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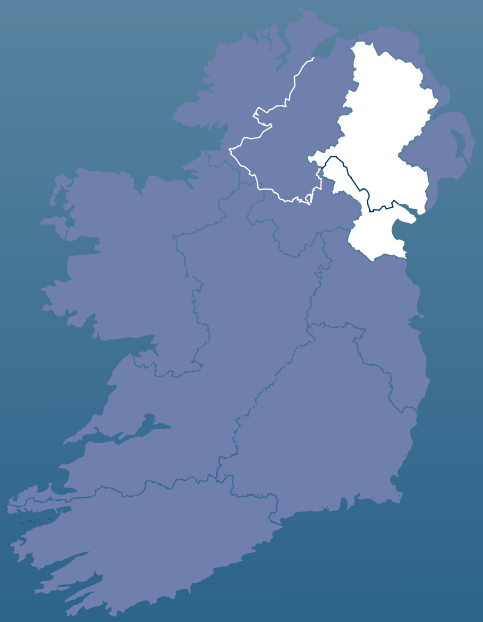
Strategic Environmental Assessment for the Water Framework Directive River Basin Management Plans and Programmes of Measures - Neagh Bann IRBD

Updated Environmental Report and Appendices



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neagh bann international river basin district
North South Shared Aquatic Resource (NS SHARE)

INTERREG IIIA

Project part financed by the European Union

NON-TECHNICAL SUMMARY

INTRODUCTION

This Environmental Report has been prepared as part of the Strategic Environmental Assessment (SEA) of the River Basin Management Plan and Programme of Measures (hereafter referred to as the Plan and POM) for the Neagh Bann International River Basin District (IRBD) in accordance with national and EU legislation. SEA is a systematic method of considering the likely significant environmental effects of a Plan or Programme by integrating environmental factors into the development of the Plan and related decision-making.

The purpose of this Environmental Report is to: a) inform the development of the Plan; b) identify describe and evaluate the likely significant effects of the Plan and its reasonable alternatives; and c) provide an early opportunity for the statutory authorities and the public to offer views through consultation.

METHODOLOGY INCLUDING CONSULTATION (Chapter 2 and 4)

This Environmental Report contains the findings of the assessment of the likely significant effects on the environment, of implementing the proposed draft Plan and POM. It reflects the requirements of the SEA Directive (2001/42/EC) on the assessment of the effects of certain plans and programmes on the environment and also the transposed regulations in Ireland (S.I. 435/2004) and Northern Ireland (S.R. 280/2004). The stages followed in the SEA are summarised in **Figure 1** below.

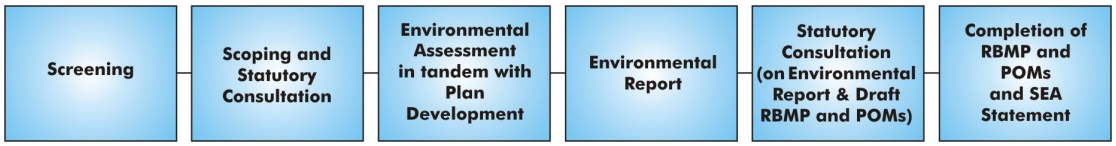

Figure 1 Summary of SEA stages

Integration of the SEA and draft Plan and POM was achieved through close involvement of relevant team members in all stages of the project, including SEA scoping; review of the existing situation; and public consultation. The SEA and Plan Teams also participated in a number of workshops in relation to developing the: SEA assessment methodology; alternatives to be considered in the SEA; SEA objectives, targets and indicators; and mitigation measures and monitoring strategies. The development of the River Basin Management Plan, including the Programme of Measures, was progressed in consultation with the *River Basin Management Plan and Programme of Measures Strategic Environmental Assessment Steering Group (see Chapter 4)*.

SCOPING THE RELEVANT ENVIRONMENTAL ASPECTS

The objective of scoping is to identify key issues of concern that should be addressed in the environmental assessment of the Plan and POM so that they can be considered in appropriate detail. Scoping also helps determine the boundaries of the assessment in terms of geographical extent and the time horizon for the assessment. **Figure 2** outlines the various elements that contribute to the scope of the SEA.

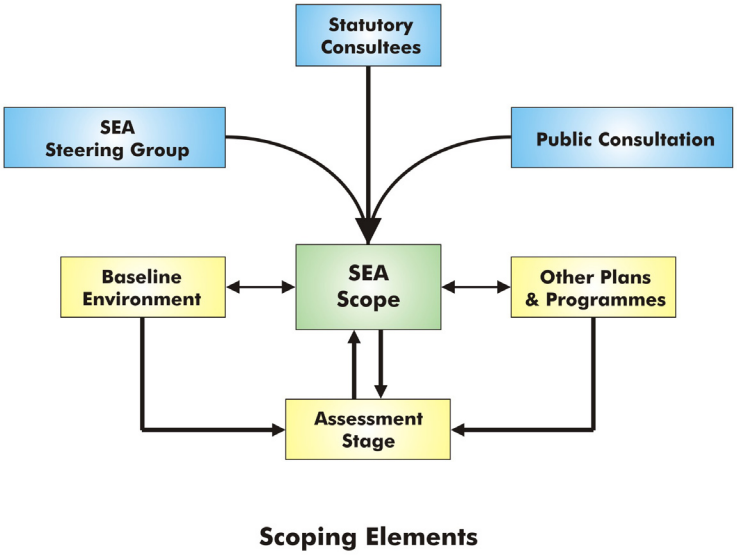

Figure 2 Overview of the Scoping Process

Consultation was carried out with the statutory consultees (Department of Communications, Energy and Natural Resources, Department of the Environment, Heritage and Local Government, Environmental Protection Agency and Northern Ireland Environment Agency) and with the public and other stakeholders. Taking into consideration feedback from consultees, a broad assessment of the potential for the Plan to influence the environment was carried out. All of the environmental topics listed in the SEA Directive have been scoped in for the assessment of the Plan. These are:

- Biodiversity, Flora and Fauna;
- Population;
- Human Health;
- Soil;
- Water;
- Landscape;
- Air;

- Climatic Factors;
- Material Assets; and
- Cultural, Architectural and Archaeological Heritage.

The Neagh Bann River Basin Management Plan and POM is a regional plan for the Neagh Bann IRBD and as such the assessment has been limited geographically to activities occurring within the functional area of the Plan. The first Plan and POM will cover the period from 2009 up to 2015, with an interim review after three years. In certain circumstances the draft Plan considers the timeline horizons of 2021 and 2027, being the end of the second and third 6-year Plan cycles, respectively. These longer-term horizons are necessary where good status or good potential or indeed LSO (less stringent objectives) cannot be achieved by 2015 or where measures to achieve these are deemed technically infeasible or disproportionate in cost. In line with the SEA Directive, short, medium and long-term impacts have been considered during the assessment. As the Plan is on a regional scale, the majority of the data relates to overall national and regional performance.

Based on the requirements of the legislation and guidance, the following information is provided in the Environmental Report.

Table 1 Contents of the Environmental Report

Requirement of SEA Directive (Article 5(1), Annex 1)	Section of Environmental Report
An outline of the contents and main objectives of the plan or programme, or modification to a plan or programme, and relationship with other relevant plans or programmes;	Chapter 3: Description of the Plan Chapter 4: Consultation
The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme, or modification to a plan or programme,	Chapter 5: Baseline Environment
The environmental characteristics of areas likely to be significantly affected	Chapter 5: Baseline Environment
Any existing environmental problems which are relevant to the plan or programme, or modification to a plan or programme, including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to the Birds Directive or the Habitats Directive	Chapter 5: Baseline Environment
The environmental protection objectives, established at international, European Union or national level, which are relevant to the plan or programme, or modification to a plan or programme, and the way those objectives and any environmental considerations have been taken into account during its preparation	Chapter 6: Review of Relevant Plans, Programmes and Policies
The likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors	Chapter 9: Assessment
The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme, or modification to a plan or programme	Chapter 10: Mitigation and Monitoring

Requirement of SEA Directive (Article 5(1), Annex 1)	Section of Environmental Report
An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information	Chapter 2: Methodology Chapter 7: Strategic Environmental Objectives, Targets and Indicators Chapter 8: Alternatives
A description of the measures envisaged concerning monitoring of the significant environmental effects of implementation of the plan or programme, or modification to a plan or programme	Chapter 10: Mitigation and Monitoring
A non-technical summary of the information provided under the above headings	Non-Technical Summary

Habitats Directive Assessment Consultation (Chapter 4)

In addition to this SEA, there is a requirement under the EU Habitats Directive assess whether the Plan has the potential to impact negatively on a Natura 2000 site. These sites include areas designated for the protection and conservation of habitats and of wild flora and fauna and include Special Protection Areas and Special Areas of Conservation. The Habitats Directive Assessment (also known as Appropriate Assessment) has been carried out in conjunction with both the SEA and the Plan making processes. Consultation on methodology of approach has taken place with both the National Parks and Wildlife Service (NPWS) and the Northern Ireland Environment Agency (NIEA) as the competent authorities in Ireland and Northern Ireland.

DESCRIPTION OF THE PLAN (Chapter 3)

The Water Framework Directive (WFD) (2000/60/EC) came into force in December 2000 and establishes a framework for community action in the field of water policy and for the protection of inland surface waters, transitional waters, coastal waters and groundwater.

The main objectives of the WFD are to maintain the "high and good status" of waters where it exists, prevent deterioration in existing status of waters and to achieve or restore at least *"*good status*"* in relation to all waters by 2015. The mechanism to achieve this under the WFD is through the adoption and implementation of River Basin Management Plans (RBMPs) and Programmes of Measures (POMs) for each of the eight identified RBDs (see **Figure 3**).

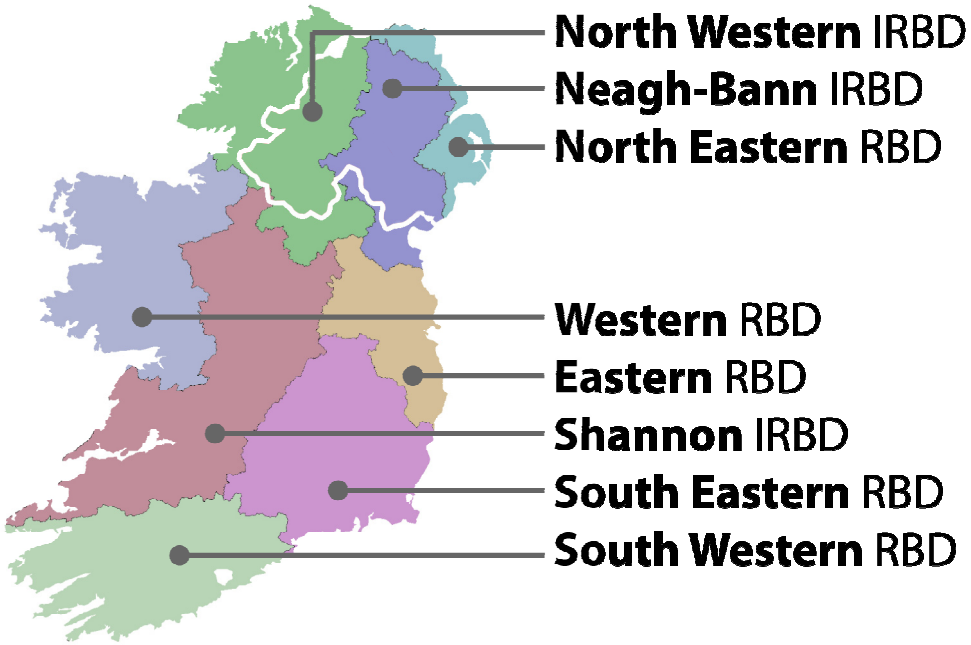

Figure 3 River Basin Management areas of Ireland

The Neagh Bann International River Basin District covers the territory of more than one Member State and therefore is assigned to an International RBD (IRBD). The Neagh Bann IRBD is flanked by the Sperrin Mountains to the north-west, the Antrim Plateau to the north-east and the Mourne Mountains and uplands of Monaghan and Meath to the south. The northern part contains the broad, very fertile Bann valley; the southern part is dominated by small drumlin hills from the last ice age.

The Plan outlines measures to tackle key water pressures in the District. Some issues of concern in the NBIRBD for which measures are proposed in the draft Plan include: spread of invasive alien species; pressure on fisheries; presence of heavily modified and artificial water bodies; point and diffuse pollution from wastewater treatment plants, licensed discharges, mines, landfills, quarries and contaminated lands; agriculture; unsewered properties; forestry; physical modifications; and abstraction. The overall objectives of the Plan are based on the objectives of the WFD and can be summarised as follows:

- Enable waters supporting protected areas to achieve their stricter status standards;
- Prevent deterioration, and in particular maintain high or good status (surface water);
- Improve waters where appropriate to achieve at least good standards (surface water);
- Progressively reduce chemical pollution (surface water);
- Limit Pollution Inputs and prevent deterioration (groundwater);

- Improve chemical quality and improve quantity where appropriate to achieve good status (groundwater); and
- Reverse increasing pollution trends (groundwater).

REVIEW OF RELEVANT PLANS, POLICIES AND PROGRAMMES (Chapter 6)

A review of the plans, policies and programmes relevant to the Plan was carried out. The review focussed primarily on National (both Ireland and Northern Ireland), European and International plans and programmes. In reviewing other plans, the following questions were asked:

- Does the Plan contribute to the fulfilment of objectives and goals set in other Plans?
- To what degree are the goals and objectives set in other plans and programmes impacted by the Plan?

The findings of the review helped define the objectives for the SEA and informed the assessment of alternative options. Some of the key Plans, Programmes and Policies include;

- The Kyoto Protocol;
- The EIA Directive;
- The EU Habitats and Birds Directives;
- The Groundwater Directive (2006/118/EC); and
- The EU Floods Directive (2007/60/EC).

THE BASELINE ENVIRONMENT (Chapter 5)

As this strategic environmental assessment deals with a plan for the Neagh Bann IRBD, the baseline data is focused at the IRBD level and includes information from both Ireland and Northern Ireland.

According to recent EPA publications (EPA, 2008), Ireland's natural environment, although under increasing pressure, generally remains of good quality and represents one of the country's most essential national assets. The fourth EPA *State of the Environment Report* (2008) identified four priority challenges for the environment, which comprise: limiting and adapting to climate change; reversing environmental degradation; mainstreaming environmental considerations; and complying with environmental legislation and agreements. The first State of the Environment Report for Northern Ireland (2008) identified four major environmental issues facing Northern Ireland. These are climate change, economic growth, rural land use and water quality. All of these are highly relevant to the WFD and the current river basin management planning process. **Table 2** sets out existing environmental pressures in the NBIRBD.

Table 2 Baseline Environment and Existing Environmental Pressures

Aspect	Existing Environmental Pressures
Biodiversity, Flora and Fauna	Throughout the island of Ireland there has been a decline in many of the native species through habitat loss, competition, development and agriculture. Wastewater discharges, runoff from agriculture, leachate from landfills and contaminated sites and nutrient input from forestry can all have detrimental effects on water quality resulting in subsequent impacts to biodiversity. Annex II species such as freshwater pearl mussel and salmon are particularly sensitive to pollution. Widespread development on shorelines and floodplains and the associated infilling of wetlands, is a potential environmental problem within this District. Invasive non-native plant and animal species are one of the greatest threats to biodiversity in Ireland.
Population and Human Health	Ireland's and Northern Ireland's economy has experienced unprecedented economic growth since the early 1990's. New individual houses and housing clusters, reliant on septic tanks, threaten water quality. Additional homes mean the spread of urban areas and an increase in rural housing, with the associated threat of more water pollution. Pressure from abstractions can reduce flow in springs and lower water levels in lakes, wetlands and wells.
Water	The main pressures on surface and groundwater quality within the IRBD are point and diffuse, physical modifications, climate change and other local issues. Point and diffuse sources include; wastewater and industrial discharges, landfills, quarries, mines and contaminated sites, agriculture, wastewater from unsewered properties, forestry; and discharge of dangerous substances.
Air and Climate	Currently there are no significant concerns with regard to air quality at the River Basin District level. With regard to climate, inputs of greenhouses gasses from water management activities in the River Basin District, which require the use of fossil fuels, add to the carbon dioxide emissions produced on the island.
Cultural Heritage	Development of water-related infrastructure, in addition to development resulting from economic growth and increasing population, is placing pressure on sites or features of architectural, archaeological or cultural heritage interest.
Landscape and Visual	Existing pressures on landscape and visual resources as a result of water management activities are limited and are primarily related to impacts to sensitive views and landscapes resulting from the siting of development, including water related infrastructure, without sensitivity to these resources.
Material Assets	Increased development including residential and industrial expansion continues to put pressure on existing water sources with regards to quantity as well as on the treatment facilities used to treat both raw water for drinking and other purposes and wastewater. In addition, existing water quality issues are resulting in pressures on economic shellfish and aquaculture activities along with fisheries used for recreational purposes. Some of the physical modifications identified as material assets, such as dams and weirs, may also be resulting in pressures on fisheries used for recreational and commercial purposes.
Soils and Land Use	Precipitation changes, predicted as one of the global warming impacts on Ireland, could have serious implications for slope stability and landslides and their resultant impacts on water management activities. Eroded soil washed into rivers during heavy rainfall contains an increased nutrient content, which can damage the balance of nutrient poor, aquatic ecosystems by shifting their species composition, supporting more nutrient-loving species. This can lead to the eutrophication of rivers and lakes. As discussed previously, extraction activities, when mismanaged, are resulting in pressures on water quality. In particular, peat cutting can be damaging to vegetation, hydrology and

Aspect	Existing Environmental Pressures
	landscape. Alternately, the extractability of mineral, sand and gravel resources is also being curtailed and/or reduced by the encroachment of residential development into rural areas and the conflicts between people and the impacts associated with these activities, e.g. noise, traffic.

In accordance with the SEA Directive, the inter-relationship between the SEA environmental topics must be taken into account. **Table 3** highlights the key inter-relationships identified in this SEA. **Table 3** highlights the key inter-relationships identified in this SEA. Of particular note is the primary interrelationship between water (quality and quantity) and biodiversity, flora and fauna, soils, human health and population. Flora and fauna rely directly on the aquatic environment as a habitat but the terrestrial environment can also be strongly impacted by the aquatic environment. Water quality is also of particular importance with regard to human health as it provides a source of drinking water and it yields foodstuffs (e.g. fish and shellfish). Water is also used for leisure and recreational purposes, providing a material asset both for local populations and as part of the tourism economy.

Table 3 Potential Inter-Relationships Between SEA Topics

	Biodiversity Flora, Fauna	Population / Human Health	Soil	Water	Air	Climatic Factors	Material Assets	Cultural Heritage
Population / Human Health	√							
Soil	√	√						
Water	√	√	√					
Air	√	√	√	√				
Climatic Factors	√	√	√	√	√			
Material Assets	√	√	√	√	X	√		
Cultural Heritage	X	√	√	√	√	√	√	
Landscape	X	√	√	√	X	√	√	√

In the absence of the Plan, water resources in the District would continue to be managed in an uncoordinated manner. In particular cross border issues would remain unaddressed, causing cumulative and synergistic impacts on water and giving rise to transboundary issues in both jurisdictions. The pressures identified in the *Water Matters – Have Your Say Report* also known as the Significant Water Management Issues or SWMI report would continue to impact on water quality and quantity, perpetuating indirect impacts associated with these on biodiversity, flora and fauna,

population and human health. Development may continue to take place in a dispersed manner, though some control would be provided by existing controls in plans such as the National Spatial Strategy and the National Development Plan in Ireland and Planning Policy Statements 1 to 18 and the Regional Development Strategy in Northern Ireland, placing further pressure on water and wastewater services in those areas, leading to adverse impacts on human health and population from poor water quality, in the form of possible cryptosporidium outbreaks, *e-coli* contamination and deterioration of bathing water quality. As a result of manmade greenhouse gas emissions, climate change is predicted to occur in the future regardless of action. The potential impacts from sea level increases, increased flooding, summer droughts, etc., will impact on water management. Some cultural heritage features would continue to be at risk from water pollution. However, planned changes to the morphology of certain water bodies as part of the Plan would not occur, potentially avoiding interference with water dependent features, such as mills and weirs.

ENVIRONMENTAL OBJECTIVES, TARGETS AND INDICATORS (Chapter 7)

There are essentially three types of Objectives considered as part of this SEA. The first relates to the *Objectives of the WFD and the RBMP* (see **Chapter 3**). The second relates to wider *Environmental Objectives*, i.e. environmental protection objectives at national and European level (see **Chapter 6**), and finally there are the *Strategic Environmental Objectives,* which were devised to test the environmental effects of the Plan / POM.

The **Strategic Environmental Objectives** are separate to the Plan objectives and provide a statement of what is intended from an environmental perspective, giving a desired direction of change. The **Strategic Environmental** Objectives reflect the existing environmental concerns in Ireland relevant to water management and take account of the scoping and consultation feedback. The selected objectives for this SEA are listed below in **Box 1**.

Box 1: Strategic Objectives Selected

Objective 1: Prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species. (Biodiversity, Flora and Fauna)

Objective 2: Contribute to sustainable development. (Population)

Objective 3: Protect and reduce risk to human health in undertaking water management activities. (Human Health)

Objective 4: Avoid damage to the function and quality of the soil resource in the River Basin District. (Soil)

Objective 5: Prevent deterioration of the status of water bodies with regard to quality, quantity and improve water body status for rivers, lakes, transitional and coastal waters and groundwater's to at least good status, as appropriate to the WFD. (Water)

Objective 6: Minimise emissions to air as a result of Plan activities. (Air Quality)

Objective 7: Minimise contribution to climate change by emission of greenhouse gasses associated with Plan implementation. (Climatic Factors)

Objective 8: Maintain level of protection provided by existing morphological infrastructure, e.g. flood defences, coastal barriers, groynes, etc. (Material Assets 1)

Objective 9: Provide new and upgrade existing water management infrastructure to protect human health and ecological status of water bodies. (Material Assets 2)

Objective 10: Support economic activities within the District without conflicting with the objectives of the WFD. (Material Assets 3)

Objective 11: Protect water as an economic resource. (Material Assets 4)

Objective 12: Avoid damage to cultural heritage resources in the River Basin District. (Cultural Heritage)

Objective 13: Avoid damage to designated landscapes in the River Basin District. (Landscape)

The overall purpose of environmental indicators in the SEA is to provide a way of measuring the environmental effect of implementing the Plan. Environmental indicators are also used to track the progress in achieving the targets set in the SEA as well as the Plan itself. The proposed indicators for this SEA have been selected bearing in mind the availability of data and the feasibility of making direct links between any changes in the environment and the implementation of the Plan / POM.

