local Community'	++	Reduction in flood risk to any business use / land, associated infrastructure, or other important infrastructure (helping to reduce damage / maintenance)
Agricultural Land						
A Roads, B Roads and minor roads						
Railways			**Residual effect with mitigation:**			
Other infrastructure			0	Can minimise significant effects and reduce to negligible.		

‘Naturalisation’ of watercourses						
Potentially Relevant Baseline Features within Lancashire & Blackpool	**Potential Significant Adverse Effect(s)**		**Pre-Existing Mitigation / Requirements**	**Recommended Mitigation**	**Potential Opportunities / Benefits**	
Biodiversity						
Sites of Special Scientific Interest (SSSI)	–	If constructed upstream of sites, potential temporary risks of construction-time effects, e.g. sedimentation or chemical spillage.	1. Legislative requirement to take all reasonable steps to prevent spread of invasive species.	1. Project-level EIA should be conducted for areas upstream of SSSIs (even if non-statutory). Include invasive species survey.	++	Increased protection from damage by extreme flooding
		Also, risk of spread of invasive species during construction.	2. Construction good practice for working in watercourses – e.g. Environment Agency’s guide on sediment control.	2. Environmental Action / Management Plan for works informed by the assessment		
				3. Environmental incident reporting system		
			Residual effect with mitigation:			
Special Areas of Conservation (SAC)			0	Can avoid effects, or if not, minimise effects and reduce to negligible.	+	Invasive species removal and reduction
Special Protection Areas (SPA)						
Ramsar sites - wetlands of international importance						
National Nature Reserve (NNR)						
Local Wildlife Sites and candidate sites	–	In addition to above: Potential ‘trade-offs’ could lead to land-take of sites / features and reduction in associated species within sites / features.	1. Local Plan policy on protection of biodiversity.	As above: Ecological assessment, invasive species survey and environmental action plan.	++	In addition to above: Naturalised watercourses offer greater habitat diversity, leading to improved biodiversity and resilience. Invasive species removal and reduction
Local Nature Reserves and candidate reserves			2. Also, all points as above for SSSIs.			
Ancient Woodlands						
BAP Priority Habitats						
Council Woodlands						
Trees with Tree Preservation Orders						
Fisheries (fish spawning areas)						
Aquatic habitats within ordinary watercourses			**Residual effect with mitigation:**			
Vegetation and terrestrial habitat suitable for protected species			–	Can minimise significant effects, but minor adverse effects remain possible - *requires monitoring* .		
Protected and other species	–	Potential harm to species during construction phase from construction activities, in-river working (disturbance of silt), and associated construction access.	1. Legislative protection - a Natural England licence is required to disturb protected species	1. Obtain ecologist consent prior to earthworks, in-river working or removal of any substantial vegetation	++	As above.
Fisheries			2. Construction good practice for working in watercourses – e.g. Environment Agency’s guide on sediment control.	2. As above, environmental action plan - ensure recognise conditions / features which warrant contacting an ecologist		
Aquatic species which rely upon these resources				3. See potential enhancement measures		
			Residual effect with mitigation:			
			–	Can minimise significant effects, but minor adverse effects remain possible - *requires monitoring* .		
Local Community						

‘Naturalisation’ of watercourses						
Local residents	– –	Potential to introduce new risks associated with open water, such as drowning, as a result of de-culverting. Children would be at greater risk.	Health and safety legislation.	1. Assess risks associated with de-culverting options, taking into account proximity of higher risk locations, for example residential areas, playgrounds, schools and other locations where vulnerable groups may be present.	++	Reduced flood risk would improve safety and mental health of local communities and visitors
Local workers / commuters				2. Include all necessary safety equipment such as life buoys and guard rails in higher risk locations.		
Other visitors		However, depending upon the culvert, there may also be a net benefit, as there can be greater risks with culverts due to their confined space.		3. Include information on waterside safety in higher risk locations.		
(See also 'Community Services / Facilities')			**Residual effect with mitigation:**		++	Removal of safety risks associated with culverts, trash screens, steep-sided channels.
(See also 'Recreation')			–	Can minimise significant effects, but minor adverse effects remain possible - *requires monitoring* .	++	Naturalised watercourses have positive effect upon human wellbeing.
Town and local centres	–	Naturalisation of watercourses potentially results in loss of developable land, particularly in urban areas. A secondary effect of this may be for community services and facilities to spread beyond current town centre limits, with potential increases in impermeable areas or new impacts upon flood plains.	Local Plan policy on planning and flood risk.	1. Use of SuDS in new developments	++	Protection from harm by extreme flooding
Other retail areas						
Community facilities (e.g. education, places of worship, health facilities, post offices)				2. Incorporate regular management and inspection to remove litter.		
Public Rights of Way						
Cycle routes			**Residual effect with mitigation:**		+	Creation of more attractive commercial and community environment.
Road and rail network			0	Can minimise significant effects and reduce to negligible.		
Recreation						
Watercourses (angling / fishing, kayaking / canoeing, etc.)	–	Some potential for landtake / loss of recreational land use or path diversion at construction, as well as visual / noise disturbance.	As for 'Local Community' and 'Biodiversity'	As for 'Local Community' and 'Biodiversity'	++	Reduction in flood risk to recreational areas / facilities
Doorstep Green						
Village Greens		(See also ‘Local Community’ and 'Biodiversity' as relates to recreation combined with nature.)				
Country Parks						
Allotments						
Green space						
Public Rights of Way						
Cycle routes			**Residual effect with mitigation:**			
Road and rail network			0	Can minimise significant effects and reduce to negligible.	++	Creation of new recreational opportunities.
Geology and Soils						
Contaminated land (various types)	– –	Potential to open up pollution pathways if sources of contamination are present.	Environmental protection and pollution control legislation.	1. Assess risks of contaminated land considering historic and present land use, potential pathways and receptors.	++	Reduction in flood risk to contaminated land
Soil quality (unknown)				2. Ensure adequate mitigation so that there are no residual significant risks of significant harm.		
			Residual effect with mitigation:			
			0	Can minimise significant effects and reduce to negligible.		
Local Geological Site	0	No potentially significant adverse effects upon geological sites identified.	N/A	N/A	+	Reduction in flood risk to geological sites and potential reduction in soil
Regionally Important Geological Sites (RIGS) and candidate sites						

