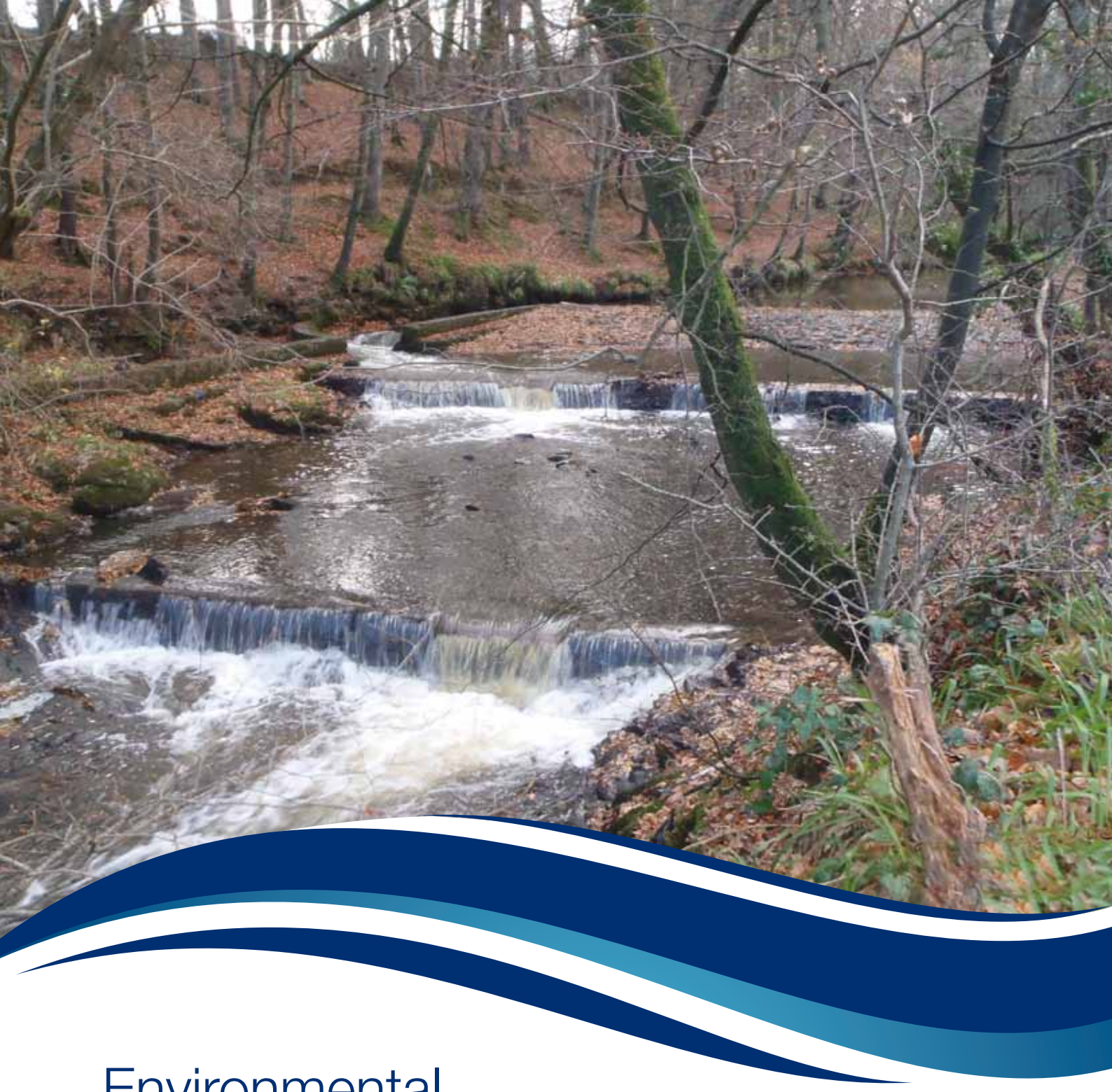


Environmental Report

RIVERS Agency

Department of Agriculture and Rural Development
www.dardni.gov.uk

You can get a copy of this document in other formats, such as:

- Large print
- Braille
- Audio CD
- Computer disk
- Other languages

To get a copy of this document in another format contact Rivers Agency at:

Tel: (028) 90253355

Fax: (028) 90252455

Email: Rivers.Agency@dardni.gov.uk

Version 1: 22 December 2015

TABLE OF CONTENTS

Appendices:

Abbreviations

DARD	Department of Agriculture and Rural Development
DRD	Department for Regional Development
EPA	Environmental Protection Agency (Republic of Ireland)
FRMP	Flood Risk Management Plan
HRA	Habitats Regulations Assessment
IPP	Individual Property Protection
NIEA	Northern Ireland Environment Agency
N2K	Natura 2000 site (includes Ramsars within this assessment)
OPW	Office of Public Works (Republic of Ireland)
PPP	Plans, Programmes and Projects
PPS15	Planning Policy Statement 15
RBD	River Basin District
RBMP	River Basin Management Plan
SFRA	Significant Flood Risk Area
SUDS	Sustainable Urban Drainage Systems
WFD	Water Framework Directive

Return to Contents Page

Executive Summary

Introduction

A Strategic Environmental Assessment (SEA) of the Flood Risk Management Plan consultation document (the Plan) has been undertaken by Rivers Agency, in order to satisfy the requirements of the SEA Directive and to ensure that any likely significant effects of the Plan are addressed as far as possible. The draft Flood Risk Management Plan was produced as a single document, and so a single SEA Scoping document and Environmental Report were also produced.

The final Flood Risk Management Plans (the Plans) have been produced as three separate documents, one for each River Basin District. The measures, measure types and activities are replicated within each Plan, and the single Environmental Report (amended) addresses all three Plans.
This Environmental Report has been prepared as part of the SEA process. The purpose of the Environmental Report is to:

- Guide the development of the Plans
- Identify and assess the likely significant impacts of the Plans and the measures
- Provide an early opportunity for both the statutory authorities and the public to offer views on any aspect of the report, through the consultation process.

Methodology and Consultation (chapter 3)
There are five key stages in the SEA process:

- Stage A – Setting the context and objectives, establishing the baseline and defining the scope;
- Stage B – Developing and refining strategic alternatives and assessing effects;
- Stage C – Preparing the Environmental Report;
- Stage D – Consulting on the Environmental Report and;
- Stage E – Monitoring implementation of the Plan.

This Environmental Report forms Stage C of the process, and is based on the information collected during Stages A and B, and any feedback from the statutory consultation authorities, who have considered the outcomes of Stages A and B.

Throughout Stages A and B, there has been ongoing liaison between Rivers Agency Flood Risk Management and Environmental staff, and the consultants undertaking these stages. The SEA scoping study has been circulated to statutory consultees in both Northern Ireland and the Republic of Ireland, and their responses have been incorporated into this Environmental Report.

Scoping the Relevant Environmental Aspects (chapters 3, 7)
Scoping has been carried out to ascertain the SEA topics that should be included within the further stages of the assessment. All topics with the exception of Air have been scoped in. Air has been scoped out as it was considered that the potential impact on air quality, noise and odour is considered to be a small scale, short

term and temporary effect, resulting from site specific protection measure types (i.e. structural works). Such works will be subject to an internal environmental impact assessment, required under the Environmental Assessment (Drainage) Regulations (NI) 2006, which includes air as one of the key areas for assessment. Details of the EIA process are provided in section 7.2 of the SEA statement.

For each of the SEA topics scoped in, an assessment has been made of the relevant environmental problems and key issues, and objectives have been set. These objectives set key questions regarding the potential impact of the Plans.

Chapter 3 also sets the overall scope of the SEA, in terms of the geography, timescale, and level at which the Plans are set. The Plans contain measures and proposals which are at both a regional or generic level, and at a more specific area level based on the 20 significant flood risk areas. The Plans do not focus down to site specific activities to manage flood risk, and this is reflected in the more generic level of assessment of the SEA.

This Environmental Report, in line with the requirements of legislation and guidance, provides the following information:

Requirement of SEA Directive (Article 5 (1), Annex 1)	**Section of Environmental Report**
An outline of the contents and main objectives of the plan or programme, and relationship with other relevant plans or programmes;	Chapter 2 – Flood Risk Management in NI. Chapter 5 – Policy Context
The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme, or modification to a plan or programme,	Chapter 4 – Baseline Environmental Information and Status
Any existing environmental problems which are relevant to the plan or programme, or modification to a plan or programme, including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to the Birds Directive or the Habitats Directive	Chapter 4 – Baseline Environmental Information and Status. Chapter 6 - HRA
The environmental protection objectives, established at international, European Union or national level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation	Chapter 2 – Flood Risk Management in NI Chapter 4 – Baseline Environmental Information and Status Chapter 5 – Policy Context
The likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors	Chapter 7 – SEA of the Plan
The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme, or modification to a plan or programme	Chapter 8 – Mitigation of the Adverse Effects

Return to Contents Page

Requirement of SEA Directive (Article 5 (1), Annex 1)	Section of Environmental Report
An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information	Chapter 2 – Flood Risk Management in N.I.
A description of the measures envisaged concerning monitoring of the significant environmental effects of implementation of the plan or programme, or modification to a plan or programme	Chapter 9 -Monitoring
A non-technical summary of the information provided under the above headings	Executive Summary

Outcomes from the Assessment

Prevention Measures

Surface Water Management – the use of activities such as SuDS is an inter-departmental issue, which is the source of ongoing discussions and plans. The implementation of these activities is assessed as having a negative impact on the SEA topics in the short term, due to construction impacts, and changes in land use. In the future, there are likely to be long term positive impacts due to flood risk management benefits, biodiversity gain, human health and landscape. These activities also have potential synergy benefits through water quality improvement and effects on stream power, which should assist in WFD targets.

Development Outside Flood Risk Areas – this measure type is managed through the application of PPS15, which is administered by local councils and Planning NI. Consequently all mitigation and policy compliance can only take place within the planning phase, which is not directly controlled by Rivers Agency. However, Rivers Agency, through its Planning Advisory Unit, advises local councils and Planning NI on flood risk, and identifies where a flood risk assessment will be required. Development will still occur, regardless of PPS15, which aims only to keep development out of flood risk areas. As such, the measure type is deemed to have an overall negative effect on the SEA topics due to the actual development. The measure type will, however, have benefits for water quality and biodiversity through retention of floodplain areas, and reducing water quality risk from development infrastructure both during and post construction. PPS 15 is already published, with Rivers Agency providing flood mapping and information as required. The Plans are not proposing any further policy under this heading, hence the continued use of the policy may be termed “Do nothing”.

Suitable Construction of New Development within Flood Risk Areas

Rivers Agency does not have a direct role in the design and construction of properties, but has a role in relation to Flood Risk and Drainage Assessments. The measure type relies on other agencies such as Planning NI and local councils. In terms of potential impact on SEA objectives, it is considered to have a potentially overall negative impact, on the basis that it is development based. However, the measure type has positive effects through potential water quality benefits such as suitable positioning of oil tanks.

Protection Measures

Do Nothing

Rivers Agency currently manages and reduces flood risk through a number of activities, which are dependent on resource. With the predictions of climate change, the "Do nothing" scenario is liable to result in negative impacts for people, material assets, environment and the economy.

Flood Alleviation schemes (floodwalls and embankments and culvert works)

The impacts from these structural works are assessed as negative for environmental topics, and mainly positive for population and human health topics (due to flood protection). Negative impacts can be mitigated by careful design, and the inclusion of works and measures which have benefits under other directives, e.g. improving fish passage through culvert re-design. Rivers Agency's EIA process is a robust, project level system which identifies potential impacts, recommends suitable mitigation measures, and identifies potential enhancements and benefits under other directives and strategies.

Enhanced Maintenance of Existing Drainage and Flood Defence Network

The assessment showed an overall net negative impact from enhanced maintenance of these networks. This reflects the theoretical worst case scenario for impacts from maintenance works – historical evidence suggests that the resulting effects are reduced from this, and indeed, may have benefits for certain species and habitats. Mitigation measures such as good working practice, agreed work methodology and inclusion of mitigation and enhancement measures will minimise the impacts, and are already used by Rivers Agency in its current regime. Rivers Agency has developed best practice maintenance methods, in consultation with bodies in the UK mainland and the Republic of Ireland. The potential for synergy with other directives such as the WFD should be followed up.

Catchment Based Management

This measure type is to be investigated and developed within the timescale of the Plans. Currently, Rivers Agency legislation does not facilitate the inclusion of these measures, and there is still uncertainty as to their benefits in large return period flood occurrences. Rivers Agency intends to look at the use of catchment based management as additional to the measures set out in the Plans, and to look to employ them through a partnership based approach. Many of these measures have benefits for Water Framework Directive issues, and wider biodiversity and human health gain, and so it is salient to look to develop these in a joined up way with other agencies and groups. This will be undertaken throughout the duration of these Plans. Already, Rivers Agency has hosted Northern Ireland's first Blue-green Cities workshop on Planning for Sustainable Flood Management. The Agency is also involved in a GIS based catchment study, to identify key issues. In terms of SEA topics, a full assessment has not been carried out, as it is unclear as to what forms of management would be proposed. It is envisaged that the long term impacts of such management would be positive, though there may be short term negative impacts.

Flood Preparedness

Flood Warning (includes communication of flood risk).

This measure type, through its deployment, will have a beneficial effect on those SEA topics that it affects. This is mainly through its effects on population and health, material assets and cultural heritage.

Flood Emergency Response

This measure type is seen as overall beneficial to most SEA topics, and particularly those of population and health and material assets. This measure type is based on inter departmental activities, which are not fully controlled by Rivers Agency.

Self Help (includes individual property protection and community engagement)

This measure type is based on individual and community resilience, and is assessed as having overall positive impacts on the SEA topics, in particular population and human health and material assets. This measure type looks to deliver its activities through inter departmental and community means.

Conclusions from the SEA

The conclusion from the SEA is that although the Plans may have potential negative impacts on aspects of the environment, these can be reduced through the application of identified and other mitigation measures, which will include liaison with consultees. The application of the EIA process at a project level will focus more clearly on environmental issues, impacts, mitigation and enhancement. The SEA has also identified the potential for multi-directive benefits through the use of synergistic works, on a partnership basis.

Impact of the SEA Process

The Plans are high level documents, which propose the management of flood risk through a number of measures and measure types. The SEA has identified the potential negative impacts of these measures, and suggested mitigatory measures for them. This information will be used in the development of the final Plans, through specific flood risk management projects within the 20 significant flood risk areas, and will feed into the further refinement of assessment through the EIA process.

The SEA has also identified areas of potential synergy with other directives, which will be developed during the timescale of the Plan.

Return to Contents Page

1. INTRODUCTION

The Strategic Environmental Assessment Directive states, within Article 1, that its objective is *"to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development."*

The assessment procedure comprises:

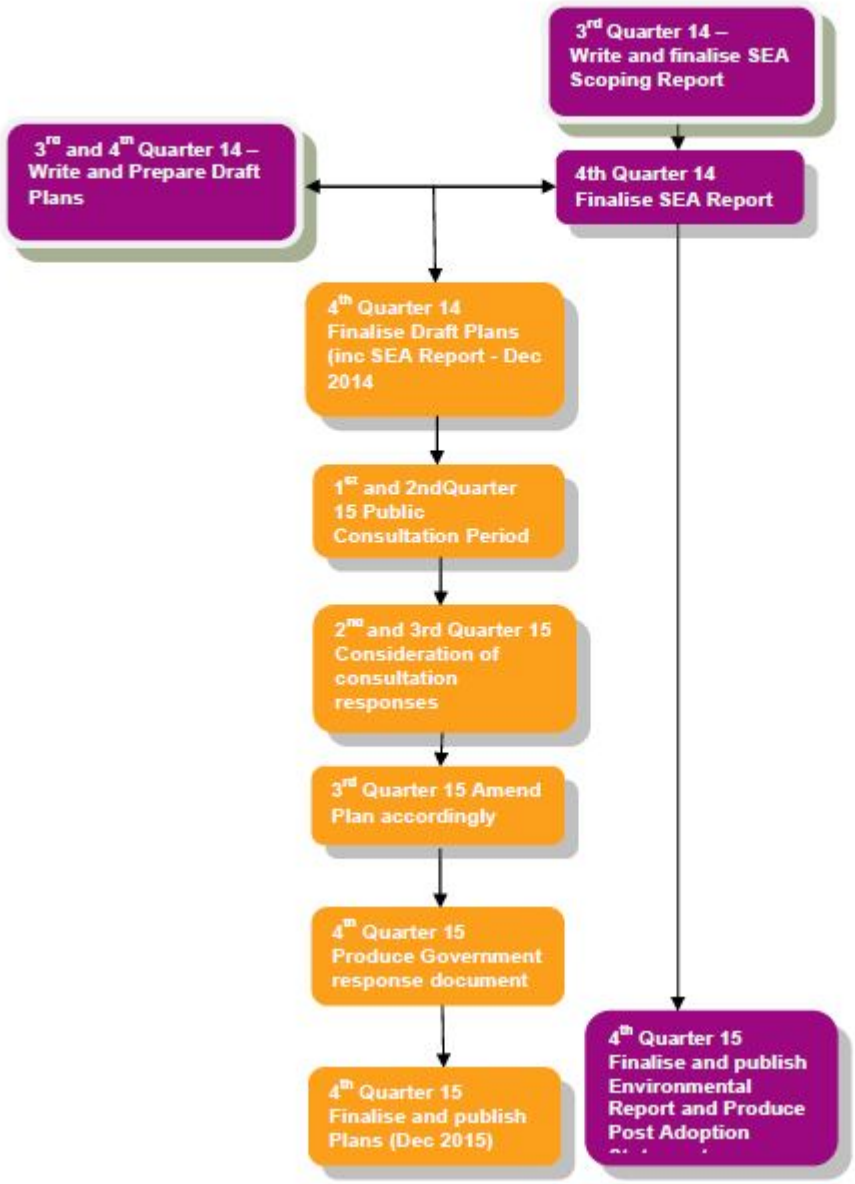
- The production of the SEA Scoping document, consultation with statutory consultees and the receipt of responses
- The preparation of an Environmental Report on the likely significant effects of the draft plan or programme
- Consultation on the draft plan or programme and the accompanying Environmental Report
- The incorporation of the Environmental Report and its findings into decision making
- The provision of information when the plan or programme is adopted, and the demonstration of how the results of the environmental assessment have been taken into account.

This Environmental Report has been prepared as part of the Strategic Environmental Assessment (SEA) of the Flood Risk Management Plans (the Plans) for Northern Ireland. The purpose of the Environmental Report is to:

- Guide the development of the Plans
- Identify and assess the likely significant impacts of the Plans and their measures
- Provide an early opportunity for both the statutory authorities and the public to offer views on any aspect of the report, through the consultation process.

The production of the Environmental Report fits into the overall programme of plan preparation which includes the stages of the SEA, and the production of the Plans themselves. This process is set out in Fig. 1 below.

Fig 1 - Process and Timescale for the Production of the FRMPs and SEA



Return to Contents Page

2. Flood Risk Management in Northern Ireland

2.1 Introduction - Flood Risk

Flooding is a natural process that can happen at any time in a wide variety of locations, and its causes, extent and impacts are varied and complex. The Floods Directive defines a flood as ***"the temporary covering by water from any source of land not normally covered by water, but does not include a flood solely from a sewerage system".*** There is a consequent risk when people and human assets, property, infrastructure, the natural environment, agricultural land, heritage, etc., are present in the area that floods. Flooding cannot be avoided, and as such, flood management is based on managing the flood risk i.e. the combination of the probability of a flood and of the potential adverse consequences associated with a flood, for human health, the environment, cultural heritage and economic activity.

There are four main sources of flooding:-

- Flooding from rivers or fluvial flooding occurs when the channel capacity is exceeded and water is conveyed and stored within the floodplains.
- Coastal flooding occurs when inundation takes place along coastal areas and estuaries as a result of a combination of high tides, storm surge and wave action.
- Surface water or pluvial flooding occurs as a result of high intensity rainfall when the ground is unable to absorb the rainfall or when run-off collects in low lying areas or when drainage systems are overwhelmed.
- Flooding from reservoirs can also arise to surrounding areas due to structural failure or the reservoir capacity being significantly exceeded.

It is accepted that we are likely to experience more regular flooding in the future. In urban areas, surface water flooding will increase due to the development of green spaces and the paving of gardens and driveways. Widespread deforestation together with drainage and land management practices designed to improve the productive potential of agricultural land has, as a consequence, increased conveyances and flows in watercourses and increased flood risk in urban areas lower down the catchment. Climate change predictions also suggest sea level rise, an increase in winter precipitation and an increase in the frequency and intensity of extreme rainfall events.

2.2 The Floods Directive

The ***European Directive on the Assessment and Management of Flood Risks (2007/60/EC)*** came into force on 26 November 2007 and was transposed into local legislation by **The Water Environment (Floods Directive) Regulations (Northern Ireland) 2009**. This Directive required Member States to assess all watercourses and coast lines which are at risk from flooding, to map the flood extent and the assets and

humans at risk in these areas, and to take adequate and co-ordinated measures to reduce this flood risk. This Directive also reinforces the rights of the public to access this information and to have a say in the planning process.

The Floods Directive was transposed into the Floods Directive Regulations Northern Ireland in 2009 in order that the Department of Agriculture and Rural Development would be able to exercise the powers conferred to it. The Department is therefore the competent authority for the purposes of the implementation of the Floods Directive, and fulfils this role through Rivers Agency.

The key milestones towards the implementation of Floods Directive include the following:

1. **Undertake a preliminary flood risk assessment** **Dec 2011**
2. **Produce flood hazard & flood risk maps** **Dec 2013**
3. **Produce flood risk management plans** **Dec 2015**

In addition to addressing existing risk, it is essential to manage flood risk long-term, to ensure that communities develop in a sustainable manner that avoids or minimizes a potential future increase in flood risk.

Development in flood-prone areas can create flood risk by building houses and other properties in areas where they may be flooded, or worsen the risk to properties up or downstream. Development in areas outside the floodplain can also increase flood risk to existing development downstream through increased runoff rates and volumes.

Flood risk in Northern Ireland has historically been addressed largely through a reactive approach and the use of structural or engineered solutions. In line with internationally changing perspectives, the Northern Ireland Government has adopted a new policy which shifted the emphasis in flood risk towards:

- A catchment based approach towards managing flood risk;
- Being more proactive in identifying, planning and setting measures to reduce future predicted flood risk.
- Better co ordination, co operation and the sharing of information.
- Promoting the use of natural flood risk management measures.

Even with this change in balance, engineered solutions are likely to continue as an integral component in the management of flood risk.

The requirements for a FRMP are set out in The Floods Directive, as are the three main measures of **prevention, protection** and **preparedness** for the management of flood risk. Each measure contains a number of measure types, which can be considered either alone, or in combination, for the management of flood risk.

The three measures are:

- **Prevention**: avoiding construction of houses and industries in flood-prone areas; by adapting future developments to the risk of flooding; and by promoting appropriate surface water management.
- **Protection:** maintaining existing drainage and flood defence networks, constructing new flood alleviation measures and catchment based management.
- **Preparedness**: informing the public about flood risk and what to do in the event of a flood, developing and implementing emergency plans and flood warning.

Notwithstanding the adoption of a wider range of measures and measure types to manage flood risk, engineered solutions are likely to continue to form a key component of any flood risk management strategy.

2.3 The Flood Risk Management Plans

The Department of Agriculture and Rural Development (DARD Rivers Agency) produced a draft **Flood Risk Management Plan** (‘**The Plan’**), which set out objectives and measures for reducing the flood risk in Northern Ireland

The Plan has been designed to be in-line with the requirements of The Water Environment (Floods Directive) Regulations (Northern Ireland) 2009. As a point of clarity, the flood risk management consultation document (which encompasses the Flood Risk Management Plans for each River Basin District (RBD)) was referred to as “the Plan”. However, the final Flood Risk Management Plans will be referred to as “the Plans” in this Environmental Report. As approaches to deliver the measures identified to manage flood risk are generally consistent across each RBD, one Environmental Report and one SEA statement have been produced.

The Flood Risk Management Plans aim is to manage the flood risk from all the sources of flooding. The Plans have a number of objectives, under the headings of Social, Environmental and Economic, which form the basis of what the Agency is trying to achieve through the Plans. In setting the objectives, the Floods Directive requires that the plans should give consideration to:

- Reducing the likelihood of flooding
- Reducing the adverse consequences of flooding for human health, economic activity and the environment including cultural heritage

Rivers Agency has produced three plans, one for each River Basin District, as used in the Water Framework Directive River Basin Management Plans and Programmes of Measures. The North Western and Neagh-Bann River Basin Districts are International River Basin Districts as they cover areas laying in both Northern Ireland and the Republic of Ireland. The North Eastern River Basin District is entirely within the boundary of Northern Ireland.

2.3.1 Plan Structure

The FRMPs (the Plans) contain specific measures for the 20 SFRAs which have been identified through the Preliminary Flood Risk Assessment process.

The key facts about the Plans are summarized in Table 1 below:

Table 1 : Key Facts about the Flood Risk Management Plans

Responsible Authority	DARD Rivers Agency
Titles	Flood Risk Management Plans for Northern Ireland – North Western, North Eastern and Neagh Bann
Purpose	Management of Flood Risk
What prompted the Flood Risk Management Plans	The Water Environment (Floods Directive) Regulations (Northern Ireland) 2009
Period covered	December 2015 – December 2021
Frequency of updates	Every six years
Area covered	Northern Ireland and in particular 20 areas of potentially significant flood risk, i.e. Belfast, Newtownards, Carrickfergus & Kilroot Power Station, Bangor, Newcastle, Newtownabbey, Downpatrick, Dundonald, Londonderry, Omagh, Strabane, Newry, Portadown, Warrenpoint, Banbridge, Lurgan, Glengormley & Mallusk, Antrim, Ballymena and Coleraine. These have been divided into the three River Basin Districts.
Objectives of Flood Risk Management Plans	To inform the implementation of land use policies to prevent flooding. To reduce the likelihood of flooding, where possible, taking into account economic and environmental factors. To raise the awareness of flood risk and planning for an emergency response and recovery
Contact	Strategic Planning Unit, DARD Rivers Agency, Hydebank, 4 Hospital Road, Ballydollaghan, Belfast, BT8 8JP

2.3.2 Plans' Aims and Objectives

The Plans aim to manage flood risk in Northern Ireland. Within the Plans, objectives have been set under the headings of **human health, the environment, cultural heritage and economic activity** – the Floods Directive stipulates that any FRMP must produce specific objectives, under these four headings. For the Northern Ireland Flood Risk Management Plans, these objectives are the same for each plan, and are shown below in Table 2:

Table 2 – Plan Objectives

Plan Objective Headings	Objectives
Economic Activity	• Reduce economic damages to properties. • Reduce economic costs on business caused by the disruption to essential infrastructure and services. • Optimise economic return on Flood Risk Management investment.
Human Health	• Reduce the risk to life. • Raise awareness of the consequences of flood risk. • Reduce risk to health and wellbeing. • Reduce the impact on people caused by the disruption to essential Infrastructure and services. • Improve recreation and public amenities.
Environment and Cultural Heritage	• Consider the impact of Climate Change • Under the Water Framework Directive, support the achievement of good ecological potential/status for water bodies. • Reduce the risk of pollution. • Avoid or mitigate impact on priority species and habitats. • Avoid or mitigate impact on designated environmental areas, including those of cultural heritage importance.

2.3.3 Plans' Measures and Measure Types

The Flood Risk Management Plans' Measures are the key methods for the achievement of the objectives. All three measures, and the measure types contained within, are salient to the fulfilment of the Plans' objectives under the four objective headings of human health, the environment, cultural heritage and economic activity.

For the Floods Directive, the three measures are:

- **Prevention**
- **Protection**
- **Preparedness**

In determining the proposed measures the Plans must also consider:-

- the preliminary flood risk assessment
- the information available in the flood maps
- the Water Framework Directive environmental objectives
- the cost and benefits of the different options for managing the flood risk
- the impact of climate change
- the opportunity for natural flood risk management.

Each of these 3 measures is further divided into a number of distinct measure types. Some of the measure types are short term in character, others are long term, and they may be used either individually, or in combination, to manage flood risk in Northern Ireland.

The measure types considered under the three measures of **Prevention, Protection and Preparedness** are shown below (Table 3), along with the preferred option/measure activity for their implementation:

Return to Contents Page

Table 3 Measures, Types and Activities of the FRM.

Measures	Measures Type	Measures Activities
Flood Prevention	**Keep new development outside Flood Risk Areas**.	• Try to ensure that new zonings are located outside flood risk areas. • Try to ensure that individual applications are located outside flood risk areas
	Ensure new development within Flood Risk Areas is suitably constructed.	• In accordance with PPS 15 try to ensure that any development which is located "by exception" in flood risk areas is appropriately built with flood resistance/resilience measures. • All proposed development applications are accompanied by a Flood Risk or Drainage Assessment.
	Surface Water Management.	• Promote the application of SuDS to all new developments.
Flood Protection	**Maintenance of the Existing Drainage and Flood Defence Network.**	• Continue to inspect and maintain designated watercourse grilles as appropriate and as funding allows. • Continue to regularly inspect the condition of all drainage and Flood Defence Assets. • Continue to implement a prioritised programme of works for the maintenance of all drainage and Flood Defence Assets. • Continue to implement a prioritised programme of works for the maintenance of all drainage and Flood Defence Assets • Continue to implement a prioritised programme of works for the maintenance of public sewer schemes
	New Flood Alleviation Schemes	• Continue to carry out feasibility studies to identify viable solutions. • Continue to implement a prioritised programme of works of flood defence and culvert alleviation schemes. • Continue to implement a prioritised programme of works of integrated surface water drainage schemes. • Continue to implement a prioritised programme of works to separate surface water systems from combined sewer systems.

	Catchment Based Management	• Look for opportunities to work with others through partnership arrangements.
Flood Preparedness	**Flood Emergency Response**	• We will continue to engage with other responsible bodies on identifying local flooding hotspots and co ordination of response procedures along with Blue Light responders. • We will continue to prepare and engage with other responders on multi Agency flood emergency response plans to those areas at known flood risk, e.g. coastal flood response plans. • We will continue to engage with local Communities in those areas at known flood risk. • We will continue to test emergency response plans through Multi Agency 'Exercising'. • We will continue to work with Co-responders in line with Flood Emergency Response "Best Practice Guidelines".
	Flood Warning and Informing suitable for NI	4 Stage Approach • Formal engagement with the Met Office in a 'partnering' approach to better inform the impact assessment of National Severe Weather Warnings for heavy rainfall. • Ensuring adequate 'Informing' in relation to flood risk to enable responders and the public to be effective in dealing with flooding. • Public dissemination of water level information. This includes the use of River level text warnings, where these are likely to be beneficial. • Review and Development.
	Community Engagement	• Rivers Agency is working with the other drainage agencies, the emergency services, local government, NIHE, Red Cross, Consumer Council, Met Office, etc., to develop and establish a consistent approach to flood warning and informing activities across Northern Ireland.
	Communication of Flood Risk	• We will continue to engage with communities to facilitate the informing aspect of 'Flood Warning and Information' proposals. • We will continue to update and improve flood risk information on the Flood Maps (NI). • We will continue to improve information on flooding on the NI Direct Website. • We will continue to work with NI Direct in the development of the Flooding Incident Line (FIL). • Continue to consult and hold flood forums with stakeholders and others to make them aware of their role and responsibilities in assessing and managing flood risk. • Seek to issue timely media messages to inform the Public of significant flooding events.

