URS

SEA of the Northumberland Local Flood Risk Management Strategy

Environmental Report (Final)

July 2015

Prepared for:
Northumberland County Council

REVISION SCHEDULE					
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1 INTRODUCTION

1.1 Background

1.1.1 Northumberland County Council (NCC) has worked to produce a Local Flood Risk Management Strategy (LFRMS) as a key duty under Section 9 of the Flood and Water Management Act, (FWMA, 2010). The purpose of the LFRMS is to guide the management of local flood risk across the County.

1.1.2 The LFRMS has been informed by this Strategic Environmental Assessment (SEA), which identifies the likely significant effects of the strategy and helps to demonstrate how the LFRMS contributes to the achievement of wider environmental objectives.

1.2 SEA Explained

1.2.1 SEA is a process that involves the systematic identification and evaluation of the potential environmental impacts of high-level decision-making (e.g. a plan, programme or strategy).

1.2.2 SEA is also a tool for communicating the likely effects of a 'plan', 'programme' or 'strategy' (and any reasonable alternatives), explaining the decisions taken with regard to the approach decided upon, and encouraging engagement from key stakeholders such as local communities, businesses and stakeholders.

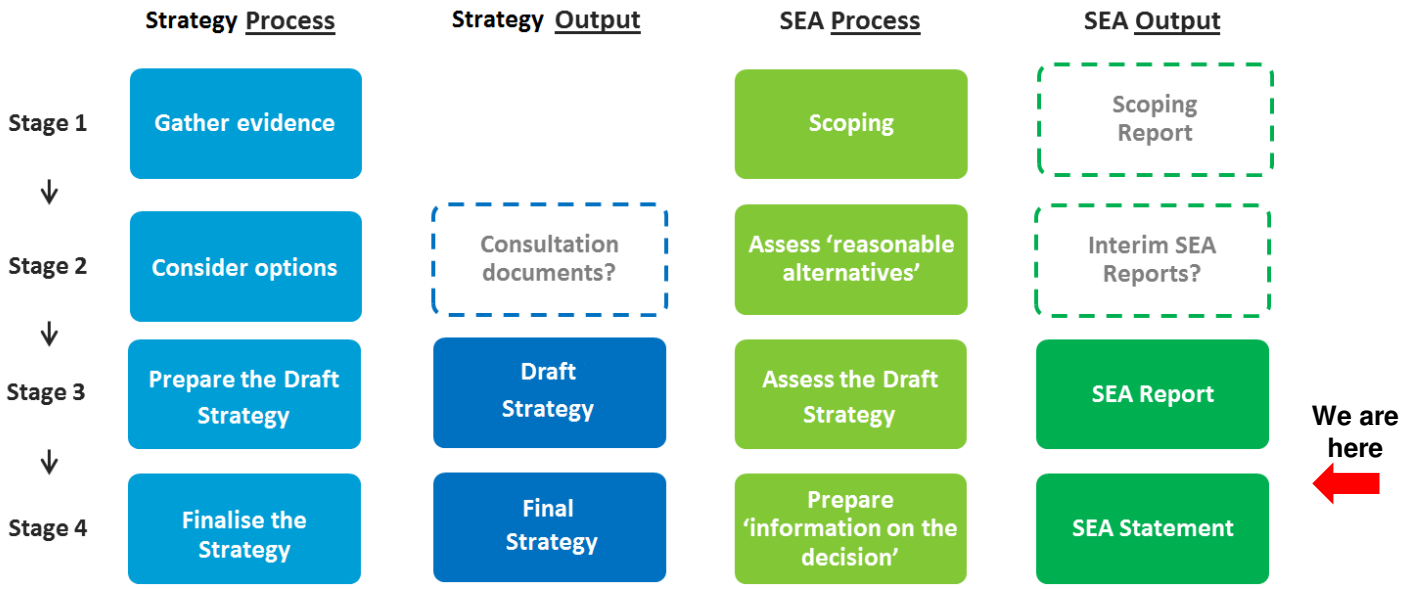
1.2.3 Although SEA can be applied flexibly, it is a legal requirement under the Environmental Assessment of Plans and Programmes Regulations 2004 (*which were prepared in order to transpose into national law the EU Strategic Environmental Assessment (SEA) Directive*).[1]

1.2.4 The regulations set out prescribed processes that must be followed. **In particular, the regulations require that a report is published for consultation alongside the draft LFRMS** that *'identifies, describes and evaluates' the likely significant effects of implementing 'the plan, and reasonable alternatives'*.[2] The Environmental report must then be taken into account alongside consultation responses when finalising the LFRMS.

1.2.5 SEA can be viewed as a four-stage process that produces a number of statutory and non-statutory outputs. As illustrated in **Figure 1-1**, 'scoping' is a mandatory process under the SEA Directive, but the publication of a scoping report is a voluntary (but useful) output.

[1] Directive 2001/42/EC: http://ec.europa.eu/environment/eia/sea-legalcontext.htm
[2] Regulation 12(2) http://www.legislation.gov.uk/uksi/2004/1633/regulation/12/made

Figure 1-1: The 'Four-Stage' SEA Process



1.3 What stage of the SEA process are we at?

1.3.1 Undertaking an SEA is an iterative process, but it typically follows the four stages identified in figure 1.1 above.

1.3.2 This Environmental Report essentially represents the outcome of stages 1, 2, 3 and 4 of this process.

1.3.3 Stage 1: Scoping

1.3.4 The scoping stage of SEA involves the following key tasks, which are undertaken to identify the environmental issues that should be a focus of the SEA and how the assessments will be undertaken.

- Reviewing the policy context.
- Establishing the current and projected baseline position for a range of environmental factors.
- Identifying the key environmental issues.
- Establishing a methodological framework that will be used as a basis for undertaking assessments (referred to as a SEA Framework).
- Identifying limitations and assumptions.

1.3.5 After gathering this information, the Council prepared a Scoping Report, to present the scope of the SEA to interested parties.

1.3.6 The Scoping Report was published and sent to the statutory bodies (English Heritage, Natural England, and the Environment Agency) to seek input and feedback on the scope of the SEA. In particular whether:

- the relevant policy context had been reviewed;

- up-to-date and relevant baseline information had been gathered;
- the most important environmental issues have been identified; *and*
- the assessment methodology is appropriate.

1.3.7 Following the period of consultation (which lasted 5 weeks between July 10th and August 15th, 2014), the Council responded to feedback as deemed necessary before finalising the Scoping Report. However it should be remembered that the scope of the SEA constantly evolves as new evidence and information become available.

Stage 2: Assessment of Reasonable Alternatives

1.3.8 Stage 2 of the SEA process involves identification and assessment of 'reasonable alternatives'. This means comparing different approaches that could be taken to achieve the objectives of the LFRMS.

As explained in Chapter 17 of this report, the Council considers that there are no reasonable alternatives to the LFRMS.

Stage 3: Assessment of the Draft LFRMS

1.3.9 The SEA process runs parallel to the preparation of the LFRMS. Therefore, as the LFRMS was being developed, it was useful to undertake an assessment of the emerging principles, objectives, measures and actions. This meant that the findings of the SEA could be taken into consideration before the LFRMS was finalised.

1.3.10 This Environmental Report sets out an assessment of the draft LFRMS.

Stage 4: Assessment of the final LFRMS

1.3.11 Once the LFRMS had been finalised, the SEA was updated to reflect any minor changes to the strategy made in light of consultation responses and the SEA findings. The Environmental Report was updated to reflect any changes.

2 NORTHUMBERLAND AND THE NORTHUMBERLAND LFRMS

2.1 Northumberland Context

2.1.1 The study area is identified within **Figure 2-1**. The county of Northumberland is located within the North East of England, with a total population of approximately 316,100[3].

2.1.2 Northumberland is the sixth largest county in England with a land area of 5,013 sq km. However it has a population of approximately 316,100 making it one of the least densely populated counties (63 people per sq km). There is an uneven distribution of population with over half of the population living in the urbanised south east (within Ashington, Blyth, Cramlington and Bedlington), which covers only 5% of the county's land area.

2.2 Northumberland LFRMS

2.2.1 NCC is designated a Lead Local Flood Authority (LLFA) under the FWMA and as such has responsibilities, duties and powers to help manage flood risk across the County.

2.2.2 The purpose of the LFRMS is to identify the extent of flood risk in Northumberland, how it will be managed in partnership with others and to outline Northumberland's approach to local flood risk management in the County.

2.2.3 The LFRMS will build upon the Preliminary Flood Risk Assessment (PFRA) produced in August 2011. The PFRA provided a high level overview of existing and potential flood risk from a variety and combination of flood sources; including surface water, groundwater and ordinary watercourses, as well as the interaction with Environmental Agency designated Main Rivers and reservoir flooding. The LFRMS will also build upon the Strategic Flood Risk Management Assessments (Level 1), prepared in September 2010.

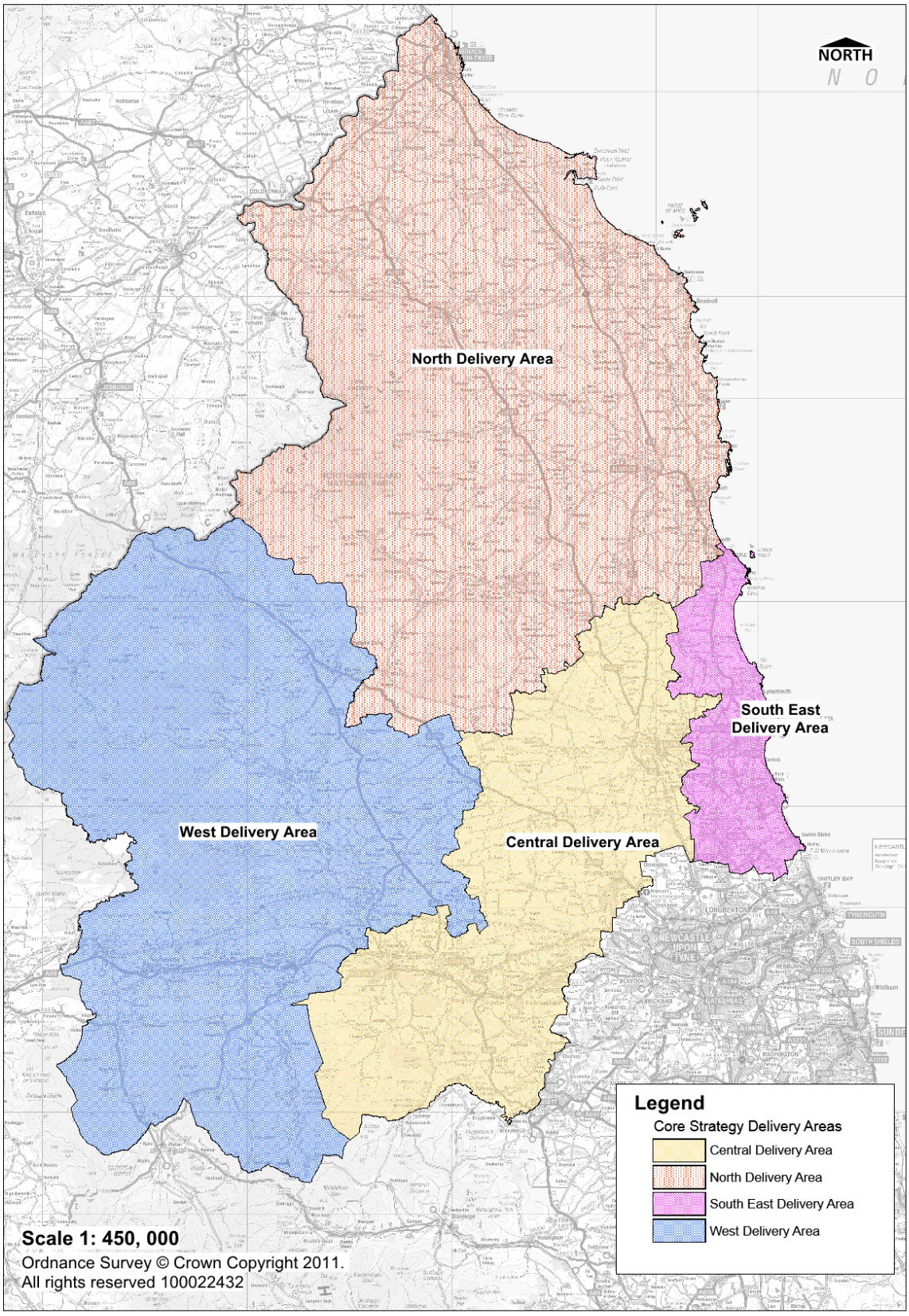
2.2.4 The SEA process has been fully integrated into the development of the LFRMS to ensure that environmental considerations are taken into account. The Environmental Report shows how the SEA has influenced the LFRMS process. Where possible, the SEA identified opportunities for environmental enhancement as well as mitigating any potentially adverse effects of the LFRMS.

2.2.5 The County Council has considered national objectives for flood risk management set by the Environment Agency and used them as a basis to develop local objectives and a series of measures or actions for inclusion in the LFRMS (see **Table 2-1**).

[3] Office of National Statistics (ONS) 2012: http://www.nomisweb.co.uk/reports/lmp/la/1946157061/report.aspx. Accessed 2/05/2014.

TABLE 2-1: FLOOD RISK MANANGEMENT OBJECTIVES AND MEASURES	
Objectives	**local measures**
LFRMS 1: Improve knowledge and understanding of flood risk throughout Northumberland	1. Identify and prioritise local flood risks, whilst taking into account the anticipated effects of climate change
	2. Work in collaboration with other risk management authorities to ensure a holistic approach to flood risk
	3. Investigate and record details of historic flood events to improve understanding and build-up an evidence base
	4. Develop and maintain the Flood Risk Asset Register to identify key flood risk assets and who is responsible for their maintenance
LFRMS 2: Promote sustainable development to reduce local flood risk with consideration of the anticipated impact of climate change	1. Inform planning policy to encourage new development in low risk areas and restore flood plains and promote sustainable, resilient development
	2. Ensure appropriate and adequate sustainable drainage solutions are included in all new developments
	3. Advocate a catchment wide approach to sustainable development and land management practices to contribute towards reducing flood risk, better water quality and wider environmental benefits
LFRMS 3: Actively manage flood risk and drainage infrastructure to reduce the likelihood of flooding throughout Northumberland	1. Use our understanding of flood risk throughout Northumberland to develop risk based, long term maintenance procedures for management of our existing flood risk.
	2. Ensure our limited resources are invested in higher risk priority areas where measures will improve social, environmental and economic benefits defenses
	3. Seek partnership working opportunities so that those that benefit from existing or proposed flood risk assets can contribute towards their planning and management
LFRMS 4: Encourage communities to become more resilient to flooding by increasing public awareness and understanding their concerns	1. Engage with communities through existing groups and networks to raise awareness of the flood risk within their area
	2. Use a range of media techniques to increase the potential for community engagement activities to reach the entire community
	3. Help communities understand the benefits of local flood plans and the importance of local flood risk assets in terms of community resilience and preparedness for flooding
LFRMS 5: Be better prepared for flood events and post flood recovery	1. Monitor and analyse warnings issued by the Environment Agency and Met Office to co-ordinate and prepare our response to extreme weather events
	2. Continue to work with other risk management authorities and partners to ensure consistent and efficient emergency response plans and support those who have been affected by flooding
	3. Use our local knowledge of flood risk to prioritise actions in advance of a potential flood incident

Figure 0-1: Map of Northumberland, split by Local Plan 'Delivery Areas'



3 STAGE 1: SCOPING

3.1 Introduction

3.1.1 In essence, scoping is the process of gathering information about the area and factors likely to be affected by the strategy. This information helps to identify what the key issues are and which of these should be the focus of the assessment.

3.1.2 The scoping process is typically recorded formally in a Scoping Report, which sets out the following:

- The contextual review / policy framework;
- The current and projected environmental baseline;
- Key environmental issues; *and*
- An SEA Framework and methodology for assessment.

3.1.3 A Scoping Report was prepared by the Council and was sent to English Heritage, Natural England and the Environment Agency (the statutory consultation bodies) for a five-week period (10th July – 15th August, 2014) to seek feedback on the scope of the SEA. **Appendix A** sets out a summary of responses received and the Council's response to these comments.

3.1.4 The content of the Scoping Report has been reproduced in this Environmental Report (essentially forming 'stage 1'), but has been updated where necessary to reflect relevant consultation responses and further evidence.

3.2 Scoping: key tasks

Contextual review / policy framework

3.2.1 An important step when seeking to establish the appropriate 'scope' of the SEA involves reviewing 'contextual' messages (*e.g. issues, objectives or aspirations*) set out within relevant published plans, policies, strategies and initiatives (PPSIs) at international, national and local level. Environmental context messages are important, as they aid the identification of the 'issues and opportunities' that should be a focus of the SEA. Assessments should also take account of the cumulative impacts that could arise as a result of other plans and programmes within and beyond the strategy period.

The current and projected baseline

3.2.2 Another important step when seeking to establish the 'scope' of an SEA involves reviewing the current state of the environment for a range of environmental topics. Doing so helps to identify those key environmental topics that should be a particular focus of the appraisal, and also helps to provide 'benchmarks' for the appraisal of significant effects.

3.2.3 Just as it is important for the scope of SEA to be informed by an understanding of current baseline conditions, it is also necessary to consider how the baseline conditions might 'evolve' in the future under the no strategy / business as usual scenario.

3.2.4 The SEA Regulations identify a non-exclusive list of environmental 'topics' that may be appropriate for initial consideration within a SEA. These include;

- Population
- Human Health
- Air
- Soil
- Water
- Climatic Factors
- Material Assets
- Landscape
- Biodiversity, Flora and Fauna
- Cultural, Architectural and Archaeological Heritage

3.2.5 This list serves as a useful starting point from which issues can be scoped out-of or into the SEA depending upon whether or not they are considered likely to affect or be affected by the LFRMS.