‘Naturalisation’ of watercourses						
Agricultural Land		Consideration given to reduction in soil fertility / quality due to loss of periodic inundation, but likely negligible from ordinary watercourses.	N/A	N/A		erosion from flooding
Water Environment						
WFD water bodies and ordinary watercourses or linked directly to them Ordinary watercourses Flood Risk Areas Ordinary watercourses WFD water bodies Main rivers	0	No significant adverse effects identified as this option is in compliance with the WFD. Assumes this option would not be pursued within urban or industrial areas where this would cause flooding of property.	N/A	N/A	++	Reduction in flood risk and enables natural hydro-geomorphological processes.
Climatic Factors						
Buildings and infrastructure	–	Minor increase in emissions of greenhouse gases as part of construction activities.	At design, it is typical to maximise achievement of a materials balance to minimise transport and waste generation. **Residual effect with mitigation:** – Can minimise significant effects, but minor adverse effects remain possible - *requires monitoring* .	1. Use of sustainably sourced biofuels for construction plant. 2. Identify potential local sources for any net spoil generated at construction.	++	Reduced flood risk as naturalised watercourses will be more adaptive to changes in rainfall patterns than artificial channels.
Landscape and Townscape						
Built environment - residential and non-residential properties Recreational features	–	As for ‘Community Services / Facilities’.	As for ‘Community Services / Facilities’.	As for ‘Community Services / Facilities’.	++	Reduction in the harm done by extreme flooding can help prevent deterioration in townscape or landscape features.
Area of High Landscape Value Historic environment features (see below) Other open countryside			**Residual effect with mitigation:** 0 The mitigation identified is likely to avoid a significant townscape / landscape effect.		++	Contributes to ‘greening’ of townscape.
Historic Environment						
Scheduled Monuments Listed Buildings Conservation Areas	–	Can include measures which involve landtake, and which can then lead to effects on historic setting (unlikely to affect integrity). Opening up of watercourses may affect historic built environment if constructed, including loss of the historic structure of the culvert itself.	Local plan policies for historic environment. **Residual effect with mitigation:** 0 Can minimise significant effects and reduce to negligible.	1. Undertake cultural heritage assessment at project level to assess potential impacts upon historic assets. 2. Environmental Action Plan (see above)	++	Protection of integrity and setting from damage by extreme flooding
Potential buried / undiscovered archaeological remains	–	Construction or any intrusion into the ground can lead to loss of, or harm to, buried archaeology.	Legislation should lead to the Scheduling of any nationally important monuments discovered. Legislation requires the reporting of finds of 'treasure' **Residual effect with mitigation:**	1. Environmental Action Plan (see above) 2. Any finds should be recorded immediately, with as precise a location as possible, and reported to the HER database 3. Any buried archaeology encountered should result in cessation of activity and appropriate archaeological investigation, consultation with English Heritage, followed by review of the design and activity	+	Potential research / educational benefits if discovered.

‘Naturalisation’ of watercourses							
			–	Any effects to nationally significant archaeology would be expected to be limited, as if nationally significant archaeology were discovered (via the mitigation identified above), detailed investigation would be expected as a *minimum* end result (up to preservation *in situ* and Scheduling). Effects to regionally or locally significant archaeology may include loss or partial loss, but achieving preservation by record.		
Material Assets							
Business / commercial properties, including retail	–	As for ‘Community Services / Facilities’.	As for ‘Community Services / Facilities’.		As for ‘Community Services / Facilities’.	++	As for ‘Community Services / Facilities’.
Agricultural Land							
A Roads, B Roads and minor roads							
Railways			**Residual effect with mitigation:**				
Other infrastructure			0	Can minimise significant effects and reduce to negligible.			

Flood storage						
Potentially Relevant Baseline Features within Lancashire & Blackpool	**Potential Significant Adverse Effect(s)**		**Pre-Existing Mitigation / Requirements**	**Recommended Mitigation**	**Potential Opportunities / Benefits**	
Biodiversity						
Sites of Special Scientific Interest (SSSI)	0	It is assumed that flood storage areas would be outside of designated sites and only used in periods of extreme rainfall. Therefore no significant effect is identified.	N/A	1. Project-level EIA should be conducted for areas upstream of SSSIs (even if non-statutory). Include invasive species survey. 2. Environmental Action / Management Plan for works informed by the assessment 3. Environmental incident reporting system	++	Increased protection from damage by extreme flooding
Special Areas of Conservation (SAC)			**Residual effect with mitigation:**			
Special Protection Areas (SPA)			0	Can minimise effects and reduce to negligible.		
Ramsar sites - wetlands of international importance						
National Nature Reserve (NNR)						
Local Wildlife Sites and candidate sites	–	Land required for flood storage areas may encroach upon wildlife sites, woodlands and other terrestrial habitats with consequent adverse effects on terrestrial species.	1. Protected species legislation.	1. Project-level EIA should be conducted for areas in vicinity of protected species and designated sites (even if non-statutory). Include invasive species survey.	++	Increased protection from damage by extreme flooding
Local Nature Reserves and candidate reserves			2. Local Plan policies for biodiversity	2. Environmental Action / Management Plan for works informed by the assessment		Likely to enhance biodiversity in some locations through introduction of temporary or permanent waterbodies.
Ancient Woodlands		Storage area may provide create an additional pathway / extend the pathway for the spread of invasive species.	3. Legislative requirement to take all reasonable steps to prevent spread of invasive species.	3. Environmental incident reporting system		
BAP Priority Habitats				4. Avoid inundation of terrestrial sites that support greater biodiversity or priority habitats.		
Council Woodlands		Disturbance during construction (e.g. increased noise and vibration)	**Residual effect with mitigation:**		++	Habitat creation and enhancement.
Trees with Tree Preservation Orders						
Notable and other species (non-aquatic)			–	Can minimise significant effects, but minor adverse effects remain possible - *requires monitoring* .		Planting of native vegetation near to watercourse.
Fisheries (fish spawning areas)	–	On-line flood storage options may harm fish spawning habitat or other aquatic habitat or alter hydrology which harms habitat and wildlife	Protected species legislation.	As above: Ecological assessment and environmental action plan.	+	Flood storage may allow opportunities to maintain base-flow in watercourses throughout year and enhance fish passage as a result.
Aquatic habitats within ordinary watercourses			Salmon and Freshwater Fisheries Act 1975 (as amended).	Also - see potential enhancement measures.		
Notable and other species (aquatic)			Water framework Directive.			Fish rescue, which contributes towards species records.
			Residual effect with mitigation:			
			0	Can minimise effects and reduce to negligible.		Habitat creation and enhancement
Green corridor	–	Loss / reduction of habitat leading to loss of connectivity	Design to maintain connectivity.		+	Potential to incorporate accessibility to nature and education
			Residual effect with mitigation:			Habitat creation and enhancement
			0	Can minimise effects and reduce to negligible.		
Invasive species	–	Spread of invasive species during construction to nearby areas or downstream	Legislative requirements and associated good construction practice.	Survey for invasive species. Implement programme of invasive weed eradication in advance of works if possible; prepare CEMP and adopt stringent measures to prevent spread of invasive species. Implement post-construction weed control if appropriate.	+	Treatment / removal of invasive species
			Residual effect with mitigation:			

