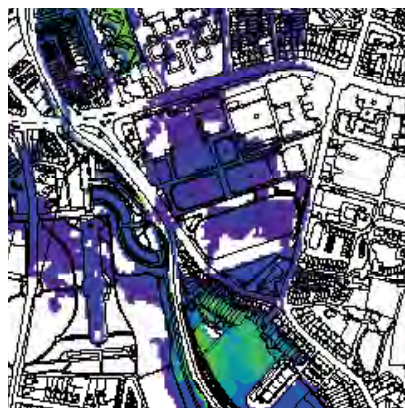
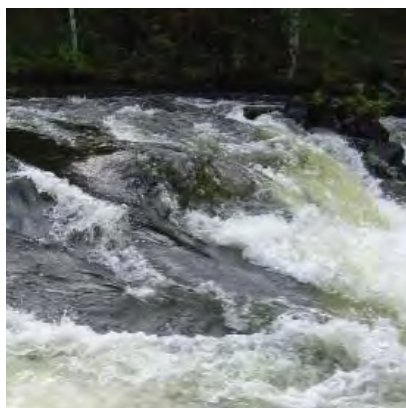


# North Western - Neagh Bann CFRAM Study

## Strategic Environmental Assessment - Constraints Report

IBE0700Rp0013







# North Western – Neagh Bann CFRAM Study

## Strategic Environmental Assessment Constraints Report

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## APPENDICES

### **APPENDIX A** Plans, Programmes and Legislation

32 Pages

## ACRONYMS

AA	Appropriate Assessment
AFA	Area for Further Assessment
ASSI	Area of Special Scientific Interest
CAFE	Clean Air for Europe [Directive]
CFRAM	Catchment Flood Risk Assessment and Management
EMEP	European Monitoring and Evaluation Programme
FRMP	Flood Risk Management Plan
DAFM	Department of Agriculture, Food and the Marine
DAHG	Department of Arts, Heritage and the Gaeltacht
DCENR	Department of Communications, Energy and Natural Resources
DECLG	Department of Environment, Community and Local Government
DoEHLG	Department of Environment Heritage and Local Government (now DECLG)
ERBD	Eastern River Basin District
EPA	Environmental Protection Agency
ESB	Electricity Supply Board
FEMFRAM	Fingal East Meath Flood Risk Assessment and Management Study
FPM	Freshwater Pearl Mussel
FRA	Flood Risk Assessment
FRMP	Flood Risk Management Plan
GSI	Geological Survey of Ireland
HA	Hydrometric Area
HPW	High Priority Watercourse
IFI	Inland Fisheries Ireland
LA	Local Authority
LAP	Local Area Plan
MCA	Multi-Criteria Analysis
MIDA	Marine Irish Digital Atlas
MPA	Marine Protected Area
MPW	Medium Priority Watercourse
NB	Neagh Bann
NBiRBD	Neagh Bann International River Basin District
NW	North Western
NWiRBD	North Western International River Basin District
OD	Ordnance Datum
OPW	Office of Public Works
OSi	Ordnance Survey Ireland

OSPAR	(Oslo Paris) Convention on the protection of North-East Atlantic marine environment
PFRA	Preliminary Flood Risk Assessment
RBD	River Basin District
SEA	Strategic Environmental Assessment
SERBD	South Eastern River Basin District
SWRBD	South Western River Basin District
SuDS	Sustainable Urban Drainage
UKCP09	UK Climate Projections 2009 (A UK climate projection tool)
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UoM	Unit of Management
WHO	World Health Organisation
WRBD	Western River Basin District



# 1 INTRODUCTION

This Constraints Report has been prepared for the Office of Public Works (OPW) in support of the Strategic Environmental Assessment (SEA) Scoping Report for the North Western - Neagh Bann Catchment-based Flood Risk and Management (CFRAM) Study. In accordance with Section K2.2 of the CFRAM Study Stage 1 Project Brief, this report comprises information from desk studies and preliminary site visits by the team, which have been undertaken in order to identify issues that may be relevant to, or might impose constraints on, the design and/or implementation of flood risk management measures in the North Western - Neagh Bann (NWNB) CFRAM study area.

The key topics under examination have been derived in accordance with the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 [S.I. 435/2004] and the Planning and Development (Strategic Environmental Assessment) Regulations 2004 [S.I. 436/2004], and their recent amendments of European Communities (Environmental Assessment of Certain Plans and Programmes) (Amendment) Regulations 2011 [S.I. 200/2011] and the Planning and Development (Strategic Environmental Assessment) (Amendment) Regulations 2011 [S.I. 201/2011].

## 2 KEY PLAN ELEMENTS TO BE ASSESSED

As part of the SEA scoping process, decisions need to be made as to what parts of the CFRAM Studies and associated Flood Risk Management Plans (FRMPs) should be assessed and to what level of detail. The purpose of the SEA is to provide a meaningful assessment of those parts of the plan that may lead to significant environmental effects, in order to contribute to more transparent decision making and to ensure the objective of integrating environmental considerations into plan making is realised.

**Table 2.1** sets out the proposed elements of the FRMP and identifies those which are to be assessed as part of the SEA and why. This information is also provided in the SEA Scoping Report to generate discussion during the SEA consultation process and will be subject to change based on the comments received.

**Table 2.1 Proposed Elements of the Plan to be Assessed**

	Draft FRMP Section	Will this be assessed in the SEA?
<b>I</b>	<b>VOLUME I – FLOOD RISK MANAGEMENT PLAN</b>	See below
1	Outlines the public and stakeholder consultation and engagement undertaken throughout the National CFRAM Programme and other relevant projects.	<b>No</b> – This is a statement about the consultation arrangements put in place. SEA consultation arrangements however may be incorporated into this.
2	Provides an overview of the catchment and coastal areas covered by the FRMP.	<b>No</b> – This provides factual information about the general environment in the area. Some of this information will however be included in the environmental report as environmental baseline information.
3	Describes the PFRA undertaken to identify the AFAs that are the focus of this FRMP.	<b>No</b> – This provides factual information about the background to the study and Plan.
4	Details the existing and potential future flood hazard and risk in areas covered by the FRMP.	<b>No</b> – This provides factual information about the flood risk in the area. Some of this information will however be included in the environmental report as environmental baseline information.
5	Sets out the flood risk management objectives that define what the FMRP is trying to achieve.	<b>Yes</b> – These Strategic Objectives will be assessed within the environmental report, to test the Plan Objectives compatibility with the SEA Objectives.
6	Describes the environmental assessments undertaken to ensure that the FMRP complies with relevant environmental legislation to and inform the process of identifying the suitable strategies that will, where possible, enhance the environment.	<b>No</b> – This is a statement about the environmental assessments undertaken for the study and Plan. This should however include guarantees that the Plan will comply with recommendations from the environmental assessments.
7	Sets out the strategy for managing flood risk in the area covered by the FRMP.	<b>Yes</b> – These will be the measures proposed to manage flood risk within the Areas for Further Assessment.
8	Outlines how the implementation of the FRMP will be monitored and reported, and then reviewed and updated at regular intervals.	<b>No</b> – This is a statement about future monitoring and reporting for the Plan. This should include recommendations from the environmental assessments.

	Draft FRMP Section	Will this be assessed in the SEA?
A	APPENDIX A – Public and Stakeholder Consultation Events and Participants.	<b>No</b> – This provides factual information about the consultation events.
B	APPENDIX B – Local Weightings for the Multi-Criteria Analysis.	<b>No</b> – This provides factual information about the background to the multi-criteria analysis scoring methodology.
C	APPENDIX C – Description of the flood risk management options.	<b>No</b> – This provides factual information about the flood risk management options.
II	<b>VOLUME II – FLOOD MAPS</b>	<b>No</b> – This is mapping of the predicted flood extents and risk in the Areas for Further Assessment.

### 3 KEY ENVIRONMENTAL ISSUES TO BE EXAMINED

In accordance with S.I. 435 of 2004, as amended, consideration has been given to the type of environmental effects, both positive and negative, that could be expected to arise from implementation of the FRMPs in the NWNB region. A draft of **Table 3.1** was issued as part of early stakeholder engagement and the current version reflects comments received to date. It is anticipated that this table will evolve as the NWNB CFRAM Study and associated FRMPs develop and as a clearer picture of the types of measures being considered and the receiving environment becomes fully apparent.

**Table 3.1 Key Environmental Issues to be Examined in the SEA**

Topics	Scoped In / Out of SEA	Environmental Awareness Issues
Biodiversity, Flora & Fauna	In	<ul style="list-style-type: none"> <li>• Effects on protected areas: European (SACs, SPAs)</li> <li>• Effects on flora and fauna, (including migratory bird species etc.)</li> <li>• Effects on Freshwater Pearl Mussel (<i>Margaritifera spp</i>) protected areas and other populations of Freshwater Pearl Mussel.</li> <li>• Effects on salmonids, other protected fish and shellfish species.</li> <li>• Effect on annex species in non-annex habitats e.g. crayfish in canals</li> <li>• Effects on Ramsar sites, UWWTD sensitive waters, NHAs, pNHAs.</li> <li>• Effects on sensitive habitats (i.e. peatlands, limestone habitats)</li> <li>• Effects on wetlands</li> <li>• Effects and opportunities on refuge for fauna</li> <li>• Potential introduction of alien species and invasive species</li> <li>• Potential for habitat loss and fragmentation.</li> <li>• Potential for habitat creation and enhancement.</li> <li>• Potential for interaction with Habitats Directive, i.e. Article 6.</li> <li>• Potential for impacts on biodiversity from breaching of natural catchments and the transfer of water.</li> <li>• Potential impacts from silt movement.</li> <li>• Potential impacts from changes in flow velocities.</li> </ul>
Population & Human Health	In	<ul style="list-style-type: none"> <li>• Recreational use of water (e.g. bathing, fishing, canal use, sailing, canoeing and kayaking).</li> <li>• Possible effects on tourism (e.g. navigation, fishing, water sports, sailing).</li> <li>• Improving degraded sites affecting water quality</li> <li>• Effects on connectivity of communities, both physical links and</li> </ul>

Topics	Scoped In / Out of SEA	Environmental Awareness Issues
		<p>communications.</p> <ul style="list-style-type: none"> <li>• Include amenity value of natural environment e.g. river walks</li> <li>• Effects on disadvantaged communities</li> <li>• Effects from drinking water abstraction (surface and groundwater).</li> <li>• Effects on drinking water protected areas.</li> <li>• Effects on overall water quality, including municipal and private drinking water supplies.</li> <li>• Effects from invasive species (e.g. Giant Hogweed).</li> <li>• Effects on contact water sports.</li> <li>• Effects related to flooding of septic tanks and waste water treatment plants.</li> <li>• Include health value of natural environment e.g. river walks.</li> <li>• Effects of disturbing rodents during works near water.</li> </ul>
Geology, Soils and Landuse	In	<ul style="list-style-type: none"> <li>• Land vulnerable to erosion</li> <li>• Erosion and soil function</li> <li>• Effects on coastal erosion</li> <li>• Influence on land use practices (e.g. fertiliser application)</li> <li>• Effects of less frequent flooding on soil quality</li> <li>• Effects on geomorphology (i.e. river channels, landforms)</li> <li>• Effects on areas where sewage sludge is spread as fertiliser</li> <li>• Effects in relation to peat slides</li> <li>• Effects on increased drainage on soils</li> <li>• Effects on caves and potholes</li> <li>• Effects on groundwater table and contamination of groundwater</li> <li>• Change in land use based on risk to water quality, quantity and flooding thus reducing value of land either by limiting development potential or requiring a change in land use.</li> <li>• Effects on access to lands</li> </ul>
Water	In	<ul style="list-style-type: none"> <li>• Pressures and impacts on ecological status of water bodies</li> <li>• Morphological impacts on water bodies from engineering and other works.</li> <li>• Impacts on water supply (including potable) and water conservation</li> <li>• Potential to improve water body status, including heavily modified and artificial water bodies.</li> <li>• Effects of upstream storage on water quality.</li> <li>• Effects of freshwater flooding in estuaries.</li> <li>• Effects of breaching natural catchments and the transfer of water.</li> </ul>

Topics	Scoped In / Out of SEA	Environmental Awareness Issues
		<ul style="list-style-type: none"> <li>Potential impacts from silt movement..</li> </ul>
Air	Out	<ul style="list-style-type: none"> <li>FRMPs unlikely to have significant effects on Air (or odour), with only short term impacts of measures being identified. Due to the lack of potential issues with Air, and in line with all other CFRAM studies in Ireland, the Air topic is proposed to be scoped out of the SEA process and will not be assessed within the environmental report.</li> </ul>
Climatic Factors	In	<ul style="list-style-type: none"> <li>Climate change mitigation and adaptation, including effects from severe weather events and coastal zone management.</li> <li>Effects on sea level rise and maintenance of sea defences.</li> <li>Effect of carbon sinks, such as forestry and peatland</li> </ul>
Material Assets & Infrastructure	In	<ul style="list-style-type: none"> <li>Protection of water-related assets</li> <li>Sustainable use of water (link to water receptor)</li> <li>Effects on potential future demand for food/biofuel production</li> <li>Effects on energy, telecommunications infrastructure, residential and commercial properties, farm assets, personal property</li> <li>Effects on shipping and ports; traffic and transportation, roads, railways lines, light houses, airports.</li> <li>Effects on individual risk receptors that can affect large numbers of people, for example, hospitals, garda stations, banks.</li> <li>Effects on wind farms should be considered</li> <li>Effects on irrigation</li> <li>Effects on landfills</li> <li>Effects on agriculture and crops</li> <li>Secondary costs associated with flooding of infrastructure</li> <li>Opportunities for uses of poorer agricultural lands</li> <li>Effects on Bord na Mona assets</li> <li>Effect on animal welfare.</li> </ul>
Cultural, Architectural & Archaeological Heritage	In	<ul style="list-style-type: none"> <li>Nationally designated sites and monuments within an appropriate distance of water bodies (distance to be confirmed during FRMP development)</li> <li>Effects on water-based archaeological features</li> <li>Effects on cultural heritage features in the vicinity of floodplains and/or watercourses (i.e. mills, mill races, weirs and bridges)</li> <li>Effects on key national sites</li> <li>Effects on historic landscapes</li> </ul>

Topics	Scoped In / Out of SEA	Environmental Awareness Issues
		<ul style="list-style-type: none"> <li>• Effects on cultural-scapes</li> <li>• Effects on historic ford crossings</li> <li>• Effects on industrial and engineering archaeology.</li> <li>• Potential for disturbance of previously undiscovered archaeological remains near or within water bodies during development of water-related infrastructure (e.g. wastewater treatment facilities, flood defences, crossings). For example much of Ireland's inshore cultural marine heritage is unrecorded.</li> <li>• Effects on areas of architectural significance</li> <li>• Effects on locally important buildings</li> <li>• Gaeltacht areas and the Irish language.</li> </ul>
Landscape & Visual Amenity	<b>In</b>	<ul style="list-style-type: none"> <li>• Effects on areas of designated landscape quality and scenic views (i.e. in CDPs and other plans),</li> <li>• Effect on parks, gardens and designed landscapes</li> <li>• Effects on the general landscape as well as riverscapes, lakescapes and seascapes</li> <li>• Potential for positive impacts should be considered and targets of improvement set</li> <li>• Effects on historic landscapes</li> </ul>
Amenity, Tourism and Recreational Use	<b>In</b>	<ul style="list-style-type: none"> <li>• Effects on heritage assets that benefit tourism</li> <li>• Effects on beaches and coastal areas</li> <li>• Effects on tourism and recreational facilities</li> </ul>
Fisheries and Angling	<b>In</b>	<ul style="list-style-type: none"> <li>• Effects on fisheries and fish habitats</li> <li>• Effects on fish migration</li> <li>• Effects on commercial, recreational and tourism fishing</li> <li>• Spread of invasive species</li> <li>• Effects on aquaculture and shellfish production</li> </ul>
Flood Related Social or Socio-Economic Issues	<b>In</b>	<ul style="list-style-type: none"> <li>• Effects on connectivity of communities</li> <li>• Effects on vulnerable social receptors, eg schools, hospitals, nursing homes)</li> </ul>

It should be noted that the OPW have requested additional environmental topic areas to be included within the environmental assessments for the FRMPs in Ireland that are not specified within the SEA Directive. These environmental topic areas will be included within the environmental report and are as follows:

- Amenity, Tourism and Recreational Use;

- Fisheries and Angling, and
- Flood Related Social or Socio-Economic Issues.



## 4 OVERVIEW OF POLICY CONTEXT

As part of the SEA process, the context of the NWNB CFRAM study must be established with regard to other plans and programmes that have been adopted at International, European and National levels. In particular the interaction of the environmental protection objectives and standards included within these plans and programmes with the NWNB FRMPs requires consideration.

**Table 4.1** identifies the main significant environmental plans, programmes and legislation, adopted at International, European Community or Member State level, which would be expected to influence, or be influenced by, the NWNB FRMPs. While it is recognised that there are many plans, programmes and legislation that will relate to the FRMPs it is considered appropriate to only deal with those significant texts, to keep the assessment at a strategic level. More information on these plans, programmes and legislation, along with their potential interaction with the FRMPs is given in **Appendix A** of this report.

**Table 4.1 Summary of Key Plans, Programmes and Legislation Relevant to the FRMPs**

Level	Plan / Programme / Legislation
<b>EU Level</b>	<ul style="list-style-type: none"> <li>• <b>EU Floods Directive [2007/60/EC]</b></li> <li>• A Blueprint to Safeguard Europe's Water Resources [COM(2012)673]</li> <li>• Bathing Water Directive [2006/7/EC]</li> <li>• Birds Directive [2009/147/EC]</li> <li>• Bonn Convention [L210, 19/07/1982 (1983)]</li> <li>• Drinking Water Directive [98/83/EC]</li> <li>• EIA Directive [85/337/EEC] [2014/52/EU]</li> <li>• Environmental Liability Directive [2004/35/EC]</li> <li>• Environmental Quality Standards Directive [2008/105/EC]</li> <li>• EU Biodiversity Strategy to 2020 [COM(2011)244]</li> <li>• European Landscape Convention [ETS No. 176]</li> <li>• Groundwater Directive [80/68/EEC] and Daughter Directive [2006/118/EC]</li> <li>• Habitats Directive [92/43/EEC]</li> <li>• Marine Strategy Framework Directive [2008/56/EC]</li> <li>• Nitrates Directive [91/676/EEC]</li> <li>• Renewable Energy Directive [2009/28/EC]</li> <li>• SEA Directive [2001/42/EC]</li> <li>• Second European Climate Change Programme [ECCP II] 2005.</li> <li>• Sewage Sludge Directive [86/278/EEC]</li> <li>• Soils Thematic Strategy [COM(2006) 231]</li> <li>• Urban Wastewater Treatment Directive [91/271/EEC]</li> <li>• Water Framework Directive [2000/60/EC]</li> <li>• World Heritage Convention [WHC-2005/WS/02]</li> </ul>

<b>National Level</b>	<ul style="list-style-type: none"> <li>• Arterial Drainage Maintenance and High Risk Designation Programme 2011-2015 (OPW, 2011)</li> <li>• Fisheries Acts 1959 to 2007 (S.I. No. 14 of 1959 and No. 17 of 2007)</li> <li>• Harnessing Our Ocean Wealth: An Integrated Marine Plan for Ireland (Inter-Departmental Marine Coordination Group 2012)</li> <li>• Irish Geological Heritage (IGH) Programme (GSI 1998-)</li> <li>• National Biodiversity Plan (2<sup>nd</sup> Revision 2011-2016) (DAHG, 2011)</li> <li>• National Climate Change Strategy 2007-2012 (DEHLG, 2007)</li> <li>• National Landscape Strategy for Ireland (Draft) 2014 – 2024 (DAHG, 2014)</li> <li>• National Monuments Acts (1930 to 2004) (S.I. No. 2 of 1930 &amp; No. 22 of 2004)</li> <li>• National Renewable Energy Action Plan (DCENR, 2010)</li> <li>• National Spatial Strategy 2002-2020 (DELG, 2002)</li> <li>• Planning System and Flood Risk Management (OPW, 2009)</li> <li>• Raised Bog SAC Management Plan (Draft) (DAHG, 2014),</li> <li>• National Peatland Strategy (Draft) (NPWS, 2014)</li> <li>• Review of Raised Bog Natural Heritage Area Network (NPWS, 2014)</li> <li>• Report of the Flood Policy Review Group (OPW, 2004)</li> </ul>
<b>Regional Level</b>	<ul style="list-style-type: none"> <li>• <b>Flood Risk Management Plans</b></li> <li>• River Basin Management Plans</li> <li>• Regional Planning Guidelines</li> <li>• Regional Development Strategies/Plans</li> <li>• Groundwater Protection Schemes</li> </ul>
<b>Sub-Regional</b>	<ul style="list-style-type: none"> <li>• County and Town Development Plans</li> <li>• County Landscape Character Assessments</li> <li>• County Renewable Energy Strategies</li> <li>• Economic development plans for rural and urban areas</li> <li>• Freshwater Pearl Mussel Sub-Basin Management Plans</li> <li>• Greater Dublin Strategic Drainage Strategy</li> <li>• Heritage Plans</li> <li>• Housing Strategies</li> <li>• Local Area Plans</li> <li>• Local Biodiversity Action Plans</li> <li>• Local Catchment Flood Risk Management Plans</li> <li>• Planning Schemes for Strategic Development Zones (SDZ)</li> <li>• Shellfish Pollution Reduction Programmes</li> <li>• Sludge Management Plans</li> <li>• Special Amenity Area Orders</li> <li>• Water Quality Management Plans</li> </ul>

## 5 DRAFT SEA OBJECTIVES

The proposed FRMP objectives and the shortlisted *Options* will be assessed against the SEA Objectives to examine the likely significant environmental impacts of the draft FRMPs. This assessment should be relatively strategic, with the aim of reporting likely impacts at the UoM level to reflect the scale at which the Plans are set. These Objectives will be used to assess the FRM *Options* and will feed directly into the Multi-Criteria Analysis (MCA) being undertaken. The MCA will consider the issues of social and environmental impacts alongside the technical and economic criteria. The MCA framework has been developed to take account of the broader range of issues relevant to delivery of the FRMP in the development and selection of FRM *Options*, and their subsequent prioritisation. The draft SEA Objectives and Sub-Objectives to be used within the MCA are given in **Table 5.1**.

The SEA will include two additional objectives for the environmental assessment, which are not currently within the MCA objectives. These objectives are given in **Table 5.2** and will cover the environmental topics of **Soil** and **Climatic Factors**. These objectives were incorporated into an earlier pilot SEA in Ireland, for the Dodder FRMP.