	Individual Property Protection	• A proposed scheme for grant aiding Individual Property Protection is currently being progressed. Eligibility will be assessed on the likelihood of future flooding and the frequency of past flooding events. • The introduction of such a scheme would be a significant step forward and be a key 'building block' in enhancing community resilience to flooding.
	Flood Recovery, Welfare and Insurance Issues	• We will continue to carry out and contribute to post flood investigations to gather information and improve knowledge and action on future flood events. • We will continue to work with Councils and local communities at flood risk in providing advice and information to aid recovery after a flood event. • We will continue to engage and work with voluntary section organisations such as the Red Cross in providing Welfare Support. • We will continue to work with the insurance industry to assist them in introducing "FloodRe" to NI to help address long term flood insurance affordability issues.

It should be noted that depending on the flooding problems for each settlement in an area of significant flood risk, one or more measure types from Table 3 may be employed by DARD Rivers Agency in the Plans. Also, the preferred approach may be taken in the short, medium or long term depending on circumstances.

In the period of the first Plans 2015-21, the measure types which may be taken forward are limited by existing legislation and relate primarily to the 20 areas of significant flood risk (section 2.5).

2.4 Transboundary Issues

The objectives and preferred options identified in the Plans will be focused on Northern Ireland (as per DARD Rivers Agency's jurisdiction). Proposals within the Plans are limited to Northern Ireland. There has been close and continuing liaison between the OPW and DARD Rivers Agency for the two international river basin districts, the North Eastern and North Western.

As preferred options to address flood risk will be located in Northern Ireland, it is not anticipated that any direct likely significant transboundary impacts will result on the additional SEA topics. However, if during the course of preparing or implementing the Plans, other significant environmental impacts seem likely, the scope of the assessment will be expanded accordingly.

As part of the statutory consultation process, the SEA scoping document has been sent for consultation to a range of government bodies in the Republic of Ireland as well as NIEA, as the statutory consultee in Northern Ireland.

2.5 Significant Flood Risk Areas

The Plans will focus on **20 areas of potentially significant flood risk** (SFRA) in Northern Ireland (Figure 1), which have been identified by DARD Rivers Agency from the preliminary flood risk assessment. For each of these areas, DARD Rivers Agency sets out objectives and measures for reducing the flood risk in the first 6 year planning cycle, 2015 -2021. These SFRAs are urban areas, where the potential impact of flooding is high due to residential, commercial and industrial properties and infrastructure.

2.6 Alternatives

Alternatives to the proposed plans must be considered. These should include the "No Plan or Programme" scenario. The option of "No Plan or Programme" is not a realistic alternative to the Plans, as the Floods Directive requires member states to assess flood risk, both in the current situation and under potential Climate Change impacts, and to take measures to manage this risk. Consequently, this alternative has not been considered further within the Plans.
The three measures, and the consequent measure types set out in Section 2.3.3 and Table 3 form the alternatives for the Plans. This is due to the limitations of current legislation. However, It is anticipated that strategies and policies will be developed and that legislation may be introduced that

will enable a wider range of measure types to be used in the management of flood risk in subsequent Plans. During the timeframe of the first Plans, Rivers Agency will seek opportunities to consider and develop natural flood management opportunities, both individually and as joint measures with other groups and bodies. This will include the consideration of synergistic measures which may address issues under a number of directives and strategies. Rivers Agency has already commenced this process through the hosting of the Blue-green Cities workshop on "Planning for Sustainable Flood Risk management" in September 2015. This workshop drew together regulatory groups from across Northern Ireland, including both central and local government, to raise awareness of opportunities for partnership working and multi-benefit measures. The Agency is also involved in developing a pilot GIS based catchment project, aimed at drawing together the range of information held by groups, to look for areas of potential multi-benefits.

DARD Rivers Agency is proposing to use the following methodology (Image 2) to assign preferred options for each of the 20 areas of potential significant flood risk (SFRA). The 20 areas were identified following an assessment of flood risk in settlements within Northern Ireland (settlement assessment). The method by which the 20 areas were chosen has already been published as the Preliminary Flood Risk Assessment and Methodology for the Identification of Significant Flood Risk Areas (Dec 2011). Within the significant flood risk areas, there is a two stage approach to identifying preferred options associated with flood risk management.

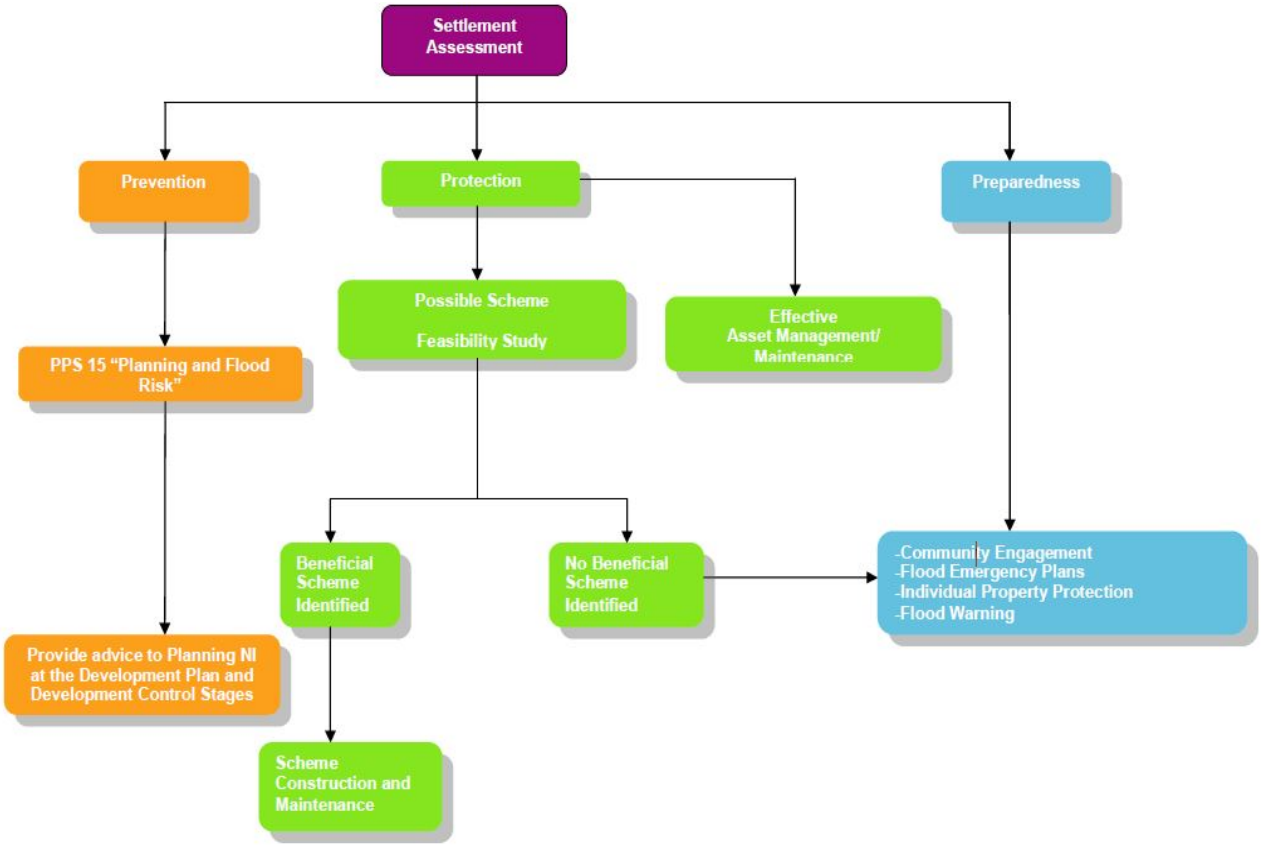


Image 2. Flow diagram to indicate how typical flood risk preferred measure pathways (alternatives) will be assigned to each settlement

Stage 1

Return to Contents Page

Due to the flooding impact on life and property, DARD Rivers Agency considers whether a flood protection scheme is possible **("Protection" stream of Image 2)**. If it is, a flood study (including benefit/cost analysis) is produced, along with the identification of short term preparedness preferred options such as local maintenance and community engagement.

In the absence of the possibility of a flood protection scheme, the settlement is moved into the **"Preparedness" stream of Image 2,** and both short and long term preparedness preferred options are considered. These include:

- Short term – local maintenance and community engagement; and,
- Long term – emergency plans, flood warnings and individual property protection.

Stage 2

If a flood protection scheme is built (which is considered long term "Protection" within the context of Image 2), the short term preparedness preferred options which have been employed are removed.

If no viable flood protection scheme is possible, then long term preparedness (in the **"Preparedness" stream of Image 2**) preferred options are applied.

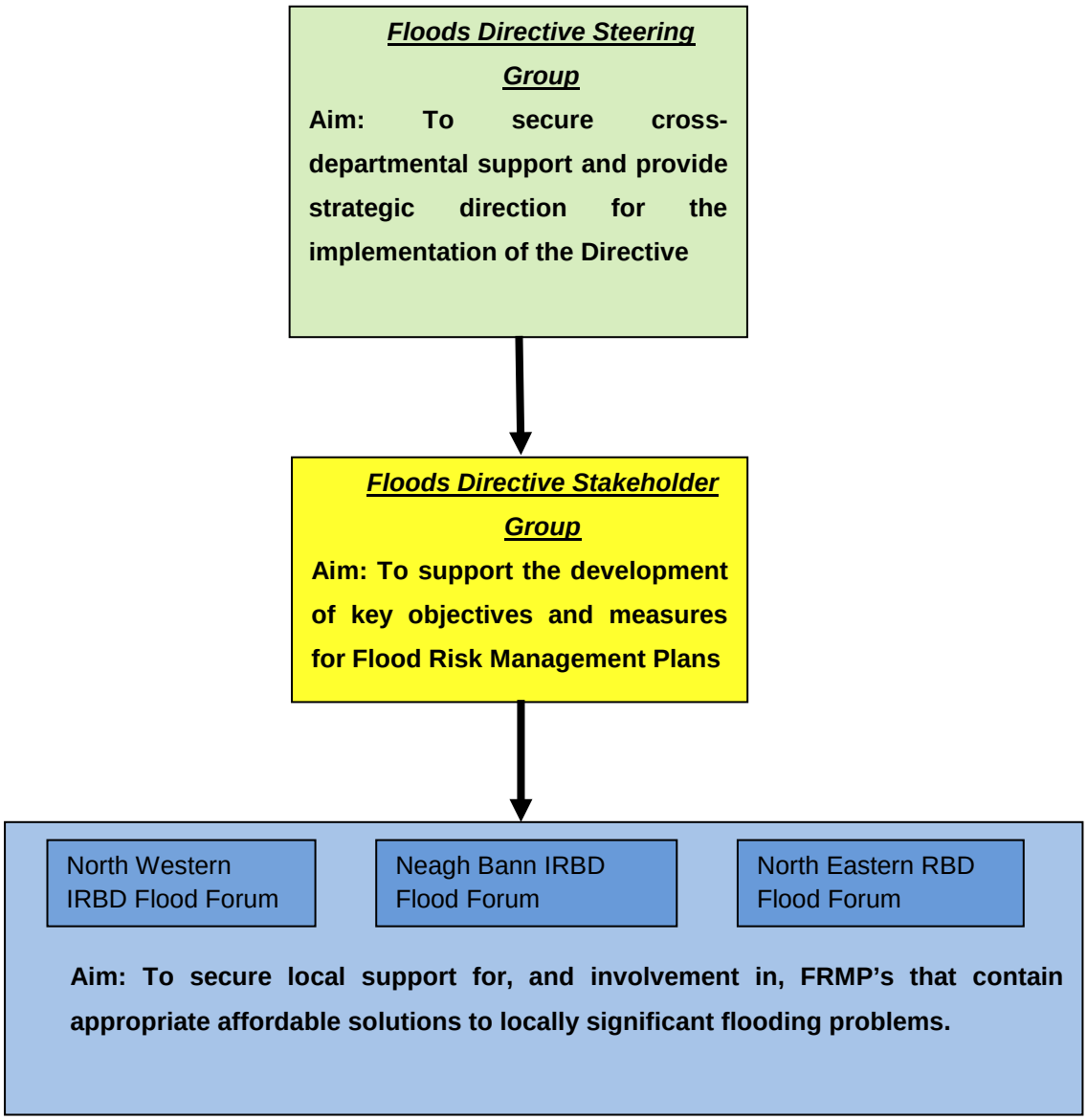
Prevention is a policy lead approach through which DARD Rivers Agency Planning Advisory Unit liaises with local councils and Planning NI, using PPS15. PPS15 is a policy which is used to minimise flood risk through flood plain protection, and ensuring that any development will not occur where it may flood itself, or cause an increased flood risk to another development or property. Prevention is considered a long term measure within the Plan.

2.7 Consultation on the Draft Plan

The Floods Directive encourages the active involvement of all interested parties in the production, reviewing and updating of the flood risk management plans. This also includes making information available to the public at all stages of the process.

Throughout the preparation stages of the preliminary flood risk assessment, maps and plans, Rivers Agency as the competent authority set up the following consultation network.

Floods Directive Consultation Network



Return to Contents Page

The **Steering Group** comprises senior representatives from key government stakeholders and ensures the successful implementation of the Directive by providing effective communication, cooperation and coordination across a number of departments and agencies.

The **Stakeholder Group** comprises government representatives with responsibility for flood risk management, the environment, farming, fishing, insurance and planning and civil contingencies. The Group shall have the opportunity to ensure that issues, challenges and opportunities associated with flood management are identified and factored into the process to produce effective catchment-based flood risk management plans that protect and enhance the environment.

The **Flood Forum Groups** take part at the local river basin level and engage with the public, local councils and local fishery and action groups, not only on flooding issues, but on the wider environmental issues of the plans. This level of engagement allows the Department to get a real sense and understanding from those who have experienced flooding first hand and how they have dealt with it, both during and after the event and what they have learnt should future flooding occur.

Meetings have also taken place with Key Infrastructure owners and with NIEA on the linkages with the Water Framework Directive. There is also ongoing co-ordination with the Office of Public Works in the Republic of Ireland to ensure best practice and integration on the cross- border North Western and Neagh Bann River Basin Districts.

3. Strategic Environmental Assessment

3.1 Introduction

European Directive 2001/42/EC 'on the assessment of the effects of certain plans and programmes on the environment'[1] (commonly referred to as the SEA Directive) introduced a requirement to undertake Strategic Environmental Assessment (SEA) on certain plans and programmes. The Flood Risk Management Plans will require a SEA.

The objective of the SEA Directive (2001/42/EC) is:
"to provide a high level of protection to the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development". (Article 1)

As a result of the SEA Directive and Northern Ireland Regulations, a SEA is required for plans and programmes which are:

- Likely to have significant environmental effects;
- Prepared for agriculture, forestry, fisheries, energy, industry, transport, waste management, water management, telecommunications, tourism, town and country planning or land use, and which set the framework for future development consent of projects requiring an EIA or an 'appropriate assessment' in accordance to the Habitats Directive; and,
- Subject to preparation and/or adoption by an authority at national, regional or local level or which are prepared by an authority for adoption, through a legislative procedure by Parliament or Government, and which are required by legislative, regulatory or administrative provisions.

3.2 SEA of the Plans

It was proposed to undertake a SEA of the Plans in order to satisfy the requirements of the SEA Directive and to ensure that any likely significant effects of the Plans were addressed as far as possible. It had been determined that the SEA was required for the Plans because:

- The Plans would be prepared for water management related development;
- The Plans would contain policies and proposals which could potentially give rise to significant environmental effects; and,
- The Plans have been prepared by DARD Rivers Agency for adoption at a national level.

Within the Plans, there are a number of measure types proposed for the management of flood risk. These have been grouped under the 3 main measures set out within the Floods Directive (see Section 2), and summarised as follows:

Prevention

- Keeping new development outside Flood Risk Areas
- Ensuring new development within Flood Risk Areas is suitably constructed

[1] This was transposed in Northern Ireland through The Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004.

Return to Contents Page

- Surface water management

Protection

- Maintenance of the existing drainage and flood defence network
- New flood alleviation schemes
- Catchment based management

Preparedness

- Flood warning and informing suitable for NI
- Flood emergency response
- Community engagement
- Communication of flood risk
- Individual Property Protection (IPP)
- Flood recovery, welfare and insurance issues

3.3 SEA Methodology

This section sets out the approach to undertaking the SEA including:

- main stages of the process,
- the environmental topics that will be included within the scope of the SEA, and
- the methods that will be used to assess effects and identify mitigation measures.

The method of assessment generally follows the UK guidance on SEA 'A Practical Guide to the Strategic Environmental Assessment Directive (ODPM 2005)'.

3.3.1 SEA Stages

There are five key stages in the SEA process:

- Stage A – Setting the context and objectives, establishing the baseline and defining the scope;
- Stage B – Developing and refining strategic alternatives and assessing effects;
- Stage C – Preparing the Environmental Report;
- Stage D – Consulting on the Environmental Report and;
- Stage E – Monitoring implementation of the Plan.

The draft Environmental Report forms Stage C of the process, and is based on the information collected during Stages A and B, and any feedback from the statutory consultation authorities, who have considered the outcomes of Stages A and B. The final Environmental report includes information and responses obtained from the public consultation process.

3.3.2 SEA Scope

Geographic – the Flood Risk Management Plans (the Plans) for Northern Ireland are regional plans, but with transboundary issues. This is due to the fact that two of the three River Basin Districts are transboundary in nature (Neagh Bann RBD and North Western RBD). One draft FRMP was produced for Northern Ireland which included the three RBDs.

Consequently, the SEA has been produced as a single document, as the approaches to deliver the measures identified to manage flood risk are generically consistent across each RBD.

Temporal – The Plans were finalised in December 2015, and cover the period from then until 2021.

Level of Plan detail – the Plans are at a River Basin District, with measures addressing flood risk management through policy recommendations. The Plans also focus on 20 specific Significant Flood Risk Areas (SFRAs), and identify potential measures and measure types, both structural and non-structural, to manage flood risk in these individual locations. This includes both short and long term measures, grouped under the three measures of Prevention, Preparedness and Protection. These measures form the alternatives within the Plans – legislative constraints limit the range of realistic alternatives within the period of the Plans.

Level of Assessment detail – the SEA does not examine site specific impacts, as the Plans do not include details of specific measure types on a geographic basis. Instead, it looks at the range of measures proposed, and their potential impact on the SEA topics. The Plans also include measure types which will not be implemented directly by the Department, and consequently, the SEA cannot assess the full impact of these measure types.

3.3.3 Scoping of SEA Topics

In accordance with The Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004, DARD Rivers Agency has considered whether the environmental effects (positive and negative) of the Plans are likely to be significant. For this, an assessment has been made of the generic potential effect of the Plans, on the key topics listed under the SEA. A summary of the conclusions are provided in Table 4.

Table 4. Scoping of SEA topics

SEA Topic	Potential effect of Flood Risk Management Plans	Scope in?
Biodiversity, flora and fauna	The Plans may have positive and negative effects on biodiversity, habitat and species through changes in flood hazard, and through implementation of preferred options.	IN
Population and Human Health	Flood risk has implications for physical and mental health and well-being. The Plans will address risk to human health from flooding.	IN
Soil and Geology	The Plans may have an effect on soil through land use changes and through proposed construction activities.	IN
Water	The Plans will have an effect on the water environment through reduction in flood risk. It is expected that impacts could be both short term (for construction) or longer term (from land use changes).	IN
Air	The Plans will not have significant effects on air quality, noise or odour	OUT
Climatic Factors	The Plans aim to improve resilience to climate change. Preferred options could impact on net greenhouse emissions through maintenance measures and emissions resulting from construction.	IN
Material Assets	The Plans will contribute to the protection of material assets including both critical and non-critical infrastructure.	IN
Cultural Heritage	The Plans will seek to protect cultural heritage from significant flood risk.	IN
Landscape	The Plans may impact landscape through flood risk management techniques, through permanent structures and potential landuse change	IN

Air is the only SEA topic which has been scoped out from the further stages of the assessment. The potential impact on air quality, noise and odour is considered to be a potentially small scale, short term and temporary effect, resulting from site specific protection measure types (i.e. structural works). Such works will be subject to an internal environmental impact assessment, required under the Environmental Assessment (Drainage) Regulations (NI) 2006, which includes air as one of the key areas for assessment. Details of this assessment are to be found in section 7.2 of the SEA Statement. At this stage there are no firm proposals for works which may cause a problem from odour.

Those topics scoped IN, have been taken forward within the assessment, through the development of relevant objectives for each topic, and an assessment of how the Plans, either alone or in combination with other plans, programmes and policies listed in section 5.2, might impact on any of these topics.

Following responses from the consultation on the SEA Scoping Document, geology and associated groundwater, and the marine environment, have been highlighted as topics which should be considered under the SEA. In response, the following information has been included:

Geology and Groundwater

Groundwater flooding is uncommon in Northern Ireland (Department of the Environment, 2006). This type of flooding generally occurs over and around aquifers where the underlying geology is highly permeable with a capacity to store rainfall (alluvial and fluvio-glacial aquifers). Other areas that could

be prone to groundwater flooding include areas close to rivers that are underlain by bedrock aquifers, areas close to groundwater fed ephemeral streams and areas of groundwater rebound. Following a desktop review of the hydro-geology and flooding history there have been no areas identified as being at "significant risk" of flooding from groundwater. However, should future evidence on this source of flooding come to light during the duration of the Plans, it will be incorporated into the review of any risk assessment, flood mapping and flood risk management plans. Groundwater issues have been discussed at a number of the Steering Group meetings listed in 2.7 which were attended by NIEA Water Management Unit.

Marine

The Marine Act (Northern Ireland) establishes DOE as the Marine Plan Authority for the inshore region. This, together with the Marine Coastal Access Act 2009 gives DOE the power to prepare and adopt a Marine Plan for Northern Ireland thereby enhancing the long-term viability of the marine area. This legislation also enables DOE to designate Marine Conservation Zones (MCZs) in Northern Ireland's inshore region – Strangford Lough has been designated a MCZ, and a further four zones are proposed.

The MCA Act 2009 made provision for the introduction of the Marine Policy Statement (MPS). The Marine Plan for Northern Ireland is currently being produced – until this plan has been finalised and agreed, all decisions capable of affecting the marine area are subject to the requirements the MPS.

Under the Marine and Coastal Access Act 2009 Part 4, a marine licence is required for works below the Mean High Water Mark. At this stage, the Plans have not identified any measure types or activities which would fall into this category. Should such activities or projects be identified, a marine licence will be applied for, along with any necessary HRA and assents resulting from other conservation legislation.

3.4 Consultation on the SEA

The draft SEA was sent to the statutory consultees on 22 October 2014. The statutory consultees are:

Northern Ireland:

NIEA Strategic Environmental Assessment Unit

Republic of Ireland:

Office of Public Works

Dept. Of Arts, Heritage and the Gaeltacht (Development Applications Unit)

Dept. Of Communications, Energy and Natural Resources (Corporate Support Unit)

Dept. Of Agriculture (Climate Change and Bio Energy Division)

Dept of Environment, Community and Local Govt. (Planning System and Spatial Policy Section)

Return to Contents Page

4 Baseline Environmental information and Status

4.1 Introduction

This section provides a summary of the baseline data sources that have been used during Stage B of the SEA, to inform the assessment. Information includes:

- Sources of baseline data;
- Summary of current baseline conditions/character; and,
- Summary of indicative key issues in relation to flood risk management.

In line with Schedule 2 of the 2004 NI Regulations the information collected identifies "the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme".

Considering the baseline at a national level provides an indication of the key constraints and opportunities for Northern Ireland as a whole. This level of detail will also enable any cumulative effects to be identified.

4.2 Baseline Data Sources

The key baseline information and the sources that have been used are detailed in Table 5.

Table 5: Summary of proposed environmental baseline data sources

Baseline information to be collected	Data source
Biodiversity, fauna and flora	
Northern Ireland	
Location and condition of designated sites Number / area of designated sites at risk of damage from flooding Marine Conservation Zones	Existing and proposed protected sites (SACs, SPAs, SCIs, ASSIs, Ramsar sites, NNRs) (NIEA) DoE Marine Environment Division
Trends in UK Biodiversity Action Plan (UK BAP) species / habitats	Biodiversity information from Northern Ireland Environment Agency (NIEA) Biodiversity Action Plans Royal Society for the Protection of Birds (RSPB) – Information on the location of significant sites for wintering, migrant and breeding birds (NI) British Trust for Ornithology (BTO) – Information on significant sites monitored for their bird interest (mainly WeBS) Whooper Swan Study Group (WSSG) – Information on the location of wintering sites and migration routes Birdwatch Ireland - Information on the location of significant sites for wintering, migrant and breeding birds (the Republic of Ireland) DoE Marine Environment Division
Habitat networks	Joint Nature Conservation Committee (JNCC) Centre for Environmental Data and Recording (CEDaR) – site specific plant and animal records

Return to Contents Page

Baseline information to be collected	Data source
	Northern Ireland's Priority Species and Species of Concern list Land Cover Map 2000 DoE Marine Environment Division
Fish Data	DCAL Inland Fisheries Group Loughs Agency AFBI NIEA – under WFD data collection
Republic of Ireland	
Number and location of designated sites within the cross border river catchments	Nature conservation designations in Counties Louth, Cavan, Leitrim, Donegal and Monaghan (Transboundary) Existing and proposed protected sites (SACs, SPAs, Ramsars, Natural Heritage Areas (NPWS) Proposed Natural Heritage Areas (pNHA) and designated Natural Heritage Areas (NHA) in the Republic of Ireland
Fish Data	Inland Fisheries Ireland
Population and Human health	
Northern Ireland	
Social vulnerability of people at risk of flooding	Northern Ireland Deprivation Statistics
Summary information on flood warnings, such as numbers of customers registered to receive flood warning	Met Office
Access to green space / recreation opportunities and impacts on human health	Outdoor NI Website
Republic of Ireland	
Social vulnerability of people at risk of flooding	Economic Vulnerability and Severity of Debt Problems: An analysis of the Irish EU-SILC 2008
Soils and Geology	
Northern Ireland	
Agricultural land in Northern Ireland	Agricultural Census in Northern Ireland Report 2013 (DARD)
Geological environment	Bedrock (solid) geology; and Drift (Quaternary) geology - from 1:10K geological mapping produced by GSNI.
Status and threats to soils and geodiversity	NIEA contaminated land database
Republic of Ireland	
Status and threats to soil and geodiversity	Teagasc Soil Reports and Maps
Geological environment	Geological Survey Ireland Maps and Reports
Water	
Northern Ireland	
River Basin Management Planning status, trends and pressures in water bodies	River Basin Management Plan from the Northern Ireland Environment Agency (NIEA) Water Management Unit (WMU). Classification/status of groundwater bodies
Sources and location of flood risk	DARD, Rivers Agency, Flood maps
Status, trends and pressures on the coastal and marine environment	DOE NI Marine Environment Division – Sustainability Report for the NI Marine Plan
Republic of Ireland	
Pressures and trends on the water environment and on River Basin Management Planning	River Basin Management Data from the Republic of Ireland Environmental Protection Agency (EPA)
Climatic factors	
Northern Ireland	
Summary of future flooding under climate change scenarios	UK Climate Impacts Programme: UK Climate Projections (UKCP09). DARD Rivers Agency Flood Maps
Trends and projections in greenhouse gas emissions	Measurement of Northern Ireland Greenhouse Gas and Carbon Dioxide Emissions: Final Report End User GHG Inventories for England, Scotland,

Return to Contents Page

Baseline information to be collected	Data source
	Wales and Northern Ireland: 1990, 2003 to 2007 Greenhouse Gas Inventories for England, Scotland, Wales and Northern Ireland: 1990 – 2007
Republic of Ireland	
Trends and projections in greenhouse gas emissions	EPA – Climate change information
Air Quality	
Northern Ireland	
Air Quality	Air Quality Management Areas (AQMAs) The United Kingdom Pollutant Release and Transfer Register (UK PRTR) website. Department of Environment web site www.airquality.co.uk
Republic of Ireland	
Air Quality	EPA Air Quality Publications and Reports
Material Assets	
Northern Ireland	
Trends in resource efficiency	Northern Ireland Neighbourhood Information Service (NINIS) Rethink Waste NI
Number and type of infrastructure at risk from flooding	DRD Transport NI Northern Ireland Railways Planning Northern Ireland Outdoor NI
Republic of Ireland	
Number and type of infrastructure at risk of flooding and Trends in resource efficiency	Waterways Ireland
Cultural Heritage	
Northern Ireland	
Number of designated historic sites (Battlefields; Gardens & Designated Landscapes; Scheduled Monuments and Sites (including those in State Care); UNESCO World Heritage Sites) at significant risk of flooding; scheduled sites and monuments; listed buildings	The Historic Monuments Database (Scheduled Monuments) Locations of Historic Parks and Gardens World Heritage Sites (Giant's Causeway) (NIEA) World Heritage Sites (United Nations Educational Scientific and Cultural Organization) Listed buildings database
Republic of Ireland	
Number of designated historic sites	Local Councils
Landscape	
Northern Ireland	
Trends and pressures on landscape	Landscape Character Areas (NIEA) Landscape Charter Areas Outline Geomorphology for Northern Ireland (NIEA) Areas of Outstanding Natural Beauty (AONB) (NIEA) Proposed National Park (NIEA).
Republic of Ireland	
Protected landscapes	Local Councils

4.3 Current Situation

Biodiversity, Flora and Fauna

Northern Ireland forms a bio-geographical unit with the Republic of Ireland with continuity of the air, water and land environments. For its size, Northern Ireland has a particularly diverse range of habitats and species. In 2002, the publication of the Northern Ireland Biodiversity Strategy committed the Government to recognising biodiversity within its policies and establishing a delivery mechanism for these policies. In Northern Ireland, the Government has a target to reduce significantly the loss of biodiversity by 2010 and to halt the loss of biodiversity by 2015. Northern Ireland's priority habitats

are of particular importance for native biodiversity and require conservation action. Aquatic and semi aquatic habitats, which include lakes, fens, bogs and wet grasslands are particularly well represented, however native woodland habitats are poorly represented.