Flood storage						
			0	Can minimise effects and reduce to negligible.		
Local Community						
Local residents	– –	Introduction of new risks associated with open water, such as drowning. Children would be at greater risk.	Health and safety legislation.	1. Assess risks associated with flood storage options, taking into account proximity of higher risk locations, for example residential areas, playgrounds, schools and other locations where vulnerable groups may be present.	++	Reduced flood risk would improve safety and mental health of local communities and visitors
Local workers / commuters				2. Include all necessary safety equipment such as life buoys and guard rails in higher risk locations.		
Other visitors		Construction works may cause disturbance (e.g. noise, traffic, heavy equipment parked nearby, air quality), anxiety and stress to some members of the local community		3. Include information on waterside safety in higher risk locations.		
				4. Provide information to residents prior to construction works. Ensure access to health facilities is maintained.	+	Reservoirs can be pleasant environments which improve human wellbeing.
(See also 'Community Services / Facilities')			**Residual effect with mitigation:**			
(See also 'Recreation')			–	Can minimise significant effects, but minor adverse effects remain possible from construction disturbance - *requires monitoring* .		
Town and local centres	–	Potential visual / noise disturbance during construction.	Construction site good practice.	Project-level assessment and environmental action plan for construction.	++	Protection from harm by extreme flooding
Other retail areas				Advanced notice sent to residents / site neighbours, with contact details for any complaints.		
Community facilities (e.g. education, places of worship, health facilities, post offices)				Monitoring and responding to noise complaints.		Improved reliability of access.
Public Rights of Way					+	
Cycle routes			**Residual effect with mitigation:**			
Road and rail network			0	Can minimise effects and reduce to negligible.		
Recreation						
Watercourses (angling / fishing, kayaking / canoeing, etc.)	– –	Possible landtake and loss of recreational features, such as green space and PRoWs.	Statutory protection of village greens.	Use complementary flood storage methods, such as washlands which can allow recreational use of land when not in flood. Otherwise, aim to sympathetically integrate with surrounding land use. Provide replacement capacity, if needed.	++	Creation of reservoirs may create new recreational opportunities (fishing, watersports).
Doorstep Green			National policy on doorstep greens.	Avoid most used rights of way / recreational areas and maintain connectivity / access wherever possible. Minimise diversions.		
Village Greens		Potential visual / noise disturbance during construction.	Local Plan policy on other recreation features.	Also, as for 'Local Community' and 'Biodiversity'.		Creation of attractive riverside walks
Country Parks						
Allotments						
Green space						
Public Rights of Way			**Residual effect with mitigation:**		+	Reduction in flood risk to recreational areas / facilities
Cycle routes			0	Can minimise significant effects and reduce to negligible.		Alongside habitat creation, can create information points to help residents and others to value nature and the outdoors.
Road and rail network	–	If in-river working, temporary loss of access to watercourse (e.g. to anglers or kayak / canoe).				
Geology and Soils						

Flood storage						
Local Geological Site	–	Possible landtake at or near to LGS or RIGS	Environmental protection and pollution control legislation.	Avoid and minimise effects on RIGS or LGS, including access..	++	Reduction in flood risk to geological sites or contaminated land.
Regionally Important Geological Sites (RIGS) and candidate sites			**Residual effect with mitigation:**			Seek benefits to amenity near to RIGS or LGS. Possibility of geological feature exposure or enhancement at construction.
			0	Can minimise significant effects and reduce to negligible.		
Agricultural Land / Soils	– –	Flood storage options may result in either landtake or use of agricultural land, which could lead to loss of 'best and most versatile' soils (ALC Grade 2 or 3a) in certain locations, occasional damage to crops during flood events, or reduction in farm access / tenability.	Environmental protection and pollution control legislation.	Avoid 'best and most versatile' land.	+	Potential reduction in soil erosion from flooding
(Grades 2 – 5)		Flooding of contaminated land can spread pollutants and harm soil quality elsewhere.		Seek to ensure farm access is maintained during construction phase. Ensure access to parts of farm can be maintained during flood events (e.g. consider raising some tracks).		
Contaminated land (various types)		Excavation works can raise, disturb and spread contaminants if watercourse has historic pollution - this can spread to land at high-flow conditions		Prior to any excavation activity, carry out testing of soils for potential contaminants. If found, must liaise with the local authority / Environment Agency and either avoid working those areas, or create an appropriate mitigation strategy.		Potential remediation of contaminated land.
Soil quality (unknown)			**Residual effect with mitigation:**			
			–	Can minimise significant effects, but minor adverse effects remain possible - *requires monitoring* .		
Water Environment						
WFD water bodies and ordinary watercourses or linked directly to them	–	Changes in the flow and hydrology of ordinary watercourses can cumulatively affect main rivers downstream.	Legislation requires no cause of deterioration of a WFD water body on a 'non-temporary' basis.	1. Avoid further modification of waterbodies.	+	Create new water features.
Main rivers		Lower flows reduce the ability of watercourse to dilute existing discharges into channel. Impact on water quality. Heightened erosion of river bed by watercourse as it compensates for loss of sediment load (sediments held within flood storage). Potential for contaminants to enter watercourse.		2. Conduct WFD assessment of the proposals.		
Ordinary watercourses				3. Investigate quality of land within construction areas to ensure no significant risk of contamination or adverse water quality from proposals.		
Flood Risk Areas				4. Watercourse specific hydro-geomorphological assessment required to understand the likely significance and consequences of erosion. Watercourse should reach a new equilibrium in the longer term.		Flood storage may help to regulate flow so that watercourses are less flashy and flows are maintained for longer in drier conditions.
Industrial processes			**Residual effect with mitigation:**			
			–	Can minimise significant effects, but minor adverse effects remain possible - *requires monitoring* .		
Climatic Factors						
Buildings and infrastructure	–	Minor increase in emissions of greenhouse gases as part of construction activities. Potential to hamper achievement of national air quality targets.	None identified	1. Use of sustainably sourced biofuels for construction plant.	++	Opportunity to improve resilience to flood risk through construction of flood storage reservoirs.
Landscape and Townscape						
Built environment - residential and non-residential properties		May result in alteration of landscape, countryside or historic environment.		In addition to 'Biodiversity' and 'Water Environment':		
Recreational features				1. Ensure sensitive choice of locations to avoid sensitive landscapes.		