3.2.6 It is important to note that the SEA should only address impacts at a strategic level, and not seek to identify the effects that are likely to result due to individual projects (for example the construction of flood defence schemes). These issues are more appropriately considered during project level Environmental Impact Assessment (EIA), or through the planning application process.

3.2.7 Given the scope of the LFRMS it was considered that the following topics (**Table 3-1**) could be 'scoped out' of the SEA as it is unlikely there would be significant effects as a result of the implementation of the LFRMS.

TABLE 3-1: TOPICS SCOPED OUT OF THE SEA

Topic	Reason for being scoped out
Air Quality	Air quality is unlikely to be significantly affected by flood risk management options. Potential effects on air quality are likely to be limited to short-term and temporary effects during the construction phase of engineered flood defences and can be assessed at project level.
Noise	Levels of noise disturbance are unlikely to be significantly affected by flood risk management options. Potential effects on noise are likely to be limited to short term temporary effects during the construction phase of engineered flood defences.
Landscape	Whilst there are a number of sensitive and important landscapes across the County, it is unlikely that the LFRMS would have a significant impact upon the character or extent of these.
Waste	Whilst some waste facilities are vulnerable / incompatible with areas at risk of flooding, the siting of new facilities would be determined through the planning process and the sequential test can be applied at project level.
Climatic Factors (*Carbon emissions*)	In the main, carbon emissions from, domestic, industrial and commercial sources have decreased across Northumberland over the last five years. Although flooding can affect the siting and operation of energy generation schemes, the LFRMS is unlikely to have a significant influence on these issues. Whilst the move towards lower carbon sources of energy generation will need to take account of issues such as flood risk, these issues are more appropriately dealt with through the process of preparation of statutory planning documents or individual projects that would most likely require an Environmental Impact Assessment.

3.2.8 The topics that were 'scoped in' and where the focus of the scoping process for the LFRMS are listed below in **Table 3-2**.

TABLE 3-2: SEA TOPICS

Chapter	Topics
4	• Population
5	• Deprivation
6	• Resilience to climate change
7	• Biodiversity, fauna and flora
8	• Historic environment
9	• Water resources
10	• Human health
11	• Community facilities and critical infrastructure
12	• Housing
13	• Economy
14	• Agriculture and land use

3.2.9 Each of these topics formed a chapter in the Scoping Report, and for each topic the following information was presented:

- The policy framework / contextual review;
- The current and projected baseline;
- A summary of the key issues identified.

3.2.10 This information has been reproduced and updated as necessary in the following chapters of the Environmental Report (as listed above in table 3-2).

4 POPULATION

4.1 Introduction

4.1.1 People are both affected by and can affect flood risk (for example, through land management practices such as agriculture, or even by paving over private gardens, which can increase surface water run-off). It is therefore important to establish the key demographical trends for Northumberland.

4.1.2 This chapter sets out the relevant policy framework/contextual review and baseline position for 'population'. The chapter concludes by drawing together the evidence presented to identify the key issues and opportunities related to 'population' that should be a focus for the SEA.

4.2 Contextual review

TABLE 4-1: POPULATION: CONTEXTUAL REVIEW

Source	Key Messages
1.1 EU Floods Directive, 2007/60/EC on the assessment and management of flood risks.	Requires all Member States to assess whether all watercourses and coastlines are at risk from flooding. It requires a six-year cycle of flood risk assessment, mapping and planning, including considering the impact of flooding on people, the economy and the environment.
1.2 National Planning Policy Framework (NPPF, 2012).	Directs development to the lowest flood risk areas and ensures that where development does go ahead, that it has taken into account the flood risk both to and from that development for the lifetime of that development.
Sustainable Communities Plan (Sustainable Communities: Building for the Future, 2003)	The Plan sets out a number of key objectives for the UK, including: • To develop sustainable communities; • To deliver a step change in housing supply; • To deliver growth areas throughout the country; • To ensure decent homes are delivered; and • To protect the countryside and the local environment.

4.3 Existing and projected baseline

4.3.1 Northumberland had an estimated population of 316,100 in 2012, as detailed in **Table 4-2**.

TABLE 4-2: NORTHUMBERLAND POPULATION ESTIMATES[4]

Area	2008	2009	2010	2011	2012
Northumberland	314,100	314,500	315,500	316,300	316,100

4.3.2 Between 2003 and 2012, the population of Northumberland increased by 2.2%, equating to an estimated additional 6,700 people. This was similar to the regional increase of 2.4% but some way off the national increase of 7.1%[5].

[4] Mid-Year Estimates, ONS via: www.nomisweb.co.uk
[5] Mid-Year Estimates, ONS via: www.nomisweb.co.uk

4.3.3 There is an uneven distribution of population in the county with over half of all residents living in the urbanised south east, which covers only 5% of the county's land area. There is a very low population density in the rural north and west, which creates particular challenges for the delivery of services.

4.3.4 The Office for National Statistics (ONS) Sub-National Population Projections are produced every 2-3 years and identify the projected population changes in local authority areas throughout the UK based on current assumptions about fertility, mortality and migration. The 2011 statistics suggest that by 2021, the population of Northumberland is projected to increase to 326,800, a percentage change of 3.1% from 2012. For Northumberland the age group with the greatest projected percentage change in population is 65+ years (24.4%)[6].

TABLE 4-3: NORTHUMBERLAND POPULATION ESTIMATES[7]

Area	2012	2015	2018	2021
Northumberland	317,100	320,300	323,500	326,800
North East	2,610,200	2,650,600	2,688,500	2,723,800
England	52,234,045	54,468,191	58,607,135	62,078,412

4.3.5 The Northumberland ONS mid-year population estimates for 2012 indicate that:

- The age group with the highest proportion of people is 44-64 year olds (30%);
- 16.9% of the population are aged between 0-15;
- 62% are aged 16 - 64 and 21.1% are 65+; and
- Northumberland has quite a large proportion of older population when compared with the national population, with 16.9% of the population in England aged 65 years or older.

TABLE 4-4: PERCENTAGE CHANGE IN POPULATION BY AGE[8]

Mid-2003 to Mid-2012	All Persons	0-15 Years	16-64 Years	65+ Years
Northumberland	2.2%	6%	-0.5%	19.8%
North East	2.4%	-4.9%	2.5%	10.4%
England	7.1%	2.9%	6.7%	14.2%

4.3.6 Population growth is likely to result in increased demand on existing infrastructure services, such as sewerage networks and local water supplies.

4.3.7 The requirement for additional housing can also result in development that causes land take of greenfield (and brownfield) land, and increased flood risk to the new development or the surrounding local area as a result of increased areas of hard-standing, which can increase the speed of surface water runoff. In turn, this can increase pressure on biodiversity and ecosystems by affecting natural drainage patterns. However, new development could also bring opportunities, such as the incorporation of sustainable urban drainage systems (SUDS) and the retro-fitting of SUDS to adjacent existing development. This would lead to a return towards more natural patterns of drainage. An increase in green infrastructure could also have wider benefits for existing local communities such as better access to recreational opportunities.

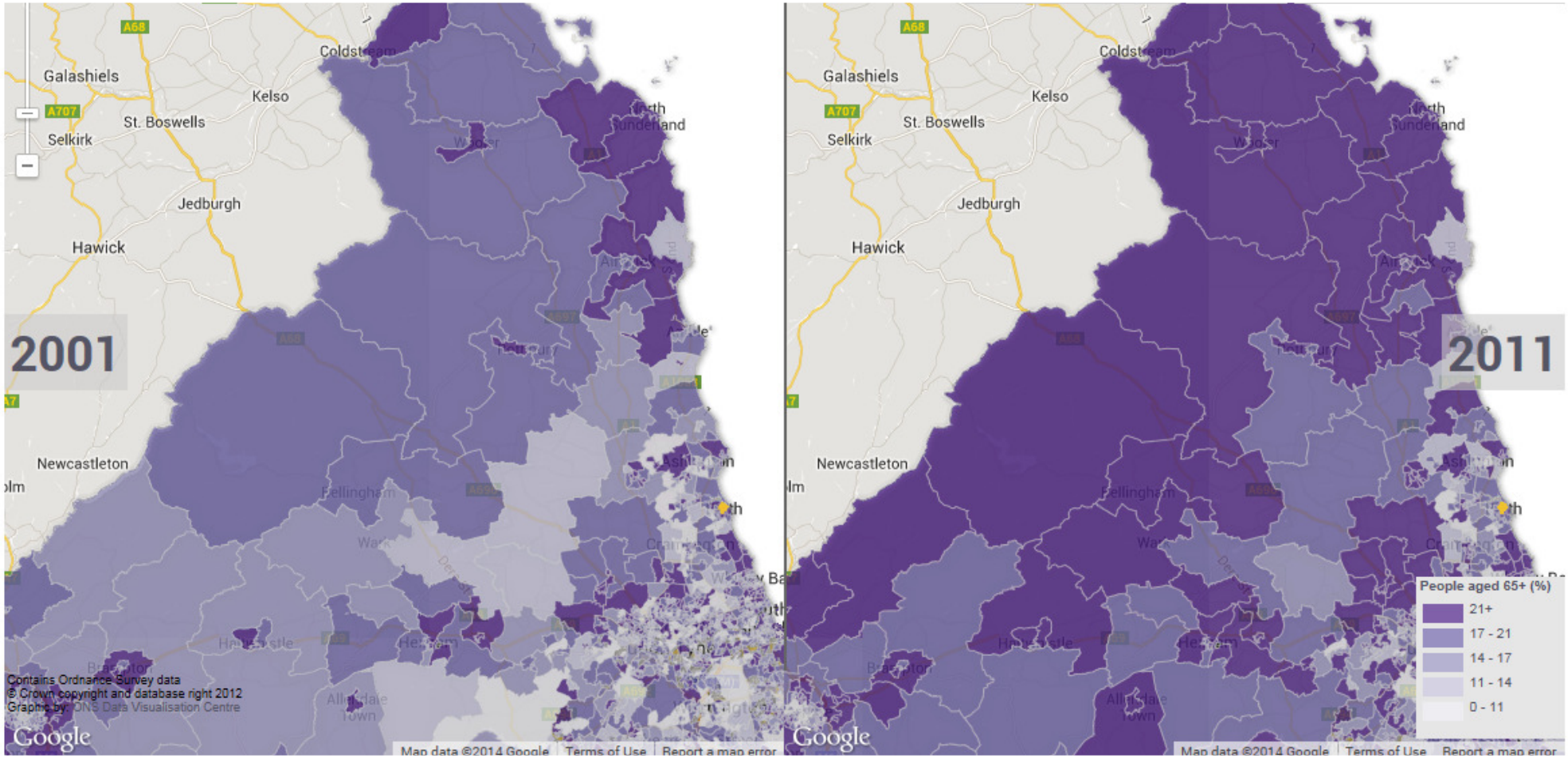
[6] ONS , 2011
[7] Mid-Year Estimates, ONS via: www.nomisweb.co.uk
[8] Office for National Statistics (ONS) (2012)

4.3.8 **Figure 4-1** shows the pattern of where older people live across Northumberland. It is evident that there are greater percentages of older people living in the rural areas to the north and west of the County. It can also be seen that the percentage of older people has increased since the 2001 Census. The isolated nature of rural areas can mean that older people in these areas find it more difficult to access services and it could take longer for emergency / support services to reach them.

4.3.9 Local research suggests that there are small concentrations of migrants in the areas of Berwick, Blyth Valley and Alnwick in particular[9]. Access to services was not reported as a particular problem for most participants that took part in the study. However, most migrants had low-income jobs and single males in particular had difficulty finding housing; which could make them more vulnerable to the effects of flooding.

[9] Northumberland Strategic Partnership (2009) Community Based Research with international migrants in Northumberland http://www.barefootresearch.org.uk/wp-content/uploads/Community-based-research-with-international-migrants-in-no….pdf

Figure 4-1: Distribution of people aged over 65+ between 2001 and 2011 (Source: Office for National Statistics)



4.4 Key Issues

4.4.1 The key issues arising from the contextual review and baseline assessment relating to 'population' in Northumberland are set-out in **Table 4-5.**

TABLE 4-5: KEY ISSUES AND RELEVANCE TO THE LFRMS

Key Issue	Relevance to the LFRMS
Northumberland's population is projected to continue growing, with a heavy concentration of residents living in the urban areas to the south east of the County.	Population growth is likely to result in increased demand and increased reliance on existing infrastructure services, such as sewerage networks and local water supplies. The subsequent increase in built development could also affect the number of people at risk of flooding by increasing surface water run-off rates
The number and proportion of people within the age group 65+ is also expected to increase.	This population group are likely to be more vulnerable to the effects of flooding.

5 DEPRIVATION

5.1 Introduction

5.1.1 Quality of life is affected by flooding. Poor quality of life and living conditions can also make communities more vulnerable to the effects of flooding. The more deprived a community, the more likely they are to be more significantly affected by the impact of flooding. These communities typically have lower levels of awareness about flood risk, and may already be suffering from poor health. Those communities that suffer losses and have low incomes and / or no insurance, may also be more susceptible to psychological health impacts, and by extension, physical health impacts[10].

5.1.2 This chapter sets out the relevant policy framework/contextual review and baseline position for 'deprivation'. The chapter concludes by drawing together the evidence presented to identify the key issues and opportunities that relate to 'deprivation' and which should be a focus for the SEA.

5.2 Contextual review

TABLE 5-1: DEPRIVATION: CONTEXTUAL REVIEW

Source	Key Messages
The Urban White Paper: Our Towns and Cities: The Future - Delivering an Urban Renaissance (2000)	The central purpose of the Paper is to address urban decline and it starts with a holistic approach to policy which recognises the need to link together a range of initiatives on housing, planning, education, transport and law and order issues.
Marmot Health Inequalities Review – Fair Society, Healthy Lives (2010)	The relevant objectives set out in the Review are to: • Create and develop healthy and sustainable places and communities.
The Northumberland Poverty and Worklessness Assessment – Updated in 2012	The report provides a broad spectrum of evidence relating to child poverty and related areas. The role of the document is to assist NCC, Northumberland Strategic Partnership (NSP) and the Northumberland Families and Children's Trust to understand the poverty and worklessness agenda in order to inform future priorities and statutory requirements.

5.3 Existing and projected baseline

5.3.1 The Index of Multiple Deprivation (IMD) 2010 produced by the Department for Communities and Local Government (DCLG) highlights the variation across the County in terms of the incidence of deprivation and social disadvantage. The IMD brings together 38 different indicators covering seven specific aspects or domains of deprivation including Income, Employment, Health and Disability, Education, Skills and Training, Barriers to Housing and Services, Living Environment and Crime.

5.3.2 Northumberland has an average rank of 144 of the 326 local authorities in England. In comparison with other local authorities in the North East, Northumberland has the second lowest proportion of Local Super Output Areas (LSOAs) in the most deprived 10% and the third highest proportion in the 10% least deprived. Northumberland has 16 LSOAs in the most deprived 10% (one more than in 2007). **Figure 5.1** (on page 20) shows that all of these most deprived LSOAs are in the South East

[10] Environment Agency (2006) Addressing Environmental Inequalities: Flood Risk. Science Report: SC020061/SR1

area of the county in the urban areas. This area also contains several LSOAs that fall into the 11% to 20% and 21% to 30% most deprived.

TABLE 5-2: LSOAS IN THE MOST DEPRIVED 10% OF IMD 2010[11]

LSOA	Name	Electoral Division LSOA falls within	Score	Rank
E01027416	Blyth Valley 001C	Croft	66.29	400
E01027540	Wansbeck 003B	Hirst	60.31	801
E01027415	Blyth Valley 002B	Croft	58.05	1,035
E01027533	Wansbeck 003A	College	55.53	1,332
E01027547	Wansbeck 003C	College/Seaton with Newbiggin West	55.02	1,406
E01027412	Blyth Valley 007D	Cramlington West	53.74	1,582
E01027542	Wansbeck 001B	Newbiggin Central and East	53.14	1,669
E01027545	Wansbeck 002D	Ashington Central/College/Hirst	52.12	1,835
E01027392	Blyth Valley 001A	Cowpen/Kitty Brewster	51.62	1,907
E01027426	Blyth Valley 004B	Newsham	51.52	1,928
E01027539	Wansbeck 002C	Hirst	50.12	2,159
E01027543	Wansbeck 001C	Newbiggin Central and East/Seaton with Newbiggin West	50.12	2,161
E01027424	Blyth Valley 001D	Kitty Brewster	49.4	2,298
E01027527	Wansbeck 004D	Ashington Central	49.04	2,372
E01027518	Wansbeck 007C	Bedlington Central	47.06	2,757
E01027393	Blyth Valley 001B	Cowpen/Kitty Brewster	45.91	3,021

TABLE 5-3: LSOAS IN THE LEAST DEPRIVED 10% OF IMD 2010[12]

LSOA	Name	Electoral Division LSOA falls within	Score	Rank
E01027455	Castle Morpeth 005A	Morpeth Kirkhill	1.93	32,321
E01027468	Castle Morpeth 007B	Ponteland South with Heddon	2.96	31,844
E01027458	Castle Morpeth 005C	Morpeth Kirkhill	3.38	31,552
E01027470	Castle Morpeth 006E	Ponteland West	3.43	31,507
E01027456	Castle Morpeth 005B	Morpeth North	3.66	31,316
E01027400	Blyth Valley 006A	Cramlington North	3.91	31,118
E01027464	Castle Morpeth 006A	Ponteland East	4.15	30,910
E01027402	Blyth Valley 006C	Cramlington North	4.16	30,898
E01027492	Tynedale 004E	Hexham West	4.56	30,488
E01027367	Alnwick 001D	Longhoughton	4.62	30,438

[11] English Indices of Deprivation 2010: Northumberland Analysis, InfoNet Research Report, May 2011
[12] Ibid.