Targets were considered over the duration of the baseline data collection and assessment, and throughout the consultation process, in order to meet the Strategic Environmental Objectives as well as the objectives of the Plan. In each case, any target that is set must be attributable to the implementation of the Plan / POM. The targets and indicators associated with each SEA Objective are presented in **Chapter 7** of the report.

ALTERNATIVES (Chapter 8)

Each of the River Basin Management Plans must include a set of management measures, entitled the Programme of Measures, aimed at achieving the objective of good status by 2015 under the WFD. Article 11 of the WFD sets out the types of measures that must be included in the Plan. Where application of these **required measures** will not be sufficient to achieve the default objective, **additional measures**, or actions, need to be identified and considered. The types of measures considered is at the discretion of the Member State; however, a non-exhaustive list of possible additional measures is provided for guidance in Annex VI Part B of the WFD.

In Ireland, the additional measures under consideration were developed as a part of the Programme of Measures studies carried out by several of the RBD projects over the last year. In Northern Ireland, the range of possible additional measures was identified by a series of technical studies. In addition, the range of additional measures available for implementation in the Plan has been informed by the early stages of the SEA process as well as the Article 6 Assessment carried out under the EU Habitats Directive (92/43/EEC).

The additional measures being considered for the Plan address the pressures described in the 2007 Water Matters – Have Your Say document prepared for the IRBD and listed in **Chapter 5**. The additional measures have been grouped by pressure and have been categorised broadly as measures that will either:

a) **reduce** the inputs of contaminants;

b) **replace or upgrade** infrastructure; or

c) **relocate** the pressure to an alternative and less sensitive location.

The additional measures represent a range of options which can be selected for the Plan, with the option of choosing one, all or a combination of these, if appropriate.

ASSESSMENT (Chapter 9)

The following scenarios have been assessed in this SEA:

(i) Business as Usual;

(ii) Business as Usual plus Other Required Measures; and

(iii) Individual Additional Measures.

The WFD reinforces the requirement to implement the provisions of existing environmental and water protection directives. The implementation of the 11 Existing Directives as specified in the WFD is considered the **Business as Usual** scenario. While many of the measures required under these 11

existing directives are expected to result in improved water quality, some of the actions arising from their implementation do not lend themselves to formal environmental assessment. The types of measures required have been grouped into themes (e.g. education and awareness, monitoring and identification) and an explanation provided as to whether or not assessment of these in the context of the Strategic Environmental Objectives is practicable at this time. For those that could be assessed, the assessment has been qualitative.

A second scenario is also assessed which includes implementation of the 11 Existing Directives plus implementation of further water protection measures listed under Article 11(3) of the WFD. This is termed the **Business as Usual plus Other Required Measures** scenario. The requirements are based on broad themes, many of which are directly tackled by the additional individual measures developed by each RBD. However, the broad themes have been assessed in the SEA as they will involve substantially new actions not currently covered by the business as usual scenario alone. As they relate to themes rather than specific actions the assessment is qualitative.

The third scenario assessed relates to **Individual Additional Measures**. These measures are required where the implementation of the 11 Directives or the other water protection measures listed in Article 11(3) would not be sufficient to achieve 'good status' by 2015. Each Additional Measure has been assessed against each of the Strategic Environmental Objectives in terms of how it contributes to achieving the objective with an assessment rating assigned for the purpose of comparison. The assessment carried out was primarily qualitative in nature, with some based on expert judgement. This qualitative assessment compares the likely impacts against the Strategic Environmental Objectives to see which Additional Measures meet the Strategic Environmental Objectives and which, if any, contradict these.

A *Do Nothing* scenario i.e. no change in current practices, has not been assessed as part of the SEA. It is considered that the 11 Existing Directives will have to be implemented regardless of the Plan and POM; therefore, a do nothing scenario is not realistic.

The approach used for assessing the draft Plan Options was an objective led assessment. For the purposes of this assessment plus (+) indicates a potential positive impact, minus (-) indicates a potential negative impact, plus/minus (+/-) indicates that both positive and negative impacts are likely or that in the absence of further detail the impact is unclear, and a neutral or no impact is indicated by 0.

At the broad level, implementation of the Plan is expected to bring environmental improvements, since it tackles specific pressures on water quality. However, there are some cases where negative impacts may arise in the wider environment. The SEA has identified such areas and where mitigation of impacts can be achieved including ensuring that monitoring and regulation is adequate, and encouraging an integrated approach to water management within the NBIRBD and throughout the

island of Ireland. In addition, the Habitats Directive Assessment results have been integrated into the SEA and where mitigation has been proposed under the Habitats Directive Assessment this has also been brought forward into the SEA. The assessment of Additional Measures is summarised in **Table 4.**

Table 4 Summary Assessment Table

	Overall Impact	Mitigation Measures Recommended
Existing 11 Directives and Other Article 11(3) Measures	+/-	√
Industrial sources	+	√
Dangerous Substances	+	√
Physical Modifications	+/-	√
Other Sources	+	√
Abstractions	+	√
Agriculture	+	√
Unsewered Properties	+ / -	√
Wastewater	+	√
Forestry	+	√
Freshwater Pearl Mussel	+ / -	√

MITIGATION AND MONITORING (Chapter 10)

Article 10 of the SEA Directive requires that monitoring be carried out to identify at an early stage any unforeseen adverse effects due to implementation of the Plan, in order to take remedial action where adverse effects are identified through monitoring.

Monitoring will focus on aspects of the environment that are likely to be significantly impacted by the Plan. Where possible, indicators have been chosen based on the availability of the necessary information and the degree to which the data will allow the target to be linked directly with the implementation of the Plan.

The proposed monitoring programme will be carried out as implementation of the Plan progresses and, depending on monitoring results, adjustments to targets and indicators may be made to ensure the continued effectiveness of the monitoring programme in the interest of optimal environmental protection.

A total of 84 mitigation measures have been recommended, including a number of measures identified during the assessment carried out under Article 6 of the Habitats Directive (92/43/EEC). See **Chapter 10** for a list of the recommended mitigation measures.

NEXT STEPS (Chapter 11)

There is still some important work to complete before this Plan is adopted. This will include some further technical and scientific planning work as well as recording, assessing and, where appropriate, taking on board comments received during consultations on the draft Plan / POMs and SEA. The next step in the SEA and Plan/ POM process will be a six-month consultation period. During this time comment on the findings of the Environmental Report, the Habitats Directive Assessment and the content of the draft Plan may be submitted for consideration.

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1 INTRODUCTION

This Environmental Report has been prepared as part of the Strategic Environmental Assessment of the River Basin Management Plan, and the associated Programme of Measures (POM), for the Neagh Bann International River Basin District in accordance with national and EU legislation. The purpose of this Environmental Report is to: a) inform the development of the Plan and POM; b) identify describe and evaluate the likely significant effects of the Plan and POM and its reasonable alternatives; and c) provide an early opportunity for the statutory authorities and the public to offer views on any aspect of this Environmental Report, through consultation.

1.1 BACKGROUND

The Water Framework Directive (WFD) (2000/60/EC) came into force in December 2000 and establishes a framework for community action in the field of water policy and for the protection of inland surface waters, transitional waters, coastal waters and groundwater. The WFD is a wide-ranging and ambitious piece of European environmental legislation, which provides for a new, strengthened system for the protection and improvement of water quality and dependent ecosystems. The WFD rationalises and updates existing legislation and provides for water management on the basis of River Basin Districts (RBDs). RBDs are essentially administrative areas, with statutorily designated co-ordinating local authorities, for coordinated water management and are comprised of multiple river basins (or catchments). Cross-border basins (i.e. those covering the territory of more than one Member State) are assigned to an international RBD (IRBD). All of the river basins on the island of Ireland have been distributed within eight RBDs. Four of the eight RBDs are wholly contained within Ireland, one is wholly within Northern Ireland and the remaining three are international RBDs, i.e. occur within Ireland and Northern Ireland.

The WFD was transposed into law in Northern Ireland by the Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2003 (S.R. 544 of 2003) and in Ireland by the European Communities (Water Policy) Regulations 2003 (S.I. 722 of 2003) (as amended by S.I. 413 of 2005 and S.I. 219 of 2006). The main objectives of the WFD is to maintain the "good and high status" of waters where it exists, prevent any deterioration in the existing status of waters and to restore at least *"*good status*"* in relation to all waters by 2015. The mechanism by which this is to be achieved under the WFD is through the adoption and implementation of River Basin Management Plans (RBMPs) and Programmes of Measures (POMs) for each of the identified RBDs.

The overall purpose of the Directive is to bring about the effective co-ordination of water environment policy and regulation across Europe in order to achieve the following, as laid out in Article 1:

- Prevent further deterioration and protect and enhance the status of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystems;
- Promote sustainable water use based on a long-term protection of available water resources;
- Enhance protection and improve the aquatic environment, *inter alia*, through specific measures for the progressive reduction of discharges, emissions and losses of priority substances and the cessation or phasing-out of discharges, emission and losses of the priority hazardous substances;
- Ensure the progressive reduction of pollution of groundwater and prevent its further pollution; and
- Contribute to mitigating the effects of floods and droughts.

1.2 NEAGH BANN RIVER BASIN DISTRICT

The Neagh Bann International River Basin District (NBIRBD) covers around 6,000 km^2 in Northern Ireland and 2,000 km^2 within Ireland. The principal river system is the Bann (on which Lough Neagh is situated) with its main tributaries the Blackwater, Sixmilewater, Main, Moyola and Ballinderry. Smaller basins include the Newry River draining to Carlingford Lough and the Castletown, Fane, Dee and Glyde rivers draining to Dundalk Bay. The main lake is Lough Neagh, almost 400 km^2, in the centre of the district: the largest lake in Britain and Ireland. Marine waters account for just over 200 km^2. There is a short length of coastline to the north where the Bann enters the North Channel. To the south 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. For information on how the boundary of the Neagh Bann IRBD was determined see the information on the Neagh Bann IRBD website (www.nbirbd.com) and the document *Working Together – Managing Our Shared Waters* for the Neagh Bann IRBD.

The NBIRBD incorporates all of County Armagh, large parts of Antrim, Louth, Monaghan and Londonderry/ Derry, significant areas of Down, Meath and Tyrone and small areas of Cavan and Fermanagh. The local authorities for Counties Cavan, Louth, Meath and Monaghan as well as the Northern Ireland Environment Agency are the competent authorities for the NBIRBD, with Monaghan County Council the co-ordinating local authority for the NBIRBD.

1.3 STRATEGIC ENVIRONMENTAL ASSESSMENT

Strategic Environmental Assessment (SEA) is a process for evaluating, at the earliest appropriate stage, the environmental effects of plans or programmes before they are adopted. It also gives the public and other interested parties an opportunity to comment and to be kept informed of decisions

and how they were made. An early consideration of environmental concerns in the planning process creates an opportunity for environmental factors to be considered explicitly alongside other factors such as social, technical or economic aspects.

The European Directive (2001/42/EC) on the Assessment of the Effects of Certain Plans and Programmes on the Environment (the SEA Directive), was transposed into national legislation in Ireland by 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). In Ireland, River Basin Management Plans fall under the remit of S.I. No. 435 of 2004. In Northern Ireland, the Directive has been transposed under a single piece of legislation, the Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004 (S.R. 280/2004). **Figure 1.1** shows an overview of the SEA Process.

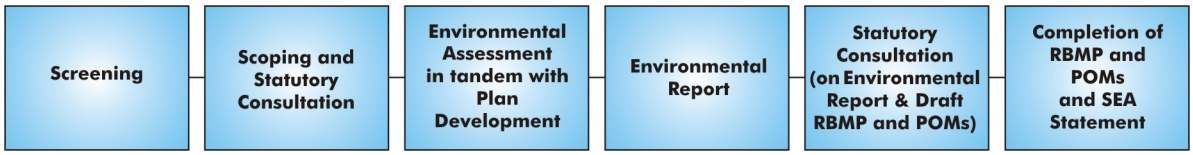

Figure 1.1 Overview of SEA Process

1.4 RESPONSIBLE AUTHORITIES FOR THE NEAGH BANN IRBD

This SEA is being carried out on behalf of the competent authorities for the Neagh Bann International River Basin District, which includes the Northern Ireland Environment Agency (NIEA), and the county councils of Cavan, Louth, Meath and Monaghan (Ireland). Monaghan County Council is the co-ordinating authority for the NBIRBD.

1.5 STUDY TEAM

The study team for the Neagh Bann IRBD comprises RPS, an environmental and engineering consultancy, working with an SEA Steering Group comprised of representatives from the following organisations:

- Northern Ireland Environment Agency;
- Department of the Environment, Heritage and Local Government;
- Environmental Protection Agency;
- Department of Agriculture, Fisheries and Food;
- North South Share Project; and

- Coordinators from each of the River Basin Districts.

These representatives are in turn participants in a number of other RBD related Steering / Working groups, Advisory Councils and Stakeholder Groups/Forums within the eight river basin districts providing an important link between the SEA Team and the River Basin Management Plan Teams. **Figure 1.2** outlines the main organisational structure for the RBDs and places the SEA project team in context.

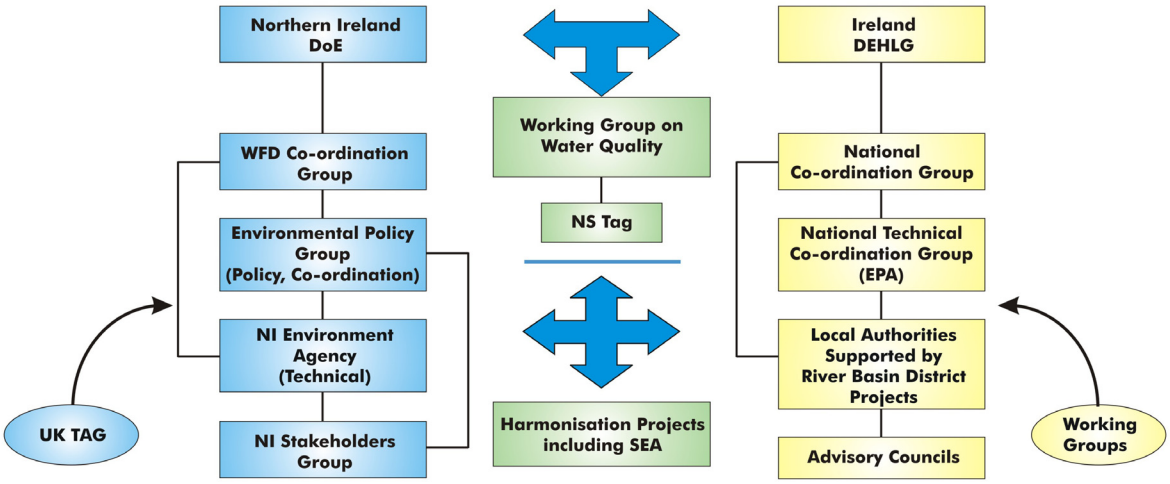

Figure 1.2 Organisational Structure for the River Basin Districts

2 METHODOLOGY

2.1 INTRODUCTION

The SEA Directive requires that certain Plans and Programmes, which are likely to have a significant impact on the environment, be subject to the SEA process. The SEA process is broadly comprised of the following steps:

SEA Step / Stage	Purpose	Status
Screening	Decision on whether or not an SEA of a Plan/Programme is required.	Completed, 2007. The Screening Document entitled *The Water Framework Directive, Assessment, Participation and Protected Areas: What are the Relationships?* is available to download from the EPA website.
Scoping	Consultation with the defined statutory bodies on the scope and level of detail to be considered in the assessment.	Completed, late 2007 to mid 2008. The Final Scoping Document is available on the public download section of the NBIRBD website.
Environmental Assessment	Assessment of the likely significant impacts on the environment as a result of the Plan or Programme culminating in the production of an Environmental Report.	Completed, December 2008.
Consultation	Consultation on the draft Plan/Programme and associated Environmental Report.	This will take place January 2009 to June 2009.
SEA Statement	Identification of how environmental considerations and consultation have been integrated into the Final Plan/Programme culminating in the production of an SEA Statement.	To be published with Final Plan in late 2009.

2.2 GUIDANCE

The Environmental Report contains the findings of the assessment of the likely significant effects on the environment resulting from implementation of the proposed RBMP and POM. It reflects the requirements of the SEA Directive (2001/42/EC) on the assessment of the effects of certain plans and programmes on the environment and also the transposed regulations in Ireland (S.I. 435/2004) and Northern Ireland (S.R. 280/2004).

The following sources of guidance have been used during the overall SEA process and preparation of the Environmental Report.

2.2.1 Ireland

Strategic Environmental Assessment (SEA) Checklist - Consultation Draft. January 2008. Environmental Protection Agency.

Implementation of SEA Directive (2001/42/EC). Assessment of Certain Plans and Programmes on the Environment. Guidelines for Regional Planning Authorities. November 2004. Department of Environment, Heritage and Local Government.

Development of Strategic Environmental Assessment (SEA) Methodologies for Plans and Programmes in Ireland. Synthesis Report. 2003. Environmental Protection Agency.

Guidelines on SEA. Department of Communications, Energy and Natural Resources. Available at: http://www.dcmnr.gov.ie/Marine/Environmental+Assessment/Environmental+Assessment.htm

2.2.2 Northern Ireland

Strategic Environmental Assessment DRAFT Practical Guidance for Practitioners on How to Take Account of Air. June 2008. Scotland & Northern Ireland Forum for Environmental Research.

Strategic Environmental Assessment DRAFT Practical Guidance for Practitioners on How to Take Account of Soil. June 2008. Scotland & Northern Ireland Forum for Environmental Research.

Strategic Environmental Assessment DRAFT Practical Guidance for Practitioners on How to Take Account of Water. June 2008. Scotland & Northern Ireland Forum for Environmental Research.

A Practical Guide to the Strategic Environmental Assessment Directive. September 2005. Office of the Deputy Prime Minister.

Strategic Environmental Assessment. Services and Standards for Responsible Authorities. Environment and Heritage Service.

2.2.3 Other

Strategic Environmental Assessment Toolkit (Version 1). September 2006. Scottish Executive.

Strategic Environmental Assessment and Biodiversity: Guidance for Practitioners. June 2004. Countryside Council for Wales, English Nature, the Environment Agency and the RSPB.

2.3 KEY STEPS IN STRATEGIC ENVIRONMENTAL ASSESSMENT

2.3.1 SCOPING

The objective of scoping is to identify key issues of concern that should be addressed in the environmental assessment of the Plan and POM so that they can be considered in appropriate detail. Scoping also helps determine the boundaries of the assessment in terms of geographical extent and the time horizon for the assessment. **Figure 2.1** outlines the various elements that contribute to the scope of the SEA.

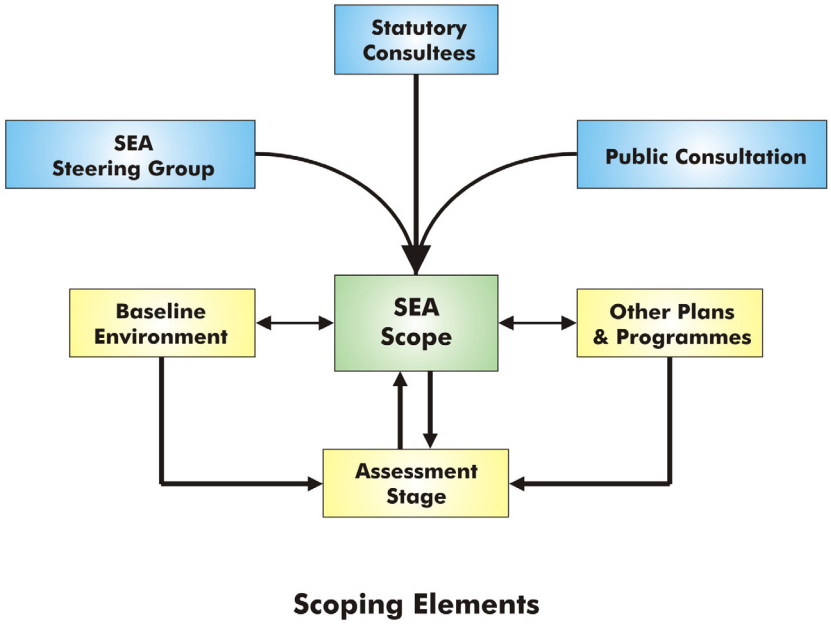

Figure 2.1 Overview of the Scoping Process

Scoping for the each of the SEAs was carried out in a coordinated manner for all eight RBMPs and their associated POMs between September 2007 and July 2008. In line with the SEA Directive, specific "environmental authorities" (statutory consultees) were consulted on the scope and level of detail of the information to be included in the Environmental Report. For the Neagh Bann RBMP and POM, the relevant statutory consultees are:

- **Ireland:** Department of Communications, Energy and Natural Resources (DCENR);
- **Ireland**: Department of Environment, Heritage and Local Government (DEHLG);
- **Ireland**: Environmental Protection Agency (EPA); and

- **Northern Ireland**: Northern Ireland Environment Agency (NIEA) (formerly the Environment and Heritage Service).

Scoping for the SEA was carried out through a series of consultations with these statutory environmental authorities based on an initial draft Scoping. A further draft was placed on public display in February 2008 and following amendments a final version was placed on the IRBD website in September 2008 (www.nbirbd.com).

Further details on consultation (dates, comments received, etc) can be found in **Chapter 4**.

2.3.1.1 DEFINING THE SCOPE

The following table provides a summary of the scope of the SEA.