Flood storage						
Trees with Tree Preservation Orders	–	Potential to include a significant retaining structure (e.g. embankment or wall), which may have impacts on existing views / character	As for 'Biodiversity' and 'Water Environment'	2. Seek landscape expertise when designing flood storage to work with and strengthen landscape character where possible.	++	Reduction in the harm done by extreme flooding can help prevent deterioration in townscape or landscape features. Reservoirs can enhance landscape.
Area of High Landscape Value				3. Consider underground storage options.		
Historic environment features (see below)				4.Where possible, avoid the need to cut down, top, lop or uproot any of trees listed under a Tree Preservation Order.		
Other open countryside			**Residual effect with mitigation:**			
			0	The mitigation identified is likely to avoid a significant townscape / landscape effect.		
Historic Environment						
Scheduled Monuments	–	May cause damage to scheduled monuments or other historic features.	Local plan policies for historic environment.	1. Undertake cultural heritage assessment at project level to assess potential impacts upon historic assets. Avoid Scheduled monuments.	++	Protection of integrity and setting from damage by extreme flooding
Listed Buildings			Legislation requires the reporting of finds of 'treasure'	2. Environmental Action Plan (see above)		
Conservation Areas				3. Any finds should be recorded immediately, with as precise a location as possible, and reported to the HER database		Enhancement of setting through design.
				4. Design works to avoid adverse effects upon setting.		
				5. Sensitive screening and construction management .		
			Residual effect with mitigation:			
			0	Can minimise significant effects, but minor adverse effects remain possible - *requires monitoring* .		
Potential buried / undiscovered archaeological remains	– –	Excavation of reservoirs can lead to loss of, or harm to, buried archaeology within or adjacent to the watercourse.	Legislation should lead to the Scheduling of any nationally important monuments discovered.	1. Environmental Action Plan (see above)	+	Potential research / educational benefits if discovered.
			Legislation requires the reporting of finds of 'treasure'	2. Any finds should be recorded immediately, with as precise a location as possible, and reported to the HER database		
				3. Any buried archaeology encountered should result in cessation of activity and appropriate archaeological investigation, consultation with English Heritage, followed by review of the design and activity		
			Residual effect with mitigation:			
			–	Any effects to nationally significant archaeology would be expected to be limited, as if nationally significant archaeology were discovered (via the mitigation identified above), detailed investigation would be expected as a *minimum* end result (up to preservation *in situ* and Scheduling). Effects to regionally or locally significant archaeology may include loss or partial loss, but achieving preservation by record.		

Material Assets						
Business / commercial properties, including retail	–	Risks of certain wetland habitat creation alongside flood storage (see also 'potential enhancements') attracting vermin, which can affect particularly sensitive industries such as the food industry.	As for 'Local Community'	As for 'Local Community' and 'Geology and Soils'.	++	Reduction in flood risk to any business use / land, associated infrastructure, or other important infrastructure (helping to reduce damage / maintenance)
Agricultural Land		Landtake could affect operation and maintenance of key infrastructure		Also: consider any particular commercial / industrial areas sensitive to vermin (e.g. food industry), and ensure habitat creation and design accounts for this constraint. Design to consider key infrastructure: avoid impacts upon connectivity		There may be opportunity to raise routes above flood risk along storage reservoir embankments to provide multiple uses.
Flood storage						
A Roads, B Roads and minor roads				Avoid impacts upon economically productive land if possible.		
Railways			**Residual effect with mitigation:**			
Other infrastructure			0	Significant effects can be fully avoided.		

Watercourse capacity increases

Potentially Relevant Baseline Features within Lancashire & Blackpool		Potential Significant Adverse Effect(s)	Pre-Existing Mitigation / Requirements	Recommended Mitigation		Potential Opportunities / Benefits
Biodiversity						
Sites of Special Scientific Interest (SSSI)	–	Hydrological changes - improving flow of water downstream could lead indirectly to erosion of riverbanks or deposition of sediment in or near designated sites, which in turn can harm habitat. May also accelerate the spread of invasive species, if present.	1. Legislative protection - though potentially after-the-fact, Natural England intervention is possible to help protect SSSI condition.	1. Ecological assessment of measures 2. Invasive species survey prior to works 3. Environmental Action / Management Plan for works informed by the assessment	++	Increased protection from damage by extreme flooding
			Residual effect with mitigation:			
Special Areas of Conservation (SAC) Special Protection Areas (SPA) Ramsar sites - wetlands of international importance National Nature Reserve (NNR)			0 Can minimise effects and reduce to negligible.		+	Invasive species removal and reduction
Local Wildlife Sites and candidate sites Local Nature Reserves and candidate reserves Ancient Woodlands BAP Priority Habitats Council Woodlands Trees with Tree Preservation Orders	– –	As above for SSSIs (hydrological changes and spread of invasive species), however some of these sites are more strongly associated with aquatic habitats and species, so potential 'worst case' magnitude of harm is greater.	Protected species legislation. Salmon and Freshwater Fisheries Act 1975 (as amended). Water framework Directive.	As above: Ecological assessment, invasive species survey and environmental action plan.	++	Increased protection from damage by extreme flooding
			Residual effect with mitigation:		++	Removal of obstacles provides opportunities to improve fish passage and increase biodiversity of watercourses.
			– Can minimise significant effects, but minor adverse effects remain possible - *requires monitoring* .			
Fisheries (fish spawning areas)	–	Direct removal of habitat may lead to loss of habitat or foraging area building up behind a flow restriction	As above.	As above: Ecological assessment and environmental action plan.	+	Invasive species removal and reduction
				Also - see potential enhancement measures		Fish rescue, which contributes towards species records.
Aquatic habitats within ordinary watercourses			**Residual effect with mitigation:**			Habitat creation and enhancement
Protected and other species			– Can minimise significant effects, but minor adverse effects remain possible - *requires monitoring* .			Opportunity to tie into Environment Agency strategies to improve fish passage. For example by targeting tributaries of main rivers where fish passage is being improved.
Invasive species	–	Spread of invasive species during construction to nearby areas or downstream		Survey for invasive species. Implement programme of invasive weed eradication in advance of works if possible; prepare CEMP and adopt stringent measures to prevent spread of invasive species. Implement post-construction weed control if appropriate.	+	Treatment / removal of invasive species
			Residual effect with mitigation:			
			0 Can minimise effects and reduce to negligible.			
Local Community						