5.3.3 The most deprived LSOA in Northumberland is within the Croft electoral division in Blyth Valley, which is ranked the 400th (of 32,482 LSOAs) most deprived in England (falling within the 2% most deprived LSOAs in the country).

5.3.4 The least deprived LSOA is located in the Morpeth Kirkhill electoral division, which is ranked 32,321 of 32,482 (falling within the 1% of least deprived LSOAs in the country). **Tables 5-2 and 5-3** identify the most and least deprived LSOAs in Northumberland.

5.3.5 The northern and western areas of Northumberland have low population densities heightened by seasonal trends in holiday and second home occupation. Reduced accessibility to services and higher living costs are assessed in the 'Barriers to Housing & Services' domain, which measures the physical and financial accessibility of housing and key local services. Due to the way in which the different domains are weighted to create the overall Index of Multiple Deprivation, problems caused by rural isolation are typically underestimated as a factor in deprivation. Northumberland has 24 LSOAs in the most deprived decile of the 'Barriers to Housing & Services' domain, all of which fall within the north and west areas of the County away from major settlements.

5.3.6 Examining the IMD domains for 'income', 'employment', 'health deprivation and disability', 'education', 'skills and training' and 'crime', these are most severe in South East Northumberland, whereas within the domains of 'barriers to housing and services' and 'living environment' deprivation is more apparent in the rural areas of Northumberland[13].

5.4 Key Issues

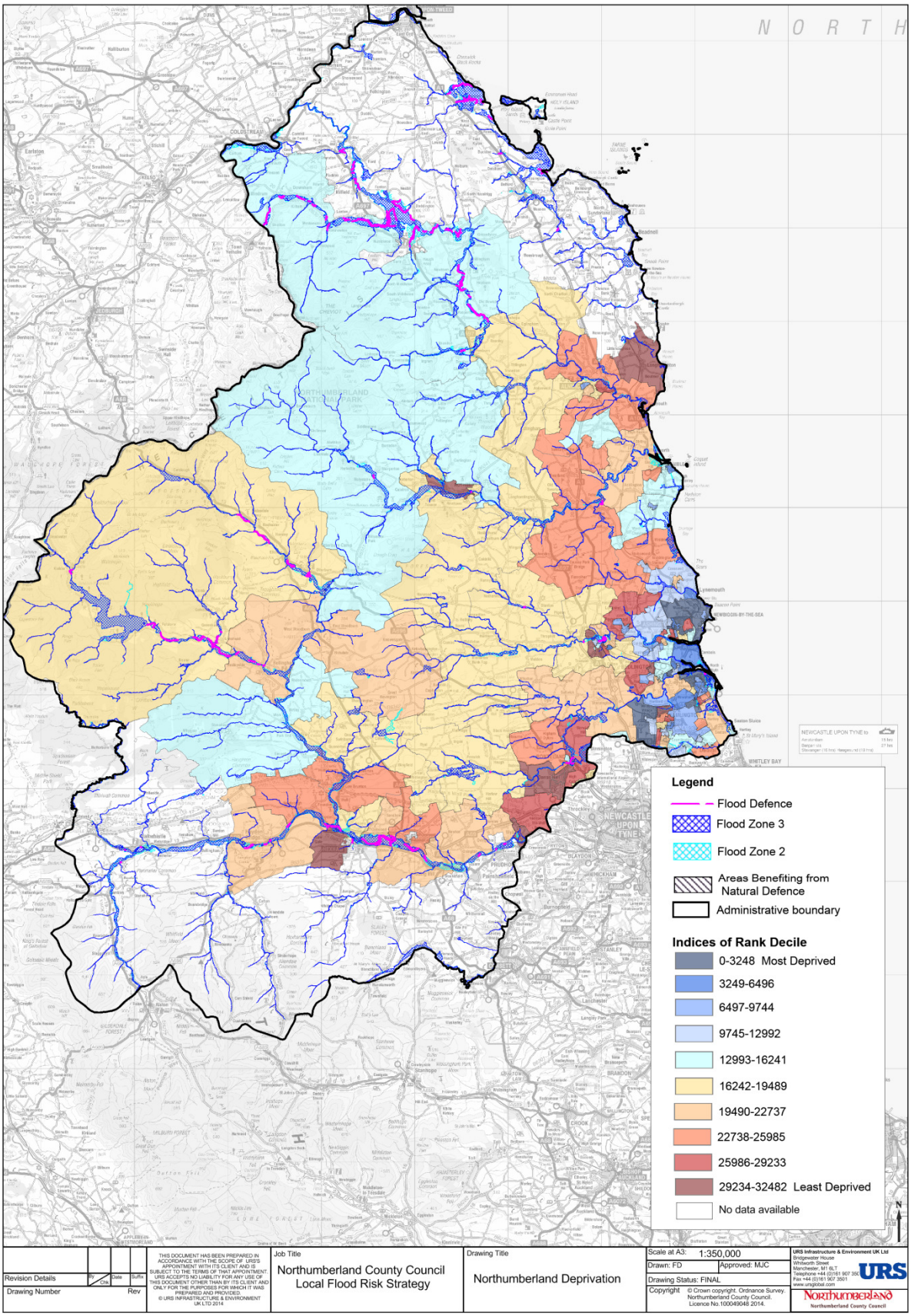
5.4.1 The key issues arising from the contextual review and baseline assessment relating to 'deprivation' in Northumberland are set out in **Table 5-4**.

TABLE 5-4: KEY ISSUES AND RELEVANCE TO THE LFRMS

Key Issue	Relevance to the LFRMS
There are concentrations of deprivation within the main settlements to the South East of the County.	Deprived communities are often more vulnerable and less resilient to the effects of flooding.

[13] English Indices of Deprivation 2010: Northumberland Analysis, InfoNet Research Report, May 2011

Figure 5-1: Northumberland IMD 2010 Overall Index and flood risk



6 HUMAN HEALTH

6.1.1 Flooding can have an adverse effect on the physical and mental health of communities. People already suffering from poor health may also find it harder to adapt to or recover from flood events.

6.1.2 This chapter sets out the relevant policy framework/contextual review and baseline position for 'human health'. The chapter concludes by drawing together the evidence presented to identify a series of key issues and opportunities that relate to 'human health' and which should be a focus for the SEA.

6.2 Contextual review

TABLE 6.1: HUMAN HEALTH: CONTEXTUAL REVIEW

Source	Key Messages
National Planning Policy Framework NPPF (2012)	The NPPF identifies the planning system's social role as being able to 'support vibrant and healthy communities', with a core planning principle being; *'to take account of and support local strategies to improve health, social and cultural wellbeing for all'*. The aim is to achieve places that promote social interaction, and which are safe and accessible.
Natural England's Accessible Natural Greenspace Standards (ANGST, 2001)	These Standards recommend that people living in towns and cities should have: • An accessible natural greenspace of at least 2 ha in size, no more than 300 metres (5 minutes walk) from home; • At least one accessible 20 ha site within two kilometres of home; • One accessible 100 ha site within five kilometres of home; • One accessible 500 ha site within ten kilometres of home; and • Statutory Local Nature Reserves at a minimum level of one hectare per thousand population. Access to natural greenspace can have a positive impact on health and wellbeing.

6.3 Existing and projected baseline

6.3.1 There is no significant difference in life expectancy at birth between males in Northumberland and in the North East. The life expectancy at birth for females in Northumberland (82.2 years) is greater than that for North East (81.2 years). **Table 6.2** shows the life expectancy data for Northumberland and the North East.

TABLE 6.2: LIFE EXPECTANCY 2008-2010[14] (AVERAGE AGE)

	Males	Females
Northumberland	78.7	82.2
North East	77.2	81.2
England	78.6	82.6

[14] Neighbourhood Statistics, Office for National Statistics (2013)

6.3.2 Over the earliest and the latest time periods covered, in Northumberland the life expectancy at birth for males has increased by 1.0 years compared with a regional increase of 0.9 years. Similarly the life expectancy at birth for females in Northumberland has increased by 0.9 years compared with a regional increase of 0.8 years.

6.3.3 Northumberland had an infant mortality rate of 3.4 deaths per 1,000 live births over the period 2008–10. This compares with the rate for the North East of England region of 3.9 deaths per 1,000 live births[15]. In Northumberland, the all cause age-standardised mortality rate was 558.5 deaths per 100,000 population over the period 2008–10. This compares with the rate for the North East of England region of 624 deaths per 100,000 persons[16].

6.3.4 The Health Profile 2010[17], which compares the health of Northumberland with the rest of England, states that over the last ten years the death rates from all causes have improved and are similar to the national average.

6.3.5 Demands on healthcare in the County are most likely to increase due to a growing population and an increasing elderly population. The types of services required may also alter in relation to the change in population profile as associated illnesses may differ. Increases in energy prices could lead to a higher proportion of people living in fuel poverty, which may also be more likely to affect older people.

6.3.6 There is estimated to be between 21,000 and 24,000 adults aged 18-64 in Northumberland who have a moderate or severe physical disability[18].

6.4 Key Issues

6.4.1 The key issues arising from the contextual review and baseline assessment relating to 'human health' in Northumberland are set out in **Table 6-3**.

TABLE 6-3: KEY ISSUES AND RELEVANCE TO THE LFRMS

Key Issue	Relevance to the LFRMS
Demands on healthcare in the County are most likely to increase due to a growing population and an increasing elderly population.	Flooding can affect the wellbeing and health of communities. Indirect effects can also be important such as preventing access to key services and facilities.

[15] Neighbourhood Statistics, Office for National Statistics (2010)
[16] The Health and Social Care Information Centre (2010)
[17] Health Profile 2010 Northumberland, Department of Health, Association of Public Health Observatories and NHS
[18] Northumberland Joint Service Needs Assessment (2012) www.northumberland.gov.uk

7 CLIMATIC FACTORS / ADAPTATION TO CLIMATE CHANGE

7.1 Introduction

7.1.1 The LFRMS has the potential to enhance resilience to climate change through reducing flood risk or environmental enhancement measures.

7.1.2 This chapter sets out the relevant policy framework/contextual review and baseline position for 'adaptation to climate change'. The chapter concludes by drawing together the evidence presented to identify a series of key issues and opportunities that relate to 'adaptation to climate change' and which should be a focus for the SEA.

7.2 Contextual review

TABLE 7-1: ADAPTATION TO CLIMATE CHANGE: CONTEXTUAL REVIEW

Source	Key Messages
National Planning Policy FrameworkNPPF (2012)	One of the twelve core planning principles set out within the NPPF is to "support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change…" The NPPF requires Local Plans to take account of the effects of climate change in the long term. New developments should be planned so that they avoid increased vulnerability to the impacts of climate change. Where new development is at risk of such impacts, this should be managed through adaptation measures.

7.3 Existing and projected baseline

7.3.1 Climate change projections for the United Kingdom published as part of the UKCP09[19] programme provided detailed probabilistic projections of climate change. Although there is uncertainty in climate change predictions, the following changes are likely to have taken place in the North East by 2080. The changes mentioned below relate to a 'medium emissions scenario'[20]:

- The central estimate of increase in winter mean temperature is 2.6ºC; it is very unlikely to be less than 1.4ºC and is very unlikely to be more than 4.1ºC;
- The central estimate of increase in summer mean temperature is 3.7ºC; it is very unlikely to be less than 2ºC and is very unlikely to be more than 5.8ºC;
- The central estimate of change in winter mean precipitation is 14%; it is very unlikely to be less than 2% and is very unlikely to be more than 32%; and
- The central estimate of change in summer mean precipitation is -18%; it is very unlikely to be less than -36% and is very unlikely to be more than 1%.

[19] Further information on the UKCP09 programme is available from: http://ukclimateprojections.defra.gov.uk/.
All of the information in relation to climate change projections was obtained from the UKCP09 website.

[20] Projections are set out within the UKCP09 programme, which correspond to three emissions scenarios (Low, Medium and High). The key characteristics of each of these scenarios are:
Medium emissions Scenario - describes a world that has rapid economic growth, quick spreading of new and efficient technologies, and a global population that reaches 9 billion mid-century and then gradually declines. It also relies on a balance between different energy sources.
High emissions Scenario - similar economic and population trends as the Medium emission scenario but more emphasis on power generation from fossil fuels.
Low emissions scenario - represents a more integrated ecologically friendly world, characterised by clean and resource efficient technologies, and lower global greenhouse gas emissions.

7.3.2 In the future the North East is therefore likely to experience a warmer climate with drier summers and wetter winters, which means that extreme events such as floods and droughts are likely to become less predictable and possibly more frequent. Development pressures will also be likely to increase CO2 emissions in the future, contributing towards the impacts of climate change.[21]

7.4 Key Issues

7.4.1 The key issues arising from the contextual review and baseline assessment relating to 'adaptation to climate change' in Northumberland are set out in **Table 7-2** below.

TABLE 7-2: KEY ISSUES AND RELEVANCE TO THE LFRMS

Key Issue	Relevance to the LFRMS
Climate change is anticipated to exacerbate flood risk.	Flood risk management initiatives can help to improve resilience to the effects of climate change by reducing flood risk, and enhancing habitats and open space, which can have knock-on benefits for health and wellbeing.

[21] UK Climate Change Programme http://ukclimateprojections.defra.gov.uk/.

8 BIODIVERSITY, FAUNA AND FLORA

8.1 Introduction

8.1.1 Actions arising from the LFRMS could have direct or indirect effects on wildlife habitats and species. For example, the retention of water could affect habitats that are water dependant. Flooding could also potentially change the nature of habitats and conversely natural habitats can also help to regulate flood risk.

8.1.2 This chapter sets out the relevant policy framework/contextual review and baseline position for 'biodiversity, fauna and flora'. The chapter concludes by drawing together the evidence presented to identify the key issues and opportunities related to biodiversity, flora and fauna' that should be a focus for the SEA.

8.2 Contextual review

TABLE 8-1: BIODIVERSITY, FAUNA & FLORA: CONTEXTUAL REVIEW

Source	Key Messages
The Habitats Directive (92/43/EEC) and **The 1992 Birds Directive** (79/409/EEC)	There is a requirement to take measures to maintain or restore to favourable conservation status, natural habitats and species of European community importance. This includes Special Areas of Conservation, Special Protection Areas and Ramsar sites.
National Planning Policy Framework NPPF (2012)	The NPPF states that planning policies should promote the 'preservation, restoration and re-creation of priority habitats, ecological networks' and the 'protection and recovery of priority species'.
The Natural Choice: securing the value of nature - Natural **Environment White Paper** (2012) **Biodiversity 2020**: A strategy for England's wildlife and ecosystem services (2011)	The Natural Environment White Paper (NEWP) and Biodiversity Strategy 2020 sets out the importance of a healthy, functioning natural environment to sustained economic growth, prospering communities and personal well-being. Key objectives and commitments are to: • Halt biodiversity loss, support functioning ecosystems and establish coherent ecological networks by 2020; • Establish a new voluntary approach to biodiversity offsetting to be tested in pilot areas; • Enable partnerships of local authorities, local communities and landowners, the private sector and conservation organisations to establish new Nature Improvement Areas; and • Address barriers to using green infrastructure to promote sustainable growth.
Northumberland Biodiversity Action Plan: Partnership Action Plan (2008)	Produced by the Northumberland Biodiversity Partnership, the Northumberland BAP enables partners to focus resources and develop local projects in order to conserve and enhance the threatened habitats and species. It includes a number of targets for Northumberland including: • Include specific policies for biodiversity conservation in the Local Development Framework for the new Northumberland authority by 2015; • Create and maintain a system to ensure the conservation of local wildlife sites in Northumberland; • Produce a targeted promotional campaign using key Northumberland BAP species to encourage members of the public to record wildlife sightings in Northumberland; • Produce an annual report on progress towards the targets in the

TABLE 8-1: BIODIVERSITY, FAUNA & FLORA: CONTEXTUAL REVIEW	
Source	**Key Messages**
	Northumberland Biodiversity Action Plan by 2008; • Ensure that 95% of SSSI's in Northumberland are in unfavourable recovering or favourable condition; and • Review the Northumberland BAP in 2015.

8.3 Existing and projected baseline

8.3.1 The UK is bound by the terms of the EC Birds & Habitats Directives and the Ramsar Convention and the Conservation of Habitats and Species Regulations 2010 (as amended), which provide for the protection of internationally important sites. These are identified as Special Areas of Conservation (SACs), Special Protection Areas (SPAs) or Ramsar sites. A number of areas within Northumberland have been recognised as being of importance due to their biodiversity interest and have been designated under International and European legislation. These are detailed below and illustrated in Figure 8.1 (Page 30).

Special Protection Areas and Special Areas of Conservation

8.3.2 The Habitats Directive requires EU Member States to create a network of protected wildlife areas, known as Natura 2000, across the European Union. This network consists of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), established to protect wild birds under the Birds Directive. These sites are part of a range of measures aimed at conserving important or threatened habitats and species. There are six SPAs within or partially within Northumberland:

TABLE 8-2: DESIGNATED SPAS AND SACS WITHIN NORTHUMBERLAND[22]	
Site Name	**Summary of reasons for designation**
Coquet Island	Coquet Island is located 1 km off the coast of Northumberland. It is a small, flat-topped island with a plateau extent of 7 ha. The island is of importance for a range of breeding seabirds, including four species of terns, auks and gulls. The seabirds feed outside the SPA in the nearby waters, as well as more distantly in the North Sea.
Lindisfarne	Lindisfarne is situated in north-east England off the Northumberland coast near Berwick-upon-Tweed. In particular, it is of major international importance in autumn and early winter in holding a high proportion of the Svalbard population of Light-bellied Brent Goose. In summer, the site supports important numbers of several breeding tern species that feed in the shallow waters around the site.
Farne Island	The Farne Islands are a group of low-lying islands between 2-6 km off the coast of Northumberland. The islands are important as nesting areas for birds, especially terns, gulls and auks. The seabirds feed outside the SPA in the nearby waters, as well as more distantly in the North Sea.
Northumbria Coast	The Northumbria Coast SPA includes much of the coastline between the Tweed and Tees Estuaries. In summer, the site supports important numbers of breeding Little Tern, whilst in winter the mixture of rocky and sandy shore supports large numbers of Turnstone and Purple Sandpiper.