**Table 5.1: Draft SEA Objectives**

Criteria	Objective		Sub-Objective	
<b>Social</b>	<b>A</b>	Minimise risk to human health and life	i)	Minimise risk to human health and life of residents
			ii)	Minimise risk to high vulnerability properties
	<b>B</b>	Minimise risk to community	i)	Minimise risk to social infrastructure and amenity
			ii)	Minimise risk to local employment
<b>Environmental</b>	<b>C</b>	Support the objectives of the WFD	i)	Provide no impediment to the achievement of water body objectives and, if possible, contribute to the achievement of water body objectives.
	<b>D</b>	Support the objectives of the Habitats Directive	i)	Avoid detrimental effects to, and where possible enhance, Natura 2000 network, protected species and their key habitats, recognising relevant landscape features and stepping stones.
	<b>E</b>	Avoid damage to, and where possible enhance, the flora and fauna of the catchment	i)	Avoid damage to or loss of, and where possible enhance, nature conservation sites and protected species or other know species of conservation concern.
	<b>F</b>	Protect, and where possible enhance, fisheries resource within the catchment	i)	Maintain existing, and where possible create new, fisheries habitat including the maintenance or improvement of conditions that allow upstream migration for fish species.
	<b>G</b>	Protect, and where possible enhance, landscape character and visual amenity within the river corridor	i)	Protect, and where possible enhance, visual amenity, landscape protection zones and views into / from designated scenic areas within the river corridor.
	<b>H</b>	Avoid damage to or loss of features, institutions and collections of cultural heritage importance and their setting	i)	Avoid damage to or loss of features, institutions and collections of architectural value and their setting.
			ii)	Avoid damage to or loss of features, institutions and collections of archaeological value and their setting.

**Table 5.2: Additional Draft SEA Objectives**

Criteria	Objective		Sub-Objective		Indicator	Minimum requirement	Aspirational target
<b>Climatic Factors</b>	<b>I</b>	No increase in flood risk to other areas	i)	Avoid increase in flood risk to other areas due to flood risk management options taking the possible impacts of climate change into account	Other areas at risk from flooding	No non-intentional increase in flood risk to other areas	Intentional decrease in flood risk to other areas
<b>Geology, Soils and Landuse</b>	<b>J</b>	Protect soil function	i)	Avoid loss of soil from erosion	Area at risk from flooding	No increase in area at risk from flooding	Reduction in area at risk from flooding to zero

## 6 OVERVIEW OF CURRENT STATE OF THE ENVIRONMENT

The SEA Environmental Report will expand on the existing information and contain a full description of the Environmental Baseline data within the study area. The key baseline information intended to be used are detailed in **Table 6.1**. It is proposed that much of the baseline information will be presented in the form of maps, diagrams and graphs, with supporting text in the Environmental Report. It is important that only data directly relevant to the FRMPs are included within the SEA.

**Table 6.1 Summary of Proposed Environmental Baseline Data and Sources**

Environmental Baseline Data	Data Sources
<b>Biodiversity, Flora and Fauna</b>	
Location and Condition of Designated Sites	NPWS, EPA & NIEA data: <ul style="list-style-type: none"> <li>• SACs &amp; Water Dependent SACs</li> <li>• SPAs &amp; Water Dependent SPAs</li> <li>• NHAs &amp; pNHAs</li> <li>• ASSIs</li> <li>• Ramsar Sites</li> <li>• Freshwater Pearl Mussel Catchments &amp; Sensitive Areas</li> <li>• Nature Reserves</li> <li>• Wildfowl Sanctuaries</li> <li>• Nutrient Sensitive Areas</li> <li>• Shellfish Areas</li> <li>• Salmonid Lakes and Rivers</li> </ul> Birdwatch Ireland data: <ul style="list-style-type: none"> <li>• IWeBs Keysites</li> </ul> OSPAR data: <ul style="list-style-type: none"> <li>• Marine Protected Areas</li> </ul>
Current threats to Biodiversity	Biodiversity Ireland data: <ul style="list-style-type: none"> <li>• Invasive Species records</li> </ul>
<b>Population &amp; Human Health</b>	
Numbers of Population and Occupancy	CSO & NISRA data: <ul style="list-style-type: none"> <li>• Census Small Areas</li> </ul>
Numbers and Locations of Health Care Services	HSE data: <ul style="list-style-type: none"> <li>• Hospitals</li> <li>• Health Centres</li> </ul>
<b>Geology, Soils &amp; Landuse</b>	
Soil and Geological Features	GSI, GSNI & EPA data: <ul style="list-style-type: none"> <li>• Bedrock &amp; Aquifers</li> <li>• Soil &amp; Subsoil type/permeability/vulnerability</li> <li>• Active Quarries &amp; Historic Mines</li> </ul>

Environmental Baseline Data	Data Sources
	<ul style="list-style-type: none"> <li>Geological Heritage Sites</li> <li>Landslide locations</li> </ul>
Landuse	NPWS, EPA & GSI data: <ul style="list-style-type: none"> <li>CORINE landcover</li> <li>Ancient and Established Woodland</li> <li>Native Woodland</li> </ul>
<b>Water – Surface water, Groundwater, Coastal &amp; Estuarine</b>	
Locations, Status and Risk of Water Bodies	EPA, NIEA & WFD data: <ul style="list-style-type: none"> <li>WFD Management Units</li> <li>Ecological status and risk of surface, coastal and transitional water bodies</li> <li>Rivers and lakes</li> </ul>
<b>Climate</b>	
General climatic summary	Met Éireann regional information. Data collected for CFRAM Study.
Climatic change information	Data collected and calculated for CFRAM Study.
<b>Material Assets &amp; Infrastructure</b>	
Number and Type of Infrastructure	NRA data: <ul style="list-style-type: none"> <li>Roads</li> </ul> DAFFT, Iarnrod Éireann & IAA data: <ul style="list-style-type: none"> <li>Ports and Harbours</li> <li>Rail</li> <li>Airports</li> </ul> Civil Defence, DEHLG & OPW data: <ul style="list-style-type: none"> <li>Civil Defence HQs</li> <li>Fire Stations</li> <li>Garda Stations</li> </ul> EPA & WFD data: <ul style="list-style-type: none"> <li>IED Sites</li> <li>Water Treatment and Waste Water Treatment Plants</li> <li>Landfills</li> <li>Drinking Water</li> </ul> Data collected for CFRAM Study
Energy and Renewable Energy Locations and Status	Eircom & ESB data: <ul style="list-style-type: none"> <li>Telephone Exchanges</li> <li>Power stations and Substations</li> </ul> AIRO data: <ul style="list-style-type: none"> <li>Wind Farms</li> </ul>
<b>Cultural, Archaeological &amp; Architectural Heritage</b>	
Location and Status of Protected Sites	DEHLG, NIAH, NPWS & NIEA data: <ul style="list-style-type: none"> <li>Record of Monuments &amp; SMR</li> <li>NIAH Buildings &amp; Listed Buildings</li> <li>UNESCO World Heritage Sites</li> </ul>

Environmental Baseline Data	Data Sources
	<ul style="list-style-type: none"> <li>Listed Parks, Gardens and Demesnes.</li> </ul> INFOMAR data: <ul style="list-style-type: none"> <li>Shipwrecks</li> </ul>
<b>Landscape &amp; Visual Amenity</b>	
Landscape Character Areas and Sensitive Landscapes	Information from CDPs: <ul style="list-style-type: none"> <li>Landscape Conservation Areas</li> <li>Landscape Character Areas</li> <li>Sensitive Landscapes</li> </ul>
<b>Amenity, Tourism and Recreational Use</b>	
Location of Designated Sites	NPWS , NIEA & WFD data: <ul style="list-style-type: none"> <li>National Parks</li> <li>Bathing Waters</li> </ul>
Locations of Amenities	OPW data: <ul style="list-style-type: none"> <li>Galleries, Museums &amp; Theatres</li> </ul> Irish Sports Council data: <ul style="list-style-type: none"> <li>Trails</li> </ul> DECLG data: <ul style="list-style-type: none"> <li>Social Amenity Areas</li> </ul> EPA & NIEA data: <ul style="list-style-type: none"> <li>Designated Bathing Waters</li> </ul> Data collected for CFRAM Study
<b>Fisheries &amp; Angling</b>	
Locations for Fishing and Species	MIDA & IFI data: <ul style="list-style-type: none"> <li>Ports</li> <li>Fishing Spots</li> <li>Angling spots</li> </ul> EPA & NIEA data: <ul style="list-style-type: none"> <li>Salmon lakes/rivers</li> <li>Inshore Fisheries – Aquaculture</li> </ul>
<b>Flood Related Social or Socio-economic Issues</b>	
Numbers and Locations of Educational Institutions	DoE & Higher Education Authority data: <ul style="list-style-type: none"> <li>Primary Schools</li> <li>Post Primary Schools</li> <li>Third Level Institutions</li> </ul>
Numbers and Locations of Care Facilities	HSE data: <ul style="list-style-type: none"> <li>Nursing Homes</li> <li>Residential Care for the Elderly</li> </ul>

It is key that the current state of the environment be described using the most recent and up-to-date environmental data, information and reports. Where updates of significant environmental data and associated reports become available during the SEA process, consideration should be given to incorporating the new information into the description of the current state of the environment. Where



data gaps are found for particular aspects of the current state of the environment, the significance of these data gaps should be clearly stated. In addition, it will be stated whether these gaps can be reasonably and realistically addressed during the SEA process. A preliminary environmental baseline for the NWNB CFRAM study region is included in **Section 6.1**.

## 6.1 ENVIRONMENTAL BASELINE

Included in the following section of this Constraints Report is a preliminary discussion of the environmental baseline for the NWNB CFRAM study area. The preliminary baseline has been divided by topic into the issues requiring assessment under the SEA legislation, including additional topic areas requested by the OPW. Further detailed baseline studies, with all associated mapping, will be developed as part of the Environmental Report to follow this scoping phase. The purpose of the following section is to demonstrate the level of baseline environmental information to be used in the assessment of potential impacts of the Plan FRM *Options*. This baseline information will form the indicators which the FRM *Options* will have the potential to impact upon. Future variation in these indicators due to the FRMPs will be monitored as part of the Plan and SEA review.

### 6.1.1 Biodiversity, Flora & Fauna

The NWNB CFRAM study area is of high ecological value, with a variety of habitats and species of conservation concern which are protected under a number of European and national designations. Areas which have been designated for the protection of habitats and species include the following:

- Special Areas of Conservation (SACs) are designated in accordance with the Habitats Directive (92/43/EEC) for the conservation of certain habitats and species and protected by the European Communities (Birds and Natural Habitats) Regulations 2011. Together with SPAs, these European Sites form part of the Natura 2000 Network. There are 53 SACs in the North Western (NW) CFRAM study area (of which 13 are classed as “water dependent” SACs). There are five SACs in the Neagh Bann (NB) CFRAM study area (of which two are classed as “water dependent” SACs).

As there is the potential for transboundary impacts from implementation of the FRMPs, potential impacts on SACs within the Northern Ireland areas of the NWIRBD and NBIRBD will also be reviewed as part of the SEA scoping. In Northern Ireland, there are 23 SACs in the NWIRBD and 12 SACs in the NBIRBD. The SACs in the NWNB CFRAM study area, as well as those in the Northern Ireland areas of the NWIRBD and NBIRBD are shown in **Figure 6.1**;

- Special Protection Areas (SPAs) are designated under the EU Birds Directive (79/409/EEC) for the protection of birds of conservation concern and protected by the European Communities (Birds and Natural Habitats) Regulations 2011. Together with SACs these European Sites form part of the Natura 2000 Network. There are 28 SPAs in the NW CFRAM study area (of which two are classed as “water dependent” SPAs). There are five SPAs in the NB CFRAM study area (of which three are classed as “water dependent” SPAs).

As there is the potential for transboundary impacts from implementation of the FRMPs, potential impacts on SPAs within the Northern Ireland areas of the North Western and Neagh Bann IRBDs will also be reviewed as part of the SEA. In Northern Ireland there are 2 SPAs in the NWIRBD and 7 SPAs in the NBIRBD. The SPAs in the NWNB CFRAM study area, as well

as those in the Northern Ireland areas of the North Western and Neagh Bann IRBDs are shown in **Figure 6.1**;

- Natural Heritage Areas (NHAs) are designated under the Wildlife Act (1976 - 2000) as they are considered important habitats which support animals or vegetation of importance. There are 18 NHAs in the NW CFRAM study area and one in the NB CFRAM study area. There are a further 118 proposed Natural Heritage Areas (pNHA) in the NW CFRAM study area and 48 in the NB CFRAM study area. pNHAs were published on a non-statutory basis in 1995, but have not since been statutorily proposed or designated. pNHAs are subject to limited statutory protection, but are recognised for their ecological value by planning and licensing authorities.

As there is the potential for transboundary impacts from implementation of the FRMPs, potential impacts on Areas of Special Scientific Interest (ASSI) within the Northern Ireland areas of the NW and NB IRBDs will also be reviewed as part of the SEA. ASSI are areas of land that have been identified by scientific survey as being of the highest degree of conservation value, either because of the flora or fauna that is found on it, or because of geological features. In Northern Ireland there are 152 ASSI sites in the NWIRBD and 107 in the NBIRBD. The NHAs and pNHAs in the NWNB CFRAM study area as well as the ASSIs in the Northern Ireland areas of the NW and NB IRBDs are shown in **Figure 6.2**;

- Ramsar Sites are designated under the Convention on Wetlands of International Importance for the protection of wetland areas (which are important feeding habitats for birds). All Ramsar sites are also recognised as SPA and/or SAC areas and so are afforded protection by the European Communities (Birds and Natural Habitats) Regulations 2011. There are five Ramsar sites in the NW CFRAM study area and one in the NB CFRAM study area.

As there is the potential for transboundary impacts from implementation of the FRMPs, potential impacts on Ramsar sites within the Northern Ireland areas of the NW and NB IRBDs will also be reviewed as part of the SEA. In Northern Ireland there are six Ramsar sites in the NWIRBD and three in the NBIRBD. The Ramsar sites in the NWNB CFRAM study area, as well as those in the Northern Ireland areas of the NW and NB IRBDs are shown in **Figure 6.1**;

- Wildfowl Sanctuaries are established under the Wildlife Act, 1976 and are excluded from the 'Open Season Order' in which shooting of game birds is permitted. There are nine wildfowl sanctuaries in the NW CFRAM study area and three in the NB CFRAM study area;
- National Parks are established under the International Union for the Conservation of Nature and are areas identified as not materially altered by human exploitation and occupation and where steps have been taken to prevent exploitation or occupation in respect of ecological, geomorphological or aesthetic features. There are no national parks in the NWNB CFRAM study area;

- Nature Reserves are identified as being important habitats to support wildlife and are protected under Ministerial Order. There are seven statutory nature reserves in the NW CFRAM study area, but none in the NB CFRAM study area;
- Freshwater Pearl Mussel Catchments and Sensitive Areas. The Freshwater Pearl Mussel (FPM) is an endangered bivalve which lives in fast-flowing, clean rivers. As filter feeders, freshwater pearl mussels are extremely vulnerable to water pollution and engineering works in rivers, such as the construction of weirs or deepening of pools. The species *Margaritifera margaritifera* and *Margaritifera durrovensis* are protected under the Habitats Directive (92/43/EEC) and the Wildlife Acts (1976, amended 2000). There are six FPM catchments in the NW CFRAM region and a further 16 FPM sensitive areas, which are either sites with previous records of *Margaritifera*, but their current status is unknown, or are catchments of other extant populations. There are no FPM catchments or sensitive areas in the NB CFRAM study area.

As there is the potential for transboundary impacts from implementation of the FRMPs, potential impacts on FPM catchments in Northern Ireland will also be reviewed in the SEA. Northern Ireland has three FPM catchments in the NWIRBD and two in the NBIRBD.

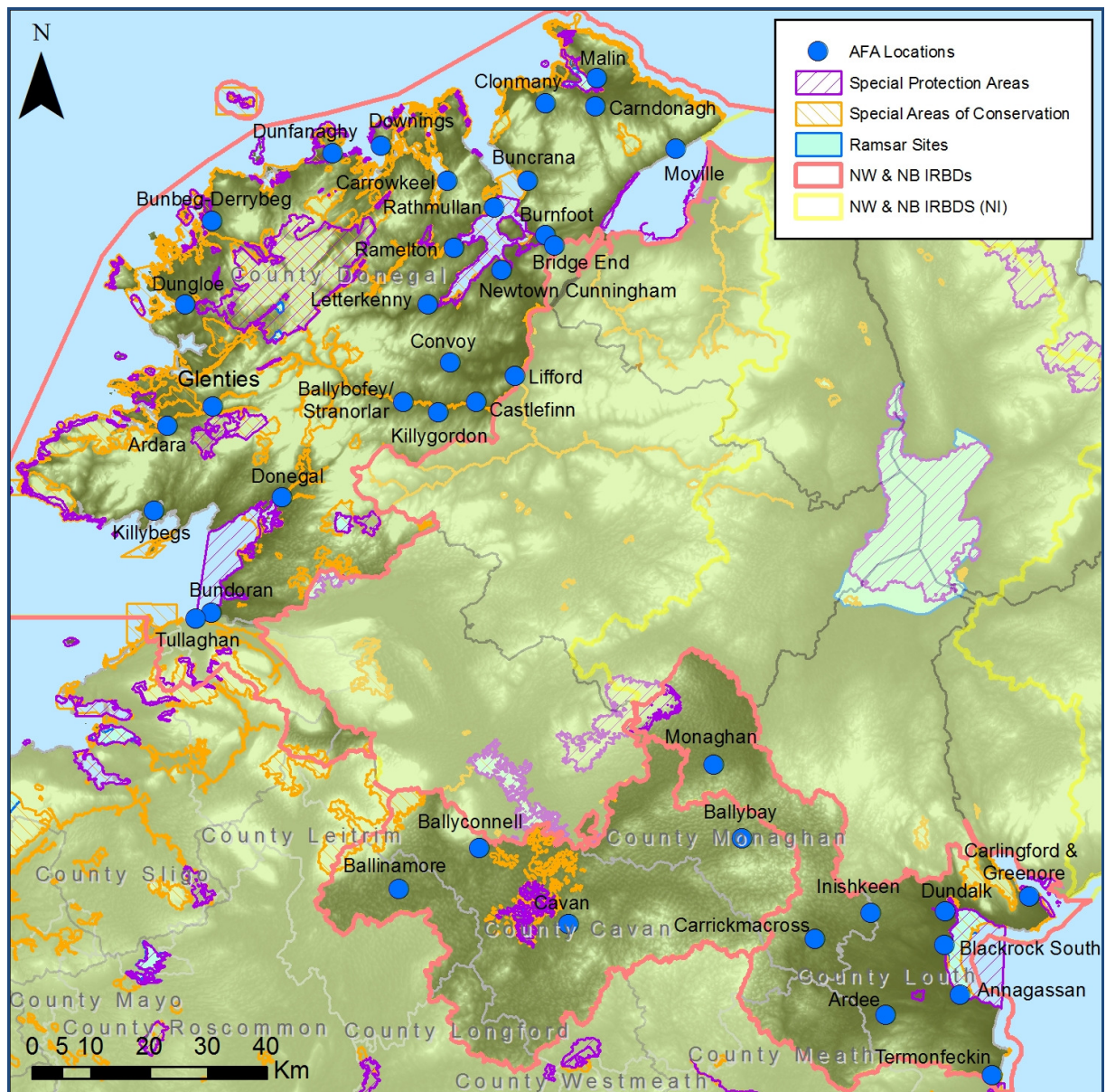
- OSPAR Marine Protected Areas (MPA) are sites identified under the OSPAR Convention to protect the marine environment of the North East Atlantic. Ireland has identified a number of its SACs as OSPAR MPAs for marine habitats. There are two OSPAR MPAs in the NW CFRAM study area and one in the NB CFRAM study area.

The biodiversity value of much of the NWNB CFRAM study area has been recognised, with a significant proportion of the catchment designated as of European or national importance. Some of the SAC and SPA designated areas are on or adjacent to estuaries, such as Donegal Bay, Lough Foyle and Dundalk Bay. The shallow mudflats and sandflats in these estuaries provide important feeding habitats for wintering waterfowl, and inshore islands such as Tory Island and Aran Island support populations of breeding seabirds. The River Finn has salmon and otter among its qualifying species.

Many of the inland environmental designations are for areas of bog or peatland, which are also important biodiversity assets. Intact bogs, which are actively forming peat, play a significant role in combating climate change by removing excess carbon dioxide from the air and placing it into long term storage for thousands of years. They purify water and reduce flooding by their capacity to absorb, hold and slowly release water. Conserving or restoring bogs is a positive action for climate change mitigation, water quality and flood relief.

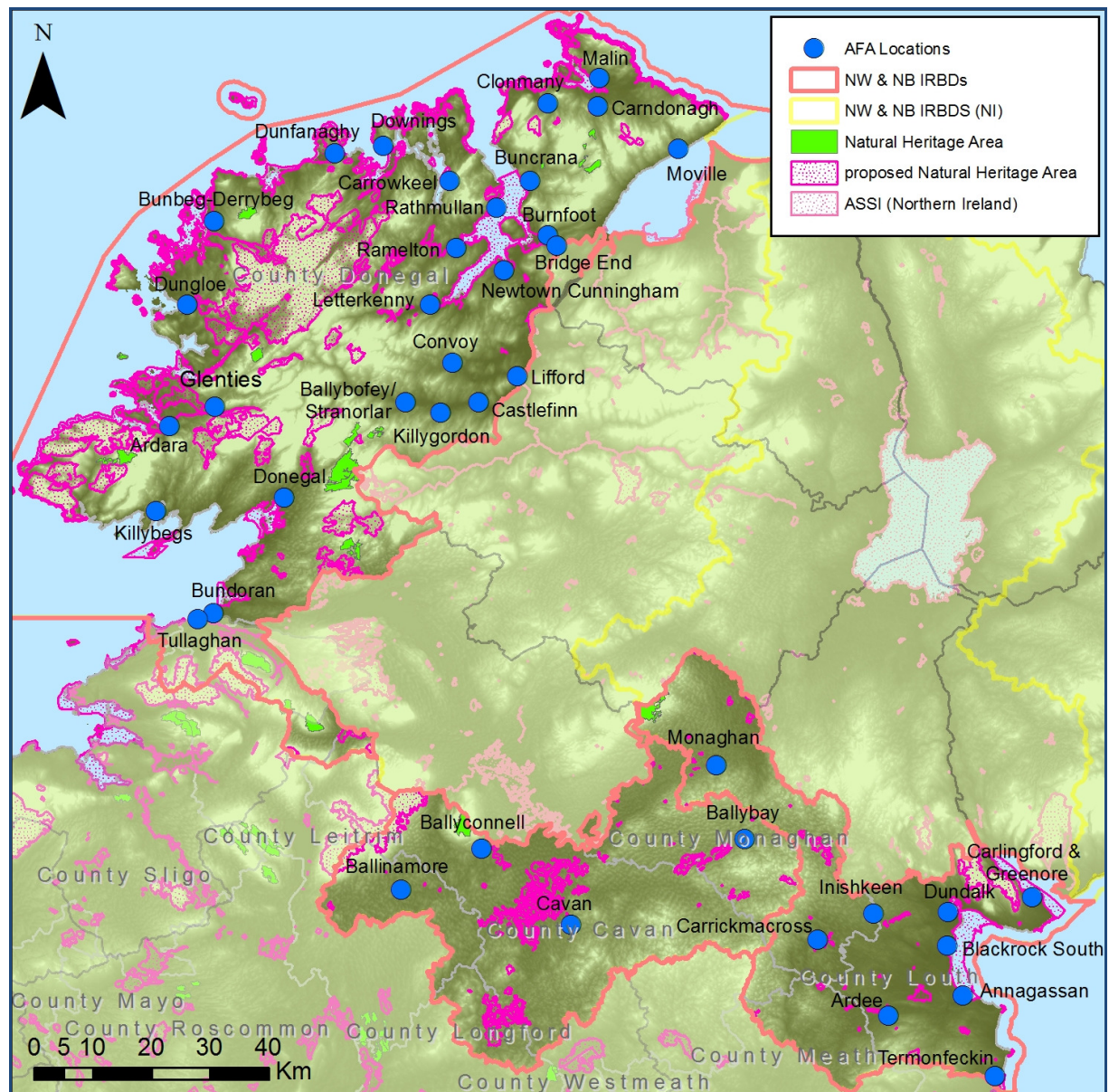
Non-native, invasive species are a particular threat to the native flora and fauna of NWNB CFRAM study area. Problematic areas are mainly river valleys, however coastal areas are also at risk from

species such as Hottentot Fig (*Carpobrotus edulis*), which is an aggressive invader of coastal habitat. As these non-native species could be spread by flooding or flood risk management measures, particularly plants, they therefore require appropriate mitigation and control strategies.