Watercourse capacity increases						
Local residents	–	Downstream cumulative effects - removing too many restrictions to flow having an adverse impact on flood risk further downstream.	Health and safety legislation.	1. Where this is used as a strategy for numerous sections of the same catchment area, use modelling to predict downstream impact.	++	Reduced flood risk would improve safety and mental health of local communities and visitors
Local workers / commuters				2. Assess history of restrictions to flow before removing, and consider historic flood events and the potential positive impact restriction may have had.		
Other visitors				3. Investigate downstream actions which may be required (e.g. partner with flood storage)		
(See also 'Community Services / Facilities')				4. Provide information to residents prior to construction works. Ensure access to health facilities is maintained.	+	Reduced flood risk can improve the reliability of access to recreation, community services and facilities
(See also 'Recreation')			**Residual effect with mitigation:**			
			0	Can minimise significant effects and reduce to negligible.		
Town and local centres	–		As above.	As above.	++	Protection from harm by extreme flooding
Other retail areas						
Community facilities (e.g. education, places of worship, health facilities, post offices)				Also, provide information to school for distribution to parents. Maintain school access. Seek opportunity to programme works outside of term times.		
Public Rights of Way						
Cycle routes			**Residual effect with mitigation:**		+	Improved reliability of access.
Road and rail network			0	Can minimise significant effects and reduce to negligible.		
Recreation						
Watercourses (angling / fishing, kayaking / canoeing, etc.)	–	As for 'Local Community'	As for 'Local Community' and 'Biodiversity'	As for 'Local Community' and 'Biodiversity'	++	Reduction in flood risk to recreational areas / facilities
Doorstep Green						
Village Greens		(See also 'Biodiversity', as relates to recreation combined with nature.)				Alongside habitat creation, can create information points to help residents and others to value nature and the outdoors.
Country Parks						
Allotments						
Green space						
Public Rights of Way						
Cycle routes			**Residual effect with mitigation:**			
Road and rail network	–	If in-river working, temporary loss of access to watercourse (e.g. to anglers or kayak / canoe).	0	Can minimise significant effects and reduce to negligible.	+	Widening or creation of by-pass channels could make a watercourse more navigable to kayak / canoe (etc.)
Geology and Soils						
Local Geological Site	–	As for 'Local Community', noting that flooding of contaminated land can spread pollutants and harm soil quality elsewhere.	As for 'Local Community'	As for 'Local Community'	++	Reduction in flood risk to geological sites or contaminated land
Regionally Important Geological Sites (RIGS) and candidate sites			**Residual effect with mitigation:**			
Contaminated land (various types, including historic landfill)			0	Can minimise significant effects and reduce to negligible.		
Agricultural Land	0	Consideration given to landtake or reduction in soil fertility / quality due to loss of periodic inundation, but likely negligible a) from ordinary watercourses and b) from a limited set of measures.	N/A	N/A		

Watercourse capacity increases						
Soil quality (unknown)	– –	In-channel works can raise, disturb and spread contaminants if watercourse has historic pollution - this can spread to land at high-flow conditions	Environmental protection and pollution control legislation.	Prior to any dredging activity, carry out testing of watercourse sediment for potential pollutants. If found, must liaise with the Environment Agency and either avoid working those areas, or create an appropriate mitigation strategy.	+	Potential reduction in soil erosion from flooding
			Residual effect with mitigation:			
			0	Can minimise significant effects and reduce to negligible.		
Water Environment						
WFD water bodies and ordinary watercourses or linked directly to them	–	Non-compliance with legal requirements of the WFD / deterioration in water quality. This may include physical modification and removal of woody debris outside of urban areas.	Legislation requires no cause of deterioration of a WFD water body on a 'non-temporary' basis.	1. Design to work with natural processes as much as possible. Avoid further modification of waterbodies.	++	Certain measures such as eliminating pinch points can assist water bodies to evolve more naturally and develop more hydro -geomorphologically diverse features.
Ordinary watercourses				2. Conduct WFD assessment of the proposals.		Potential to help implement or contribute towards the measures and objectives defined in the RBMPs - see 'Biodiversity'.
Flood Risk Areas				3. Investigate quality of land within construction areas to ensure no significant risk of contamination or adverse water quality from proposals.		
WFD water bodies	– –	Changes in hydrology and disturbance of sediment can result in siltation of watercourses and movement of contaminants within them	**Residual effect with mitigation:**			Reduction in flood risk to developed land, and particularly industrial processes, can reduce pollution events resulting from flooding.
Main rivers			0	The LFRMS must ensure compliance with the WFD, including effects on hydrology.		
Industrial processes	–	Changes in the flow and hydrology of ordinary watercourses can cumulatively affect main rivers downstream.	As above.	As above and as for 'Geology and Soils'		
			Residual effect with mitigation:			
		Potential for contaminants to enter watercourse	0	The LFRMS must ensure compliance with the WFD.		
Climatic Factors						
The emissions required in the existing management and recovery from flood risk	–	Minor increase in emissions of greenhouse gases as part of construction activities. Potential to hamper achievement of national air quality targets.	At design, it is typical to maximise achievement of a materials balance to minimise transport and waste generation.	1. Use of sustainably sourced biofuels for construction plant.	+	The emissions of new FRM measures are at least partly offset by the reduction in emissions (both direct and embodied) in the avoidance of harm from flooding, and the recovery from flood damage.
				2. Identify potential local sources for any net spoil generated at construction.		
			Residual effect with mitigation:			
			–	Can minimise significant effects, but minor adverse effects remain possible - *requires monitoring* .		
Landscape and Townscape						
Built environment - residential and non-residential properties	–	May result in loss or modification of structures of value to built environment, such as bridges.	As for 'Biodiversity' and 'Water Environment'	In addition to 'Biodiversity' and 'Water Environment':	++	Reduction in the harm done by extreme flooding can help prevent deterioration in townscape or landscape features.
Recreational features				1. Ensure sensitive modification of structures, such as bridges so that landscape and townscape is not compromised.		Through sensitive design river corridor
Area of High Landscape Value				2. Seek landscape expertise when designing flood storage to work with and strengthen landscape character where possible.		