Table 2.1 Scope of the SEA

Geographic Scope	The Neagh Bann RBMP and POM is a regional plan for the Neagh Bann IRBD (see **Figure 3.2**) and as such the assessment has been limited geographically to activities occurring within the functional area of the Plan. While recognition will be given within the Plan to the issue of water management in the adjacent RBDs, no separate assessment has been undertaken of these areas in the SEA. A separate SEA will be carried out for each of the seven remaining (I)RBDs.
Temporal Scope	The RBMP and POM will cover the period from 2009 up to 2015, with an interim review after three years. However, the Plan also considers the horizons of 2021 and 2027, which are the end of the second and third 6-year plan cycles, respectively. In line with the SEA Directive, short, medium and long-term impacts must be considered during the assessment. However, it is considered that short-term assessment may not be very constructive as implementation of the RBMP, and the associated POM, will take time to show effect; therefore, the results of such an assessment are likely to be similar to a 'business as usual' scenario for the short-term. As such, assessments have been made for 2015 (as a medium term horizon) and 2030 (as a long term horizon), which is beyond the end of the third RBMP cycle.
Level of Detail of the Plan	The level of detail of the Environmental Report is determined by the content and level of detail of the Plan and POM. As the Plan is on a regional scale, the majority of the data relates to overall national and regional performance. The Plan delivers over-arching policy recommendations - including the general type of infrastructure required for water management - that to a large extent are implemented on a practical basis by bodies such as government agencies and local authorities.
Level of Detail of Assessment	This exercise is based on a broader judgement as to whether effects would be better assessed under lower level plans and/or programmes. This SEA, for example, does not examine site-specific impacts due to development of water infrastructure, since that is outside the scope of this regional level plan. As portions of the Plan and POM will be implemented within other regional or local plans, or through infrastructure projects, the local environmental concerns related to these may be examined through subsequent SEAs on these plans or Environmental Impact Assessment (EIA) at the project level.
Assessment Parameters	Cumulative / synergistic and secondary, permanent and temporary effects have been assessed. Medium and long-term impacts were also assessed.

Scoping of SEA Environmental Topics	All of the environmental topics listed in the SEA Directive have been scoped in for the assessment of the RBMP and the associated POM. These are:	
	Biodiversity, Flora and Fauna	Air
	Population	Climatic Factors
	Human Health	Material Assets
	Soil	Cultural, Architectural and Archaeological Heritage
	Water	Landscape

2.3.1.2 Climate Change

Although not expressly referenced in the WFD, the evolution of the RBMPs and POMs has considered the implications of climate in terms of characterisation of baseline conditions, identification of pressures on water bodies and in the development of the POMs for achievement of water quality objectives under the WFD.

In Ireland, consideration has been given to "climate checking" measures in the document, *Adapting the Plan to Climate Change*, prepared by the Western River Basin District (2008). The purpose of the climate check exercise was to ensure the resilience of the proposed water management measures in the longer term.

Current predictions for Ireland indicate that climate issues may be relatively significant for measures related to:

- Protected areas;
- Abstractions; and
- Physical modifications to river and marine morphology.

The study identified the need for the Programme of Measure to be flexible and adaptable to potential future climate change, in terms of temperature, storm surge, floods and droughts.

The report *Preparing for Climate Change in Northern Ireland*, published by the Department of the Environment and the Scotland and Northern Ireland Forum for Environmental Research (2007) reviewed the potential impact of climate change in Northern Ireland and makes recommendations for adaptation. This report includes an initial assessment of threats to water management and resources in Northern Ireland and was used in the draft Plan to identify generic actions to address the impact of climate change on the water environment. These generic actions ensure that waters are protected from deterioration due to climate change and that climate change factors are taken into account both in terms of mitigation and adaptation when developing and implementing measures to improve the water environment.

The SEA Directive does reference climate as an environmental issue to be addressed in the assessment of the Plan. The SEA has considered climatic factors by considering first if climate change can impact on the identified pressure (e.g. abstractions) and if so whether the measure proposed in the RBMP and POMs could be compromised in the future as a result of climate change. In addition, the SEA has also considered how the measures proposed could contribute to climate change through generation and emission of greenhouse gases.

2.3.1.3 Flooding

The broad purpose of the WFD is to protect ecosystems, prevent pollution and promote sustainable water use with a strong focus on water quality and the health of aquatic ecosystems. The WFD represents one arm of water management; however, there are other elements which the EU is tackling in parallel, with one such element being flooding. The frequency and intensity of flood events in Ireland and Europe generally has increased in the recent past and it is predicted that this situation will continue into the future. In response to this the EU has developed a directive on the assessment and management of flood risk ("Floods Directive"). The purpose of the Floods Directive is "*to establish a framework for the assessment and management of flood risks, aiming at the reduction of the adverse consequences for human health, the environment, cultural heritage and economic activity associated with floods in the Community*".

The Directive came into force in November 2007 and is required to be transposed into Irish law before 26 November 2009. The Directive requires Member States 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 2015. The Directive applies to inland waters as well as all coastal waters across the whole territory of the EU.

There is obviously considerable potential for overlap between these two Directives and it is intended that the Floods Directive will be closely linked with the WFD in terms of implementation and administration, e.g. EU Commission has indicated that the Floods Directive will be focussed at the RBD level to ensure compatibility between these two pieces of legislation. In addition, the WFD is already linked with the Floods Directive through one of its key objectives *to mitigate the effects of floods and drought.*

In response to the key objectives of the WFD and the link to the Floods Directive, the RBMP and POM will address flooding through measures to reduce the risk of flood related impacts on water quality and ecosystem health, such as from accidental pollution incidents as a result of floods. However, it will not address specific measures to combat or reduce flooding from a socio-economic perspective. This will be addressed under Flood Management Plans as part of the implementation of the Floods Directive.

It is likely that during the second round of RBMP drafting, when the Floods Directive is in force in Member States, the coherence of the two Directives and their resultant Plans and measures can be tested and adjustment made, where necessary.

2.3.2 ENVIRONMENTAL ASSESSMENT AND ENVIRONMENTAL REPORT

2.3.2.1 Contents of the Environmental Report

Based on the legislation and guidance, the Environmental Report must include the information outlined in **Table 2.2**.

Table 2.2 Key Elements of the Environmental Report

Requirement of SEA Directive (Article 5(1), Annex 1)	Section of Environmental Report
An outline of the contents and main objectives of the plan or programme, or modification to a plan or programme, and relationship with other relevant plans or programmes;	Chapter 3: Description of the Plan Chapter 4: Consultation
The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme, or modification to a plan or programme,	Chapter 5: Baseline Environment
The environmental characteristics of areas likely to be significantly affected	Chapter 5: Baseline Environment
Any existing environmental problems which are relevant to the plan or programme, or modification to a plan or programme, including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to the Birds Directive or the Habitats Directive	Chapter 5: Baseline Environment
The environmental protection objectives, established at international, European Union or national level, which are relevant to the plan or programme, or modification to a plan or programme, and the way those objectives and any environmental considerations have been taken into account during its preparation	Chapter 6: Review of Relevant Plans, Programmes and Policies
The likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors	Chapter 9: Assessment
The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme, or modification to a plan or programme	Chapter 10: Mitigation and Monitoring
An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information	Chapter 2: Methodology Chapter 7: Strategic Environmental Objectives, Targets and Indicators Chapter 8: Alternatives
A description of the measures envisaged concerning monitoring of the significant environmental effects of implementation of the plan or programme, or modification to a plan or programme	Chapter 10: Mitigation and Monitoring
A non-technical summary of the information provided under the above headings	Non-Technical Summary

2.3.2.2 Environmental Assessment

The environmental assessment includes a combination of qualitative assessment and expert judgement. Quantitative assessment was not possible at the level of detail currently presented in the draft Plan / POMs; however, it is recognised that additional detail may be developed in the future as part of the RBMP / POM planning process. **Table 2.3** outlines the type of assessment has been carried out.

Table 2.3 SEA Environmental Assessment

Environmental Receptors	Is it Quantifiable?
Biodiversity, Flora and Fauna	Quantitative assessment may be possible, e.g. % loss of habitat, number of EU designated sites impacted, if sufficient detail is available from the draft Plan / POMs.
Human Health / Population	Health impacts would primarily be secondary via emissions to air, water, soil, etc. There is no quantitative baseline data that could be usefully examined vis-à-vis Plan policies. However reference to emissions under the heading *Air Quality* may be useful.
Soil / Geology	Quantitative assessment may be possible, e.g. area of contaminated land to be addressed, if sufficient detail is available from the draft Plan / POMs.
Water	Quantitative assessment may be possible, e.g. volumes extracted, if sufficient detail available from the draft Plan / POMs.
Air / Climate	Relevant issues relate to odour from WWTP / WWTW, emissions from digesters / incinerators and transport related emissions. Quantitative assessment may be possible, e.g. changes in energy use in the context of increased / improved water and wastewater treatment, if sufficient detail is available from the draft Plan / POMs.
Material Assets	Quantitative assessment may be possible, e.g. number of bridges, dams affected, if sufficient detail is available from the draft Plan / POMs.
Cultural, Architectural and Archaeological Heritage	Quantitative assessment may be possible, e.g. number of monuments and listed buildings near or in water bodies, if sufficient detail available from the draft Plan / POMs.
Landscape	By its nature assessment of landscape and visual impacts is subjective. In addition, without specific information on the location and character of potential infrastructural projects, there is no obvious way of examining alternatives quantitatively.

2.3.3 SEA STATEMENT

The main purpose of the SEA Statement is to provide information on the decision-making process and to document how environmental considerations, i.e. the views of consultees and the recommendations of the Environmental Report, have been taken into account in the adopted Neagh Bann River Basin

Management Plan and Programme of Measures. The SEA Statement illustrates how decisions were taken, making the process more transparent.

The SEA Statement for the Neagh Bann River Basin Management Plan and Programme of Measures will be compiled after the statutory consultation on the draft RBMP and associated POMs and Environmental Report has been completed.

2.4 HABITATS DIRECTIVE ARTICLE 6 ASSESSMENT

The Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora) obliges member states to designate Special Areas of Conservation (SACs) to protect and conserve habitats and species of importance in a European Union context. Article 6 is one of the most important articles of the Habitats Directive in determining the relationship between conservation and site use. Article 6(3) requires that "Any plan or project not directly connected with or necessary to the conservation of a site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives."

It is important to note that the phrase 'Appropriate Assessment' is sometimes used more loosely to refer to the whole process set out under Articles 6(3) and 6(4) of the Habitats Directive. Therefore, it is important to note that in this case the term Habitats Directive Assessment will be used, not *'Appropriate Assessment'* (which refers to Stage 2 in the sequence under Habitats Directive Assessment). A Habitats Directive Assessment of the RBMP and POM was carried out in parallel with the SEA and Plan processes, with the findings of the Habitats Directive Assessment used to guide the development of the alternatives to be considered as part of the SEA.

2.5 DIFFICULTIES AND DATA GAPS

The following difficulties and data gaps were encountered:

- Poor boundaries / administrative overlap for some data sets;
- Lack of quantitative data to same degree of detail for topic areas other than those which are water-related;
- Some information not compiled by the relevant agencies (e.g. biodiversity, cultural heritage);
- Lack of digitised data in some topic areas (e.g. landscape);
- Quantitative assessment made very difficult due to the very strategic level of the measures proposed for incorporation in the Programme of Measures; and

- Not all of the proposed monitoring measures are currently being gathered and reported on at a national level.

3 DESCRIPTION OF THE PLAN

3.1 RIVER BASIN PLANNING AND THE NEAGH BANN IRBD

As stated in **Section 1, Introduction,** the purpose of the WFD is to maintain the "high and good status" of waters where it exists, prevent deterioration in existing status of waters and to achieve or restore at least *"*good status*"* in relation to all waters by 2015. The mechanism by which this is to be achieved under the WFD is through the adoption and implementation of River Basin Management Plans (RBMPs) and Programmes of Measures (POMs) for each of the eight identified RBDs (see **Figure 3.1**). In the case of the international river basin districts, the draft RBMPs are comprised of both the draft Plan summary documents for Northern Ireland and Ireland as well as a 'Working Together' document which describes the coordination that has taken place between the two jurisdictions and the commitment to future coordination.

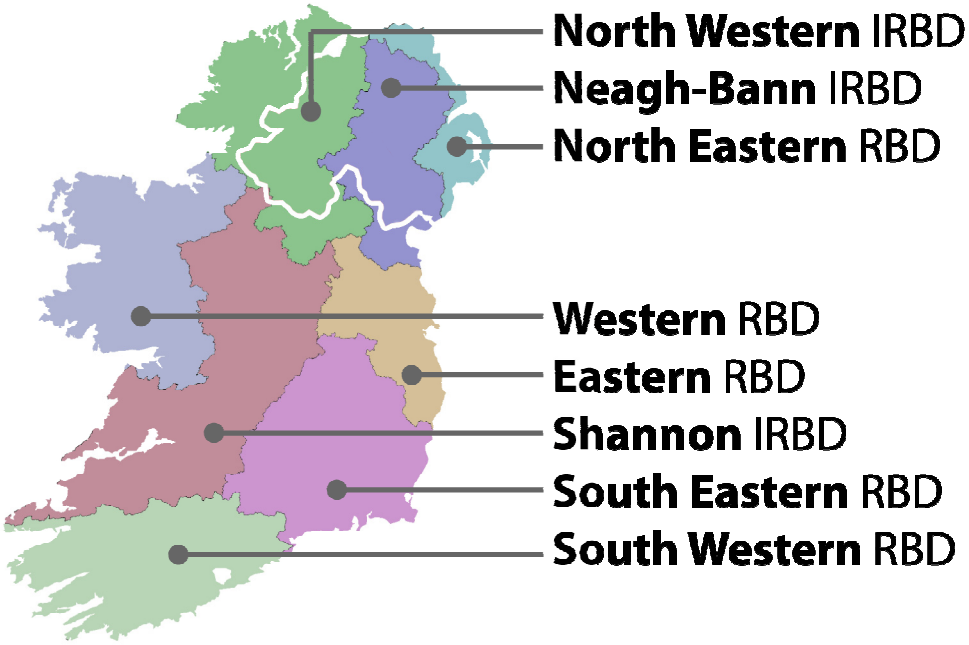

Figure 3.1 River Basin Management areas of Ireland

As stated previously, the Neagh Bann district covers the territory of more than one Member State and therefore is assigned to an International RBD (IRBD). The Neagh Bann IRBD is flanked by the Sperrin Mountains to the north-west, the Antrim Plateau to the north-east and the Mourne Mountains and uplands of Monaghan and Meath to the south. The northern part contains the broad, very fertile Bann valley; the southern part is dominated by small drumlin hills from the last ice age. The geographic scope of the Neagh Bann IRBD is shown in **Figure 3.2**.

Over half a million people live in the Neagh Bann IRBD. Most of the main urban areas — Antrim, Ardee, Armagh, Ballymena, Banbridge, Coleraine, Cookstown, Craigavon, Dundalk, Dungannon, Monaghan, Newry and Portadown — are located beside rivers. In rural areas, many people live in small villages or single dwellings

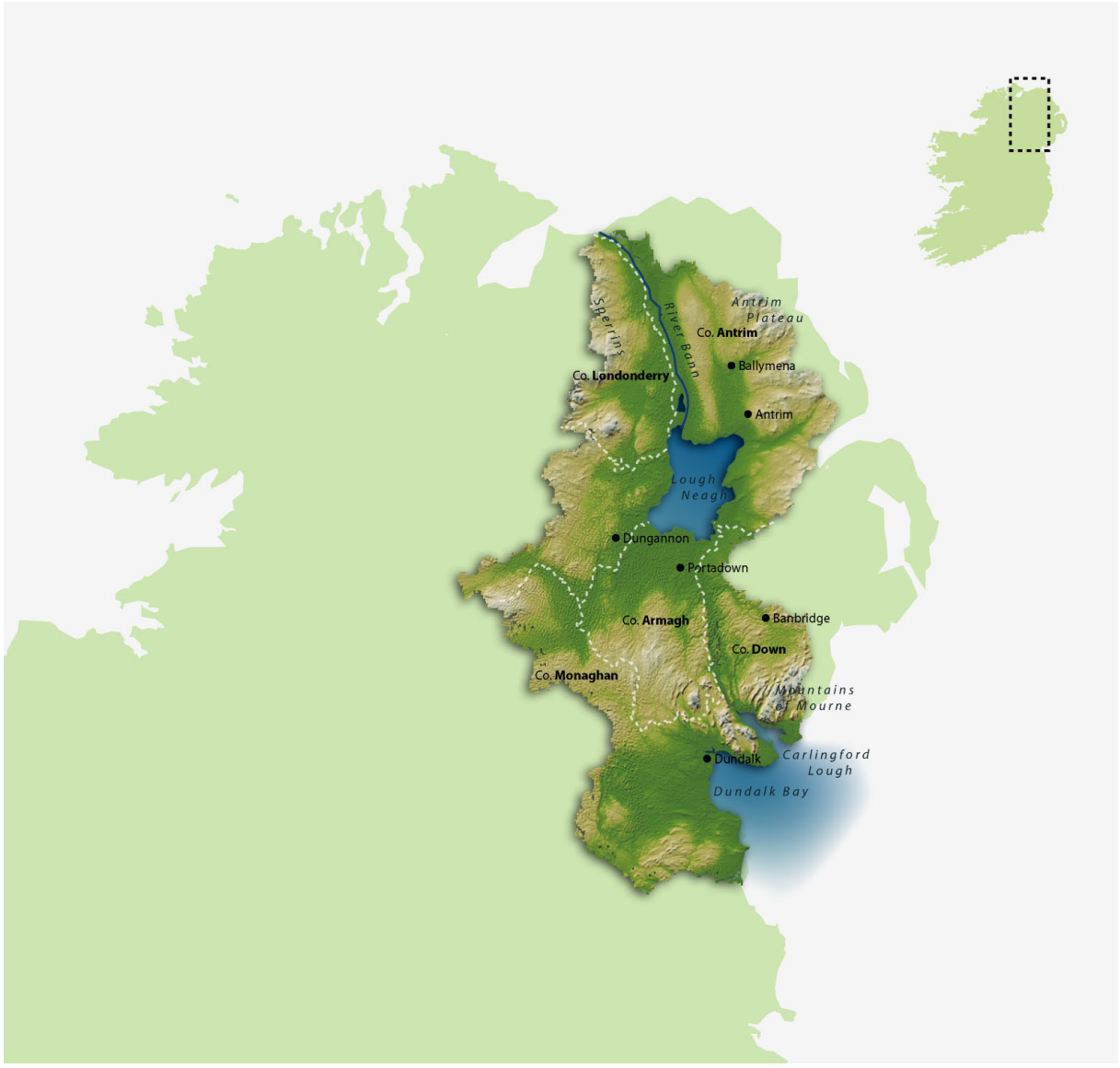

Figure 3.2 Neagh Bann IRBD

Agriculture, mostly livestock grazing on pastureland, is the main activity. The district has internationally important wetlands, which support a wide range of plants and animals, and its waters provide fishing and boating: some areas within the district are popular holiday destinations.

In addition, some areas of the IRBD contain rare and vulnerable habitats and wildlife. These areas include parts of Dundalk Bay, Carlingford Lough and Clogherhead, the Sperrins, Slieve Gullion, the Mournes and Slieve Croob.

3.2 CURRENT WATER MANAGEMENT SITUATION IN THE NBIRBD

3.2.1 Northern Ireland

In Northern Ireland, 99% of the drinking water supply is provided by Northern Ireland Water (formerly Water Service), which also has responsibility for the promotion of sustainable development of public water supply. Protection of drinking water sources is the joint responsibility of Northern Ireland Water, Department of Regional Development (DRD), Northern Ireland Environment Agency (NIEA) and the Forest Service. NIEA issue licenses for abstractions of water for hydroelectric schemes. NIEA consult externally with Northern Ireland Water, Loughs Agency, DoE Planning Service, Department of Culture, Arts and Leisure (DCAL) and internally with Natural Heritage and Hydrology teams about the possible impacts of a scheme before issuing a licence. With regard to impoundments of water, the Department consult with other agencies that have responsibility for fisheries legislation and, where relevant, the Habitats Regulations in Northern Ireland. All fish pass designs and specifications must be submitted to the DCAL for approval before a pass is constructed.

Northern Ireland Water is also the sole provider of water sewerage services in Northern Ireland, with the obligation to monitor effluent at treatment plants. Its activities in this respect are assessed by NIEA, which is responsible for administering a system of discharge consents relating to the quality and quantity of trade and sewage effluent that may be discharged from major industrial activities. In terms of septic tanks, the Department of the Environment (DoE) Planning Service planning system is the key control for ensuring the protection of our waters by restricting the location of new developments. NIEA consent all discharges and undertake inspections and enforcement for water quality incidents related to septic tanks and proprietary on-site systems.

The Department of Regional Development (Road Service) and Northern Ireland Water and NIEA are responsible for reducing the pollution and flood risk from urban development. The Department of Agriculture and Rural Development (DARD) and DOE have joint responsibility for implementing the Nitrates Directive and are responsible for all issues relating to the agricultural sector in relation to discharge, sewage and pollution prevention and control. DARD provides practical guidance for farmers and growers in relation to pollution control and is responsible for approval of any pesticides that are used on farms in Northern Ireland.

Within the forestry sector, responsibility to reduce sedimentation and nutrient and pesticide inputs lies with DARD, the Forest Service and private landowners, with regulation and support provided by the DOE and the Heath and Safety Executive (HSE).

The NIEA is also responsible for the regulation of waste activities, processing licences in this sector, including pollution prevention and control permits and is the competent authority for movements of

waste into and out of Northern Ireland. NIEA maintains a high level of advice and guidance to legitimate producers, carriers and managers of waste.

In terms of flood control the Rivers Agency is responsible for managing the water levels of several loughs and river stretches with additional water level management provided by other departments in specific instances. The Rivers Agency also has general powers to undertake, construct and maintain drainage works (which includes defence) and emergency works to watercourses and sea defences. Northern Ireland Water is responsible for improving flow in rivers and levels in lakes with support and regulation provided by DRD and the Northern Ireland Authority for Utility Regulation (NIAUR).