**Figure 6.1 International Environmental Designations**





**Figure 6.2 National Environmental Designations**

### ***Future Trends***

In the future, it is likely that there will be benefits to both protected sites and species, and the wider aquatic environment, with the implementation of measures to achieve good ecological status or potential under the WFD.

In addition, the continued development of specific biodiversity action plans under the National Biodiversity Plan and related plans should provide a framework for protecting these increasingly threatened habitats and species.

Changes in land use, such as increasing urbanisation, afforestation or changing agricultural practices, will continue to threaten biodiversity within the NWNB CFRAM study area, both within and outside of the designated sites.

**Key Issues**

- Consideration of effects of flood risk management measures on SACs, SPAs, NHAs, (including proposed NHAs) and other designated nature conservation sites within the NWNB CFRAM study area, in addition to those outside the study area that may be impacted by proposals within in;
- Where there is a potential risk to European Sites (SPAs and SACs) from the implementation of measures, it will be necessary to undertake appropriate assessment in accordance with the Birds and Natural Habitats Regulations to ensure that adverse impacts on these sites will not arise;
- Consideration must also be given to effects on flora and fauna, such as migratory bird species and invertebrates or sensitive habitats in areas which do not hold designations, to avoid habitat fragmentation or loss;
- Freshwater Pearl Mussel, Atlantic Salmon and Lamprey species are particularly sensitive to pollution and in-channel flood risk management measures. Other protected fish and shellfish species may also be affected by flood risk management measures;
- Changes to the flooding regime may have effects on sensitive habitats, e.g. bogs, fens, peatlands, limestone habitats or wetland areas;
- Changes to the flooding regime can adversely impact upon biodiversity, through nutrient enrichment, detrimental impacts on water quality, siltation and community changes;
- Implementation of flood risk management measures can also contribute towards the spread of invasive/non-native species if not properly managed.

**6.1.2 Population & Human Health**

The 2011 census data held by the Central Statistics Office (CSO, 2011) show a total population for the NWNB CFRAM study area of approximately 401,343, of which 253,675 are in the NW RBD and 147,668 are in the NB RBD.

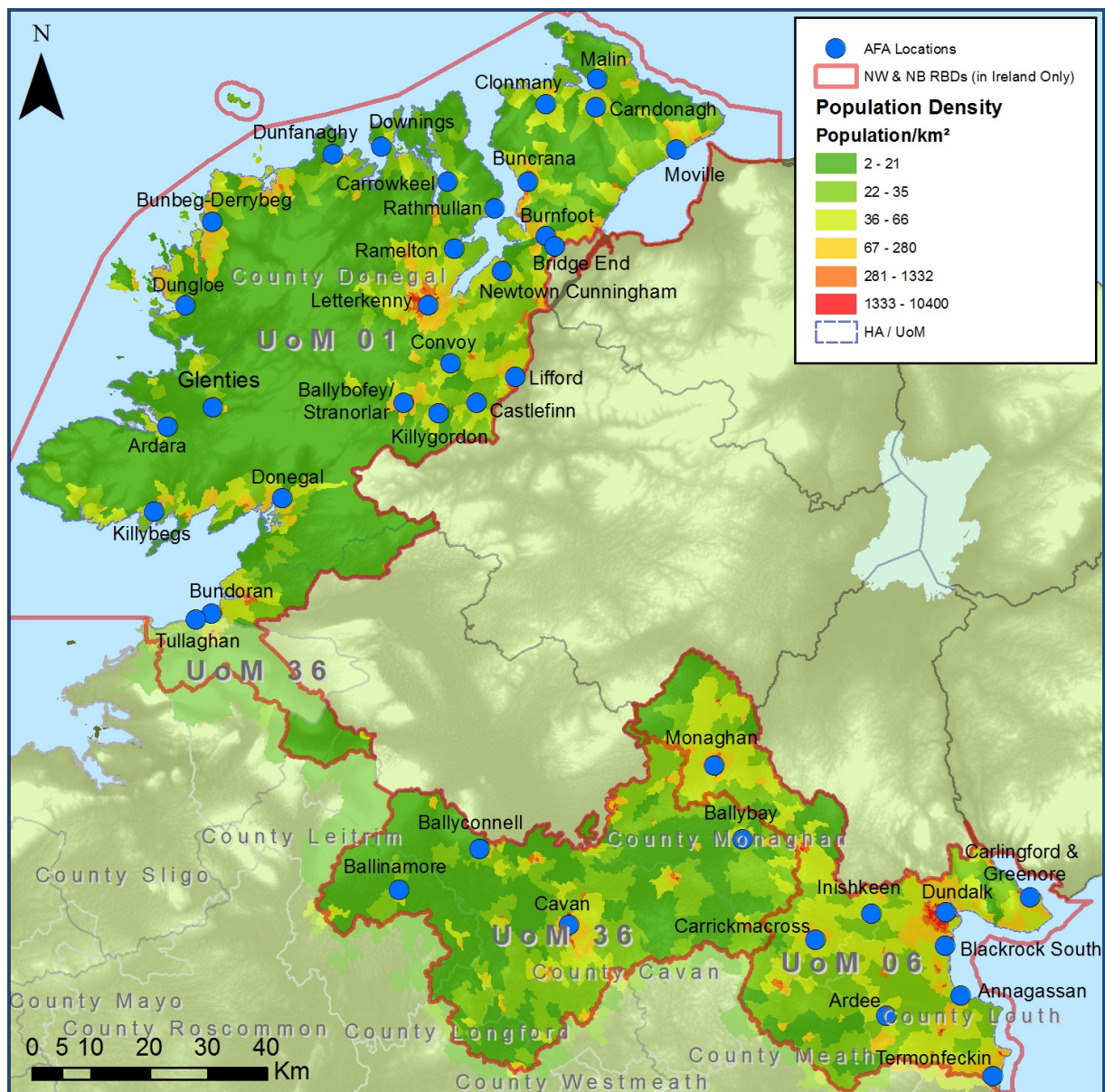
The NW RBD has a low average population density. Less than 2% of the land is urbanised and many people live in small villages or single dwellings. Most of the main urban areas are located beside rivers – Ballybofey, Cavan, Donegal Town and Letterkenny. The NB RBD has a greater population density than the NW but is still very rural in nature. The primary settlements include the towns of Dundalk, Monaghan, Ardee, Carrickmacross, Castleblaney and Ardee.

Population has increased in County Donegal by around 9.4% since the previous census in 2006, with Counties Cavan (+14.3) Monaghan (+8.0) and Louth (+10.5) also recording growth at or above the



national average (+8.1%) over the same period. The population density by Small Area for the NWNB CFRAM Study area is shown in **Figure 6.3** (CSO, 2011).

The 2011 census also revealed the high rates of emigration which have occurred during the economic downturn following the previous census, with a decrease of 12% since 2006 in the population of 19-24 year olds. The CSO confirmed that emigration plays a significant role in the diminishing young population, with around 30,000 young people aged between 15 and 24 leaving the country each year to seek work elsewhere. This has left behind a population with a higher proportion of aging (>65) people and particularly young people (<15) than elsewhere in Europe.



**Figure 6.3** Population Density (population/km<sup>2</sup>) by Small Area from 2011 Census



The population of pre-school children has increased by 18%, which is up 50% since the last census was conducted and a Eurostat report<sup>1</sup> quotes Ireland as currently having the highest proportion of under-15s in Europe, at 22%. The report speculates that the growing gap between old and young populations in the wider EU could result in labour market shortages and an increased burden supporting the remainder of the population.

The number of older people (aged over 65) has increased by 14% since the last census, and there are greater numbers of older people now living in nursing homes (20,000) and residential hospitals (5,000). The data has also showed a 7% increase in the number of young adults (19-24) living in the family home rather than moving out.

More detailed population figures from publications including the 2011 Census will be used to inform the baseline description of population in the SEA.

In terms of human health, impacts relevant to the SEA are those which arise as a result of interactions with environmental vectors (i.e. environmental components such as air, water, food or soil through which contaminants or pollutants, which have the potential to cause harm, can be transported so that they come into contact with human beings). Hazards or nuisances to human health can arise as a result of exposure to these vectors, for example from incompatible adjacent land uses. These issues are also discussed in the Soils, Geology and Land Use (6.1.3), Water (6.1.4) and Material Assets (6.1.7) sections.

### ***Future Trends***

The population trend within the NWNB CFRAM study area is generally one of increasing growth, broadly matching the national average growth through the last census period of around 8.1%, although some areas, such as County Cavan, are experiencing greater rates of up to 14%. There will be ongoing population pressure on infrastructure and resources and the provision of adequate health care resources for the expanding population, particularly in terms of the expansion of the aging and young populations that are not economically active.

### ***Key Issues***

- Ongoing population growth for all counties and cities within the NWNB CFRAM study area creating increasing pressures on water resources, e.g. quality of water supply for drinking water abstraction (including private supplies as well as municipal treatment) and waste water treatment;
- Interactions with public use of waterbodies (e.g. bathing, fishing, leisure craft, sailing, watersports);

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<sup>1</sup> Eurostat (2015) "What it Means to be Young in the European Union Today" Facts and Figures on Youth and Children in the EU

- Population centres in the NW and NB catchments tend to be located on the coast or by rivers.
- Certain invasive species (e.g. giant hogweed) can be harmful to human health (relationship with biodiversity).

### **6.1.3 Geology, Soils & Landuse**

The geology of the NW study area has a cover of glacial deposits of schist, quartzite and granite. A quartzite strip running northeast-southwest has resulted in ridges of mountains such as Errigal, Muckish and Crocknafarragh, due to its erosion resistant properties. Glacial inlets, such as Lough Swilly, characterise the northwest coast of the district. To the northeast of the district, Lough Foyle is formed in sedimentary rocks and has a long history of subsidence. Ancient metamorphic basement rocks dominate the northern portion of the district and younger Carboniferous and Triassic sandstones and mudstones occur to the east. Carboniferous and Devonian mudstones, limestones and sandstones form the majority of the southern portion including the area around the Lough Erne system. To the south east, older Ordovician/Silurian greywackes and mudstones occur. There is extensive coverage of superficial deposits, mainly glacial till, but also sand and gravels.

In the northern portion of the Neagh Bann study area, the landscape is dominated by drumlins that stretch across Monaghan and Louth and into Northern Ireland. Ordovician/Silurian greywackes and mudstones, intruded by younger granites, occur in the southern extents of the Neagh Bann study area. In the west, a variety of Devonian and Carboniferous mudstones, limestones and sandstones occur along with areas of Permo-triassic sandstones. There is extensive coverage of superficial deposits, mainly till but also sand and gravels.

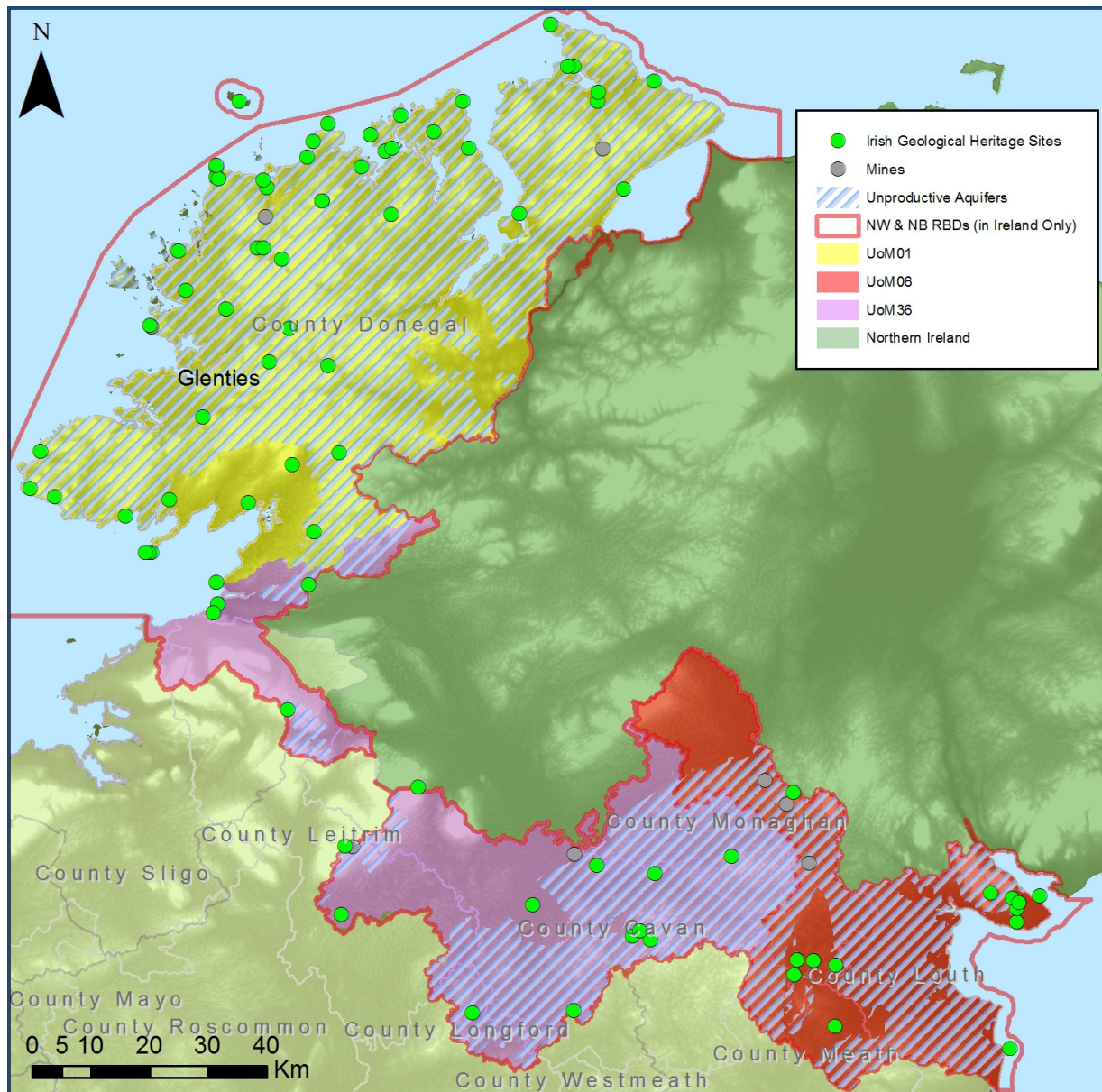
The SEA will consider published national data on important geological features. The GSI and the DAHG are currently identifying sites of geological interest across the country that will be proposed as Natural Heritage Areas. There have been 68 such sites identified so far within the NW study area and 13 in the NB, for features as diverse as drumlins, lamprophyres and mine workings.

There are five mines within the NW CFRAM study area, whose target minerals include coal, lead, talc and iron. The NB CFRAM study area has three mines, all in Monaghan, producing mainly lead but also recovering quantities of zinc, barium, silver and antimony.

**Figure 6.4** demonstrates the distribution of the Irish Geological Heritage sites, the mines and the areas of unproductive aquifers in the NWNB CFRAM study area. Poorly productive aquifer areas can indicate areas of reduced infiltration and rejected groundwater recharge, which may contribute to flood risk.

To date, there is no legislation in Ireland which is specific to the protection of soil resources. However, there is currently an EU Thematic Strategy on the protection of soil which includes a proposal for a Soil Framework Directive, including the proposal of common principles for protecting soils across the

EU. Soils have the potential to be impacted upon by implementation of flood risk management measures and will be considered by the assessment.



**Figure 6.4 Current Geological Heritage Sites, Mines and Unproductive Aquifers**

In terms of soils, gleys derived from mainly non-calcareous parent materials cover most of the North West river basin district. Blanket peat also covers significant parts of County Donegal, with large pockets also present in County Leitrim and County Cavan. There is wide distribution of podzols (peaty), lithosols and other peats, in addition to areas of outcropping rock throughout the County Donegal and smaller areas present in County Cavan. Acid brown earths and brown podzolics are present in significant areas along the Cavan/Monaghan border, in pockets along the west and north coastlines of Donegal (including the shores of Lough Swilly), as well as a significant area stretching from the heart of County Donegal to the Northern Ireland border and northwards to Lough Foyle.

Acid brown earths and brown podzolics also cover most of the NB CFRAM study area. Surface water and ground water gleys derived from non-calcareous parent materials are also distributed widely through the NB study area, particularly in the western and northern parts, as well as some areas of the south east near the coast. Shallow acid brown earths/ brown podzolics, lithosols, regosols, and some outcropping rocks are also distributed throughout the study area, while cutaway/cutover basin and blanket peats are located in western inland areas.

Land use directly affects the surface and groundwater environments through processes such as run off, infiltration and abstraction. The broad pattern of land cover in the NWNB CFRAM study area has been determined from the CORINE Land Cover Database (2012) from which it can be seen that the main land use types in the study area are agricultural lands (pastures, arable, etc.), however there are also significant areas of peat bogs. The classification of land cover within the study area, based on the CORINE mapping, is shown in **Table 6.2** and **Table 6.3** below.

**Table 6.2 Land Cover Area and percentage in the NBIRBD in CFRAM Study Area**

Description	Area (Km <sup>2</sup> )	% of NBIRBD (CFRAM)
Pastures	1,241	67
Non-irrigated arable land	232	13
Land principally occupied by agriculture	104	6
Intertidal flats	51	3
Discontinuous urban fabric	43	2
Peat bogs	36	2
Transitional woodland shrub	23	1
Complex cultivation patterns	21	1
Coniferous forest	17	1
Mixed forest	15	1

**Table 6.3 Land Cover Area and percentage in the NWIRBD in CFRAM Study Area**

Description	Area (Km <sup>2</sup> )	% of NWIRBD (CFRAM)
Pastures	2,838	38
Peat bogs	2,022	27
Land principally occupied by agriculture	940	12
Transitional woodland shrub	332	4
Coniferous forest	318	4
Moors and heathland	299	4
Water bodies	142	2
Sparsely vegetated areas	107	1
Intertidal flats	105	1
Discontinuous urban fabric	79	1

Agricultural and natural areas represent the main land-use within the NW CFRAM study area. The fertile Foyle basin and valley supports intensive and arable farming. In the Erne catchment the predominant land use is pasture, reflecting the rural nature of the catchment and subsequent reliance on livestock farming. Intensive farming mainly consists of beef, dairy, sheep and pig farming. The upland regions of the study area support coniferous forest plantations, as well as sheep and cattle grazing.

UoM01 is essentially rural, dominated by peat bogs, with pockets of forest in western upland areas and pasture to the east. There are several pockets of agricultural areas with significant natural vegetation across the area. UoM36 is also essentially rural, dominated by pasture and natural vegetation. There are pockets of peat bogs in the uplands to the north west and areas of forest, again mainly in the north west.

Drainage of bog lands and peat extraction activities potentially lead to large quantities of peat silt being discharged to the receiving waters in UoM01 and UoM36. The predominance of peat bogs and associated drainage of the land suggests that in general, the level of exposed soil is significant within the catchment and therefore sediment loss to watercourses could be an issue, particularly within AFAs to the north and west – Bunbeg/Derrybeg, Dungloe, Glenties, Ardara, Carndonagh and Malin.

The land use in the NB CFRAM study area is typified by improved pasture but also includes extensive arable farming, particularly in County Louth. To the northern extent of the study area, the landscape is dominated by drumlins. Agriculture is also the predominant land use in this area. There are pockets of peat bogs and coniferous forestry in upland areas surrounding Carlingford Lough and in Slieve Beagh in Co. Monaghan.

Overgrazing of soils in areas of commonage is a source of exposed soils washing into headwaters, increasing flashiness through more rapid run-off and erosion increased sediment load to rivers resulting in increased deposition downstream. Under the Water Framework Directive this pressure was identified as a potential risk to river morphological status in the national context, however is not thought to be a pressure in UoM01, UoM06 and UoM36. If an AFA is within a flashy catchment, this will be taken into account in the assessment of options and in the environmental report. Flashy catchments are characterised as responding very quickly to rainfall, with the flow of water rising rapidly to a high peak before receding similarly. The environmental report will provide hydrographs and descriptions, where necessary, of the characteristics that make the catchment flashy.

There are 22 areas of native woodland identified by the NPWS within the NW study area, covering an area of almost 12km<sup>2</sup>. There are also a further 11km<sup>2</sup> of ancient and long-established woodlands, many of which are in protected areas. In the NB study area, 106 areas of native woodland cover over 6km<sup>2</sup> with a further 6km<sup>2</sup> of ancient or long-established woodland identified by the NPWS.

### ***Future Trends***

Land cover is dominated by agricultural pastureland, with urban areas making up a very small proportion of the study area. While it is unlikely that the general pattern of land use will be substantially

changed in the future, the increasing population will continue to drive a requirement for new housing and expansion of developed areas.

Increases in population pose pressures on agriculture to increase productivity, which coincides with the Irish agricultural industry also aiming to provide more goods to the global market. Land drainage to improve soil quality may have effects on flood risk by increasing the speed at which water reaches the main arterial river networks.

### ***Key Issues***

- Effects of changes in the flooding regime on land vulnerable to erosion;
- Effects of changes in the flooding regime on rates of coastal erosion; waterlogged sands lose their cohesive properties and area at much greater risk of erosion;
- Influence of changes in flooding regime on land use practices (e.g. fertiliser application) or soil quality/productivity;
- Effects on geomorphology such as river channels and landforms;
- Flood management options under consideration in the FRMPs include non-structural options such as planning control and land use management. Publication of the FRMPs may result in the zoning of lands for particular land use practices for the purpose of preventing or protecting against flooding. Changes in land use zoning may reduce land values by limiting development potential;
- Appropriately managed pasture, rough semi-natural vegetation, wetlands (including peat bogs) and forestry/woodland can all assist in the attenuation and storage of rapid surface runoff and floodplain flows upstream of flood risk receptors;
- The targeted use of appropriate agri-environment scheme agreements could be used for multiple benefits, including flood management and biodiversity gains;
- Natural flood storage and attenuation areas on floodplains including wetlands, should be protected from development pressures;
- Effects of changes in the flooding regime on access to land, many areas have been “cut off” by floods in the past.