Watercourse capacity increases						
Trees with Tree Preservation Orders				3. Where possible, avoid the need to cut down, top, lop or uproot any of trees listed under a Tree Preservation Order.		
Historic environment features (see below)			**Residual effect with mitigation:**			
Other open countryside			0	The mitigation identified is likely to avoid a significant townscape / landscape effect.		
Historic Environment						
Scheduled Monuments	– –	May affect historic structures such as bridges. Widening of watercourses may affect historic built environment if constructed as a result of culverted or canalised watercourses	Local plan policies for historic environment.	1. Undertake cultural heritage assessment at project level to assess potential impacts upon historic assets.	++	Protection of integrity and setting from damage by extreme flooding
Listed Buildings			Legislation requires the reporting of finds of 'treasure'	2. Environmental Action Plan (see above)		
Conservation Areas				3. Any finds should be recorded immediately, with as precise a location as possible, and reported to the HER database		Enhancement of setting through design.
				4. Design works to avoid adverse effects upon setting.		
				5. Sensitive screening and construction management .		
			Residual effect with mitigation:			
			–	Can minimise significant effects, but minor adverse effects remain possible - *requires monitoring* .		
Potential buried / undiscovered archaeological remains	–	Construction of by-pass channels or widening can lead to loss of, or harm to, buried archaeology adjacent to the watercourse.	Legislation should lead to the Scheduling of any nationally important monuments discovered.	1. Environmental Action Plan (see above)	+	Potential research / educational benefits if discovered.
			Legislation requires the reporting of finds of 'treasure'	2. Any finds should be recorded immediately, with as precise a location as possible, and reported to the HER database		
				3. Any buried archaeology encountered should result in cessation of activity and appropriate archaeological investigation, consultation with English Heritage, followed by review of the design and activity		
			Residual effect with mitigation:			
			–	Any effects to nationally significant archaeology would be expected to be limited, with detailed investigation a *minimum* end result (up to preservation *in situ* and Scheduling). Effects to regionally or locally significant archaeology may include loss or partial loss, but achieving preservation by record.		
Material Assets						
Business / commercial properties, including retail	–	Downstream cumulative effects - removing too many restrictions to flow having an adverse impact on flood risk further downstream.	As for 'Local Community'	As for 'Local Community'	++	Reduction in flood risk to any business use / land, associated infrastructure, or other important infrastructure (helping to reduce damage / maintenance)
Agricultural Land				Also: consider any particular commercial / industrial areas sensitive to vermin (e.g. food industry), and ensure habitat creation and design accounts for this constraint.		
A Roads, B Roads and minor roads				Design to consider key infrastructure: avoid impacts upon connectivity		

Watercourse capacity increases						
Railways		Land take could affect operation and maintenance of key infrastructure		Avoid impacts upon economically productive land if possible.		
Other infrastructure			**Residual effect with mitigation:**			
			0	Can minimise significant effects and reduce to negligible.		

New / raised defences						
Potentially Relevant Baseline Features within Lancashire & Blackpool	**Potential Significant Adverse Effect(s)**		**Pre-Existing Mitigation / Requirements**	**Recommended Mitigation**	**Potential Opportunities / Benefits**	
Biodiversity						
Sites of Special Scientific Interest (SSSI)	–	Hydrological changes - improving flow of water downstream could lead indirectly to erosion of riverbanks or deposition of sediment in or near designated sites, which in turn can harm habitat. May also accelerate the spread of invasive species, if present.	1. Legislative protection - though potentially after-the-fact, Natural England intervention is possible to help protect SSSI condition.	1. Ecological assessment of measures 2. Invasive species survey prior to works 3. Environmental Action / Management Plan for works informed by the assessment	++	Increased protection from damage by extreme flooding
			Residual effect with mitigation:			
Special Areas of Conservation (SAC) Special Protection Areas (SPA) Ramsar sites - wetlands of international importance National Nature Reserve (NNR)			0 Can minimise effects and reduce to negligible.		+	Invasive species removal and reduction
Local Wildlife Sites and candidate sites Local Nature Reserves and candidate reserves Ancient Woodlands BAP Priority Habitats Council Woodlands Trees with Tree Preservation Orders	– –	As above for SSSIs (hydrological changes and spread of invasive species), however some of these sites are more strongly associated with aquatic habitats and species, so potential 'worst case' magnitude of harm is greater.	Protected species legislation. Salmon and Freshwater Fisheries Act 1975 (as amended). Water framework Directive.	As above: Ecological assessment, invasive species survey and environmental action plan.	+	Increased protection from damage by extreme flooding
			Residual effect with mitigation:			
			– Can minimise significant effects, but minor adverse effects remain possible - *requires monitoring* .			
Fisheries (fish spawning areas) Aquatic habitats within ordinary watercourses Protected and other species	– –	Loss of natural habitat through modification may lead to loss of habitat or species diversity.	As above.	As above: Ecological assessment and environmental action plan. Also - see potential enhancement measures.	+	Invasive species removal and reduction
			Residual effect with mitigation:			
			– Can minimise significant effects, but minor adverse effects remain possible - *requires monitoring* .			
Local Community						
Local residents Local workers / commuters Other visitors (See also 'Community Services / Facilities') (See also 'Recreation')	–	Raised defences may lead to greater segregation from water environment or create less attractive communities.	Land drainage legislation. Water Framework Directive.	1. Where this is used as a strategy for numerous sections of the same catchment area, use modelling to predict downstream impact. 2. Investigate upstream and downstream actions which may be required (e.g. partner with flood storage)	++	Reduced flood risk would improve safety and mental health of local communities and visitors
			Residual effect with mitigation:			
			0 Can minimise significant effects and reduce to negligible.		+	Reduced flood risk can improve the reliability of access to recreation, community services and facilities
Town and local centres Other retail areas Community facilities (e.g. education, places of worship, health facilities, post offices) Public Rights of Way Cycle routes Road and rail network	–		As above.	As above.	++	Protection from harm by extreme flooding
			Residual effect with mitigation:			
			0 Can minimise significant effects and reduce to negligible.		+	Improved reliability of access.

New / raised defences						
Recreation						
Watercourses (angling / fishing, kayaking / canoeing, etc.)	–	As for 'Local Community'	As for 'Local Community' and 'Biodiversity'	As for 'Local Community' and 'Biodiversity'	++	Reduction in flood risk to recreational areas / facilities
Doorstep Green						
Village Greens		(See also 'Biodiversity', as relates to recreation combined with nature.)				
Country Parks						
Allotments						
Green space						
Public Rights of Way						
Cycle routes			**Residual effect with mitigation:**			Alongside habitat creation, can create information points to help residents and others to value nature and the outdoors.
Road and rail network	–	If in-river working, temporary loss of access to watercourse (e.g. to anglers or kayak / canoe).	0	Can minimise significant effects and reduce to negligible.		
Geology and Soils						
Local Geological Site	–	As for 'Local Community', noting that flooding of contaminated land can spread pollutants and harm soil quality elsewhere.	As for 'Local Community'	As for 'Local Community'	++	Reduction in flood risk to geological sites or contaminated land
Regionally Important Geological Sites (RIGS) and candidate sites			**Residual effect with mitigation:**			
Contaminated land (various types)			0	Can minimise significant effects and reduce to negligible.		
Agricultural Land	0	Consideration given to reduction in soil fertility / quality due to loss of periodic inundation, but likely negligible a) from ordinary watercourses and b) from a limited set of measures.	N/A	N/A	+	Potential reduction in soil erosion from flooding
Soil quality (unknown)	–	In-channel, piling or excavation works can raise, disturb and spread contaminants if watercourse has historic pollution - this can spread to land at high-flow conditions	Environmental protection and pollution control legislation.	Prior to any construction activity, carry out testing of watercourse sediment for potential pollutants. If found, must liaise with the local authority / Environment Agency and either avoid working those areas, or create an appropriate mitigation strategy.		
			Residual effect with mitigation:			
			0	Can minimise significant effects and reduce to negligible.		
Water Environment						
WFD water bodies and ordinary watercourses or linked directly to them	–	Non-compliance with legal requirements of the WFD / deterioration in water quality. This may include physical modification and removal of woody debris outside of urban areas.	Legislation requires no cause of deterioration of a WFD water body on a 'non-temporary' basis.	1. Avoid further modification of waterbodies.	0	None identified.
Ordinary watercourses				2. Conduct WFD assessment of the proposals.		
Flood Risk Areas				3. Investigate quality of land within construction areas to ensure no significant risk of contamination or adverse water quality from proposals.		
WFD water bodies			**Residual effect with mitigation:**			
Main rivers			0	The LFRMS must ensure compliance with the WFD.		
Industrial processes	– –	Changes in hydrology and disturbance of sediment can result in siltation of watercourses and movement of contaminants within them	As above.	As above and as for 'Geology and Soils'		
			Residual effect with mitigation:			
	–	Changes in the flow and hydrology of ordinary watercourses can cumulatively affect main rivers downstream.	0	The LFRMS must ensure compliance with the WFD.		
Climatic Factors						