With respect to morphological changes the removal of any material from the bed of a river requires the consent of the Fisheries Conservancy Board (FCB) and in the Foyle and Carlingford areas the consent of the Foyle, Carlingford and Irish Lights Commission (FCILC). Rivers Agency have a statutory obligation to maintain free flowing rivers and have powers to carry out drainage schemes on any designated waterway. Work programmes are agreed with DCAL Inland Fisheries and NIEA. Consent for culverting must be approved by Rivers Agency who consult with DCAL where a culvert proposal might impede fish movements or otherwise impact a fishery. DoE Planning Service will only permit the culverting or canalisation of a watercourse in exceptional circumstances. The DARD and Rivers Agency provide environmental support and advice on new flood defence schemes and maintenance works.

The DOE, through NIEA, is responsible for licensing of deposits in the sea within the Northern Ireland zone. DARD is the appropriate Department regarding harbour works within any fishery harbour and DRD covers all other harbours. The extraction of minerals from the marine environment by dredging are licensed by NIEA who determines licence applications through a consultation process with other government Departments and organisations with a statutory role.

Northern Ireland has a number of international obligations to address invasive species issues and main pieces of legislation relating to invasive alien species are implemented by DARD, DCAL, FCLIC and Loughs Agency. NIEA are committed to raising awareness among water users with the aim of preventing further spread.

DCAL is responsible for the salmon and inland fisheries of Northern Ireland and managing fish migration with enforcement jointly carried out by FCB and Loughs Agency. DARD is responsible for the licensing of fish and shellfish farms in Northern Ireland. FCILC are responsible for licensing and regulation of aquaculture and shellfisheries in the Loughs Foyle and Carlingford areas. Technical advice, guidance and support are provided by DCAL and Loughs Agency on matters relating to the conservation, protection, development and improvement of fisheries.

3.2.2 Ireland

In Ireland, municipal drinking water supplies are provided by local authorities, which obtain approval to abstract water from surface water sources under the Water Supplies Act 1942 and must establish and maintain registers of abstractions under the Water Pollution Acts 1977 to 1990 as amended. Local authorities also provide wastewater treatment for urban areas in Ireland, and are obligated to undertake monitoring at treatment plants, adhere to water quality objectives, designate bodies of water that are sensitive to eutrophication and make provision for pre-treatment of industrial wastewater entering the collection system (under Section 16 of the Water Pollution Act 1997). The Department of Environment Heritage and Local Government (DEHLG) plan and supervise provision of water supply and wastewater treatment under the Water Services Investment Programme (WSIP) and supervise and monitor the performance of water services authorities in accordance with the Water Services Act, Strategic Plans and EPA licensing regulations.

Local authorities also provide licences or consents for small-scale commercial and industrial discharges to sewer systems and/ or waters. The Environmental Protection Agency (EPA) administers the Integrated Pollution Prevention Control (IPPC) licensing system, which covers all operations, including discharges, carried out in connection with licensed large-scale industrial and agricultural activities. The EPA is also responsible for processing licences in the waste management sector.

The Office of Public Works (OPW) is the lead authority for river and coastal flooding and erosion management. In terms of flood controls, the OPW are responsible for controlling river flooding in agricultural and urban areas, while the ESB are responsible for managing level control in catchments modified by hydroelectric power schemes. In lakes used for abstraction local authorities are responsible for maintaining certain levels in the lakes itself and in maintaining a compensation flow to the down stream catchment. The OPW are responsible for constructing and maintaining drainage works, emergency works to watercourses and sea defences. The local authorities and OPW are responsible for permitting of culverting and canalisation of watercourses.

Fishing and aquaculture activities are licensed by local authorities, regional fisheries boards and the Department of Agriculture, Fisheries and Food. Works on the foreshore are authorised or licensed by the Department of Agriculture, Fisheries and Food. Permits for disposal of dredged material at sea are required from the Minister for Agriculture, Fisheries and Food.

The DEHLG, under the Nitrates Directive, are required to develop a National Action Programme in consultation with all interested parties and to ensure implementation of the National Action Programme. The Department of Agriculture, Fisheries and Food (DAFF) are responsible for monitoring and evaluating programmes in relation to farm practices to determine the effectiveness of measures and maintaining a register of all farm holdings to be made available to the EPA and local

authorities. The EPA are responsible for issuing reports to the DEHLG on implementation every four years, carrying out monitoring for the purposes of the Regulations and providing recommendations and direction to Local Authorities regarding monitoring, inspections and measures to be taken. The local authorities are responsible for carrying out monitoring to establish the extent of pollution in surface and groundwater's attributable to agriculture and determine trends in the occurrence and extent of such pollution, carrying out farm inspections, maintaining a register of farm inspections.

3.3 STEPS TO RIVER BASIN MANAGEMENT PLANNING

A sequential approach was taken to developing the River Basin Management Plans and their associated Programmes of Measures, for the Neagh Bann IRBD. This involved asking a number of questions to determine the needs of each River Basin Management Plan, as laid out in **Table 3.1**.

Table 3.1 Steps to RBMP and POM development

Questions	Details	Where has this been answered
What Causes Our Water Problems?	Which issues are causing problems? What waters should be the focus and what actions should we take to solve them.	Article 5 Characterisation - Technical Summary Report Water Matters – Have Your Say Booklet POMS study output reports (Ire only) Draft River Basin Management Plan
How Healthy Are Our Waters?	What is the condition of the waters?	WFD Monitoring Programme National Report WFD Status Background Document Draft River Basin Management Plan
What Do We Plan To Achieve?	Once we know the condition of our waters and the causes of their problems we have to set sustainable goals, or objectives; this means deciding what standards we need our waters to achieve, in balance with what uses and special interests we need them to support.	WFD Objectives & Exemptions Background Document (Ire only) WFD Objectives Background Document (NI only) Draft River Basin Management Plan
What Actions Must We Take?	The Water Framework Directive stipulates some required measures we have to take to manage our waters. We have identified actions under these required measures, setting out existing and new plans and programmes to ensure full and effective implementation.	Programme of Measures Background Documents POMS study output reports (Ire only) Draft River Basin Management Plan
What Will Required Measures Achieve?	We need to identify how far the required measures will take us towards achieving our objectives. We have assessed how effective these measures will be and identified cases where extra effort may be needed to improve or protect our waters.	WFD Objectives & Exemptions Background Document (Ire only) WFD Objectives Background Document (NI only) Draft River Basin Management Plan

Questions	Details	Where has this been answered
What Further Actions Can We Take?	We need to identify additional actions that can go further than the required measures to deal with any remaining problems in targeted waters. Alternative actions have to be tested to select ones that are practical, feasible and of significant benefit.	Programme of Measures Background Document POMS study output reports (Ire only) Economic Baseline and Guidance Background Documents Draft River Basin Management Plan
What Will Additional Measures Achieve?	Again we need to review how far the required plus the additional measures will take us towards achieving our objectives. In some cases, even after considering every possible action, we may not be able to restore waters and objectives must be refined.	WFD Objectives & Exemptions Background Document (Ire only) WFD Objectives Background Document (NI only) Artificial and Heavily Modified Water Bodies Background Documents Draft River Basin Management Plan
Our Objectives in the Neagh Bann District	We have set out the particular waters in the Neagh Bann District where we have proposed alternative objectives. The timescales for achieving improvements in our waters are also demonstrated.	Working Together Document Draft River Basin Management Plan Water Maps (Ire) / WFD Interactive Web Map (NI)
Our Plan For The Neagh Bann District	The outcome of this planning process is an action programme for the Neagh Bann District to achieve these improvements. We have proposed a detailed action plan setting out what, where and when actions are needed and who will do them.	Working Together Document Draft River Basin Management Plan Water Maps (Ire) / WFD Interactive Web Map (NI)

Further information on the supporting documents and WFD interactive web map / Water Maps is available on the NIEA website (www.ni-environment.gov.uk/wfd) and on www.wfdireland.ie/

3.4 RISK ASSESSMENT OF WATER BODIES IN THE NEAGH BANN IRBD

3.4.1 Introduction

As part of the 2005 Characterisation Study for the NBIRBD an assessment of the risks to water bodies within the IRBD was carried out. This was risk-based analysis, which projected the likelihood of a water body meeting its WFD status objectives. The assessment examined water status issues both from the top down (looking at drivers which cause **pressures** on waters) and from the bottom up (looking at known **impacts** on water status). The overall risk assessment process was a precautionary one, in that a single pressure can cause a water body to be classified at risk. Where a water body was identified as having more than one pressure, the worst case was used to classify the overall risk assessment results for the water body. Four categories have been used to describe the analysis results as described in **Table 3.2.**

Table 3.2 Water body Risk Categories

	Category	Description
(1a)	**Water bodies at significant risk – "At Risk"**	Water bodies for which consideration of appropriate measures to improve status can start as soon as practical
(1b)	**Water bodies probably at significant risk** – "**Probably at Risk"**	Focus for more detailed risk assessments (including, where necessary, further characterisation) aimed at determining whether or not the water bodies in this category are at significant risk in time for the publication of the interim overview of significant water management issues in 2007
(2a)	**Water bodies probably not at significant risk** – "**Probably not at Risk"**	Focus for more detailed risk assessments aimed at improving the quality of information and determining whether or not the water bodies in this category are not at significant risk in time for the publication of the draft River Basin Management Plan due to be completed in 2008
(2b)	**Water bodies not at significant risk – "Not at Risk"**	Consideration of appropriate measures to ensure no deterioration in status can start as soon as practical

It should be noted that the 2005 risk assessments have now been superseded by current water body classifications. Further information can be found in Section 5.3.3 and in the draft Plan.

3.4.2 Surface Water Bodies Risk Assessment Summary

Tables 3.3 to 3.6 provide a summary of the 2005 risk assessment for each of the water body types considered, e.g. river, lakes, coastal and transitional. Within the District, 98.4% of the river water bodies (98.9% by area) were classified as either At Risk or Probably at Risk and all of the 14 lake bodies were classified as either At Risk or Probably at Risk. Seven of the 10 transitional water bodies (93% by area) were classified as either At Risk or Probably at Risk. Lastly, four of the five coastal water bodies (88.4% by area) in the District were classified as either At Risk or Probably at Risk. **Figure 3.3** provides a summary of the overall risk assessment.

Table 3.3 River Water Bodies Risk Assessment Summary

Reporting Category	Number of Water bodies	% of Number	km Affected	% Area of RBD
1a – At Risk	187	58.5	4648.7	67.9
1b – Probably At Risk	128	40	2131.6	31.1
2a – Probably Not At Risk	3	0.9	61.8	0.9
2b – Not At Risk	2	0.6	9.7	0.1
Total At Risk (1a + 1b)	**315**	**98.5**	**6780.3**	**99.0**

Source: Table 4.2, *Neagh- Bann International River Basin District Article 5 Characterisation - Technical Summary Report*

Table 3.4 Lake Water Bodies Risk Assessment Summary

Reporting Category	Number of Water bodies	% of Number	% Area of RBD
1a – At Risk	9	64.3	97.7
1b – Probably At Risk	5	35.7	2.3
2a – Probably Not At Risk	0	0	0
2b – Not At Risk	0	0	0
Total At Risk (1a + 1b)	**14**	**100**	**100**

Source: Table 4.3, *Neagh- Bann International River Basin District Article 5 Characterisation - Technical Summary Report*

Table 3.5 Transitional Water Bodies Risk Assessment Summary

Reporting Category	Number of Water bodies	% of Number	% Area of RBD
1a – At Risk	6	60	90.9
1b – Probably At Risk	1	10	2.1
2a – Probably Not At Risk	2	20	6.9
2b – Not At Risk	1	10	0.1
Total At Risk (1a + 1b)	**7**	**70**	**93**

Source: Table 4.4, *Neagh- Bann International River Basin District Article 5 Characterisation - Technical Summary Report*

Table 3.6 Coastal Water Bodies Risk Assessment Summary

Reporting Category	Number of Water bodies	% of Number	% Area of RBD
1a – At Risk	2	40.0	55.7
1b – Probably At Risk	2	40.0	32.7
2a – Probably Not At Risk	0	0	0
2b – Not At Risk	1	20.0	11.6
Total At Risk (1a + 1b)	**4**	**80.0**	**88.4**

Source: Table 4.5, *Neagh- Bann International River Basin District Article 5 Characterisation - Technical Summary Report*

3.4.2.1 Groundwater Risk Assessment Summary

The WFD sets objectives of good quantitative and chemical status for groundwater's. As shown in **Table 3.7**, of the 37 groundwater bodies included within the NBIRBD, 28 were classified as either At Risk or Probably at Risk, representing 55.8% of the groundwater body area.

Table 3.7 Groundwater Bodies Risk Assessment Summary

Reporting Category	Number of Water bodies	% of Number	% Area of RBD
1a – At Risk	2	5.4	0.9
1b – Probably At Risk	26	70.3	54.9
2a – Probably Not At Risk	8	21.6	43.5
2b – Not At Risk	1	2.7	0.7
Total At Risk (1a + 1b)	**28**	**75.7**	**55.8**

Source: Table 4.5, *Neagh- Bann International River Basin District Article 5 Characterisation - Technical Summary Report*

3.4.2.2 Other Issues of Concern

Alien Species. Alien species are non-indigenous invasive flora and fauna, which threaten the native ecology of the NBIRBD by competing for habitats and / or food. Six species of concern are present in the NBIRBD. Australian Swamp Stonecrop has been found on Lough Neagh, Lough Beg, Lough Island Reavy and the Gosford River, Common Cord Grass and Japanese Seaweed have been found in Carlingford Lough, Water Fern has been found in Lough Neagh and the River Bann, Floating Pennywort in Sixmilewater River and Zebra Mussels have been found recently in Lough Neagh.

Fisheries. Fishery activities have started to be addressed. Amongst the freshwater fish species, salmon (and trout) are subjected to the greatest fishing /angling pressures in Northern Ireland and Ireland. In Northern Ireland the commercial fisheries for salmon, trout, eels and pollan have declined in recent years and although angling remains the major participation sport in Northern Ireland, catches are becoming more variable. Species most sensitive to impacts on their habitats, such as salmon and char, are currently under pressure whilst a major decline in eel recruitment to the coast is a real concern. The sea loughs also provide economically valuable areas for shellfisheries such as mussel and native oysters. In the NBIRBD commercial aquaculture activities are located in Carlingford Lough and Inner Dundalk Bay. Further offshore, in Outer Dundalk Bay, Hydraulic Dredging takes place and Otter Trawling is also undertaken in Portstewart Bay.

Bathing Water Standards. Bathing Waters are areas protected for use as recreational bathing and must meet standards for microbiological quality in order to protect human health. Risk categories were assigned to recognised bathing waters according to results of monitoring carried out in these waters. Where a bathing water failed to meet the requirements of the EU and national bathing water standards as 'at risk' designation was assigned.

Heavily Modified and Artificial Water bodies. Surface water bodies that are unlikely to achieve good status because of physical alterations to facilitate human activities including navigation, water

abstraction and regulation, flood protection and land drainage have been identified for special consideration under the WFD. The Directive recognises that there are cases where the benefits of such uses need to be retained and permits identification and designation of Artificial Water bodies (AWB) and Heavily Modified Water bodies (HMWB). In the Northern Ireland section of NBIRBD there have been 44 water bodies designated as HWMB (Rivers-34, Lakes-8 and Transitional-2). In the Ireland section of the NBIRBD there is one AWB designation at Ulster Canal.

3.4.2.3 Economics Baseline

While the SEA is not primarily concerned with the economic impact of the Plan, these types of impacts are considered indirectly in the assessment of impacts under SEA topic headings such as Material Assets and Population. A separate economic analysis was carried out in Ireland on the measures included in the Plan as part of the work performed under the WFD.

A baseline economic characterisation of the NBIRBD was carried out at a national level in Northern Ireland and is included in the report, *The Northern Ireland Water Framework Directive Article 5 Economic Analysis of Water Use*. In Ireland an initial economic characterisation was carried out for each of its RBDs, the results of which are published in the report, *Economic Analysis of Water Use in Ireland*.

The economics baseline included consideration of water demand sources (e.g. households, industry), the monetary value of water-using activities to the economy, the recreational benefits of water and the cost of provision of water services.

4 CONSULTATION

4.1 CONSULTATION DURING SCOPING STAGE

To begin the process of scoping the SEA for the Neagh Bann RBMP and POMs an initial consultation was held with the Statutory Authorities, as designated by the relevant SEA legislation and listed in **Table 4.1**. This step also represented the transboundary consultation required under the legislation for this IRBD. Following the statutory consultation, it was considered best practice to include a number of relevant non-statutory consultees in the scoping process; these are also listed in **Table 4.1.** In addition, the Draft Scoping Report was published on the Neagh Bann IRBD website to encourage further participation by stakeholders and the public in the consultation process.

Table 4.1 Consultees in the SEA Scoping Process

Consultee	Statutory / Non-Statutory	Tier
Environmental Protection Agency	Statutory	First
Minister for Environment, Heritage and Local Government	Statutory	First
Minister for Communications, Energy and Natural Resources	Statutory	First
DoE (NI) Environment and Heritage Service*	Statutory	First
Ireland River Basin District Project Coordinators	Non-Statutory	Second
Northern Ireland Interdepartmental Working Group	Non-Statutory	Second
Northern Ireland Stakeholder Forum	Non-Statutory	Second
Ireland River Basin Advisory Councils	Non-Statutory	Second
Ireland River Basin Management Groups	Non-Statutory	Second
Ireland River Basin Steering Groups	Non-Statutory	Second
Northern Ireland Council for Nature Conservation and Countryside	Non-Statutory	Second

** Now the Northern Ireland Environment Agency*

Prior to the publication of the Draft Scoping Report comments were received from the:

- Department of Communications, Energy and Natural Resources (23/11/07 and 10/01/08);
- Department of the Environment, Heritage and Local Government (28/11/07 and 15/01/08);
- Environmental Protection Agency (23/11/07 and 18/01/08);
- DoE (NI) Environment and Heritage Service (23/11/07, 15/01/08, 25/01/08); and
- Royal Society for the Protection of Birds (NI) (13/11/07).

In addition comments were received from the following stakeholders/bodies upon publication of the Draft Scoping Report:

- Health and Safety Executive, Ireland;
- Northern Ireland Freshwater Task Force;
- Office of Public Works, Ireland;
- Harbour Master Shannon Estuary;
- Coillte;
- Friends of Irish Environment;
- National Parks and Wildlife Service; and
- Department of the Environment, Heritage and Local Government.

It should be noted that the list above includes the names of all bodies/organisations from which comments were received, regardless of which (I)RBD comments were sent to, as comments received on one RBD were considered, where applicable, for the remaining seven RBDs.

The comments received in relation to the Draft Scoping Reports generally consisted of:

- Information on potential sources of baseline information;
- Comments on the assessment methodology;
- Additional SEA Objectives to be considered;
- Additional pressures to be considered; and
- Additional types of impacts to be considered.

All of the comments received are included with the Final Scoping Report for the SEA of the Neagh Bann IRBD River Basin Management Plan and Programme of Measures, which is available at www.nbirbd.com. Any comments received after publication of the Final Scoping Document have been considered in the development of this Environmental Report.

4.2 CONSULTATION DURING ENVIRONMENTAL ASSESSMENT STAGE

To ensure that timely consultation with the statutory consultees and non-statutory consultees continued throughout the evolution of the RBMP/ POM and the SEA process, it was decided to circulate a paper discussing the preliminary alternatives being considered as well as the proposed

assessment methodology. The purpose of this discussion paper was to inform key stakeholders about the proposed alternatives to be considered as part of the SEA and to elicit comment on these.

A number of SEA Integration Workshops and Information Awareness Sessions were held to elicit comments from the Plan makers in order to refine the assessment included in the SEA. Key issues raised during these workshops / meetings are included in Key issues raised during some of these workshops / meetings are included in **Table 4.2**.

Table 4.2 Key Issues Raised at SEA and Plan Integration Workshops

Alternatives Workshop (Ire)	SEA Awareness Day (NI)	Objectives, Targets and Indicators Workshop (Ire and NI)
Climate Change Language and Terminology Level of Detail Proposed Alternatives Assessment Approach Additional Plans to be produced, e.g. Pearl Mussel	Assessment of 'Business as Usual Scenario' Appropriate Assessment in the SEA and Plan making process Potential conflicts between the WFD and the Habitats Directive Language for measures Format of Ireland and Northern Ireland Plans	Proposed Objectives, Targets and Indicators Tone of Language and Terminology Level of Detail for Targets Water as an Economic Resource Consultation

4.3 TRANSBOUNDARY CONSULTATION

Under the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations (S.I. No 435 of 2004) and the Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) (S.R. 280 of 2004), transboundary consultations are required where the Plan is likely to have significant environmental effects on other Member States. It was determined during scoping that the two relevant jurisdictions for the RBD would be Ireland and Northern Ireland. As stated above, the relevant agencies in both jurisdictions were consulted during the Scoping stage of the SEA and will be notified as part of the consultation process for the Environmental Report.