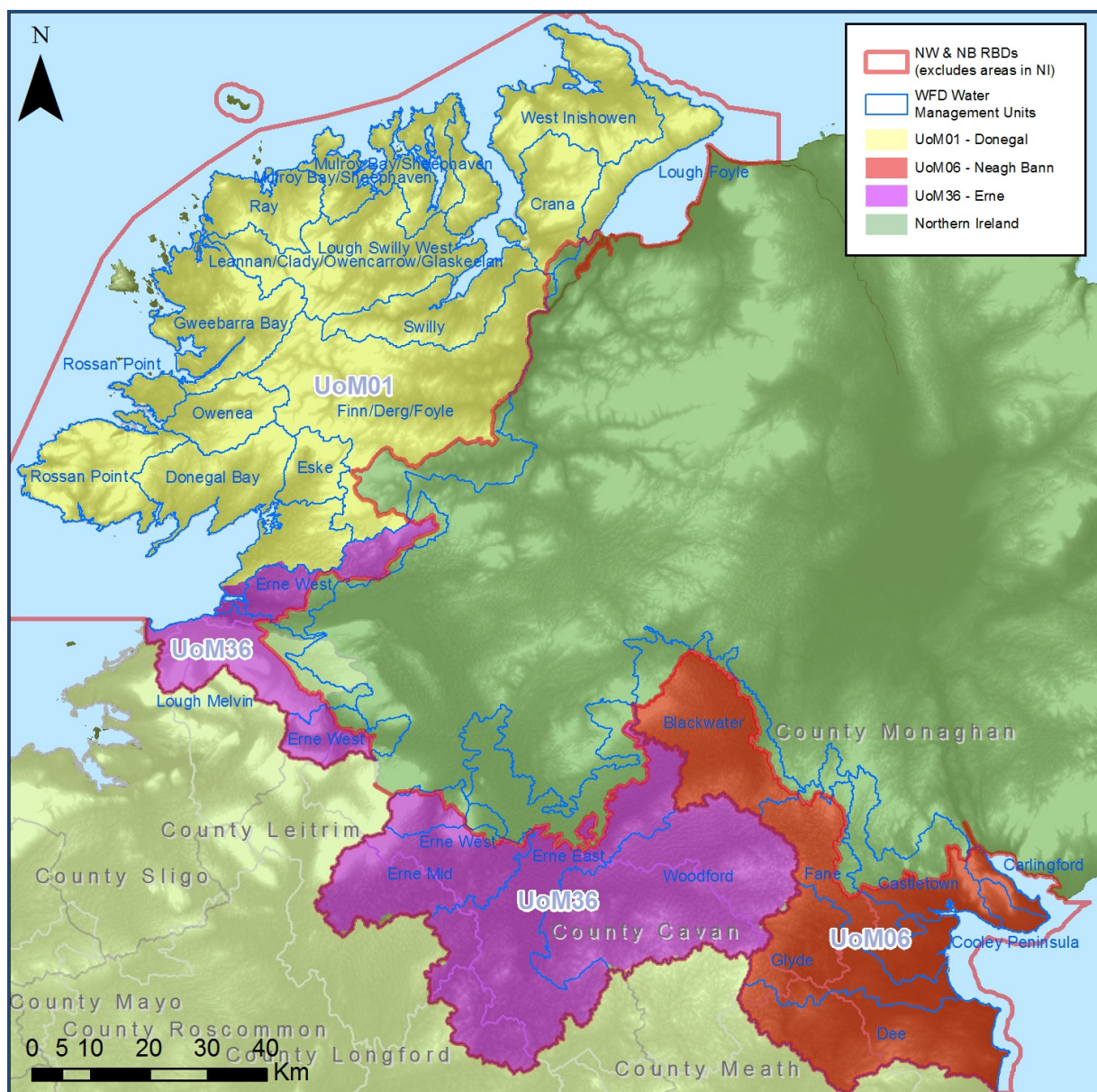
#### **6.1.4 Water**

The NWNB CFRAM study area includes three Units of Management (UoM). The UoMs constitute major catchments / river basins (typically greater than 1,000km<sup>2</sup>) and their associated coastal areas,



or conglomerations of smaller river basins and their associated coastal areas. The NWIRBD includes two UoMs in Ireland, UoM 01 (Donegal) and UoM 36 (Erne). The NBIRBD covers one single UoM in Ireland, UoM 06 (Neagh Bann). There is historical evidence of a high level of flood risk within certain areas of the NWNB CFRAM Study areas, with significant coastal and fluvial flooding events having occurred in the past.

The NWNB CFRAM study area coincides with the areas of the NWIRBD and NBIRBD within Ireland. These two districts were delineated under the WFD to enable the management of water resources to be undertaken on a catchment-wide basis in accordance with the Directive. **Figure 6.5** demonstrates how the Water Management Units in Ireland, designated for the NWIRBD and NBIRBD under the WFD, fit into the UoMs / HAs are being adopted for the NWNB CFRAM study.



**Figure 6.5 NW & NB RBDs, UoMs and Water Management Units**

The NW and NB River Basin Management Plans (RBMP) (2009-2015) were developed to satisfy the requirements of the WFD and have classified all waterbodies according to their chemical, biological and hydromorphological status ranging from bad to high, based on monitoring data collected between 2007 and 2009. The RBMPs aim to protect all waters within the district, improve all waters so that they reach 'Good Ecological Status' by 2015 (where technically feasible) and avoid any deterioration in status. Extended deadlines to achieve good status, to either 2021 or 2027, may be needed in some areas due to technical, economic, environmental or recovery constraints. The most recent status of waterbodies within the catchment area, released by the EPA in 2011<sup>2</sup>, are summarised below and shown in **Figure 6.6**.

- **Rivers:** The NW study area includes 705 rivers and canals in the district of which the principal rivers are the cross border Foyle (draining much of the mountains of Donegal and the Sperrins) and Erne (draining parts of Cavan, and Monaghan) and the Swilly (draining parts of Donegal).

River Water Bodies		
NW	NB	
704	95	Total No of RWB
102	0	High Eco Status
287	24	Good Eco Status
166	25	Moderate Eco Status
144	46	Poor Eco Status
5	0	Bad Eco Status

There are 96 rivers and canals in the NB study area. The principal river system is the Blackwater, which drains to the Neagh Bann system in Northern Ireland. Smaller basins include the Castletown, Fane, Dee and Glyde rivers.

- **Lakes:** There are 226 lakes in the NW study area. The main lakes are Lough Melvin (22 km<sup>2</sup>) Lough Oughter (13km<sup>2</sup>) and Lough Gowna (13 km<sup>2</sup>); the district also includes Upper Lough Macnean (7 km<sup>2</sup>), Lower Lough Macnean (4 km<sup>2</sup>) and Lough Veagh (2 km<sup>2</sup>).

Lake Water Bodies		
NW	NB	
230	17	Total No of LWB
60	2	Good Eco Status
58	10	Moderate Eco Status
100	4	Poor Eco Status
7	1	Bad Eco Status
5	0	Unassigned Eco Status

The NB study area has 17 lakes, of which the main lake is Lough Muckno (almost 4 km<sup>2</sup>) east of Castleblayney. Other lakes include Emy Lough (0.5km<sup>2</sup>), Lough Brackan (0.1km<sup>2</sup>) and Glaslough Lake (0.2km<sup>2</sup>).

<sup>2</sup> Updated results from the 2009-2015 monitoring cycle are anticipated to be published in August / September 2015. This data will be used in the SEA when it becomes available.



- Transitional and Coastal Waters:** The NW study area includes 2,500 km<sup>2</sup> of marine waters, mostly off County Donegal, but including small sections of coastline in Counties Leitrim and Sligo. The marine waters include 22 estuaries and 23 coastal waters. Major features include many islands, headlands and inlets, Donegal Bay and the Erne, Swilly and Foyle estuaries.

Transitional Water Bodies		
NW	NB	
22	9	Total No of TWB
5	0	High Eco Status
2	0	Good Eco Status
9	9	Moderate Eco Status
6	0	Poor Eco Status
0	0	Bad Eco Status
6	0	Unassigned

In the NB, marine waters include 9 estuaries and 4 coastal waters and account for just over 200 km<sup>2</sup>. The Newry River Estuary flows into the Irish Sea at Carlingford Lough and the Ballymascanlan and Castletown estuaries meet the Irish Sea at Dundalk Bay

Coastal Water Bodies		
NW	NB	
23	4	Total No of CWB
6	0	High Eco Status
2	1	Good Eco Status
7	2	Moderate Eco Status
8	1	Unassigned

- Groundwaters:** There are 72 groundwater bodies in the NW study area ranging in size from less than 1 km<sup>2</sup> to over 1,440km<sup>2</sup>. The district's more productive aquifers, that contribute approximately half the flow in surface waters, are located in south Donegal, Sligo, Leitrim, Cavan, along with some limestone associated with the Erne system and sandstone aquifers. There are also a number of gravel aquifers that are fairly significant throughout the district, particularly in Donegal, such as the Swilly gravels. Elsewhere, the remaining aquifers are not deemed to be very productive but all have the potential to yield water, and will on average contribute about a third of river flow (mainly from the more weathered zone at the top of the bedrock). Therefore, these aquifers also have an important role to play in management of the district's waters.

Groundwater Water Bodies		
NW	NB	
72	28	Total No of GWB
72	26	Good Overall Quality
0	2	Poor Overall Quality

There are 28 groundwater bodies in the NB study area ranging in size from less than 1 km<sup>2</sup> to over 300 km<sup>2</sup>. In the south and west of the District, including the areas adjacent to Carrickmacross and Monaghan, permeable rocks and soils allow groundwater to be stored in underground aquifers,

but most of the District has rocks and mixed clays that hinder water seepage.

- **Artificial Waters:** Seven surface waters in the NW study area have been heavily modified for such uses as navigation (for example ports), water storage, public drinking-water supply, flood defence or land drainage. These are Lough Salt, Loughs Nacung, Dunlewy and Assaroe, two stretches of the River Erne, and Killybegs harbour.

In the NB study area, the Clady headrace canal and parts of the Shannon Erne waterway have been designated as heavily modified water bodies. These modified and artificial waters provide important uses and benefits to society, which cannot be replaced by other means and need to be retained. Therefore, these waters are subject to a different set of objectives.

It can be seen in **Figure 6.6** that the majority of the good and high status waterbodies are in UoM01, particularly around the Derryveagh Mountains and other rural areas of County Donegal.

All of the activities in the study area have the potential to impact water quality or quantity and therefore must be sustainably managed. The majority of the study area is generally used for agriculture (principally pasture land) but there is a significant proportion of peat bog also.

According to the most recent status results from the EPA, issued in 2011, 55% of rivers and 51% of lakes in the NW CFRAM study area are in satisfactory condition, with high or good ecological status. In the NB CFRAM study area, over 51% of rivers and 70% of lakes achieved high or good status.

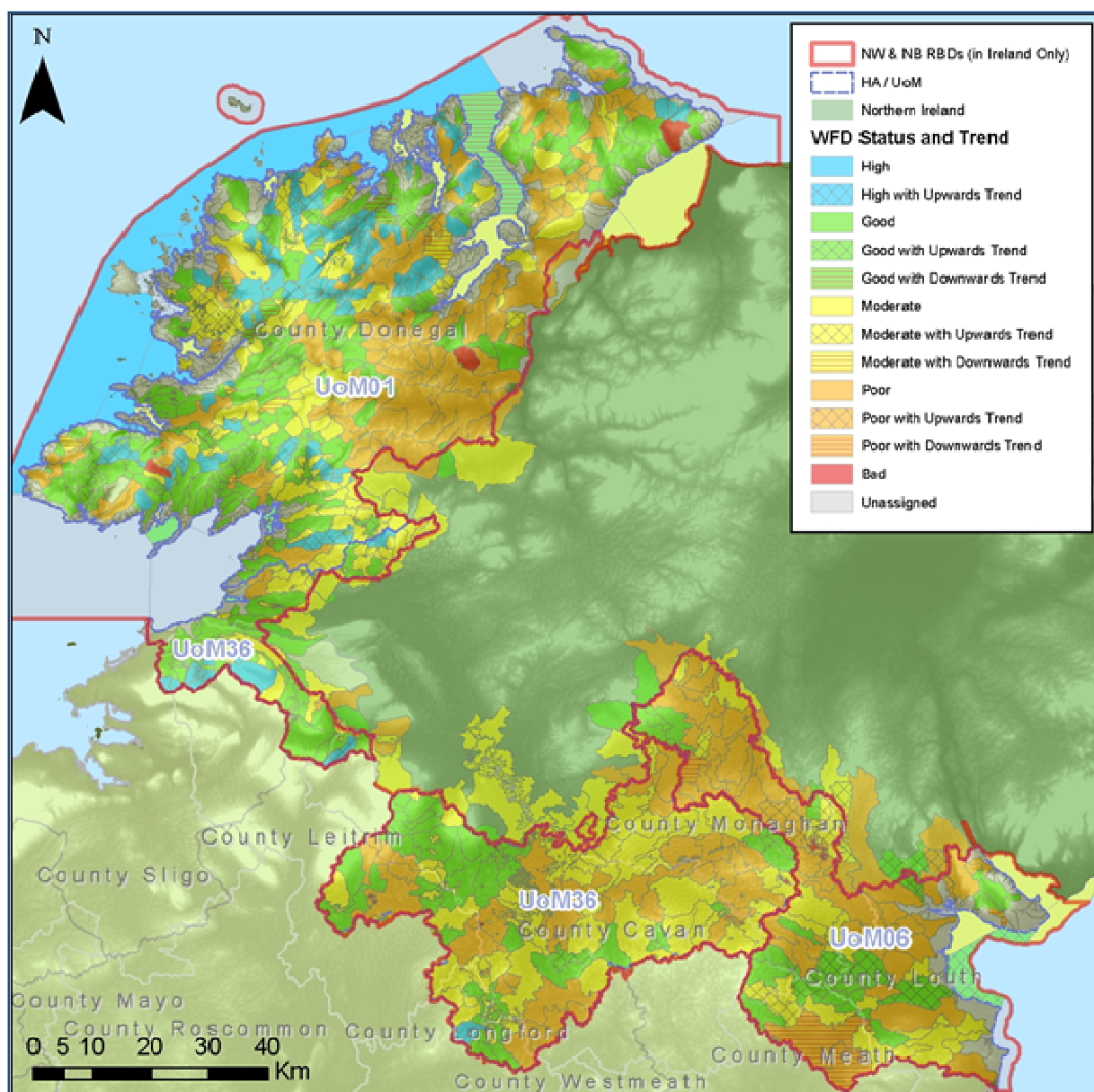
As part of the WFD work programme, the EPA identified 220 river waterbodies and 36 lakes in the NW CFRAM study area that were predicted to be at risk of failing to achieve the required standards of the WFD at the completion of the 2009-2015 monitoring cycle. A further 42 rivers and 17 lakes were assessed as “probably at risk” of failing to achieve good status.

In the NB CFRAM study area, 62 river waterbodies and five lakes were predicted to be at risk of failing to achieve good status. A further nine rivers and nine lakes were assessed as probably at risk.

Five out of the 23 coastal waterbodies in the NW CFRAM study area and one out of the four in the NB CFRAM study area were considered to be at risk of failing to meet target objectives. Six transitional waterbodies, out of a total of 22 in the NW CFRAM study area were also predicted to be at risk. In the NB CFRAM study area, four out of the 9 transitional waterbodies were predicted to be at risk, with a further two probably at risk. The distribution of all at risk or probably at risk waterbodies is shown in **Figure 6.7**.

**Figure 6.6** also demonstrates that in the mid-cycle monitoring round undertaken in 2011, 38 river waterbodies in the NW CFRAM study area were observed to be on an upwards trend, improving water quality since 2008, however 25 were identified as trending downwards, which represents an increased

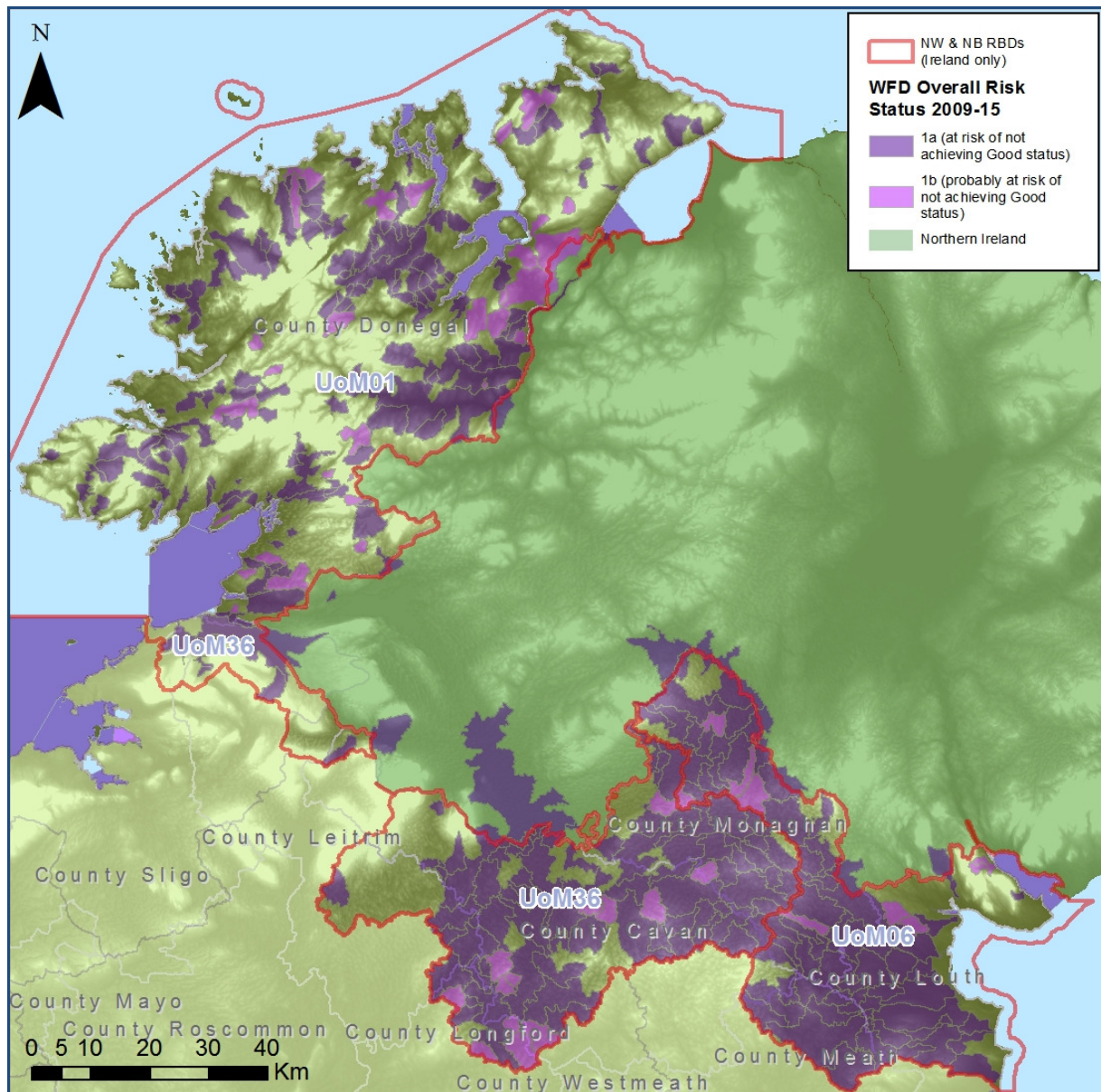
risk of failing to meet WFD objectives of maintaining or improving status by the end of the monitoring cycle. In the NB CFRAM study area, 11 river waterbodies were observed to be on an upwards trend, improving water quality, however five were identified as trending downwards.



**Figure 6.6 Current WFD Status (published 2011) of NW & NB RBD Waterbodies**

Certain rivers were designated under the EU Freshwater Fish Directive (78/659/EEC) (transposed into Irish law under S.I. No. 293/1988 - European Communities (Quality of Salmonid Waters) Regulations, 1988) as “salmonid waters”. The objective of this designation type was for the maintenance of water quality for salmon and trout freshwater species. The Freshwater Fish Directive has now been subsumed into the Water Framework Directive; however salmonid rivers remain on the register of protected areas. As there is the potential for transboundary impacts from implementation of the FRMPs, potential impacts on salmonid waters in Northern Ireland will also be considered in the SEA. Salmonids are discussed further in **Section 6.1.11** and rivers designated for salmonids in the NWNB

CFRAM study area and those in the NWIRBD and NBIRBD in Northern Ireland are shown in **Figure 6.8**.



**Figure 6.7 Distribution of Catchments at risk of not meeting WFD Objectives**

Within the NW CFRAM study area there are 68 water treatment plants, 54 Urban Waste Water Treatment locations, 9 registered landfill sites and 22 Industrial Emission Directive (IED) sites. The NB CFRAM study area has 17 water treatment plants, 24 Urban Waste Water Treatment locations, 2 registered landfill sites and 14 Industrial Emission Directive (IED) sites. Flooding of these potentially contaminative sites has the potential to generate new pathways for pollutants to reach rivers and other waterbodies and result in failure to achieve WFD objectives. Flooding of smaller, more localised sites, such as septic tanks and small wastewater treatment plants can also have an adverse impact. A programme of improvement and upgrade to secure safe water supplies is underway to identify and remedy non-complying septic tanks. The Water Services (Amendment) Act 2012 means that all on-site

septic tank systems or domestic wastewater treatment systems now have to be registered, with an Inspection Plan being devised which should lead to water quality improvements.

More diffuse pollution pressures can also impact on water quality, for example flooding of agricultural land can introduce nutrients to rivers, such as through washing off slurry applied to fields. Forestry operations and peat cutting in upper catchments can also adversely impact on water quality.

The Seveso III Directive (2012/18/EU) is concerned with the prevention of major accidents that involve dangerous substances and the limitation of their consequences for humans and the environment. It applies to establishments where dangerous substances are produced, used, handled or stored. The Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (the "COMAH Regulations") implement this Directive in Irish law. Consideration must be given to these sites and the potential for pollution events arising from flooding.

Hydrogeomorphology refers to the interacting hydrological, geological and surface processes which occur within a watercourse and its floodplain, while river continuity is primarily an environmental concept relating to the linear nature of the river eco system and its disruption due to manmade structures such as weirs and dams which alter river flow and can impede fish migration. Morphological pressures have been given consideration under the WFD. As well as catchment based morphological pressures, localised morphological alterations can have an impact on channel capacity and the structural integrity of flood defences due to the effects of scour from high sediment loads within rivers, e.g. known areas of bank erosion within AFAs can undermine existing channel structures. The impact of hydrogeomorphological changes in the NWNB CFRAM study area ultimately applies to the performance of flood risk management options. Any morphological issues identified during field surveys for the hydrological modelling will be incorporated into the environmental assessment.

In the national context, UoM01 is a relatively high slope, high energy system due to the mountainous landscape, particularly resulting from small steep coastal catchments. There are also larger river systems further inland, consistent with the lowland meandering type such as the River Finn. There is a predominance of step-pool-cascade and bedrock channels in the mountainous areas to the west of County Donegal with lower lying areas to the east characterised by pool riffle and lowland meandering channels. The eastern portion of UoM36 is a relatively low slope, low energy system with predominance of inland low slope lowland meandering channels. In contrast, the western portion of UoM36 is generally characterised by relatively steep, step pool cascade channels consistent with the upland areas to the west of Ireland.

UoM06 is a relatively low slope, low energy system with a predominance of inland low slope lowland meandering channels, flanked by steeper pool riffle channels to the west and north east where lands of higher altitude progress towards low lying flatter lands both to the north in County Armagh and at the Louth coast.