In the Republic of Ireland, approximately 25% of forests, peatlands, freshwater habitats and dunes (Habitats in Ireland listed under the Habitats Directive by Broad Habitat Category) were listed as "poor". Only 7% of the listed habitats were considered to be in a favourable state. Of the species listed under the Habitats Directive, 39% have favourable status.

Populations and human health

Spatial measures of deprivation have been used to inform policy and target areas of need in Northern Ireland since the 1970s. The Northern Ireland Multiple Deprivation Measure (NIMDM) 2010 provided information on seven types of deprivation and an overall multiple deprivation measure comprising a weighted combination of the seven types of deprivation. Belfast is the most deprived local council area and the Magherafelt council area is considered the least deprived.

In the Republic of Ireland, an individual is defined as being deprived if they experience two or more forms of enforced deprivation, from a list of eleven, which include measures for food, heating and entertainment. In 2010, 22.6% of the Republic of Ireland population had experienced deprivation.

Soil

In Northern Ireland, the highest agricultural land classes are Classes 2 to 3A which cover 31% of the area of the study area; they represent the best and most versatile agricultural soils. Class 5 is of limited use to agriculture; however it often supports a rich range of biodiversity.

In the Republic of Ireland, approximately 65% of the land cover is classed as "agricultural areas" and as such the landscape is still predominantly rural and agricultural.

Water

There are a number of existing plans and activities related to flood risk management. Flooding can lead to the release of pollutants from Integrated Pollution and Prevention Control sites. Other issues relating to water are extensive and driven largely by the EU Water Framework Directive and its transposition into law. The Water Framework Directive requires the prevention of deterioration of aquatic ecosystems, with the key objectives of achieving good status for all inland and coastal waters. River Basin Management Plans set out the methods for achieving these objectives. In 2014, 33% of NI river water bodies were classified as 'high' or 'good' quality.

In the marine environment, the Marine Strategic Framework Directive acts in a similar way to WFD, by working to prevent deterioration.

Air

Air quality continues to improve in Northern Ireland with a long-term decline in the number of days of moderate or worse air quality. Levels of particulate matter (PM10) are within EC limit values. However, localised high levels of PM10 are sometimes seen in cold, settled winter weather conditions, when residential burning of solid fuel is high, and wind dispersal of pollutants is low. Levels of nitrogen dioxide (due to transport) remain a problem, with monitored levels at particular locations exceeding objectives. A wide range of air quality monitoring is carried out in Northern Ireland and the Republic of Ireland. Some monitoring sites in Northern Ireland are run as part of UK-wide monitoring networks; others are operated by district councils in order to meet local objectives. There are 32 air quality monitoring stations, with some of these being background sites only.

In the Republic of Ireland, a nationwide monitoring network of 29 stations measures levels of air pollutants. This network is managed by the EPA.

Climatic factors

Greenhouse gas emissions in Northern Ireland have decreased since the 1990 baseline, with a reduction of 17.5% achieved by 2011. There was a decrease of over 5% between 2010 and 2011, mainly due to a large reduction in burning oil use in the residential and business sectors after the exceptionally cold weather in 2010, and a reduction in emissions from coal consumption at power stations. Northern Ireland faces changes to its climate over the next century. Projections suggest that Northern Ireland may face hotter, drier summers and warmer, wetter winters as a result of climate change. This means that Northern Ireland may need to make changes to lifestyles to adjust to the changing climate. This will include the likelihood of flood risk due to climatic change.

In the Republic of Ireland, sectorial breakdowns of emission production between 1990 and 2010 have identified agriculture as the largest source of greenhouse gas emissions (30.5%). The energy and transport sectors were second and third highest (21.8% and 18.9% respectively) with the remainder produced by industrial and commercial (14.6%), residential (12.7%) and waste (1.4%).

Material Assets

There has been a fourfold increase in household waste in Northern Ireland recycling since 2002. Local authority collected municipal waste arising fell by just under 10% between 2004/05 and 2011/1. Over half of Northern Ireland's municipal waste is still sent to landfill. The new Northern Ireland Waste Management Strategy 'Delivering Resource Efficiency' supports the objectives of the EU 'Roadmap to a Resource Efficient Europe' which requires a greater focus on waste prevention, re-use and recycling in line with the Waste Hierarchy.

In the Republic of Ireland, there has been a 16% reduction in the amount of municipal waste generated between 2010 and 2007. This reduction has been attributed to a fall in personal consumption in addition to waste management and prevention practices. In addition, the "National Waste Prevention Programme" was launched in 2004 and has been targeted at various sectors, including hospitals, households, business and the hospitality industry.

It is estimated that around 5.5% or 46,000 properties in Northern Ireland are within either the 100 year fluvial floodplain or the 200 year coastal floodplain. One third of these properties currently have some level of protection.

Cultural Heritage

Northern Ireland and the Republic of Ireland have a rich heritage of archaeological sites, monuments and buildings representing the aspirations and achievements of past societies and providing evidence of settlement, industrial, agricultural and ritual activity from 9,000 years ago to the present day.

Landscape

The value of the Northern Ireland landscape continues to be recognised in the designation of Areas of Outstanding Natural Beauty (AONBs). Within Northern Ireland, the landscape has been described in 130 landscape character areas and into 24 seascape character areas (which includes a description of the Atlantic Ocean, North Channel and Irish Sea (South Down)).

In the Republic of Ireland, landscape designation is part of the remit of local councils and as such designations are made at the local level.

4.4 Environmental Problems and Key Issues

As part of Schedule 1 of The Environmental Assessment of Plan and Programmes Regulations (Northern Ireland) 2004, “environmental problems relevant to the plan or programme” should be identified as part of the criteria for determining the likely significance of effects on the environment. The Plans will seek to solve existing problems or reduce their effects associated with flood risk in Northern Ireland. Table 6 provides a description of environmental problems and key issues which have been identified in relation to the Plans.

Table 6: Environmental problems relevant to the Flood Risk Management Plans

SEA Topic	Relevant environmental problems and key issues
Biodiversity, fauna and flora	Threats to ecosystems and biodiversity; declining priority habitats and protected species. Pressures on biodiversity from land use change, pollution, invasive species and unsustainable fisheries practices. Measures to manage flood risk can have positive and negative impacts on habitats and species. Habitat creation or enhancement (for example as part of natural flood management or Sustainable Drainage Systems (SuDS)) can benefit biodiversity, fauna and flora. Other measures (for example some engineering works) could negatively impact on habitats and species, although sensitively designed and constructed schemes can lessen impacts (through mitigation) and should deliver benefits.
Population and human health	Flooding has impacts particularly within densely populated urban areas where it has the potential to affect high numbers of individuals. Impacts of flooding may be greater for some vulnerable or deprived groups. Impacts on health can include risk to life, the effects of exposure to water and contaminants, and immediate and longer term mental health impacts. In addition to reducing flood risk, measures to manage flood risk can have other impacts on people, both positive and negative. For example, green space may be engineered to act as flood storage in urban areas.
Geology and Soil	Soil is at risk from a number of threats including changing vegetation, erosion, acidification, compaction and sealing by development. Flooding and flood prevention measures could impact on soil and geological factors, with associated impacts from erosion, disturbance and landslips. Geology can potentially be impacted by unsympathetic flood risk management and associated drainage practices. Though sediment transport is a natural process, it can cause negative effects through siltation of engineered channels resulting in sediment loading of aquatic habitats.
Water	Flooding is a natural process but patterns of flooding can be altered and exacerbated by human influence (for example, changes to land use or hydromorphology such as modification of river channels). Flooding can result in diffuse pollution through the liberation of contaminants and sediments into watercourses at great volumes. However, flood risk management measures can also have negative impacts, for example, through some types of land use change or changes to river or coastal morphology. Potential impacts on groundwater should be considered.

Return to Contents Page

SEA Topic	Relevant environmental problems and key issues
Air and Climatic Factors	The main climate trends for Northern Ireland are considered to be warmer and drier summers, and warmer and wetter autumns and winters. However, convective storms, associated with surface water flooding, are likely to be more intense in summer months. Sea level rises and storm surges are also likely to lead to an increase in flood risk. The risk of flooding can be exacerbated by coastal squeeze. Flood risk management measures can impact on greenhouse gas emissions e.g. - changes in land use associated with flood risk management measures can impact on climatic factors by protecting green networks and soil resources which act as carbon sinks - construction of new flood protection measures could use significant energy and material resources. Measures can also help to adapt to changes in climate e.g. - physical measures that can be adapted in future to deal with increased flood risk - natural flood management measures that can help to create space for water.
Material assets	Flooding can cause significant damage to properties, utilities, transport, and community infrastructure. In rural areas, the disruption can be particularly severe where alternative infrastructure may be rare or absent. The process of construction may use significant material resources, and also generate waste including soil. The implementation of flood risk management measures should reduce the potential impact of flooding on material assets and infrastructure. Waste management and recovery.
Cultural Heritage	Cultural and historic environment assets and their settings are under pressure from a variety of influences. Some assets may be at significant flood risk. Measures to manage flood risk could impact on cultural heritage, for example, through disturbance or damage from engineering works. Changes to hydrological patterns can also impact on (both positively and negatively) wetland archaeology, by enhancing or adversely affecting wetlands.
Landscape	Landscapes are dynamic places, shaped by natural processes and human activity. Pressures on landscape include climate change, erosion and landslips, land use and development. Flood risk management measures could impact both positively and negatively on landscape. For example, impacts could arise from flood protection schemes, natural flood risk management measures, or the cumulative impacts of changes to land use or land management.

Return to Contents Page

5 Policy Context

5.1 Introduction

The following chapter gives an overview of the policy context in which the Plans sit. It includes a listing of other policies, programmes and plans which have relevance to the Plans, and also an assessment of the potential cumulative effects of the policies, programmes and plans, and the Plans. Section 5.2 provides an overview of the policies, programmes and plans relevant to the SEA topics. Further detail is provided in Table 7.

Biodiversity, Flora and Fauna

In Northern Ireland and the Republic of Ireland, biodiversity, flora and fauna are protected internationally, nationally and locally. Northern Ireland has European protected sites and species which are legislated for under the Ramsar Wetlands Convention, the Habitats Directive and the Birds Directive. Further information on these sites and the potential effects of policies, programmes and plans, and the Plans themselves, is provided in the HRA, and summarised in Chapter 6.

The Wildlife and Natural Environment Act (Northern Ireland) 2011 makes it the "duty of every public body, in exercising any functions, to further the conservation of biodiversity as far as is consistent with the propose exercise of those functions". The legislative definition of "conserving biodiversity" includes "in relation to any species of flora or fauna, restoring or enhancing a population of that species" and "in relation to any type of habitat, restoring or enhancing the habitat". In Northern Ireland, the Government has a target to reduce significantly the loss of biodiversity by 2010 and to halt the loss of biodiversity by 2015. The Northern Ireland Biodiversity Strategy, published in 2002, is currently under review by DOE.

There are a number of directives covering fisheries aspects – the Freshwater Fish Directive is subsumed into the Water Framework Directive, and the Eel Directive targets eel escapement, and the development of eel management plans. The NASCO strategy aims to conserve and enhance salmon numbers, as do the Fisheries Act (1966) and the Salmon Conservation Regulations (2013).

Populations and Human Health

In Northern Ireland, "Shaping Our Future – Regional Development Strategy for Northern Ireland 2025", is the overarching document which addresses a range of economic, social, environmental and community issues along with producing objectives to improve social cohesion and deliver sustainable development in Northern Ireland.

In the Republic of Ireland, "Our Sustainable Future" seeks to provide for the integration of sustainable development into key areas of policy.

Soil

There is no explicit legislation which protects soils in Northern Ireland.

In the Republic of Ireland as a response to the Thematic Strategy for Soil Protection and the proposed introduction of the Soils Directive, the Environmental Impact Assessment Regulations for On-Farm Development (2011) was introduced to protect soil from operations such as soil drainage.

Water

The Water Framework Directive (WFD) (2000) was introduced to bring a common approach to safeguarding all water and water dependent ecosystems. The units of management for the WFD are shared with the Floods Directive and as a result there is a transboundary element to the floods legislation in Northern Ireland. In addition to the WFD, the enactment of the Floods Directive requires cognisance of the Marine Directive, which aims to achieve Good Environmental Status (GES) in Europe's Seas by 2020. The WFD subsumes a number of daughter directives covering shellfish, bathing waters and freshwater fish amongst others.

The Marine Strategy Framework Directive aims to protect and enhance both inshore and offshore marine waters, in a similar way to the WFD.

Air

In both Northern Ireland and the Republic of Ireland, air quality is measured according to standards relating to European legislation and as such, there is a requirement on each jurisdiction to plan how they will deal with air quality exceedances. In Northern Ireland, Air Quality Management Areas (AQMAs) are declared and in the Republic of Ireland, Air Quality Management Plans have been produced. The UK Climate Change Act 2008 makes it a requirement that NI departments develop a climate change adaptation programme which will address the findings of the most recent report on the risks and opportunities from climate change to Northern Ireland. The first NI Climate Change Adaptation Programme was laid in the Assembly in January 2014 – it contains the government response to the risks and opportunities identified in the Climate Change Risk Assessment (CCRA) for Northern Ireland, which was published in January 2012. The Adaptation Programme covers the period 2014 – 2019. It provides the strategic objectives in relation to adaptation to climate change, the proposals and policies by which each department will meet these objectives, and the timescales associated with the proposals and policies identified.

Climatic factors

Climate change is addressed as an international issue and as a result, the UN Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol has been produced to inform governments regarding their obligations in relation to climate change. Both Northern Ireland and the Republic of Ireland have climate change measures in place as a result of international guidance.

Material Assets

In the context of protection of material assets both Northern Ireland and the Republic of Ireland have national contingency plans. Both jurisdictions have general planning information regarding to flooding. In Northern Ireland, flooding is considered as a local activity which requires multi-agency co-ordination at a local level.

In the Republic of Ireland, the Office of Emergency Planning provides information about what to do in the instance of flooding.

Cultural Heritage

In Northern Ireland, cultural heritage monuments and objects are protected by the Historic Monuments and Archaeological Objects (NI) Order 1995.

In the Republic of Ireland, cultural heritage monuments are protected by the National Monuments Act (1930).

Landscape

Both the UK and Republic of Ireland are signatories to the European Landscape Convention (the Florence Convention). The convention aims to encourage public authorities to adopt policies and measures at local, regional, national and international level of protecting, managing and planning landscapes throughout Europe. In addition to the European Landscape Convention, Northern Ireland through Department of Environment (DOE), have designated Areas of Outstanding Natural Beauty (AONB) under the Nature Conservation and Amenity Lands Order (NI) 1985.

5.2 Relationship with Other Policies and Environmental Objectives

The Plans sit within a myriad of environmental legislation, policy and plans. These programmes and plans have the potential, both individually and in combination, to affect the environment. Similarly, the Plans have the potential to effect, either alone or in combination, any or all of the key topics listed within the SEA. Table 7 below considers the “in combination” effect of the Plans, and the various key policies and legislation, under the SEA topics.

Table 7: Relationship with other Policies and Environmental Objectives – Biodiversity, Habitats and Species

Name of Policy	Main requirements of Policy objective	How it affects or is affected by the Flood Risk Management Plans in terms of SEA issues
Biodiversity, habitats and species		
International		
Convention on Wetlands of International Importance 1971 (amended 1982 and 1987	Otherwise known as the Ramsar Convention, this provides a framework for national action and international co-operation for the conservation and sustainable utilization of wetlands and their resources. It recognises the fundamental ecological functions of wetlands and their economic, cultural, scientific, and recreational value, particularly as a key habitat for waterfowl. There is a Ramsar List of designated sites for management & conservation at an international level.	The Plans should ensure that all Ramsar sites are protected from loss or damage as a result of flood management preferred options.
UN Convention on Biological Diversity(1992)	Key objective of the Convention is to develop national strategies for the conservation and sustainable use of biological diversity, which should be integrated across other policy sectors. Key biological resources should be identified and protected. Monitoring of potentially damaging processes and activities should also be undertaken. Actions taken under the Convention include: - Establishment of a UK Biodiversity Action Plan (BAP) to implement the Convention. - Establishment of Local BAPs to protect, enhance and promote local biodiversity.	The Plans should look for opportunities to conserve and where possible, restore biodiversity. The implementation of the Plans should seek areas of synergy between national and local biodiversity action plans.
European		
Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora ("Habitats Directive")	Builds on the Birds Directive (see below) by protecting natural habitats and other species of wild plants and animals. Together with the Birds Directive, it underpins a European network of protected areas known as Natura 2000: Special Protection Areas (SPAs, classified under the Birds Directive) and Special Areas of Conservation (SACs, classified under the Habitats Directive).	The Plans should ensure that Natura 2000 sites are suitably protected from loss or damage. The Plans are subject to a Habitats Regulations Assessment (HRA) to ensure that they do not adversely affect SPAs and SACs.

Return to Contents Page

Name of Policy	Main requirements of Policy objective	How it affects or is affected by the Flood Risk Management Plans in terms of SEA issues
Council Directive 79/409/EEC on the conservation of wild birds ("Birds Directive")	Protects all wild birds, their nests, eggs and habitats within the European Community. It gives EU member states the power and responsibility to classify Special Protection Areas (SPAs) to protect birds which are rare or vulnerable in Europe, as well as all migratory birds which are regular visitors.	The Plans should ensure that Natura 2000 sites are protected from loss or damage.
The Pan-European Biological and Landscape Diversity Strategy (1995)	The Strategy aims to reverse the decline of landscape and biological diversity, by promoting innovation and proactive policy making. It supports preceding measures for protecting natural heritage, and aims to supplement these by further supporting a number of action themes relating to different environmental resources.	The Plans should support the Strategy by considering the contribution that measures could make to protecting biodiversity and landscapes.
Our life insurance, our natural capital: an EU biodiversity strategy to 2020 (2011)	Aims to reverse biodiversity loss and speed up the EU's transition towards a resource efficient and green economy. Includes targets and actions related to: - halting deterioration in Natura 2000 sites and measurable improvements in status -maintaining and enhancing ecosystems and services through green infrastructure, and restoring degraded ecosystems - combating invasive species - contributing to averting biodiversity loss	The Plans should support the aims and commitments of the Strategy by minimising impacts on biodiversity, and by considering the contribution that measures could make to maintaining and restoring ecosystems.
The EU Freshwater Fish Directive (78/659/EEC) – now within WFD	Seeks to protect freshwater bodies identified as for sustaining fish population, by setting physical and chemical water quality objectives for salmonid and cyprinid waters	The Plans will take cognisance of the requirements of the Directive, including fish habitat and passage, commercial and recreational fishing, hydrology and water quality and the requirements under Annex II of the Habitats Directive.
United Kingdom		

Return to Contents Page

Name of Policy	Main requirements of Policy objective	How it affects or is affected by the Flood Risk Management Plans in terms of SEA issues
UK Post 2012 Biodiversity Framework	A UK agreement on a framework of priorities for the Convention of Biological Diversity	The Plans will take cognisance of this framework, by virtue of regard to the country level strategies
Northern Ireland		
The Wildlife and Natural Environment Act (NI) 2011	Main objectives are the protection of certain species and their habitats, responsibilities regarding ASSIs and the biodiversity duty for government bodies	The Plans will take cognisance of the requirements of this legislation within the development of measure types and activities and will identify methods to assess and minimise potential impacts (the EIA process)
The Wildlife (NI) Order 1985 and amendments.	Makes it an offence to intentionally kill, injure, or take any nationally protected species, wild bird or their eggs or nests.	Impact on nationally protected species and wild birds will need to be considered as part of the Plans.
Offshore Marine Conservation (Natural Habitats etc.) Regulations (S.I. 2007/184)	To ensure that activities in marine areas are carried out in a manner that is consistent with Council Directive 92/43/EEC (the Habitats Directive) and Council Directive 79/409/EEC (the Birds Directive).	The Plans will ensure that any proposed activities are undertaken with cognisance of the Habitats and Birds Directives and the Marine Strategy Framework Directive
The Nature Conservation and Amenity Lands Order 1985 (NCALCO) as amended in the Environment Order (NI) 2002 (see below)	Places particular emphasis on the establishment of a network of Areas of Special Scientific Interest (ASSIs), National Nature Reserves (NNRs), Nature Reserves (NRs) and Marine Nature Reserves (MNRs). These include areas important for their geology and land forms as well as for their wildlife.	The Plans should support the aims and commitments of the Order by minimising impacts on biodiversity and designated sites, and seeking enhancement opportunities
The Environment (NI) Order 2002	Legislates for the establishment and protection of sites of importance to nature conservation, including ASSIs	The Plans will take cognisance of this legislation through the application of the assent and internal EIA process
The Conservation (Natural Habitats) Regulations (NI) 1995	Implements the Habitats Directive in NI	The Plans have been subjected to an HRA, and will carry out further HRAs at the project level as required.

Return to Contents Page

Name of Policy	Main requirements of Policy objective	How it affects or is affected by the Flood Risk Management Plans in terms of SEA issues
Recommendations to Government for a Biodiversity Strategy (Northern Ireland Biodiversity Group, 2000). Northern Ireland Biodiversity Strategy 2002 (including NI Species and Habitat Action Plan and Departmental Biodiversity Implementation Plan)	This strategy contains 76 recommendations proposing measures to support the conservation of biodiversity for the period 2001-2016.	The Plans should support the aims and commitments of the Strategy by minimising impacts on biodiversity and seeking opportunities for enhancement
Republic of Ireland		
Inland Fisheries Act 2010 (No. 10 of 2010)	Seeks to conserve fish stocks and habitat through the protection, management and conservation of the inland fisheries resource.	The Plans will take cognisance of the requirements of the Act, including fish habitat and passage, commercial and recreational fishing, hydrology and water quality and the requirements under Annex II of the Habitats Directive.
Flora Protection Order 1999	To protect listed flora and their habitats from alteration, damage or interference in any way.	The Plans will be cognisant of effects on flora.
The Wildlife Act 1976 (The Wildlife (Amendment) Act 2000)	To protect wildlife (both Flora and Fauna) and the control of activities which may impact adversely on the conservation of wildlife	The Plans will have regard to this Act.
Population and human health		
International		
Aarhus Convention	The Aarhus Convention establishes a number of rights of the public (individuals and their associations) with regard to the environment. The Parties to the Convention are required to make the necessary provisions so that public authorities (at national, regional or local level) will contribute to these rights to become effective	The Plans should support the requirements of responders to fulfil their statutory duties
The Stockholm Convention (2001)	A global treaty to protect human health and the environment	The Plans should support the requirements of responders to fulfil their statutory duties.
European		

Return to Contents Page

Name of Policy	Main requirements of Policy objective	How it affects or is affected by the Flood Risk Management Plans in terms of SEA issues
Directive 2002/49/EC (the Environmental Noise Directive	Defines a common approach intended to avoid, prevent or reduce on a prioritised basis the harmful effects, including annoyance, due to the exposure to environmental noise	The Plans should support the requirements of responders to fulfil their statutory duties
The EU REACH Initiative Registration, Evaluation and Authorisation of Chemicals (REACH)	REACH is the Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals	The Plans should support the requirements of responders to fulfil their statutory duties
United Kingdom		
Civil Contingencies Act 2004	The Act delivers a framework for civil protection in the UK. The act defines the responsibilities for responders to emergency which include (among others): - assess the risk of emergencies and use to inform contingency planning - put in place emergency Plan - put in place arrangements to make information available to the public about civil protection matters and to maintain arrangements to warn, inform and advise the public in the event of an emergency	The Plans will include provisions for flood risk emergency planning.
Northern Ireland		
Environmental Noise Regulations (Northern Ireland) 2006	To avoid, prevent or reduce on a prioritised basis the harmful effects, including annoyance, of exposure to environmental noise.	The Plans should support the requirements of responders to fulfil their statutory duties.
Shaping Our Future - Regional Development Strategy for Northern Ireland 2025, DRD, September 2001 and Shaping Our Future – Adjustments to the Regional Development Strategy – 2025, June 2008	Sets out a strategic and long-term perspective on the future development of Northern Ireland up to the year 2035. It addresses a range of economic, social, environmental and community issues which are relevant to delivering the objectives of achieving sustainable development and social cohesion in Northern Ireland.	The Plans will need to contribute to environmental protection and sustainable development.
Soil		
European		

Return to Contents Page

Name of Policy	Main requirements of Policy objective	How it affects or is affected by the Flood Risk Management Plans in terms of SEA issues
EU Thematic Strategy for Soil Protection, including proposals for a Soil Framework Directive (2006)	The Soil Thematic Strategy is seeking to: - Establish common principles for the protection and sustainable use of soils; - Prevent threats to soils, and mitigate the effects of those threats; - Preserve soil functions within the context of sustainable use; and - Restore degraded and contaminated soils to approved levels of functionality.	The Plans should take into account the proposed framework for soil protection and improvement
Water		
European		
Water Framework Directive (2000/60/EC)	The Directive establishes a legal framework for the protection, improvement and sustainable use of surface waters, transitional waters, coastal waters and groundwater across Europe in order to: - Prevent deterioration and enhance status of aquatic ecosystems, including groundwater; - Promote sustainable water use; - Reduce pollution; and - Contribute to the mitigation of floods and droughts. Key objective is for all inland and coastal waters to achieve 'good ecological status' (or "good ecological potential") by 2015. This is to be achieved through River Basin Management Plans.	The Plans should not result in the reduction in class of any waterbody. The Plans should build on the geographic overlap with WFD and look for opportunities for multi-benefit measures and synergy.
Bathing Water Directive 2006 (2006/7/EC)	The Directive aims to protect the public and the environment from faecal pollution at waters used for bathing by a large number of visitors. Achieves this by making information on bathing water available to the public, and by setting standards to be met by 2015.	The Plans should consider the contribution that measures could make towards the attainment of bathing water quality standards and not cause a reduction in bathing water quality.

Return to Contents Page

Name of Policy	Main requirements of Policy objective	How it affects or is affected by the Flood Risk Management Plans in terms of SEA issues
Nitrates Directive (91/676/EC)	The Nitrates Directive has the objectives of reducing water pollution caused or induced by nitrates from agricultural sources and preventing further pollution. Key requirements are the designation of Nitrate Vulnerable Zones and the establishment of action programmes in relation to these zones	The Plans should take into account the contribution that measures could make towards reducing nitrate pollution and should not cause an increase in nitrates pollution.
Groundwater Daughter Directive (2006/118/EC)	Made under the Water Framework Directive, the Daughter Directive aims to prevent and limit inputs of pollutants to groundwater. It also provides further details on criteria for assessing good groundwater status and for the identification of significant and sustained upwards trends and the starting points for trend reversal.	The Plans should contribute to the protection of groundwater from point source and diffuse pollution that could be caused or exacerbated by flooding.
OSPAR Convention – Convention for the Protection of the Marine Environment of the NE Atlantic	Guides international cooperation on the protection of the marine environment of the North-East Atlantic.	The Plans take cognisance of the Convention
Marine Strategy Framework Directive	Aim is to achieve 'Good Environmental Status' (GES) by 2020 across Europe's marine environment	The Plans take cognisance of the aims of the Directive
United Kingdom		
Pollution and Prevention and Control Act 1999 (Integrates Directive (96/61/EC))	Regulating industrial and commercial activities which may cause environmental pollution and to prevent and control any emissions that are capable of causing pollution.	The Plans should identify significant flood risk from Integrated Pollution Prevention and Control sites and make recommendations for their protection.
Coast Protection Act 1949	The Act provides Local Authorities with permissive powers to undertake works to protect the coast against erosion and encroachment by the sea.	The Plans should take account of existing and planned works under this Act.
UK Marine Policy Statement	The framework for preparing Marine Plans and taking decisions affecting the marine environment.	The Plans take cognisance of the contents of the statement
Northern Ireland		
The Water (NI) Order 1999	Promote the conservation of the water resources of Northern Ireland Promote the cleanliness of water in waterways and underground strata	The Plans should take account of existing and planned works under this Act.

Return to Contents Page

Name of Policy	Main requirements of Policy objective	How it affects or is affected by the Flood Risk Management Plans in terms of SEA issues
Abstraction and Impoundment (Licensing) Regulations (Northern Ireland) 2006	Aimed at supporting the protection of the water environment.	The Plans should take account of existing and planned works under this Regulation.
Control Of Pollution (Oil Storage) Regulations (NI) 2010 which are due to come into force on 31 October 2010.	Will set minimum design standards for new and existing above ground oil storage facilities, providing a legal requirement for the standards to be met.	The Plans should be cognisant of the regulations.
The Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2003	Protection and enhancement of the aquatic environment	The Plans should be cognisant of the regulations.
The Surface Waters (Dangerous Substances) (Classification) Regulations (NI) 1998 (SR 397 of 1998)	Protection and enhancement of the aquatic environment	The Plans should be cognisant of the regulations.
The Sludge (Use in Agriculture) Regulations (Northern Ireland) 1990	Protection and enhancement of the aquatic environment	The Plans will be cognisant of licensing by the appropriate authority to ensure Directive compliance.
The Groundwater Regulations (Northern Ireland) 2009	Protection and enhancement of the aquatic environment	The Plans will be cognisant of licensing by the appropriate authority to ensure Directive compliance.
The Nitrates Action Programme Regulations (Northern Ireland) 2006 Nitrates Action Programme and Phosphorus Regulations 2011-2014	Aims to protect water quality across Europe by preventing nitrates from agricultural sources polluting ground and surface waters and by promoting the use of good farming practices.	The Plans should be cognisant that Northern Ireland has been designated a nitrate vulnerable zone.
The Industrial Pollution Control (Northern Ireland) Order 1997 (No. 2777 (N.I. 18))	Protection and enhancement of the aquatic environment	The Plans will be cognisant of licensing by the appropriate authority to ensure Directive compliance.
The Water (Northern Ireland) Order 1999 (No. 662 (N.I. 6))	To promote the conservation of the water resources To promote the cleanliness of surface and ground water Establishes powers to make regulations for the control of water abstraction. Requires consent for any discharges to the aquatic environment during construction and operational activities	The Plans should be cognisant of the Order.
The Water and Sewerage Services (Northern Ireland) Order 2006	Protection and enhancement of the aquatic environment	The Plans will be cognisant of licensing by the appropriate authority to ensure Directive compliance.