New / raised defences						
Buildings and infrastructure	–	Minor increase in emissions of greenhouse gases as part of construction activities.	None identified	Use of sustainably sourced biofuels for construction plant.	++	Reduction in the harm done by extreme flooding can help prevent deterioration in townscape or landscape features.
			Residual effect with mitigation:			
			–	Can minimise effects, but emissions are (by present standards) a certainty.		
Landscape and Townscape						
Built environment - residential and non-residential properties	– –	Likely to affect townscape setting and have urbanising effect in the landscape. If a large extent of defences, the impact may be major adverse.	As for 'Biodiversity' and 'Water Environment'	In addition to 'Biodiversity' and 'Water Environment':	++	Reduction in the harm done by extreme flooding can help prevent deterioration in townscape or landscape features.
Recreational features				1. Ensure sensitive modification of structures, such as bridges so that landscape and townscape is not compromised.		
Trees with Tree Preservation Orders				2. Seek landscape expertise when designing defences to work with and strengthen landscape character where possible.		
Area of High Landscape Value				3.Where possible, avoid the need to cut down, top, lop or uproot any of trees listed under a Tree Preservation Order.		
Historic environment features (see below)			**Residual effect with mitigation:**			
Other open countryside			–	Can minimise significant effects, but minor adverse effects remain possible - *requires monitoring* .		
Historic Environment						
Scheduled Monuments	– –	May affect setting of historic assets.	Local plan policies for historic environment.	1. Undertake cultural heritage assessment at project level to assess potential impacts upon historic assets.	++	Protection of integrity and setting from damage by extreme flooding
Listed Buildings				2. Environmental Action Plan (see above)		
Conservation Areas			**Residual effect with mitigation:**			
			–	Even with mitigation, if in a sensitive location, some adverse effect may not be avoidable or able to be made negligible.		
Potential buried / undiscovered archaeological remains	– –	Construction defences can require intrusion into the ground, and thus lead to loss of, or harm to, buried archaeology adjacent to the watercourse.	Legislation should lead to the Scheduling of any nationally important monuments	1. Environmental Action Plan (see above)	+	Potential research / educational benefits if discovered.
			Legislation requires the reporting of finds of 'treasure'	2. Any finds should be recorded immediately, with as precise a location as possible, and reported to the HER database		
				3. Any buried archaeology encountered should result in cessation of activity and appropriate archaeological investigation, consultation with English Heritage, followed by review of the design and activity		
			Residual effect with mitigation:			
			–	Any effects to nationally significant archaeology would be expected to be limited, as if nationally significant archaeology were discovered (via the mitigation identified above), detailed investigation would be expected as a *minimum* end result (up to preservation *in situ* and Scheduling). Effects to regionally or locally significant archaeology may include loss or partial loss, but achieving preservation by record.		
Material Assets						

New / raised defences						
Business / commercial properties, including retail	0	No significant adverse effects identified.	As for 'Local Community'	As for 'Local Community'	++	Reduction in flood risk to any business use / land, associated infrastructure, or other important infrastructure (helping to reduce damage / maintenance)
Agricultural Land						There may be opportunities for multiple benefits, for example through linking flood defence construction with new road construction.
A Roads, B Roads and minor roads						
Railways			**Residual effect with mitigation:**			
Other infrastructure			0	Can minimise significant effects and reduce to negligible.		

Flood proofing and resilience							
Potentially Relevant Baseline Features within Lancashire & Blackpool	**Potential Significant Adverse Effect(s)**		**Pre-Existing Mitigation / Requirements**	**Recommended Mitigation**	**Potential Opportunities / Benefits**		**Potential Enhancement Measures**
Biodiversity							
All habitats and species	0	No significant adverse effects identified.	N/A	N/A	0	None identified.	None identified.
Local Community							
Local residents Local workers / commuters Other visitors (See also 'Recreation')	–	Use of portable measures may leave vulnerable people or those away a lot at greater risk of flooding than others.	Disability Discrimination Act **Residual effect with mitigation:** 0 Can minimise significant effects and reduce to negligible.	1. Ensure households are equipped and able to use flood resilience solutions proposed.	++	Reduced flood risk would improve safety and mental health of local communities and visitors	None identified.
All service / facility buildings and areas	–		As above. **Residual effect with mitigation:** 0 Can minimise significant effects and reduce to negligible.	As above.	+ +	Protection from localised flooding Improved reliability of access.	None identified.
Recreation							
All recreational features	–	As for 'Local Community'	As for 'Local Community' **Residual effect with mitigation:** 0 Can minimise significant effects and reduce to negligible.	As for 'Local Community'	+ +	Protection from localised flooding Improved reliability of access.	None identified.
Geology and Soils							
All geological features and soils	0	No significant potential adverse effects identified.	N/A	N/A	0	None identified.	None identified.
Water Environment							
WFD water bodies and ordinary watercourses or linked directly to them Ordinary watercourses Main rivers	0	No significant potential adverse effect identified.	N/A	N/A	+	Preventing flooding of properties will certain prevent chemical contaminants from entering water bodies during and immediately after flood events.	None identified.
Climatic Factors							
Buildings and infrastructure	0	No significant potential adverse effect identified.	N/A	N/A	+	Protection from localised flooding.	None identified.
Landscape and Townscape							
Built environment - residential and non-residential properties Historic environment features (see below)	–	Minor detractions within townscape.	None relevant - impact must be managed by LFRMS. **Residual effect with mitigation:** 0 Can minimise significant effects and reduce to negligible.	Consider sensitive designs for sensitive locations, for example Conservation Areas.	+	Protection from localised flooding.	None identified.
Historic Environment							
Scheduled Monuments Listed Buildings Conservation Areas	–	May slightly affect setting of historic assets.	Local plan policies for historic environment. **Residual effect with mitigation:** 0	As above for Landscape and townscape. Can minimise significant effects and reduce to negligible.	+	Protection of integrity and setting from damage by localised flooding	None identified. None identified.
Material Assets							
Business / commercial properties, including retail Agricultural Land A Roads, B Roads and minor roads	0	No significant adverse effects identified.	N/A	N/A	++	Reduction in flood risk to any business use / land, associated infrastructure, or other important infrastructure (helping to reduce damage / maintenance)	None identified.