A further consideration in UoM01 and UoM36 is the potential effect of arterial drainage on watercourse channel and floodplain geomorphology. The OPW have used the Arterial Drainage Acts to implement



various catchment wide drainage and flood relief schemes. Arterial drainage scheme works may consist of dredging of the existing watercourse channels, installation of field drains / drainage ditches and the construction of earthen embankments using dredged material to protect agricultural land. The effect of arterial drainage within UoM01 relates to the River Swilly in Letterkenny and the River Skeoge in Burnfoot/Bridgend. Both schemes involved river widening and deepening and construction of flood embankments. The long term effect of the scheme is land improvement, with some secondary increases in channel conveyance for lower AEP event flows. Within UoM36, Ballinamore, Ballyconnell and Cavan AFAs are located within catchments that have been extensively arterially drained in the past. These schemes are all termed "Drainage Districts" which means that the drainage works were undertaken before the introduction of the Arterial Drainage Act in 1945, usually by local drainage boards for agricultural purposes. They do not fall under the OPW's remit for channel maintenance in terms of channel capacity for flood flow conveyance and in most cases they have re-naturalised as a result. In terms of sedimentation of rivers, the initial drainage schemes have had the long term effect of making river courses more susceptible to bed and bank erosion in high flow conditions and resulting siltation, due to the removal of natural gravels and bank vegetation. However in the case of historical drainage districts, the lack of systematic and programmed maintenance has allowed re-naturalisation of channels.

Within UoM06, Monaghan, Carrickmacross, Annagassan and Ardee are AFAs within catchments that have been extensively arterially drained in the past. The Glyde and Dee Arterial Drainage Scheme took place between 1950 and 1957 and was a pilot drainage scheme implemented shortly after the 1945 Arterial Drainage Act. It benefited 10,643 hectares of land in terms of drainage for agricultural use. The Monaghan Blackwater Scheme was a smaller more recent scheme that took place between 1984 and 1992 benefitting 2,367 hectares of land. Historical drainage has also been undertaken within Dundalk. In terms of sedimentation of rivers, the initial schemes have had the long term effect of making river courses more susceptible to bed and bank erosion in high flow conditions and resulting siltation. This was due to the removal of natural gravels and bank vegetation. However this impact is more of a consideration in the Glyde and Dee Scheme since it was one of the first to be carried out. Environmental practices evolved over time such that the Monaghan Blackwater Scheme is likely to have had less impact in this regard. Whilst the initial works took place historically, maintenance activities have since been required to maintain channel capacity by removing silt and debris build up, typically every six years. Maintenance works in itself can be a source of sediment loss if bank vegetation and river buffer zones are not protected. However the OPW now employ comprehensive environmental drainage maintenance practices which minimise the risk of sediment loss in light of the Water Framework Directive and other related legislation whilst still fulfilling their statutory duties under the Arterial Drainage Act to maintain channel conveyance capacity from a flood risk perspective.

### ***Future Trends***

The implementation of the measures as required by the WFD, together with other national water legislation (e.g. Urban Waste Water Treatment Regulations 2001 (S.I. No. 254 of 2001) as amended 2008 and the European Union (Good Agricultural Practice for Protection of Waters) Regulations 2014

(S.I. No. 31/2014), should bring about improvements in the water environment into the future. The EPA Code of Practice for Wastewater Treatment Systems and Disposal Systems (EPA, 2010) serving Single Houses will be applied to all new developments to help protect the water environment.

### **Key Issues**

- All strategic flood risk management options being proposed should fully consider any WFD implications and, wherever possible, link to and support the programme of measures in the NW and the NB RBMPs to improve ecological status of water bodies;
- Flooding of key water supply and water treatment facilities would present a pollution risk with associated impacts on human health, water quality and ecology; however flood risk management may provide opportunities to improve water quality;
- Morphological impacts on water bodies from engineering and other works; e.g. the Clady river along with Loughs Nacung (Upper and Lower) and Dunlewy are heavily attenuated by an ESB dam structure.
- Licensed abstractions and discharges should not be affected by strategic flood risk management options;
- Group Water Schemes and private wastewater treatment systems, where poorly installed, operated or maintained, can be a threat to water quality. Flood risk management options should ensure that water quality is not compromised further;
- The effects of upstream storage on water quality in downstream catchments should be considered.

### **6.1.5 Air**

The Air Quality Standards Regulations 2011 (S.I. No. 180/2011) make provisions for the implementation of Directive 2008/50/EC on ambient air quality and cleaner air for Europe. The EPA is the competent authority in Ireland for the implementation of the regulations.

Under the Clean Air for Europe (CAFE) Directive, EU member states must designate "Zones" for the purpose of managing air quality. In Ireland, four zones have been defined in the Air Quality Standards Regulations for the purpose of air quality assessment and air quality management. These are:

Zone A: Dublin

Zone B: Cork

Zone C: 24 named cities and large towns.

Zone D: Rural Ireland, i.e. the remainder of the State excluding Zones A, B and C.

The NW CFRAM study area encompasses one Zone C area, Letterkenny, and the NB also encompasses one Zone C area, Dundalk. The remainder of the study area is Zone D.

There are two air quality monitoring sites within the NW CFRAM study area, neither of which are currently active<sup>3</sup>. There are also two European Monitoring and Evaluation Programme (EMEP) monitoring sites, one at Malin Head and one (now decommissioned) at Glenveagh Co. Donegal. The NB CFRAM study area has eleven air quality monitoring sites, of which three are not currently active. There are no EMEP sites in the NB study area.

Overall, air quality in Ireland compares favourably with other EU Member States<sup>4</sup> and all measured values of the principal pollutants are currently all below limit and target values set out in the CAFE Directive. However, when the parameters are compared to the tighter World Health Organisation (WHO) Air Quality Guideline values, it highlights some potential issues. Ireland is above these guideline values with respect to PM<sub>10</sub>, PM<sub>2.5</sub>, ozone and PAH. This may have important implications for Ireland in the future, if the WHO guideline values are adopted as limit values by the EU.

The implementation of strategic CRFAM measures will not influence air quality in themselves; however implementation of flood risk management measures has the potential to impact on air quality, particularly during construction (albeit impacts are likely to be localised and minor due to exhaust emissions from construction vehicles and dust dispersion). Any flood risk management schemes arising from the FRMPs will be subjected to the proper planning controls, including environmental assessment as necessary.

As mentioned in **Table 3.1**, due to the lack of potential issues with Air, and in line with all other CFRAM studies in Ireland, the Air topic is proposed to be scoped out of the SEA process and will not be assessed within the environmental report.

### 6.1.6 Climate

Within the NW region of Ireland, annual average air temperatures (measured at Malin Head, Co. Donegal) 1981-2010<sup>5</sup> were around 9.8°C, with an average of 3.5 hours sunshine per day. Mean annual rainfall over this period was 1,076 mm, with an average of 70 days per year when rainfall amounts exceed 5mm. Within the NB region, annual average air temperatures (measured at Clones,

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<sup>3</sup> National Ambient Air Quality Network information page <http://www.epa.ie/air/quality/data/#.VciRrJNRaVA> (accessed 10/08/2015)

<sup>4</sup> EPA (2014) "Air Quality in Ireland 2013 - Key Indicators of Ambient Air Quality"

<sup>5</sup> Met Eireann (2015) 30 Year Averages <http://www.met.ie/climate-ireland/30year-averages.asp> (accessed 14.09.2015)



Co. Cavan) 1981-2010<sup>6</sup> were around 9.4°C, with an average of 3.3 hours sunshine per day. Mean annual rainfall over this period was approx. 960mm, with an average of 64 days per year when rainfall amounts exceed 5mm. Rainfall patterns are typical of what might be expected in terms of wind patterns and topography.

Areas located in the southern and western portions of the NWNB CFRAM Study area have higher rainfall figures than those to the north and east. The catchments to the west are generally located on higher ground and receive the highest levels of rainfall. Prevailing weather patterns generally move from the southwest to the northeast.

According to the United Nations Intergovernmental Panel on Climate Change (2007) there is “unequivocal” evidence of climate change and furthermore:

*"most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations."* (Climate Change 2007, IPCC, Fourth Assessment Report AR4).

Further to this carbon dioxide levels in the atmosphere were observed at over 400 parts per million in Hawaii. This is considered a milestone threshold and is at a level last thought to have occurred several million years ago when the arctic was ice free and sea levels were up to 40m higher.

It is likely that climate change will have a considerable impact on flood risk in Ireland, with sea level rise already being observed and it is anticipated that there will be wetter winters across the island. These potential impacts could have serious consequences for Ireland, where all of the main cities are on the coast and many of the main towns are on large rivers. While there is uncertainty associated with many aspects of potential climate change and its impacts on flood risk, it would be prudent to take the potential for change into account in the development of Flood Risk Management policies and strategies and the design of Flood Risk Management measures.

The effects of climate change on flood risk management are obvious but in terms of fluvial flooding they are not straightforward to quantify. Changes in sea level have direct impact on coastal flooding and a range of predictions on projected rises are available. A number of meteorological projections are also available for changes in rainfall but these have a wide degree of variance particularly from season to season and are difficult to translate into river flow.

Research into climate change in Ireland is coordinated by Met Éireann through the Community Climate Change Consortium for Ireland ([www.c4i.ie](http://www.c4i.ie)). Research summarised in the report ‘Ireland in a Warmer World – Scientific Predictions of the Irish Climate in the 21st Century’ (Mc Grath *et al*, 2008) seeks to quantify the impact of climate change on Irish hydrology and considers the impacts of nine Irish catchments. The ensemble scenario modelling from the regional climate change model predicts

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<sup>6</sup> Met Éireann (2015) Malin Head Averages <http://www.met.ie/climate-ireland/1981-2010/malin.html> accessed 14.09.2015

that between the two periods of 1961 – 2000 and 2021 – 2060 that Ireland is likely to experience more precipitation in autumn and winter (5 – 10%) and less precipitation in summer (5 – 10%). Between the periods of 1961 – 2000 and 2060 – 2099 this trend is likely to continue with increases of 15 – 20% generally, but up to 25% in the northern half of the country in autumn and drier summers of up to 10 – 18%.

Research from c4i indicates that sea levels around Ireland have been rising at an annual rate of 3.5mm per year for the period 1993 – 2003 which is higher than the longer term rate of 1.8mm per year for the period 1963 – 2003. This trend is likely to be more modest in the Irish Sea with a 'net trend' (allowing for isostatic adjustment of the earth's crust) of 2.3 – 2.7mm per year. On top of this the report notes that storm surges are likely to increase in frequency.

Predictions for sea level rise in Ireland are based on the most recent UK Climate Projection tool (UKCP09) which puts the central estimate of relative sea level rise at Belfast (to the east and north of the NWNB CFRAM study area) for the year 2095, at 31.6cm, based on a medium emissions scenario. The central estimate of a high emissions scenario for 2095 is 40.3cm, but the predictions range from approximately 10cm to 70cm. The relative sea level rise detailed in UKCP09 allows for vertical land movement (isostatic adjustment) based on estimates taken from 'Glacial isostatic adjustment of the British Isles: New constraints from GPS measurements of crustal motion' (Bradley *et al*, 2008).

### ***Future Trends***

The predicted impacts of climate change are likely to include:

- Increases in the frequency and intensity of rainfall;
- Increases in peak flows;
- A rise in sea levels and increased storminess;
- Increases in urbanisation;
- Implementation of, or lack of, the strategic CFRAM measures is not expected to affect future climate trends.

### ***Key Issues***

- There is a strong likelihood of increased fluvial and coastal flooding resulting from the effects of climate change;
- The carbon footprint of flood risk management options should be a consideration during their development.

### 6.1.7 Material Assets

Resources that are valued and that are intrinsic to specific places are called 'material assets'. Material Assets that will be considered by the SEA, due to their potential for interaction with flood risk management, include:

- Drinking water infrastructure;
- Waste water infrastructure;
- Waste infrastructure;
- Roads and Transport infrastructure;

The NW CFRAM study area has over 10.9km of designated river waterways for the abstraction of drinking water and 59 drinking water lakes. There are also 68 water treatment plants and 54 waste water treatment facilities within the study area.

The NB CFRAM study area has over 11.65km of designated river waterways for the abstraction of drinking water and 10 drinking water lakes. There are also 17 water treatment plants and 24 waste water treatment facilities within the study area.

The NWNB CFRAM study area is relatively poorly serviced in terms of transport infrastructure in comparison with other regions. Although the NW region has over 19,000km of roads, it has no motorways. The NB has 5,458km of roads and 42km of motorways. There are also no passenger railways currently in use in the NW study area, whilst the NB study area has one railway station, at Dundalk on the Belfast-Dublin line.

There is one airport and one airfield in the NWNB CFRAM study area, at Donegal and Letterkenny respectively. The military also maintains a helipad at Finner, Bundoran.

There are three designated harbours in the NW CFRAM study area (Ballyshannon, Buncrana and Killybegs) and two ports (Dundalk and Greenore) and one harbour (Annagassan) in the NB study area.

There are 24 fire stations, 73 Garda stations and three civil defence sites in the NW CFRAM study area. The NB has nine fire stations, 19 Garda stations and two civil defence sites. The effectiveness of these assets has a strong link to transport infrastructure, through the necessity to travel rapidly and directly throughout the region.

Flooding of the transport infrastructure has the potential to cause disruption to movements of residents and commuters which could have a short-term impact on the local economy as well as potentially causing damage which could have longer-term impacts as repairs are undertaken. In particular, the potential for flooding to adversely impact on local road networks through the damage or collapse of

bridges over watercourses should be recognised as this has the potential to severely disrupt local communities and potentially poses a risk of injury or death.

Other potentially relevant infrastructure features within the NWNB CFRAM study area that could be impacted by flooding and flood risk management include Eircom exchanges, of which there are 109 in the NW study area and 35 in the NB study area. Other assets include power stations, of which there are three in the NW study area (all hydro powered) and 56 sub-stations. There are 21 sub-stations in the NB study area. There are in excess of 36 large renewable projects (mainly wind farms) in the NW study area and four in the NB study area. Flooding of these assets could result in disruptions to the provision of services to communities.

### ***Future Trends***

As described in the amenity and population sections, it is expected that infrastructure development will be necessary to respond to predicted population growth in the region.

As rural and peripheral urban areas develop, improvements in public transport will be required. Proposals such as the Rural Transport Initiative will lead increased service to previously remote areas.

Ports in the region have, for the most part, been highlighted for expansion in the relevant Local Authority Development Plans. Expansion of these facilities will require additional development of coastal areas and associated management of flood risk.

There is likely to be continued investment in renewable energy in Ireland in order to meet climate change targets.

### ***Key Issues***

- Protection and enhancement of water related assets;
- Application of sustainable uses of water;
- Development of roads and other transport assets can alter land drainage run-off characteristics and can result in related changes in river hydrology and therefore flooding;
- Effects on potential future demand for natural resources, such as biofuels, and other renewable energy sources;
- Effects on energy supplies, telecommunications infrastructure, residential and commercial properties, farm assets, personal property. Flood-Related Social or Socio-Economic Issues.

### 6.1.8 Cultural, Archaeological & Architectural Heritage

The NWNB CFRAM study area hosts a variety of archaeological and architectural heritage sites which are afforded varying levels of protection under national legislation such as the National Monuments Acts (1930 to 2004) and the Planning and Development Act (2000). These sites include:

- World Heritage Sites – the Department of Arts, Heritage and the Gaeltacht are responsible for the nomination of World Heritage Sites (sites of outstanding heritage value) in Ireland such that they are protected under the World Heritage Convention. There are currently no World Heritage Sites within the NWNB CFRAM study area, nor any on the UNESCO “tentative list”<sup>7</sup> for future recognition.
- Records of Monuments and Places (RMP) – the National Monuments Service ([www.archaeology.ie](http://www.archaeology.ie)) holds responsibility for maintaining this inventory of sites of archaeological significance which pre-date the eighteenth Century (including records of those which historically have been destroyed). These sites are established under the National Monuments Acts. There are currently 5,752 recorded monuments in the NW CFRAM study area and 2,889 in the NB CFRAM study area.
- National Inventory of Architectural Heritage (NIAH) – is a record of sites of architectural heritage importance in Ireland dating from the start of the eighteenth century up to the present day which are established under the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 1999. The National Inventory of Architectural Heritage also maintains an inventory of historic gardens and demesnes. There are currently 229 records in the NIAH within the NW CFRAM study area and 1,196 in the NB CFRAM study area.
- Records of Protected Structures – The Planning and Development Act 2000 requires Local Authorities to compile a “Record of Protected Structures” as part of the County Development Plan. These are structures, or part thereof, which are considered to be of architectural value. Many of these structures also appear on the NIAH list and can be water-related features such as bridges, weirs, walls and embankments. The County Development Plans will be reviewed to take these records into consideration in the SEA.
- Architectural Conservation Areas – In accordance with Article 81 of the Planning and Development Act, Local Authority County Development Plans are required to identify Architectural Conservation Areas and to include an objective in the Plan to preserve the character of such areas. The County Development Plans will be reviewed to take these areas into consideration in the SEA.

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<sup>7</sup> UNESCO (2015) Tentative Lists <http://whc.unesco.org/en/tentativelists/state=ie> accessed 12/08/2015

- Preservation Order sites - available from the Department of Arts, Heritage and the Gaeltacht, are sites protected under the National Monuments Act. There are 39 sites subject to a Preservation Order (including five temporary sites) within the NW CFRAM study area. Of these, two are assessed of being at “high” vulnerability and 24 at “moderate” vulnerability. In the NB study area there are 44 sites subject to a preservation order (six of which are temporary) with three assessed as “high” vulnerability and 13 assessed as being “more vulnerable”.
- Shipwrecks - Wrecks over 100 years old and archaeological objects found underwater are protected under the National Monuments (Amendment) Acts 1987 and 1994. Significant wrecks less than 100 years old can be designated by Underwater Heritage Order (UHO) on account of their historical, archaeological or artistic importance. The Shipwreck Inventory of Ireland includes all known wrecks for the years up to and including 1945 and approximately 12,000 records have been compiled and integrated into the shipwreck database thus far. At present, there are two recorded shipwrecks within the NW and none in the NB CFRAM study area. Shipwreck records continue to be updated and the register will be re-examined during the preparation of the SEA.

Flooding and changes in groundwater levels has the potential to cause physical damage to archaeological and architectural heritage sites. The implementation of flood risk management measures has also the potential to include destruction of features of architectural heritage value, e.g. the destruction of a listed bridge for the purpose of improving the capacity of a river.

### ***Future Trends***

The archaeological heritage of the NWNB CFRAM study area also includes unrecorded archaeological sites in addition to the identified designated features. There may be significant archaeological resources in the study area that are as yet undiscovered. The FRMPs will need to take into account potential impacts on undiscovered archaeological features which may be present.

### ***Key Issues***

- Effects on key national sites.
- Many RMP sites are associated with watercourses, such as mills, mill races and bridges. These may potentially be impacted by the implementation of flood risk management measures;
- Other features, including churches, religious buildings and country houses, are located in close proximity to watercourses and as such may constrain the application of certain flood risk management measures at these locations;
- Tidal and coastal flood risk management measures may potentially impact upon maritime archaeology;

- Effects of flood risk management measures on historic landscapes or cultural-scapes.

### **6.1.9 Landscape & Visual Amenity**

There is no national database of designated landscape areas in Ireland. Sensitive areas of landscape are identified at Local Authority level through City / County Development Plans. Landscape Character Assessments are produced by Local Authorities as part of their development plans which identify areas of high, moderate and low sensitivity within the county. The Local Authority approach to identifying sensitive landscape areas is based on DoEHLG<sup>8</sup> guidance on landscape and landscape assessment. The determination of landscape sensitivity takes the initial approach of identifying landscape character (based on landform / landcover and visual distinctiveness e.g. river valleys and water corridors, upland areas etc.). Following this landscape value is assigned (historical, cultural, religious, ecological), and finally landscape sensitivity is determined (a measure of the ability of the landscape to accommodate change without suffering unacceptable effects to its character and values).

Areas which can be most sensitive to visual impacts include:

- Lands with an elevation of >200m;
- Forested areas;
- Lands with a slope of >30 Degrees;
- Open landscapes like lakes and estuaries; and,
- Other natural land cover types.

The Planning and Development Act, 2000 requires that planning authorities should set out in their County Development Plans objectives for the preservation of the character of the landscape, including the preservation of views and prospects and the amenities of places and features of natural beauty or interest within their functional area. At present no specific Landscape Conservation areas have been identified in the NWNB CFRAM study area. However 69 Sensitive Landscape Areas or Landscape Character Assessment Areas have been identified in the NW study area (in counties Donegal, Leitrim, Longford, Cavan and Monaghan). There have been 22 Sensitive Landscape Areas or Landscape Character Assessment Areas identified in the NB study area, in counties Monaghan, Cavan, Louth and Meath. The majority of these areas surround lakes, rivers or coastal areas. These areas will be examined and reviewed in the SEA Environmental Report.

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<sup>8</sup> Department of Environment, Heritage and Local Government, the name under which the current Department of Environment Community and Local Government was known 2002-2011.

### ***Future Trends***

The existing landscape is not expected to change significantly in the immediate future, however if population targets under the National Spatial Strategy are reached, urban expansion is likely to place localised pressure on the landscape. County Development Plans identify objectives and strategies for landscape protection which aim to restrict away from areas of significant beauty or interest.

### ***Key Issues***

- Effects on areas of designated high landscape quality and scenic views in CDPs and other plans;
- Effect on local parks, gardens, amenity walks and designed landscapes. Flood protection measures can intrude upon views and prospects;
- Effects on the general landscape as well as riverscapes, lakescapes and seascapes. Flood risk management options need to be sympathetic towards landscape character and opportunities to enhance landscape character should be explored.

#### **6.1.10 Amenity, Tourism and Recreational Use**

The North Western regional tourism area (comprising counties Cavan, Donegal, Leitrim, Monaghan and Sligo) attracted 506,000 international visitors in 2013, generating over €176 million of revenue<sup>9</sup>. Donegal is the eighth most popular county in Ireland for domestic tourism, with approximately 269,000 trips taken in 2013, and an estimated domestic visitor spend of €64 million. Cavan and Leitrim together received 192,000 domestic visitors (estimated spend €35million) and Louth and Monaghan are the least frequently visited counties with 129,000 combined visitors.

Donegal airport, located at Carrickfinn, near Bunbeg in northwest Donegal, operates scheduled flights to Dublin and Glasgow and also accommodates chartered flights and helicopters servicing the west coast gas industry.

The NWNB CFRAM study area offers a variety of natural coastal and inland landscapes, which provide tourism and recreation opportunities and have created a number of tourist attractions.

There are 20 designated bathing waters in the NW CFRAM study area and four in the NB CFRAM study area. In the 2015 bathing season, 13 beaches in Donegal and three beaches in Louth achieved “Blue Flag” status. There is one marina in the NW study area, at Fahan, Lough Swilly and one in the NB, at Carlingford. Local ferry services exist from Burtonport, Bunbeg and Magheraroarty to the offshore islands and from Greencastle to Magilligan in Northern Ireland. Greenore Port has recently

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<sup>9</sup> Fáilte Ireland (2014) [Regional tourism performance in 2013](#) (accessed 10/08/2015)



received planning consent for a roll-on roll-off car ferry service linking it with Greencastle in Northern Ireland, which it hopes to begin operations in 2016<sup>10</sup>.