Return to Contents Page

Name of Policy	Main requirements of Policy objective	How it affects or is affected by the Flood Risk Management Plans in terms of SEA issues
The Urban Waste Water Treatment Regulations (Northern Ireland) 2007	Protection and enhancement of the aquatic environment	The Plans will be cognisant of licensing by the appropriate authority to ensure Directive compliance.
Revised Planning Policy Statement 15 – Planning and Flood Risk	Sets out the Department's planning policies to minimise flood risk to people, property and the environment.	The Plans will use PPS15 as its preventative measure in relation to flood risk which may result from future planning in Northern Ireland.
DRD Long Term Water Strategy	Aims to improve and protect our natural water environment and create a more sustainable and secure means of delivering wholesome water	The Plans will work closely with the Strategy and seek areas of synergy
Living with Water Programme	A pilot study to develop a Strategic Drainage Infrastructure Plan for Belfast	The Plans will work closely with the Programme
Marine and Coastal Access Act 2009	Aims to help ensure clean, healthy, safe, productive and biologically diverse oceans and seas by putting in place a new system for improved management and protection of the marine and coastal environment	The Plans acknowledge the need for a marine licence for works below Mean High water. They also recognises the requirements of the Act
Marine Act (NI) 2013	Provides a system of marine planning that will balance conservation, energy and resource needs; improved management for marine nature conservation and the streamlining of marine licensing for some electricity projects	The Plans acknowledge the role of the Act.
Republic of Ireland		
Local Government (Water Pollution) Act, 1977	Protection and enhancement of the aquatic environment	The Plans will be cognisant of licensing by the appropriate authority to ensure Directive compliance.
(Water Quality Standards for Phosphorus) Regulations 1998 (SI 258 of 1998)	Protection and enhancement of the aquatic environment	The Plans will be cognisant of licensing by the appropriate authority to ensure Directive compliance.
Water Quality in Ireland 2005: Key indicators of the Aquatic Environment	Protection and enhancement of the aquatic environment	The Plans will be cognisant of licensing by the appropriate authority to ensure Directive compliance.
The Provision and Quality of Drinking Water in Ireland: A Report for the Year 2011	Protection and enhancement of the aquatic environment	The Plans will be cognisant of licensing by the appropriate authority to ensure Directive compliance.

Return to Contents Page

Name of Policy	Main requirements of Policy objective	How it affects or is affected by the Flood Risk Management Plans in terms of SEA issues
Towards setting guideline values for the protection of groundwater in Ireland (2003)	Protection and enhancement of the aquatic environment	The Plans will be cognisant of licensing by the appropriate authority to ensure Directive compliance.
The Waste Management Act 1996 and amendments	Protection and enhancement of the aquatic environment	The Plans will be cognisant of licensing by the appropriate authority to ensure Directive compliance.
Air and Climate		
International		
UN Kyoto Protocol	Alleviate the impacts of climate change and reduce global emissions of Green House Gases.	The Plans should be cognisant of the Protocol.
Doha Amendment to the Kyoto Protocol	Alleviate the impacts of climate change and reduce global emissions of Green House Gases.	The Plans should be cognisant of the amendments to the Protocol.
The United Nations Framework	Alleviate the impacts of climate change and reduce global emissions of Green House Gases.	The Plans should be cognisant of the Framework.
Integrated Energy and Climate change package 2007	Alleviate the impacts of climate change and reduce global emissions of Green House Gases.	The Plans should be cognisant of the regulations.
European		
Second European Climate Change Programme (ECCP ll) 2005.	Develop the necessary elements of a strategy to implement the Kyoto protocol.	The Plans will be cognisant of the Programme.
United Kingdom		
Climate Change Act 2008	Established a framework to develop an economically credible emissions reduction Requirement for NI Departments to produce a NI Climate Change Adaptation Programme path.	The Plans will be cognisant of the Act.
National Climate Change Strategy 2007-2012 (including Adaption Framework)		The Plans will be cognisant of the Strategy.
Northern Ireland		
Climate Change Risk Assessment for Northern Ireland (2012)	Identify priorities for action and appropriate adaptation measures that will be required to minimise risks to our economy, environment and society	The Plans will be cognisant of the risk assessment.
Greenhouse Gas Emissions Reduction Action Plan	Identifies measures and targets for all NICS Depts. to reduce greenhouse gas emissions	The Plans will take cognisance of this plan

Return to Contents Page

Name of Policy	Main requirements of Policy objective	How it affects or is affected by the Flood Risk Management Plans in terms of SEA issues
Climate Change Risk Assessment for NI (2012)	Identifies priorities for action and appropriate adaptation measures that will be required to minimise risks to our economy, environment and society	The Plans aim to manage flood risk which is a key risk area identified as an outcome of climate change
NI Climate Change Adaptation Programme (2014)	Provides strategic objectives and proposals, and policies, by which Departments will meet these objectives	The Plans aim to manage flood risk which is a key risk area identified as an outcome of climate change
Material assets		
United Kingdom		
Civil Contingencies Act 2004	The Act delivers a framework for civil protection in the UK. The Act defines the responsibilities for responders to emergency which include (among others): - assess the risk of emergencies and use to inform contingency planning - put in place emergency Plan - put in place arrangements to make information available to the public about civil protection matters and to maintain arrangements to warn, inform and advise the public in the event of an emergency.	The Plans have a measure which addresses emergency response/civil contingency.
Cultural Heritage		
International		
UNESCO World Heritage Sites	World Heritage Site status is the highest accolade of recognition of an area of globally outstanding natural and/or cultural heritage. A site requires statutory protection and management.	The Plans aim to manage any significant flood risk at world heritage sites, and should aim to prevent damage to these sites from any flood risk management measures.
United Kingdom		
Ancient Monuments and Archaeological Areas Act	Protects ancient monuments, including monuments on the foreshore and underwater. It is an offence to carry out, without the prior written consent of the Scottish Ministers (scheduled monument consent), any works which would have the effect of demolishing, destroying, damaging, removing, repairing, altering, adding to, flooding or covering up the monument.	The Plans should have regard to protecting scheduled monuments from flood risk and to preventing damage from the implementation of flood risk management measures.
Northern Ireland		
Historic Monuments and Archaeological Objects (NI) Order 1995	Provides for the protection of all archaeological sites and objects.	The Plans will need to ensure that archaeological sites and objects are protected and given appropriate consideration.

Return to Contents Page

Name of Policy	Main requirements of Policy objective	How it affects or is affected by the Flood Risk Management Plans in terms of SEA issues
PPS 6 Planning, Archaeology and the Built Heritage	Sets out the Department's planning policies for the protection and conservation of archaeological remains and features of the built heritage.	The Plans will need to ensure that archaeological sites, buildings and objects are protected and given appropriate consideration.
Article 42 (1) of the Planning Order 1991 – Listed Buildings	Protects buildings of architectural and historic importance	The Plans will need to ensure that listed buildings and objects are protected and given appropriate consideration
Landscape		
International		
UNESCO World Heritage Sites	World Heritage Site status is the highest accolade of recognition of an area of globally outstanding natural and/or cultural heritage. A site requires statutory protection and management.	The Plans should have due consideration to protecting sites.
European		
European Landscape Convention	The European Landscape Convention is a Council of Europe initiative that highlights the importance of all landscapes and encourages more attention to their care and planning.	The Plans should have due consideration to protecting landscapes.
Northern Ireland		
A Planning Strategy for Rural Northern Ireland (DOE, 1993);	Establishes the objectives and the policies for land use and development appropriate to the particular circumstances of Northern Ireland and which need to be considered on a scale wider than the individual District Council Area. Note that it is being superseded by Planning Policy Statements, but some policies remain in place, including those relating to mineral excavation.	The Plans will need to address environmental protection and sustainable development. The Plans will be cognisant of impacts to environmental designations.
PPS 1 - General Principles (DOE, March 1998)	Sets out the general principles that the Department observes in formulating planning policies, making development Plan and exercising control of development.	The Plans will need to consider the key themes of sustainable development, mixed use, quality development and design that underlie this PPS.
PPS 2 - Planning and Nature Conservation (DOE, June 1997)	Sustainable development and to conserving and where possible enhancing and restoring our natural heritage.	The Plans will consider nature conservation.

Return to Contents Page

Name of Policy	Main requirements of Policy objective	How it affects or is affected by the Flood Risk Management Plans in terms of SEA issues
PPS 4: Planning and Economic Development (DOE, November 2010)	This PPS sets out the Department's planning policies for economic development uses and indicates how growth associated with such uses can be accommodated and promoted in development Plan. It seeks to facilitate and accommodate economic growth in ways compatible with social and environmental objectives and sustainable development.	The Plans will consider economic development.
PPS 8 -Open Space, Sport and Outdoor Recreation (DOE, 2004)	Sets out the Department's planning policies for the protection of open space, in association with residential development and the use of land for sport and outdoor recreation.	The Plans will need to promote the sustainable development of productive activities, which support employment at all skill levels, while fully considering the requirements of other interests.
PPS 13 – Transportation and Land Use (DRD, February 2005)	This PPS has been prepared to assist in the implementation of the Regional Development Strategy to guide the integration of transportation and land use.	The Plans will need to consider integration of land use and transportation.
PPS 21- Sustainable Development in the Countryside (DOE, June, 2010)	Sets out Planning Policies for Development in the Countryside.	The Plans will need to consider the conservation of the landscape and natural resources of the rural area.

Return to Contents Page

6 Habitats Regulations Assessment

6.1 Introduction

A Habitats Directive Article 6 assessment is required under the Habitats Directive (92/43/EEC), where a plan or project may give rise to significant effects upon a Natura 2000 site (N2K). The Plans are deemed to have the potential to cause such effects.

6.2 Results of the HRA

The assessment of the Flood Risk Management Plans produced the following findings:

- The Plans are not required for the management of the N2K sites and as such, an assessment of their potential impact on N2K sites must be carried out.
- Measures under Prevention and Preparedness fall into areas of policy, warning and informing, individual property protection and resilience, and emergency planning and advice. These measures have been assessed to have no effect on any N2K sites within Northern Ireland, and consequently no further assessment has been undertaken.
- Measures under Protection contain both structural and non-structural measures, and are focussed on the 20 SFRAs identified within the Plans. At this stage, there is no certainty as to whether structural measures will be implemented in any of the SFRAs – this will depend on the outcome of feasibility studies. Should structural measures be identified for any of the SFRAs where there is a potential for impact on a N2K site, the proposals will go through a separate and specific HRA, which will look more closely at the potential impacts, options and mitigation for the work. The HRA will be used to select those measures which will have no significant effect on the N2K sites, or where necessary, to design out any potential impacts. As all N2K sites are also ASSIs under national legislation, any proposals will have to go through the assent process, with all proposals and measures requiring agreement from NIEA before any works can proceed. This process will act as a second line of protection for N2K sites, and will ensure that any measures implemented have been agreed through consultation with the statutory consultee. The proposals will also have to undergo assessment through the Drainage (Environmental Impact Assessment) Regulations (NI) 2006, which will assess any potential impact on N2K sites, along with a number of other criteria.

  For these reasons, it is considered **that there will be no significant impact on any N2K site due to the Plans' protection measures.**

7 SEA OF THE PLANS

7.1 Introduction

The SEA has set topics which need to be included within the assessment. For each of these eight topics, a number of objectives have been developed. These objectives have been established with the overall goal of assessing and minimising the potential effect of the Plans, and the measures and measure types contained within. The objectives have also assisted in the selection of measure types, and will be used in the development of the activities which follow on from the measures and measure types within the lifetime of the Plans.

7.2 SEA Objectives

The table below (Table 8) lists the SEA topics and the objectives that have been established, and uses these to ask salient questions about the potential impact of the Plans.

Table 8: SEA Objectives and Potential Impacts

SEA Topic	Proposed SEA Objective Number	Proposed SEA Objective	Proposed questions for use in assessment: Do the Flood Risk Management Plans:
Biodiversity, Fauna and Flora	1	Protect internationally and nationally designated sites.	Provide effective protection of "protected areas" defined under the WFD? Provide effective protection of water dependent international, national and local designated sites? Contribute to water dependent UK Biodiversity Action Plan objectives? Support delivery of Northern Ireland Biodiversity Strategy and Action Plans?
	2	Protect, maintain and, if possible, improve linkages between existing green spaces to allow for ecological connectivity and biodiversity.	
	3	Protect, maintain and, if possible, improve existing habitats and native species of flora and fauna.	
Population and Human Health	4	Promote and enhance quality of life for communities throughout the plan area through the promotion of relevant and appropriate flood risk management options.	Improve the health and living environment of people and communities? Ensure no loss in opportunities for healthy lifestyles?
Geology and Soil	5	Safeguard soil quality, quantity and function, including valuable soil resources such as agricultural land and carbon rich soils.	Address issues relating to soils, e.g. soil loss and sedimentation?

Return to Contents Page

SEA Topic	Proposed SEA Objective Number	Proposed SEA Objective	Proposed questions for use in assessment: Do the Flood Risk Management Plans:
Water	6	Maintain compliance with requirements arising from the implementation of the Water Framework Directive and improve water quality where possible.	Reduce the impacts from point source pollution, flow regulation and morphological alterations? Ensure flow regulation is appropriate? Result in reduction in class of water bodies from morphological alterations? Minimise impact on, and where possible improve fisheries habitat and passage?
Climatic Factors	7	Manage the effects of climate change through flood risk management	Reduce vulnerability to the effects of climate change? Assist in addressing the potential impacts of climate change on biodiversity?
Material Assets	8	Ensure adequate protection, where possible, and sustainable use of material assets.	Make most efficient use of water management infrastructure? Protect existing infrastructure – e.g. flood defences? Reduce the risk of flooding, of material assets?
Cultural Heritage	9	Protect cultural heritage sites (listed buildings, maritime history, historic parks, gardens and demesnes, scheduled monuments etc).and, where appropriate, enhance opportunities for the public to interact with them	Impact on Scheduled Monuments and Archaeological Sites?
Landscape	10	Protect, maintain and, where possible, enhance identified landscapes of value. Manage and maintain landscape features that contribute to the landscape characteristics of the RBDs.	Protect and, where appropriate, enhance national designated landscape areas? Protect and, where appropriate, enhance locally designated landscape areas?

7.3 Assessment of Plans Objectives against SEA Objectives

As part of the SEA scoping, the Plans objectives were assessed against the SEA objectives, to identify areas of potential significant impact. The Plans objectives are shown in section 2.3.2. The full assessment is contained in Appendix 1 of this report. A summary of the outcome of this assessment is shown below in Table 9.

Table 9-Summary of the Assessment of Likely Impacts of Plans and SEA Objectives

Return to Contents Page

FRMP Objective	SEA Objective compatibility summary
- Economic Activity o Reduce economic damages to properties; o Reduce economic costs on business caused by the disruption to essential infrastructure and services; o Optimise economic return on Flood Risk Management investment.	"Reducing economic damage to properties" FRMP objective will provide opportunities to optimise materials use and minimise waste production in flood risk management and facilitate the protection of protected structures. "Reduce economic costs on business caused by the disruption to essential infrastructure and services" may conflict with the biodiversity objectives of the SEA, where nationally designated sites, ecological linkages and existing habitats may be sacrificed to offset economic costs and damages. "Optimising the economic return on flood risk management investment" may have an uncertain relationship with biodiversity, cultural heritage and landscape SEA objectives because economic returns would be against resources of intrinsic value. In rural and semi-rural environments there are also uncertainties regarding how agricultural land is valued with regard to output and Flood Risk Management investment.
- Human Health o Reduce the risk to life; o Raise awareness of the consequences of flood risk; o Reduce risk to health and wellbeing; o Reduce the impact on people caused by the disruption to essential Infrastructure and services; o Improve recreation and public amenities.	It is not considered there is incompatibility between the "Reduce the risk to life" FRMP Objective and the SEA objectives relating to protected sites, protected species and agricultural land. "Raise awareness of the consequences of flood risk" FRMP objective is broadly compatible with all SEA objectives because it allows custodians of public sites and land/property owners to be made aware of flood issues which may potentially adversely affect them. "Reduce risk to health and wellbeing" FRMP objective is broadly compatible with the health and population and material assets SEA objectives. The health and population SEA objective relates directly to health, while material assets relate to wellbeing. Where protection of material assets (homes) is linked to stress reduction. "Reduce the impact on people caused by the disruption to essential Infrastructure and services" FRMP objective is broadly compatible with the health and population and material assets SEA objectives. The health and population SEA objective in the context would be compatible with the stress of disruption, while the material assets SEA objective would be compatible with minimising disruption of services. Improving recreation and public amenities allow for synergies within the biodiversity objectives relating enhancing access into protected sites to improve wellbeing.
- Environmental and Cultural Heritage o Consider the impact of Climate Change; o Under the Water Framework Directive, support the achievement of good ecological potential/status for water bodies; o Reduce the risk of pollution; o Avoid or mitigate impact on priority species and habitats; o Avoid or mitigate impact on designated environmental areas, including those of	"Consider the impact of Climate Change" FRMP objective is broadly compatible will all SEA objectives because of the wide ranging effects associated with climate change. "Under the Water Framework Directive, support the achievement of good ecological potential/status for water bodies" FRMP objective broadly agrees with the biodiversity, soil and water SEA objectives because these all tie into gaining and retaining good ecological potential/status for water bodies. "Reduce the risk of pollution" FRMP objective is broadly compatible with all SEA objectives, however it should be caveated in the assessment that reducing the risk of pollution from flood risk management does not reduce

Return to Contents Page

FRMP Objective	SEA Objective compatibility summary
cultural heritage importance.	pollution resulting from floods and the measures associated with this FRMP objective should include advice and solutions for issues surrounding wastes and effluents brought to areas because of floods. Both "Avoid or mitigate impact on priority species and habitats" FRMP objective and "Avoid or mitigate impact on designated environmental areas, including those of cultural heritage importance" FRMP objective are broadly compatible with the biodiversity SEA objectives. Protected species and sites exist in both terrestrial and aquatic environments and they may be impacted as a result of FRMP.

Overall, the Plans and SEA objectives broadly agree with each other. However, this does not mean that the measures, measure types and activities which have been designed to meet the Plans objectives may not have residual effects. As such, the next stage in the assessment is to consider the potential impacts of the Plans measures and measure types against the SEA objectives.

7.4 Assessment of the Plans Measures and Measure Types against SEA Objectives

An assessment was carried out of the potential effects of the Plans measures and measure types on the SEA objectives. The Plans measures, measure types and activities are set out in Table 3 in section 2.3.3. The assessment was carried out to focus more clearly on the potential impacts of the possible structural and non-structural management tools and activities which have been developed within the Plans.

Measure types within these Plans are generic in character, and the assessment reflects this. Under the measure type of "New Flood Alleviation Schemes", the two most likely structural activities, i.e. floodwalls and embankments, and culverts, have been considered separately. Included within the assessment is a consideration of the "Do Nothing" option, which is considered to be a continuation of current flood risk management practice in the absence of the Plans proposals.

The full assessment of the measure types against the SEA objectives is contained within Appendix 2 of this report. A summary of the assessment is presented below in Table 10.

Table 10: Summary of Likely Impacts of Plan Measure Types on SEA Objectives

FRMPs Measure Type	SEA Objective Assessment Summary
Surface Water Management	Surface water management covers a range of potential measures including SuDS ponds. It is deemed to broadly agree with the SEA objectives. However the effects SuDS measures will have in relation to regional flood events would be limited. Their effect on agricultural land would also be dependent on individual landowners wanting to give up their land to these measures. Landowners would also require support in relation to design and location of measures. There would be a mixed compliance for landscape because surface water management may be large scale development on the boundaries of communities which would have local landscape impacts.
Development Outside Flood Risk Areas	Development outside flood risk areas is reliant on local councils and Planning NI applying PPS15, and on the provision of up to date flood area mapping by DARD Rivers Agency. The use of PPS15 influences local development plans by minimising the amount of development land designated in areas of flood risk.
Ensure New Development Within Flood Risk Area is Suitably Constructed	Rivers Agency does not have a direct role in the design and construction of properties, but has a role in requiring and assessing Flood Risk and Drainage Assessments. The measure type relies on other agencies such as Planning and local councils
New Flood Alleviation Scheme - Flood Walls and Embankments	The flood walls and embankments measure is broadly compliant with the SEA objectives, however in relation to biodiversity, the placement of a flood wall or embankment may remove a boundary habitat (either riparian or coastal) and in the case of riparian habitats, species movement might be inhibited. In the case of coastal habitats, sediment movements which may feed dune systems may be cut off. In the case of the landscape SEA objective, flood walls and embankments, do change the landscape character but the magnitude of effect depends on the viewer. Overall, the measure type has a mixed compatibility with the range of SEA objectives.
New Flood Alleviation Scheme - Culvert Works	Culvert works have a mixed compliance with the SEA objectives because while they will reduce flood risk, they will require correct siting and design to maintain habitat and sediment linkages and address the effects of climate change.
Enhanced Maintenance of Existing Drainage and Flood Defence Network	The enhanced maintenance of the existing drainage and flood defence network will be a continuation of River Agency's current best practice, but with an increased focus on flood risk management.
Catchment Based Management	Rivers Agency proposes to look at catchment based management through partnership working with other bodies – this will be commenced during the timeframe of the first Plan. The assessment highlights the potential for such measures, but legislative constraints currently preclude the inclusion of definite measure types. This measure type has both positive and negative potential impacts on the SEA objectives.
Flood Warning	DARD Rivers Agency will continue to work with the MET Office to inform the impact assessment of heavy rainfall. As part of FRMP, they will also raise awareness about flood risk and if appropriate, disseminate water level alerts. This will allow the public to leave their homes once the emergency has commenced. Overall, this measure type is compatible with the SEA objectives.
Flood Emergency Response and Information - Includes Communication of Flood Risk	In relation to "Flood Emergency Response", DARD Rivers Agency will continue to engage with other responsible bodies and to assist in the production of multi Agency flood emergency plans. The result is that most of the actions in relation to this measure will be the same as "do nothing" with enhanced protection proposed around reservoirs.

Return to Contents Page

FRMPs Measure Type	SEA Objective Assessment Summary
Self Help – Community Engagement, Individual Property Protection, Flood Recovery, Welfare and Insurance Issues.	DARD Rivers Agency already promote the role of Flood Community Liaison Officer. Part of this role is to disseminate information about self-help and making property more flood resilient. Self-help and flood resilience will be on individual levels and as such, the strategic impact of the measure will only become present once the number of individuals making their properties flood resilient reaches a critical mass before there is wide spread acceptance of the scheme. Overall, this measure type is not incompatible with the SEA objectives

Measure types and activities under the Protection measure may include site specific structural measures, but at this stage, the Plans do not focus on spatial measures. The assessment looks at the potential impact of the generic measures and measure types, and provides an overview of the likely impacts of protection activity types, which can then be honed on a site specific basis.

7.5 Cumulative Assessment

This section of the assessment assesses the cumulative effects of the Plans (all preferred options) across the entire study area on each SEA topic, e.g. assesses the total effect on water quality that is likely to result from the implementation of the Plans.

The following section provides a summary of the cumulative assessment, based on the assessment tables which are in Appendices 8 and 9.

Flood Prevention

Do Nothing

DARD Rivers Agency currently manages and reduces flood risk using the resources available, but not every area can be protected. In the future, the impacts of climate change are likely to result in more frequent and severe flooding events. This is likely to result in negative effects in terms of increased flood risk and flood damage for humans, infrastructure, property, businesses, historic assets, and soil.

Surface Water Management

Surface water management schemes (e.g. SuDS) are likely to have adverse effects on all SEA topics during construction. However, this is a short term impact. In the long term there are likely to be beneficial effects on human health, infrastructure, property, businesses and historic assets due to the management of flood risk, and also from a water quality perspective. There is potentially a benefit to biodiversity in the long term due to habitat creation and management.

Development outside Flood Risk Areas

Where this measure is applicable to a SEA topic, it is assessed as having an adverse effect (with mitigation). This is because the main tool DARD Rivers Agency has for compliance with development outside Flood Risk Areas is PPS 15, which can only be applied during the planning application stage. Consequently all mitigation and policy compliance can only take place within the planning phase, which is not directly controlled by Rivers Agency. PPS 15 is already published (October 2014) and is used by local councils and Planning NI. FRMP is not proposing any additional policy in relation to development outside Flood Risk Areas.

Suitable Construction of New Development within Flood Risk Areas

Rivers Agency does not have a direct role in the design and construction of properties, but has a role in requiring and assessing Flood Risk and Drainage Assessments. The measure type relies on other agencies such as Planning and Local Councils. In terms of potential impact on SEA objectives, it is considered to have a potentially negative impact, on the basis that it is development lead, rather than due to flood management aspects.

Flood Protection:

Do Nothing Option

DARD Rivers Agency currently manages and reduces flood risk using the resources available but not every area can be protected. In the future as the impacts of climate change results in more frequent and severe flooding events, DARD River Agency will not have the capacity to deal with all flooding issues. The “Do Nothing” option would, in the long term, be deemed to have a negative impact, as the likelihood of flooding increases due to climate change.

Flood Walls and Embankments

Predicted impacts resulting from the direct or indirect effects of flood walls and embankments on SEA topics is predominantly adverse (residual effect) where both permanent and temporary impacts will require mitigation. Adverse effects include loss, damage or disturbance of agricultural land, habitat, recreational land and land used by the community or land identified for future development as well as damage and disturbance to land within the boundaries of private property and disruption to existing land access arrangements.

Adverse effects have also been recorded for riparian and coastal environments which may be permanently disrupted because of the construction of a flood wall or embankment.

Beneficial effects were recorded for the population and human health SEA topic because those topics encompass the protection of property.

Culvert Works

Predicted impacts resulting from the direct or indirect effects of culvert works on SEA topics is predominantly adverse (residual effect) where both permanent and temporary impacts will require mitigation. Adverse effects include loss, damage or disturbance of agricultural land, habitat, recreational land and land used by the community or land identified for future development as well as damage and disturbance to land within the boundaries of private property and disruption to existing land access arrangements. Potential negative impacts could also result from incorrectly designed culverts forming a barrier to fauna and sediment passage.

Beneficial effects were recorded for the population and human health SEA topic because those topics encompass the protection of property.

Enhanced Maintenance of Existing Drainage and Flood Defence Network

All the SEA topics recorded an adverse residual impact due to enhanced maintenance of existing drainage and flood defence networks. This also takes account of the "do nothing" scenario, where DARD Rivers Agency is not proposing to change how their maintenance programme works for the duration of FRMPs.

Flood Preparedness:

Do Nothing

The flood management team keep up-to-date with current flood risk knowledge and flood management techniques, and communicate these to the public so that all have an understanding of current flood risk issues. As more data is recorded and built up over time the understanding of risks and risk areas will increase and more efficient and effective management can be implemented to reduce flood risk. This will have benefits in terms of protecting humans, property and businesses, infrastructure, water quality, biodiversity, landscape, soils and historic assets from flood damage.

Flood Warning – includes communication of flood risk

The flood warning measure was assessed as having an overall positive effect, particularly for economic and health and social aspects. Awareness of flood warning services is important to allow people to prepare for a flood event and understand what to do in a flood event.

Flood Emergency Response

This measure was only considered applicable to the SEA topics relating to Population and Human Health, Water, Climate Factors and Landscape. It was considered beneficial because it allows for the planning of flood emergency response. DARD Rivers Agency considers any response document a multi-agency publication because it will include other organisations which are responsible for flood risk in Northern Ireland.

Self Help – Includes Community Engagement and IPP

Implementing a self help strategy should engage a wide variety and geographical distribution of people. The more people that are aware of flood risk and how to deal with it the more benefits will be gained in terms of flood protection. If the public are aware of the flood prevention options and resilience measures available to them to reduce flooding effects, then they are more likely to use these to protect themselves and their properties and businesses. This measure type is likely to have a beneficial effect on reducing impacts and consequences of flooding, protecting historic assets, property, assets and businesses, resulting in benefits for human health. Activities such as storing fuels and oils out of the way of flood water will help protect water quality from pollution. However it is dependent on individual compliance and liaison with the DARD Rivers Agency Flood Community Liaison Officer.

It should be noted that:

- Catchment based management has not been included within this cumulative assessment, as there are no definite proposals within the lifespan of this first Plan, save for an undertaking to look for opportunities to work with others through partnership arrangements.
- Suitable construction of new development within significant flood risk areas has also not been included within the matrix, as it falls mainly within the remit of Planning, and through the Review of Public Administration, Local Councils. Rivers Agency already requires the production of flood risk and drainage assessments in certain circumstances.

Return to Contents Page

8 Mitigation of the Adverse Effects

8.1 Introduction

Having assessed the likely adverse impacts that the measures and measure types within the Plans may have on the environment, it is necessary as part of the SEA process to develop appropriate mitigation measures to avoid, reduce or remedy any potential significant adverse effects that could occur at the plan level and for these measures to be integrated into the draft FRMP as appropriate.

8.2 Forms of Mitigation

In terms of this SEA two forms of mitigation have been identified as being required to avoid or reduce adverse effects on the environment. These are:

- **Suggested Plan Level Actions** – these are measures/actions that will be incorporated into the FRMPs to avoid/reduce or remedy significant adverse effects. These relate to strategic level measures that have been identified in the FRMPs.
- **EIA Guidance and Project Level Mitigation** – these are measures that are not incorporated into the FRMPs, due to their high level strategic nature, but are recognised as good practice. Some of these mitigation measures are already required under legislation, and are built into the Environmental Impact Assessment procedure which has been developed and is implemented by Rivers Agency, for example. Details of the EIA process is provided in section 7.2 of the SEA statement. It is likely that a number of these measures (depending on project specifics) will be required in order to achieve development consent at the project level.

This mitigation measure information is contained within Appendix 3, where an assessment has been made of the initial potential effects, and, taking into account the implementation of mitigation measures, of the residual effects. These mitigations look at the potential impact of measure types and activities in general, not on a site specific basis, as the Plans do not have this detailed information. The EIA process will develop these mitigation measures at a project level.

8.2.1 Suggested Plan Level Actions

Within the FRMPs, measure types and activities for areas of current flood risk, and areas identified as at future flood risk, have been identified. In these scenarios, there is potential for significant adverse effects, which may not happen during this plan cycle but may happen in future cycles.

Due to the high level and strategic nature of the Plans measure types and activities, the following areas have been identified where plan level mitigation measures/actions will be integrated into the main body of the FRMPs:

- Developing mechanisms for monitoring, reviewing and managing areas of emerging flood risk at a strategic level.
- Ensuring coordination between all bodies associated with flood risk management in Northern Ireland.

- Ensuring compliance with European and national legislation at a project level.

The following are proposed actions, to mitigate the effects of the Plans, in the three areas identified above:

Action 1: Information gathering framework for feasibility studies to address possible flood alleviation schemes identified

The Plans reference areas where modelling has identified flood risk but there is no historical evidence to verify the model. DARD Rivers Agency could set up a centralised data gathering project to specifically deal with these areas, where phone calls from householders and landowners are collated to establish the true extent of flood risk in these identified areas.

This could be tied into a monitoring programme to address how flood risk is communicated in these areas and what measures should be put in place while feasibility studies take place.

Action 2: Coordination with the other bodies associated with flood risk management

In Northern Ireland, flood risk management is also within the remit of Transport NI and Water NI. To minimise the effects of flooding in Northern Ireland and significant environmental effects of flood risk management techniques, coordination is required between these bodies. In terms of taking forward the Plan it is recognised that there needs to be consistency and coordination between all bodies. The development of the new Department for Infrastructure, which will include Water NI, Transport NI and DARD Rivers Agency, is a key method by which this coordination will be undertaken.