4.4 INTEGRATION OF RIVER BASIN MANAGEMENT PLANNING AND STRATEGIC ENVIRONMENTAL ASSESSMENT

This Environmental Report was developed in parallel with the development of the Neagh Bann River Basin Management Plan and Programme of Measures. The SEA process commenced in September 2007, and while the initial stages of the planning process began in 2004 with the start of the characterisation of the IRBD, consultation on the issues to be addressed in the Plan began in June

2006 with the publication of a timetable and work programme for production of the Plan. This was followed by consultation on the *Water Matters – Have Your Say* report for the District published in 2007. The elements of the River Basin Management Plan and SEA are presented schematically below (**Figure 4.1**)

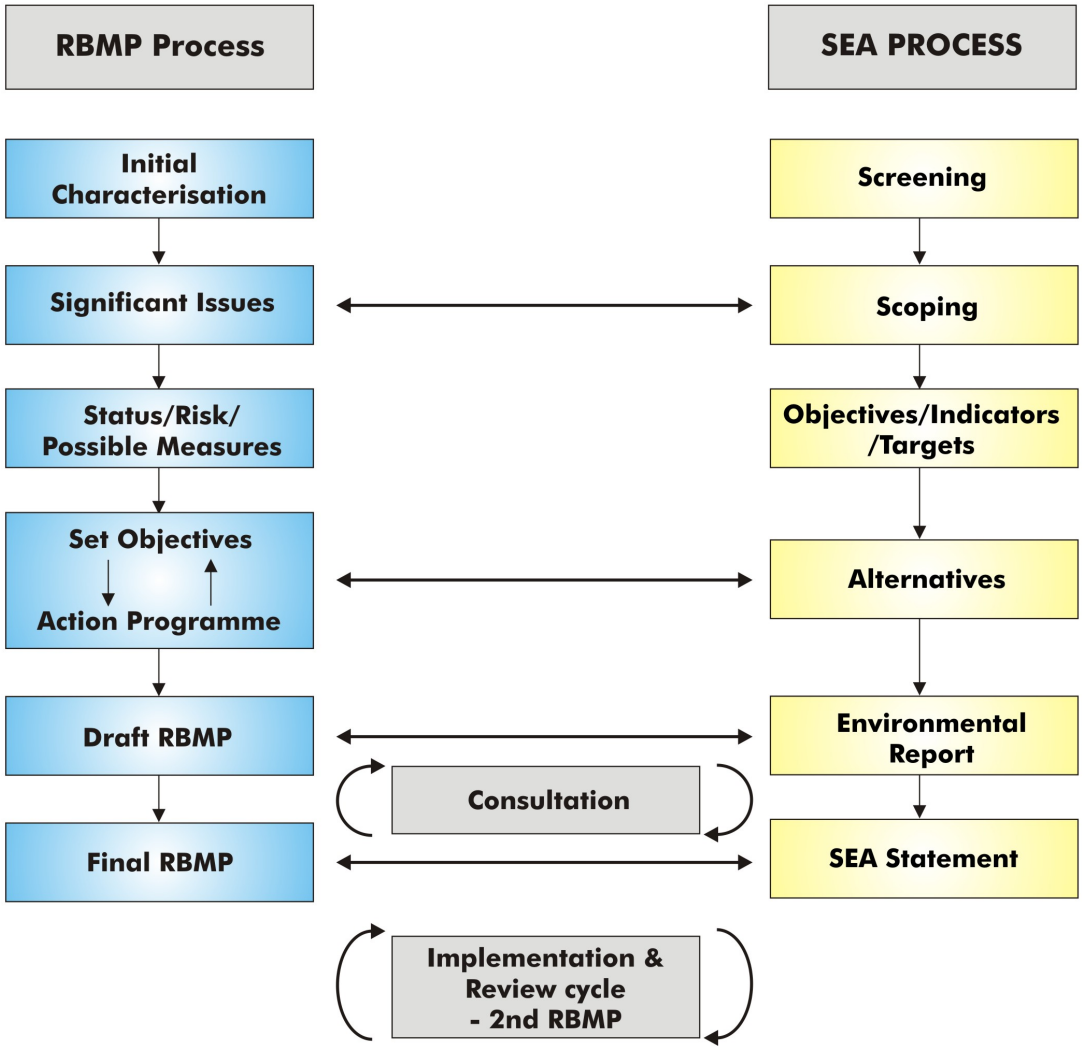

Figure 4.1 Building Blocks of the River Basin Management Plan and POM

Integration of the SEA and the RBMP/POM was achieved through close involvement of relevant team members in all stages of the project including: SEA scoping; review of the existing situation; and public consultation. The SEA and RBMP Teams also participated in a number of workshops in relation to developing the: SEA assessment methodology; alternatives to be considered in the SEA; SEA objectives, targets and indicators; and mitigation measures and monitoring strategies. The development of the River Basin Management Plan, including the Programme of Measures, was progressed in consultation with the *River Basin Management Plan and Programme of Measures Strategic Environmental Assessment Steering Group*.

4.5 PROPOSED CONSULTATION ON DRAFT PLAN, POM AND ENVIRONMENTAL REPORT

This Environmental Report does not form the final step in the SEA process. The consultation programme on the draft RBMP and POM will also provide an opportunity for statutory bodies and stakeholders to comment on the findings of the SEA. The requirements for consultation under both the WFD and the SEA Directive, as transposed, are outlined in **Table 4.3**.

Table 4.3 Consultation Requirements under the WFD and SEA Directive

Water Framework Directive	SEA Directive	Comments
6 months (Article 14(2))	In Ireland, a consultation period of not less than 4 weeks is required for the Environmental Report (S.I. 435/2004 Article 13(2)(a)) In Northern Ireland, the legislation requires that the consultation period must be of sufficient length to ensure that consultees are given an '*early and effective opportunity to express their opinion on the relevant documents*'. (S.R. 2004/280)	Consultation on the Environmental Report prepared as part of the SEA will last for 6 months and run in parallel with the consultation on the draft Plan.

The development of the consultation programmes for the draft Plan / POM and the SEA are currently underway. Please see the IRBD website for details of these which will be posted as they become available. Following consultation on the draft Plan / POM and Environmental Report, the comments received will be considered and a revised Final Plan / POM and SEA statement will be completed. Section 11 outlines the next steps in the SEA and Plan making process.

4.6 HABITATS DIRECTIVE ASSESSMENT CONSULTATION

Consultation on the methodology used for the Habitats Directive Article 6 assessment and the results from the assessment was held with the National Parks and Wildlife Service (NPWS) (part of the DoEHLG), who are the competent Authority for conservation of habitats and species in Ireland, and also with the NIEA who are the competent Authority for the conservation of habitats and species in Northern Ireland. Comments were received on the proposed assessment methodology. In addition, two one-day workshops were held with the NPWS and the NIEA to review the outcomes of the stage one screening, and to discuss suggested changes to the draft RBMP as a result of findings. Potential mitigation measures arising from the POMs were also discussed and recommendations made for future plans or projects. For further information please see the Article 6 report.

5 BASELINE ENVIRONMENT

5.1 INTRODUCTION

This section examines the relevant aspects of the current state of the environment within the Neagh Bann IRBD in relation to biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, cultural heritage, landscape, material assets and the interrelationship between these factors.

As this strategic environmental assessment deals with a plan for the Neagh Bann IRBD, the baseline data is focused at the IRBD level and includes information from both Ireland and Northern Ireland. The baseline has been compiled using available datasets and indicators suggested during scoping. The main sources of data used in the compilation of this baseline are listed in the references section of this document.

5.2 CURRENT STATE OF THE ENVIRONMENT

5.2.1 Ireland

According to recent EPA publications (EPA, 2008), Ireland's natural environment, although under increasing pressure, generally remains of good quality and represents one of the country's most essential national assets. In the EPA's *2020 Vision – Protecting the Irish Environment* document it is noted that pressures on the environment have increased significantly. As Ireland's economy has grown in the past ten years these pressures have accelerated at a rate that far exceeds that observed in other EU countries.

The fourth EPA *State of the Environment Report* (2008) (the most recent such assessment carried out by the EPA) identified four priority challenges for the environment, which, if addressed successfully, should benefit the present and future quality of Ireland's environment. These comprise: limiting and adapting to climate change; reversing environmental degradation; mainstreaming environmental considerations; and complying with environmental legislation and agreements, all of which are highly relevant to the WFD and the current river basin management planning process. These challenges are summarised as follows:

Challenges	Components	Relationship to WFD
Limiting and Adapting to Climate Change	Mitigating the causes and effects of climate change Adapting to climate change impacts Improving our understanding of climate change	The measures in the Plan have been assessed, to determine the potential impacts on them from climate change and their ability to adapt, based on European recommendations.
Mainstreaming Environmental Considerations	Incorporating environmental considerations into policies and plans Ensuring environmental responsible business Changing behaviours	Through the need for development plans to consider the objectives and precepts of the River Basin Management Plan the WFD ensures that water management issues are brought forward into the overall planning process.
Reversing Environmental Degradation	Preventing eutrophication and other water pollution Protecting natural habitats and species populations Remediation of contaminated land	The purpose of the WFD and the River Basin Management Planning process is to prevent and reduce impacts to water quality from pressures, such as eutrophication and contaminated land, as well as protect ecological resources.
Complying with Environmental Legislation and Agreements	Building a culture of environmental compliance Enforcement of legislation at national and local level Meeting EU and other international obligations	The WFD reinforces the requirement to implement and enforce existing environmental protection legislation as well as providing a coordinated approach to the management of water resources in order to meet EU and other international obligations in this area.

In *2020 Vision – Protecting the Irish Environment* (EPA, 2007) the EPA outlines six environmental goals which reflect on the main challenges identified in the State of the Environment reports as well as key issues at the global and EU level as reflected in the 6th Environmental Action Plan (EAP). These goals, which in the majority have relevance to the RBMP and POMs, are:

- Limiting and adapting to climate change;
- Clean air;
- Protected waters;
- Protected soils and biodiversity;
- Sustainable use of natural resources; and
- Integration and enforcement.

These goals are identified as a means of realising the vision of protecting and improving Ireland's environment.

5.2.2 Northern Ireland

According to Northern Ireland's first State of the Environment Report (2008) some of the major environmental issues facing Northern Ireland are as follows:

Challenges	Components	Relationship to WFD
Climate change:	There is a need to greatly reduce greenhouse gas emissions and to change the way the environment is managed in order to cope with predicted changes in the climate such as extreme weather conditions.	The measures in the Plan have been assessed, to determine the potential impacts on them from climate change and their ability to adapt, based on European recommendations
Economic growth:	Many benefits have come with economic growth along with significant environmental costs. More sustainable ways of pursuing economic expansion and limiting the impact on the environment need to be found.	Through the need for development plans to consider the objectives and precepts of the River Basin Management Plan the WFD ensures that water management issues are brought forward into the overall planning process.
Rural land use:	More sustainable agricultural and rural land use practices need to be adopted to allow for compatibility between modern agricultural practices and a high quality environment	The purpose of the WFD and the River Basin Management Planning process is to prevent and reduce impacts to water quality from pressures, such as agriculture and rural land use, as well as protect ecological resources.
Water Quality:	Nutrient enrichment, or eutrophication, is the greatest threat to the state of Northern Ireland waters and their biodiversity. Positive steps to address the diffuse sources of pollution causing this issue are required.	The purpose of the WFD and the River Basin Management Planning process is to prevent and reduce impacts to water quality from pressures, such as eutrophication, as well as protect ecological resources.

5.3 BASELINE AND RELEVANT ENVIRONMENTAL PROBLEMS IN THE NBIRBD

5.3.1 Flora, Fauna and Biodiversity

5.3.1.1 Designated Sites

Both Ireland and Northern Ireland have designated sites and species of conservation value and/or concern in an effort to protect their biodiversity resource. Designated conservation areas are areas containing habitats or species of national or international conservation importance. There are five types of designation considered here for the NBIRBD: Special Areas of Conservation, Special Protection Areas and Ramsar sites (common to both Ireland and Northern Ireland); Natural Heritage Areas (Ireland only); and Areas of Special Scientific Interest (Northern Ireland only). Special Areas of Conservation (SAC) are protected under the European Union (EU) Habitats Directive (92/43/EEC) and Special Protection Areas (SPA) are designated under the EU Birds Directive (79/409/EEC) and together these sites form the backbone of the Natura 2000 network. Ramsar sites are wetlands of

international importance designated under the Ramsar Convention, an intergovernmental treaty which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.

Natural Heritage Areas (NHAs), are protected under the Wildlife Act 1976 (as amended 2000). NHAs are areas considered important for the habitats present or which hold species of plants and animals whose habitat needs protection. Areas of Special Scientific Interest (ASSIs) are designated under The Environment (Northern Ireland) Order 2002, which provides much of the legislative basis for the protection of sites of importance to nature conservation in Northern Ireland. ASSIs are areas of land that have been identified by scientific survey as being of the highest degree of conservation value. **Table 5.1** gives the numbers and types of each designation present in the District. The locations of these sites are shown on **Figures 5.1 and 5.2**.

Table 5.1 Number and Types of Designated Sites in the District

Designation Type	Number*
Special Areas of Conservation	24
Special Protection Areas	7
Ramsar	7
Natural Heritage Areas	49
Areas of Special Scientific Interest	84

** includes candidate / proposed sites*

5.3.1.2 Water Dependent Habitats

Article 6 of the Water Framework Directive (2000/60/EC), requires each Member State to establish a register of water dependent habitats or species including Salmonid waters, Special Areas of Conservation and Special Protection Areas. In the portion of the NBIRBD in Northern Ireland, there are 178 reaches and 10 lakes designated as salmonid water bodies under the EU Freshwater Fish Directive (2006/44/EC). The protected areas for Salmonid species in Ireland are listed in the Salmonid Regulations (S.I. 293 / 1988), which designate “waters capable of supporting salmon (*Salmo salar*), trout (*Salmo trutta*), char (*Salvelinus*) and whitefish (*Coregonus*)” as protected. The Habitat Regulations (S.I. 94 / 1997) separately protect the habitats of Atlantic Salmon. In total there are seven salmonid designated water bodies in Ireland portion of the NBIRBD, six rivers and one lake.

In total there are 23 SACs and five SPAs designated as water dependent within the NBIRBD. Only the SACs that contain water dependent species and habitats have been included within the Register.

5.3.1.3 Freshwater Pearl Mussel (*Margaritifera margaritifera*)

The Freshwater Pearl Mussel is a bivalve and can be up to 140mm with an oval-shaped heavy black shell. They are filter feeders associated with Salmonid waters, but they require higher water quality than Salmonids. They have a complex life cycle with a fish host usually required during the larval stages. In Ireland, native salmon (*Salmo salar*) and trout (*Salmo trutta*) are used as hosts. The fish provides the essential step in the mussel's life cycle and adult mussels are an indicator of good clean water. Each mussel can filter up to 50 litres of water per day. For more information on the Pearl Mussel see the appendix to this chapter.

There has been a considerable decline in species distribution and numbers. A previous study on the ecological requirements of water dependent species and habitats throughout the North Western IRBD, Neagh Bann IRBD and the North Eastern RBD found Pearl Mussel populations throughout the Foyle system extending to the northeast. Within this study area, the Pearl Mussel is now confined to ten river systems, five in Ireland and five in Northern Ireland. The following SACs are designated for Pearl Mussels within the Neagh Bann IRBD (**Table 5.2)**.

Table 5.2 SACs designated for *Margaritifera* within the Neagh Bann IRBD

SAC Site Code	SAC Site Name	River Systems designated for *Margaritifera*
UK0030296	Upper Ballinderry River	Upper Balinderry

5.3.1.4 Shellfish Growing Areas

The following shellfish growing areas are found in the Neagh Bann River Basin District as delineated by the Food Standards Agency (Northern Ireland) and the Sea Fisheries Protection Authority (Ireland): Dundalk Bay (Ireland) and Carlingford Lough (Ireland and Northern Ireland).

5.3.1.5 Existing Environmental Pressures / Problems: Biodiversity, Flora and Fauna

Urban growth on the island of Ireland has been accelerating at a greater rate over recent years as increased development expands city and town limits into the countryside. Artificial land cover throughout Ireland remains relatively low; however, the constant encroachment on natural habitats will undoubtedly have an impact on natural flora, fauna and biodiversity.

Throughout the island of Ireland there has been a decline in many of the native species through habitat loss, competition, development and agriculture. Irish and Northern Irish legislation protect some of these species. In Ireland there are 18 species of plant and animal identified as endangered

and a further 52 recorded as vulnerable, while in Northern Ireland some 272 plant and animal species (identified as Priority Species) and 40 Priority Habitats require some conservation action. There are also 457 species on the Northern Ireland Species of Conservation Concern (SOCC) list.

The *Water Matters – Have Your Say* document for the Neagh Bann IRBD highlighted the main pressures/problems facing the water environment within the river basin; these are listed in **Section 5.3.3, Water**.

Each of these pressures may potentially impact directly or indirectly on the biodiversity of water dependent habitats and species. Wastewater discharges, runoff from agriculture, leachate from landfills and contaminated sites and nutrient input from forestry can all have detrimental effects on water quality resulting in subsequent impacts to biodiversity.

Species listed in Annex II of the Habitats Regulations, such as freshwater pearl mussel and salmon are particularly sensitive to pollution. *Margaritifera* requires extremely oligotrophic conditions, preferably rivers with a biotic quality index of Q5 (Ireland) or a GQS value of A (Northern Ireland). The EPA and NIEA use these Q5 and A values, respectively, to indicate the highest quality status categories. Salmon need very good water quality typical of that found in upland streams. The species needs pool, glide and riffle so there is a requirement for rivers where dredging is not on-going and there are no abrupt changes to the current patterns as might occur through physical modifications.

Widespread development on shorelines and floodplains, and the associated infilling of wetlands, is a potential environmental problem within this District. This can have a direct effect on dependent habitats, such as machair and turloughs. There is the potential for impacts to occur related to the sustainability of water supplies in light of development and growing demand in the Neagh Bann IRBD. Surface water abstraction can result in a direct impact on rivers and lakes and their associated flora and fauna. Indirect impacts may occur through abstraction of groundwater and the resultant effect on groundwater dependent habitats, such as alkaline fens and petrifying springs.

Invasive non-native plant and animal species are one of the greatest threats to biodiversity in Ireland. Invasive alien species negatively impact on Irish biodiversity through competition, herbivory, predation, habitat alteration, and introduction of parasites or pathogens and poses a risk to the genetic integrity of native species. Terrestrial and aquatic habitats can be negatively affected, resulting in severe damage to conservation and economic interests, such as agriculture, fisheries, forestry and various recreational activities. Despite this some invasive aquatic plant species continue to be imported onto the island for sale in garden centres. Six species of concern are present in the NBIRBD: Australian Swamp Stonecrop (*Crassula helmsii)*, Common Cord Grass *(Spartina anglica)*, Japanese Seaweed (*Sargassum muticum)*, Water Fern (*Azolla filiculoides),* Pennywort (*Hydrocotyle ranunculoide)* and Zebra Mussels (*Dreissena polymorpha)*.

5.3.2 Population and Human Health

5.3.2.1 Introduction

This section provides baseline data on population and human health in Northern Ireland and Ireland as it relates to water quality issues. Principally it relates to drinking water and bathing water quality.

The population of Ireland was over 4.2 million in 2006, while the population of Northern Ireland was over 1.7 million. Both populations have been increasing at ever growing rates; however the population densities are still low from a European perspective and the overall population still remains below that of the island in the early 19th century. Over half a million people live in the Neagh Bann IRBD. Most of the main urban areas – Antrim, Ardee, Armagh, Ballymena, Banbridge, Coleraine, Cookstown, Craigavon, Dundalk, Dungannon, Monaghan, Newry and Portadown – are located beside rivers (**Figure 5.3**). The proximity of urban areas to rivers can have significant impacts on water resources in terms of both quantity and quality.

5.3.2.2 Population

Tables 5.3 and 5.4 shows the population of each County (Ireland) and Council Area (Northern Ireland) in the Neagh Bann IRBD. During the intercensal periods 1996 to 2002 and 2002 to 2006 all counties experienced population increases, with significant increases in population in County Meath, between 1996 and 2002 (22.1%) and 2002 to 2006 (21.5%). A similar increase in population was experienced throughout the council areas in Northern Ireland, with Banbridge (23.6%), Coleraine (11.7%), Ballymoney (11.1%) and Londonderry / Derry (10.2%) all experiencing significant increases.

Table 5.3 Trends in population for counties, part or all of which lie within the NBIRBD (Ireland)

County	1996	2002	% Change '96 - '02	2006	% Change '02 - '06
Monaghan	51,313	52,593	2.5	55,997	6.5
Louth	92,166	101,821	10.5	111,267	9.3
Meath	109,732	134,005	22.1	162,831	21.5
Cavan	52,944	56,546	6.8	64,003	13.2

Source: Census of Population of Ireland 1996, 2002 and 2006.

Table 5.4 Census Populations 1991 and 2001 for District Council Areas, part or all of which lie within NBIRBD (Northern Ireland)

Council Area	1991	2001*	% Increase 1991-2001
Fermanagh	54,033	57,527	6.5
Londonderry / Derry	95,371	105,066	10.2
Armagh	51,817	54, 263	4.7
Ballymena	56,641	58,610	3.5
Ballymoney	24, 198	26, 894	11.1
Banbridge	33,482	41,392	23.6
Coleraine	50,438	56, 315	11.7
Cookstown	31,082	32, 581	4.8
Craigavon	74,986	80, 671	7.6
Dungannon	45, 428	47,735	5.1
Magherafelt	36, 293	39, 780	9.6
Newry and Mourne	82, 943	87,058	5.0

Source: Northern Ireland Statistics and Research Agency: Census Population for Northern Ireland 1996 and 2001.

For additional information on the main cities, towns, minor towns and villages within the NBIRBD please see the appendix to this chapter.

The majority of the area of the District would be of low population density; however, higher population density areas are present around the main towns, in particular Armagh, Dundalk and Newry, which are located on the Callan, Blackwater and Newry Rivers.

5.3.2.3 Drinking Water Quality

The European Communities (Drinking Water) Regulations (No. 2), 2007 came into force in March 2007. In accordance with these regulations, the local authorities in Ireland must notify the EPA where there has been a failure to meet a quality standard. **Table 5.5** below presents information on the overall drinking water compliance rate within the various counties throughout the Ireland, as recorded in the EPA (2008) report, *The Provision and Quality of Drinking Water in Ireland, A Report on the Years 2006 - 2007*. Specific information on microbiological and chemical compliance is included in the appendix to this chapter.

Table 5.5 Drinking Water Quality Compliance in NBIRBD (Ireland)

County	Overall Compliance Rate of Drinking Water
Monaghan	Overall compliance rate was 96.7%, near the national average and improved from 94.8% in 2005.
Louth	Overall compliance rate was 97.3%, close to the national average.
Meath	Overall compliance rate was down slightly from 96.7% in 2005 to 95.8% in 2006.
Cavan	Overall compliance rate was 94.3%, below the national average but an improved from 91.1% in 2005.