Tourism is largely centred around coastal resorts in Co. Donegal, with the Atlantic beaches particularly popular with surfers and water sports enthusiasts. The more sheltered beaches of the east coast are also popular, due to their accessibility from Dublin and other heavily populated areas. The lakeland areas of Cavan and surrounds are also popular for fishing and watersports. The “Wild Atlantic Way” is a touring route which extends from the Inishowen peninsula in Co. Donegal and follows the western coastline to Kinsale, Co. Cork. It provides a popular itinerary and waypoints for tourists wishing to explore the Atlantic coastline.

There are around 1,042km of amenity walks within the NW CFRAM study area and 1,179km of cycle routes. The NB CFRAM study area has round 258km of amenity walks and 112km of cycle routes.

In addition to hotels, guesthouses and bed and breakfasts which are largely concentrated within the larger towns and villages, camping and caravanning sites are a major feature of the accommodation available to visitors to the NWNB CFRAM study area. These are most often associated with popular beaches, but also exist near loughs and rivers.

### ***Future Trends***

Tourism Ireland’s Corporate Plan 2014-2016 aims to increase Ireland’s share in European tourism and be a strong driver for economic growth. Growth targets include increasing overseas visitor numbers by 15% and spending by 24%, focusing on “the experience” of visiting Ireland, including its people and its natural assets.

In the North West tourism region, tourism has been identified as having huge potential to bring about economic and social regeneration. Donegal County Council has been working with Fáilte Ireland and other tourism providers to capitalise on the marketing activities presented by the Wild Atlantic Way initiative. The region is positioning itself as a provider of adventure tourism and amongst its plans is the ongoing development of walking and cycling trails. Funding from the Department of Agriculture, Food and the Marine has been received to develop pontoons and access gangways at Teelin, Mountcharles and Greencastle Piers, providing visitors with safe and secure access to waters. In the NB study area, a new initiative to attract visitors to the east coast, complementing the west coast’s “Wild Atlantic Way” is being promoted, called “Ireland’s Ancient East”. This focuses attention on prehistoric and medieval heritage sites, such as those found in the Boyne valley and at Carlingford Lough.

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<sup>10</sup> The Irish News, 12<sup>th</sup> June 2015 <http://www.irishnews.com/business/2015/06/12/news/greencastle-greenore-ferry-link-approval-will-boost-tourism--136101/> (accessed 10.09.2015)

**Key Issues –**

- Protecting and promoting heritage assets;
- Maintenance and enhancement of beaches and coastal assets;
- Development and promotion of existing and new quality visitor accommodation and business facilities.

**6.1.11 Fisheries Aquaculture & Angling**

The responsibility of monitoring fish for the purpose of assigning waterbody status in accordance with the Water Framework Directive has been assigned to Inland Fisheries Ireland (IFI).

Monitoring in the NWIRBD study area in 2011 (IFI, 2012) showed a total of nine fish species recorded in the nine surveyed rivers within the study area (Brown Trout, Salmon, Eel, Lamprey sp., Three-Spined Stickleback, Minnow, Nine-Spined Stickleback and Roach). The Brown Trout was the most commonly encountered species in the NWIRBD study area, being recorded at all sites, followed by Salmon, Eel and Lamprey.

The Dromore and Waterfoot River sites were the most diverse sites surveyed within the NWIRBD study area in 2011 with a total of six fish species recorded in both. The site that recorded the lowest diversity in this region was the Cronaniv Burn, with only two species recorded, brown trout and salmon. The greatest abundances of brown trout and salmon were recorded in the Burnfoot and Owentocker Rivers respectively. Under the Fish Classification Scheme 2 (FCS2) tool each river was assigned a draft fish classification status. Two sites were classified as “High”, five sites as “Good”, one sites as “Moderate”, and one site as “Poor”.

In the NBIRBD study area, fish surveys were undertaken at the Big River and the White river in 2012 and in the Fane River and the White River in 2013 (IFI, 2013a and IFI, 2014).

In the NBIRBD study area, a total of seven fish species were recorded during the 2012 WFD surveillance monitoring programme for fish in rivers (Brown Trout, Eel, Lamprey sp., Minnow, Stone Loach and Three-Spined Stickleback). Of the two sites surveyed, the White River was the more diverse, with seven species recorded, compared to just two in the Big River. Brown trout and eels were recorded in both sites, while all other species were present only in the White River.

During the 2013 WFD surveillance monitoring programme, undertaken at the White River and the Fane River, a total of six species were recorded, Brown Trout, Eel, Salmon, Three-spined Stickleback, Stone Loach and Minnow. The greatest abundances of brown trout and salmon were both recorded at the Fane River. Under the FCS2, the Big River and Fane River achieved “good” ecological status however the White River was classed as “poor” and had experienced a deterioration from the previous survey in 2009.

In Ireland the WFD Freshwater Morphology Programme of Measures and Standards has identified barriers to fish migration as one of the principal issues placing channels at risk in terms of failing to achieve good hydromorphology status. Such barriers can adversely impact on fish community composition and population structure.

Flooding and flood risk management will need to consider the impact upon fish habitat. Flood-related threats include siltation due to changes in flow affecting erosion and deposition patterns, pollution from flooding episodes and displacement of fish. Flood risk management operations, particularly in-channel working, has the potential to cause disturbance, habitat damage, in particular to spawning gravels, and cause a temporary or permanent impediment to fish and eel passage. Any options selected for flood risk management should not permanently restrict fish passage.

Environmental Rivers Enhancement Programmes (EREP) are funded by OPW and administered by IFI. These programmes include capital enhancement and maintenance: river bank protection, fish passage improvements, spawning enhancement, in-stream structures, fencing and riparian zone improvement. These measures will enhance the environment in support of fisheries.

Fish surveys carried out in the two of the transitional waters of the NWIRBD study area (the Erne and Gweebarra Estuaries) in 2012 (IFI 2013b and IFI 2013c) recorded nine species (Erne) and 14 species (Gweebarra), resulting in a Transitional Fish Classification Index (TFCI) status of “moderate” and “good” respectively. The most recent fish survey in transitional waters in the NBIRBD study area was undertaken in 2009 in Inner Dundalk Bay and the Castletown Estuary (Central and Regional Fisheries Boards, 2010). A total of 11 fish species were recorded in the Castletown Estuary and 16 fish species were recorded in Inner Dundalk Bay. Both waterbodies were assigned a “moderate” TFCI status based on these results.

In the NW CFRAM study area the Eastern Atlantic is a very significant fishery area with pelagic species, demersal species and shellfish all landed in the region's ports. Killybegs in particular is a premier deepwater fishery harbour, capable of accommodating vessels up to 200m. It has 4 landing piers for pelagic fish and accounts for around 45% of the total fish landed by Irish vessels at Irish ports (EC, 2010). In the NB CFRAM study area, Port Oriel at Clogherhead lands demersal fish and shellfish.

There are 261 licensed aquaculture sites in the NW CFRAM study area, mainly cultivating oysters and other shellfish such as mussels, clams and abalone. There are 41 also aquaculture sites licensed to farm salmon. The NB study area has 77 licensed sites for aquaculture, again largely focusing on oyster cultivation but also mussels and cockles.

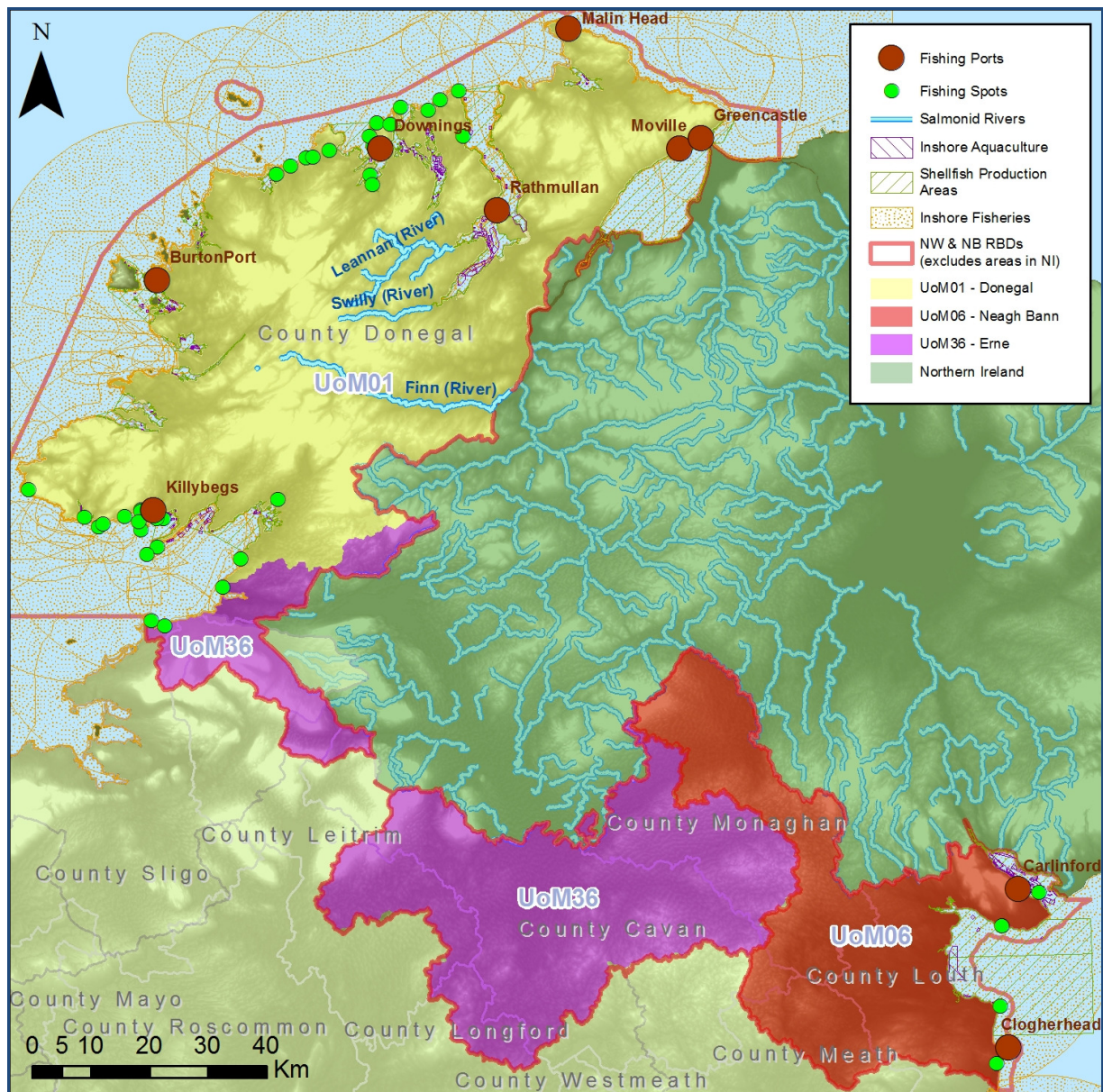
The Donegal coast in the NW CFRAM study area has 37 fishing spots and 39 shore angling spots promoted in the IFI's angling guide. The Louth coastline in the NB CFRAM study area has five fishing spots and six shore angling sites promoted by the IFI. Anglers have a variety of fishing types available, including inshore, small boat, charter boat, rock fishing or flyfishing.

**Figure 6.8** shows the designated salmonid rivers, main fishing ports, main sea angling areas and main inshore fisheries in the NWNB CFRAM study area.

### **Future Trends**

There are existing on-going programmes for the protection and management of fisheries, such as EREP, which will continue to operate and to contribute towards the enhancement of fisheries in Ireland.

Improvements to be introduced as part of the Programme of Measures to allow achievement of WFD objectives will assist in protecting and enhancing the fisheries resource of the NWIRBD and NBIRBD.



**Figure 6.8 Fisheries and Ports in the North Western - Neagh Bann CFRAMS Study Area**

**Key Issues**

- Flood risk management measures should give consideration to the protection and enhancement of fishery habitat and should have regard to any fishery management programmes. Also fish migration needs to be considered in the identification of flood risk management options;
- Consideration should be given to the enhancement and preservation of commercial and tourism fishery facilities;
- Implementation of flood risk management measures may contribute towards the spread of invasive species if not properly managed.

**6.1.12 Flood-Related Social or Socio-Economic Issues**

In addition to residential properties, schools, hospitals, health service centres and nursing homes (as well as their ancillary services and roads) are recognised as vulnerable receptors to flooding. Impacts on these will be assessed as key indicators of the NWNB CFRAM Study.

In the 2011 census, over 91,500 residential properties were identified in the NW CFRAM study area and almost 52,000 in the NB CFRAM study area. The most densely populated areas are found in Dundalk, Cavan, Donegal Town, Letterkenny, Monaghan, Castletown, Ardee and Clones.

Health care facilities in the NW CFRAM study are fairly limited in their distribution, with some communities in central Donegal and the Fanad peninsula being located quite some distance from their nearest hospital, a problem exacerbated by the less well developed road infrastructure in rural areas. There are 98 health centres distributed throughout the NW CFRAM study area along with 20 nursing homes and 15 residential care homes for the elderly, many of which are also associated with hospitals or health centres.

There are 271 primary schools and 39 post-primary schools in the NW CFRAM Study Area. There is one third-level education institution.

The NB CFRAM study area has seven hospitals that are well connected by primary transport corridors. There are also 19 health centres, ten nursing homes and four residential care homes. In terms of education, the NB study area has 113 primary schools, 21 post primary schools and 1 third level education facility.

**Future Trends**

The population structure described in Section 6.1.2, with its greater proportion of young people (<15) and older people (>65) may lead to increasing demand for schools and elderly care facilities.



***Key Issues***

- Effects on connectivity of communities. Flooding in the past has caused areas to be “cut off” from surrounding infrastructure. Aging and young populations are particularly vulnerable to these impacts;
- A number of vulnerable receptors (e.g. schools, hospitals, nursing homes) located in lowland areas which are potentially at flood risk.

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## **APPENDIX A**

### **Plans, Programmes and Legislation**



## PRELIMINARY REVIEW OF LEGISLATIONS, PLANS, POLICIES AND PROGRAMMES

The draft tables below provide a summary of the relevant EU Directives, the transposing regulations and/or the regulatory framework for environmental protection and management arising from them. The information is not exhaustive and it is recommended to consult the Directive, Regulation, Plan or Programme to become familiar with the full details of each. These tables will be updated accordingly following the receipt of scoping responses and will be presented in the SEA Environmental Report later in the process.

### EUROPEAN

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Relevant Legislation in Ireland	Relevance to NWNB CFRAM Study
<i>Biodiversity, Flora and Fauna</i>				
The EU Birds Directive 2009/147/EC	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.	<ul style="list-style-type: none"> <li>• Preserve, maintain or re-establish a sufficient diversity and area of habitats for all the species of birds referred to in Annex I.</li> <li>• Preserve, maintain and establish biotopes and habitats to include the creation of protected areas (Special Protection Areas); ensure the upkeep and management in accordance with the ecological needs of habitats inside and outside the protected zones, re-establish destroyed biotopes and creation of biotopes</li> <li>• Measures for regularly occurring migratory species not listed in Annex I is required as regards their breeding, moulting and wintering areas and staging posts along their migration routes. The protection of wetlands and particularly wetlands of</li> </ul>	European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011)	<p>The NWNB CFRAM study should ensure that European Sites are suitably protected from loss or damage.</p> <p>The flood risk management strategies are expected to require a screening for Appropriate Assessment, following which there may be requirement for a Natura Impact Statement to ensure that any strategies proposed do not adversely affect SPAs and SACs.</p>

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Relevant Legislation in Ireland	Relevance to NWNB CFRAM Study
		international importance.		
The EU Habitats Directive (92/43/EEC)	Builds on the Birds Directive (see above) 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).	<ul style="list-style-type: none"> <li>Propose and protect sites of importance to habitats, plant and animal species.</li> <li>Establish a network of Natura 2000 sites hosting the natural habitat types listed in Annex I and habitats of the species listed in Annex II, to enable the natural habitat types and the species' habitats concerned to be maintained or, where appropriate, restored at a favourable conservation status in their natural range.</li> <li>Carry out comprehensive assessment of habitat types and species present.</li> <li>Establish a system of strict protection for the animal species and plant species listed in Annex IV.</li> </ul>	<p>European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011)</p> <p>The Wildlife Act 1976 (S.I. No. 39/1976) and The Wildlife (Amendment) Act 2000 (S.I. No. 38/2000)</p>	

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Relevant Legislation in Ireland	Relevance to NWNB CFRAM Study
<p>The EU Biodiversity Strategy to 2020 [COM(2011)244] “Our life insurance, our natural capital”</p>	<p>Aimed at reversing biodiversity loss and speeding up the EUs transition towards a resource efficient and green economy. Primary objectives of the strategy include:</p> <ul style="list-style-type: none"> <li>• conserving and restoring nature;</li> <li>• maintaining and enhancing ecosystems and their services;</li> <li>• ensuring the sustainability of agriculture, forestry and fisheries;</li> <li>• Ensuring the sustainable use of fisheries resources</li> <li>• combating invasive alien species; and</li> <li>• addressing the global biodiversity crisis.</li> </ul>	<ul style="list-style-type: none"> <li>• To mainstream biodiversity in the decision making process across all sectors.</li> <li>• To substantially strengthen the knowledge base for conservation, management and sustainable use of biodiversity.</li> <li>• To increase awareness and appreciation of biodiversity and ecosystems services.</li> <li>• To conserve and restore biodiversity and ecosystem services in the wider countryside.</li> <li>• To conserve and restore biodiversity and ecosystem.</li> <li>• services in the marine environment</li> <li>• To expand and improve on the management of protected areas and legally protected species.</li> <li>• To substantially strengthen the effectiveness of International governance for biodiversity and ecosystem services.</li> </ul>	<p>Actions for Biodiversity 2011-2016’, Ireland’s 2nd National Biodiversity Plan (DAHG, 2011)</p>	<p>The NWNB CFRAM study should have regard for this strategy and look for opportunities to conserve, and, where possible, restore or enhance biodiversity.</p>
<p>The Convention on the Conservation of Migratory Species of Wild Animals (also known as CMS or “The Bonn Convention” [L210, 19/07/1982 (1983)])</p>	<p>The Bonn Convention focuses on preserving the habitats used by migratory species and aims to enhance the conservation of terrestrial, marine and avian species on a global scale throughout their range.</p>	<ul style="list-style-type: none"> <li>• Establishes a legal foundation for internationally coordinated conservation measures throughout a migratory range.</li> <li>• Migratory species threatened with extinction are listed on Appendix I of the Convention. CMS Parties strive towards strictly protecting these animals, conserving or restoring the</li> </ul>	<p>European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011)</p>	<p>The NWNB CFRAM study should have regard for the implications on migratory species of introducing new flood risk management strategies.</p>

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Relevant Legislation in Ireland	Relevance to NWNB CFRAM Study
		<p>places where they live, mitigating obstacles to migration and controlling other factors that might endanger them.</p> <ul style="list-style-type: none"> <li>In Europe, legislation to ensure that the provisions of the Bonn convention are applied includes the Birds Directive and the Habitats Directive.</li> </ul>		
<i>Climatic Factors</i>				
<p>Second European Climate Change Programme (ECCP II) 2005.</p> <p>Climate Change Agreement [UNFCCC, 2007]</p>	<p>Objectives seek to develop the necessary elements of a strategy to implement the Kyoto protocol.</p> <p>The climate and energy package is a set of binding legislation which aims to ensure the European Union meets its ambitious climate and energy targets for 2020. These targets, known as the "20-20-20" targets, set three key objectives for 2020:</p> <ul style="list-style-type: none"> <li>A 20% reduction in EU greenhouse gas emissions from 1990 levels;</li> <li>Raising the share of EU energy consumption produced from renewable resources to 20%;</li> <li>A 20% improvement in the EU's energy efficiency.</li> </ul>	<p>Develop a framework for a low carbon economy which will be achieved through a National Mitigation Plan (to lower Ireland's level greenhouse emissions) and a National Adaptation Framework (to provide for responses to changes caused by climate change). This includes:</p> <ul style="list-style-type: none"> <li>Reform of the EU Emissions Trading System (EU ETS) to include a cap on emission allowances in addition to existing system of national caps</li> <li>Agreement of national targets for non-EU ETS emissions from countries outside the EU</li> <li>Commitment to meet the national renewable energy targets of 16% for Ireland by 2020</li> <li>Preparation of a legal framework for technologies in carbon capture and storage</li> </ul>	<p>National Climate Change Strategy (DELG, 2000) and National Climate Change Strategy 2007-2012 (DEHLG, 2007)</p> <p>The Climate Action and Low Carbon Development Bill 2015 [2/2015]</p>	<p>The NWNB CFRAM study should aim to contribute towards climate change mitigation. The study could potentially have implications on achieving renewable energy targets as maintenance and construction of flood risk management infrastructure may contribute to energy use or may complement energy production.</p>

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Relevant Legislation in Ireland	Relevance to NWNB CFRAM Study
Renewable Energy Directive (2009/28/EC)	<ul style="list-style-type: none"> <li>Provides a framework for the production and promotion of energy from renewable sources. Identifies national targets for renewable sources consumed in transport, electricity and heating and cooling by 2020. States must:</li> <li>Meet a target of 20% for renewable energy sources</li> <li>Outline how the national target will be met under the Directive</li> <li>Prepare and implement a national energy action plan</li> </ul>	<ul style="list-style-type: none"> <li>Where possible, the electricity distribution network should give priority to generating units using energy from renewable sources</li> <li>Requirement for public bodies to take steps in ensuring all new or recently renovated (&gt;2011) public buildings fulfil an exemplary role in the context of the Directive.</li> </ul>	European Union (Renewable Energy) Regulations 2014. (S.I. No. 483/2014)	The CFRAM studies could potentially have implications on achieving renewable energy targets as maintenance and construction of flood risk management infrastructure may contribute to energy use or may influence renewable energy production.
<i>Cultural, Architectural and Archaeological Heritage</i>				
United Nations Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris 1972) "The World Heritage Convention" [WHC-2005/WS/02]	<p>Objectives seek to ensure the identification, protection, conservation, presentation and transmission to future generations of cultural and natural heritage and ensure that effective and active measures are taken for these.</p> <p>The Convention recognises the way in which people interact with nature and encourages signatories to</p> <ul style="list-style-type: none"> <li>integrate the protection of cultural and natural heritage into regional planning programmes,</li> <li>set up staff and services at their sites,</li> <li>undertake scientific and technical</li> </ul>	<ul style="list-style-type: none"> <li>Establishment of measures for the protection of monuments of national importance by virtue of the historical, architectural, traditional, artistic or archaeological interest attaching to them. Includes the site of the monument, the means of access to it and any land required to preserve the monument from injury or to preserve its amenities.</li> <li>World Heritage Sites in Ireland are specific locations that have been included in the UNESCO World Heritage Programme list of sites of outstanding cultural or natural importance to the common heritage of humankind. Two such sites in Ireland have been designated</li> </ul>	National Heritage Plan 2002 - 2007 (DAHG, 2002)	The NWNB CFRAM study should consider sites of cultural and natural heritage and ensure they are protected from loss or damage resulting from flood management measures.



Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Relevant Legislation in Ireland	Relevance to NWNB CFRAM Study
	<p>conservation research and</p> <ul style="list-style-type: none"> <li>adopt measures which give this heritage a function in the day-to-day life of the community.</li> </ul>			
<i>Geology, Soils and Landuse</i>				
EU Thematic Strategy for Soil Protection [COM(2006) 231] (including proposals for a Soil Framework Directive)	<p>Highlights a need for action to prevent the ongoing deterioration of Europe's soils.</p> <p>The Soil Thematic Strategy would seek to:</p> <ul style="list-style-type: none"> <li>Establish common principles for the protection and sustainable use of soils;</li> <li>Prevent threats to soils, and mitigate the effects of those threats;</li> <li>Preserve soil functions within the context of sustainable use; and</li> <li>Restore degraded and contaminated soils to approved levels of functionality.</li> </ul>	<ul style="list-style-type: none"> <li>Objective of integrating soil protection into other EU policies, including agriculture and rural.</li> <li>Promotion of rehabilitation of industrial sites and contaminated land.</li> </ul>	No current legislation in Ireland specific to the protection of soil resources.	The provisions of the European Strategy should form a framework for soil protection and improvement that the NWNB CFRAM study should take into account.
<i>Landscape and Visual Amenity</i>				
European Landscape Convention (ETS No. 176), Florence, 20 October 2000	<ul style="list-style-type: none"> <li>Promotion of the protection, management and planning of European landscapes and organising European co-operation on landscape issues.</li> </ul>	<ul style="list-style-type: none"> <li>Respond to the public's wish to enjoy high-quality landscapes and to play an active part in the development of landscapes.</li> <li>Each administrative level (national,</li> </ul>	The Planning and Development Acts 2000 - 2010 (S.I. No. 30/2000, S.I. No. 30/2010)	The NWNB CFRAM study could potentially have implications on landscapes and visual amenity.

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	<ul style="list-style-type: none"> <li>Applies to the entire territory of the Parties and covers natural, rural, urban and peri-urban areas.</li> <li>Inclusion of landscapes that might be considered outstanding as well as everyday or degraded landscapes.</li> <li>Aimed at the protection, management and planning of all landscapes and raising awareness of the value of a living landscape.</li> <li>Complements the Council of Europe's and UNESCO's heritage conventions.</li> </ul>	regional and local) should draw up specific and/or sectoral landscape strategies within the limits of its competences. These are based on the resources and institutions which, when co-ordinated in terms of space and time, allow policy implementation to be programmed. The various strategies should be linked by landscape quality objectives.	National Spatial Strategy 2002-2020 "People, Places and Potential" (DELG, 2002)	
<i>Population and Human Health</i>				
Drinking Water Directive (98/83/EC)	<ul style="list-style-type: none"> <li>Aimed at the improvement and maintenance of the quality of water intended for human consumption.</li> <li>Aims to protect human health from the adverse effects of any contamination of water intended for human consumption by ensuring that it is wholesome and clean.</li> </ul>	<ul style="list-style-type: none"> <li>Sets values applicable to water intended for human consumption for a defined range of parameters.</li> <li>Requires implementation of all measures necessary to ensure that regular monitoring of the quality of water intended for human consumption is carried out, in order to check that the water available to consumers meets the requirements set out in the legislation.</li> <li>Any failure to meet the required standards is immediately investigated in order to identify the cause.</li> <li>Any necessary remedial action is taken as soon as possible to restore</li> </ul>	<p>European Union (Drinking Water) Regulations 2014 (S.I. No. 106/2007) (as amended)</p> <p>European Communities (Water Policy) Regulations 2003 (S.I. No. 722/2003)</p>	The NWNB CFRAM study may have implications for waters used as a drinking water supply.

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		<p>its quality and gives priority to their enforcement action.</p> <ul style="list-style-type: none"> <li>• Undertake remedial action to restore the quality of the water where necessary to protect human health.</li> <li>• Notification of consumers when remedial action is being undertaken, except where the competent authorities consider the non-compliance with the required standards value to be trivial.</li> </ul>		
<p>Bathing Water Directive (revised) 2006 [2006/7/EC]</p>	<p>The overall objective of the revised Bathing Water Directive remains the protection of public health whilst bathing. It:</p> <ul style="list-style-type: none"> <li>• imposes stricter standards for water quality and the implementation of new method of assessment.</li> <li>• establishes a more pro-active approach to the assessment of possible pollution risks, and to the management of bathing waters; and</li> <li>• places considerable emphasis on promoting increased public involvement, and for improved dissemination of information on bathing water quality to the general public.</li> </ul>	<ul style="list-style-type: none"> <li>• Updates the way in which water quality is measured, focusing on fewer microbiological indicators, and setting different standards for inland and coastal bathing sites.</li> <li>• Reduces the health risks linked to bathing by setting scientifically based minimum water quality standards.</li> <li>• Makes changes to monitoring and sampling frequency.</li> <li>• Allows a limited number of water samples to be disregarded during short term pollution incidents, if the event is predicted and the public warned beforehand.</li> <li>• Provides better information to the public, allowing more informed choices to be made about the risk of bathing.</li> <li>• Improves the overall management of bathing water quality by requiring an</li> </ul>	<p>Bathing Water Quality (Amendment) Regulations 2008 (S.I. No. 79/2008) (as amended)</p>	<p>The NWNB CFRAM study should consider the contribution that measures could make towards the attainment of bathing water quality standards. Coastal outfalls and flooding events can be linked with bathing water pollution.</p>

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		<p>assessment of potential sources of pollution.</p> <ul style="list-style-type: none"> <li>Is compatible with other EU water related legislation, in particular the Water Framework Directive.</li> </ul>		
<i>Water</i>				
The 'Floods' Directive, 2007 (2007/60/EC)	This Directive provides a framework for the assessment and management of flood risks, aiming to reduce the adverse consequences associated with flooding for human health, the environment, cultural heritage and economic activity.	<p>Member States must:</p> <ul style="list-style-type: none"> <li>assess the risk of flooding of all water courses and coast lines,</li> <li>map the flood extent and assets and humans at risk in these areas at River Basin level and in areas covered by Article 5(1) and 13(1); and</li> <li>implement flood risk management plans and take adequate and coordinated measures to reduce this flood risk.</li> </ul> <p>Member States are required to first carry out a preliminary assessment by 2011 to identify the river basins and associated coastal areas at risk of flooding. For such zones they would then need to draw up flood risk maps by 2013 and establish flood risk management plans focused on prevention, protection and preparedness by the end of 2015. The public must be informed and allowed to participate in the planning process.</p>	<p>European Communities (Assessment and Management of Flood Risks) Regulations 2010</p> <p>European Union (Environmental Impact Assessment) (Flood Risk) Regulations 2012 (S.I. No. 470/2012)</p>	The National Preliminary Flood Risk Assessment describes the areas that have potential for significant flood risk. Consequently, Flood Risk and Flood Hazard maps in addition to Flood Risk Management Plans are being produced. These regional scale plans will be the key outputs of the NWNB CFRAM study.

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Relevant Legislation in Ireland	Relevance to NWNB CFRAM Study
The EU Water Framework Directive (2000/60/EC), (as amended by Decision 2455/2001/EC and Directives 2008/32/EC, 2008/105/EC and 2009/31/EC.	<p>Aims to improve water quality and quantity within rivers, estuaries, coasts and aquifers.</p> <p>Aims to prevent the deterioration of aquatic ecosystems and associated wetland by setting out a timetable until 2027 to achieve good ecological status or potential.</p> <p>Member States are required to manage the effects on the ecological quality of water which result from changes to the physical characteristics of water bodies.</p> <p>Action is required in those cases where these “hydro-morphological” pressures are having an ecological impact which will interfere with the ability to achieve WFD objectives.</p> <p>The following Directives have been subsumed into the Water Framework Directive :</p> <ul style="list-style-type: none"> <li>• The Drinking Water Abstraction Directive</li> <li>• Sampling Drinking Water Directive</li> <li>• Exchange of Information on Quality of Surface Freshwater Directive</li> <li>• Shellfish Directive</li> <li>• Freshwater Fish Directive</li> <li>• Groundwater (Dangerous Substances) Directive</li> </ul>	<ul style="list-style-type: none"> <li>• Identification and establishment of individual river basin districts.</li> <li>• Preparation of individual river basin management plans for each of the catchments. These contain the main issues for the water environment and the actions needed to deal with them.</li> <li>• Establishment of a programme of monitoring water quality in each RBD.</li> <li>• Establishment of a Register of Protected Areas (includes areas previously designated under the Freshwater Fish and Shellfish Directives which have become sites designated for the protection of economically significant aquatic species under WFD and placed on the Protected Areas register).</li> <li>• Promotion of sustainable management of the water environment by carefully considering current land use and future climate scenarios, minimising the effects of flooding and drought events and facilitating long term improvements in water quality, including the protection of groundwater near landfill sites, as well as minimising agricultural runoff.</li> </ul>	<p>European Communities (Water Policy) Regulations, 2003 (S.I. No. 722/ 2003)</p> <p>European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (S.I. No. 272/2009)</p>	<p>The NWNB CFRAM study will need to consider the requirements of the WFD and ensure that it does not compromise its objectives, and that it contributes to achieving its aims. The WFD uses the same study areas (river basin districts) as the Floods Directive (see above) and is based on the same 6 year cycle of planning.</p> <p>Water quality and quantity is linked to the NWNB CFRAM study as flooding events can lead to water pollution and changes in water levels. The NWNB CFRAM study should promote sustainable management of the water environment by carefully considering current land use and future climate scenarios, minimise the effects of flooding and drought events and to facilitate long term improvements in water quality, including the protection of groundwater.</p>

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Relevant Legislation in Ireland	Relevance to NWNB CFRAM Study
	<ul style="list-style-type: none"> <li>Dangerous Substances Directive</li> </ul>			
<p>The Groundwater Directive (80/68/EEC) and,</p> <p>Groundwater Daughter Directive (2006/118/EC)</p>	<ul style="list-style-type: none"> <li>Aims to protect groundwater from pollution by controlling discharges and disposals of certain dangerous substances to groundwater.</li> <li>Made under the Water Framework Directive, the Daughter Directive aims to prevent and limit inputs of pollutants to groundwater.</li> </ul>	<ul style="list-style-type: none"> <li>Establishment of criteria for assessing good groundwater status and for the identification of significant and sustained upwards trends and the starting points for trend reversal.</li> <li>Threshold values adopted for the pollutants, groups of pollutants and indicators of pollution which have been identified as contributing to the characterisation of bodies or groups of bodies of groundwater as being at risk.</li> </ul>	<p>European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9/2010)</p>	<ul style="list-style-type: none"> <li>The NWNB CFRAM study should, where possible, contribute to the protection of groundwater from point source and diffuse pollution that could be caused or exacerbated by flooding.</li> </ul>
<p>The Nitrates Directive (91/676/EC)</p>	<ul style="list-style-type: none"> <li>Objectives of reducing water pollution caused or induced by nitrates from agricultural sources and preventing further pollution.</li> <li>Key requirements are the designation of Nitrate Vulnerable Zones and the establishment of action programmes in relation to these zones.</li> </ul>	<ul style="list-style-type: none"> <li>Aims to create good farming practices by establishing a voluntary code of good agricultural practice.</li> <li>Identify and designate zones at risk of surface water and groundwater pollution from nitrates.</li> <li>Implement compulsory action programmes for nitrates vulnerable zones.</li> <li>Enforce the implementation of a national Nitrates Action Programme.</li> <li>Monitoring of water quality to assess nitrogen compounds.</li> <li>Introduction of 2-metre wide uncultivated and unsown buffer zones adjacent to streams/drains, where tillage crops are grown.</li> </ul>	<p>European Union (Good Agricultural Practice for Protection of Waters) Regulations 2014. S.I. No. 31/2014 ("the Nitrates Regulations")</p>	<p>Impacts on water quality are of relevance to the NWNB CFRAM study as flooding can be linked with water pollution.</p>

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Urban Wastewater Treatment Directive 91/271/EEC. Amended under Directive 98/15/EEC	<ul style="list-style-type: none"> <li>The primary objective is to protect the environment from the adverse effects of discharges of urban wastewater, by the provision of urban wastewater collecting systems (sewerage) and treatment plants for urban centres.</li> <li>The Directive also provides general rules for the sustainable disposal of sludge arising from wastewater treatment.</li> </ul>	<ul style="list-style-type: none"> <li>Establishes minimum requirements for urban waste water collection and treatment systems in specified agglomerations to include special requirements for sensitive areas and certain industrial sectors.</li> <li>Urban waste water entering collecting systems shall before discharge, be subject to secondary treatment.</li> <li>Annex II requires the designation of areas sensitive to eutrophication which receive water discharges.</li> </ul>	European Communities (Urban Waste Water Treatment) Regulations 2001 (S.I. No. 254/2001)	Impacts on water quality are of relevance to the NWNB CFRAM study as flooding can be linked with water pollution.
Environmental Quality Standards Directive (Directive 2008/105/EC) (also known as the Priority Substances Directive), as amended by Directive 2013/39/EU.	<ul style="list-style-type: none"> <li>Establishes environmental quality standards (EQS) for priority substances and certain other pollutants as provided for in Article 16 of the Water Framework Directive and aims to achieve good surface water chemical status in accordance with the provisions and objectives of Article 4 of the Water Framework Directive.</li> </ul>	<ul style="list-style-type: none"> <li>Apply the EQS laid down in Part A of Annex I to this Directive for bodies of surface water.</li> <li>Determine the frequency of monitoring in biota and/or sediment of substances.</li> <li>Monitoring shall take place at least once every year, unless technical knowledge and expert judgment justify another interval.</li> <li>Notify the European Commission if the substances for which EQS have been established if a deviation of the monitoring is planned along with the rationale and approach.</li> <li>Establish an inventory, including maps, if available, of emissions, discharges and losses of all priority substances and pollutants listed in Part A of Annex I to this Directive for</li> </ul>	<p>European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I. No. 272/2009)</p> <p>European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003)</p>	Impacts on water quality are of relevance to the NWNB CFRAM study as flooding can be linked with water pollution.



Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Relevant Legislation in Ireland	Relevance to NWNB CFRAM Study
		each river basin district.		
A Blueprint to Safeguard Europe's Water Resources (2012)	To ensure sufficient availability of good quality water for sustainable and equitable water use	<ul style="list-style-type: none"> <li>• Aims to ensure the availability of a sufficient quantity of good quality water.</li> <li>• Aims to improve the implementation of current EU water policy.</li> <li>• Promotes the integration of water and other policies.</li> <li>• Outlines actions required for the implementation of current water legislation, integration of water policy objectives into other policies, and filling the gaps in particular as regards water quantity and efficiency.</li> </ul>	European Communities (Water Policy) Regulations, 2003 (S.I. No. 722/2003)	The NWNB CFRAM study will have regard to this Blueprint and will (in combination with other users and bodies) cumulatively contribute towards the achievement of the objectives of the regulatory framework for environmental protection and management.
Marine Strategy Framework Directive (2008/56/EC).	<ul style="list-style-type: none"> <li>• Establishes a framework whereby the necessary measures are undertaken to achieve or maintain good environmental status in the marine environment by the year 2020.</li> <li>• Requires the development and implementation of marine strategies in order to protect and preserve the marine environment, prevent its deterioration or, where practicable, restore marine ecosystems in areas where they have been adversely affected.</li> <li>• It aims to prevent and reduce inputs in the marine environment, with a view to phasing out pollution as defined in Article 3(8), so as to</li> </ul>	<ul style="list-style-type: none"> <li>• Preparation of an assessment of the current environmental status of the waters concerned and the environmental impact of human activities.</li> <li>• Establishment of a series of environmental targets and associated indicators.</li> <li>• Development of a programme of measures designed to achieve or maintain good environmental status, by 2020.</li> <li>• Establishment of a monitoring programme for ongoing assessment and regular updating of targets.</li> <li>• Cooperation with transboundary</li> </ul>	European Communities (Marine Strategy Framework) Regulations 2011 (S.I. No. 249/2011)	The NWNB CFRAM study may have implications on the environmental status of coastal waters, as it extends to coastal flooding.

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Relevant Legislation in Ireland	Relevance to NWNB CFRAM Study
	ensure that there are no significant impacts on or risks to marine biodiversity, marine ecosystems, human health or legitimate uses of the sea.	Member States to implement these measures.		
<i>Environment and Sustainable Development</i>				
EIA Directive (2011/92/EU as amended by 2014/52/EU)	<ul style="list-style-type: none"> <li>Requires the assessment of the environmental effects of public and private projects which are likely to have significant effects on the environment.</li> <li>Aims to assess and implement avoidance or mitigation measures to eliminate environmental effects, before consent is given of projects likely to have significant effects on the environment by virtue, inter alia, of their nature, size or location are made subject to a requirement for development consent and an assessment with regard to their effects.</li> </ul>	<ul style="list-style-type: none"> <li>All projects listed in Annex I are considered as having significant effects on the environment and compulsorily require an EIA.</li> <li>For projects listed in Annex II, a "screening procedure" is required to determine the effects of projects on the basis of thresholds/criteria or a case by case examination. The competent authority may give a decision on whether a project requires EIA.</li> <li>Requirement for identification, description and assessment in an appropriate manner, in the light of each individual case, on the direct and indirect effects of a project on the following factors: human beings, fauna and flora, soil, water, air, climate and the landscape, material assets and the cultural heritage, the interaction between each factor.</li> <li>Requirement for consultation with relevant authorities, stakeholders and public allowing sufficient time to make a submission before a decision is made.</li> </ul>	<p>European Communities (Environmental Impact Assessment) Regulations 1989 (S.I. No. 349/1989) (as amended)</p> <p>European Union (Environmental Impact Assessment) (Flood Risk) Regulations 2012 (S.I. No 470/2012)</p>	The NWNB CFRAM study will have regard to the EIA regulations in the development of any future flood risk management schemes.

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		<ul style="list-style-type: none"> <li>Establishment of a recognised structure and content for the Environmental Impact Statement, which is the document submitted as a written account of the EIA.</li> <li>Inclusion of proposed flood risk management schemes in EIA screening process</li> </ul>		
Environmental Liability Directive (2004/35/EC)	<ul style="list-style-type: none"> <li>Establishes a framework for environmental liability based on the 'polluter-pays' principle, to prevent and remedy environmental damage.</li> <li>Relates to environmental damage caused by occupational activities (listed in Annex III), and to any imminent threat of such damage occurring by reason of any of those activities; damage to protected species and natural habitats caused by any occupational activities other than those listed in Annex III, and to any imminent threat of such damage occurring by reason of any of those activities, whenever the operator has been at fault or negligent.</li> </ul>	<ul style="list-style-type: none"> <li>Describes procedures for circumstances where environmental damage has occurred. Requires the polluter to take all practicable steps to immediately control, contain, remove or otherwise manage the relevant contaminants and/or any other damage factors in order to limit or to prevent further environmental damage and adverse effects on human health or further impairment of services and the necessary remedial measures.</li> <li>Establishes measures for cases where environmental damage has not yet occurred, but there is an imminent threat of such damage occurring.</li> <li>The regulations make the polluter financially liable and allow the competent authority to initiate cost recovery proceedings where appropriate.</li> </ul>	European Communities (Environmental Liability) Regulations 2008 [S.I. No. 547/2008]	Flooding events can lead to water pollution. The NWNB CFRAM study will be obliged to comply with the requirements of the regulations.

**NATIONAL**

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Related Legislation or Plans	Relevance to NWNB CFRAM Study
<i>Biodiversity, Flora and Fauna</i>				
'Actions for Biodiversity 2011-2016', Ireland's 2 <sup>nd</sup> National Biodiversity Plan (DAHG, 2011)	<ul style="list-style-type: none"> <li>National strategy for the maintenance and enhancement of biological diversity, which should be integrated across other policy sectors.</li> </ul>	<ul style="list-style-type: none"> <li>Identification and protection of key biological resources and the monitoring of potentially damaging processes and activities.</li> <li>Preparation of Local Biodiversity Action Plans by Local Authorities to protect, enhance and promote local biodiversity</li> </ul>	UN Convention on Biological Diversity (1992) Strategic Plan 2011 to 2020 "Living in Harmony with Nature".	The NWNB CFRAM study should look for opportunities to conserve, and where possible restore, biodiversity.
Flora (Protection) Order 1999 (S.I. No. 94/1999)	<ul style="list-style-type: none"> <li>Enforces the protection of rare and endangered plants.</li> </ul>	<ul style="list-style-type: none"> <li>Derived from Section 21 of the Wildlife Act, objectives include it being illegal to alter, damage or interfere in any way with named flora species or their habitats. This protection applies wherever the plants are found and is not confined to sites designated for nature conservation.</li> </ul>	The Wildlife Act 1976 (S.I. No. 39/1976) and The Wildlife (Amendment) Act 2000 (S.I. No. 38/2000)	The NWNB CFRAM study should have regard to the protection of flora in accordance with the Order.
The Fisheries Acts, 1959 to 2007 (S.I. No. 14 of 1959 and No. 17 of 2007) and the Inland Fisheries Act 2010 (No. 10 of 2010)	<ul style="list-style-type: none"> <li>These acts provide for the efficient and effective management, conservation, protection, development and improvement of fisheries, hatcheries and fish farms. The species protected include all freshwater fish, sea bass and certain molluscs.</li> </ul>	<ul style="list-style-type: none"> <li>Inland Fisheries Ireland which replaced the Fisheries Boards following the Inland Fisheries Act (2010) must ensure the suitability of fish habitats, including taking consideration of the conservation of biodiversity in water ecosystems.</li> <li>The Act also requires those involved in aquaculture to obtain a licence.</li> <li>As well as enforcing provisions of</li> </ul>	Local Government Water Pollution Acts 1977 (S.I. No. 1/1977) & 1990 (S.I. No. 21/1990)	The NWNB CFRAM study should take into account the legislation which does not allow barriers to migration or the obstruction of the passage of fish or the impairment of the usefulness of the bed and soil of any waters as spawning grounds or their capacity to produce the food of fish

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		the Fisheries Acts, IFI is empowered to enforce the Water Pollution Acts 1977 & 1990, and at fisheries sensitive locations where industrial, local authority and agricultural discharges have resulted in a serious deterioration in water quality, including fish kills, successful prosecutions have been taken.		
<i>Climatic Factors</i>				
National Renewable Energy Action Plan (DCENR, 2010)	<ul style="list-style-type: none"> <li>Sets out the national strategic approach and measures to deliver on the Renewable Energy Directive 2009/28/EC</li> <li>Aims to achieve target of 16% renewable energy usage by 2020</li> </ul>	<p>Sets national targets to be met by 2020 as follows:</p> <ul style="list-style-type: none"> <li>40% electricity consumption from renewable sources</li> <li>10% electric vehicles by 2020</li> <li>12% renewable heat by 2020</li> </ul>	<p>European Communities (Renewable Energy) Regulations 2011 (S.I. No. 147/2011)</p> <p>Requirement of the Renewable Energy Directive (2009/28/EC)</p>	The NWNB CFRAM study should have regard for achieving renewable energy targets as maintenance and construction of flood risk management infrastructure may contribute to energy use or may influence energy production
National Climate Change Strategy 2007-2012 (DEHLG, 2007)	<ul style="list-style-type: none"> <li>Establishes a framework for action to reduce Ireland's greenhouse gas emissions</li> </ul>	<p>Sets out principles and actions for the reduction of CO<sub>2</sub> emissions in Ireland in the following areas:</p> <ul style="list-style-type: none"> <li>energy supply</li> <li>transport</li> <li>waste management</li> <li>industry, commercial and services sector</li> <li>agriculture</li> </ul>	<p>European Communities (Renewable Energy) Regulations 2011 (S.I. No. 147/2011) "The Framework for Climate Change Bill"</p>	The NWNB CFRAM study will have regard to this strategy and will (in combination with other users and bodies) cumulatively contribute towards the achievement of the objectives of the regulatory framework for environmental protection and management.