Action 3: Compliance with EIA Regulations and Habitats Directive

It is acknowledged that the flood risk management projects taken forward under the Plans will have to be screened to determine the need for an EIA and/or Habitat Regulations Assessment (HRA). An HRA has been carried out for the Plans (chapter 6), and states Rivers Agency's ongoing commitment to carry out project based HRAs and assents where their works so require. Additionally, there is legislation (Drainage (Environmental Impact Assessment) Regulations (NI) 2006), to ensure that projects taken forward will be fully assessed in order to identify, and address (avoid or reduce) potential significant adverse effects at the project level as identified in this assessment (Section 7.2 SEA Statement).

8.2.2 Suggested Project Level Actions

Appendix 3 provides a summary of suggested project level mitigation measures that may be appropriate for generic flood risk management measures and which have been considered as part of the assessment of potential effects. However, it should be noted that possible additional mitigation measures may also need to be identified on a project and site specific basis, and DARD Rivers Agency may be obliged to apply specific mitigation as part of the individual project consenting process. As above, Rivers Agency's own EIA procedure encompasses this requirement.

8.2.3 Partnership Working and Multi-benefits

Rivers Agency will also pursue opportunities for added benefit in the implementation of the flood risk activities and measure types. In particular, opportunities will be sought for activities which have benefits for other directives, as well as Floods Directive. To this end, liaison with NIEA, and through the interdepartmental Catchment Oversight Group, with other bodies, will seek to identify work activities and practices where a partnership approach will result in multi-directive benefits. The value of partnership work has been promulgated through the recent Blue-green Cities workshop on Planning for Sustainable Flood Risk Management, and will be developed throughout the lifespan of the Plans. Through the Catchment Oversight Group, a pilot catchment study based on the Moyola River, County Londonderry has been developed with its first phase being led by DARD Rivers Agency. This is an exercise which uses GIS to map information from a range of stakeholders, with the aim of identifying sites and projects where works may have benefits under a number of headings.

Return to Contents Page

9 MONITORING

9.1 Introduction

Under the SEA Directive and The Environmental Assessment of Plans and Programmes (Northern Ireland) Regulations 2004, Rivers Agency is required to monitor the significant effects of the implementation of the Plans. Part IV (16) of the Regulations states that the responsible authority 'shall monitor the significant environmental effects of the implementation of each plan or programme with the purpose of identifying unforeseen adverse effects at an early stage and undertaking appropriate remedial action'.

9.2 Monitoring Framework

The monitoring framework sets out the measures that could be used by Rivers Agency to monitor both the implementation of the Plans, and its effects on the environment.

The uncertainties associated with high level, strategic assessment make monitoring all the more important. Monitoring allows for periodic checks to confirm the accuracy of the assumptions on which the original assessment was based and to ensure that the proposed mitigation measures remain relevant and are being effectively implemented. Monitoring is therefore closely linked to the proposed mitigation measures set out in Chapter 8.

Monitoring should measure the following:

- a change in environmental baseline that will indicate the effects of the plans;
- the significant effects that have been identified during this assessment;
- whether the mitigation measures proposed to offset or reduce the significant effects have been implemented and are effective; and,
- any unforeseen impacts that have occurred.

9.3 Monitoring of the SEA and the Plans

Due to the high level nature of information produced for assessment, it has not been possible to present a detailed monitoring strategy based on specific indicators and targets, until further studies have been carried out. The monitoring framework needs to focus on monitoring the effectiveness of the Plans in managing flood risk in a way that minimises adverse effects on the environment, rather than monitoring individual projects. As such, monitoring should be tightly linked to the implementation of the plan level mitigation measures/actions set on in section 8.2 of this report.

9.3.1 Monitoring of Suggested Plan Level Actions

The following actions (Table 11) have been suggested as monitoring tools for the generic plan level measure types.

Table 11: Suggested Monitoring Tools for Plan Level Actions

Action	Deliverables to Monitor	Timescales (from Plan Adoption)
Information gathering framework for feasibility studies to address possible flood alleviation schemes identified.	6 monthly reviews on the status of areas which have been modelled as at risk from flooding.	6 months from plan adoption and for duration of plan.
Coordination with the other bodies associated with flood risk management.	6 monthly flood risk management planning meetings	6 months from plan adoption and for duration of plan.
Compliance with EIA Regulations and Habitats Directive.	6 monthly register of flood risk management projects screened for EIA and HRA.	6 months from plan adoption and for duration of plan.

9.3.2 Monitoring of Effects on SEA Topics

Monitoring of the effects on the SEA topics (key receptors) is also required under the SEA Directive and The Environmental Assessment of Plans and Programmes (Northern Ireland) Regulations 2004. The high level nature of the Plans makes it difficult at this stage, to produce specific monitoring criteria, and so a broad brush approach has been taken, based on the potential impacts assessed during the SEA process. Table 12 sets out the proposed measures against the SEA topics:

Table 12 : Suggested Monitoring Measures for SEA Topics

SEA Topic	Proposed Measures
Biodiversity, Flora and Fauna	Protected sites and species are monitored with regards to their conservation objectives. Any increase in unfavourable/favourable conditions will be monitored in conjunction with the implementation of flood risk management projects as well as any habitat loss/increase. *NIEA carry out monitoring of designated sites and this information will be used*
Cultural Heritage	Historical sites (monuments, listed buildings, archaeological sites etc) should be appropriately documented where they are lost or relocated as a result of the implementation of flood risk management infrastructure. *NIEA could provide this information, as they will have been consulted on a statutory basis in such circumstances.*
Water	Water quality will be monitored by the NIEA under the requirements of the Water Framework Directive (WFD). Where the implementation of flood risk management infrastructure will result in modifications to services associated with infrastructure such as sewers or pumping stations further studies should be carried out to ensure these are not impacting on the water quality of water features within Northern Ireland. *NIEA assess the status of waterbodies for WFD, including water quality*
Soils	The condition and quality of designated sites of geological importance (ASSIs) is subject to ongoing monitoring. This should be reviewed in conjunction with the flood risk management projects. *NIEA carry out monitoring of designated sites and this information will be used*
Population and Human Health	The potential nuisance (noise) effects of flood risk management construction should be monitored. *This can be done as part of specific project management*. Where flood risk has been identified by modelling but not verified through historic events, these areas should be monitored to assess if their flood risk potential has been enhanced. *This can be done in house by Rivers Agency*
Material Assets	Benefits from implemented flood risk management measures should be monitored. *Rivers Agency will assess the benefits of any flood alleviation scheme. Post event evaluations will be carried out as required.* Rivers Agency will assess the cost benefit of a range of measure types prior to the selection of preferred option. *Rivers Agency will assess the benefits of any flood alleviation scheme.* Potential effects on private dwellings associated with single property protection advocated in FRMP should be monitored.
Climate Factors	The Climate Change Adaptation Programme provides the proposals and policies by which government departments (including DARD) will meet climate change objectives. *This should include an audit mechanism for target meeting*
Landscape	SuDS is considered to be a long term strategy for the management of surface water flooding. The endorsement of the use of SuDs in the development of future legislation should include the necessary formal monitoring arrangements.

Return to Contents Page

10 Conclusions

10.1 Introduction

The SEA has been carried out to assess the potential effects of the Plans, their measures, measure types and activities on the environment. This has been done under the key areas highlighted as SEA topics.

The Plans have been produced as strategic documents, that include measures which are generic in nature (Prevention and Preparedness) and those which have the potential to be more site specific (Protection). The application of any and all of the measures is limited to the 20 Significant Flood Risk Areas which have been highlighted within the Plans.

10.2 Summary of Assessment Findings

Prevention Measures

Surface Water Management – the use of activities such as SuDS is an inter-departmental issue, which is the source of ongoing discussions and plans. The implementation of these activities is assessed as having a negative impact on the SEA topics in the short term, due to construction impacts, and changes in land use. In the long term, there are likely to be positive impacts due to flood risk management benefits, biodiversity gain, human health and landscape. These activities also have potential synergy benefits through water quality improvement and effects on stream power, which should assist in WFD targets.

Development Outside Flood Risk Areas – this measure type is managed through the application of PPS15, which is administered by local councils and Planning NI. Consequently all mitigation and policy compliance can only take place within the planning phase, which is not directly controlled by Rivers Agency. Development will still occur, regardless of PPS15, which aims only to keep development out of flood risk areas. As such, the measure type is deemed to have an overall negative effect on the SEA topics. The measure type will, however, have benefits for water quality and biodiversity through retention of floodplain areas, and reducing water quality risk from development infrastructure both during and post construction. PPS 15 is already published, with Rivers Agency providing flood mapping and information as required.

Suitable Construction of New Development within Flood Risk Areas

Rivers Agency does not have a direct role in the design and construction of properties, but has a role in relation to Flood Risk and Drainage Assessments. The measure type relies on other agencies such as local councils and Planning NI and local councils. In terms of potential impact on SEA objectives, it is considered to have a potentially overall negative impact, on the basis that it is development led, rather than due to flood management aspects. However, it has positive effects through potential water quality benefits such as the correct positioning of oil tanks.

Protection Measures

Do Nothing

Rivers Agency currently manages and reduces flood risk through a number of activities, which are dependent on resource. With the predictions of climate change, the "Do nothing" scenario is liable to result in negative impacts for people, material assets, environment and the economy.

Flood Alleviation schemes (floodwalls and embankments and culvert works)

The impacts from these structural works are assessed as negative for environmental topics, and mainly positive for population and human health topics (due to flood protection). Negative impacts can be mitigated by careful design, and the inclusion of works and measures which have benefits under other directives e.g. improving fish passage through culvert redesign.

Enhanced Maintenance of Existing Drainage and Flood Defence Network

The assessment showed an overall net negative impact from enhanced maintenance of these networks. This reflects the worst case scenario for impacts from maintenance works – historical evidence suggests that the resulting effects are reduced from this, and indeed, may have benefits for certain species and habitats. Mitigation measures such as good working practice, agreed work methodology and inclusion of mitigation and enhancement measures will minimise the impacts, and are already used by Rivers Agency in its current regime. The potential for synergy with other directives such as the WFD should be further developed.

Catchment Based Management

This measure type is to be investigated and developed within the timescale of the Plans. Currently, Rivers Agency legislation does not facilitate the inclusion of these measures, and there is still uncertainty as to their benefits in large return flood instances. Rivers Agency intends to look at the use of catchment based management as additional to the measures set out in the Plan, and to look to employ them through a partnership based approach. This has already commenced through the Blue-green Cities workshop held in September 2015. Many of these measures have benefits for Water Framework Directive issues, and wider biodiversity and human health gain, and so it is salient to look to develop these in a joined up way with other agencies and groups. In terms of SEA topics, a full assessment has not been carried out, as it is unclear as to what forms of management would be proposed. It is envisaged that the long term impacts of such management would be positive, though there may be short term negative impacts.

Flood Preparedness

Flood Warning (includes communication of flood risk).

This measure type, through its deployment, will have a beneficial effect on those SEA topics that it affects. This is mainly through its effects on population and health, material assets and cultural heritage.

Flood Emergency Response

This measure type is seen as overall beneficial to most SEA topics, and particularly those of population and health and material assets. This measure type is based on inter departmental activities, which are not fully controlled by Rivers Agency.

Self Help (includes individual property protection and community engagement)

This measure type is based on individual and community resilience, and is assessed as having overall positive impacts on the SEA topics, in particular population and human health and material assets. This measure type looks to deliver its activities through inter departmental and community means.

10.3 Conclusions from the HRA

The HRA has been carried out based on the three River Basin Districts, and assessing the potential impacts of the three Plan measures on salient N2K sites identified geographically. It concludes that the only measure likely to have a potential negative effect on any N2K site is the Protection measure. It also concludes that at this stage the actual impacts cannot be identified, but that the potential impacts can be mitigated through further HRAs, the assent process (due to ASSI designation of the sites), liaison with NIEA and application of Rivers Agency's internal EIA procedure.

10.4 Summary of Conclusions

The Flood Risk Management Plans for Northern Ireland are a strategic level approach that identifies the measures and activities which will be used for the management of flood risk in Northern Ireland.

These measures and activities will be applied in the 20 significant flood risk areas identified in the Plans. The SEA process has assessed the potential impacts of these measures and activities on the SEA topics, and this information will be used in the selection of activities to address specific flood risk problems. The SEA process has also proposed mitigation measures to address negative impacts, which will be built into project development plans.

As such, the outcome of the SEA is that although the Plans may have potential negative impacts on aspects of the environment, these can be reduced through the application of identified and other mitigation measures, which will include liaison with consultees. It has also been identified that some of these negative impacts are short term in nature, mainly due to the impact of construction works, and may, in the longer term, have positive effects. The SEA has also identified the potential for multi-directive benefits through the use of synergistic works, on a partnership basis.

ENVIRONMENTAL REPORT

Appendix 1
Assessment of Plan Objectives against SEA Objectives

December 2015

Return to Contents Page

Return to Contents Page

Key to Assessment of Alternatives

Assessment Symbol	Explanation of Symbol
+	Positive Impact
-	Negative Impact
/	Both positive and negative impacts or unclear in the absence of further detail
0	Neutral or no impact

Return to Contents Page

Return to Contents Page

SEA Objectives / FRMP Objectives	Protect internationally and nationally designated sites	Protect and maintain, if possible improve linkages between existing green spaces to allow for ecological connectivity	Protect, maintain and if possible, improve existing habitats and native species of flora and fauna	Promote and enhance quality of life for communities through the plan area through the promotion of relevant and appropriate flood risk management options	Safeguard soil quality, quantity and function, including valuable soil resources such as agricultural land and carbon rich soils	Maintain compliance with requirements arising from the implementation of the Water Framework Directive and improve water quality where possible	Manage the effects of climate change through flood risk management	Ensure adequate protection, where possible, and sustainable use of material assets.	Protect and, where appropriate, enhance opportunities for the public to interact with cultural heritage sites (listed buildings, maritime history, historic parks, gardens and demesnes, scheduled monuments etc.	Protect, maintain and, where possible, enhance indentified landscapes of value. Manage and maintain landscape features that contribute to the landscape characteristics of the RBDs.	Compatibility Summary
Economic Activity											
Reduce economic damages to properties	/	/	/	0	-	0	+	+	+	0	"Reducing economic damage to properties" FRMP objective will provide opportunities to optimise materials use and minimise waste production in flood risk management and facilitate the protection of protected structures. There are uncertainties of the relationship between biodiversity SEA objectives and how economic damage to properties will be reduced. This is because property protection may take place with a net negative impact on protected sites, depending on the location of FRMP measures. There is also a potential conflict between reducing economic damage to

SEA Objectives / FRMP Objectives	Protect internationally and nationally designated sites	Protect and maintain, if possible improve linkages between existing green spaces to allow for ecological connectivity	Protect, maintain and if possible, improve existing habitats and native species of flora and fauna	Promote and enhance quality of life for communities through the plan area through the promotion of relevant and appropriate flood risk management options	Safeguard soil quality, quantity and function, including valuable soil resources such as agricultural land and carbon rich soils	Maintain compliance with requirements arising from the implementation of the Water Framework Directive and improve water quality where possible	Manage the effects of climate change through flood risk management	Ensure adequate protection, where possible, and sustainable use of material assets.	Protect and, where appropriate, enhance opportunities for the public to interact with cultural heritage sites (listed buildings, maritime history, historic parks, gardens and demesnes, scheduled monuments etc.	Protect, maintain and, where possible, enhance indentified landscapes of value. Manage and maintain landscape features that contribute to the landscape characteristics of the RBDs.	Compatibility Summary
											properties and safe guarding agricultural land, because if surface water management engineers flooding away from properties, in rural and semi-rural areas, the only areas this water can go into are agricultural. There are compatibilities between this FRMP objective and SEA objectives relating to material assets and cultural heritage. There are also compatibilities between the FRMP objective and the SEA Objective relating to the management of flood risk.
Reduce economic costs on businesses caused by the destruction of essential infrastructure	-	-	-	0	+	0	0	+	0	0	May conflict with the biodiversity objectives of the SEA, where nationally designated sites, ecological linkages and existing habitats may be impacted

SEA Objectives / FRMP Objectives	Protect internationally and nationally designated sites	Protect and maintain, if possible improve linkages between existing green spaces to allow for ecological connectivity	Protect, maintain and if possible, improve existing habitats and native species of flora and fauna	Promote and enhance quality of life for communities through the plan area through the promotion of relevant and appropriate flood risk management options	Safeguard soil quality, quantity and function, including valuable soil resources such as agricultural land and carbon rich soils	Maintain compliance with requirements arising from the implementation of the Water Framework Directive and improve water quality where possible	Manage the effects of climate change through flood risk management	Ensure adequate protection, where possible, and sustainable use of material assets.	Protect and, where appropriate, enhance opportunities for the public to interact with cultural heritage sites (listed buildings, maritime history, historic parks, gardens and demesnes, scheduled monuments etc.	Protect, maintain and, where possible, enhance indentified landscapes of value. Manage and maintain landscape features that contribute to the landscape characteristics of the RBDs.	Compatibility Summary
and services											upon to offset economic costs and damages. Reducing economic costs and damage will provide opportunities to optimise materials use and minimise waste production in flood risk management and facilitate the protection of protected structures.
Optimise economic return on Flood Risk Management investment	/	/	/	0	/	+	0	+	/	/	Optimising the economic return on flood risk management investment may have an uncertain relationship with biodiversity, cultural heritage and landscape SEA objectives because economic returns would be against resources of intrinsic value. In rural and semi-rural environments there are also uncertainties regarding how agricultural land is valued with

SEA Objectives / FRMP Objectives	Protect internationally and nationally designated sites	Protect and maintain, if possible improve linkages between existing green spaces to allow for ecological connectivity	Protect, maintain and if possible, improve existing habitats and native species of flora and fauna	Promote and enhance quality of life for communities through the plan area through the promotion of relevant and appropriate flood risk management options	Safeguard soil quality, quantity and function, including valuable soil resources such as agricultural land and carbon rich soils	Maintain compliance with requirements arising from the implementation of the Water Framework Directive and improve water quality where possible	Manage the effects of climate change through flood risk management	Ensure adequate protection, where possible, and sustainable use of material assets.	Protect and, where appropriate, enhance opportunities for the public to interact with cultural heritage sites (listed buildings, maritime history, historic parks, gardens and demesnes, scheduled monuments etc.	Protect, maintain and, where possible, enhance indentified landscapes of value. Manage and maintain landscape features that contribute to the landscape characteristics of the RBDs.	Compatibility Summary
											regard to output and Flood Risk Management investment.
Human Health and Social											
Reduce the risk to life	0	+	0	+	0	+	+	/	/	/	It is not considered there is incompatibility between the "Reduce the risk to life" FRMP Objective and the SEA objectives relating to protected sites, protected species and agricultural land. There is compatibility between the SEA objectives regarding ecological connectivity, quality of life, the WFD and climate change. This is because of the actual and intrinsic benefit associated with these SEA objectives and reducing both chronic and acute risks to life which result from flooding.
Raise awareness of the	+	+	+	+	+	+	+	+	+	+	This FRMP objective is broadly

SEA Objectives / FRMP Objectives	Protect internationally and nationally designated sites	Protect and maintain, if possible improve linkages between existing green spaces to allow for ecological connectivity	Protect, maintain and if possible, improve existing habitats and native species of flora and fauna	Promote and enhance quality of life for communities through the plan area through the promotion of relevant and appropriate flood risk management options	Safeguard soil quality, quantity and function, including valuable soil resources such as agricultural land and carbon rich soils	Maintain compliance with requirements arising from the implementation of the Water Framework Directive and improve water quality where possible	Manage the effects of climate change through flood risk management	Ensure adequate protection, where possible, and sustainable use of material assets.	Protect and, where appropriate, enhance opportunities for the public to interact with cultural heritage sites (listed buildings, maritime history, historic parks, gardens and demesnes, scheduled monuments etc.	Protect, maintain and, where possible, enhance indentified landscapes of value. Manage and maintain landscape features that contribute to the landscape characteristics of the RBDs.	Compatibility Summary
consequences of flood risk											compatible with all SEA objectives because it allows custodians of public sites and land/property owners to be made aware of flood issues which may potentially adversely affect them.
Reduce risk to health and wellbeing	0	0	0	+	0	0	0	+	0	0	This FRMP objective is broadly compatible with the health and population and material assets SEA objectives. The health and population SEA objective relates directly to health, while material assets relate to wellbeing. Where protection of material assets (homes) is linked to stress reduction.
Reduce the impact on people caused by the disruption to essential infrastructure and	0	0	0	+	0	0	0	+	0	0	This FRMP objective is broadly compatible with the health and population and material assets SEA objectives. The health and population

SEA Objectives / FRMP Objectives	Protect internationally and nationally designated sites	Protect and maintain, if possible improve linkages between existing green spaces to allow for ecological connectivity	Protect, maintain and if possible, improve existing habitats and native species of flora and fauna	Promote and enhance quality of life for communities through the plan area through the promotion of relevant and appropriate flood risk management options	Safeguard soil quality, quantity and function, including valuable soil resources such as agricultural land and carbon rich soils	Maintain compliance with requirements arising from the implementation of the Water Framework Directive and improve water quality where possible	Manage the effects of climate change through flood risk management	Ensure adequate protection, where possible, and sustainable use of material assets.	Protect and, where appropriate, enhance opportunities for the public to interact with cultural heritage sites (listed buildings, maritime history, historic parks, gardens and demesnes, scheduled monuments etc.	Protect, maintain and, where possible, enhance indentified landscapes of value. Manage and maintain landscape features that contribute to the landscape characteristics of the RBDs.	Compatibility Summary
services											SEA objective in the context would be compatible with the stress of disruption, while the material assets SEA objective would be compatible with minimising disruption of services.
Improve recreation and public amenities	0	+	0	+	0	/	0	+	+	/	Improving recreation and public amenities allow for synergies within the biodiversity objectives relating enhancing access into protected sites to improve wellbeing.
Environmental (including cultural heritage)											
Consider the impact of climate change	+	0	0	+	+	+	+	+	+	+	This FRMP objective is broadly compatible will all SEA objectives because of the wide ranging effects associated with climate change.
Under the Water Framework Directive,	+	+	+	0	+	+	+	+	0	0	The FRMP objective broadly agrees with the biodiversity, soil and water

SEA Objectives / FRMP Objectives	Protect internationally and nationally designated sites	Protect and maintain, if possible improve linkages between existing green spaces to allow for ecological connectivity	Protect, maintain and if possible, improve existing habitats and native species of flora and fauna	Promote and enhance quality of life for communities through the plan area through the promotion of relevant and appropriate flood risk management options	Safeguard soil quality, quantity and function, including valuable soil resources such as agricultural land and carbon rich soils	Maintain compliance with requirements arising from the implementation of the Water Framework Directive and improve water quality where possible	Manage the effects of climate change through flood risk management	Ensure adequate protection, where possible, and sustainable use of material assets.	Protect and, where appropriate, enhance opportunities for the public to interact with cultural heritage sites (listed buildings, maritime history, historic parks, gardens and demesnes, scheduled monuments etc.	Protect, maintain and, where possible, enhance indentified landscapes of value. Manage and maintain landscape features that contribute to the landscape characteristics of the RBDs.	Compatibility Summary
support the achievement of good ecological potential/status for water bodies											SEA objectives because these all tie into gaining and retaining good ecological potential/status for water bodies. The relationship between this FRMP objective and the climate change SEA objective, managing the effects of climate change, should encompass measures to retain or improve WFD ecological status.
Reduce the risk of pollution	+	+	+	+	+	+	0	+	+	+	This FRMP objective is broadly compatible with all SEA objectives mainly due to the protection of infrastructure such as sewage treatment works. However it should be caveated in the assessment that reducing the risk of pollution from flood risk management does not reduce

SEA Objectives / FRMP Objectives	Protect internationally and nationally designated sites	Protect and maintain, if possible improve linkages between existing green spaces to allow for ecological connectivity	Protect, maintain and if possible, improve existing habitats and native species of flora and fauna	Promote and enhance quality of life for communities through the plan area through the promotion of relevant and appropriate flood risk management options	Safeguard soil quality, quantity and function, including valuable soil resources such as agricultural land and carbon rich soils	Maintain compliance with requirements arising from the implementation of the Water Framework Directive and improve water quality where possible	Manage the effects of climate change through flood risk management	Ensure adequate protection, where possible, and sustainable use of material assets.	Protect and, where appropriate, enhance opportunities for the public to interact with cultural heritage sites (listed buildings, maritime history, historic parks, gardens and demesnes, scheduled monuments etc.	Protect, maintain and, where possible, enhance indentified landscapes of value. Manage and maintain landscape features that contribute to the landscape characteristics of the RBDs.	Compatibility Summary
											pollution resulting from floods and the measures associated with this FRMP objective should include advice and solutions for issues surrounding wastes and effluents brought to areas because of floods.
Avoid or mitigate impact on priority species and habitats	+	+	+	+	0	+	/	0	0	0	This FRMP objective is broadly compatible with the biodiversity and water SEA objectives. Protected species exist in both terrestrial and aquatic environments and there may be impacts in a range of habitats as a result of FRMP. There is uncertainty about compatibility between this FRMP objective and the climate change SEA objective because as a reaction to climate change, some habitats and associated priority species ranges are

SEA Objectives / FRMP Objectives	Protect internationally and nationally designated sites	Protect and maintain, if possible improve linkages between existing green spaces to allow for ecological connectivity	Protect, maintain and if possible, improve existing habitats and native species of flora and fauna	Promote and enhance quality of life for communities through the plan area through the promotion of relevant and appropriate flood risk management options	Safeguard soil quality, quantity and function, including valuable soil resources such as agricultural land and carbon rich soils	Maintain compliance with requirements arising from the implementation of the Water Framework Directive and improve water quality where possible	Manage the effects of climate change through flood risk management	Ensure adequate protection, where possible, and sustainable use of material assets.	Protect and, where appropriate, enhance opportunities for the public to interact with cultural heritage sites (listed buildings, maritime history, historic parks, gardens and demesnes, scheduled monuments etc.	Protect, maintain and, where possible, enhance indentified landscapes of value. Manage and maintain landscape features that contribute to the landscape characteristics of the RBDs.	Compatibility Summary
											changing.
Avoid or mitigate on designated environmental areas, including those of cultural heritage importance	+	+	+	0	/	/	/	+	+	+	This FRMP objective is broadly compatible with the SEA biodiversity objectives and the material assets, cultural heritage and landscape objectives. All of these SEA topic areas have designations which are recognised by the FRMP objective. There is uncertainty about the relationship between this FRMP objective and the SEA objectives regarding agricultural land, the WFD and climate change. In relation to agricultural land which is rarely designated, this could provide a location for mitigation which would result in impacted soil quality. For the Water SEA Objective, the WFD

SEA Objectives / FRMP Objectives	Protect internationally and nationally designated sites	Protect and maintain, if possible improve linkages between existing green spaces to allow for ecological connectivity	Protect, maintain and if possible, improve existing habitats and native species of flora and fauna	Promote and enhance quality of life for communities through the plan area through the promotion of relevant and appropriate flood risk management options	Safeguard soil quality, quantity and function, including valuable soil resources such as agricultural land and carbon rich soils	Maintain compliance with requirements arising from the implementation of the Water Framework Directive and improve water quality where possible	Manage the effects of climate change through flood risk management	Ensure adequate protection, where possible, and sustainable use of material assets.	Protect and, where appropriate, enhance opportunities for the public to interact with cultural heritage sites (listed buildings, maritime history, historic parks, gardens and demesnes, scheduled monuments etc.	Protect, maintain and, where possible, enhance indentified landscapes of value. Manage and maintain landscape features that contribute to the landscape characteristics of the RBDs.	Compatibility Summary
											does designate water bodies and as such, there may be issues surrounding improving flood defences in one part of a catchment to the detriment of other parts. For the Climate SEA Objective, there are no designated areas, however mitigation for climate change induced extreme weather events may be required.

ENVIRONMENTAL REPORT

Appendix 2: Assessment of Plan Measure Types against SEA Objectives

December 2015

Return to Contents Page

Return to Contents Page

Key to Assessment of Alternatives

Assessment Symbol	Explanation of Symbol
✓	Positive Impact
x	Negative Impact
✓/x	Both positive and negative impacts or unclear in the absence of further detail
0	Neutral or no impact

Return to Contents Page

Return to Contents Page

SEA Objectives / FRMP Measure	Protect internationally and nationally designated sites	Protect and maintain, if possible improve linkages between existing green spaces to allow for ecological connectivity	Protect, maintain and if possible, improve existing habitats and native species of flora and fauna	Promote and enhance quality of life for communities through the plan area through the promotion of relevant and appropriate flood risk management options	Safeguard soil quality, quantity and function, including valuable soil resources such as agricultural land and carbon rich soils	Maintain compliance with requirements arising from the implementation of the Water Framework Directive and improve water quality where possible	Manage the effects of climate change through flood risk management	Ensure adequate protection, where possible, and sustainable use of material assets.	Protect and, where appropriate, enhance opportunities for the public to interact with cultural heritage sites (listed buildings, maritime history, historic parks, gardens and demesnes, scheduled monuments etc.	Protect, maintain and, where possible, enhance indentified landscapes of value. Manage and maintain landscape features that contribute to the landscape characteristics of the RBDs.	Summary
Flood Prevention											
Do Nothing	✓	0	✓	✓	0	✓	✓	✓	✓	✓	The “do nothing” i.e. the continuation of current measures without the introduction of the Plan, will broadly meets all the SEA objectives. This is because Planning Policy Statement (PPS 15) was published in September 2014 and as such is the planning guidance which aims to minimise development in areas of flood risk.
Surface Water Management	✓	0	✓	✓	0	✓	✓	✓	✓	✓/x	Surface water management covers a range of potential measures including SuDS ponds and other sustainable flood management measures. It is deemed to broadly agree the SEA objectives.