[22] Defra (2014), UK SPAs, http://jncc.defra.gov.uk/page-1409 [accessed 7.5.14]

Holburn Lake and Moss	The SPA of Holburn Lake and Moss is located about 5 km inland from the coast of Northumberland. The site is of ornithological importance as a roost for the Icelandic population of Greylag Goose. These birds feed in surrounding agricultural areas outside the SPA, sometimes beyond the immediate surroundings.
North Pennine Moors	The North Pennine Moors SPA and SCA is situated in Cumbria, County Durham, Northumberland and North Yorkshire and includes parts of the moorland massif between the Tyne Gap (Hexham) and the Ribble-Aire corridor (Skipton). It encompasses extensive tracts of semi-natural moorland habitats. The site is of European importance for several upland breeding species, including birds of prey and waders.
Border Mires Keilder – Butterburn	This SAC is situated on the border of Cumbria and Northumberland and consists of considerable areas of blanket bog
Harbottle Moors	Harbottle Moors SAC is a relatively low-lying example of upland European dry heath. Some areas are relatively species-rich, with up to six different dwarf shrub species being found. This may suggest a fairly un-intensive management history with regard to grazing and burning
Simonside Hills	This SAC is an example of European Dry Heaths, with some smaller areas of blanket bog.
Walton Moss	Walton Moss SAC is a largely intact raised bog of roughly rectangular shape, with an arm of mossland protruding westwards from the south-west corner. The peat spills over from the main basin, forming blanket mire, and as such it is classified as an intermediate bog. Some peat-cutting has taken place in the south-east and south-west of the moss, lowering the surface by about 1.5 m. Most of the mire expanse remains very wet and drainage is restricted to the edges.
Tyne and Allen River Gravels	This SAC, close to Haltwhistle, encompasses the most extensive, structurally varied and species-rich examples of riverine Calaminarian grasslands in the UK. The river gravels contain a range of structural types, ranging from a highly toxic, sparsely vegetated area with abundant lichens through to closed willow/alder Salix/Alnus woodland. In addition, the site is of considerable functional interest for the series of fossilised river channel features. Spring sandwort Minuartia verna and thrift Armeria maritima are particularly abundant, and there are several rare species, including Young's helleborine Epipactis youngiana, which has its main UK population at this site. The site is also of great importance for its lichen communities. A number of rare and scarce species are present, including the Red Data Book-listed Peltigera venosa.
The Roman Wall Loughs	The Roman Wall Loughs SAC near to Haltwhistle contains three natural eutrophic lakes, Crag, Broomlee and Greenlee Loughs. Together the loughs contain 11 species of pondweed Potamogeton.
The Tweed Estuary SAC	The Tweed Estuary SAC is a complex estuary, which discharges into the North Sea. It is a long narrow estuary, which is still largely natural and undisturbed, with its water quality classified as excellent throughout. It supports a wide range of habitats compared with other estuaries in north-east England.

Ramsar Sites

8.3.3 Ramsar sites are wetlands of international importance designated under the Ramsar Convention. Within Northumberland there are four Ramsar sites. The heath bog areas of the Irthinghead Mires, Holburn Lake and Moss and the coastal edge and tidal areas around Lindisfarne and the Northumbria Coast have been designated as wetlands of international importance.

Sites of Special Scientific Interest

8.3.4 A 'Site of Special Scientific Interest' (SSSI) gives legal protection to sites for wildlife and geology in England. SSSIs are managed to conserve the special features and geology which in turn protects rare and endangered species, habitats and natural features that may be supported within that area.

8.3.5 In Northumberland there are 114 sites designated as SSSI. Natural England reports on the condition of SSSIs, grading them into six categories. Northumberland, along with the North East and England is meeting the Government's target of 95% with 99.01% of SSSI land being classed as in 'favourable' or 'recovering' condition. However, it should be noted that Northumberland, the North East or England did not meet the Government's target of at least 50% of SSSIs being in 'favourable' condition by 2010. **Table 8-3** displays the SSSI conditions for Northumberland, the North East and England as a whole.

8.3.6 In Northumberland 68.14% of SSSIs are in an unfavourable / recovering condition. This suggests that these sites are likely to move to a favourable condition in the future as all the necessary management measures are in place. This should help to lead to an overall improvement in the condition of SSSIs within Northumberland. The spatial distribution of sites within and surrounding Northumberland provides a rich network of biodiversity with sites covering many habitat types. The LFRMS is most likely to affect sites that are dependent upon water or could be affected by flooding and water quality.

TABLE 8-3: SSSI CONDITION[23]

Area	% of area meeting PSA target	% of area favourable	% of area unfavourable / recovering	% of area unfavourable no change	% of area unfavourable declining	% of area destroyed/ part destroyed
Northumberland	99.01	30.87	68.14	0.76	0.24	0.00
North East	98.48	22.90	75.58	0.90	0.62	0.01
England	96.17	37.54	58.63	2.18	1.61	0.03

8.3.7 There are a number of additional threats that could put pressure on habitats, which would make them more vulnerable to impacts that might arise as a result of flooding and the LFRMS. This includes:

- Atmospheric pollution (such as acid precipitation and nitrogen deposition) and increased flood risk that may arise as a result of climate change;
- Increased development planned across the area (including for housing, business, leisure, transport infrastructure and employment land), this will place increased pressure on areas of biodiversity value due to land take for development and an increase in population; and

[23]Information in relation to the condition of SSSIs throughout the area has been taken from the Natural England website. http://www.naturalengland.org.uk/ourwork/conservation/designatedareas/sssi/default.aspx [accessed on 6/05/2014].

- An increase in population is likely to lead to an increase in leisure and recreational pressure and increased demand for natural resources such as water. New development may lead to an increase in disturbance through human activity, loss of habitat, increased predation (e.g. from domestic pets), atmospheric, land and water based pollution.

8.3.8 If these threats are not managed appropriately in the future, then this could lead to a negative impact on the future biodiversity baseline in relation to the preservation and enhancement of key habitats and species throughout Northumberland.

8.3.9 Local Wildlife, Geological Sites and Nature Reserves

8.3.10 There are a number of sites within Northumberland that have regional local biodiversity importance, such as Local Wildlife and Geological Sites (LWGSs) and Local Nature Reserves (LNRs). Locally designated sites, although not of the same status as international or national sites, have an important role to play in contributing to overall biodiversity targets and to the quality of life and well-being of communities. LNRs are for both people and wildlife. They are places with wildlife or geological features that are of special interest locally. They offer people special opportunities to study or learn about nature or simply to enjoy it. There are 25 LNRs in Northumberland.[24]

8.3.11 It is assumed that the number of designated sites would be unlikely to alter substantially in the foreseeable future. The development of further species action plans would provide an improved foundation for the protection of the various species and increase awareness of their locations so measures may be put in place for enhanced protection. Currently it is anticipated, that the percentage of SSSI land within Northumberland classed as in 'favourable' condition will increase, as 68.14% of SSSI land is currently classed as in 'recovering' condition[25].

8.4 Key Issues

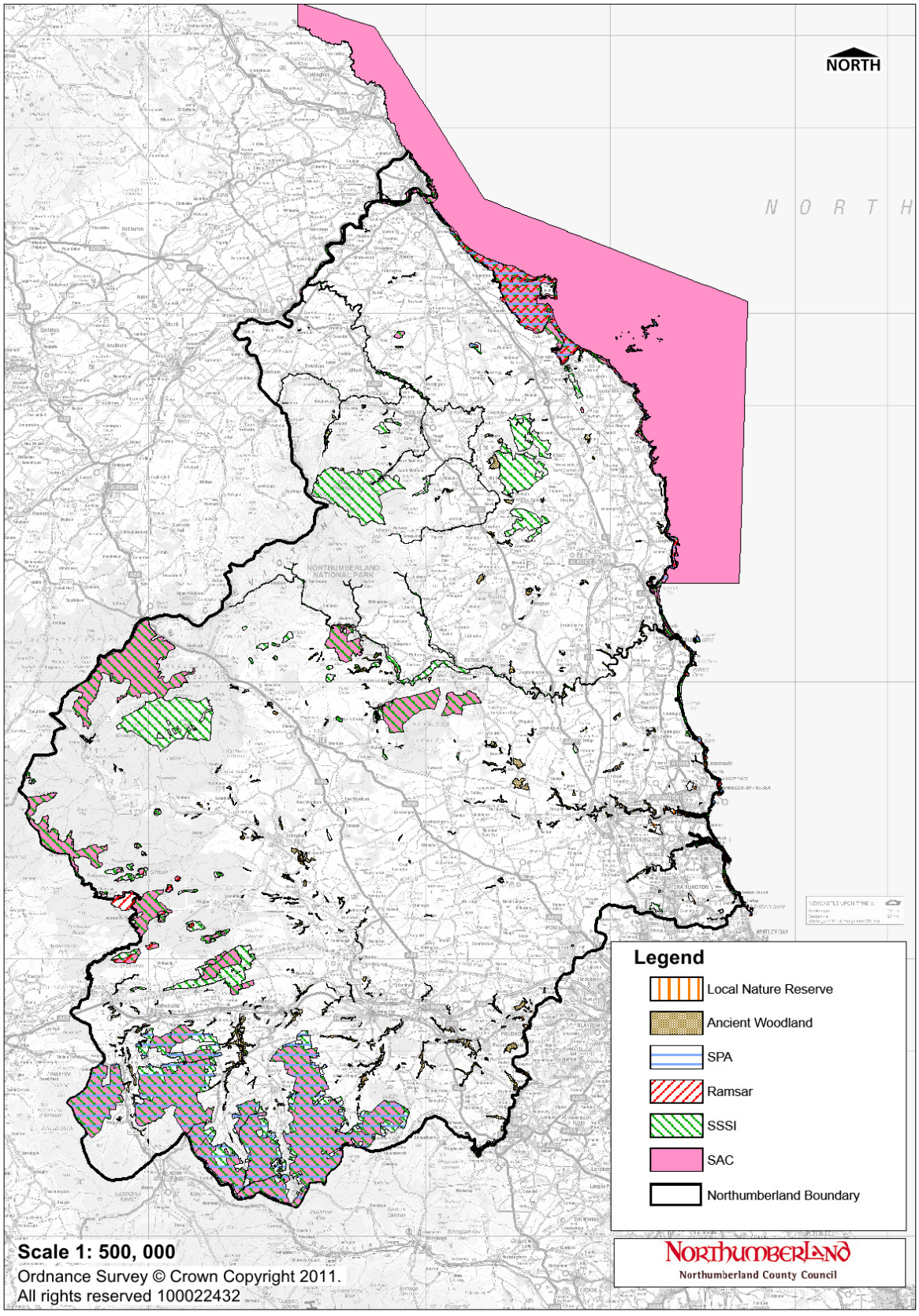
8.4.1 The key issues arising from the contextual review and baseline assessment relating to 'biodiversity' in Northumberland are set out in **table 8-4**.

TABLE 8-4: KEY ISSUES AND RELEVANCE TO THE LFRMS

Key Issue	Relevance to the LFRMS
There are a number of habitats of European, regional and local importance within Northumberland.	Habitats can be affected by the effects of flooding and flood management measures, particularly those that are sensitive to the quantity and quality of water.

[24] Natural England (2013) http://www.lnr.naturalengland.org.uk/Special/lnr/lnr_results.asp?N=&C=31&Submit=Search [accessed 7.5.14]
[25] Natural England (2014) SSSI conditions

Figure 8-1: Designated Sites within Northumberland



9 HISTORIC ENVIRONMENT AND HERITAGE

9.1 Introduction

9.1.1 At this strategic level, it is not proportionate to determine the effects of the LFRMS on specific heritage assets or their setting. These impacts are more appropriately considered at project level. However, flood risk and flood risk management measures can still affect the character of the historic environment and significance of heritage assets within it; so it is useful to establish the policy context and baseline position.

9.1.2 This chapter sets out the relevant policy framework/contextual review and baseline position for 'historic environment and heritage'. The chapter concludes by drawing together the evidence presented to identify the key issues and opportunities related to 'historic environment and heritage' that should be a focus for the SEA.

9.2 Contextual review

TABLE 9-1: HISTORIC ENVIRONMENTAND HERITAGE: CONTEXTUAL REVIEW

Source	Key Messages
Government White Paper: **Heritage Protection for the 21st Century**[26] (2007)	The paper seeks to put the historic environment at the heart of the planning system. The proposals in the Heritage Protection Review White Paper are based on three core objectives: • The need to develop a unified approach to the historic environment; • Maximising opportunities for inclusion and involvement; and Supporting sustainable communities by putting the historic environment at the heart of an effective planning system.
The NPPF (2012)	The NPPF recognises heritage assets as an irreplaceable resource that should be conserved in a manner appropriate to their significance. The NPPF defines significance as: *"the value of a heritage asset to this and future generations because of its heritage interest. That interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage assets physical presence, but from its setting also."*
The Government's Statement on the Historic Environment for England (2010)	The Government's Statement on the Historic Environment for England sets out its vision for the historic environment. It calls for those who have the power to shape the historic environment to recognise its value and to manage it in an intelligent manner in light of the contribution that it can make to social, economic and cultural life. Also of note is the reference to promoting the role of the historic environment within the Government's response to climate change and the wider sustainable development agenda.
Northumberland Local Plan	Northumberland County Council produced a Core Strategy Preferred Options Consultation Document in February 2013. Policy 53 addressed Historic Environment and Heritage Assets'. There is an intention *to 'conserve, enhance and promote the integrity of Northumberland's distinctive and valued historic environment and heritage assets'.* This includes identifying and taking action for heritage assets at risk or vulnerable to becoming at risk.

[26] https://www.gov.uk/government/publications/heritage-protection-for-the-21st-century-white-paper

9.3 Existing and projected baseline

9.3.1 Northumberland contains a variety of features recognised for their heritage value. As illustrated on **Figure 9.1**, statutorily Listed Buildings are found throughout the county, with concentrations in the main towns and smaller settlements. These include a range of historic buildings and structures such as Norman Castles, country houses, fortified farmhouses, and buildings associated with the County's diverse social, economic and cultural legacy. There are a total of 5574 Listed Buildings (of which 174 are Grade 1). Many of these Listed Buildings fall within or adjacent to Environment Agency Flood Zones 2 and 3, and areas at risk of surface water flooding. There is therefore potential for the setting and condition of these heritage assets to be affected by flood events.

9.3.2 Further features of the historic and built environment include scheduled monuments (975), conservation areas, historic parks and gardens (18), battlefields (4), and wrecks.

9.3.3 There are also number of historic landscapes throughout the County, including the Northumberland Coast and North Pennines Areas of Outstanding Natural Beauty. Hadrian's Wall World Heritage Site (which is also a Scheduled Ancient Monument) located to the south of the County is of particular importance for its heritage value.

9.3.4 English Heritage have identified that there is a medium risk that flooding could affect access to Warkworth Hermitage. Although this risk assessment is focused on tidal flood risk and erosion, this area is also known to have flooded due to heavy rainfall[27].

9.4 Key Issues

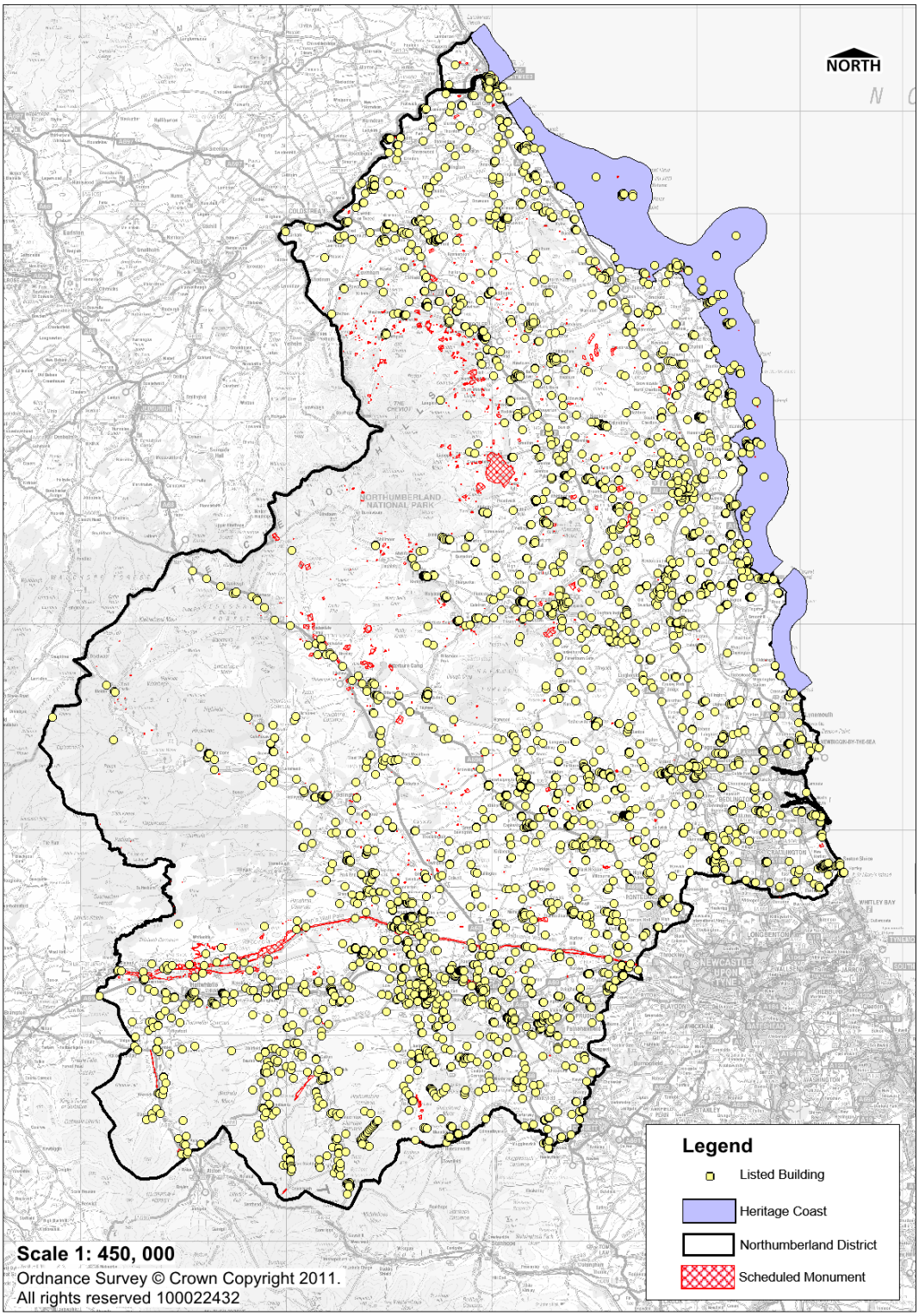
9.4.1 The key issues arising from the contextual review and baseline assessment relating to 'historic environment and heritage' in Northumberland are set out in **Table 9-2**.