Source: The Provision and Quality of Drinking Water in Ireland 2006-2007, EPA 2008

Throughout 2006 the Water Service in Northern Ireland sampled drinking water across all districts to test for compliance with the standards in the Water Quality (Water Supply) Regulations (Northern Ireland) 2002. There are nine Council Areas within the Northern Ireland portion of the NBIRBD. These represent some 40 water supply zones. The overall chemical and microbiological compliance rate for drinking water in Northern Ireland as a whole in 2007 was 99.60%. In 2006, there were reoccurring trihalomethane contraventions at five of the zones (Lough Braden, Limavady, Clay Lake, Castor Bay-Shanmoy and at Killylane). There were also recurring bromate contraventions due to treatment chemical quality at one zone (Claylake). See the appendix to this chapter for more detail.

5.3.2.4 Risk of Cryptosporidium Contamination

Cryptosporidium is a protozoal parasite that causes a diarrhoeal illness in humans. Both humans and animals are potential reservoirs. Surface water supplies with inadequate treatment (chlorination only) are at risk of failing to remove *Cryptosporidium* oocysts in the treatment process if present in the raw water.

The EPA has required local authorities to carry out risk assessment on all water supplies in relation to *Cryptosporidium*. From this, plants with very high and high risk have been identified. The results of this risk assessment process is guiding local authorities both in terms of their monitoring programmes and investment prioritisation under the Water Services Investment Programme. The use of turbidity meters on filtering systems has been a requirement of this programme from a monitoring perspective together with an increase in sampling and monitoring level. The EPA has also introduced the remedial action list (RAL) and this allows for the tracking of remedial action on plants identified as at higher risk from *Cryptosporidium*. A review of the counties within Ireland did not identify any plants in the NBIRBD as being at risk of *Cryptosporidium* contamination (EPA, 2007).

A review of the report on Drinking Water Quality in Northern Ireland (2007) showed that of the 43 treatment plants reviewed, only one required a monitoring programme for cryptosporidium oocysts.

5.3.2.5 Elevated Lead Levels in Drinking Water

A recent issue throughout several counties in Ireland has been the presence of elevated lead levels in drinking water. The permitted level of lead in drinking water is 25 micrograms per litre (due to reduce to 10 micrograms per litre in 2013), compared to some of the measured levels between 35 micrograms per litre to upwards of 80 micrograms per litre in some parts of Ireland. Older lead pipes are at this time thought to be responsible for the contamination due to lead being dissolved out of pipes bringing in mains water and internal plumbing in older homes. To date none of the water supplies in the District have been identified as having lead issues (EPA, 2008). The HSE, EPA and DOEHLG are developing a national strategy to deal with lead piping and measures to deal with this are anticipated.

This is also an issue in some areas of Northern Ireland. To address this NI Water, has been treating the water supply from 2004 with the chemical orthophosphoric acid to lessen the amount of lead dissolved during the transfer of water from reservoirs to the household tap. This has been successful and has improved compliance with the lead standard to 99.14% in 2007 from 94.92% in 2004

5.3.2.6 Bathing Waters

Monitoring of water quality in the NBIRBD in designated bathing sites is carried out in accordance with the provisions of the European Council Directive concerning the quality of bathing water (76/160/EEC). The purpose of this directive is to ensure that bathing water quality is maintained, and if necessary improved, so that it complies with specified standards designed to protect public health and the environment. Overall bathing water quality in the District appears to be good in all areas. More detail as to bathing water quality areas within the NBIRBD is provided in the appendix to this chapter.

5.3.2.7 Existing Environmental Pressures / Problems: Population and Human Health

Ireland's economy has experienced unprecedented economic growth since the early 1990's. Traditionally based around agriculture, particularly livestock farming, it is now dominated by services and industry. Both Ireland and Northern Ireland have seen expansion in other sectors: construction and consumer spending have increased and tourism, including recreational fishing and golf holidays, is a major growth industry throughout the island.

New individual houses and housing clusters, reliant on septic tanks, threaten water quality. County Monaghan has one of the highest percentages (40%) of one off housing units built since 1991 in Ireland, whilst demand for rural housing in Northern Ireland has sparked debate about planning policy. Development on floodplains also risks having adverse effects on both water quality and flooding behaviour.

More people and increased household water usage have required bigger water supply schemes and produced larger volumes of wastewater to treat and dispose. Demand for more food and industrial goods has led to more intensive or expanded activities with higher water demand and pollution threats. Additional homes mean the spread of urban areas and an increase in rural housing, with the associated threat of more water pollution. Pressure from abstractions can reduce flow in springs and lower water levels in lakes, wetlands and wells. This can make the water supply itself unsustainable and have an indirect impact on aquatic plants and animals as well as wetland areas. In extreme cases riverbeds may dry up, lakeshores can become exposed and, in coastal areas, salt water may intrude into groundwater.

5.3.3 Water

5.3.3.1 Surface Waters

The NBIRBD drains significant portions of Counties Antrim, Armagh, Louth and Monaghan. Counties Cavan, Londonderry/ Derry, Meath and Tyrone have smaller drainage areas in the District. The main river basins in the NBIRBD include Lough Neagh/River Bann system with smaller river basins draining into Carlingford Lough and Dundalk Bay. **Figure 5.4** shows the river systems in the NBIRBD.

From the EPA's *Water Quality in Ireland: Key Indicators of the Aquatic Environment* reports (2007 and 2005), river water quality in Ireland between 2004 and 2006 showed some improvement over the 2001 to 2003 period, with 71.4 per cent unpolluted, 18.1% slightly polluted, 10.0% moderately polluted and 0.6% seriously polluted. Based on the same EPA reports, river water quality in the Ireland side of the NBIRBD was showing signs of slight improvement over the previous reporting periods, with a significant increase in the "slightly polluted" category and a decrease in the "moderately polluted" rivers. However there has also been a continual slight decline in the number of "unpolluted" watercourses.

In Northern Ireland the General Quality Assessment (GQA) chemical and biological classification of rivers was previously used to establish river water quality. In Northern Ireland in 2005 the GQA chemical classification found 63% of the river lengths were in the top classes (A and B). However the GQA biological classification of the Northern Ireland river systems from 1995-2005 showed a reduction in the percentage of river length in the highest quality class.

The main lake in the district is Lough Neagh, which is the largest freshwater lake in the British Isles, with a surface area of 396km^2. Other lakes in the NBIRBD include Lough Fea, Lough Gullion, Portmore Lough, Stoneyford Reservoir, Spelga Dam, Cam Lough, Lough Island Reavy, Lough Ross, Lough Beg, Lough Muckno and Emy Lough. The WFD reporting threshold for lakes is a minimum of

50 hectares in surface area or to be located in a protected area, and there are 2 in Ireland and 12 in Northern Ireland, which meet this threshold. **Figure 5.4** shows the main lakes in the NBIRBD.

Marine waters in the NBIRBD account for just over 200km^2. In the north of the district there is a short length of coastline where the Bann enters the North Channel, while in the south of the district 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. There are 10 transitional water bodies in the NBIRBD (falling into 2 types) and 5 coastal water bodies (falling into three types). There are three cross-border coastal water bodies (falling into three types), however there are no transitional cross-border water bodies.

A new "water status" assessment approach was implemented over the past year on the island of Ireland as part of the WFD. The approach incorporates chemical and biological monitoring into a status grade for each water body. These early results are based solely on one year's data, reflecting the best current understanding of status, however, it is expected that this will improve over time as monitoring data, and the scientific tools used to interpret it, expand and improve in future river basin planning cycles. **Table 5.6** demonstrates the existing surface water quality of the Neagh Bann River Basin District in Ireland while **Table 5.7** shows surface water quality status in the Northern Ireland portion, while **Table 5.8** shows the cross border surface water body status.

Table 5.6 Surface Water Status in the Neagh Bann IRBD (Ireland)*

Surface Water Category	High	Good	Moderate	Poor	Bad	Unknown
Rivers and Canals % of total number of bodies	0.0	23.2	55.1	21.7	0.0	0.0
Lake (% of total area)	0.0	0.0	3.7	9.6	65.1	21.6
Transitional (% of total area)	0.0	0.0	94.0	0.0	0.0	6.0
Coastal (% of total area)	23.7	0.0	76.3	0.0	0.0	0.0

*As of 01/12/08

Table 5.7 Surface Water Status in the Neagh Bann IRBD (Northern Ireland)*

Surface Water Category	High	Good	Moderate	Poor	Bad	Unknown
Rivers and Canals (% of total number of bodies)	0.0	23.7	43.0	20.5	6.0	6.8
Lake (% of total area)	0.0	0.0	0.6	1.6	97.8	0.0
Transitional (% of total area)	0.0	0.0	0.0	0.0	0.0	100.0
Coastal (% of total area)	0.0	80.4	19.6	0.0	0.0	0.0

*As of 01/12/08

Table 5.8 Surface Water Status for Cross Border Water Bodies Neagh Bann IRBD*

Surface Water Category	High	Good	Moderate	Poor	Bad	Unknown
Rivers and Canals (% of total number)	0.0	11.5	30.8	53.8	3.8	0.0

*As of 01/12/08

The results show that, with a few exceptions, the majority of the water bodies in the NBIRBD, in both Ireland and Northern Ireland, are mainly in the moderate, poor or bad classifications. A summary of water body status is shown on **Figure 5.6**. Based on the current water status results 77% of rivers, all lakes, all transitional waters and 24% of the coastal water bodies in the Ireland side of the NBIRBD will need to have their status improved to meet the requirements of the WFD, while 76% of rivers, 100% the lakes, all the transitional waters and 20% of the coastal water bodies on the Northern Ireland side of the NBIRBD will need to have their status improved to meet the requirements of the WFD.

5.3.3.2 Groundwater

Groundwater is an important source of drinking water but also makes an important contribution to river flows and lake levels. **Figure 5.5** shows the aquifer distribution in the NBIRBD. In the NBIRBD there were four groundwater body types identified, based on flow regime of the aquifer, namely karstic, productive fissured bedrock, gravel and poorly productive bedrock. The classification resulted in 37 groundwater bodies being delineated, with 5 of these being cross-border bodies.

Groundwater status in the NBIRBD for Ireland, Northern Ireland and cross-border water bodies is given in **Tables 5.9**, **5.10**, and **5.11** respectively, based on the new water status classification (2008). All of the cross border groundwater bodies were found to be of good status, while in Northern Ireland only 13% of the groundwater bodies failed to meet good chemical and quantitative status (see **Figures 5.7a and b**). In the Ireland side of the NBIRBD the status of the groundwater was found to be good for all groundwater for both chemical and quantitative status, therefore meeting the requirements of the WFD.

Table 5.9 Groundwater Status in the NBIRBD (Ireland)*

Groundwater	Good	Failing to Achieve Good
Chemical Status (km^2) % of total	100.0	0.0
Quantitative Status (km^2) % of total	100.0	0.0

*As of 01/12/08

Table 5.10 Groundwater Status in the NBIRBD (Northern Ireland)*

Groundwater	Good	Failing to Achieve Good

Groundwater	Good	Failing to Achieve Good
Chemical Status (% of total area)	87%	13%
Quantitative Status (% of total area)	87%	13%

*As of 27/11/08

Table 5.11 Groundwater Status in the NBIRBD (Cross Border Water bodies)*

Groundwater	Good	Failing to Achieve Good
Chemical Status (% of total number of bodies)	100.0	0.0
Quantitative Status (% of total number of bodies)	100.0	0.0

*As of 01/12/08

5.3.3.3 Important Water Resources

Register of Protected Areas

Article 6 of the WFD requires each Member State to establish a register of protected areas. This register for Ireland and Northern Ireland was split into five categories. **Table 5.12** summarises the existing protected areas throughout the RBD. Each of these categories is discussed in further detail in other related sections.

Table 5.12 Areas of the NBIRBD designated under the Register of Protected Areas

Protected Area	Total Designated Areas	Other Relevant Section in Chapter 5
Drinking Waters	198	5.3.2
Economically Significant Aquatic Species*	203	5.3.7
Recreational and Bathing Waters	7	5.3.7
Nutrient Sensitive Waters	210	5.3.8
Protection of Habitats		
Salmonid waters (Ireland only)	7	5.3.1
Water Dependent SACs	20	5.3.1
Water Dependent SPAs	5	5.3.1

** Designated shellfish waters are included under this category in both Northern Ireland and Ireland. Designated salmonid waters are also included under this category in Northern Ireland.*

Heavily Modified Water Bodies and Artificial Water Bodies

Some surface waters in the District have been substantially changed in character to allow certain uses such as navigation (for example ports), water storage, public supply, flood defence or land drainage. To recognise that the benefits from such modifications need to be retained, these waters are

designated as heavily modified. The same reasoning applies to artificial waters (for example canals) created for human activities. Examples of these modifications include the Lough Neagh sluice gates and hydropower-generating schemes on the River Maine.

5.3.3.4 Existing Environmental Pressures / Problems: Water

The main pressures on surface and groundwater quality within the NBIRBD can be summarised into the following categories. More details as to each of these are included in the previous Water Matters booklet for the District. It should be noted that the pressures included in the Plan for Northern Ireland have evolved from those previously published. Where this is the case, the new heading is referenced in parentheses.

Wastewater and Industrial Discharges (Collection and Treatment of Sewage / Industry and Other Businesses/ Urban Development)

Inadequately treated effluents and spills or leakage from sewerage networks can lead to unacceptable levels of pollutants in receiving waters. These pollutants can damage water quality and downstream uses (e.g. bathing waters, shellfish waters or waters supporting sensitive species). In the Neagh-Bann District, estimates indicate that municipal and industrial discharges produce over 25% of the yearly phosphorus load and over 10% of the nitrogen load. Some rivers (such as the Proules) have been seriously polluted by such discharges. In response, facilities are being improved in many urban areas including Carrickmacross, which discharges to the Proules, and other locations such as Banbridge and Ballyclare.

Landfills, Mines, Quarries and Contaminated Sites (Industry and Other Businesses / Waste)

Waste disposal sites (including old un-lined landfills), quarries, mines, gasworks sites and industrial lands produce lesser discharges to waters than wastewater plants and industries; however subsurface residues or waste products from previous activities may have seeped into the ground and continue to threaten groundwater and surface waters. The key threat to waters from these sites is potential contamination from pollutants (mainly dangerous substances, for example metals and fuel). These chemicals may travel through groundwater and enter surface waters, affecting the quality of both, damaging aquatic plants and animals and impairing water uses. There is concern about the potential impacts of such sites in the Neagh-Bann District. One example is the illegal dumping that occurs along the border and upland of the District, where sand pits or uncultivated land have been used to dispose of waste.

Agriculture

Two main water quality problems relating to agriculture have been identified. These are enrichment of water by nutrients (phosphorus and nitrogen), from substances such as fertilisers (both organic and inorganic) as well as erosion of nutrient enriched soils, and organic pollution from animal slurry/manure and silage effluent. A third, pesticides, is covered under dangerous substances. In the Neagh-Bann District, agriculture is an important activity, using about 80% of the land. Estimates of nutrient input into waters indicate that agriculture produces over 60% of the yearly phosphorus load and 80% of the nitrogen load.

Wastewater from Unsewered Properties (Collection and Treatment of Sewage/ Urban Development)

In rural areas many houses and businesses are not connected to public systems that collect, treat and dispose of wastewater, and they rely mainly on on-site systems (conventional septic tanks or proprietary systems) via soil percolation areas, which if not designed, installed or operated properly can result in water pollution. As many properties are spread over wide areas, provision of public sewerage systems, especially ahead of new development, is very difficult and often very costly.

Forestry

Forests can have both positive and negative impacts on the environment. Negative impacts are largely related to poor management or to planting on unsuitable soils, and many of the current water problems associated with afforestation are a legacy of old practices, which have been subsequently amended. Forestry can cause also acidification of water through the capture of sulphur and nitrogen compounds from the atmosphere by forest canopies. Rain become more acidic as it passes through the canopies into the ground below and may worsen the chemical balance of receiving waters. Nutrient enrichment can also occur through the introduction of extra nutrients, which in naturally nutrient–poor areas, can lead to problems such as algal growth. Road-making and stream crossing as well as felling activities can cause erosion and sedimentation on susceptible soils, reducing water quality. Incorrect pesticide usage can also result in contamination of waters. Public and private forestry areas cover less than 5% of the land area within the Neagh-Bann District; however, many of them are in sensitive salmon and trout spawning areas in forested upland headwaters.

Discharge of Dangerous Substances (Industry and Other Businesses/ Agriculture/ Forestry)

Some dangerous substances can be toxic to aquatic plants and animals. They can persist in waters and sediments, and slowly build up in the bodies of aquatic organisms, poisoning them and causing problems higher up the food chain or interfering with natural breeding processes. Dangerous substances spillages can require rapid response and costly clean-up operations, e.g. a spill of diesel

from a fuel laundering plant into the Flurry River in May 2005, which required a joint response by the then Environment and Heritage Service and Louth County Council.

Physical Modifications (Freshwater and Marine Morphology)

Physical modifications can impact waterways by directly affecting habitats, or by indirectly changing natural processes through altering plant and animal communities, by reducing their variety or numbers. Land drainage, overgrazing, de-forestation and cattle access can have an indirect effect, changing how much and how fast water drains off the land, resulting in an increased risk of property flooding. Physical modifications in the Neagh-Bann District include Greenore Port, the control system on Lough Neagh and the Lower Bann, hydropower-generating schemes on the River Maine and historic drainage works in the Blackwater catchment. Widespread development on floodplains, particularly with respect to potential effects on water quality and flooding behaviour, is also a potential environmental problem within this district.

Climate Change

The impact of climate change is difficult to predict; however, there is the potential for heavier winter rainstorms that may cause more flash flooding, causing an increase in diffuse pollution loads from soil run-off and raising the demand for flood controls. Summer droughts are more likely and recent reports have indicated that the effects of climate change in Ireland will have serious consequences for water resources, resulting in a potential 40% reduction in drinking water supplies by mid-century. Temperature changes may give invasive alien species a competitive advantage.

Shared Waters

A consistent approach to environmental policies and regulation in both jurisdictions is important to avoid imbalances which could inadvertently increase pressures, such as when waste from Ireland was illegally dumped in Northern Ireland after the introduction of waste charging in Ireland.

5.3.4 Air and Climate

5.3.4.1 Introduction

The EU has introduced several measures to address the issue of air quality management in Member States. The Air Quality Framework Directive (96/62/EC) set out the principles of the approach, and set out the limit values for pollutants in four “daughter” directives.

The National Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002) transpose the first and second "Daughter" directives 1999/30/EC which relate to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air and 2000/69/EC which relate to limit values for benzene and carbon monoxide in ambient air.

The Air Quality Strategy for England, Scotland, Wales and Northern Ireland sets objectives for a series of pollutants to be met in all UK countries. The Department of the Environment in Northern Ireland has also published the Air Quality Standards Regulations (Northern Ireland) 2007, which implemented the requirements of the fourth daughter Directive on heavy metals and PAHs (polycyclic aromatic hydrocarbons) as well as replacing the Air Quality Limit Values Regulations (Northern Ireland) 2002 (S.R. 2002 No. 94) and the Air Quality (Ozone) Regulations (Northern Ireland) 2003 (S.R. 2003 No. 240), which implemented the third daughter directive on ozone.

Under the respective Regulations, the EPA and Local Authorities are responsible for ambient air quality monitoring in Ireland. The Department of Environment and Local Authorities are responsible for air quality monitoring in Northern Ireland. There is continuous monitoring carried out throughout the island, with seven monitoring stations in the NBIRBD including Dundalk, Armagh, Newry, Cookstown, Ballymena, Antrim and Ballymoney. The EPA and DOENI compile annual reports on air quality.

The EU has recently adopted the CAFÉ Directive (2008/50/EC), which incorporates all the main air quality limits and measurements techniques into one Directive. In addition to the previous Directives, the CAFÉ Directive includes a target value for $PM_{2.5}$. As yet, the Directive has not been transposed into Irish or UK law.

5.3.4.2 Air Quality: Ireland

The EU Air Framework Directive requires that member states divide their territory into zones for the assessment and management of air quality. The zones adopted in Ireland are as follows:

- **Zone A** - Dublin City and Environs.
- **Zone B** - Cork City and Environs.
- **Zone C** - 16 Urban areas with populations greater than 15,000.
- Note: Zone C includes Galway, Limerick, Waterford, Clonmel, Kilkenny, Sligo, Drogheda, Wexford, Athlone, Ennis, Bray, Naas, Carlow, Tralee and Dundalk.
- **Zone D** is the remainder of the state excluding Zones A, B and C.

The section of the NBIRBD in Ireland is Zone C and Zone D. The EPA *Air Quality in Ireland 2006: Key indicators of Ambient Air Quality* concludes that pollutant concentrations in Zone C towns are below

the Air Quality standards limit values. According to the EPA report air quality in Zone D areas is generally very good with low concentrations of pollutants such as NO_2, PM_{10}, CO. Concentrations of ozone are higher in rural areas than is urban areas due to the absence of the nitrogen oxide in rural areas as an ozone scavenger.

In addition to the legislated air pollutants, nuisance such as dust deposition and odour can impact on amenity of the environment. Nuisance can occur at a local level in the vicinity of industrial, waste and wastewater treatment facilities. The EPA records all complaints relating to IPPC and Waste licensed facilities.

The European Communities (Waste Water Treatment)(Prevention of Odours and Noise) Regulations 2005 (S.I. 787 of 2005) require that waste water treatment plants are designed, constructed and maintained as to avoid causing nuisance through odours and noise. The EPA audits the facilities to assess compliance with the Regulations. The recent EPA report on 'Urban Waste Water Discharges in Ireland for Population Equivalents Greater than 500 Persons, A Report for the Years 2004 and 2005 details the findings of these audits. There were no odour issues identified at WWTP in the NBIRBD area.

5.3.4.3 Air Quality: Northern Ireland

The Department of the Environment (NI) reports on ambient air quality in Northern Ireland. The area of the NBIRBD in Northern Ireland is generally rural in nature with some major urban centres such as Coleraine, Ballymena, Dungannon, Armagh and Newry. Air quality in the urban areas is dominated by transport and industrial sources with traffic-derived pollutant concentrations more elevated in the vicinity of roads. There are a number of Air Quality Management Areas declared within the area encompassed by the NBIRBD. These include:

- Ballymoney; due to elevated particulate matter concentrations an Air Quality Management Area (AQMA) has been declared for an area in the north west of Ballymoney, bounded to the east by the railway line, to the north by the A26 and to the west by the B66.
- Ballymena has declared two AQMA due to elevated particulate matter concentrations:

  Ballykeel AQMA: Dwellings in the Ballykeel 1, Ballykeel 2, Chichester Park Central, Chichester Park Ease and Chichester Park West estates together with certain houses on Crebilly Road, Larne Road, Meadowvale, Moat Road, River View and Knockeen Crescent.