SEA Objectives / FRMP Measure	Protect internationally and nationally designated sites	Protect and maintain, if possible improve linkages between existing green spaces to allow for ecological connectivity	Protect, maintain and if possible, improve existing habitats and native species of flora and fauna	Promote and enhance quality of life for communities through the plan area through the promotion of relevant and appropriate flood risk management options	Safeguard soil quality, quantity and function, including valuable soil resources such as agricultural land and carbon rich soils	Maintain compliance with requirements arising from the implementation of the Water Framework Directive and improve water quality where possible	Manage the effects of climate change through flood risk management	Ensure adequate protection, where possible, and sustainable use of material assets.	Protect and, where appropriate, enhance opportunities for the public to interact with cultural heritage sites (listed buildings, maritime history, historic parks, gardens and demesnes, scheduled monuments etc.	Protect, maintain and, where possible, enhance indentified landscapes of value. Manage and maintain landscape features that contribute to the landscape characteristics of the RBDs.	Summary
											However the effects SuDS measures will have in relation to regional flood events is likely to be limited because their effectiveness is dependent on development specific siting and design, and they are usually small scale dealing with specific geographic issues. The development of sustainable flood risk management measures in agricultural land would also be dependent on individual landowners wanting to give up their land for these measures. Landowners would also require support in relation to design and siting of the measures. There would be a mixed

SEA Objectives / FRMP Measure	Protect internationally and nationally designated sites	Protect and maintain, if possible improve linkages between existing green spaces to allow for ecological connectivity	Protect, maintain and if possible, improve existing habitats and native species of flora and fauna	Promote and enhance quality of life for communities through the plan area through the promotion of relevant and appropriate flood risk management options	Safeguard soil quality, quantity and function, including valuable soil resources such as agricultural land and carbon rich soils	Maintain compliance with requirements arising from the implementation of the Water Framework Directive and improve water quality where possible	Manage the effects of climate change through flood risk management	Ensure adequate protection, where possible, and sustainable use of material assets.	Protect and, where appropriate, enhance opportunities for the public to interact with cultural heritage sites (listed buildings, maritime history, historic parks, gardens and demesnes, scheduled monuments etc.	Protect, maintain and, where possible, enhance indentified landscapes of value. Manage and maintain landscape features that contribute to the landscape characteristics of the RBDs.	Summary
											compliance for landscape because surface water management may be large scale development on the boundaries of communities, which could have local landscape impacts.
Development outside Flood Risk Area	0	0	✓/X	✓/X	0	✓/X	✓/X	✓/X	✓/X	✓/X	Development outside flood risk areas is reliant on Planning NI and local councils applying PPS15, and on the provision of up to date flood area mapping by DARD Rivers Agency. The use of PPS15 influences local development plans by minimising the amount of development land designated in areas of flood risk.
Ensure New Development within	0	0	✓/X	✓	0	✓/X	✓	✓/X	✓/X	✓/X	Rivers Agency does not have a direct role in the design and construction of

SEA Objectives / FRMP Measure	Protect internationally and nationally designated sites	Protect and maintain, if possible improve linkages between existing green spaces to allow for ecological connectivity	Protect, maintain and if possible, improve existing habitats and native species of flora and fauna	Promote and enhance quality of life for communities through the plan area through the promotion of relevant and appropriate flood risk management options	Safeguard soil quality, quantity and function, including valuable soil resources such as agricultural land and carbon rich soils	Maintain compliance with requirements arising from the implementation of the Water Framework Directive and improve water quality where possible	Manage the effects of climate change through flood risk management	Ensure adequate protection, where possible, and sustainable use of material assets.	Protect and, where appropriate, enhance opportunities for the public to interact with cultural heritage sites (listed buildings, maritime history, historic parks, gardens and demesnes, scheduled monuments etc.	Protect, maintain and, where possible, enhance indentified landscapes of value. Manage and maintain landscape features that contribute to the landscape characteristics of the RBDs.	Summary
Flood Risk Area is suitably constructed											properties, but has a role in requiring and assessing Flood Risk and Drainage Assessments. The measure type relies on other agencies such as Planning and local councils
Flood Protection											
Do Nothing	✓	✓/X	✓/X	✓	✓	✓	✓/X	✓	✓✓	✓	There is existing flood risk management infrastructure in Northern Ireland and it is maintained by DARD Rivers Agency. It has been tested by extreme weather events and it is maintained to continue service. In many instances it is not sufficient to deal with projected climate change.
Flood Walls and	✓/X	X	✓/X	✓	✓	✓/X	✓	✓	✓	✓/X	The flood walls and embankments

SEA Objectives / FRMP Measure	Protect internationally and nationally designated sites	Protect and maintain, if possible improve linkages between existing green spaces to allow for ecological connectivity	Protect, maintain and if possible, improve existing habitats and native species of flora and fauna	Promote and enhance quality of life for communities through the plan area through the promotion of relevant and appropriate flood risk management options	Safeguard soil quality, quantity and function, including valuable soil resources such as agricultural land and carbon rich soils	Maintain compliance with requirements arising from the implementation of the Water Framework Directive and improve water quality where possible	Manage the effects of climate change through flood risk management	Ensure adequate protection, where possible, and sustainable use of material assets.	Protect and, where appropriate, enhance opportunities for the public to interact with cultural heritage sites (listed buildings, maritime history, historic parks, gardens and demesnes, scheduled monuments etc.	Protect, maintain and, where possible, enhance indentified landscapes of value. Manage and maintain landscape features that contribute to the landscape characteristics of the RBDs.	Summary
Embankments											measure is broadly compliant with the SEA objectives. However in relation to biodiversity, the placement of a flood wall or embankment may remove a boundary habitat (either riparian or coastal) and in the case of riparian habitats, species movement might be inhibited. In the case of coastal habitats, sediment movements which may feed dune systems may be cut off. In the case of the landscape SEA objective, flood walls and embankments do change the landscape character but the magnitude of effect depends on the viewer. Overall, the measure type has a mixed

SEA Objectives / FRMP Measure	Protect internationally and nationally designated sites	Protect and maintain, if possible improve linkages between existing green spaces to allow for ecological connectivity	Protect, maintain and if possible, improve existing habitats and native species of flora and fauna	Promote and enhance quality of life for communities through the plan area through the promotion of relevant and appropriate flood risk management options	Safeguard soil quality, quantity and function, including valuable soil resources such as agricultural land and carbon rich soils	Maintain compliance with requirements arising from the implementation of the Water Framework Directive and improve water quality where possible	Manage the effects of climate change through flood risk management	Ensure adequate protection, where possible, and sustainable use of material assets.	Protect and, where appropriate, enhance opportunities for the public to interact with cultural heritage sites (listed buildings, maritime history, historic parks, gardens and demesnes, scheduled monuments etc.	Protect, maintain and, where possible, enhance indentified landscapes of value. Manage and maintain landscape features that contribute to the landscape characteristics of the RBDs.	Summary
											compatibility with the range of SEA objectives.
Culvert Works	✓	✓/X	✓/X	✓	✓	✓	✓/X	✓	✓✓	✓	Culvert works have a mixed compliance with the SEA objectives because while they will reduce flood risk, they will require correct siting and design to maintain habitat linkages and address the effects of climate change.
Enhanced Maintenance of existing Drainage and Flood Defence Network	X	X	X	X	X	X	X	X	X	X	Enhanced maintenance of the existing drainage and flood defence network is a continuation of current Rivers' Agency practice but with an increased emphasis on flood risk management.
Catchment Based Management	✓	✓/X	✓/X	0	✓/X	✓/X	✓	0	0	✓/X	Rivers Agency proposes to look at catchment based management through

SEA Objectives / FRMP Measure	Protect internationally and nationally designated sites	Protect and maintain, if possible improve linkages between existing green spaces to allow for ecological connectivity	Protect, maintain and if possible, improve existing habitats and native species of flora and fauna	Promote and enhance quality of life for communities through the plan area through the promotion of relevant and appropriate flood risk management options	Safeguard soil quality, quantity and function, including valuable soil resources such as agricultural land and carbon rich soils	Maintain compliance with requirements arising from the implementation of the Water Framework Directive and improve water quality where possible	Manage the effects of climate change through flood risk management	Ensure adequate protection, where possible, and sustainable use of material assets.	Protect and, where appropriate, enhance opportunities for the public to interact with cultural heritage sites (listed buildings, maritime history, historic parks, gardens and demesnes, scheduled monuments etc.	Protect, maintain and, where possible, enhance indentified landscapes of value. Manage and maintain landscape features that contribute to the landscape characteristics of the RBDs.	Summary
											partnership working with other bodies – this will be commenced during the timeframe of the first Plan. The assessment highlights the potential for such measures, but legislative constraints currently preclude the inclusion of definite measure types.
Flood Preparedness											
Do Nothing	0	0	✓	✓	0	✓	✓	✓	✓	✓	DARD Rivers Agency already operates within a framework for the co-ordination of flood emergencies in Northern Ireland. DARD Rivers Agency already has flood community liaison officers and already works with councils and other stakeholders to predict the severity of

SEA Objectives / FRMP Measure	Protect internationally and nationally designated sites	Protect and maintain, if possible improve linkages between existing green spaces to allow for ecological connectivity	Protect, maintain and if possible, improve existing habitats and native species of flora and fauna	Promote and enhance quality of life for communities through the plan area through the promotion of relevant and appropriate flood risk management options	Safeguard soil quality, quantity and function, including valuable soil resources such as agricultural land and carbon rich soils	Maintain compliance with requirements arising from the implementation of the Water Framework Directive and improve water quality where possible	Manage the effects of climate change through flood risk management	Ensure adequate protection, where possible, and sustainable use of material assets.	Protect and, where appropriate, enhance opportunities for the public to interact with cultural heritage sites (listed buildings, maritime history, historic parks, gardens and demesnes, scheduled monuments etc.	Protect, maintain and, where possible, enhance indentified landscapes of value. Manage and maintain landscape features that contribute to the landscape characteristics of the RBDs.	Summary
											flood events. If FRMP is not published, it will not affect any of the existing work.
Flood Warning – includes communication of flood risk	0	0	0	✓	0	0	0	✓	✓	0	DARD Rivers Agency will continue to work with the MET Office to inform the impact assessment of heavy rainfall. As part of FRMP, they will also raise awareness about flood risk and if appropriate, disseminate water level alerts. This will allow the public to leave their homes once the emergency has commenced. Overall, this measure type is not incompatible with the SEA objectives.
Flood Emergency Response	0	0	✓/X	✓/X	0	✓/X	✓/X	✓/X	✓/X	✓/X	In relation to “Flood Emergency Response”, DARD Rivers Agency will

SEA Objectives / FRMP Measure	Protect internationally and nationally designated sites	Protect and maintain, if possible improve linkages between existing green spaces to allow for ecological connectivity	Protect, maintain and if possible, improve existing habitats and native species of flora and fauna	Promote and enhance quality of life for communities through the plan area through the promotion of relevant and appropriate flood risk management options	Safeguard soil quality, quantity and function, including valuable soil resources such as agricultural land and carbon rich soils	Maintain compliance with requirements arising from the implementation of the Water Framework Directive and improve water quality where possible	Manage the effects of climate change through flood risk management	Ensure adequate protection, where possible, and sustainable use of material assets.	Protect and, where appropriate, enhance opportunities for the public to interact with cultural heritage sites (listed buildings, maritime history, historic parks, gardens and demesnes, scheduled monuments etc.	Protect, maintain and, where possible, enhance indentified landscapes of value. Manage and maintain landscape features that contribute to the landscape characteristics of the RBDs.	Summary
											continue to engage with other responsible bodies and to assist in the production of multi Agency flood emergency plans. The result is that most of the actions in relation to this measure will be the same as “do nothing” with enhanced protection proposed around reservoirs.
Self Help – includes community engagement and IPP	0	0	0	✓	0	0	0	✓	0	0	DARD Rivers Agency already promotes the role of Flood Community Liaison Officer. Part of this role is to disseminate information about self-help and making property more flood resilient. Self-help and flood resilience will be on individual levels and as such, the strategic impact

SEA Objectives / FRMP Measure	Protect internationally and nationally designated sites	Protect and maintain, if possible improve linkages between existing green spaces to allow for ecological connectivity	Protect, maintain and if possible, improve existing habitats and native species of flora and fauna	Promote and enhance quality of life for communities through the plan area through the promotion of relevant and appropriate flood risk management options	Safeguard soil quality, quantity and function, including valuable soil resources such as agricultural land and carbon rich soils	Maintain compliance with requirements arising from the implementation of the Water Framework Directive and improve water quality where possible	Manage the effects of climate change through flood risk management	Ensure adequate protection, where possible, and sustainable use of material assets.	Protect and, where appropriate, enhance opportunities for the public to interact with cultural heritage sites (listed buildings, maritime history, historic parks, gardens and demesnes, scheduled monuments etc.	Protect, maintain and, where possible, enhance indentified landscapes of value. Manage and maintain landscape features that contribute to the landscape characteristics of the RBDs.	Summary
											of the measure will only become present once the number of individuals making their properties flood resilient reaches a critical mass before there is wide spread acceptance of the scheme. Overall, this measure type is not incompatible with the SEA objectives

ENVIRONMENTAL REPORT

Appendix 3:

Summary of Plans' Effects (by Measure Type) and Mitigation Measures

December 2015

Return to Contents Page

Return to Contents Page

Table 1: Summary of Effects of Flood Walls and Embankments

Topic	Sub-topic	Intervention details		Duration	Potential impact description	Potential Effect (without mitigation)	Mitigation	Residual effect significance (with mitigation)
		Phase	Characteristic					
Biodiversity	**Effect on protected sites**	Construction / Decommissioning	Effects on existing and proposed protected sites (SACs, SPAs, SCIs, ASSIs, Ramsar sites, NNRs) (NIEA)	Temporary	Potential disturbance to and loss of habitats, trees and vegetation as a result of the creation of flood walls and embankments Access to the site of the works would be required and this is likely to involve the removal of any areas of habitats, trees and vegetation. Impact on qualifying criteria of site	Significant adverse	• Carry out necessary HRA/assent. • Liaise with Natural Heritage through the statutory consultee process • Look for enhancement aspects e.g. for WFD. • Complete EIA process including optioneering. • Minimise footprint of works and disturbance due to access. • Avoid tree loss and vegetation where possible. • Adhere to construction mitigation guidance including Pollution prevention guidance (PPGs) and where appropriate site specific method statements.	Neutral
	Effect on protected sites	Operation (maintenance)	Effects on existing and proposed protected sites (SACs, SPAs, SCIs, ASSIs, Ramsar sites, NNRs) (NIEA)	Permanent	Potential disturbance to and loss of habitats, trees and vegetation as a result of the creation of flood walls and embankments Access to the site of the works would be required and this is likely to involve the removal of any areas of habitats, trees and vegetation. Ongoing effect on qualifying criteria	Significant adverse	• Minimise footprint of works and disturbance due to access. • Establish agreed (With Natural Heritage) maintenance regime to fit with site management priorities (prior to works).	Neutral
	Effect on protected sites	Operation	Effects on existing and proposed protected sites (SACs, SPAs, SCIs, ASSIs, Ramsar sites, NNRs) (NIEA)	Permanent	Ensure site integrity is retained and flood waters do not carry and deposit pollutants onto the protected site. Potential benefits of implementation of enhancement measures.	Beneficial	N/A	Beneficial
	Aquatic/riparian habitats	Construction/ Decommissioning	River bank/bed disturbance during construction/ decommissioning	Temporary	Loss of aquatic/riparian habitats. Loss of trees (which may contain bat roosts) as a result of the creation of flood walls and embankments. Fish (Salmonid and Lamprey) species redds may become silt laden resulting from sediment pollution from run-off or work activities. Bivalves (Freshwater pearl mussels) and crustacean (white	Significant adverse	• Minimise footprint of works and disturbance due to access. • Avoid tree loss where possible • Look at catchment options using EIA procedure. • To offset the impact of any woodland losses, bat boxes could be erected within remaining areas of riparian woodland. • Consider habitat enhancement measures e.g. fisheries works • If in stream works are required, they should be timed to minimise impacts to all aquatic species. • Species translocation may be required in areas where conflicts cannot be resolved. • Design in sediment control measures during works	Adverse

Return to Contents Page

Table 1: Summary of Effects of Flood Walls and Embankments

Topic	Sub-topic	Intervention details		Duration	Potential impact description	Potential Effect (without mitigation)	Mitigation	Residual effect significance (with mitigation)
		Phase	Characteristic					
					clawed crayfish) species are susceptible to siltation resulting from sediment runoff and bed disturbance.			
	Aquatic/riparian habitats	Operation (maintenance)	River bank/bed disturbance during maintenance	Temporary	Siltation resulting from in stream works and vegetation management.	Significant adverse	• Programme works to not coincide with major high or low flow events or periods when protected species are using the site. • Agree maintenance works with e.g. Inland Fisheries/Loughs Agency • Control invasives in line with RA protocol within flood defences. • Utilise sediment control measures	Adverse
	Aquatic habitats	Operation	Flood walls and embankments in place.	Permanent	Reduction in the number and severity of flood events which may be beneficial to some aquatic habitats.	Neutral	• Monitor to ensure no detrimental effect on habitats and species. • Monitor to ensure any mitigation works are functioning correctly e.g. fish passes/mammal access routes.	Neutral
	Aquatic / coastal Habitats	Construction / Decommissioning	Coastal habitat disturbance during construction/ decommissioning	Temporary	Loss of aquatic/coastal habitat. Barriers to fish migration. Fish (Salmonid) species may be impacted by silt laden runoff resulting from sediment pollution from run-off or work activities.	Significant adverse	• If in stream works are required, they should be timed to minimise impacts to all aquatic species. • Species translocation may be required in areas where conflicts cannot be resolved. • Ensure that all necessary HRA/assents are complete pre works. • Complete EIA process including optioneering	Adverse
	Riparian habitats	Operation	Loss of riparian habitat	Permanent	Removal of riparian habitat including removal of otter holts, paths and couches.	Significant adverse	• Translocation of riparian species (otters) to artificial holts outside the area of flood walling.	Adverse
	Coastal habitats	Operation	Loss of coastal habitat	Permanent	Removal of coastal habitat which are fed by sea based sedimentary systems.	Significant adverse	• Include sediment transport in scheme design parameters and minimise risks through design. • Carry out necessary assessment and consultation in line with MSFD and protected sites. • Consider access for fauna to the shore as well as within coastal habitats eg. otters	Adverse
	Effect on protected species	Construction / Decommissioning	Removal of vegetation during construction, construction noise, potential for piling activity.	Temporary	Potential disturbance to and loss of riparian habitat as a result of the creation of flood walls and embankments. Potential temporary disturbance to any bat foraging activity. May restrict or prevent the movement of migratory and mobile wildlife species between habitats and within habitat.	Significant adverse	• Construction should follow all Pollution Prevention Guidance (PPGs) and method statements for work should be agreed with NIEA in areas where European and nationally protected species may be encountered. • Vegetation/tree removal would be undertaken outside the bird breeding season where possible to ensure no bird nests with young or eggs are destroyed. • Alternatively, if vegetation removal is required during the bird breeding season, trees and scrub should be checked for the presence of breeding	Adverse

Return to Contents Page

Table 1: Summary of Effects of Flood Walls and Embankments								
Topic	**Sub-topic**	**Intervention details**		**Duration**	**Potential impact description**	**Potential Effect (without mitigation)**	**Mitigation**	**Residual effect significance (with mitigation)**
		Phase	**Characteristic**					
					Construction work may have a range of impacts on breeding birds through direct disturbance to nesting birds and indirect impact by inadvertently encouraging predators to reduction in tree and shrub cover Fish (Salmonid and Lamprey) species would be susceptible to construction related impacts. Potential sources of impact include noise vibration from /flood wall construction, sediment pollution from run-off or work activities. Noise from machinery and equipment may cause temporary local disturbance effects to birds but would be short term during construction and, phased across the different locations. Potentially more disruptive operations include any particularly noisy activities. This would be a short term impact and, with the implementation of appropriate techniques to reduce noise and vibration, no significant impact is anticipated.		birds/active nests by a qualified and experienced ecologist. • New/replacement planting would help to reinstate ground cover and close woodland gaps as far as is practicable. • Control of runoff from working areas. • Scheme detailed designed to ensure no alteration to existing normal flow regime. • Consult appropriately regarding FWPM or fisheries watercourses • Obtain licences where required for species translocation e.g. badger setts	
	Effect on protected species	Operation(maintenance)	Removal of vegetation during maintenance, noise from maintenance equipment	Temporary	Sediment loading resulting from maintenance including wall repointing or rebuilding.	Significant adverse	• Time maintenance to not conflict with presence of protected species. • Adherence to PPGs and best practice regarding building materials and working practices around water courses. • Control of runoff from working areas. • Design maintenance regime to minimise impact on protected species. • Identify, implement and manage habitat improvement works where applicable. • Obtain licences where required for species translocation e.g. badger setts	Adverse
	Terrestrial habitat	Construction / Decommissioning	Removal of vegetation during construction, construction noise, potential for piling activity.	Temporary	Potential disturbance to and loss of habitat as a result of the creation of flood walls and embankments. Access to the site would also be required and this is likely to involve the removal of some areas of additional habitats. During decommissioning continued habitat fragmentation	Significant adverse	• Carry out EIA process including optioneering • Minimise footprint of works and disturbance due to access. • Avoid tree loss where possible • New/replacement planting would help to reinstate ground cover and close woodland gaps as far as is practicable. • Time work to avoid conflicts with breeding/wintering birds.	Adverse

Table 1: Summary of Effects of Flood Walls and Embankments								
Topic	**Sub-topic**	**Intervention details**		**Duration**	**Potential impact description**	**Potential Effect (without mitigation)**	**Mitigation**	**Residual effect significance (with mitigation)**
		Phase	**Characteristic**					
					or severance may occur. Potential disturbance to and loss of riparian habitat as a result of the creation of flood walls and embankments. Potential temporary disturbance to any bat foraging activity. Construction work may have a range of impacts on breeding birds through direct disturbance to nesting birds and indirect impact by inadvertently encouraging predators to reduction in tree and shrub cover Noise from machinery and equipment may cause temporary local disturbance effects to birds but would be short term during construction and phased across the different locations.		• Observe general PPGs regarding construction.	
	Terrestrial habitat	Construction	Removal of mature trees	Permanent	Removal of trees which may contain bat roosts.	Significant adverse	• Removal of bat roosts in trees under licence and use of bat boxes to enhance opportunities for roosting bats.	Adverse
	Terrestrial habitat	Operation (maintenance)	Removal of vegetation during maintenance, noise from maintenance equipment.	Temporary	Sediment loading resulting from maintenance including wall repointing or rebuilding.	Significant adverse	• Control of runoff from working areas. • Minimise footprint of works and disturbance due to access. • Use of pollution prevention and sediment control measures	Adverse
Population and human health	**Noise**	Construction / Decommissioning	Establishment of site working areas and accesses, site clearance, associated temporary land take. Noise outputs from construction/ decommissioning equipment.	Temporary	The construction of the scheme has the potential to generate noise and vibration effects which, if not properly controlled, may result in statutory nuisance.	Significant adverse	• All construction works would be carried out in accordance with BS5228, “Noise and Vibration Control on Construction and Open Sites”. BS5228 provides guidance on general mitigation measures. • Contractors working on behalf of DARD Rivers Agency should also comply with Part 7 (Statutory Nuisances) of the Clean Neighbourhoods and Environment Act (Northern Ireland) 2011.	Adverse
	Noise	Operation (maintenance)	Equipment used during maintenance, may produce a noise nuisance.	Temporary	Maintenance equipment has the potential to generate noise and vibration effects which, if not properly controlled, may result in nuisance to any sensitive receptors in the vicinity.	Significant adverse	• All maintenance works would be carried out in accordance with BS5228, “Noise and Vibration Control on Construction and Open Sites”. BS5228 provides guidance on general mitigation measures. • Contractors working on behalf of DARD Rivers Agency should also comply with Part 7 (Statutory Nuisances) of the Clean Neighbourhoods and Environment Act (Northern Ireland) 2011.	Adverse

Return to Contents Page

Table 1: Summary of Effects of Flood Walls and Embankments

Topic	Sub-topic	Intervention details		Duration	Potential impact description	Potential Effect (without mitigation)	Mitigation	Residual effect significance (with mitigation)
		Phase	Characteristic					
	Agricultural	Construction / Operation (maintenance) / Decommissioning	Establishment of site working areas and accesses, site clearance, associated temporary land take	Temporary	Potential temporary loss, damage or disturbance of agricultural land. Field drainage may be affected.	Significant adverse	• Timing of works agreed with landowner to minimise disturbance to farm working. • Maintain existing access arrangements to fields. If this is not possible provide alternative access arrangements during the construction period. • Where existing access cannot be maintained, consider access arrangements prior to works on site and construct necessary facilities before undertaking any works that may cause disruption. • Temporary land take during the construction period would be returned to agricultural use on completion of the works.	Adverse
	Agricultural	Operation	Flood wall in place protecting holding.	Permanent	Protection of agricultural activity during flood events, including protection of crops and/or animals.	Beneficial	N/A	Beneficial
	Recreation and Tourism Interests	Construction / Operation (maintenance) / Decommissioning	Establishment of site working areas and accesses, site clearance, associated temporary land take	Temporary	Potential temporary land take of recreation and tourism facilities. Public access routes in the locality could be temporarily affected.	Significant adverse	• Minimisation of temporary land-take, especially within public recreational areas. • Provide designated temporary access points where accessibility and severance may pose a temporary problem. • Look for opportunities to enhance recreation interests e.g. fishing stands, canoe access	Adverse
	Recreation and Tourism Interests	Operation	Instatement of flood wall	Permanent	Potential permanent land take of recreation and tourism facilities.	Significant adverse	• Minimisation of permanent land-take where possible, especially within public recreational areas. • Provision of alternative permanent access or facilities • Minimise time requirements for maintenance.	Adverse
	Recreation and Tourism Interests	Operation	Instatement of flood wall	Permanent	Benefiting the local population by reducing flood risk and its impacts for communities, businesses and tourism.	Beneficial	N/A	Beneficial
	Private property (Residential and commercial)	Construction / decommissioning	Establishment of site working areas and accesses, site clearance, associated temporary land take	Temporary	Potential temporary landtake, within the boundaries of private and commercial properties, during construction/decommissioning. Construction/decommissioning impact regarding site access for the duration of the works.	Significant adverse	• Minimisation of temporary land-take, especially within private residential and commercial property boundaries. • Agree access arrangements with stakeholders (landlords, tenants, business/domestic premises user/owners). • Restoration of all disturbed areas, including private gardens, commercial property, and implement landscaping where appropriate	Adverse
	Private property (Residential and commercial)	Operation	Instatement of the flood wall	Permanent	Beneficial impact in relation to the protection of private property, including both commercial and residential property, from flood events. Benefits include retention of infrastructure so business and domestic activities can continue. Protection of life through	Beneficial	N/A	Beneficial

Return to Contents Page

Table 1: Summary of Effects of Flood Walls and Embankments								
Topic	**Sub-topic**	**Intervention details**		**Duration**	**Potential impact description**	**Potential Effect (without mitigation)**	**Mitigation**	**Residual effect significance (with mitigation)**
		Phase	**Characteristic**					
					protection of housing.			
	Private property (Residential and commercial)	Operation	Instatement of the flood wall	Permanent	Potential permanent landtake, within the boundaries of private property, during construction.	Significant adverse	• Minimisation of permanent and-take, especially within private residential and commercial property boundaries. • Minimise access and time requirements for maintenance.	Adverse
Soil	**Soil erosion / transport / sediment contamination**	Construction / Decommissioning	Establishment of site working areas and accesses, site clearance, associated temporary land take	Temporary	Potential physical impacts during construction include compaction of topsoil and subsoil, which may reduce infiltration of water into the soil and reduced aeration. Direct soil contamination may occur through accidental spillage of fuel, oils from construction vehicles and plant. Soil compaction may also result in increased erosion and increased run-off with the risk of pollution (including nutrients and pesticides) to surface waters. Siltation resulting from erosion/transport can damage riverine ecosystems including fish redds and bi valve beds.	Significant adverse	• Adoption of good practice procedures in relation to careful soil stripping, handling and storage during site clearance, construction and restoration periods. • Limit working periods to periods of suitable weather. • Instate erosion and sediment controls. • Restore disturbed areas.	Adverse
	Soil erosion / soil transport	Operation	Instatement of the flood wall	Permanent	Sediment would not be taken from the banks and instead would be taken from other parts of the river system, thereby retaining bank integrity and allowing natural sedimentation processes to continue in flood events.	Beneficial	N/A	Beneficial
	Sediment Contamination	Operation	Instatement of the flood wall	Permanent	During flood events, if contaminated sediments/sewage are picked up in the higher reaches of the catchment, they will not be deposited on land adjacent to the flood wall.	Beneficial	N/A	Beneficial
Water	**Water quality**	Construction / Decommissioning	Establishment of site working areas and accesses, site clearance	Temporary	Potential effects on surface water and groundwater features during construction include: • Water pollution from silt laden runoff • Chemical spills from oils and other potentially polluting substances • Inappropriate disposal of construction site foul	Significant adverse	• Adherence to construction mitigation guidance, for example ensuring that site impermeability is not increased temporarily during construction. • A utilities survey should be carried out to ascertain the locations of existing services throughout the development area. Subsequent adherence to construction best practice procedures should ensure that construction processes adequately take into account the location of the existing services on site so that these are not unknowingly damaged	Adverse

Return to Contents Page

Table 1: Summary of Effects of Flood Walls and Embankments

Topic	Sub-topic	Intervention details		Duration	Potential impact description	Potential Effect (without mitigation)	Mitigation	Residual effect significance (with mitigation)
		Phase	Characteristic					
					water (from equipment washing etc) • Inappropriate disposal of construction site foul water • Localised impacts on the channel and bed of a watercourse in proximity to the works and • ongoing alterations to ground water flows		and do not lead to localised flooding. • Temporary drainage system using construction SuDS if feasible or other methods to control and treat silt laden run off should be investigated and used. Discharge consents from NIEA should be in place if necessary. • Construction should take place in line with good practice. This would include bunded fuel storage areas and designated refuelling areas. • New flood walls and embankments should be orientated in flow direction as appropriate to protect from scour. • Design and implement method statement for works, to include sediment control and pollution control measures. • Adhere to all relevant PPGs for water quality • Consider ground water implications for e.g. piling	
	Water resources	Operation	WFD protected areas including drinking water, bathing waters and UWWTD Sensitive Areas.	Permanent	Flood water contaminated with sediments and other pollutants can have detrimental effects on all WFD protected areas and the use of flood walls and embankments would not minimise this effect or prevent it from happening	Significant adverse	• Carry out study prior to location of flood walls and embankments to minimise risk of pollutants and other sediments affecting the water course adjacent to the flood wall and embankments.	Adverse
Climatic Factors	**Greenhouse gas emissions**	Construction Operation (maintenance) Decommissioning	Establishment of site working areas and accesses, site clearance	Temporary	Potential increase in carbon emissions from construction of flood wall.	Significant adverse	• Ensure equipment is appropriately maintained to minimise emissions.	Adverse
	Climate change effects	Operation	Instatement of the flood wall	Permanent	The instatement of a flood wall wouldn't prevent extreme weather events from happening, it would minimise its impact around the area of flood risk protection.	N/A	N/A	N/A
Material Assets	**Infrastructure and utilities**	Construction/ Decommissioning	Establishment of site working areas and accesses, site clearance	Temporary	Potential to disrupt electricity cables, local roads and other utilities during construction.	Significant adverse	• Consultation and survey prior to construction to locate all electrical cables and utilities. • Traffic Management Plan to be prepared. • Liaise with utility bodies to share excavation/site works where possible.	Adverse
	Infrastructure and utilities	Operation	Instatement of the flood wall	Permanent	During extreme weather events (resulting in floods), transport links and utilities protected by flood walls and embankments may still be used by consumers. Where utilities are affected by the weather, the removal of flooding would minimise repair times.	Beneficial	N/A	Beneficial