TABLE 9.2: KEY ISSUES AND RELEVANCE TO THE LFRMS

Key Issue	Relevance to the LFRMS
Northumberland contains a rich diversity of protected and valued heritage assets.	Flooding can lead to the loss of heritage features such as bridges, mills and weirs. Flooding could affect the character, significance or access to heritage assets.

[27] English Heritage Coastal Estate Risk Assessment (2011) *online at:* http://services.english-heritage.org.uk/ResearchReportsPdfs/068_2011WEB.pdf

Figure 9-1: Nationally Designated Heritage Assets



10 WATER QUALITY AND RESOURCES

10.1 Introduction

10.1.1 Flooding and flood risk management is closely related to the quality and availability of water resources. Flood risk management measures could also have an impact (positive or negative) on water quality, with knock on effects on water sensitive habitats.

10.1.2 This chapter sets out the relevant policy framework/contextual review and baseline position for 'water quality and resources'. The chapter concludes by drawing together the evidence presented to identify the key issues and opportunities related to 'water quality and resources' that should be a focus for the SEA.

10.2 Contextual review

TABLE 10-1: WATER RESOURCES: CONTEXTUAL REVIEW

Source	Key Messages
The Water Framework Directive (WFD, 2000)	The Water Framework Directive promotes an integrated and coordinated approach to water management at the river basin scale. The key relevant objectives are: • Establish a strategic framework for managing the water environment and provide a common approach to protecting and setting environmental objectives for all ground and surface waters and the promotion of sustainable water use; • The Environment Agency has general responsibility for ensuring the Directive is given effect and has to approve environmental objectives, programmes of measures and river basin management plans; and • For surface water, the Directive requires that environmental objectives are based on the chemical and, more significantly, ecological status of the water body. For groundwater, quantitative and chemical objectives must be set.
The Bathing Water Regulations 2013	Under the Bathing Waters Regulations, the EA is required to carry out the monitoring of bathing waters in England and Wales. Bathing waters in England and Wales are 'designated' by Defra and the Welsh Government. As part of the monitoring significant sources of pollution are identified which cause individual bathing waters to fail and progress plans to improve the water quality.
Flood & Water Management Act (FWMA, 2010)	The Flood and Water Management Act highlights that alternatives to traditional engineering approaches to flood risk management include: • Utilising the environment, such as management of the land to reduce runoff and harnessing the ability of wetlands to store water.
Water for life (The Water White Paper) (2011)	The Water White Paper sets out the Government's vision for a more resilient water sector, where water is valued as the precious resource it is. It states the measures that will be taken to tackle issues such as poorly performing ecosystems, and the combined impacts of climate change and population growth on stressed water resources.

TABLE 10-1: WATER RESOURCES: CONTEXTUAL REVIEW	
Source	**Key Messages**
Water Resources for the Future – A Strategy for England and Wales (2009)	The Water Resources for the Future strategy is part of a framework of integrated water resources planning, looking 25 years ahead. It considers the needs for water both of the environment and of society, and examines the uncertainties about future water demand and availability. Key objectives set out within the Strategy include: • Promote water efficiency – expect household water metering to become widespread over the next 25 years; • Pay further attention to leakage control; • Promote water sensitive agricultural practices; farmers should consider crop suitability and the possibility of increased winter storage; • Active promotion of water efficiency opportunities for commerce and industry; and • Deliver the sustainable development of water resources through working together.
Draft Water Resources Management Plan: Northumbrian Water (2013)	The plan looks across the period from 2015 to 2040 starting from the baseline position of 2012/13. It looks at supply and demand issues and scenarios surrounding the Water Resource Zones for the region.
River Basin Management Plans (2009)	The River Basin Management Plan for the Northumbria River Basin District deals with the pressures facing the water environment (and in particular water quality) and the actions that will address them. River Basin Management Plans are reproduced every 6 years. The plan provides key actions for improving the water quality of waterbodies in the various catchment areas within the plan area.

10.3 Existing and projected baseline

Water Quality

10.3.1 Ecological status and chemical status together define the overall surface water status of a watercourse under the Water Framework Directive. Ecological status applies to surface water bodies and is based on the following quality elements: biological quality, general chemical and physio-chemical quality, water quality with respect to specific pollutants (synthetic and non-synthetic), and hydromorphological quality. There are five classes of ecological status (high, good, moderate, poor or bad). Chemical status is assessed by compliance with the environmental standards for chemicals that are listed in the Environmental Quality Standards Directive 2008/105/EC[28], which include priority substances, priority hazardous substances and eight other pollutants. Furthermore, the level of risk that a number of pressure elements[29] poses to a water body is graded by the EA.

10.3.2 The River Basin Management Plan for the Northumbria River Basin District (prepared by the EA in December 2009) includes information in relation to key characteristics and the water quality of Northumberland. It states by 2015, that 15%of surface waters (rivers, lakes, estuaries and coastal waters) are expected to improve for at least one biological, chemical or physical element, measured as part of an assessment of good status according to the Water Framework Directive.

[28] The European Parliament and the Council of the European Union (2008) Environmental Quality Standards Directive 2008/105/EC. Available from: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0084:0097:EN:PDF (accessed 12/2013)

[29] Pressure elements include point source pollution risk, diffuse pollution risk, combined source sanitary risk, combined source nutrients risk, water abstraction and flow regulation risk, physical or morphological alteration risk, and alien species risk.

10.3.3 This includes an improvement of 878 km of the river network in the river basin district, in relation to fish, phosphate, specific pollutants and other elements. 49%of surface waters will be expected to be at good or better ecological status/potential and 33%of groundwater bodies will be expected to be at good status by 2015. In combination 48%of all water bodies are projected to be at good status by 2015.

10.3.4 Having said this, an increased level of development could have an impact on designated nature conservation sites due to likely increases in flow from waste water treatment works to accommodate new development. These potential effects will be explored in a detailed Water Cycle Study that is currently being completed by URS on behalf of Northumberland County Council.

TABLE 10-2: RIVER AND LAKE WATER BODIES QUALITY INDICATORS FOR RIVER CATCHMENTS IN NORTHUMBRIA[30]

Indicator	2010	2015
% at good ecological status or potential	44	54
% assessed at good or high biological status	41	55
% assessed at good chemical status	0	0
% at good status overall (chemical and ecological)	44	54
% improving for one or more elements in rivers		20

Water resources

10.3.5 An Outline Water Cycle Study was published in 2012[31], highlighting that wastewater flow from the proposed level of development (in the emerging Local Plan) across Northumberland could be accommodated within existing consent conditions by some of the waste water treatment works (WwTW). However, several WwTW do not have capacity to accept and treat any further wastewater from proposed development at the current time (i.e. before future development is considered) or in the near future without requiring an increase in the volumes that they are permitted (or consented) to discharge. For these catchments (development areas) a solution is required to treat additional wastewater generated as a result of the proposed development.

10.3.6 Northumberland Water has undertaken an assessment[32] to calculate if there is likely to be a surplus of available water or a deficit in each of their supply areas in Northumberland by 2031, once additional demand from proposed development and other factors such as climate change are taken into account.

10.3.7 The results show that there are adequate water resources to cater for the proposed development within the Kielder Water Resource Zone (WRZ). Proposed development in the Berwick and Fowberry WRZ can also be catered for within existing resources except under exceptional circumstances.

[30] Environment Agency (2009) River Basin Management Plan, Northumbria River Basin District. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/297473/gene0910bsrv-e-e.pdf (accessed 5/2014)
[31] Northumberland Council Council (2012) Outline Water Cycle Study (May, 2012)
[32] Northumbrian Water Final Water Resources Management Plan 2010-2035 (2010)

10.4 Key Issues

10.4.1 The key issues arising from the contextual review and baseline assessment relating to 'water quality and water resources' in Northumberland are set out in **Table 10-2**.

TABLE 10.2: KEY ISSUES AND RELEVANCE TO THE LFRMS

Key Issue	Relevance to the LFRMS
Although water quality is generally improving, increased development could lead to greater volumes of flows from waste water treatment works.	The LFRMS has the potential to help reduce pressure on water quality through the implementation of natural flood management schemes.

11 COMMUNITY FACILITIES AND CRITICAL INFRASTRUCTURE

11.1 Introduction

11.1.1 Critical infrastructure in the context of the LFRMS are those where flooding could compromise the delivery of community services, thereby threatening the health and safety of a wider population.

11.1.2 This chapter sets out the relevant policy framework/contextual review and baseline position for 'community facilities and critical infrastructure'. The chapter concludes by drawing together the evidence presented to identify the key issues and opportunities that should be a focus for the SEA.

11.2 Contextual Review

TABLE 11-1: COMMUNITY FACILITIES & CRITICAL INFRASTRUCTURE: CONTEXTUAL REVIEW

Source	Key Messages
Strategic Framework and Policy Statement on Improving the Resilience of Critical Infrastructure to Disruption from Natural Hazards, (2010)	This document sets an approach to managing risk to infrastructure: • Build a level of resilience into critical infrastructure assets that ensures continuity during a worst case flood event. • Considering the threat from current and future natural hazards in the design of new assets. • Increase the robustness and resilience of existing services or assets by building additional network connections. • Identifying key components and moving them out of harm's way. • Improved arrangements for sharing of information on infrastructure network performance and standards. • Enhancing skills and capabilities to respond to emergencies arising from natural hazards.
National Infrastructure Plan, (2010)	Forecasts a 20% increase in congestion by 2025 and requires a change in how infrastructure is planned, coordinated and delivered with adaptation to provide security and resilience. Private sector capital is to be attracted and the cost of capital for projects needs to be reduced.
National Planning Policy Framework (2012)	Sets out how planning should contribute to sustainable development. Development plan policies should take account of environmental issues such as the potential impact of the environment on proposed developments by avoiding development in areas at risk of flooding, and as far as possible by accommodating natural hazards and the impacts of climate change.

11.3 Existing and projected baseline

11.3.1 Community facilities and strategic infrastructure are critical to the health, safety and accessibility of the population. For example, the blockage of key transport routes through flooding could affect productivity and the ability to access facilities. Community buildings not only provide a focal point for community development activities, but they can also be important during and after flood events as a source of shelter and support.

11.3.2 It is important to ensure that critical infrastructure such as hospitals, police stations, schools and energy generation/transmission facilities are well located and resilient to the effects of flooding. **Table 11-2** identifies a non-exhaustive list of community facilities and critical infrastructure within the County. Where possible, specific facilities/ infrastructure have been identified. **Figure 11.1** also illustrates the location of important facilities including police and fire stations, hospitals, waste water treatment facilities (WwTW), ports and household waste recycling sites (HWRC)

11.3.3

TABLE 11-2: COMMUNITY FACILITIES AND CRITICAL INFRASTRUCTURE	
Critical Infrastructure in Northumberland	
Health - Wansbeck General Hospital. - Alnwick Infirmary. - Blyth Community Hospital. - Haltwhistle War Memorial Hospital. - Hexham General Hospital. - Rothbury Community Hospital.	Education - 123 first schools. - 29 middle schools. - 14 secondary schools. - 8 Special schools.
Transport Infrastructure - The A69 is the key route running east / west and linking a number of the County's main settlements between Carlisle and Newcastle. Running alongside this is the Newcastle to Carlisle railway line. - The A1 is the key route running from Newcastle through key settlements on the east coast of the County. Running parallel is the East Coast Mainline, which runs north / south with stops at Morpeth, Alnmouth and Berwick, linking to Newcastle.	Utilities - Lynemouth Power Station. (420 MW coal and biomass). - High voltage electricity transformers. - Waste Water Treatment Works. - Kielder Reservoir Community Cohesion and Safety - 10 Police stations.[33] - 17 Fire and Rescue Stations.[34] - Community centres. - Places of worship.

11.3.4 Due to the large, rural nature of the County, access to services is not as readily available in the smaller settlements and villages throughout Northumberland. These areas can therefore be more isolated, especially during extreme weather events such as flooding where key access routes might be affected and local services may be limited.

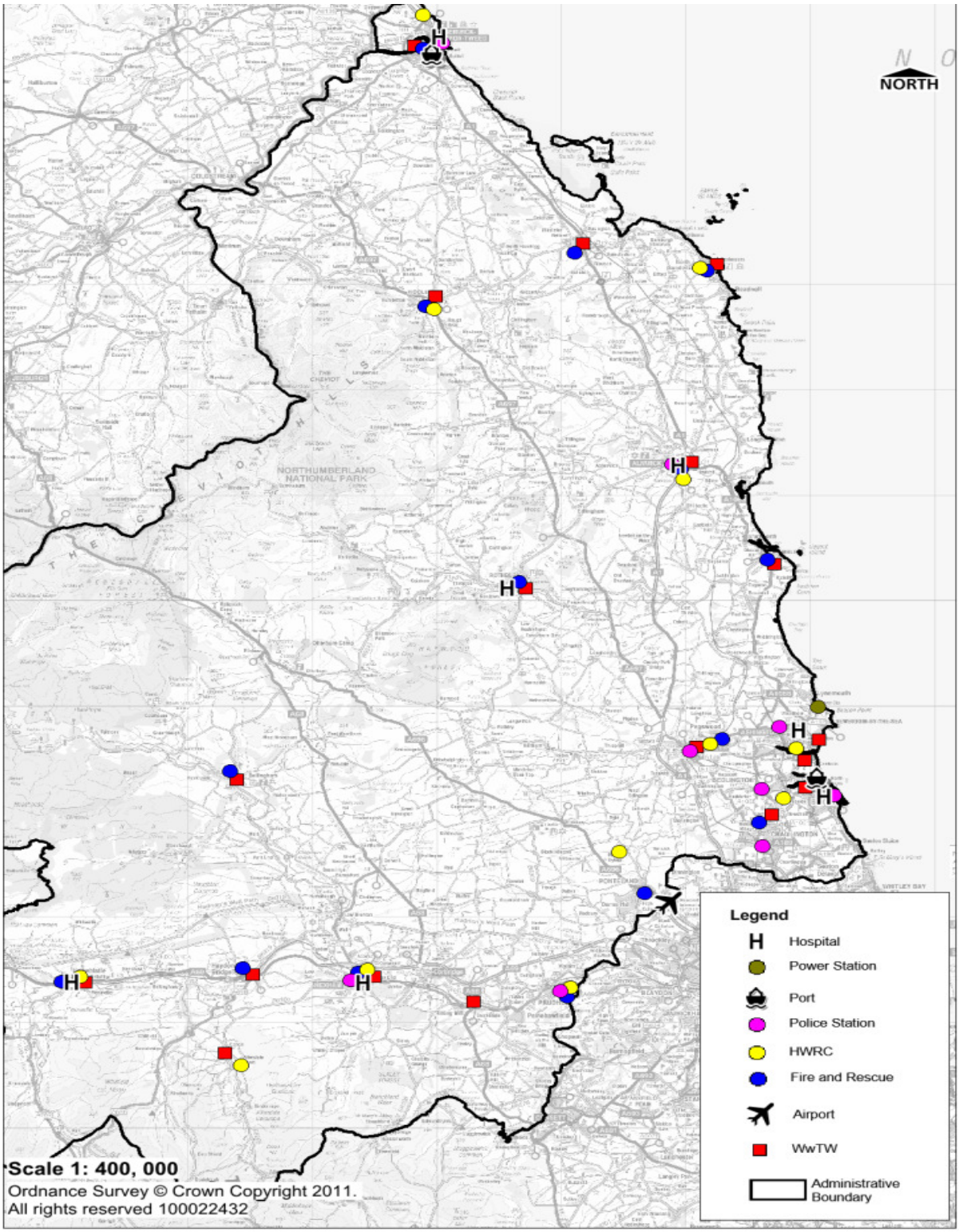
11.4 Key Issues

11.4.1 The key issues arising from the contextual review and baseline assessment relating to 'community facilities and critical infrastructure' in Northumberland are set out in **Table 11-3**.

TABLE 11-3: KEY ISSUES AND RELEVANCE TO THE LFRMS	
Key Issue	**Relevance to the LFRMS**
Rural areas typically have poorer access to key services and strategic transport links. Critical infrastructure is predominantly located in and around the main towns and service centres.	Flood events in urban areas are more likely to affect a greater number of people and critical infrastructure. However, events in rural areas might lead to greater isolation for affected communities.

[33] http://www.northumbria.police.uk
[34] http://www.northumberland.gov.uk/default.aspx?page=1304

Figure 11-1: Critical Infrastructure



12 HOUSING

12.1 Introduction

12.1.1 Actions arising from the LFRMS could affect the homes within flood risk areas. Conversely, the construction and modification of homes could affect flood risk and influence flood management decisions.