  Dunclag AQMA: Dwellings in the Dunclag Gardens, Dunclag Park, Dunvale and Millfield estates together with certain houses within Blacksgrove, Cushendall Road, Doury Road, Garvey Wood, Grove Road, Johnstone Close, Moorland Close and Parklands.

- Antrim has declared one AQMA due to elevated sulphur dioxide concentrations The area incorporates dwellings in the Greystone and Ballycaigy/Glenburn estates.

The local authorities responsible for each must prepare an Action Plan for the AQMA. Air quality in the rural areas of the NBIRBD is good and typical of rural air quality on the island.

5.3.4.4 Baseline Climatic Factors

The existing climate in Ireland is dominated by the Atlantic Ocean. Consequently, Ireland does not suffer from the extremes of temperature experienced by many other countries at similar latitude.

According to Met Eireann, average annual temperature is about 9°C. In the middle and east of the country temperatures tend to be somewhat more extreme than in other parts of the country. For example, summer mean daily maximum is about 19°C and winter mean daily minimum is about 2.5°C in these areas.

Mean annual wind speed varies between about 4 m/sec in the east midlands and 7 m/sec in the northwest. Strong winds tend to be more frequent in winter than in summer. Daily sunshine duration is highest in the southeast of the country. Average rainfall varies between about 800 and 2,800mm. Average annual rainfall varies between about 800mm in the southeast and 2,800mm in the northwest.

With south-westerly winds from the Atlantic dominating, rainfall figures are highest in the northwest, west and southwest of the country, especially over the higher ground. Rainfall accumulation tends to be highest in winter and lowest in early summer.

Northern Ireland is influenced by the warm surface waters of the Gulf Stream resulting in a mild, moist climate. The region maintains a fairly constant year round temperature with an annual mean in lowland areas of around 8.5ºC to 9.5ºC, and annual rainfall varying from around 800mm to 1,600mm according to altitude (State of the Environment Report, 2008).

According to the UK Climate Impacts Programme Report UKCIP08, The Climate of the United Kingdom and Recent Trends:

- Temperatures in Northern Ireland have risen by about 0.8 ºC since about 1980, but this rise has not been attributed to specific causes.
- All regions of the UK have experienced an increase in the contribution to winter rainfall from heavy precipitation events. In summer all regions except NE England and N Scotland show decreases.

- Sea-surface temperatures around the UK coast have risen over the past three decades by about 0.7ºC.
- Sea level around the UK rose by about 1mm/yr in the 20th century, corrected for land movement. The rate for the 1990s and 2000s has been higher than this.

Greenhouse gases in the atmosphere (including carbon dioxide, methane, nitrous oxides and a number of gases that arise from industrial processes) are rising, as a result of human activity.

Under the Kyoto Protocol, Ireland's target is to limit emissions to 13% above 1990 levels over the five year period from 2008 through 2012, within the overall EU target to reduce emissions to 8% above 1990 levels in the same timeframe. For the period beyond 2012, the EU Council of Ministers has recently committed to achieving at least a 20 per cent reduction of greenhouse gas emissions by 2020, compared to 1990 levels. The Council also agreed to extend this target to a 30 per cent reduction if other developed countries commit to comparable reductions. Ireland's share of the reduction target has yet to be agreed.

The United Kingdom's target under the Kyoto protocol is to reduce emissions to 12.5% below 1990 levels. It is one of only two EU countries which projects that existing domestic policies and measures will be sufficient to meet their targets. Total carbon dioxide emissions in Northern Ireland were around 2.9% of the UK total in 2004 and have increased by 3.6% since 1990. Road transport is the largest cause of emissions in Northern Ireland, and has risen 49.8% from 1990 to 2004 compared with a 9.1% rise in the UK. Reductions in greenhouse gases are not as marked in Northern Ireland as in the UK as a whole for a number of reasons. Partly this reflects the different sector mix, the smaller industrial base, a larger agricultural sector, and historically low availability of natural gas. The Northern Ireland Sustainable Development Strategy sets out targets for to reduce greenhouse gas emissions by 25% below 1990 levels by 2025 and carbon dioxide levels by 30% below 1990 levels by 2025.

5.3.4.5 Existing Environmental Pressures / Problems: Air and Climate

Currently there are no significant concerns with regard to air quality at the District level. Poor wastewater treatment infrastructure can lead to odour nuisance issues at specific plants. Dust and PM_{10} can also be an issue locally during construction and operation.

With regard to climate, inputs of greenhouses gasses from water management activities in the District, which require the use of fossil fuels, add to the carbon dioxide emissions produced on the island. The emission of carbon dioxide in general is currently the focus of emission reduction programmes under the UK's and Ireland's Kyoto Protocol agreements. In addition, the potential changes in climate predicted as a result of anthropogenic carbon emissions are expected to result in pressures on water quantity and precipitation regimes, as discussed in the previous section.

5.3.5 Cultural Heritage

The sites, structures and features considered as part of the cultural heritage baseline include: water related features (sites or features of which the water and water body is an essential part of the site, for example, water mills or canals) and non-water related features (sites or features in close proximity to existing water bodies, where although water is not part of the site, they could be adversely affected by alteration or changes in the existing water body). Coastal and marine heritage is also considered.

5.3.5.1 Introduction

The period when hunter/fishers dominated Europe is known as the Mesolithic. The first colonists came essentially in search of flint and then only later began penetrating the interior of the province, sailing up the Bann and Lagan in their coracles. During the Mesolithic people usually moved about following the seasonal migrations of animals like the red deer or attempting to catch fish, such as salmon, in their annual runs upriver. Numerous Mesolithic sites are located along the lower River Bann and both the western and northern Shores of Lough Neagh. One of the most famous Early Mesolithic sites is Mount Sandel, near Coleraine.

The second major colonisation of Ireland began with the arrival of new people that changed the face of the landscape through farming. One of the earliest Neolithic farmsteads on the island is a site at Ballynagilly, Co. Tyrone. By far the most common and spectacular monuments of the Neolithic period are its tombs. In addition to tombs, there are other stone monuments, which are believed to have been erected towards the end of the Neolithic. The most impressive are the stone circles, with one of the main concentrations of these circles found in the NBIRBD.

5.3.5.2 Record of Monuments and Places and Sites and Monuments Record

The Record of Monuments and Places *(*RMP*)* and the Sites and Monuments Record (SMR) are statutory lists of all known archaeological monuments in Ireland and Northern Ireland, respectively. Within the Neagh Bann District, 122 sites and monuments are listed on the RMP and SMR, both water and non-water related, within 10m of rivers or the coast (see **Figure 5.8**). These sites consist of a range of coastal fortifications, mills, canals, historic weirs, islands and island sites as well as enclosures, ring forts, castles, megalithic tombs and ritual sites.

5.3.5.3 Engineering Heritage

Within Northern Ireland there are 554 sites on the industrial heritage register within 10m of rivers in the NBIRBD. A major proportion of these industrial sites are bridges (381), while the remainder are sites

such as flax mills, distilleries, Great Northern Railway (GNR) buildings and gasworks. Engineering heritage data for the Ireland side of the IRBD includes bridges, fords and other features.

5.3.5.4 Marine Heritage

In general the majority of marine archaeological features occur beyond the RBMP limits for transitional and coastal water bodies (one mile). The Underwater Heritage database is currently being compiled for Ireland. A Northern Irish database is available and there are a number of wrecks and historical features marked on the Hydrographical charts for the region; however, these are primarily marked for navigational rather than cultural heritage importance. This database includes 287 wrecks within the NBIRBD region, most of which are within/near the Lower Bann by Coleraine, and in the Carlingford Lough area. Much of Ireland's inshore cultural marine heritage is unrecorded. There are estimated to be thousands of wrecks in Ireland's inshore waters. Most of these are currently unknown and difficult to detect, especially those of wooden construction, though most of these wrecks and structures are thought to be associated with historic ports and harbours and their approaches.

5.3.5.5 Sites and properties

In addition to the monument registers, there are a number of properties managed by cultural heritage groups within the NBIRBD area, which contain water related elements. In the Northern Ireland portion of the District, there are 97 listed buildings and 59 protected gardens within 10m of a river including sites such as Gilford Castle in Banbridge, Parkanaur in Dungannon and Gosford Castle in Armagh. In County Louth there are 36 historical surveyed buildings within 10m of rivers, while in County Meath there are 7 of such buildings. The historical buildings of Monaghan and Cavan have not been surveyed at this time.

5.3.5.6 Existing Environmental Pressures / Problems: Cultural Heritage

Development resulting from economic growth and increasing population is placing pressure on sites or features of architectural, archaeological or cultural heritage interest. Individually these developments, including development of water-related infrastructure, puts direct pressure of architectural heritage, where it is in proximity, or increases the potential to interact with known or previously unknown archaeological sites and features. This is particularly important, as water environments are often an important source of previously unknown archaeological material, as they can preserve organic matters often missing from dry-land sites. For example, the rivers of the NBIRBD, including the Lower Bann, are potentially rich in previously unknown archaeological features, as both settlement and ritual activity (in the form of the deposition of artefacts) are often associated with these. Cumulatively, this results in impacts on the overall cultural heritage resource.

5.3.6 Landscape

5.3.6.1 Introduction

The Neagh Bann IRBD takes in all of County Armagh, large parts of Antrim, Louth, Monaghan and Londonderry/ Derry, significant areas of Down, Meath and Tyrone and small areas of Cavan and Fermanagh. The district covers a range of landscapes which includes the Sperrin Mountains to the North West the Antrim Plateau to the north-east and the Mourne Mountains and uplands of Monaghan and Meath to the south, the broad, very fertile Bann valley in the north, small drumlin hills from the last ice age in the south and also some internationally important wetlands.

5.3.6.2 Protected Landscape Areas - Ireland

In terms of landscape and visual amenity, local authorities in Ireland conserve and protect scenic value as Areas of High Amenity, Areas of Outstanding Natural Beauty and Protected Views. Each local authority is responsible for the designation of these within their individual jurisdictions, with each Development Plan providing objectives to protect such views. Specific landscape features within the counties are often not listed within these plans, as such it is difficult to provide a list of these within this baseline. Therefore, a summary description of the landscape character of each of the counties in the IRBD is provided in the appendix to this chapter, along with specific examples where available. A summary of the designated landscape features within the study area is also included in the appendix.

5.3.6.3 Protected Landscape Areas – Northern Ireland

The Northern Ireland Environment Agency records nine Areas of Outstanding Natural Beauty (AONBs) in Northern Ireland, five of which are partly or wholly within the NBIRBD. AONBs represent landscapes of distinctive character and special scenic value, which have been designated to protect and enhance the qualities of each area and to promote their enjoyment by the public.

The AONBs within the NBIRBD are the Sperrin AONB, Bineveagh AONB, Mourne AONB, Antrim Coast & Glens AONB and Ring of Gullion AONB. The Sperrin AONB is a largely mountainous area stretching from the Strule Valley in the west to the perimeter of the Lough Neagh lowlands in the east and contains considerable areas of moorland penetrated by narrow glens and deep valleys. Binevenagh AONB covers the area between the Roe Estuary and Magilligan, the cliffs of Binevenagh, the Bann Estuary and Portstewart sand dunes. The Mourne AONB includes twelve peaks and the highest Mountain in Northern Ireland, Slieve Donard (850m). Beneath the cluster of peaks, cliffs and rock pinnacles, the mountain slopes descend through moorland, woodland, field and farms before meeting the County Down coast. The Antrim Glens and Coast runs from Ballycastle to Larne and is dominated by a high undulating plateau cut by deep glens which opens north and eastwards to the

sea. The Ring of Gullion AONB is a unique geological landform of a ring dyke, with a special cultural heritage as has been inhabited for over 6,000 years.

5.3.6.4 Existing Environmental Pressures / Problems: Landscape and Visual

Existing pressures on landscape and visual resources as a result of water management activities are limited and are primarily related to impacts to sensitive views and landscapes resulting from the siting of development, including water related infrastructure, without sensitivity to these resources.

5.3.7 Material Assets

5.3.7.1 Introduction

The following is a summary of the baseline environment within the NBIRBD in relation to Material Assets. The summary below includes both water-related material assets, such as wastewater treatment works, coastal defences, harbours and ports, as well as non-water related material assets, such as roads and rail. The purpose of including water and non-water related material assets is to characterise those facilities whose operations may be affected either by measures included in the Plan or who need measures implemented to alleviate impacts occurring in the absence of the Plan.

5.3.7.2 Water Related Material Assets

Water Supply

There are 12 impoundments in the Northern Ireland portion of the NBIRBD, all of which provide public water supplies. In the Ireland portion of the NBIRBD there are 14 impoundments. Within the Neagh Bann District the majority of impoundments are located in the south west of the region. The locations of these impoundments are shown on **Figure 5.9**.

Abstractions within the NBIRBD are taken from a mix of groundwater, lake and river sources and are used for both public and private water supplies. Within the Northern Ireland side of the district there are 92 registered abstractions, while in the Ireland side there are 54 registered abstractions. The locations of the main abstraction points within the NBIRBD are shown on **Figure 5.9**.

There are also 19 active water treatment works within the Northern Ireland portion of the NBIRBD. Within the Ireland side of the IRBD there are 17 water treatment works.

Wastewater Treatment Facilities

There are 346 active wastewater treatment facilities within the NBIRBD, 332 of which are in Northern Ireland and 14 in Ireland. The majority of these discharge to rivers; however, a few discharge to lakes, transitional and coastal waters. There are also 222 active registered septic tanks in the Northern Ireland side of the District, no similar information is available for Ireland. The locations of the wastewater treatment facilities within the NBIRBD are shown on **Figure 5.9**.

Coastal Defences

Coastal defences with the NBIRBD consist of seven areas of seawalls and rock armour. In total there are only about 3km of defences in the Neagh Bann district, as this RBD has a relatively small coastline.

Flood Defences

There are approximately 320km of flood defences managed by the Department of Agriculture and Rural Development (DARD) Rivers Agency within the Northern Ireland portion of the NBIRBD. A large proportion of this infrastructure is on the Upper Bann, the Newry River and the Moyola River. No such equivalent data could be sourced for the Ireland portion of the NBIRBD.

Dams, Weirs and Hydroelectric Power

There are 40 dams, 72 fords, 221 weirs and 54 sluices within the Northern Ireland side of the RBD. These watercourse modifications serve a variety of uses, for instance for level controls on Lough Neagh.

Navigable Waters and Canals

Navigable marine and estuarine waters within the NBIRBD include the Lower Bann and Lough Neagh Navigation, and parts of the Newry Canal, Ulster Canal and Lagan Navigation. The Lower Bann and Lough Neagh system stretches from Coleraine in the north to Blackwatertown in the south, with 90km of navigable rivers and 390km^2 of navigation in Lough Neagh. The Ulster Canal was opened in 1841 to join Lough Neagh with the Erne system; however, the canal fell into disrepair within 20 years. Agencies on both sides of the border are investigating the potential of re-establishing the canal. The Newry Canal and the Lagan Navigation are also currently closed to full navigation, since 1974 and 1958 respectively. However, the feasibility of their full re-establishment has been brought up by several groups.

Fisheries and Shellfish Waters

In the NBIRBD there are 22 inland aquaculture sites, which are mostly located north of Lough Neagh. There are 77 commercial aquaculture operations within the district, which are mainly oyster and mussel farms. These shellfish industries are almost all within Carlingford Lough. Donegal Bay is also home to commercial fisheries and aquaculture operations. **Figure 5.10** shows the location of aquaculture and commercial fisheries within the NBIRBD.

Harbours and Ports

Due to the relatively small coastline of the Neagh Bann IRBD there are generally less marine morphological features than in other districts. The main concentration of infrastructure is in the southeast of the District, with the commercial ports of Greenore and Warrenpoint in Carlingford Lough and Dundalk Harbour at Dundalk Bay. Clogherhead fishing port is also present in the south east of the IRBD.

Recreational Use of Waters

There are seven protected bathing waters within the NBIRBD, being at Portstewart and Castlerock in the north of the district and Cranfield, Shelling Hill, Lurganboy, Clogherhead and Seapoint in the south. Warrenpoint, Portstewart Strand and Cranfield in the Northern Ireland portion of the NBIRBD are listed as blue flag beaches. The Neagh Bann IRBD is rich with recreational water activities, with Lough Neagh and Carlingford Lough popular areas for sailing, fishing and numerous water sports.

5.3.7.3 Non-Water Related Material Assets

Roads and Rail Infrastructure

There are an estimated 10,800km of road in the NBIRBD. Of these 1% are classed as Motorway, 7% as either National Primary or Primary Routes, 4% are classed as National Secondary Routes or A Roads and 17% as classed as Regional or B Roads. The remaining road infrastructure within the NBIRBD is comprised of minor roads and unclassified urban roads. In addition, there are approximately 380km of existing rail infrastructure in the district, of which some 230km are still in active use.

Landfills, Mines and Quarries

There are two landfills located within the Ireland portion of the NBIRBD; Whiteriver Landfill near Drogheda and Scotch Corner Landfill between Castleblayney and Monaghan Town. Both these

landfills are relatively modern, lined, waste disposal facilities. As of 2005 there were 75 licensed landfills in Northern Ireland as a whole; 12 of which are located in the NBIRBD and subject to sampling by the NIEA Water Management Unit.

There are also a number of mines and quarries within the NBIRBD. The potential for mineral and sand and gravel resources in the NBIRBD is discussed in **Section 5.3.8, Soil, Geology and Land Use**.

5.3.7.4 Existing Environmental Pressures / Problems: Material Assets

Increased development including residential and industrial expansion continues to put pressure on existing water sources with regards to quantity as well as on the treatment facilities used to treat both drinking water and wastewater. In addition, existing water quality issues are resulting in pressures on economic shellfish and aquaculture activities along with fisheries used for recreational purposes. Some of the physical modifications identified as material assets, such as dams and weirs, may also be resulting in pressures on fisheries used for recreational and commercial purposes.

5.3.8 Soil, Geology and Land Use

5.3.8.1 Soils

The most predominant soil types in the Neagh Bann District are Gleys and Acid Brown Earth, with smaller areas of Brown Earths, Grey Brown Podzols and Peats. The poorly and imperfectly drained Gley soils in the district are mainly in the north east and the south west of the district, while the well drained Acid Brown Earths are mostly in the south east of the RBD. Smaller areas of poorly drained, persistently wet Blanket Peat exist in the north east of the district, with poorly drained Basin Peat being present in some areas around Lough Neagh. Areas of well-drained Brown Earths and moderately drained Grey Brown Podzols are also present throughout the RBD.

Soil Suitability

Soil suitability classification essentially consists of outlining the range of uses to which a given soil is adaptable, including determining the production potential of each soil for the normal range of farm or forest crops. This classification provides the essential link between the physical and economic aspects of the use of soils. An evaluation of soils was carried out as part of the National Soil Survey of Ireland (now known as Teagasc) for a number of counties in Ireland over a period of many years. The survey carried out in County Meath found thirty seven per cent (85,716 ha) of the soils to be Class A suitability, meaning it is well adapted to new techniques and is mainly suitable for cultivated crops,

pasture or forestry (Teagasc, 1983). Forty one per cent (96,285 ha) of the soils are Class B suitability, having more limited use-range than those in Class A and being generally of only moderate suitability for cultivated crops, pasture and forestry. The remaining soils in the county fall into Class C, D, E and variable. This type of characterisation was not carried out for any of the other counties within the District.

Agricultural land classification is held by the Agri-Food and Biosciences Institute (AFBI) in Northern Ireland. The highest agricultural land class (Class 1) does not occur in Northern Ireland and Classes 2-3A (31% of the total) represent the best and most versatile agricultural soils. However, more specific data than that currently presented in the State of the Environment Report (2008) is not publicly available.

Nitrate Vulnerable Zones

In 2004, Northern Ireland adopted a 'total territory' approach to protection of waters under the Nitrates Directive. The Nitrates Action Programme Regulations (Northern Ireland) 2006 and the Phosphorus (Use in Agriculture) Regulations (Northern Ireland) 2006 bring into operations measures to improve the use of these nutrients on farms. Within Ireland, a Nitrates Action Programme has been prepared in accordance with Article 5 of the Nitrates Directive and is to be applied to the state as a whole.

Soil Contamination

In Northern Ireland, the Department of the Environment has proposed the implementation of a contaminated land regime contained in Part III of the Waste and Contaminated Land (NI) Order 1997 to cover the determination and remediation of contaminated land. The regulations, and guidance for their implementation (when published), will bring into force a framework for the identified and remediation of land where contamination causes unacceptable risks. Some 12,000 sites in Northern Ireland have so far been identified as being used for some purpose, which could potentially have caused contamination. The redevelopment of such land must be carefully managed to ensure that the contamination does not pose a threat to human health and the environment.

In April 2007, the EPA published a Code of Practice that provides a framework for the identification of contaminated sites, the assessment of the potential risks associated with them and the identification of the appropriate remedial measures or corrective actions required to minimise risk to the environment and human health. Following the publication of the Code, the EPA trained local authority staff on its use and application. Local authorities are now implementing the Code and the EPA is overseeing its implementation; however, a list of contaminated sites within the District is not centrally compiled.

Slope Stability and Landslide Potential

Ireland is fortunate not to be a high-risk area for landslides, though landslides do occur, however infrequently, with the most occurrences in coastal, upland and peat bog areas. Though the potential for major destructive landslides is slight, there have been instances of severe events in Ireland in the past.

The GSI Irish Landslides Working Group (ILWG) is currently in the process of compiling a landslide database in order to assess the scale of the landslide problem historically and also to assess the susceptibility of areas to landslide hazard in the future. This has direct relevance to the sustainable development of the landscape in terms of housing, infrastructure etc. and is therefore an important issue for the planning process. This national landslide susceptibility database is not currently complete, though information on specific areas is available.