Land management							
Potentially Relevant Baseline Features within Rotherham	**Potential Significant Adverse Effect(s)**		**Pre-Existing Mitigation / Requirements**	**Recommended Mitigation**	**Potential Opportunities / Benefits**		**Potential Enhancement Measures**
Biodiversity							
Sites of Special Scientific Interest (SSSI)	0	It is assumed that land management would not impact these designated sites. Therefore no significant effect is identified.	N/A	N/A	+	Possible protection from damage by extreme flooding	None identified.
Special Areas of Conservation (SAC)							
Special Protection Areas (SPA)							
Ramsar sites - wetlands of international importance							
National Nature Reserve (NNR)							
Local Wildlife Sites and candidate sites	0	No significant potential adverse effect is identified. Woodland and wildlife sites are not likely to be damaged by the types of land management interventions required.	N/A	N/A	+	Possible protection from damage by extreme flooding	Potential opportunities to feed into wider RBMP objectives and link with other local authorities within the river catchment to create larger landscape scale initiatives.
Local Nature Reserves and candidate reserves							
Ancient Woodlands					+	Potential opportunities to improve habitats such as through peat bog restoration or afforestation.	
Fisheries (fish spawning areas)	0	No potential significant adverse effects identified.	N/A	N/A	+	Land management may allow opportunities to maintain base flow in watercourses throughout year and enhance fish passage as a result.	
Local Community							
Local residents	0	No potential significant adverse effects identified.	N/A	N/A	++	Reduced flood risk would improve safety and mental health of local communities and visitors	Potential opportunities to involve volunteers or community groups in landscape management initiatives, which may improve community cohesion and wellbeing.
Local workers / commuters							
Other visitors					+	Forests can be pleasant environments which improve human wellbeing.	
Town and local centres	0	No potential significant adverse effects identified.	N/A	N/A	++	Protection from harm by extreme flooding	
Other retail areas							
Community facilities (e.g. education, places of worship, health facilities, post offices)							
Public Rights of Way							
Recreation							
Watercourses (angling / fishing, kayaking / canoeing, etc.)	0	No potential significant adverse effects identified.	As for 'Local Community' and 'Biodiversity'	As for 'Local Community' and 'Biodiversity'	++	Reduction in flood risk to recreational areas / facilities	As for 'Local Community'.
Doorstep Green							
Village Greens							
Country Parks							
Allotments							
Green space							

Land management							
Public Rights of Way Cycle routes Road and rail network							
Geology and Soils							
Local Geological Site Regionally Important Geological Sites (RIGS) (known as Geodiversity Heritage Sites in Lancashire) and candidate sites Contaminated land (various types)	0	No potential significant adverse effects identified.	Environmental protection and pollution control legislation.	Prior to any excavation activity, carry out testing of soils for potential contaminants. If found, must liaise with the local authority / Environment Agency and either avoid working those areas, orcreate an appropriate mitigation strategy.	++	Reduction in flood risk to geological sites or contaminated land	None identified.
Agricultural Land Soil quality (unknown)	–	Changes in land management may result in lower agricultural yields or less profitable produce.	Local plan policies for agricultural land use. **Residual effect with mitigation:** – Can minimise significant effects, but minor adverse effects remain possible - *requires monitoring* .	Avoid best and most versatile land.	+	Potential reduction in soil erosion from flooding.	
Water Environment							
WFD water bodies and ordinary watercourses or linked directly to them Main rivers Ordinary watercourses Flood Risk Areas	–	Changes in the flow and hydrology of ordinary watercourses can cumulatively affect main rivers downstream.	Legislation requires no cause of deterioration of a WFD water body on a 'non-temporary' basis. **Residual effect with mitigation:** 0 The LFRMS must ensure compliance with the WFD.	1. Avoid further modification of waterbodies. 2. Conduct WFD assessment of the proposals.	+	Creates new water environments.	See 'Biodiversity'.
Climatic Factors							
Buildings and infrastructure	0	No potential significant adverse effects identified.	As for 'Water Environment.'	N/A	++ +	Opportunity to improve resilience to flood risk through better land management. Changes to land management may improve the carbon storage capacity of soils.	See 'Biodiversity'
Landscape and Townscape							
Built environment - residential and non-residential properties Recreational features Area of High Landscape Value Historic environment features (see below) Other open countryside	–	May result in alteration of landscape, countryside or historic environment.	As for 'Biodiversity' and 'Water Environment' **Residual effect with mitigation:** 0 The mitigation identified is likely to avoid a significant townscape / landscape effect.	In addition to 'Biodiversity' and 'Water Environment': 1. Ensure sensitive choice of locations to avoid sensitive landscapes.	++	Reduction in the harm done by extreme flooding can help prevent deterioration in townscape or landscape features.	See 'Recreation'.
Historic Environment							
Scheduled Monuments			Local plan policies for historic environment.	1. Undertake cultural heritage assessment at project level to assess potential impacts upon historic assets. Avoid Scheduled monuments.			

Land management							
Listed Buildings	0	No potential significant effect identified.		2. Environmental Action Plan (see above)	++	Protection of integrity and setting from damage by extreme flooding	None identified.
Conservation Areas			Legislation requires the reporting of finds of 'treasure'	3. Any finds should be recorded immediately, with as precise a location as possible, and reported to the HER database			
			Residual effect with mitigation:				
Potential buried / undiscovered archaeological remains	–	Excavation activities can lead to loss of, or harm to, buried archaeology.	0	Likely to be negligible.	+	Potential research / educational benefits if discovered.	None identified.
Socio-Economics / Material Assets							
Business / commercial properties, including retail	0	Assuming land management options would avoid key infrastructure, no significant adverse effect is identified.	As for 'Local Community'	As for 'Local Community' and 'Geology and Soils'.	++	Reduction in flood risk to any business use / land, associated infrastructure, or other important infrastructure (helping to reduce damage / maintenance)	None identified.
Agricultural Land							
A Roads, B Roads and minor roads							
Railways			**Residual effect with mitigation:**				
Other infrastructure			0	Negligible.			