12.1.2 This chapter sets out the relevant policy framework/contextual review and baseline position for 'housing'. The chapter concludes by drawing together the evidence presented to identify the key issues and opportunities related to 'housing' that should be a focus for the SEA.

12.2 Contextual review

TABLE 12-1: HOUSING: CONTEXTUAL REVIEW

Source	Key Messages
NPPF, (2012)	The NPPF sets out the need to deliver a wide choice of high quality homes. Local planning authorities are also called upon by the NPPF to 'widen opportunities for homeownership' and to 'create sustainable, inclusive and mixed communities'.
Laying the Foundations: A Housing Strategy for England, (2011)	The Housing Strategy sets out a package of reforms to: • get the housing market moving again; • lay the foundations for a more responsive, effective and stable housing market in the future; • support choice and quality for tenants; and • improve environmental standards and design quality. The new strategy will address concerns across the housing market making it easier to secure mortgages on new homes, improving fairness in social housing and ensuring homes that have been left empty for years are lived in once again.
Northumberland Local Plan, Preferred Options Document (2013)	The Council's preferred strategy is to focus housing and employment growth in the Main Towns and Service Centres, supporting their role and function, and to allow for an appropriate level of development elsewhere that precludes loss of population anywhere in the County.

12.3 Existing and projected baseline

12.3.1 There were 138,500 occupied households in Northumberland in 2011 (compared to 130,800 in 2001), an increase of 5.9%, with an average of 2.3 residents per household. The majority of households are concentrated in the main urban settlements in the South East of the Borough. Due to the large, rural nature of much of Northumberland, the overall housing density is very low at only 28 households per km^2 in Northumberland compared to a mean in England and Wales of 155 households per km^2.[35]

12.3.2 The Northumberland Core Strategy Preferred Options Consultation Document[36] produced in October 2013, sets out the number of households planned to be delivered from 2011 to 2031 (the Plan period), with the provision of 24, 310 dwellings being proposed over the plan period (**see table 12-1**).

[35] Northumberland County Council / 2011 Census. http://www.northumberland.gov.uk/default.aspx?page=15753
[36] Northumberland County Council (2013) Core Strategy Preferred Option for Housing, Economy and Greenbelt.

12.3.3 Annually, the South East of Northumberland is capable of accommodating the majority of the planned supply, taking 641 dwellings per year, followed by Central Northumberland at 314, North at 187 and West at 74.

TABLE 12-1: Planned Housing delivery in Northumberland

Delivery areas	Housing targets
South East Northumberland Delivery Area	**12,820**
Main Towns	
Amble	740
Ashington	1,600
Bedlington	1,200
Blyth	3,480
Cramlington	3,480
Service Centres:	
Guidepost / Stakeford / Choppington	420
Newbiggin-by-the-Sea	320
Seaton Delaval / New Hartley / Seghill / Holywell/ Seaton	800
Rest of Delivery Area	780
Central Northumberland Delivery Area	**6,270**
Main Towns	
Hexham	900
Morpeth	1,500
Prudhoe	1,000
Service Centres	
Corbridge	300
Ponteland	850
Rest of Delivery Area	1,720
North Northumberland Delivery Area	**3,740**
Main Towns	
Alnwick	1,000
Berwick-upon-Tweed	900
Service Centres	
Belford	200
Seahouses	300
Rothbury	380
Wooler	380
Rest of Delivery Area	580
West Northumberland Delivery Area	**1,480**
Main Towns	
Haltwhistle	400
Service Centres	
Allendale	100
Bellingham	300
Haydon Bridge	200

Rest of Delivery Area	480

12.3.4 The 2013 Strategic Housing Land Availability Assessment (SHLAA) indicates that there were sufficient potential developable sites to confirm the preferred provision of 24,310, although the deliverability of this figure is dependent on the housing market of the County and its sub-regions.

12.3.5 The Core Strategy highlights that given Northumberland's rural setting, it has less available previously developed land (PDL) than in many other authorities in England. Furthermore the amount of planning applications on PDL is steadily dropping due to the reduction in available sites, as a result, there is insufficient PDL coming forward to accommodate the required level of housing growth to deliver the overall strategy.

12.3.6 Additionally, as a result of the North East's recent suppressed housing markets, it is expected that there shall be a latent demand which could increase housing demand towards the middle and latter part of the plan period. Northumberland Council have specified that new residential schemes must reflect local demand in determining the mix of housing they provide across development, whilst ensuring there is an appropriate mix of housing types, sizes and tenures. Furthering this, the 2013 Strategic Housing Market Assessment (SHMA) update also reconfirmed the Stage 1 Preferred Options Core Strategy's affordable housing target of 30%, subject to individual site requirement variations. Considering the overall 30% target across the County, the Core Strategy acknowledges that Northumberland has considerable variation across its housing markets, illustrating that levels of affordable housing provision will be subject to flexibility, and could be higher on some sites than others.

TABLE 12-2: AFFORDABLE HOUSING TARGETS

Delivery Area	Affordable Housing Target
North Northumberland	35%
Central Northumberland	30%
South East Northumberland	25%
West Northumberland	35%

Core Strategy Preferred Options, October 2013

12.4 Key Issues

12.4.1 The key issues arising from the contextual review and baseline assessment relating to 'housing and economy' in Northumberland are set out in **Table 12-3**.

TABLE 12-3: KEY ISSUES FOR HOUSING

Key Issue	Relevance to the LFRMS
The majority of households are located in the urbanised south east of the County. There are plans for significant housing growth in these areas over the next 15 years. There is a need to provide approximately 24,000 homes to support aspirations for economic growth.	An increase in housing (predominantly in urban areas) could have an effect on flood risk by increasing the amount of hard-standing, which would in turn affect rates of surface water-run-off.

13 ECONOMY

13.1 Introduction

13.1.1 Economic activity and growth can be affected by flood events and flood risk. The LFRMS could therefore influence how Northumberland's economy responds to and is likely to be affected by flood risk.

TABLE 13-1: ECONOMY: CONTEXTUAL REVIEW

Source	Key Messages
NPPF, (2012)	The NPPF aims to plan proactively to meet the development needs of business and support an economy fit for the 21st century. A commitment to securing economic growth is set out in the NPPF. This is in order to 'create jobs and prosperity', to build on 'the country's inherent strengths' and to meet the 'twin challenges of global competition and of a low carbon future'. This should include supporting existing, new and emerging business sectors, including positively planning for 'clusters or networks of knowledge driven, creative or high technology industries'.
Northumberland Growth & Resilience Framework (2013-2016)	This Framework sets out Northumberland County Council's approach to promoting growth and resilience for the period 2013 to 2016: • To deliver the Economic Strategy for Northumberland; • Establish a coherent approach for promoting growth and resilience by setting out the key economic and social actions that will be driven forward across Northumberland over the next three years; • Define, as appropriate, those economic and social actions that need to be specifically tailored and targeted at meeting the differing issues, challenges and opportunities presented by the distinct parts of the county ; • Prescribe a suite of headline performance indicators that provide a comprehensive barometer as to the collective progress being made in promoting growth and resilience relative to the north eastern and national averages.
The Northumberland Economic Strategy (2010-2015)	The Northumberland Economic Strategy 2010-15 sets out the vision to secure opportunities for residents and businesses in a resilient economy. The strategy provides the strategic context for economic development and regeneration in the county. The strategic economic priorities are: • To become a low carbon economy; • To create the conditions for sustainable growth; • To support resilient and diverse sectors; and • To enable inclusion and enterprise.

13.2 Existing and projected baseline

13.2.1 Gross Value Added (GVA) data is used to provide an estimate of a local areas contribution towards the UK economy. In 2010, Northumberland's businesses contributed a total of £3.95bn, 0.36% of the GVA for England as a whole, and 9.6% of the total for the North East. The total GVA figure was 3.7% lower than the previous year, reflecting the effects of the global recession. In 2010 Northumberland GVA[37] per resident head was[38] £12,669; this was lower than both the North East (£15,723) and the England average (£21,054).

[37] GVA per head of population is the standard measure of economic performance.
[38] ONS GVA figures, 2014

13.2.2 The 2013 employment rate[39] in Northumberland stood at 78.5%, which was higher than both the regional (74%) and national (77.4%) rates[40].

13.2.3 For many years, the economy of Northumberland has experienced fundamental economic restructuring. Jobs have been lost in the traditional industries, particularly deep coal mining and agriculture.

13.2.4 Northumberland experienced peak unemployment levels in July 2011 – June 2012 with 13,000 economically active people unemployed. This represented 8.5% of the Northumberland population. The trend has improved somewhat in recent years falling to 11,499 in December 2013[41] and is expected to continue to improve.

13.2.5 The structure of the County's economy has undergone substantial change over the past 30 years. There has been a reduction of the agricultural workforce and a move away from deep coal mining. It now has a broader base - incorporating manufacturing, certain service sectors, and in particular the public sector, on which it is now heavily dependent. However recently, there has been a decline in manufacturing employment, as experienced nationally, but without the growth in high value service sector employment.

13.2.6 There are a number of key positive features of the Northumberland economy:

- Small businesses dominate the economy with 83% of firms employing fewer than ten people;
- Many small businesses are leading edge in their sectors and are a vital part of the economy;
- A number of the larger companies are high tech and operate globally;
- New business start-ups are generally resilient, with failure rates below the regional and national average;

13.2.7 Northumberland's economy, as part of the wider North East Local Enterprise Partnership (NELEP) market, is intrinsically linked to the economies of neighbouring authorities, Tyneside in particular:

- Over 44,000 people who live in the County travel to adjoining areas for employment, with the majority commuting into Tyneside;
- Just over 16,000 people commute into the County for employment, the majority coming from Tyneside;
- The rate of out commuting has ebbed and flowed over recent years, but with no definite downward trend.

13.2.8 The County's economy has core strengths and opportunities in key sectors such as energy, low carbon industries, certain manufacturing and process industries such as pharmaceuticals and engineering, ports, and tourism. Expansion of production and research and development operations within these key sectors has the potential to offer higher value, knowledge based jobs to both Northumberland residents and in-migrants.

[39] The percentage of the working age population who are employed including the self-employed.
[40] Nomis, Employment and Unemployment (Jan 2013-Dec 2013)
[41] Nomis Annual Population Survey, December 2013

13.2.9 Evidence suggests that the Northumberland's service sector will expand over the plan period. The growth of high quality service jobs can be strongly influenced by lifestyle factors, given the ability to attract highly skilled workers. It is also the case that improving telecommunications allows for remote operation of such businesses. Northumberland's beautiful and historic markets towns and its attractive rural landscapes are therefore key opportunities to attract mobile, highly skilled migrants likely to bring or establish such businesses, and as such will be a focus for business start-ups in creative and knowledge based service industries. Improving the quality of telecommunications is vital to achieve this.

13.2.10 In order to deliver the level of jobs required to positively grow and diversity the Northumberland economy as identified within the economic projections, ELR and emerging North East LEP Strategic economic plan there is a need to allow for around 24,000 new homes over the plan period. This means planning for higher levels of growth in some areas which are actually experiencing a decline in population.

13.3 Key Issues

13.3.1 The key issues arising from the contextual review and baseline assessment relating to 'economy' in Northumberland are set out in **Table 13-2**.

TABLE 13-2: KEY ISSUES FOR ECONOMY

Key Issue	Relevance to the LFRMS
The economy is characterised by small businesses, but has core strengths in growing sectors such as low carbon energy development.	Smaller businesses may find it more difficult to respond to the effects of flooding.
Increased economic growth in key sectors needs to be supported by resilient infrastructure.	The LFRMS can help to reduce flood risk to critical infrastructure and improve resilience to flooding.

14 AGRICULTURE AND LAND USE

14.1 Introduction

14.1.1 The majority of Northumberland is rural, characterised by open countryside and small-medium sized towns. As such, agriculture is an important land use across the County.

14.1.2 Agricultural practices and other land uses can affect patterns of surface water run-off, which can have an effect on flooding (either positive or negative). Conversely, flood risk can have adverse impacts on certain uses of land.

14.2 Contextual review

TABLE 14-1: AGRICULTURE & LAND USE: CONTEXTUAL REVIEW

Source	Key Messages
NPPF, (2012)	Chapter 3 of the NPPF stresses the importance of agriculture in supporting the rural economy. The NPPF recognises that both new and existing development should not contribute to, be put at unacceptable risk from, or be adversely affected by unacceptable levels of soil pollution or land instability.
Safeguarding our Soils: A Strategy for England (2009)	Sets a vision for the future of soils in the country; "*By 2030, all of England's soils will be managed sustainably and degradation threats tackled successfully. This will improve the quality of England's soils and safeguard their ability to provide essential services for future generations*". An element of this vision is the condition of soils in urban areas, which are to be *'sufficiently valued for the ecosystem services they provide and given appropriate weight in the planning system'.* Good quality soils in urban areas are recognised in this strategy as being 'vital in supporting ecosystems, facilitating drainage and providing urban green spaces for communities'.

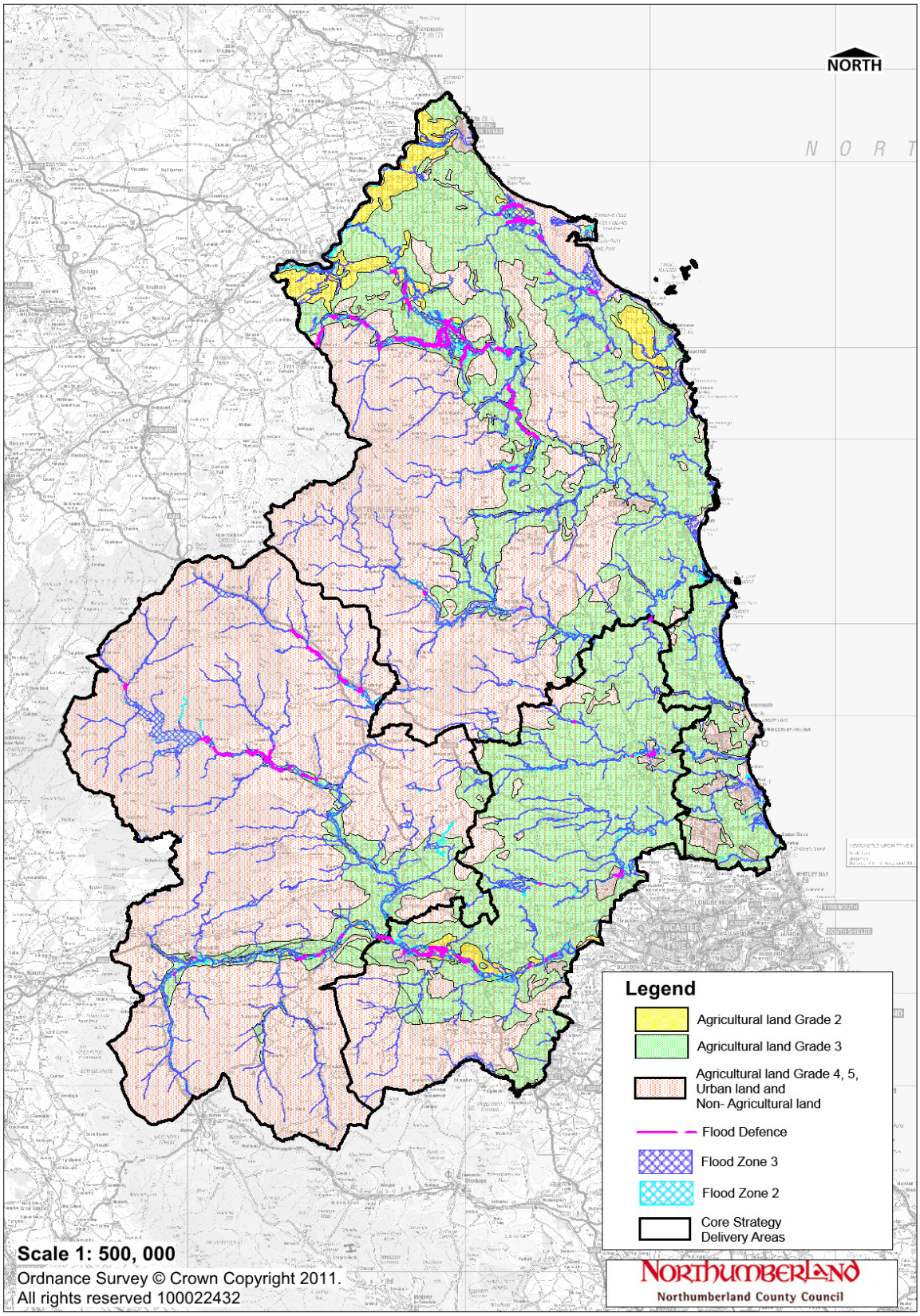
14.3 Existing and projected baseline

14.3.1 Agricultural practices can have a significant impact on local flooding issues, often simple measures, such as ploughing fields against the direction of water flow or introducing filter strips alongside watercourses can make a big difference. Such measures are set out in the Environment Agency Rural SUDS Report 2012.

14.3.2 It is a possibility that LFRMS measures could change the frequency and extent of flooding, which could lead to changes in the suitability of land for certain uses; for example by affecting versatility, productivity, soil quality and mineral resources.

14.3.3 The national Agricultural Land Classification associated with different areas throughout Northumberland are illustrated in **Figure 14.1**. The majority of land is classified as non-agricultural, or 'not best and most versatile'. However, there is a large amount of Grade 3 (good to moderate quality agricultural land) to the east of the County, with smaller pockets of Grade 2 (very good quality agricultural land) agricultural land.

Figure 14-1: Northumberland Agricultural Land Classifications (Source: Natural England, 2013)



14.4 Key Issues

14.4.1 The key issues arising from the contextual review and baseline assessment relating to 'historic environment and heritage' in Northumberland are set out in **Table 14-2**.