Return to Contents Page

Table 1: Summary of Effects of Flood Walls and Embankments

Topic	Sub-topic	Intervention details		Duration	Potential impact description	Potential Effect (without mitigation)	Mitigation	Residual effect significance (with mitigation)
		Phase	Characteristic					
	Planned infrastructure developments	Operation	Instatement of the flood wall	Permanent	The area and associated infrastructure would receive protection from flooding.	Beneficial	N/A	Beneficial
	Waste	Construction/ Decommissioning	Establishment of site working areas and accesses, site clearance	Temporary	Contaminants within waste from the site (eg. Soil) may have implications for it subsequent disposal or reuse.	Significant adverse	• Design should aim to minimise waste and maximise the re-use of suitable materials on site. • Draw up and adhere to Waste Management Plan, where required. • In order to minimise waste, where required for access routes and working areas, topsoils will be stripped prior to the works and stockpiled on site. At the end of construction it will be replaced and therefore no topsoil will be removed from the site.	Adverse
Cultural Heritage	**Archaeological Sites**	Construction Operation (maintenance) Decommissioning	Existing and proposed protected sites (Listed buildings, Scheduled Ancient Monuments, Conservation Areas, Historic Parks, Gardens and demesnes)	Temporary	Potential direct/indirect adverse impacts that may result from the flood wall relate to disturbance or damage through noise, vibration and disturbance during construction and possible effects on setting.	Significant adverse	• Construction Contract Documents should include general measures to be employed by the Contractor to protect known and unknown features/areas of interest. • Facilitate archaeologists requirements under legislation. • Liaise with Built Heritage through the statutory consultation process	Adverse
	Archaeological Sites	Operation	Existing and proposed protected sites (Listed buildings, Scheduled Ancient Monuments, Conservation Areas, Historic Parks, Gardens and demesnes)	Permanent	Potential beneficial impacts may occur as a result of enhanced protection from flooding.	Beneficial	N/A	Beneficial
Landscape	**Landscape Character**	Construction/ Decommissioning	Landscape Character Areas	Temporary	Construction plants, cranes and operatives will potentially impact the visual amenities of the area. During the construction phase, the visual impacts could include: • Removal of vegetation, particularly trees and bank-side vegetation, mainly along river banks. • Construction traffic – large vehicles moving along roads and throughout the site. • Earth-moving – stripping of topsoil, installation of temporary topsoil stores and permanent embankments.	Significant adverse	• Replacing lost vegetation and landscape planting and seeding design to improve landscape and visual integration. • Grading of topsoil stores to minimise visual intrusion. • Have agreed final landscape plan in place.	Adverse

Return to Contents Page

Table 2: Summary of Effects of Culvert Works

Topic	Sub-topic	Intervention details		Duration	Potential impact description	Potential Effect (without mitigation)	Mitigation	Residual effect significance (with mitigation)
		Phase	Characteristic					
Biodiversity	**Effect on protected sites**	Construction / Decommissioning	Effects on existing and proposed protected sites (SACs, SPAs, SCIs, ASSIs, Ramsar sites, NNRs) (NIEA)	Temporary	Potential disturbance to and loss of habitats, trees and vegetation as a result of the creation of culverts. Access to the site of the works would be required and this is likely to involve the removal of any areas of habitats, trees and vegetation. Potential barrier to fauna and sediment movement	Significant adverse	• Carry out necessary HRA/assent. • Liaise with Natural Heritage through the statutory consultee process • Look for enhancement aspects e.g. for WFD. • Complete EIA process including optioneering. • Minimise footprint of works and disturbance due to access. • Avoid tree loss and vegetation where possible. • Adhere to construction mitigation guidance including Pollution prevention guidance (PPGs) and where appropriate site specific method statements. • Ensure necessary fish and mammal passage is designed in, by using best practice design and construction methods. • Ensure sediment transport regime is maintained.	Adverse
	Effect on protected sites	Operation (maintenance)	Effects on existing and proposed protected sites (SACs, SPAs, SCIs, ASSIs, Ramsar sites, NNRs) (NIEA)	Permanent	Potential disturbance to and loss of vegetation as a result of the creation of culverts. Access to the site of the works would be required and this is likely to involve the removal of any areas of habitats, trees and vegetation.	Significant adverse	• Time maintenance activities to periods when impacts to vegetation can be minimised. • Ensure maintenance maintains fauna and sediment passage	Adverse
	Effect on protected sites	Operation	Effects on existing and proposed protected sites (SACs, SPAs, SCIs, ASSIs, Ramsar sites, NNRs) (NIEA)	Permanent	Ensure site integrity is retained by diverting flood water away from protected sites.	Beneficial	N/A	Beneficial
	Aquatic riparian habitats	Construction/ Decommissioning	River bank/bed disturbance during construction/ decommissioning	Temporary	Loss of aquatic/riparian habitats. Loss of trees (which may contain bat roosts) as a result of culvert creation. Fish (Salmonid and Lamprey) species redds may be removed because of culvert installation. Bivalves (Freshwater pearl mussels) and crustacean (white clawed crayfish) specie habitats would be removed by culvert installation. Disturbance to movement patterns for mammals which use river corridors.	Significant adverse	• Design culverts to facilitate aquatic protected species. Use open based and arched culverts where possible following fisheries/CIRIA guidance documents • To offset the impact of any woodland losses, bat boxes could be erected within remaining areas of riparian woodland. • If in stream works are required, they should be timed to minimise impacts to all aquatic species. • Species translocation may be required in areas where conflicts cannot be resolved. • Culvert design to include mammal ledges and suitable fish passage	Adverse

Return to Contents Page

Table 2: Summary of Effects of Culvert Works

Topic	Sub-topic	Intervention details		Duration	Potential impact description	Potential Effect (without mitigation)	Mitigation	Residual effect significance (with mitigation)
		Phase	Characteristic					
							• Ensure culvert design maintains natural sediment and flow regime.	
	Aquatic habitats	Operation	Culvert in place.	Permanent	Culverts will minimise aquatic habitat creation through sediment deposition where they are in place, however wet channels and dry ledges have been designed, they should ensure that mammals and fish can traverse the culvert length.	Neutral	• Use open bottom and wet channel culverts preferentially to maintain water flow through the culverts. • Dry ledges should be included to ensure mammal passage. • Ensure maintenance maintains natural flow and sediment regime and fauna passage	Neutral
	Effect on protected species	Construction / Decommissioning	Removal of vegetation during construction, construction noise.	Temporary	Potential temporary disturbance to any bat foraging activity. May restrict or prevent the movement of migratory and mobile wildlife species between habitats and within habitat. Construction work may have a range of impacts on breeding birds through direct disturbance to nesting birds and indirect impact by inadvertently encouraging predators to reduction in tree and shrub cover Fish (Salmonid and Lamprey) species would be susceptible to construction related impacts. Potential sources of impact include noise vibration from culvert construction, sediment pollution from run-off or work activities. Noise from machinery and equipment may cause temporary local disturbance effects to birds but would be short term during construction and, phased across the different locations.	Significant adverse	• Construction should follow all Pollution Prevention Guidance (PPGs) and method statements for work should be agreed with NIEA in areas where European and nationally protected species may be encountered. • Vegetation/tree removal would be undertaken outside the bird breeding season where possible to ensure no bird nests with young or eggs are destroyed. • Alternatively, if vegetation removal is required during the bird breeding season, trees and scrub would be checked for the presence of breeding birds/active nests by a qualified and experienced ecologist. • Control of runoff from working areas. • Scheme detailed designed to ensure improved flow regime. • Ensure fauna passage for eg. fish and otters. • Ensure no sediment release from works which may affect habitats and species downstream	Adverse
	Effect on protected species	Operation (maintenance)	Removal of vegetation during maintenance, noise from maintenance equipment	Temporary	Sediment loading resulting from maintenance including culvert clearing.	Adverse	• Time maintenance to not conflict with presence of protected species. • Adherence to PPGs and best practice regarding building materials and working practices around water courses. • Control of runoff from working areas. • Ensure no sediment release from works which may affect habitats and species downstream • Ensure retention of natural flow and sediment regimes	Minor adverse

Table 2: Summary of Effects of Culvert Works

Topic	Sub-topic	Intervention details		Duration	Potential impact description	Potential Effect (without mitigation)	Mitigation	Residual effect significance (with mitigation)
		Phase	Characteristic					
	Terrestrial habitat	Construction / Decommissioning	Removal of vegetation during construction, construction noise.	Temporary	Potential disturbance to and loss of habitat as a result of the creation of culvert. Access to the site would also be required and this is likely to involve the removal of some areas of additional habitats. During decommissioning continued habitat fragmentation or severance may occur. Potential temporary disturbance to any bat foraging activity. Construction work may have a range of impacts on breeding birds through direct disturbance to nesting birds and indirect impact by inadvertently encouraging predators to reduction in tree and shrub cover Noise from machinery and equipment may cause temporary local disturbance effects to birds but would be short term during construction and, phased across the different locations.	Significant adverse	• Minimise footprint of works and disturbance due to access. • Avoid tree loss where possible • New/replacement planting would help to reinstate ground cover and close woodland gaps as far as is practicable and create bat foraging highways. • Time work to avoid conflicts with breeding/wintering birds. • Observer general PPGs regarding construction.	Adverse
	Terrestrial habitat	Construction	Removal of mature trees	Permanent	Removal of trees which may contain bat roosts.	Significant adverse	• Survey of trees pre works. • Removal of bat roosts in trees under licence and use of bat boxes to enhance opportunities for roosting bats.	Adverse
	Terrestrial habitat	Operation(maintenance)	Removal of vegetation during maintenance, noise from maintenance equipment.	Temporary	Waste generation resulting from maintenance including culvert clearing.	Significant adverse	• Control of runoff from working areas. • Minimise footprint of works and disturbance due to access.	Adverse
Population and human health	**Noise**	Construction / Decommissioning	Establishment of site working areas and accesses, site clearance, associated temporary land take. Noise outputs from construction/decommissioning equipment.	Temporary	The construction/decommissioning of culverts have the potential to generate noise and vibration effects which, if not properly controlled, may result in statutory nuisance.	Significant adverse	• All construction works would be carried out in accordance with BS5228, “Noise and Vibration Control on Construction and Open Sites”. BS5228 provides guidance on general mitigation measures. • Contractors working on behalf of DARD Rivers Agency should also comply with Part 7 (Statutory Nuisances) of the Clean Neighbourhoods and Environment Act (Northern Ireland) 2011.	Adverse
	Noise	Operation (maintenance)	Equipment used during maintenance, may produce a noise nuisance.	Temporary	Maintenance equipment has the potential to generate noise and vibration effects which, if not properly controlled, may result in a statutory nuisance.	Significant adverse	• All maintenance works would be carried out in accordance with BS5228, “Noise and Vibration Control on Construction and Open Sites”. BS5228 provides guidance on general mitigation measures. • Contractors working on behalf of DARD Rivers Agency should also	Adverse

Return to Contents Page

Table 2: Summary of Effects of Culvert Works

Topic	Sub-topic	Intervention details		Duration	Potential impact description	Potential Effect (without mitigation)	Mitigation	Residual effect significance (with mitigation)
		Phase	Characteristic					
							comply with Part 7 (Statutory Nuisances) of the Clean Neighbourhoods and Environment Act (Northern Ireland) 2011.	
	Agricultural	Construction / Operation (maintenance) / Decommissioning	Establishment of site working areas and accesses, site clearance, associated temporary land take	Temporary	Potential temporary loss, damage or disturbance of agricultural land. Field drainage may be affected.	Significant adverse	• Timing of works agreed with landowner to minimise disturbance to farm working. • Maintain existing access arrangements to fields. If this is not possible provide alternative access arrangements during the construction period. • Where existing access cannot be maintained, consider access arrangements prior to works on site and construct necessary facilities before undertaking any works that may cause disruption. • Temporary land take during the construction period would be returned to agricultural use on completion of the works.	Adverse
	Agricultural	Operation	Culvert in place protecting land holding	Permanent	Protection of agricultural activity during flood events, including protection of corps and/or animals.	Beneficial	N/A	Beneficial
	Recreation and Tourism Interests	Construction / Operation (maintenance) / Decommissioning	Establishment of site working areas and accesses, site clearance, associated temporary land take	Temporary	Potential temporary land take of recreation and tourism facilities. Public access routes in the locality could be temporarily affected.	Significant adverse	• Minimisation of temporary land-take, especially within public recreational areas. • Minimise time requirements for maintenance. • Provide designated temporary access points where accessibility and severance may pose a temporary problem.	Adverse
	Recreation and Tourism Interests	Operation	Instatement of culvert	Permanent	Benefiting the local population by reducing flood risk and its impacts for communities, businesses and tourism.	Beneficial	N/A	Beneficial
	Private property (Residential and commercial)	Construction / decommissioning	Establishment of site working areas and accesses, site clearance, associated temporary land take	Temporary	Potential temporary landtake, within the boundaries of private and commercial properties, during construction/decommissioning. Construction/decommissioning impact regarding site access for the duration of the works.	Significant adverse	• Minimisation of temporary land-take, especially within private residential and commercial property boundaries. • Agree access arrangements with stakeholders (landlords, tenants, business/domestic premises user/owners). • Restoration of all disturbed areas, including private gardens, commercial property, and implement landscaping where appropriate	Adverse

Return to Contents Page

Table 2: Summary of Effects of Culvert Works

Topic	Sub-topic	Intervention details		Duration	Potential impact description	Potential Effect (without mitigation)	Mitigation	Residual effect significance (with mitigation)
		Phase	Characteristic					
	Private property (Residential and commercial)	Operation	Instatement of the culvert	Permanent	Beneficial impact in relation to the protection of private property, including both commercial and residential property, from flood events. Benefits include retention of infrastructure so business and domestic activities can continue. Protection of life through protection of housing.	Beneficial	N/A	Beneficial
Soil	**Soil erosion / transport / sediment contamination**	Construction / Decommissioning	Establishment of site working areas and accesses, site clearance, associated temporary land take	Temporary	Potential physical impacts during construction/decommissioning include compaction of topsoil and subsoil, which may reduce infiltration of water into the soil and reduced aeration. Direct soil contamination may occur through accidental spillage of fuel, oils from construction vehicles and plant. Soil compaction may also result in increased erosion and increased run-off with the risk of pollution (including nutrients and pesticides) to surface waters. Siltation resulting from erosion/transport can damage riverine ecosystems including fish redds and bi valve beds.	Significant adverse	• Adoption of good practice procedures in relation to careful soil stripping, handling and storage during site clearance, construction and restoration periods. • Limit working periods to periods of suitable weather. • Instate erosion and sediment controls. • Restore disturbed areas. • Draw up and implement method statement including sediment control measures. • Ensure no invasive species moved into or out from site during any soil movement.	Adverse
	Soil erosion / soil transport	Operation	Instatement of culvert	Permanent	Sediment within a flooded system would stay within the system instead of being deposited on adjacent land.	Beneficial	N/A	Beneficial
Water	**Water quality**	Construction / Decommissioning	Establishment of site working areas and accesses, site clearance	Temporary	Potential effects on surface water and groundwater features during construction include: • Water pollution from silt laden runoff • Chemical spills from oils and other potentially polluting substances • Inappropriate disposal of construction site foul water (from equipment washing etc) • Inappropriate disposal of construction site foul water • Localised impacts on the channel and bed of a watercourse in proximity to the works and • ongoing alterations to ground water flows	Significant adverse	• Adherence to construction mitigation guidance, for example ensuring that site impermeability is not increased temporarily during construction. • A utilities survey should be carried out to ascertain the locations of existing services throughout the development area. Subsequent adherence to construction best practice procedures should ensure that construction processes adequately take into account the location of the existing services on site so that these are not unknowingly damaged and do not lead to localised flooding. • Temporary drainage system using construction SuDS if feasible or other methods to control and treat silt laden run off should be investigated and used. Discharge consents from NIEA should be in place if necessary.	Adverse

Return to Contents Page

Table 2: Summary of Effects of Culvert Works

Topic	Sub-topic	Intervention details		Duration	Potential impact description	Potential Effect (without mitigation)	Mitigation	Residual effect significance (with mitigation)
		Phase	Characteristic					
							• Construction should take place in line with good practice. This would include bunded fuel storage areas and designated refuelling areas. • New flood walls and embankments should be orientated in flow direction as appropriate to protect from scour. • Design and implement method statement for works, to include sediment control and pollution control measures. • Adhere to all relevant PPGs for water quality	
	Water resources	Operation	WFD protected areas including drinking water, bathing waters and UWWTD Sensitive Areas.	Permanent	Flood water contaminated with sediments and other pollutants can have detrimental effects on all WFD protected areas and the use of culverts would not minimise this effect or prevent it from happening	Significant adverse	• Carry out study prior to location of culverts to minimise risk of pollutants and other sediments affecting the water course restricted by culverts.	Adverse
Climatic Factors	**Greenhouse gas emissions**	Construction Operation (maintenance) Decommissioning	Establishment of site working areas and accesses, site clearance	Temporary	Potential increase in carbon emissions from construction of culverts.	Significant adverse	• Ensure equipment is appropriately maintained to minimise emissions.	Adverse
	Climate change effects	Operation	Instatement of culverts	Permanent	The instatement of a culvert wouldn't prevent extreme weather events from happening, it would minimise its impact around the area of flood risk protection.	N/A	N/A	**N/A**
Material Assets	**Infrastructure and utilities**	Construction/ Decommissioning	Establishment of site working areas and accesses, site clearance	Temporary	Potential to disrupt electricity cables, local roads and other utilities during construction.	Significant adverse	• Consultation and survey prior to construction to locate all electrical cables and utilities. • Traffic Management Plan to be prepared. • Liaise with utility bodies to share excavation/site works where possible.	Adverse
	Infrastructure and utilities	Operation	Instatement of culvert	Permanent	During extreme weather events (resulting in floods), transport links and utilities which have water flowing through culverts surrounding them minimising the impact of flooding.	Beneficial	N/A	Beneficial
	Waste	Construction/ Decommissioning	Establishment of site working areas and accesses, site clearance	Temporary	Contaminants within waste from the site (eg. Soil) may have implications for it subsequent disposal or reuse.	Significant adverse	• Design should aim to minimise waste and maximise the re-use of suitable materials on site. • In order to minimise waste, where required for access routes and working areas, topsoils will be stripped prior to the works and stockpiled on site. At the end of construction it will be replaced and therefore no topsoil will be removed from the site. • Draw up and adhere to Waste Management Plan, where required.	Adverse

Return to Contents Page

Table 2: Summary of Effects of Culvert Works

Topic	Sub-topic	Intervention details		Duration	Potential impact description	Potential Effect (without mitigation)	Mitigation	Residual effect significance (with mitigation)
		Phase	Characteristic					
Cultural Heritage	**Archaeological Sites**	Construction Operation (maintenance) Decommissioning	Existing and proposed protected sites (Listed buildings, Scheduled Ancient Monuments, Conservation Areas, Historic Parks, Gardens and demesnes)	Temporary	Potential direct/indirect adverse impacts that may result from the culvert relate to disturbance or damage through noise, vibration and disturbance during construction and possible effects on setting.	Significant adverse	• Construction Contract Documents would include general measures to be employed by the Contractor to protect known and unknown features/areas of interest • Facilitate archaeologists' requirements under legislation. • Liaise with Built Heritage through the statutory consultation process	Adverse
	Archaeological Sites	Operation	Existing and proposed protected sites (Listed buildings, Scheduled Ancient Monuments, Conservation Areas, Historic Parks, Gardens and demesnes)	Permanent	Potential beneficial impacts may occur as a result of enhanced protection from flooding.	Beneficial	N/A	Beneficial
Landscape	**Landscape Character**	Construction/ Decommissioning	Landscape Character Areas	Temporary	During the construction phase, the visual impacts could include: • Removal of vegetation, particularly trees and bank-side vegetation, mainly along river banks. • Construction traffic – large vehicles moving along roads and throughout the site. • Earth-moving – stripping of topsoil, installation of temporary topsoil stores and permanent embankments.	Significant adverse	• Replacing lost vegetation and landscape planting and seeding design to improve landscape and visual integration. • Grading of topsoil stores to minimise visual intrusion. • Landscaping in the area of the culvert to improve landscape integration.	Adverse

Table 3: Summary of Effects of Enhanced Maintenance of Existing Drainage and Flood Defence Networks								
Topic	**Description of effect**	**Intervention details**		**Duration**	**Potential impact description**	**Potential Effect (without mitigation)**	**Mitigation**	**Residual effect significance (with mitigation)**
		Phase	**Characteristic**					
Biodiversity	**Effect on protected sites**	Operation (maintenance)	Existing and proposed protected sites (SACs, SPAs, SCIs, ASSIs, Ramsar sites, NNRs) (NIEA)	Temporary	Potential disturbance to habitats, trees and vegetation as a result of maintenance and access to the site.	Significant adverse	• Carry out necessary HRA/assent. • Liaise with Natural Heritage through the statutory consultee process • Look for enhancement aspects eg. for WFD. • Minimise footprint of works and disturbance due to access. • Avoid tree loss and vegetation where possible. • Adhere to construction mitigation guidance including Pollution prevention guidance (PPGs) and where appropriate site specific method statements. • Adhere to in house guidance on sediment control measures for maintenance works.	Adverse
	Effect on protected species	Operation (maintenance)	Disturbance during maintenance	Temporary	Potential disturbance to habitats. Noise from machinery and equipment for maintenance may cause temporary local disturbance effects to birds but would be short term. Potentially more disruptive operations include any particularly noisy activities. This would be a short term impact and, with the implementation of appropriate techniques to reduce noise and vibration, no significant impact is anticipated.	Significant adverse		Adverse

Return to Contents Page

Table 3: Summary of Effects of Enhanced Maintenance of Existing Drainage and Flood Defence Networks

Topic	Description of effect	Intervention details		Duration	Potential impact description	Potential Effect (without mitigation)	Mitigation	Residual effect significance (with mitigation)
		Phase	Characteristic					
	Aquatic habitat	Operation (maintenance)	River bed disturbance during maintenance	Temporary	Potential disturbance to habitats.	Significant adverse	• Ensure necessary fish and mammal passage is designed in. • Ensure sediment transport regime is maintained. • Timing of works to minimise conflicts with protected and/or aquatic species which may be on the site. • Look for opportunities to design enhancement measures into maintenance works. • Manage all works to minimise impact on the environment through timing of works, sediment control, work methodology and habitat retention. Follow RA TGN16 (good practice guidance) • Ensure no spread of invasive species	Adverse
	Riparian habitat	Operation (maintenance)	River bank disturbance during maintenance	Temporary	Potential disturbance to habitats.	Significant adverse		Adverse
	Terrestrial habitat	Operation (maintenance)	Removal of vegetation during construction, construction noise	Temporary	Access to the site would be required and this is likely to result in disturbances to habitats.	Significant adverse		Adverse
Population and human health	**Noise**	Operation (maintenance)	Establishment of site working areas and accesses	Temporary	The maintenance of the works has the potential to generate noise and vibration effects which, if not properly controlled, may result in nuisance to any sensitive receptors n the vicinity.	Significant adverse	• All works would be carried out in accordance with BS5228, “Noise and Vibration Control on Construction and Open Sites”. BS5228 provides guidance on general mitigation measures	Adverse
	Agricultural	Operation (maintenance)	Establishment of site working areas and accesses	Temporary	Potential disturbance of agricultural land.	Significant adverse	• Maintain existing access arrangements to fields. • Consider access arrangements prior to works on site and construct necessary facilities before undertaking any works that may cause disruption. • Ensure spoil disposal is correctly carried out. • Ensure no spread of invasive species	Adverse
	Recreation and Tourism Interests	Operation (maintenance)	Establishment of site working areas and accesses	Temporary	Public access routes in the locality could be temporarily affected.	Significant adverse	• Provide designated temporary access points where accessibility and severance may pose a temporary problem. • Minimise timescale of disturbance	Adverse
	Private property (Residential and commercial)	Operation (maintenance)	Establishment of site working areas and accesses	Temporary	Disruption to existing land access arrangements.	Significant adverse	• Consider access arrangements prior to works on site and construct necessary facilities before undertaking any works that may cause disruption. • Provide designated temporary access points where accessibility and severance may pose a temporary problem.	Adverse
Soil	**Soil erosion**	Operation (maintenance)	Establishment of site working areas and accesses	Temporary	Potential physical impacts during maintenance include compaction of topsoil and subsoil	Significant adverse	• Adoption of good practice procedures in relation to careful soil stripping, handling and storage. • Retain marginal vegetation in channels to maximise erosion protection	Adverse

Return to Contents Page

Table 3: Summary of Effects of Enhanced Maintenance of Existing Drainage and Flood Defence Networks								
Topic	**Description of effect**	**Intervention details**		**Duration**	**Potential impact description**	**Potential Effect (without mitigation)**	**Mitigation**	**Residual effect significance (with mitigation)**
		Phase	**Characteristic**					
	Sediment Transport	Operation (maintenance)	Establishment of site working areas and accesses	Temporary	Sediment transport can cause negative effects through siltation.	Significant adverse	• Adoption of good practice procedures in relation to careful soil stripping, handling and storage. • Utilise good practice guidelines to minimise sediment release during works (RA TGN16)	Adverse
	Sediment Contamination	Operation (maintenance)	Establishment of site working areas and accesses	Temporary	Direct soil contamination may occur through accidental spillage of fuel, oils from construction vehicles and plant.	Significant adverse	• Limiting the extent and location of the working areas and storage areas. • Implementation of erosion and sediment controls. • Restoration of disturbed areas.	Adverse
Water	**Water quality**	Operation (maintenance)	Establishment of site working areas and accesses, site clearance	Temporary	Releasing pollutants into watercourse may diminish water quality.	Significant adverse	• Scheduling activities so that the area and duration of soil exposure are minimised. • Utilise good practice guidelines to minimise sediment release during works (RA TGN16)	Adverse
	Water resources	Operation (maintenance)	Establishment of site working areas and accesses, site clearance	Temporary	Potential impact on groundwater both during operation.	Significant adverse	• The adoption of appropriate pollution control procedures, in accordance with guidance, to reduce the risk of sediment laden surface water run-off entering watercourses and groundwater.	Adverse
Climatic Factors	**Greenhouse gas emissions**	Operation (maintenance)	Establishment of site working areas and accesses, site clearance	Temporary	Potential increase in carbon emissions from transport to and from site.	Significant adverse	• Minimise journeys • Ensure that all plant is correctly maintained to minimise emissions	Adverse
Material Assets	**Infrastructure and utilities**	Operation (maintenance)	Establishment of site working areas and accesses, site clearance	Temporary	Potential to disrupt electricity cables, local roads and other utilities.	Significant adverse	• Consultation prior to construction to locate all electrical cables and utilities.	Adverse
	Waste	Operation (maintenance)	Establishment of site working areas and accesses, site clearance	Temporary	Potential for contaminated sites.	Significant adverse	• In order to minimise waste, where required for access routes and working areas, top soils will be stripped prior to the works and stockpiled on site. At the end of construction it will be replaced and therefore no topsoil will be removed from the site. • Disposal of spoil to agreed standards (RA TGN16) • Disposal of waste material under Duty of Care and to licensed sites	Adverse
Cultural Heritage	**Archaeological Sites**	Operation (maintenance)	Existing and proposed protected sites (Listed buildings, Scheduled Ancient Monuments, Conservation Areas, Historic Parks, Gardens and demesnes)	Temporary	Potential direct/indirect adverse impacts through noise, vibration and disturbance during maintenance works and possible effects on setting.	Significant adverse	• Maintenance Contract Documents would include general measures to be employed by the Contractor to protect known and unknown features/areas of interest. • Adherence to general measures to protect known and unknown	Adverse

Return to Contents Page

Table 3: Summary of Effects of Enhanced Maintenance of Existing Drainage and Flood Defence Networks								
Topic	**Description of effect**	**Intervention details**		**Duration**	**Potential impact description**	**Potential Effect (without mitigation)**	**Mitigation**	**Residual effect significance (with mitigation)**
		Phase	**Characteristic**					
							features/areas of interest. • Facilitation of archaeologists as required. • Liaison with Built Heritage through the statutory consultation procedure.	
Landscape	**Landscape Character**	Operation (maintenance)	Landscape Character Areas	Temporary	Operatives will potentially impact the visual amenities of the area.	Significant adverse	• Replacing lost vegetation and landscape planting and seeding design to improve landscape and visual integration.	Adverse

Table 4: Summary of Effects of Surface Water Management –SuDS

Topic	Description of effect	Intervention details		Duration	Potential impact description	Potential Effect (without mitigation)	Mitigation	Residual effect significance (with mitigation)
		Phase	Characteristic					
Biodiversity	**Effect on protected sites**	Construction Operation(maintenance) Decommissioning	Existing and proposed protected sites (SACs, SPAs, SCIs, ASSIs, Ramsar sites, NNRs) (NIEA)	Temporary	Potential disturbance during construction to habitats, trees and vegetation as a result of the creation of SuDS.	Significant adverse	• Minimise footprint of works and disturbance due to access. • Develop under agreement with NIEA and other stakeholders	Adverse
	Effect on protected sites	Operation	Existing and proposed protected sites (SACs, SPAs, SCIs, ASSIs, Ramsar sites, NNRs) (NIEA)	Permanent	Potential for habitat enhancement	Beneficial	N/A	Beneficial
	Effect on protected species	Construction Operation (maintenance)	Removal of vegetation during construction, construction noise	Temporary	Potential disturbance during construction to habitats, trees and vegetation and species as a result of the creation of SuDs Encourage habitat enhancement for protected species	Significant adverse	• Minimise footprint of works and disturbance due to access. • Avoid tree loss where possible • Do not disturb any areas of existing habitats • The wildlife existing habitats should be surveyed by an experienced ecologist during the early planning stages. • Develop under agreement with NIEA	Adverse
	Aquatic habitats	Construction Operation (maintenance)	River bank disturbance during construction	Temporary	Potential disturbance during construction to habitats, trees and vegetation and species as a result of the creation of SuDs Encourage habitat enhancement for protected species	Significant adverse	• Minimise footprint of works and disturbance due to access. Avoid tree loss where possible • Do not disturb any areas of existing habitats • The wildlife existing habitats should be surveyed by an experienced ecologist during the early planning stages. • Survey the hydrology of the area to ensure natural water flow, above and below the ground, will not be effected either by changes in water quantity or quality. • Ensure adequate protection for existing aquatic habitats from flooding events. • Develop under agreement with NIEA and Fisheries agencies.	Adverse
	Terrestrial habitat	Construction Operation (maintenance)	Removal of vegetation during construction, construction noise	Temporary	Potential disturbance during construction to habitats, trees and vegetation and species as a result of the creation of SuDs Encourage habitat enhancement for protected species	Mixed	• Minimise footprint of works and disturbance due to access. Avoid tree loss where possible • Do not disturb any areas of existing habitats • The wildlife existing habitats should be surveyed by an experienced ecologist during the early planning stages.	Mixed
Population and human health	**Noise**	Construction Operation (maintenance)	Establishment of site working areas and accesses, site clearance, associated temporary land take and the visual appearance, dust and nuisance associated with	Temporary	The construction of the SuDs has the potential to generate some noise and vibration effects	Significant adverse	• All construction works would be carried out in accordance with BS5228, “Noise and Vibration Control on Construction and Open Sites”. BS5228 provides guidance on general mitigation	Adverse