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		<ul style="list-style-type: none"> <li>residential</li> <li>public sector</li> </ul>		
National Climate Change Adaptation Framework – Building Resilience to Climate Change (DECLG, 2012)	Aims to provide the policy context for a strategic national adaptation response to climate change, promote dialogue and understanding of adaptation issues identify and promote adaptation solutions and committing to actions to support the adaptation process			
<i>Cultural, Architectural and Archaeological Heritage</i>				
The National Monuments Acts (1930 to 2004) (S.I. No. 2/1930 & No. 22/2004)	<ul style="list-style-type: none"> <li>Objectives seek to ensure the identification, protection, conservation, presentation and transmission to future generations of cultural and natural heritage and ensure that effective and active measures are taken for these.</li> <li>Establishment of measures for the protection of monuments of national importance by virtue of the historical, architectural, traditional, artistic or archaeological interest attaching to them. Includes the site of the monument, the means of access to it and any land required to preserve the monument from injury or to preserve its amenities.</li> </ul>	<ul style="list-style-type: none"> <li>Establishment of a National Inventory of Architectural Heritage (NIAH). The objective of the NIAH is to aid in the protection and conservation of the built heritage, especially by advising planning authorities on the inclusion of particular structures in the Record of Protected Structures (RPS).</li> <li>Sites included in the RPS are awarded automatic protection and may not be demolished or materially altered without grant of permission under the Planning Acts.</li> <li>Policy created on licensing of excavations and guidelines for licensees on strategies and method statements, reports and publications.</li> </ul>	<p>The Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999 (S.I. No. 119/1999)</p> <p>The Planning and Development Act 2000 (S.I. No. 30/2000)</p> <p>Framework and Principles for the Protection of the Archaeological Heritage (DAHG, 1999)</p> <p>Policy and Guidelines on Archaeological Excavation (DAHG,</p>	The NWNB CFRAM study should consider sites of archaeological, architectural, cultural and natural heritage and ensure they are protected from loss or damage resulting from flood management measures.

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Related Legislation or Plans	Relevance to NWNB CFRAM Study
			1999)  Architectural Heritage Protection - Guidelines for Planning Authorities (DAHG, 2011)	
<i>Geology, Soils and Landuse</i>				
Food Harvest 2020 “A vision for Irish agri-food and fisheries” (DAFF, 2010)	<ul style="list-style-type: none"> <li>A strategy to chart the direction of agri-food, forestry and fisheries for the ten year period to 2020.</li> <li>Aims to innovate and expand the Irish food industry in response to increased global demand for quality foods</li> </ul>	<ul style="list-style-type: none"> <li>Sets out a vision for the potential growth in agricultural output after the removal of milk quotas in 2015</li> <li>Aims to increase the value of primary output of the agriculture, fisheries and forestry sector by 33% over compared to the 2007-2009 average.</li> </ul>	<p>European Communities (Food and Feed Hygiene) Regulations 2009 (S.I. No. 432/2009) (as amended)</p> <p>European Communities (Hygiene of Foodstuffs) (S.I. No. 369/2006)</p>	The NWNB CFRAM study should consider landuse factors, such as agriculture, in its strategies.
Agri-vision 2015 Action Plan (DAFF, 2006)	<ul style="list-style-type: none"> <li>Outlines the vision for agricultural industry to improve competitiveness and response to market demand while respecting and enhancing the environment.</li> </ul>	<ul style="list-style-type: none"> <li>Emphasises the link between agricultural production and public goods such as the landscape, heritage, and biodiversity.</li> </ul>		The NWNB CFRAM study should consider landuse factors, such as agriculture, in its strategies.
<p>Rural Environmental Protection Scheme (REPS)</p> <p>Agri-Environmental Options Scheme(AEOS)</p> <p>Green, Low-Carbon,</p>	<ul style="list-style-type: none"> <li>Agri-environmental funding schemes administered by the Department of Agriculture, Food and the Marine aimed at rural development for environmental enhancement and protection</li> </ul>			The NWNB CFRAM study should consider landuse factors, such as agriculture, in its strategies.



Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Related Legislation or Plans	Relevance to NWNB CFRAM Study
Agri-environment Scheme (GLAS)				
<p>Raised Bog SAC Management Plan (Draft) (DAHG, 2014),</p> <p>National Peatland Strategy (Draft) (NPWS, 2014)</p> <p>Review of Raised Bog Natural Heritage Area Network (NPWS, 2014)</p>	<ul style="list-style-type: none"> <li>Aims to meet nature conservation obligations in regards to the loss of natural bog habitats, while having regard to national and local economic, social and cultural needs.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that the implications of management choices for water levels, quantity and quality are fully explored, understood and factored into policy making and land use planning.</li> <li>Review the current raised bog NHA network in terms of its contribution to the national conservation objective for raised bog habitats and determine the most suitable sites to replace the losses of active raised bog habitat and high bog areas within the SAC network and to enhance the national network of NHAs</li> </ul>	<p>The Wildlife (Amendment) Act 2000 (S.I. No. 38/2000)</p> <p>European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011)</p>	The NWNB CFRAM study should take into consideration areas of bog habitat or peatland.
Irish Geological Heritage (IGH) Programme (GSI 1998-)	Programme to raise awareness about geological heritage and to recognise and protect geological heritage (or geoheritage).	<p>Establishment of county geological sites and integration of these into the planning system.</p> <p>Preparation of guidelines to aid the extractive industry in addressing geological heritage, particularly in the end usage of quarries.</p> <p>Targeted mapping to provide more detail in priority areas and areas of low data coverage</p> <p>Designation of three UNESCO-supported Global Geoparks – Copper</p>	<p>National Heritage Plan 2002 - 2007 (DAHG, 2002)</p> <p>The Wildlife (Amendment) Act 2000 (S.I. No. 38/2000)</p>	The NWNB CFRAM study should take into consideration areas of geological heritage.

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Related Legislation or Plans	Relevance to NWNB CFRAM Study
		Coast (Waterford), Marble Arch Caves (Fermanagh-Cavan) and Burren & Cliffs of Moher (Clare),		
<i>Landscape and Visual Amenity</i>				
National Landscape Strategy for Ireland (Draft) 2014 – 2024 (DAHG, 2014)	<ul style="list-style-type: none"> <li>Strategy for the provision of a framework for the protection of the many cultural, social, economic and environmental values embedded in the landscape.</li> </ul>	<ul style="list-style-type: none"> <li>To be implemented by the State, working in co - operation with public authorities, stakeholders, communities and individuals.</li> <li>Objectives include to establish and to implement, through a series of actions, policies aimed at understanding, managing, protecting and planning the landscape.</li> <li>Sets out specific measures to integrate and embed landscape considerations in all sectors which influence the landscape and improve and enhance the quality of decision - making by those who have an impact on it.</li> </ul>		The NWNB CFRAM study will have regard to this strategy and will (in combination with other users and bodies) cumulatively contribute towards the achievement of the objectives of the regulatory framework for environmental protection and management.
<i>Material Assets and Infrastructure</i>				
National Infrastructure and Capital Investment Plan 2012-2016 (Department of Public Expenditure and Reform, 2011)	<ul style="list-style-type: none"> <li>Replaces the National Development Plan. Assesses the existing capacity of Ireland's infrastructure and identifies remaining gaps which must be addressed to aid economic recovery, social cohesion and environmental sustainability.</li> </ul>	<p>The approach identifies four main components of the investment strategy, namely:</p> <ul style="list-style-type: none"> <li>Economic infrastructure – encompassing transport networks, energy provision and</li> </ul>		The NWNB CFRAM study will have regard to this plan and will (in combination with other users and bodies) cumulatively contribute towards the achievement of its objectives.

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		<p>telecommunications capacity.</p> <ul style="list-style-type: none"> <li>Investment in the productive sector and human capital – such as direct supports for enterprise development; science, technology and innovation advancement; supports for tourism, agriculture, fisheries and forestry; and capital investment in education infrastructure.</li> <li>Environmental infrastructure – including our waste and water systems and investment for environmental sustainability.</li> <li>Critical social investment – such as the health service and social housing programmes.</li> </ul>		
<i>Water</i>				
<p>Harnessing Our Ocean Wealth: An Integrated Marine Plan for Ireland (The Inter-Departmental Marine Coordination Group (MCG), 2012)</p>	<ul style="list-style-type: none"> <li>Aims to build on Ireland's rich maritime heritage and increase engagement with the sea.</li> <li>Strengthen maritime identity increase awareness of the value (market and nonmarket), opportunities and social benefits of engaging with the sea</li> </ul>	<ul style="list-style-type: none"> <li>Establishes two targets: <ul style="list-style-type: none"> <li>Double the value of our ocean wealth to 2.4% of GDP by 2030</li> <li>Increase the turnover from Ireland's ocean economy to exceed €6.4bn by 2020</li> </ul> </li> <li>Focuses on creating a thriving maritime economy, whereby Ireland harnesses the market opportunities to achieve economic recovery and socially inclusive, sustainable growth.</li> <li>Sets out to achieve healthy</li> </ul>		<p>The NWNB CFRAM study will have regard to this plan and will (in combination with other users and bodies) cumulatively contribute towards the achievement of its objectives.</p>

Directive/ Plan/Programme	High Level Description	Key Objectives, Actions etc.	Related Legislation or Plans	Relevance to NWNB CFRAM Study
		ecosystems that provide monetary and non-monetary goods and services		
Arterial Drainage Maintenance and High Risk Designation Programme 2011-2015 (Office of Public Works, 2011)	<ul style="list-style-type: none"> <li>Sets out the roles and responsibilities of the OPW in maintaining all rivers, embankments and urban flood defences on which it has executed works since the 1945 Act in "proper repair and effective condition".</li> </ul>	<ul style="list-style-type: none"> <li>Part 1 of the Programme comprises Arterial Drainage Maintenance (including Scheme Channel Maintenance Works, Maintenance of Scheme Structures, Scheme Embankment Maintenance and Flood Relief Scheme Maintenance.</li> <li>Part 2 of the Programme comprises High Risk Channel Designation.</li> </ul>	Arterial Drainage Act, 1945 (S.I No 3/1945) as amended and extended 1995 (S.I. No. 14/1995)	In future planning cycles it is likely that the arterial drainage plans will be brought together with flood risk management planning under the NWNB CFRAM study.
<i>Environment and Sustainable Development</i>				
National Spatial Strategy for Ireland 2002-2020 People, Places and Potential (DELG, 2002)	<ul style="list-style-type: none"> <li>Planning framework for Ireland</li> <li>Aims to achieve a better balance of social, economic and physical development across Ireland, supported by effective planning</li> </ul>	<ul style="list-style-type: none"> <li>Proposes that areas of sufficient scale and critical mass will be built up through a network of gateways, hubs and key town</li> </ul>	Local Government (Planning and Development) Act, 1963 (as amended) (S.I. No. 28/1963) Requirement of the Planning and Development (Amendment) Act 2010 (S.I. No. 30/2010)	The NWNB CFRAM study will have regard to this strategy and will (in combination with other users and bodies) cumulatively contribute towards the achievement of its objectives.

**REGIONAL/SUB-REGIONAL**

Plan/Programme	High Level Description	Key Objectives, Actions etc.	Related Legislation or Plans	Relevance to NWNB CFRAM Study
County and Town Development Plans	<ul style="list-style-type: none"> <li>• Outlines planning objectives for County/Town development over six year lifespan</li> <li>• Strategic framework for planning and sustainable development including those set out in National Spatial Strategy and Regional Planning Guidelines</li> </ul>	<ul style="list-style-type: none"> <li>• Identifies future infrastructure, development and zoning required</li> <li>• Protects and enhances amenities and environment.</li> <li>• Guides planning authority in assessing proposals.</li> </ul>	Requirement of the Planning and Development Act 2000 (S.I. No. 30/2000) as amended	The NWNB CFRAM study will have regard to these plans and will (in combination with other users and bodies) cumulatively contribute towards the achievement of its objectives.
Local Area Plans	<ul style="list-style-type: none"> <li>• Statutory document which provides detailed planning policies to ensure proper planning and sustainable development of area.</li> <li>• Sets out objectives for future planning and development.</li> </ul>	<ul style="list-style-type: none"> <li>• Identifies issues of relevance to the area and outlines principles for future development of area.</li> <li>• Is consistent with relevant County/Town Development Plans, National Spatial Strategy and Regional Planning Guidelines</li> </ul>	<p>Local Government (Planning and Development) Act, 1963 (S.I. No. 28/1963) (as amended)</p> <p>Requirement of the Planning and Development (Amendment) Act (2010) (S.I. No. 30/2010)</p>	The NWNB CFRAM study will have regard to these plans and will (in combination with other users and bodies) cumulatively contribute towards the achievement of its objectives.
Planning Schemes for Strategic Development Zones (SDZ)	<ul style="list-style-type: none"> <li>• An area of land designated by the Government to contain specified developments of economic or social importance to the State.</li> <li>• Aims to create sustainable communities under a master plan to facilitate the requirements by which it was acquired by the State.</li> </ul>	<ul style="list-style-type: none"> <li>• Development includes necessary infrastructural and community facilities and services.</li> </ul>	Local Government (Planning and Development) Act, 1963 (S.I. No. 28/1963) (as amended)	The NWNB CFRAM study will have regard to these Zones and will (in combination with other users and bodies) cumulatively contribute towards the achievement of its objectives.

Plan/Programme	High Level Description	Key Objectives, Actions etc.	Related Legislation or Plans	Relevance to NWNB CFRAM Study
Housing Strategies	<ul style="list-style-type: none"> <li>Ensures proper planning and sustainable development of the area of the development plan.</li> <li>Provides housing policy for existing and future population of the area.</li> </ul>	<ul style="list-style-type: none"> <li>Identifies the existing needs or likely future need for housing.</li> <li>Ensures the availability of housing for persons of different levels of income.</li> <li>Ensures a mixture of housing types to suit demographics.</li> <li>Each Local Authority is required to prepare a housing strategy and review it every two years.</li> </ul>	<p>Local Government (Planning and Development) Act, 1963 (S.I. No. 28/1963) (as amended)</p> <p>Requirement of the Planning and Development Act 2000 (S.I. No. 30/2000) as amended</p>	The NWNB CFRAM study will have regard to these Strategies plan and will (in combination with other users and bodies) cumulatively contribute towards the achievement of its objectives.
Biodiversity Action Plans	<ul style="list-style-type: none"> <li>Aims to protect, conserve, enhance and restore biodiversity and ecosystem services across all spectrums.</li> </ul>	<ul style="list-style-type: none"> <li>Outlines the status of biodiversity and identifies species of importance.</li> <li>Outlines objectives and targets to be met to maintain and improve biodiversity.</li> <li>Aims increase awareness.</li> </ul>		The NWNB CFRAM study will have regard to these plans and will (in combination with other users and bodies) cumulatively contribute towards the achievement of its objectives.
Heritage Plans	<ul style="list-style-type: none"> <li>Aims to highlight the importance of heritage at a strategic level.</li> </ul>	<ul style="list-style-type: none"> <li>Manage and promote heritage as well as increase awareness.</li> <li>Aim to conserve and protect heritage.</li> </ul>		The NWNB CFRAM study will have regard to these plans and will (in combination with other users and bodies) cumulatively contribute towards the achievement of its objectives.
County Landscape Character Assessments	<ul style="list-style-type: none"> <li>Characterises the geographical dimension of the landscape.</li> </ul>	<ul style="list-style-type: none"> <li>Identifies the quality, value, sensitivity and capacity of the landscape area.</li> <li>Guides strategies and guidelines for the future development of the landscape.</li> </ul>	<p>Requirement of the Planning and Development Act 2000 (S.I. No. 30/2000) as amended</p> <p>Landscape and</p>	The NWNB CFRAM study will have regard to these plans and will (in combination with other users and bodies) cumulatively contribute towards the achievement of its objectives.

Plan/Programme	High Level Description	Key Objectives, Actions etc.	Related Legislation or Plans	Relevance to NWNB CFRAM Study
			Landscape Assessment Guidelines (DoEHLG, 2000)	
Special Amenity Area Orders	<ul style="list-style-type: none"> <li>Aims to protect special areas of landscape, environmental or amenity value</li> </ul>		Local Government (Planning and Development) Act, 1963 (S.I. No. 28/1963) (as amended)	The NWNB CFRAM study will have regard to these orders and will (in combination with other users and bodies) cumulatively contribute towards the achievement of its objectives.
Shellfish Pollution Reduction Programmes	<ul style="list-style-type: none"> <li>Aims to improve water quality and ensure the protection or improvement of designated shellfish waters in order to support shellfish life and growth and contribute to the high quality of shellfish products directly edible by man.</li> </ul>	<ul style="list-style-type: none"> <li>Identifies key and secondary pressures on water quality in designated shellfish areas.</li> <li>Outlines specific measures to address identified key and secondary pressures on water quality.</li> <li>Addresses the specific pressures acting on water quality in each area.</li> </ul>	European Communities (Quality of Shellfish Waters) Regulations 2006 (SI 268/2006) (as amended) and requirement of Shellfish Waters Directive (2006/113/EC) for designated shellfish waters	Impacts on water quality are of relevance to the NWNB CFRAM study as flooding can be linked with water pollution.
Freshwater Pearl Mussel Sub-Basin Management Plans	<ul style="list-style-type: none"> <li>Identifies the current status of the species and the reason for loss or decline.</li> <li>Identifies measure required to improve or restore current status.</li> </ul>	<ul style="list-style-type: none"> <li>Identifies pressures on Freshwater Pearl Mussels for each of the designated populations in Ireland.</li> <li>Outlines restoration measures required to ensure favourable conservation status.</li> </ul>	Requirement of Water Framework Directive (2000/60/EC) and Habitats Directive (92/43/EEC) European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003) European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011)	Impacts on water quality are of relevance to the NWNB CFRAM study as flooding can be linked with water pollution.



Plan/Programme	High Level Description	Key Objectives, Actions etc.	Related Legislation or Plans	Relevance to NWNB CFRAM Study
			The Wildlife Act 1976 (S.I. No. 39/1976) and The Wildlife (Amendment) Act 2000 (S.I. No. 38/2000)	
Groundwater Protection Schemes	<ul style="list-style-type: none"> <li>• Preserve and prevent deterioration in quality and identify the status of groundwater.</li> <li>• Protect groundwater quality for drinking water purposes.</li> <li>• Provides a framework for and informs planning authorities.</li> </ul>	<ul style="list-style-type: none"> <li>• Assess and identify the vulnerability, aquifer potential and source protection of groundwater.</li> <li>• Map Groundwater Protections Zones.</li> <li>• Identify groundwater protection responses for existing and potential environmental risks.</li> <li>• Integrate Groundwater Protection Schemes into County Development Plans.</li> </ul>		Impacts on water quality are of relevance to the NWNB CFRAM study as flooding can be linked with water pollution.
County Renewable Energy Strategies	<ul style="list-style-type: none"> <li>• Aims to ensure competitive, secure and sustainable energy</li> </ul>	<ul style="list-style-type: none"> <li>• Progress renewable energy forms at county level.</li> <li>• Develop sustainable energy forms including renewable electricity, bioenergy, wind energy etc.</li> </ul>	Renewable Energy Directive (2009/28/EC) European Communities (Renewable Energy) Regulations 2011 (S.I. No. 147/2011) The Framework for Climate Change Bill	The NWNB CFRAM study will have regard to these Strategies and will (in combination with other users and bodies) cumulatively contribute towards the achievement of its objectives.
Sludge Management Plans	<ul style="list-style-type: none"> <li>• Outlines how all types of non-hazardous sludge arising from waste water and water treatment, agriculture and industry will be dealt with.</li> </ul>		Waste Management Act 1996 (as amended) Waste Management (Use of Sewage Sludge in Agriculture) Regulations, 1998 (as amended)	The NWNB CFRAM study will have regard to these plans and will (in combination with other users and bodies) cumulatively contribute towards the

Plan/Programme	High Level Description	Key Objectives, Actions etc.	Related Legislation or Plans	Relevance to NWNB CFRAM Study
			Urban Waste Water Treatment Directive (91/271/EEC) European Communities (Urban Waste Water Treatment) Regulations 2001 (S.I. No. 254/2001)	achievement of its objectives.
Economic development plans for rural and urban areas	Plans to enable areas to achieve sustained and sustainable economic growth and development.	<ul style="list-style-type: none"> <li>Identifies opportunities for development of the economy in an areas</li> <li>Identifies challenges that may be preventing economic development</li> <li>Identifies what is required to ensure that the opportunities are realised and jobs created</li> </ul>		The NWNB CFRAM study will have regard to these plans and will (in combination with other users and bodies) cumulatively contribute towards the achievement of its objectives.
River Basin Management Plans and associated Programmes of Measures - including International (Northern Ireland) Plans and Programmes	<ul style="list-style-type: none"> <li>Establish a framework for the protection of water bodies at River Basin District (RBD) level</li> <li>Preserve, prevent the deterioration of water status and where necessary improve and maintain "good status" of water bodies in that RBD</li> <li>Promote sustainable water usage</li> </ul>	<ul style="list-style-type: none"> <li>Aims to protect and enhance all water bodies in the RBD and meet the environmental objectives outlined in Article 4 of the Water Framework Directive</li> <li>Identifies and manages water bodies in the RBD</li> <li>Establishes a programme of measures for monitoring and improving water quality in the RBD</li> <li>Involves the public through consultations</li> </ul>	Requirement of the Water Framework Directive (2000/60/EC) European Communities (Water Policy) Regulations, 2003 (SI No. 722) (as amended) Guidelines for the Establishment of River Basin District Advisory Councils (RBDAC) (WFD Ireland)	Water quality and quantity is linked to the NWNB CFRAM study as flooding events can lead to water pollution and changes in water levels. The NWNB CFRAM study should promote sustainable management of the water environment by carefully considering current land use and future climate scenarios, minimise the effects of flooding and drought events and to facilitate long term improvements in water quality, including the protection of groundwater.

Plan/Programme	High Level Description	Key Objectives, Actions etc.	Related Legislation or Plans	Relevance to NWNB CFRAM Study
Water Quality Management Plans	<ul style="list-style-type: none"> <li>Aims to manage and protect water at catchment based level</li> </ul>	<ul style="list-style-type: none"> <li>Ensure quality of water covered by the plan is maintained and protected</li> <li>Manages the status of water at catchment level</li> <li>Aims to prevent and abate pollution of waters</li> </ul>	Requirement of the local Government (Water Pollution) Act 1977 (S.I. No. 1/1977)	Water quality and quantity is linked to the NWNB CFRAM study as flooding events can lead to water pollution and changes in water levels. The NWNB CFRAM study should promote sustainable management of the water environment by carefully considering current land use and future climate scenarios, minimise the effects of flooding and drought events and to facilitate long term improvements in water quality, including the protection of groundwater.
Regional Planning Guidelines	<ul style="list-style-type: none"> <li>Gives regional effect to National Spatial Strategy</li> </ul>	<ul style="list-style-type: none"> <li>Guides development for each county in the region</li> <li>Inform County Development Plans in situ with National Spatial Strategy recommendations</li> </ul>	Planning and Development (Amendment) Act 2010 (S.I. No. 30/2010)	The NWNB CFRAM study will have regard to these planning guidelines and will (in combination with other users and bodies) cumulatively contribute towards the achievement of its objectives.