TABLE 14-2: KEY ISSUES FOR RESOURCE MANAGEMENT AND MATERIAL ASSETS

Key Issue	Relevance to the LFRMS
Agricultural land is under pressure from changing land use and development. There is a low amount of the highest quality (best and most versatile) agricultural land across the County.	An increase in development on agricultural land, and a change in the way that agricultural land is managed have the potential to affect flood risk. Lower quality agricultural land could be utilised for managing flood risk.

15 INTER-RELATIONSHIPS

15.1 Interrelationships

15.1.1 It is useful to consider the interrelationships between the different environmental factors discussed in Chapters 4 to 14. This gives a clearer indication of the baseline position and how changes to one aspect of the environment can be beneficial or conversely have an adverse impact within other aspects of the environment.

15.1.2 For example, an increase in the delivery of housing and jobs would be likely to have a beneficial effect on the health and wellbeing of communities; whilst flooding in areas that are important for agriculture could have a negative impact on the local economy.

15.1.3 Flooding within areas with high levels of deprivation may also disproportionately affect human health if people and their neighbourhoods are less able to address the consequences of flooding. Flooding in rural areas could exacerbate isolation and poorer access to services.

15.1.4 Water quality and biodiversity are also both closely related; as changes in water quality could have a significant effect on aquatic and water-margin habitats and the species they support. Both of these environmental aspects can also be affected by flooding and flood risk management measures. Conversely, environmental opportunities may also be delivered through the LFRMS that deliver multiple benefits including environmental, economic and social benefits (e.g. through increased tourism, increased open space areas).

15.1.5 There are a variety of habitats throughout Northumberland that are designated as Special Protection Areas, Special Areas of Conservation and/or SSSIs, some of which are associated with watercourses. These areas are mainly rural in nature, so flooding and flood management measures in these areas might be expected to have a greater impact on the environment, compared to urban areas.

15.2 Limitations

15.2.1 The information gathered as part of the SEA process has been obtained through a desk-based assessment. Potential impacts e.g. potential construction impacts arising during the building or raising of flood defences are more appropriately addressed through project level Environmental Impact Assessment undertaken for specific schemes and are thus not covered in the SEA. However, where environmental opportunities or constraints are broadly identifiable, they will be highlighted in the SEA to avoid adverse effects and facilitate positive environmental opportunities at an early stage of delivery.

15.2.2 The strategic nature of the LFRMS means that the scope of the SEA is somewhat ‘high-level’ and does not identify locally specific baseline information or issues at settlement level.

16 THE SEA FRAMEWORK

16.1.1 The SEA framework provides a methodological framework by which the environmental effects of the Strategy can be assessed by examining how the LFRMS would impact upon the baseline position (and its likely evolution in the absence of the LFRMS) relating to each environmental objective. The SEA framework also incorporates relevant objectives and supporting questions to allow an Equality Impact Assessment to be undertaken as an integrated part of the assessment process.

16.1.2 **Table 16-1** presents the SEA framework; which consists of five objectives, each with supporting questions and indicators. These objectives have been derived from the key issues identified in Chapters 4 to 15 of this Environmental Report.

16.1.3 The SEA framework was finalised following completion of consultation on the Scoping Reportwith some minor amendments made to reflect consultation responses and updated evidence. Amendments to the SA have been highlighted below. New text is highlighted in purple text (like this).

TABLE 16-1: THE SEA FRAMEWORK

SEA Objective	Supporting questions for SEA (incorporating EqIA)
1. Help to tackle deprivation, rural isolation and reduce inequalities between different groups and communities.	- How will it affect deprived communities? - Will it affect different groups of people equally? - How will it affect the health and wellbeing of communities?
2. Improve resilience to the effects of flooding and climate change.	- How will it affect flood risk and resilience to flood events? - Will it help to adapt to the wider effects of climate change?
3. Protect the condition and setting of heritage assets.	- Will it reduce the risk and effects of flooding on settlement or landscape character? - Will it help to protect the condition of heritage assets? - Will it help to maintain access to heritage assets?
4. Protect, restore and enhance the quality, functionality and connectivity of green and blue infrastructure.	- Will it help to protect designated habitats from the negative effects of flooding? - Will it enhance or create habitats through the use of natural flood management techniques? - Will it help to ensure that Water Framework Directive Targets are met? - Will it help to protect soil quality and make the best use of agricultural land?
5. Support the growth of a resilient local economy and housing market.	- Will it help to improve the resilience of local businesses to flood risk? In particular smaller businesses? - Will it help protect and secure the infrastructure required to support economic growth in both rural and urban areas? - Will it help to support a higher level of growth in the South East of the County?

17 APPRAISAL OF REASONABLE ALTERNATIVES

17.1 Introduction

17.1.1 Due to the strategic nature of the LFRMS, it is considered that there are limited alternatives to the guiding principles and measures within the draft LFRMS.

17.1.2 The LFRMS and action plan do not contain specific detail about the location of flood management schemes. Therefore, it would not be possible to undertake a meaningful assessment of significant environmental effects in this geographical context either.

17.2 Are there reasonable alternatives at a strategic level?

17.2.1 The strategic approach adopted in the draft LFRMS is to focus flood management activities into areas of 'greatest need', which takes into account economic, social (and to a lesser extent) environmental factors.

17.2.2 In determining whether there may be 'reasonable alternatives' to this broad approach, several alternative strategic approaches were considered. However, it was determined that these alternatives were not reasonable for the following reasons:

17.2.3 *Do nothing / business as usual* - It is considered that these are not 'reasonable' or appropriate approaches because the LFRMS is required by the Flood and Water Management Act. Taking positive action on flood risk is also inherently positive, given that approaches are often focused on achieving multiple benefits to the economy, communities and the environment.

17.2.4 *Focusing resources and measures in all areas at risk of flooding* - Addressing flood risk wherever it occurs rather than targeting the highest risk areas (i.e. a dispersed approach) is not cost effective and spreads limited resources too thinly. It is considered that this approach is not appropriate, particularly for a County the size of Northumberland.

17.3 Are there reasonable alternatives to the measures and actions?

17.3.1 At the scoping stage of the SEA, a series of draft local measures were being developed. At this point, the question was posed (*in the Scoping Report*) as to whether there could be potential alternative approaches to some of the local measures being suggested (See table 17.1).

TABLE 17-1: POTENTIAL ALTERNATIVES HIGHLIGHTED IN THE SCOPING REPORT

Draft Local Measures	Potential alternatives
Identify and prioritise local flood risks, whilst taking into account the anticipated effects of climate change.	- Are there different ways that vulnerable / priority areas could be categorised?
Ensure our limited resources are invested in higher risk priority areas where measures will improve social, environmental and economic benefits defences	
Advocate a catchment wide approach to sustainable development and land management practices to contribute towards reducing flood risk, better water quality and wider environmental benefits.	- Is it reasonable to look at an approach that focuses on greater protection downstream in urban areas?

17.3.2 As the draft LFRMS was being prepared, the proposed methods for categorising priority areas became clearer. It is evident from the detail included in the draft LFRMS, that the method for prioritising flood management would be based on a range of factors as follows:

- Historic and on-going flood risk;
- Availability of funding and external contributions;
- Identified benefits to properties, communities, businesses and/or infrastructure;
- Where there is strong community engagement;
- Where there are opportunities to support economic growth;
- Where there are opportunities to work collaboratively with other Risk Management Authorities (RMAs);
- The delivery of multiple benefits, including wider environmental benefit; and
- Feedback from consultation with internal and external stakeholders.

17.3.3 This prioritisation process will build up a picture over time of the most beneficial flood risk management projects within the highest risk areas, allowing Northumberland County Council and partners to focus efforts on funding local projects. (based upon a more holistic assessment of risk).

17.3.4 It would be possible to prioritise areas for investment by focusing more heavily on some of these individual factors. However, it is considered that this would be ineffective. For example:

Strong focus on supporting economic growth – This approach would not support the protection of existing settlements that are not anticipated to grow significantly.

Focus on areas where there is strong community engagement – This approach would exclude vulnerable communities that have not established strong community networks.

18 APPRAISAL OF THE LFRMS

18.1 Introduction and methodology

18.1.1 The following chapters (19-23) present an assessment of the LFRMS against each of the five objectives in the SEA Framework. The assessment takes account of the actions, measures and objectives, which are linked together to make-up the LFRMs (see **Appendix B and table 2-1**).

18.1.2 Effects have been forecast taking into account the criteria presented within Schedule 2 of the SEA Regulations[42] and current levels of knowledge. Hence, account has been taken of the probability, duration, scale, frequency and reversibility of effects as far as possible.

18.1.3 These factors have helped to form an opinion on the extent of the effects, as represented by one of the following symbols.

- Positive ✓✓
- Minor positive ✓
- Negligible effect -
- Minor negative ×
- Negative ××

18.1.4 Under each of the five Environmental objectives within the SEA Framework, the effects of the LFRMS have been recorded in a series of tables (*see example below in Figure 18.1*) for each of the individual measures proposed under the five LFRMS objectives (as set out in table 2-1 in this report). For example, in Figure 18.1 below, positive implications have been determined for the LFRMS Measures 1.1, 1.2, 1.3 and 1.4, and an overall positive score has been presented for this LFRMS objective to illustrate how the measures work in combination to affect the environmental factors being assessed.

Figure 18.1: Presenting effects for the LFRMS measures.

LFRMS Objective 1	1.1	1.2	1.3	1.4	Obj1
Improve knowledge and understanding.	✓	✓	✓	✓	✓✓

LFRMS OBJECTIVE 2	2.1	2.2	2.3	Obj 2
Promote sustainable development and consider climate change.				

LFRMS Objective 3	3.1	3.2	3.3	Obj 3
Actively manage flood risk and drainage infrastructure.				

LFRMS Objective 4	4.1	4.2	4.3	Obj4
Support communities to become more resilient to flooding.				

LFRMS Objective 5	5.1	5.2	5.3	Obj5
Be better prepared for flood events and post flood recovery.				

[42] Environmental Assessment of Plans and Programmes Regulations, 2004

18.1.5 It is important to note that these assessment scores are not necessarily indicative of 'significant effects' (*in terms of affecting the baseline position*) but are to provide an indication of the broad implications of each of the LFRMS measures.

18.1.6 However, further discussion of the **significance of effects** is presented for each sustainability objective to illustrate the effects of all the LFRMS actions, measures and objectives when considered together 'as a whole' *(i.e. the cumulative effects*).

18.1.7 Where relevant and appropriate, this discussion also includes recommendations for enhancement or mitigation (of significant effects) that are likely to occur as a result of adopting the draft LFRMS.

18.2 Limitations

18.2.1 The ability to forecast effects is limited by understanding of the baseline and (in particular) the future baseline and also the challenge of relating policy to the ultimate effects that result from its implementation. In light of this, where likely significant effects are forecast this will be supported by explanation of the assumptions made[43].

18.3 Mitigation and Recommendations

18.3.1 A draft version of the LFRMS was subjected to SEA, and recommendations for improvements were made at this time. These comments were taken into account as the LFRMS was being finalised. The recommendations that were made and the Councils response to these are included at the end of each assessment chapter that follows.

[43] As stated by Government Guidance (The Plan Making Manual, see http://www.pas.gov.uk/pas/core/page.do?pageId=156210): *"Ultimately, the significance of an effect is a matter of judgment and should require no more than a clear and reasonable justification."*

19 COMMUNITIES, HEALTH AND WELLBEING

19.1 Introduction

19.1.1 This chapter outlines the effects of the LFRMS on the baseline relating to 'communities, health and wellbeing', which includes consideration of deprivation, inequalities, health and community development'. The appraisal has been guided by the following SEA Objectives and sub-questions.

SEA objective 1: Help to tackle deprivation, rural isolation and reduce inequalities between different groups and communities.

- *How will it affect deprived communities?*
- *Will it affect different groups of people equally?*
- *How will it affect the health and wellbeing of communities?*

LFRMS Objective 1	1.1	1.2	1.3	1.4	Obj1
Improve knowledge and understanding.	?	-	-	-	✓

LFRMS Objective 2	2.1	2.2	2.3	Obj 2
Promote sustainable development and consider climate change.	✓	-	✓	✓

LFRMS Objective 3	3.1	3.2	3.3	Obj 3
Actively manage flood risk and drainage infrastructure.	-	✓	-	✓

LFRMS Objective 4	4.1	4.2	4.3	Obj4
Support communities to become more resilient to flooding.	✓	✓	✓	✓✓

LFRMS Objective 5	5.1	5.2	5.3	Obj5
Be better prepared for flood events and post flood recovery.	✓	✓	-	✓

19.2 Discussion of significant effects

Measures to improve knowledge and understanding are inherently positive, as they will improve resilience to flood risk. The focus of the LFRMS on the urban areas also means that deprived communities in urban areas are likely to benefit from any measures as it will help to better understand the extent of flood risk. However, the majority of measures / actions proposed to achieve objective 1 of the LFRMS are procedural in nature and unlikely to have a significant positive impact on their own. In combination however, the actions and measures supporting objective 1 of the LFRMS are likely to have a minor positive effect on the baseline.

Measure 2.1 seeks to restore natural flood plains, which should have positive effects by allowing areas of lower risk to flood. Measure 2.1 will also help to ensure that new development is promoted in areas at lower risk of flooding. This is positive for the health and wellbeing of new communities as it reduces exposure to the effects of flooding. Measures to incorporate SUDs into development and to achieve a reduction in run-off rates from Greenfield developments would also have a positive effect in helping to manage flood risk to existing urban areas.

Measure 2.2 also ought to have indirect positive effects on health by helping to reduce the risk of surface water flooding associated with new development.

Measure 2.3 seeks to promote and develop natural flood management schemes, which ought to benefit rural communities by helping to reduce surface water flood risk (e.g. through tree planting and natural flood storage). This is positive, as some rural communities can be isolated by flood events, and these areas contain a greater concentration of people over 65 (who may be more likely to be vulnerable to the effects of flooding). Overall, the measures and actions in place to support objective 2 are likely to have a minor positive effect.

Measures 3.1 -3.4 are largely procedural measures to improve the management and awareness of flood maintenance activities. Measure 3.2 in particular might have a positive effect on communities at risk of flooding that are affected more frequently, but where the number of properties affected may not typically trigger a response.

The measures and actions proposed to meet Objective 4 ought to have a positive effect on the health and wellbeing of communities by seeking to improve engagement on flood risk matters. Measure 4.2 in particular would have a positive effect for vulnerable groups that may not be as knowledgeable about flood risk nor engaged in improvement activities.

Measures 5.1 to 5.3 are mostly procedural in nature, but should have some positive effects in terms of engaging communities in flood management activities.

19.3 Summary

When viewed as a whole, the range of measures and actions within the LFRMS are likely to work in tandem to achieve a **significant positive effect** with regards to tackling flood risk in areas of deprivation, which would have indirect knock-on benefits on health and wellbeing. Actions that focus on identifying vulnerable groups and developing communications and action plans to engage these groups would have a particular positive effect in terms of reducing potential inequalities between social groups.

Recommendations made

Make links to health partners to ensure that response and recovery plans and actions take account of the potential effects on mental health.

Council response

The Health Authority is represented at the Council's Flood Improvement Delivery Group which was formed after the 2012 floods to ensure more coordinated response and recovery efforts. The Council acknowledge that this is an issue for the Improvement Delivery Group to consider, and is picked up in the final LFRMS through Measure 5.1.

20 CLIMATE CHANGE RESILIENCE

20.1 Introduction

20.1.1 This chapter outlines the effects of the LFRMS on the baseline relating to 'climate change resilience'. The appraisal has been guided by the following SEA Objectives and sub-questions.

SEA objective 2: Improve resilience to the effects of flooding and climate change

- *How will it affect flood risk and resilience to flood events?*
- *Will it help to adapt to the wider effects of climate change?*

LFRMS Objective 1	1.1	1.2	1.3	1.4	Obj1
Improve knowledge and understanding.	✓	✓	-	-	✓

LFRMS Objective 2	2.1	2.2	2.3	Obj 2
Promote sustainable development and consider climate change.	✓	✓	✓	✓✓

LFRMS Objective 3	3.1	3.2	3.3	Obj 3
Actively manage flood risk and drainage infrastructure.	✓	✓	✓	✓

LFRMS Objective 4	4.1	4.2	4.3	Obj4
Support communities to become more resilient to flooding.	✓	✓	-	✓

LFRMS Objective 5	5.1	5.2	5.3	Obj5
Be better prepared for flood events and post flood recovery.	-	-	-	✓

20.2 Discussion of effects

20.2.1 The measures and actions that support LFRMS Objective 1 are likely to have a positive effect in terms of improving preparation and resilience to flooding.

20.2.2 The measures and actions that support LFRMS Objective 2 are also likely to have a positive effect in managing flood risk in areas of need. In particular, there would be positive effects in managing surface water flooding if new developments incorporated drainage systems that reduced run-off rates. The use of SUDs might also include natural drainage systems (that can also be beneficial in terms of enhancing green infrastructure) which could help to contribute towards urban cooling.

20.2.3 Objective 3 is also likely to have a positive effect by helping to improve understanding and management of flood risk. Much of the actions are procedural and a continuation of current practice, so the effects are unlikely to be significant.

20.2.4 Measures to support Objectives 4 and 5 are also likely to have positive implications in terms of improving awareness of and preparedness for climate change (particularly amongst community groups).

20.3 Summary

When viewed as a whole, the range of measures and actions within the LFRMS are likely to work in tandem to achieve a **significant positive effect** with regards to improving resilience to the effects of climate change. The focus is largely upon improving the resilience of people and property, which should have a significant effect in the more densely populated parts of the County (which also happen to contain the greatest concentrations of deprivation).

Recommendations made

Make stronger links to the role that flood risk management can play in helping to deal with the wider effects of climate change. For example, developing green infrastructure which delivers multiple benefits, such as flood risk management, urban cooling and enhancement of biodiversity.