Return to Contents Page

Table 4: Summary of Effects of Surface Water Management –SuDS								
Topic	**Description of effect**	**Intervention details**		**Duration**	**Potential impact description**	**Potential Effect (without mitigation)**	**Mitigation**	**Residual effect significance (with mitigation)**
		Phase	**Characteristic**					
			construction				measures	
	Agricultural	Construction Operation (maintenance)	Establishment of site working areas and accesses, site clearance, associated temporary land take	Temporary	Potential loss or disturbance of agricultural land. Potential severance and viability issues and access to the fields could be affected.	Significant adverse	• Maintain existing access arrangements to fields. If this is not possible provide alternative access arrangements during the construction period. • Consider access arrangements prior to works on site and construct necessary facilities before undertaking any works that may cause disruption. • Temporary land take during the construction period would be returned to agricultural use on completion of the works.	Adverse
	Recreation and Tourism Interests	Construction Operation (maintenance)	Establishment of site working areas and accesses, site clearance, associated temporary land take	Temporary	Benefiting the local population by reducing flood risk and its impacts for communities, businesses and tourism and creating attractive areas for social and recreational activities Public access routes in the locality could be temporarily affected during construction, however, a staged approach to construction would ensure that such routes are passable for the majority of the construction period.	Significant adverse	• Provide designated temporary access points where accessibility and severance may pose a temporary problem.	Adverse
	Private property (Residential and commercial)	Construction Operation (maintenance)	Establishment of site working areas and accesses, site clearance, associated temporary land take	Temporary	Beneficial impact in relation to the protection of private property, including both commercial and residential property, from flood events. Disruption to existing land access arrangements. Potential permanent and temporary landtake, within the boundaries of private property, during construction.	Significant adverse	• Minimisation of land-take (permanent and temporary) where possible, especially within private residential and commercial property boundaries. • Maintain existing access arrangements to property, as well as movement along public access routes. If this is not possible provide alternative access arrangements during the construction period and limit closures to off-peak periods. • Consider access arrangements prior to works on site and construct necessary facilities before undertaking any works that may cause disruption. • Provide designated temporary access points where accessibility and severance may pose a temporary problem. • Restoration of all disturbed areas, including private gardens, commercial property, and implement landscaping	Adverse

Table 4: Summary of Effects of Surface Water Management –SuDS								
Topic	**Description of effect**	**Intervention details**		**Duration**	**Potential impact description**	**Potential Effect (without mitigation)**	**Mitigation**	**Residual effect significance (with mitigation)**
		Phase	**Characteristic**					
							where appropriate	
Soil	**Soil erosion**	Construction Operation (maintenance)	Establishment of site working areas and accesses, site clearance, associated temporary land take	Temporary	Potential physical impacts during construction include compaction of topsoil and subsoil, which may result in poor plant growth, due to the restriction of plant roots, reduced infiltration of water into the soil and reduced aeration. SuDs may reduce peak flows and reduce the potential for erosion from direct runoff	Significant adverse	• Adoption of good practice procedures in relation to careful soil stripping, handling and storage during site clearance, construction and restoration periods.	Adverse
	Sediment Transport	Construction Operation (maintenance)	Establishment of site working areas and accesses, site clearance, associated temporary land take	Temporary	SuDs reducing the likelihood of floods arising and preventing the spread of pollutants.	Beneficial	N/A	Beneficial
	Sediment Contamination	Construction Operation (maintenance)	Establishment of site working areas and accesses, site clearance, associated temporary land take	Temporary	Direct soil contamination may occur through accidental spillage of fuel, oils from construction vehicles and plant. This may result in detrimental effects on plant-life and this would be of particular concern in respect of soils within residential property gardens, and agricultural soils.	Significant adverse	• Limiting the extent and location of the working areas and storage areas. • Implementation of erosion and sediment controls. • Re-use of excavated materials, where possible, in earth embankments and landscaping. • Restoration of disturbed areas.	Adverse
Water	**Water quality**	Construction Operation (maintenance)	Establishment of site working areas and accesses, site clearance	Temporary	Reducing the impact of diffuse pollution caused by human activities Potential effects during construction comprise: • direct changes in surface flow due to interception or diversion of existing groundwater and other drainage pathways; and • direct effects due to the placement of structures adjacent to/in the watercourse, with potential effects on existing flow regimes.	Significant adverse	• Scheduling construction activities so that the area and duration of soil exposure are minimised • where possible, undertaking construction in phases, so that sections are • restored before progressing to the next section/phase; • reducing the movement of construction plant and equipment on site; • locating stockpiled material away from existing watercourses; and • the containment of run-off prior to treatment and discharge/disposal.	Adverse
	Water resources	Construction Operation (maintenance)	Establishment of site working areas and accesses, site clearance	Temporary	Potential impact on groundwater both during construction and operation.	Significant adverse	• Carry out study and consultation with NIEA prior to design of scheme. • The adoption of appropriate pollution control procedures, in accordance with guidance, to reduce the risk of sediment laden surface water run-off entering watercourses and groundwater.	Adverse

Table 4: Summary of Effects of Surface Water Management –SuDS

Topic	Description of effect	Intervention details		Duration	Potential impact description	Potential Effect (without mitigation)	Mitigation	Residual effect significance (with mitigation)
		Phase	Characteristic					
Climatic Factors	**Greenhouse gas emissions**	Construction Operation (maintenance)	Establishment of site working areas and accesses, site clearance	Temporary	Managing and mitigating the future effects of climate change with regard to flooding including infrastructure	Significant adverse	• Ensure all plant is correctly maintained and utilised.	Adverse
Material Assets	**Infrastructure and utilities**	Construction Operation (maintenance)	Establishment of site working areas and accesses, site clearance	Temporary	Potential to disrupt electricity cables, local roads and other utilities.	Significant adverse	• Consultation prior to construction to locate all electrical cables and utilities. • Traffic Management Plan to be prepared.	Adverse
	Planned infrastructure developments	Construction Operation (maintenance)	Establishment of site working areas and accesses, site clearance	Permanent	Potential for land to be identified in the Local Area Plans for development e.g. housing, commercial, open space etc. Potential temporary and permanent land take of developments. The area would receive protection from flooding and therefore would benefit in this respect.	Significant adverse	• Minimisation of land-take (permanent and temporary) where possible.	Adverse
	Waste	Construction Operation (maintenance)	Establishment of site working areas and accesses, site clearance	Temporary	Potential for contaminated sites. Contaminants may have implications for the disposal or re-use of waste soil and mud on site.	Significant adverse	• Design should aim to minimise waste and maximise the re-use of suitable materials on site. • In order to minimise waste, where required for access routes and working areas, topsoils will be stripped prior to the works and stockpiled on site. At the end of construction it will be replaced and therefore no topsoil will be removed from the site. • Produce and implement Waste Management Plan as required.	Adverse
Cultural Heritage	**Archaeological Sites**	Construction Operation (maintenance)	Existing and proposed protected sites (Listed buildings, Scheduled Ancient Monuments, Conservation Areas, Historic Parks, Gardens and demesnes)	Temmporary	Potential beneficial impacts may occur as a result of enhanced protection from flooding. Potential direct/indirect adverse impacts that may result from the SuDS relate to disturbance or damage through noise, vibration and disturbance during construction.	Mixed	• Construction Contract Documents would include general measures to be employed by the Contractor to protect known and unknown features/areas of interest. Carry out consultation with Built Heritage as statutory consultee early in the feasibility stage.	Mixed
Landscape	**Landscape Character**	Construction Operation (maintenance)	Landscape Character Areas	Temporary	SuDs can create attractive, well designed public open space but construction can cause impacts to local receptors. Potential disturbance during construction to landscape and visual amenity adjacent to domestic developments as a result of the creation of SuDs	Mixed	• Replacing lost vegetation and landscape planting and seeding design to improve landscape and visual integration. • Produce agreed final landscape plan.	Mixed

Return to Contents Page

Table 5 : Summary of Effects of Development outside Flood Risk Areas								
Topic	**Description of effect**	**Intervention details**		**Duration**	**Potential impact description**	**Potential Effect (without mitigation)**	**Mitigation**	**Residual effect significance (with mitigation)**
		Phase	**Characteristic**					
Biodiversity	**Effect on protected sites**	Pre-planning/statutory planning stages	Informing the development planning process to ensure, where possible, that new zonings and new planning applications within local development plans are located outside flood risk areas	Temporary	N/A	N/A	N/A	N/A
	Effect on protected species	Pre-planning/statutory planning stages	Informing the development planning process to ensure, where possible, that new zonings and new planning applications within local development plans are located outside flood risk areas	N/A	N/A	N/A	N/A	N/A
	Aquatic habitats	Pre-planning/statutory planning stages	Informing the development planning process to ensure, where possible, that new zonings and new planning applications within local development plans are located outside flood risk areas	Temporary	Potential for flooding in aquatic habitats	Significant adverse	• Compliance with PPS 15 to ensure the conservation and enhancement of the natural environment and biodiversity.	Adverse
	Terrestrial habitat	Pre-planning/statutory planning stages	Informing the development planning process to ensure, where possible, that new zonings and new planning applications within local development plans are located outside flood risk areas	Temporary	Potential for flooding in terrestrial habitats	Significant adverse	• Compliance with PPS 15 to ensure the conservation and enhancement of the natural environment and biodiversity.	Adverse
Population and human health	**Noise**	Pre-planning/statutory planning stages	Informing the development planning process to ensure, where possible, that new zonings and new planning applications within local development plans are located outside flood risk areas	Temporary	N/A	N/A	N/A	N/A

Table 5 : Summary of Effects of Development outside Flood Risk Areas								
Topic	**Description of effect**	**Intervention details**		**Duration**	**Potential impact description**	**Potential Effect (without mitigation)**	**Mitigation**	**Residual effect significance (with mitigation)**
		Phase	**Characteristic**					
	Agricultural	Pre-planning/statutory planning stages	Informing the development planning process to ensure, where possible, that new zonings and new planning applications within local development plans are located outside flood risk areas	Temporary	Potential loss, damage or disturbance of agricultural land.	Significant adverse	• Compliance with PPS 15 to promote an integrated and sustainable approach, both locally and at catchment scale, to the management of development and flood risk to protect natural environment .	Adverse
	Recreation and Tourism Interests	Pre-planning/statutory planning stages	Informing the development planning process to ensure, where possible, that new zonings and new planning applications within local development plans are located outside flood risk areas	Temporary	Potential loss, damage or disturbance to recreation areas	Significant adverse	• Compliance with PPS 15 to promote an integrated and sustainable approach, both locally and at catchment scale, to the management of development and flood risk which contributes to the prudent and efficient use of economic resources	Adverse
	Private property (Residential and commercial)	Pre-planning/statutory planning stages	Informing the development planning process to ensure, where possible, that new zonings and new planning applications within local development plans are located outside flood risk areas	Temporary	Potential loss, damage or disturbance to private property	Significant adverse	• Compliance with PPS 15 to promote an integrated and sustainable approach, both locally and at catchment scale, to the management of development and flood risk which contributes to the prudent and efficient use of economic resources and seek to protect development that is permitted within flood risk areas by ensuring that adequate and appropriate measures are employed to mitigate and manage the flood risks to the development and elsewhere.	Adverse
Soil	**Soil erosion**	Pre-planning/statutory planning stages	Informing the development planning process to ensure, where possible, that new zonings and new planning applications within local development plans are located outside flood risk areas	Temporary	N/A	N/A	N/A	N/A
	Sediment Transport	Pre-planning/statutory planning stages	Informing the development planning process to ensure, where possible, that new zonings and new planning	Temporary	N/A	N/A	N/A	N/A

Table 5 : Summary of Effects of Development outside Flood Risk Areas								
Topic	**Description of effect**	**Intervention details**		**Duration**	**Potential impact description**	**Potential Effect (without mitigation)**	**Mitigation**	**Residual effect significance (with mitigation)**
		Phase	**Characteristic**					
			applications within local development plans are located outside flood risk areas					
	Sediment Contamination	Pre-planning/statutory planning stages	Informing the development planning process to ensure, where possible, that new zonings and new planning applications within local development plans are located outside flood risk areas	Temporary	N/A	N/A	N/A	N/A
Water	**Water quality**	Pre-planning/statutory planning stages	Informing the development planning process to ensure, where possible, that new zonings and new planning applications within local development plans are located outside flood risk areas	Temporary	Potential damage or disturbance to water quality	Significant adverse	• Compliance with PPS 15 to support the retention and restoration of natural flood plains and natural watercourses as a form of flood alleviation and an important environmental and social resource, and ensure that this is recognised in the decision making process	Adverse
	Water resources	Pre-planning/statutory planning stages	Informing the development planning process to ensure, where possible, that new zonings and new planning applications within local development plans are located outside flood risk areas	Temporary	Potential damage or disturbance to water resources	Significant adverse	• Compliance with PPS 15 to support the retention and restoration of natural flood plains and natural watercourses as a form of flood alleviation and an important environmental and social resource, and ensure that this is recognised in the decision making process	Adverse
Climatic Factors	**Greenhouse gas emissions**	Pre-planning/statutory planning stages	Informing the development planning process to ensure, where possible, that new zonings and new planning applications within local development plans are located outside flood risk areas	Temporary	N/A	N/A	N/A	N/A
Material Assets	**Infrastructure and utilities**	Pre-planning/statutory planning stages	Informing the development planning process to ensure, where possible, that new zonings and new planning applications within local development plans are	Temporary	Potential to disrupt electricity cables, local roads and other utilities.	Significant adverse	• Compliance with PPS 15 to promote an integrated and sustainable approach, both locally and at catchment scale, to the management of development and flood risk which contributes to the prudent and efficient use of economic resources and seek	Adverse

Table 5 : Summary of Effects of Development outside Flood Risk Areas								
Topic	**Description of effect**	**Intervention details**		**Duration**	**Potential impact description**	**Potential Effect (without mitigation)**	**Mitigation**	**Residual effect significance (with mitigation)**
		Phase	**Characteristic**					
			located outside flood risk areas				to protect development that is permitted within flood risk areas by ensuring that adequate and appropriate measures are employed to mitigate and manage the flood risks to the development and elsewhere.	
	Planned infrastructure development	Pre- planning /statutory planning stages	Informing the development planning process to ensure, where possible, that new zonings and new planning applications within local development plans are located outside flood risk areas	Temporary	Potential for development land to be disturbed and or damaged	Significant adverse	• Compliance with PPS 15 to promote an integrated and sustainable approach, both locally and at catchment scale, to the management of development and flood risk which contributes to the prudent and efficient use of economic resources and seek to protect development that is permitted within flood risk areas by ensuring that adequate and appropriate measures are employed to mitigate and manage the flood risks to the development and elsewhere.	Adverse
	Waste	Pre- planning/ statutory planning stages	Informing the development planning process to ensure, where possible, that new zonings and new planning applications within local development plans are located outside flood risk areas	Temporary	N/A	N/A	N/A	N/A
Cultural Heritage	**Archaeological Sites**	Pre- planning/ statutory planning stages	Informing the development planning process to ensure, where possible, that new zonings and new planning applications within local development plans are located outside flood risk areas	Temporary	Potential direct/indirect impacts include disturbance or damage.	Significant adverse	• Compliance with PPS 15 to promote an integrated and sustainable approach, both locally and at catchment scale, to the management of development and flood risk which contributes to the conservation of archaeology and the built heritage	Adverse
Landscape	**Landscape Character**	Pre- planning /statutory planning stages	Informing the development planning process to ensure, where possible, that new zonings and new planning applications within local development plans are located outside flood risk areas	Temporary	Potential direct/indirect impacts include disturbance or damage.	Significant adverse	• Compliance with PPS 15 to promote an integrated and sustainable approach, both locally and at catchment scale, to the management of development and flood risk which contributes to the conservation of natural environment.	Adverse

Table 6: Summary of Effects of Self Help (community resilience)								
Topic	**Description of effect**	**Intervention details**		**Duration**	**Potential impact description**	**Potential Effect (without mitigation)**	**Mitigation**	**Residual effect significance (with mitigation)**
		Phase	**Characteristic**					
Biodiversity	**Effect on protected sites**	Pre-deployment	Notification of early warning, placing of sandbags, the assembly of demountable flood guards and assisting in evacuation procedures.	Permanent	N/A	N/A	N/A	N/A
	Effect on protected species	Pre-deployment	Notification of early warning, placing of sandbags, the assembly of demountable flood guards and assisting in evacuation procedures.	Permanent	N/A	N/A	N/A	N/A
	Aquatic habitats	Pre-deployment	Notification of early warning, placing of sandbags, the assembly of demountable flood guards and assisting in evacuation procedures.	Permanent	N/A	N/A	N/A	N/A
	Terrestrial habitat	Pre-deployment	Notification of early warning, placing of sandbags, the assembly of demountable flood guards and assisting in evacuation procedures.	Permanent	N/A	N/A	N/A	N/A
Population and human health	**Noise**	Pre-deployment	Notification of early warning, placing of sandbags, the assembly of demountable flood guards and assisting in evacuation procedures.	Permanent	N/A	N/A	N/A	N/A
	Agricultural	Pre-deployment	Notification of early warning, placing of sandbags, the assembly of demountable flood guards and assisting in evacuation procedures.	Permanent	Farmers can implement measures to protect their assets from flood damage. Promote the role of the Flood Community Liaison Officer whereby the dissemination of information on self help and making property more flood resilient is made readily available to local communities at flood risk	Beneficial	N/A	Beneficial
	Recreation and Tourism Interests	Pre-deployment	Notification of early warning, placing of sandbags, the assembly of demountable flood guards and assisting in	Permanent	This measure should help people plan and prepare for flooding events which in turn should reduce the impacts on recreation and tourism.	Beneficial	N/A	Beneficial

Table 6: Summary of Effects of Self Help (community resilience)								
Topic	**Description of effect**	**Intervention details**		**Duration**	**Potential impact description**	**Potential Effect (without mitigation)**	**Mitigation**	**Residual effect significance (with mitigation)**
		Phase	**Characteristic**					
			evacuation procedures.		Promote the role of the Flood Community Liaison Officer whereby the dissemination of information on self help and making property more flood resilient is made readily available to local communities at flood risk			
	Private property (Residential and commercial)	Pre-deployment	Notification of early warning, placing of sandbags, the assembly of demountable flood guards and assisting in evacuation procedures.	Permanent	Help property owners and custodians plan and prepare for flooding events which in turn should reduce the impacts property and businesses. Promote the role of the Flood Community Liaison Officer whereby the dissemination of information on self help and making property more flood resilient is made readily available to local communities at flood risk	Beneficial	N/A	Beneficial
Soil	**Soil erosion**	Pre-deployment	Notification of early warning, placing of sandbags, the assembly of demountable flood guards and assisting in evacuation procedures.	Permanent	N/A	N/A	N/A	N/A
	Sediment Transport	Pre-deployment	Notification of early warning, placing of sandbags, the assembly of demountable flood guards and assisting in evacuation procedures.	Permanent	N/A	N/A	N/A	N/A
	Sediment Contamination	Pre-deployment	Notification of early warning, placing of sandbags, the assembly of demountable flood guards and assisting in evacuation procedures.	Permanent	N/A	N/A	N/A	N/A
Water	**Water quality**	Pre-deployment	Notification of early warning, placing of sandbags, the assembly of demountable flood guards and assisting in evacuation procedures.	Permanent	Help property owners and site custodians plan and prepare for flooding events. Measures such as storing fuels and oils out of the way of flood water will help protect water quality from pollution.	Beneficial	N/A	Beneficial
	Water resources	Pre-deployment	Notification of early warning, placing of sandbags, the assembly of demountable flood guards and assisting in evacuation procedures.	Permanent	Help property owners and site custodians plan and prepare for flooding events. Measures such as storing fuels and oils out of the way of flood water will help protect water resources from pollution.	Beneficial	N/A	Beneficial

Table 6: Summary of Effects of Self Help (community resilience)								
Topic	**Description of effect**	**Intervention details**		**Duration**	**Potential impact description**	**Potential Effect (without mitigation)**	**Mitigation**	**Residual effect significance (with mitigation)**
		Phase	**Characteristic**					
Climatic Factors	**Greenhouse gas emissions**	Pre-deployment	Notification of early warning, placing of sandbags, the assembly of demountable flood guards and assisting in evacuation procedures.	Permanent	N/A	N/A	N/A	N/A
Material Assets	**Infrastructure and utilities**	Pre-deployment	Notification of early warning, placing of sandbags, the assembly of demountable flood guards and assisting in evacuation procedures.	Permanent	N/A	N/A	N/A	N/A
	Planned infrastructure developments	Pre-deployment	Notification of early warning, placing of sandbags, the assembly of demountable flood guards and assisting in evacuation procedures.	Permanent	N/A	N/A	N/A	N/A
	Waste	Pre-deployment	Notification of early warning, placing of sandbags, the assembly of demountable flood guards and assisting in evacuation procedures.	Permanent	N/A	N/A	N/A	N/A
Cultural Heritage	**Archaeological Sites**	Pre-deployment	Notification of early warning, placing of sandbags, the assembly of demountable flood guards and assisting in evacuation procedures.	Permanent	This measure should help people plan and prepare for flooding events which in turn should reduce the impacts on historic assets.	Beneficial	Promote the role of the Flood Community Liaison Officer whereby the dissemination of information on self help and making property more flood resilient is made readily available to local communities at flood risk	Beneficial
Landscape	**Landscape Character**	Pre-deployment	Notification of early warning, placing of sandbags, the assembly of demountable flood guards and assisting in evacuation procedures.	Permanent	This measure should help people plan and prepare for flooding events which in turn should reduce the impacts on landscape.	Beneficial	Promote the role of the Flood Community Liaison Officer whereby the dissemination of information on self help and making property more flood resilient is made readily available to local communities at flood risk	Beneficial

Return to Contents Page

Table 7: Summary of Effects of Flood Emergency Response (planning to prepare for the flood emergencies, co ordination of communication prior to/during the flood emergency, provision of expertise/advice to inform the response and, coordination of a level emergency response and post flood event review)								
Topic	**Description of effect**	**Intervention details**		**Duration**	**Potential impact description**	**Potential Effect (without mitigation)**	**Mitigation**	**Residual effect significance (with mitigation)**
		Phase	**Characteristic**					
Biodiversity	**Effect on protected sites**	Pre-deployment	Flood emergency planning for existing and proposed protected sites (SACs, SPAs, SCIs, ASSIs, Ramsar sites, NNRs)	Permanent	N/A	N/A	N/A	N/A
	Effect on protected species	Pre-deployment	Flood emergency planning for National and European protected species	Permanent	N/A	N/A	N/A	N/A
	Aquatic habitats	Pre-deployment	N/A	Permanent	N/A	N/A	N/A	N/A
	Terrestrial habitat	Pre-deployment	Flood emergency planning for agricultural land holdings and associated infrastructure.	Permanent	N/A	N/A	N/A	N/A
Population and human health	**Noise**	Pre-deployment	Flood emergency planning for Sports and leisure centres, amusement arcades/parks, swimming pool, hotel, boarding house, self-catering unit, bingo hall, theatre, cinema	Permanent	N/A	N/A	N/A	N/A
	Agricultural	Pre-deployment	Flood emergency planning for houses and commercial units	Permanent	Farmers can implement measures to protect their assets from flood damage.	Beneficial	N/A	Beneficial
	Recreation and Tourism Interests	Pre-deployment	Flood emergency planning for soil resources	Permanent	This measure should help people plan and prepare for flooding events which in turn should reduce the impacts on recreation and tourism.	Beneficial	N/A	Beneficial
	Private property (Residential and commercial)	Pre-deployment	Flood emergency planning for soil resources.	Permanent	This measure should help people plan and prepare for flooding events which in turn should reduce the impacts property and businesses.	Beneficial	N/A	Beneficial
Soil	**Soil erosion / transport / sediment contamination**	Pre-deployment	Flood emergency planning for soil resources	Permanent	N/A	N/A	N/A	N/A

Table 7: Summary of Effects of Flood Emergency Response (planning to prepare for the flood emergencies, co ordination of communication prior to/during the flood emergency, provision of expertise/advice to inform the response and, coordination of a level emergency response and post flood event review)								
Topic	**Description of effect**	**Intervention details**		**Duration**	**Potential impact description**	**Potential Effect (without mitigation)**	**Mitigation**	**Residual effect significance (with mitigation)**
		Phase	**Characteristic**					
Water	**Water quality**	Pre-deployment ion	Flood emergency planning for greenhouse gas emission targets	Permanent	This measure should help people plan and prepare for flooding events. Measures such as storing fuels and oils out of the way of flood water will help protect water quality from pollution.	Beneficial	N/A	Beneficial
	Water resources	Pre-deployment	Flood emergency planning for roads, railways, communications network, electricity network, wastewater/water treatment network.	Permanent	This measure should help people plan and prepare for flooding events. Measures such as storing fuels and oils out of the way of flood water will help protect water quality from pollution.	Beneficial	N/A	Beneficial
Climatic Factors	**Greenhouse gas emissions**	Pre-deployment		Permanent	N/A	N/A	N/A	N/A
Material Assets	**Infrastructure and utilities**	Pre-deployment		Permanent	N/A	N/A	N/A	N/A
	Planned infrastructure developments	Pre - deployment	Flood emergency planning for proposed transport links, utilities and housing developments	Permanent	N/A	N/A	N/A	N/A
	Waste	Pre-deployment	Flood emergency planning for wastes produced from site works, wastes from industrial and domestic processes.	Permanent	N/A	N/A	N/A	N/A
Cultural Heritage	**Archaeological Sites**	Pre-deployment	Flood emergency planning for scheduled monuments and listed buildings.	Permanent	This measure should help people plan and prepare for flooding events which in turn should reduce the impacts on historic assets.	Beneficial	N/A	Beneficial
Landscape	**Landscape Character**	Pre-deployment	Flood emergency planning for landscape Policy Areas	Permanent	This measure should help people plan and prepare for flooding events which in turn should reduce the impacts on landscape.	Beneficial	N/A	Beneficial

Return to Contents Page

Table 8: Summary of Effects of Flood Warning

Topic	Description of effect	Intervention details		Duration	Potential impact description	Potential Effect (without mitigation)	Mitigation	Residual effect significance (with mitigation)
		Phase	Characteristic					
Biodiversity	**Effect on protected sites**	During deployment	Flood warning planning for existing and proposed protected sites (SACs, SPAs, SCIs, ASSIs, Ramsar sites, NNRs)	Short term	Will allow action by managers	N/A	NIEA should be aided in providing flood risk management plans to address how protected site objectives will be met post flood event.	N/A
	Effect on protected species	During deployment	Flood warning planning for National and European protected species	Short term	Will allow action by managers	N/A		N/A
Population and human health	**Noise**	During deployment	N/A	Short term	N/A	N/A	N/A	N/A
	Agricultural	During deployment	Flood warning planning for agricultural land holdings and associated infrastructure.	Short term	Allows movement of stock from risk areas	Significant positive	Provide information about how farmers should produce flood risk management plan for holdings, including "safe" locations to move stock to and areas which should be left fallow because of flood risk.	Significant positive
	Recreation and Tourism Interests	During deployment	Flood warning planning for sports and leisure centres, amusement arcades/parks, swimming pool, hotel, boarding house, self-catering unit, bingo hall, theatre, cinema	Short term	Allows evacuation or self help measures to be applied	Significant positive	Policies should be in place to help custodians of recreation and tourism interests prepare for flooding events. Infrastructure should be in place so custodians of recreation and tourism interests have information about when they can re-entre their premises.	Significant positive
	Private property (Residential and commercial)	During deployment	Flood warning planning for houses and commercial units	Short term	Allows evacuation or self help measures to be applied	Significant positive	Policies should be in place to help householders and commercial premises prepare for flooding events. Measures such as storing fuels and oils out of the way of flood water will help protect water quality from pollution. Infrastructure should be in place, so property owners and occupiers know where they will be evacuated to and how to secure their premises. Information should also be available regarding how updated relating to the flood warning will be relayed to property owners and occupiers.	Significant positive
Soil	**Soil erosion**	During deployment	Flood warning planning for soil resources	Short term	N/A	N/A	N/A	N/A

Table 8: Summary of Effects of Flood Warning

Topic	Description of effect	Intervention details		Duration	Potential impact description	Potential Effect (without mitigation)	Mitigation	Residual effect significance (with mitigation)
		Phase	Characteristic					
	Sediment Transport	During deployment	Flood warning planning for soil resources	Short term	N/A	N/A	N/A	N/A
	Sediment Contamination	During deployment	Flood warning planning for soil resources	Short term	N/A	N/A	N/A	N/A
Water	**Water quality**	During deployment	Flood warning planning for streams, rivers and lakes	Short term	N/A	N/A	N/A	N/A
	Water resources	During deployment	Flood warning planning for streams, rivers and lakes	Short term	N/A	N/A	N/A	N/A
Climatic Factors	**Greenhouse gas emissions**	During deployment	Flood warning planning for greenhouse gas emission targets	Short term	N/A	N/A	N/A	N/A
Material Assets	**Infrastructure and utilities**	During deployment	Flood warning planning for roads, railways, communications network, electricity network, wastewater/water treatment network.	Short term	Allows for evacuation, safe storage of assets and self help measures to be applied	Significant positive	Insure project sponsors/developers and contractors have flood risk management plans in place which include information about how transport systems will be diverted to un affected areas and utilities will be managed to minimise disruption to services.	Significant positive
	Planned infrastructure developments	During deployment	Flood warning planning for proposed transport links, utilities and housing developments	Short term	N/A	N/A	N/A	N/A
	Waste	During deployment	Flood warning planning for wastes produced from site works, wastes from industrial and domestic processes.	Short term	N/A	N/A	N/A	N/A
Cultural Heritage	**Archaeological Sites**	During deployment	Flood warning planning for scheduled monuments and listed buildings.	Short term	Allows managers to implement evacuation and self help measures	Significant positive	Have a flood plan for listed buildings and if appropriate, scheduled monuments. Have appropriate supplies in place to enact flood plan. If artefacts are to be stored, have manpower and a secure location identified to pack and move artefacts, prior to evacuation notice.	Significant positive
Landscape	**Landscape Character**	During deployment	Flood warning planning for Landscape Policy Areas	Short term	N/A	N/A	N/A	N/A

Return to Contents Page

ISBN 978-1-84807-591-7

RIVERS Agency

Department of Agriculture and Rural Development
www.dardni.gov.uk

INVESTORS IN PEOPLE

DMS 15.16.113e