Council response

Promoting SuDS (through measure 2.2) both through development and by incorporating in Council-led schemes when possible, we will be positively contributing to climate change. Measure 1.2 also identified that a holistic approach to flood management will be taken and 3.2 seeks to achieve multi-beneficial outcomes, which will take account of wider climate change adaptation.

21 HERITAGE

21.1 Introduction

21.1.1 This chapter outlines the effects of the LFRMS on the baseline relating to 'heritage'. The appraisal has been guided by the following SEA Objectives and sub-questions.

SEA objective 3: Protect the condition and setting of landscape and heritage assets.

- *Will it reduce the risk and effects of flooding on settlement or landscape character?*
- *Will it help to protect the condition of heritage assets?*
- *Will it help to maintain access to heritage assets?*

LFRMS Objective 1	1.1	1.2	1.3	1.4	Obj1
Improve knowledge and understanding.	✓	-	?	-	✓

LFRMS Objective 2	2.1	2.2	2.3	Obj 2
Promote sustainable development and consider climate change.	✓	✓	-	✓✓

LFRMS Objective 3	3.1	3.2	3.3	Obj 3
Actively manage flood risk and drainage infrastructure.	-	✓	-	✓

LFRMS Objective 4	4.1	4.2	4.3	Obj4
Support communities to become more resilient to flooding.	-	-	-	-

LFRMS Objective 5	5.1	5.2	5.3	Obj5
Be better prepared for flood events and post flood recovery.	-	-	-	-

21.2 Discussion of effects

21.2.1 Measure 1.1 includes actions to prioritise flood investigation activities in 'high risk areas'. This ought to have a positive effect on the protection of heritage assets (and their settings) that are located in the main settlements at risk of flooding. Measure 1.3 also has the potential for positive implications as it will help to build a better picture of the areas at risk of flooding and what measures may need to be implemented. However, it is not clear the extent to which the 'risk-based approach' would take account of environmental issues; which could mean that the protection of valued landscapes and heritage features is not seen as a priority.

21.2.2 Measures 2.1 and 2.2 seek to strengthen links with the planning process to ensure that new development does not increase surface water run-off. This is likely to have knock-on benefits for the protection of heritage assets and the character of settlements in areas at risk.

21.2.3 Overall, Objective 2 is likely to have a moderately positive effect. Seeking to restore natural flood plains could also lead to a change in the character of some landscapes, which may be perceived as either positive or negative.

21.2.4 Objective 3 is likely to have positive effects, in the main due to Measure 3.2, which seeks to achieve multi-beneficial solutions through partnership working. This ought to include consideration of solutions that take account of environmental assets such as landscape character and heritage. Seeking to develop an approach that priorities the frequency as well as number of properties at risk should also be positive in terms of protecting heritage assets in less populated areas that may still be at risk of flooding. However, it may be difficult to justify significant flood management measures in areas at risk of flooding that contain heritage assets / valued landscapes but would not result in significant social benefits.

21.2.5 Objectives 4 and 5 (and the supporting measures and actions) are focused predominantly on improving the resilience and preparedness of communities to flood risk. Whilst improved awareness and planning could have some knock-on benefits in terms of helping to better protect heritage assets, there is unlikely to be any significant effects.

21.3 Summary

When viewed as a whole, the range of measures and actions within the LFRMS should help to protect heritage assets and the character of landscapes from flood risk. However, these effects are not thought likely to have a significant effect on the baseline position.

Given the need to focus resources in areas that will achieve the greatest benefits, it is also likely that some heritage assets outside of the main settlements could remain at risk of flooding. Adopting a holistic, catchment-wide approach to flood risk management is one way of managing these risks though.

Recommendations made

No measures were identified.

22 GREEN AND BLUE INFRASTRUCTURE

22.1 Introduction

22.1.1 This chapter outlines the effects of the LFRMS on the baseline relating to '*green and blue infrastructure'*, which includes effects on habitats and species, water quality and soil.

22.1.2 The appraisal has been guided by the following SEA Objectives and sub-questions.

SEA objective 4: Protect, restore and enhance the quality, functionality and connectivity of green and blue infrastructure.

- *Will it help to protect designated habitats from the negative effects of flooding?*
- *Will it enhance or create habitats through the use of natural flood management techniques?*
- *Will it help to ensure that Water Framework Directive Targets are met?*
- *Will it help to protect soil quality and make the best use of agricultural land?*

LFRMS Objective 1	1.1	1.2	1.3	1.4	Obj1
Improve knowledge and understanding.	✓	-	✓	-	✓

LFRMS Objective 2	2.1	2.2	2.3	Obj 2
Promote sustainable development and consider climate change.	✓	✓	✓	✓✓

LFRMS Objective 3	3.1	3.2	3.3	Obj 3
Actively manage flood risk and drainage infrastructure.	-	✓	-	✓

LFRMS Objective 4	4.1	4.2	4.3	Obj4
Support communities to become more resilient to flooding.	✓	-	-	✓

LFRMS Objective 5	5.1	5.2	5.3	Obj5
Be better prepared for flood events and post flood recovery.	-	-	-	-

22.2 Discussion of effects

22.2.1 Measures 1.1 and 1.3 seek to investigate flood risk based upon a consideration of environmental, social and economic factors. Although social and economic factors are likely to be the driving factors, consideration of environment, may help to ensure that flooding that could affect sensitive habitats is investigated and actions taken where appropriate. This would lead to a minor positive effect for Objective 1.

22.2.2 The measures and actions that support Objective 2 are likely to have a **significant positive effect** on the baseline. In particular, the implementation of SUDs could include natural flood management schemes, which ought to have a positive effect on water environments and associated wildlife habitats and species. Measures to protect rural communities might also have knock on positive effects in terms of better management of agricultural land.

22.2.3 Measure 3.2 seeks to identify solutions that have multiple benefits, including environmental aspects. This should lead to the support for natural flood management schemes that can help to reduce pollution to watercourses and enhance wildlife habitats.

22.2.4 Objectives 4 and 5 are unlikely to have any direct effects on the baseline as the focus of the measures and actions are focused on improving community preparedness to flooding. However, Measure 4.1 could have positive implications in terms of enhancing green and blue infrastructure as it promotes a whole catchment approach to flood management.

22.3 Summary

22.3.1 In combination, the LFRMS actions and measures are likely to have a **significant positive effect** by protecting water quality through reducing surface water run-off (and hence the potential for contamination of watercourses). Natural flood management schemes may also present opportunities to enhance and protect wildlife habitats.

Recommendations made

The definition of 'impacts' for draft Measures 1.1 and 1.3 could also take account of environmental factors.

Council response

The draft measures and actions were amended to include further reference to the need to consider environmental factors when determining prioritisation of flood measures. In the final LFRMS, measures 2.3 and 3.2 seek to achieve environmental benefits.

23 ECONOMY AND HOUSING

23.1 Introduction

23.1.1 This chapter outlines the effects of the LFRMS on the baseline relating to '*economy and housing'*.

23.1.2 The appraisal has been guided by the following SEA Objectives and sub-questions.

SEA Objective 5: Support the growth of a resilient local economy and housing market.

- *Will it help to improve the resilience of local business to flood risk? In particular SMEs?*
- *Will it help to protect and secure the infrastructure required to support economic growth in both rural and urban areas?*
- *Will it help to support a higher level of growth in the South East of the County?*

LFRMS Objective 1	1.1	1.2	1.3	1.4	Obj1
Improve knowledge and understanding.	-	-	-	-	-

LFRMS Objective 2	2.1	2.2	2.3	Obj 2
Promote sustainable development and consider climate change.	✓	✓	✓	✓✓

LFRMS Objective 3	3.1	3.2	3.3	Obj 3
Actively manage flood risk and drainage infrastructure.	✓	✓✓×	✓	✓✓

LFRMS Objective 4	4.1	4.2	4.3	Obj4
Support communities to become more resilient to flooding.	-	-	-	-

LFRMS Objective 5	5.1	5.2	5.3	Obj5
Be better prepared for flood events and post flood recovery.	-	✓	-	✓

23.2 Discussion of effects

23.2.1 Although Objective 1 will help to improve knowledge of flood risk, the measures are unlikely to have a direct positive effect on the local economy.

23.2.2 Overall, Objective 2 would be likely to have a positive effect. Measures 2.1 and 2.2 would be likely to help reduce flood risk to businesses and communities through a reduction in surface water run-off and directing development to lower flood risk areas. Measure 2.3 would also have a particularly positive effect on rural communities by promoting natural flood management measures. This should help to improve resilience to flood events for businesses in rural areas.

23.2.3 The actions and measures that support Objective 3 are mainly positive as they seek to maintain and enhance (in a targeted manner) flood management assets. This would have direct positive effects by helping to reduce flood risk to businesses and homes. A 'risk-based' approach to prioritisation would be likely to focus resources into the main settlements, which is where a greater number of properties and 'critical infrastructure' would be affected. However, this approach might not help to protect communities and businesses in some rural areas.

23.2.4 Objective 4 would have some indirect positive effects by helping to raise public awareness and preparedness to flood risk. However, it may be possible to enhance the positive effects by also seeking to include SMEs in engagement activities.

23.2.5 Measure 5.2 is likely to have positive implications by promoting improved resilience to flood risk, particularly for critical infrastructure that supports business activities.

23.3 Summary

In combination, the LFRMS measures are likely to have a **significant positive effect** on the baseline position by helping to reduce flood risk and improve resilience to flooding in the parts of the County that are anticipated to see the highest growth in housing and employment. However, whilst this ought to be positive for communities and businesses in the larger settlements in the County, the positive effects in rural areas might be less pronounced.

Recommendations made

Seek to work with small and medium sized enterprises to help improve their resilience to flood risk. Make links with Local Enterprise Partnerships (LEPs) to identify activities and projects that could help to reduce flood risk and improve resilience.

Council response

Part of the work of Community Engagement Officers is to work with businesses to increase awareness of flood risk and support them in developing flood action plans. In the final LFRMS, Local Objective 4 refers to the need to help people manage their own risk better. The definition of 'communities' within the associated measures includes consideration of local businesses.

24 SUMMARY OF EFFECTS

24.1.1 The effects of the LFRMS considered 'as a whole' have been summarised below.

24.1.2 Overall, the LFRMS is unlikely to have any significant adverse effects. The main benefits relate to improved resilience to flooding in urban areas, which would have a positive effect on communities and businesses in these areas. Adopting a catchment wide approach to management and promotion of natural flood management schemes should also help to reduce flood risk to rural areas and present opportunities to enhance wildlife habitats.

24.1.3 The approach to communication should help to engage with a range of social groups that may be at risk of flooding. Improving community resilience to flood events may also help to improve wellbeing and reduce risks to health.

1.1.1 Following the finalisation of the LFRMS the Environmental Report was updated to reflect any changes that were made. Changes to the measures that clarified the importance of environmental factors led to a slightly more positive effect in terms of green and blue Infrastructure.

TABLE 24-1: SUMMARY OF EFFECTS

SEA Objective	Summary of effects
Communities, health and wellbeing	When viewed as a whole, the range of measures and actions within the LFRMS are likely to work in tandem to achieve a **significant positive effect** with regards to tackling flood risk in areas of deprivation, which would have indirect knock-on benefits on health and wellbeing. Actions that focus on identifying vulnerable groups and developing communications and action plans to engage these groups would have a particular positive effect in terms of reducing potential inequalities between social groups.
Climate Change Resilience	When viewed as a whole, the range of measures and actions within the LFRMS are likely to work in tandem to achieve a **significant positive effect** with regards to improving resilience to the effects of climate change. The focus is largely upon improving the resilience of people and property, which should have a significant effect in the more densely populated parts of the County.
Landscape and Heritage	When viewed as a whole, the range of measures and actions within the LFRMS should help to protect heritage assets and the character of landscapes from flood risk. However, these effects are not thought likely to have a significant effect on the baseline position. Given the need to focus resources in areas that will achieve the greatest benefits, it is also likely that some heritage assets outside of the main settlements could remain at risk of flooding. Adopting a holistic, catchment-wide approach to flood risk management is one way of managing these risks though.
Green and Blue Infrastructure	In combination, the LFRMS actions and measures are likely to have a **significant positive effect** by protecting water quality through reducing surface water run-off (and hence the potential for contamination of watercourses). Natural flood management schemes may also present opportunities to enhance and protect wildlife habitats.

TABLE 24-1: SUMMARY OF EFFECTS	
SEA Objective	**Summary of effects**
Economy and Housing	In combination, the LFRMS measures are likely to have a **significant positive effect** on the baseline position by helping to reduce flood risk and improve resilience to flooding in the parts of the County that are anticipated to see the highest growth in housing and employment. However, whilst this ought to be positive for communities and businesses in the larger settlements in the County, the positive effects in rural areas might be less pronounced.

25 NEXT STAGES

25.1 Introduction

25.1.1 This Part of the Environmental Report explains the next steps that will be taken as part of the strategy-making / SEA process, including in relation to monitoring.

25.2 Consultation

25.2.1 The Council engaged with a range of stakeholders to seek their input and feedback on the draft LFRMS. A formal consultation took place in February 2015-April 2015.

25.2.2 This Environmental Report has also been made available alongside the LFRMS to enable stakeholders to understand the environmental implications of the draft strategy. In-line with the requirements of the Regulations[44], the Environmental Report has also been sent directly to the three 'statutory bodies', which are:

- Historic England (formerly English Heritage)
- Natural England
- The Environment Agency

25.3 Finalising the strategy

25.3.1 Following the consultation period, the Council has worked alongside partners to finalise the LFRMS, taking into account consultation responses, new evidence and the findings of the SEA (as appropriate).

25.3.2 This Environmental Report presents the assessment findings relating to the final LFRMS.

25.4 Strategy adoption and monitoring

25.4.1 At the time of Adoption a 'Statement' must be published that sets out (amongst other things):

- How this the Environmental Report and responses received as part of the consultations have been taken into account when finalising the strategy; and
- Measures decided concerning **monitoring.**

25.4.2 At the current stage (i.*e. within the Environmental Report*), there is a need to present 'measures envisaged concerning monitoring' only. As such, set out below are measures that might be taken to monitor the significant effects that have been identified in the SEA.

[44] The Environmental Assessment of Plans and Programmes Regulations 2004. http://www.legislation.gov.uk/uksi/2004/1633/regulation/5/made

TABLE 25-1: PROPOSED MONITORING MEASURES		
SEA Objective	**Significant effects**	**Monitoring measures**
Communities, health and wellbeing	Potential to reduce inequalities between social groups and improve health and wellbeing by reducing risk to flooding.	- Percentage change in the number of properties / people affected by flooding in deprived areas.
Climate Change Resilience	Improved resilience of communities and properties to the effects of climate change.	- It is likely that this will be assessed qualitatively and through flood mitigation scheme implementation
Green and Blue Infrastructure	Contribution to improved water quality. Enhancement and creation of green infrastructure, including wildlife habitats.	- Water Framework Directive Assessment status of watercourses. - Hectares of green infrastructure / wildlife habitat created or enhanced as part of flood management schemes.
Economy and Housing	Reduced flood risk and improved resilience to flooding in the parts of the County that are anticipated to see the highest growth in housing and employment.	- Monitor new development and review flood risk assessments submitted as part of planning applications.

APPENDIX A

Scoping Consultation Responses

Consultee	Summary of Comments	Council Response
Natural England	It should be noted that the Conservation (Natural Habitats & c.) Regulations 1994 (Paragraph 7.3, Page 30) have been superceded by the Conservation of Habitats and Species Regulations 2010 (as amended), which sought to incorporate all of the amendments to the 1994 Regulation into a single revised Regulation (which was subsequently subject to amendment in 2012).	The relevant section has been amended to reflect this information.
Natural England	The SEA does not identify the 13 Special Areas of Conservation present within Northumberland. These sites have been designated for the habitats they support, and several of them are associated with rivers. There may therefore be the potential for changes to these habitats as a result of changes to flooding or altered water levels. These issues should be recognised and considered as far as possible at this stage.	SACs have been explicitly identified as part of the scoping process.
Natural England	The sustainability appraisal framework and methods of appraisal are appropriate, but it may worth including a supporting question in relation to SEA Objective 4 (Table 15-1, Page 57) to ensure that the objective will have no detriment to designated sites, and the habitats and species they support.	Appraisal framework amended.
English Heritage	Paragraph 8.1 of the Scoping Report should more accurately refer to the **character** of the historic environment (landscape scale) and the **significance** (including setting if appropriate) of the heritage assets with it. Paragraph 8.3 refers to 'features' recognised for their heritage value. Nowhere in the remainder of the section, however, is the broad range of asset types made known. Here it would be helpful to explain that they include Hadrian's Wall World Heritage Site, listed buildings, scheduled monuments, conservation areas, historic parks and gardens, battlefields, and wrecks. Nor does reference to castles, houses, farmhouses and other buildings adequately convey the breadth of heritage in the county, stretching back to pre-historic times. Paragraph 8.4 of the Scoping Report identifies only one issue in respect of the historic environment. Again, reference to the potential to affect (harm?) the **significance** of heritage assets should be made. I would go further, flooding having the potential to give rise to the destruction/catastrophic loss of some heritage assets (bridges, weirs and mills being such examples). Frequent flooding could give rise to an inability to secure insurance against damage, leading to spiralling depreciation/diminution in levels of investment/consequent loss of value etc. On the positive side, careful interventions could indeed enhance the historic environment, and ways in which this could be achieved is a legitimate issue for the Strategy to address. The baseline for the Scoping Report should set out both the numerical extent of each asset type and commentary in respect of their condition, that is, the extent to which they may be at risk for whatever reason.	Baseline section updated to include more specific data about the number of designated heritage features. Reference to significance of assets added. Key issue updated.

APPENDIX B: LFRMS OBJECTIVES, MEASURES AND ACTIONS