The incidence of landslides is more common in the UK. The British Geological Survey (BGS) has an extensive national database on landslide hazard. Some studies have been carried out in Northern Ireland but no comprehensive database has been set up. It is planned to extend the landslides database to include known events in Northern Ireland with further research into the methodology, implications and practicality of landslide risk assessment and landslide susceptibility mapping to be considered.

5.3.8.2 Geology

Palaeogene basalts underlie the majority of the northern and central area of the IRBD. Significant areas of Palaeogene clays and silts surround southern Lough Neagh with Ordovician / Silurian greywackes and mudstones, intruded by younger granites, occurring further south. In the west of the district a variety of Devonian and Carboniferous mudstones; limestone's and sandstones occur along with areas of Permo-triassic sandstones. There is extensive coverage of superficial deposits consisting of mainly till but also sand and gravels. With relatively high rainfall, upland areas suitable for the collection and storage of water and the presence of Lough Neagh, not surprisingly, surface water is the dominant source of water supply in the NBIRBD. Nevertheless, groundwater is still an important source of water for public drinking water and for industrial, agricultural and domestic supply. For the most part the NBIRBD is underlain by poorly productive aquifers, however modest, and occasionally more significant supplies, can be obtained from the Tertiary basalts and the Devonian sandstone and limestone sequences, and the numerous Quaternary sand and gravel deposits, located mainly within the river valleys, such as those in the River Main valley around Clogh Mills.

The relief over the extent of the NBIRBD is wide ranging. The lowlands in the immediate hinterland of Lough Neagh are at an elevation of less than 20m Above Ordnance Datum (AOD) whilst the upland areas and in particular the Mourne Mountains extend to an elevation of over 600m AOD.

Groundwater Vulnerability and Protection Zones

The vulnerability of groundwater to pollution can be related back to both soil permeability and depth, i.e. the thicker and less permeable the overlying subsoil layer the lower the risk of pollution. Groundwater vulnerability zones have been mapped in Ireland by the Geological Survey of Ireland and in Northern Ireland by the Geological Survey of Northern Ireland, as shown on **Figure 5.11**. Groundwater vulnerability ranges across the District with the majority of the central area, around Lough Neagh being of lower vulnerability, with this lower vulnerability groundwater accounting for over 50% of the Northern Ireland area of the RBD. In the Ireland area of the RBD the majority of the groundwater is not fully surveyed, and is thus classed as high to low vulnerability; however there is also a relatively large area of extreme vulnerability in the south east of the district.

Source protection zones have been established across the island. These are zones around groundwater sources such as wells, boreholes and springs used for public drinking water supply, which show the risk of contamination from any activities that might cause pollution in the area, i.e., the closer the activity, the greater the risk. Eighteen source protection zones are currently mapped within the Ireland side of the NBRBD. It should also be noted that the entire island of Ireland has been designated as a Protected Area for Groundwater under the WFD.

Mineral Potential

The island can be divided into a number of mineral provinces that are endowed with a diverse suite of base and precious metals, as well as industrial minerals. The majority of the NBIRBD is contained within the Longford-Down Massif and the North-Western Basement mineral provinces of the island.

The North-Western Basement province contains some of Ireland's oldest rocks, with Proterozoic gneisses overlain by metamorphosed sandstones, limestone’s and volcanics rocks. These are intruded by Palaeozoic granites. Demonstrated potential for base metals is shown by widespread 18th and 19th century workings, with many small mines and "trials" to be found. Quartz veins and shear zones are prime gold targets (e.g. Curraghinalt and Cavanacaw, both in Northern Ireland) and gold is also associated with massive sulphides (e.g. Glentogher, Co Donegal). Molybdenum-copper mineralisation is associated with the Palaeozoic granites. Diamond and other gemstone targets have been identified in the far north of the province, in the Inishowen Peninsula. A number of types of dimension and ornamental stone have also been exploited from this province.

Three principal groups of metallic mineral deposits occur in the Lower Palaeozoic rocks of the Longford-Down Massif. Firstly, there are vein deposits, mainly containing lead and zinc, but also including antimony and gold (e.g. Clontibret, Co Monaghan). A number of these vein deposits have been exploited historically. Secondly, stratiform (bedded) iron-manganese deposits. Several of these deposits were worked during the late-19th century. Finally, there is minor copper-molybdenum mineralization associated with granites. **Figure 5.12** illustrates the known mineral deposits located within the NBIRBD.

Within the Ireland side of the NBIRBD there are 245 known mineral locations and 17 active extraction facilities (eight pits and nine quarries). In the Northern Ireland side of the NBIRBD there are 85 identified quarries, which are mainly for basalts and igneous rocks, clay and shale, and sand and gravel.

Sand and Gravel Potential

Unlike most other forms of development, minerals can only be worked where they are found. This means that the spatial distribution of mineral resources and thus the potential for workings is dictated by geological considerations and not by the demands of human geography. The GSI Minerals Section has begun a programme of mapping of Aggregate Potential on a county-by-county basis. However, this level of information is not yet available.

5.3.8.3 Land Use

The land use around the Lough Neagh basin is typified by improved pasture but also includes some internationally important wetland habitats. North of Lough Neagh, the Lower Bann River valley is very fertile and supports highly productive farmland. To the south of Lough Neagh the landscape is dominated by drumlins that stretch across the south of Northern Ireland and into Counties Monaghan and Louth.

The primary land cover within the NBIRBD is agriculture, covering over 80% of the district. Pasture land is the most common agricultural land use making up approximately 78% of the agricultural land. The second highest land use in the district is forest and semi natural areas, covering approximately 7% of the NBIRBD. The majority of this forest and semi natural areas is scrub and herbaceous vegetation (69%), however of the forested areas coniferous forests are most prevalent (71%). Wetlands cover some 5.15% of the NBIRBD, the majority of which (81%) is peat bog. Artificial surfaces form 2.37% of all surface areas within the NBIRBD, of which urban fabric forms the greatest percentage (73%). **Figure 5.13** shows the distribution of land uses in the NBIRBD.

As discussed in **Section 5.3.2, Population,** the main population areas in the NBIRBD are Coleraine, Ballymena, Craigavon, Armagh, Newry, Monaghan, Cavan, Dundalk and Ardee.

5.3.8.4 Existing Environmental Pressures / Problems: Soil and Land Use

Predictions have been made about the impact of global warming on Ireland, with these predictions indicating a change to wetter winters and drier summers (Sweeney, 1997). In addition there may be an increase in frequency of high intensity rainfall events. Such precipitation changes could have serious implications for slope stability and landslides and their resultant impacts on water management activities.

Eroded soil washed into rivers during heavy rainfall contains an increased nutrient content, which can damage the balance of nutrient poor, aquatic ecosystems by shifting their species composition, supporting more nutrient-loving species. This can lead to the eutrophication of rivers and lakes. If contaminated soils are eroded and transported to the sea, aquatic plants and animals can be severely damaged.

As discussed previously, extraction activities, when mismanaged, are resulting in pressures on water quality. In particular, peat cutting can be damaging to vegetation, hydrology and landscape. Localised cutting has little long-term impact, but commercial extraction removes an irreplaceable resource. Alternately, the extractability of mineral, sand and gravel resources is also being curtailed and/or reduced by the encroachment of residential development into rural areas and the conflicts between people and the impacts associated with these activities, e.g. noise, traffic. The additional restrictions associated with water management activities is a cumulative pressure on these resources.

5.3.9 Inter-relationships

The interrelationship between the SEA environmental topics is an important consideration for environmental assessment. **Table 5.13** highlights the key interrelationships identified in this SEA, with √ indicating a potential inter-relationship (either positive or negative) and X indicating limited or no inter-relationship. These potential interrelationships will be taken into account in the assessment of the different alternatives.

Of particular note is the primary interrelationship between water (quality and quantity) and biodiversity, flora and fauna, soils, human health and population. Flora and fauna rely directly on the aquatic environment as a habitat but the terrestrial environment can also be strongly impacted by the aquatic environment. Habitats, such as callows and turloughs, rely on the aquatic environment for their formation and terrestrial fauna and birds can rely on it as a source of food. Water quality is also of particular importance with regard to human health as it provides a source of drinking water and it

yields foodstuffs (e.g. fish and shellfish). Water is also used for leisure and recreational purposes, providing a material asset both for local populations and as part of the tourism economy.

Another key interrelationship is between water and climate. Greenhouse gas emissions associated with energy use during water management activities, such as treatment of drinking water and wastewater, have the potential to negatively impact on climate through increased contribution to climate change. This in turn can result in more frequent and more intense flooding and drought conditions affecting material assets and human health as well as biodiversity.

In carrying out the assessment these important direct and indirect relationships have been taken into account fully to ensure a robust and complete assessment.

Table 5.13 Potential Inter-Relationships Between SEA Topics

	Biodiversity Flora, Fauna	Population / Human Health	Soil	Water	Air	Climatic Factors	Material Assets	Cultural Heritage
Population / Human Health	√							
Soil	√	√						
Water	√	√	√					
Air	√	√	√	√				
Climatic Factors	√	√	√	√	√			
Material Assets	√	√	√	√	X	√		
Cultural Heritage	X	√	√	√	√	√	√	
Landscape	X	√	√	√	X	√	√	√

5.4 EVOLUTION OF THE ENVIRONMENT IN THE ABSENCE OF THE PLAN

The NBIRBD Plan incorporates the requirements of existing directives, daughter directives and measures to reduce pollution. It provides for the coordination of these controls to reduce impacts to the water environment across Ireland and Northern Ireland and examines how human activities are impacting the water environment in a holistic fashion. In the absence of the Plan, water resources in the District would continue to be managed in an uncoordinated manner. In particular cross border issues would remain unaddressed, causing cumulative and synergistic impacts on water and giving rise to transboundary issues in both jurisdictions.

According to a recent EPA report (2008) trends in water quality in Ireland show an overall improvement; however, the rate of this improvement in surface waters is not sufficient to meet the

requirement of having good status in all waters by 2015 as required by the Water Framework Directive. In the absence of the Plan, the pressures identified in the 2007 *Water Matters – Have Your Say* report would continue to impact on water quality and quantity, perpetuating the indirect impacts associated with these on biodiversity, flora and fauna, population and human health, as discussed in the previous sections. For instance, the proposed strategies to target waters listed on the Register of Protected Areas under the WFD, e.g. plans to protect water dependent habitats and species, such as salmonids and shellfish, would lack the impetus provided by the RBMP/ POM.

In the absence of the Plan, development may continue to take place in a dispersed manner with increasing numbers of one-off houses and associated septic tanks being developed, which may continue to contribute to reductions in surface and/or groundwater quality. Also, those urban areas currently experiencing unsustainable development pressure would continue to grow, though some control would be provided by existing controls in plans such as the National Spatial Strategy and the National Development Plan in Ireland and Planning Policy Statements 1 to 18 and the Regional Development Strategy in Northern Ireland.. This growth would place further pressure on water and wastewater services in those areas, leading to adverse impacts on human health and population from poor water quality, in the form of possible cryptosporidium outbreaks, *e-coli* contamination and deterioration of bathing water quality.

The trend in air quality in Ireland is a year on year improvement in air quality with a reduction in the main pollutant concentrations (with the exception of ozone). The absence of the Plan is not expected to affect this trend.

As a result of manmade greenhouse gas emissions, climate change is predicted to occur in the future regardless of action. The UN Intergovernmental Panel on Climate Change (IPCC) in their *Climate Change 2007: Climate Change Impacts, Adaptation and Vulnerability Report* predict sea level rise, changes in rainfall patterns and temperatures as well as changes in the frequency of droughts and extreme weather events. The potential impacts from sea level increases, increased flooding, summer droughts, etc., will impact on water management.

According to the EPA report *Implications of the EU Climate Protection Target for Ireland*, water supply and quality are highly sensitive to climate variability and change. Future changes in climate are likely to have major impacts on water resources in Ireland. Recent research by Murphy and Charlton (2006) outlines spatial changes in run-off for Ireland in future downscaled scenarios. The results highlight the importance of individual catchment characteristics in controlling response to climate change. Reductions in groundwater storage and recharge will increase the risk of drought in some areas. The likelihood and magnitude of flood events are also likely to increase, which has important implications for infrastructure and development on affected flood plains. Also, there will be impacts upon the reliability of existing flood defences, and, in the future, increased insurance costs. Water quality is

another area for concern as in certain areas it may be impacted by the contamination of coastal aquifers from saline intrusion.

Therefore, evolution of the climatic environment in the absence of the Plan is likely to be heavier winter rainstorms causing more flash flooding, resulting in an increase in diffuse pollution loads from soil run-off and increasing demand for flood controls. These types of flood events (though not directly addressed by the Plan) would continue to pose a risk to soils as a result of erosion and release of contaminants, thus potentially leading to further water quality problems.

Summer droughts are also likely and recent reports have indicated that the effects of climate change in Ireland will have serious consequences for water resources, resulting in a potential 40% reduction in drinking water supplies. Also, temperature changes may give invasive alien species a competitive advantage.

The report *Preparing for Climate Change in Northern Ireland*, published by Department of the Environment and the Scotland and Northern Ireland Forum for Environmental Research (2007) reviewed the potential impact of climate change in Northern Ireland and made recommendations for adaptation. In the areas of water resources and conservation, biodiversity and habitats the potential adaptation strategies identified included:

- Review of legislation to assess whether it will provide sufficient protection for priority/designated habitats in a changing climate and to identify whether revisions may be required.
- Review of monitoring to assess whether existing systems are sufficiently sensitive to the effects of a changing climate and identify where new systems may be required.
- Education and awareness: particularly focussed on the human impact on species and habitats and the scale of the likely impacts of a changing climate.
- More detailed modelling of impacts on NI water resources, addressing long-term impacts on supplies, environment and water quality.
- Further development of adaptive actions already identified, many of which include wider environmental benefits. Some adaptation may be realised through compliance with the Water Framework and Nitrates Directives.
- Ensure risks and adaptation are adequately represented within long term planning for water resources. Adaption costs can be minimised by maintaining and improving current infrastructure.
- Changes to the planning processes and regulatory framework for the water sector in NI will provide opportunities for the development of adaptive planning.

In the absence of the Plan some cultural heritage features would continue to be at risk from water pollution. In addition, the uncoordinated approach to provision of water management infrastructure to meet demands could result in unnecessary impacts on existing cultural heritage resource and designated landscapes. However, planned changes to the morphology of certain water bodies as part of the Plan would not occur, potentially avoiding interference with water dependent features, such as mills and weirs.

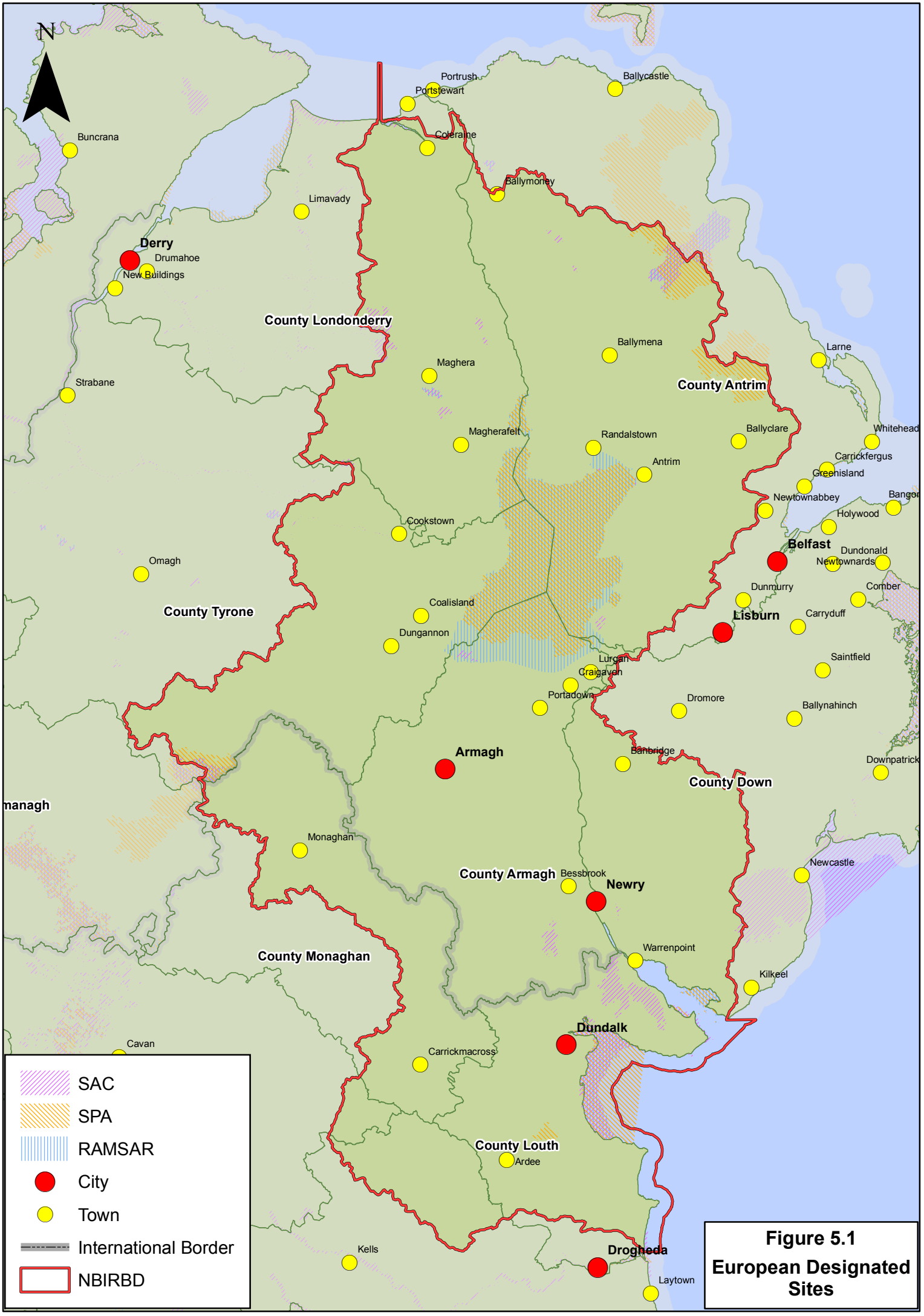

Figure 5.1

European Designated Sites

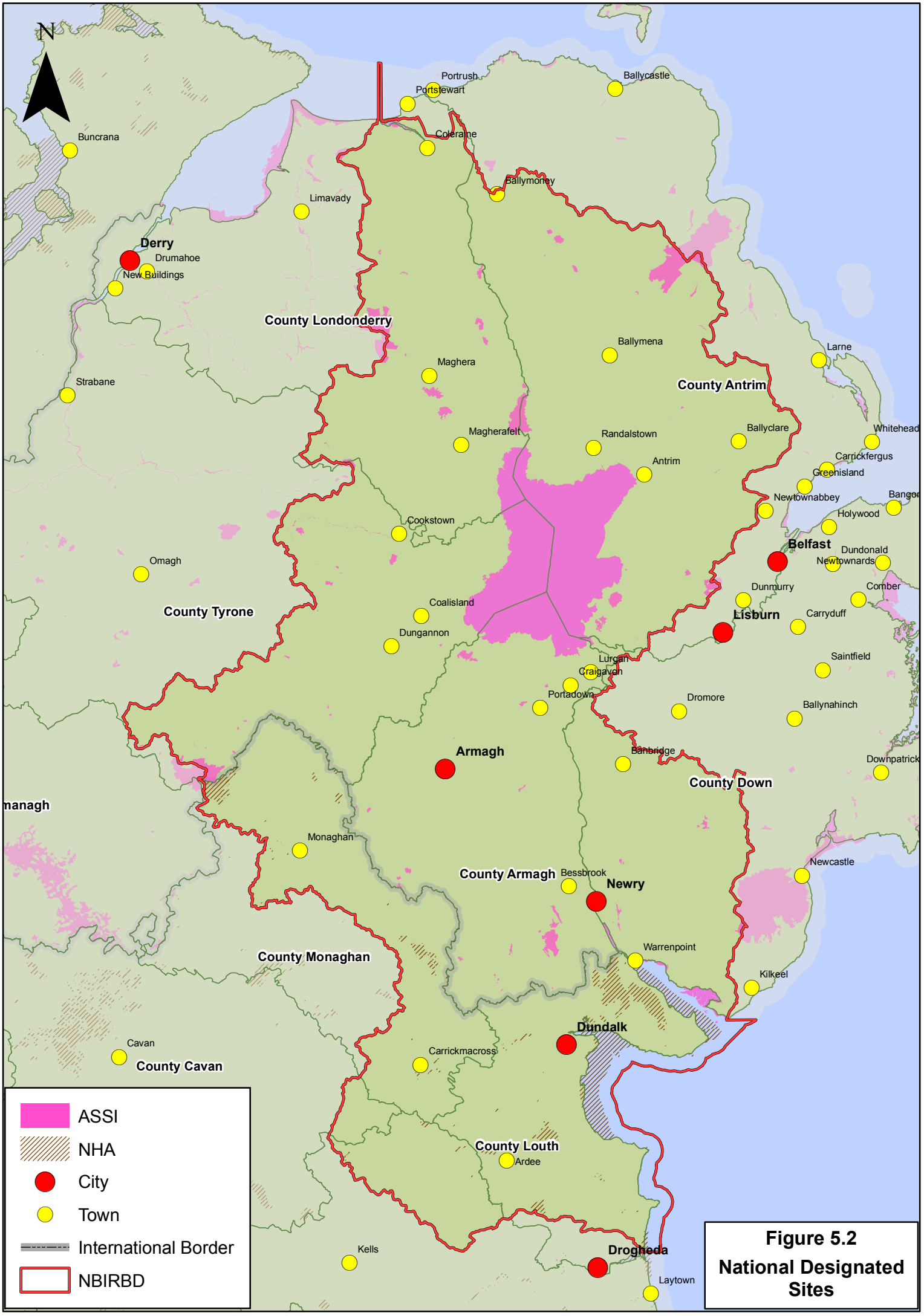

Figure 5.2

National Designated Sites

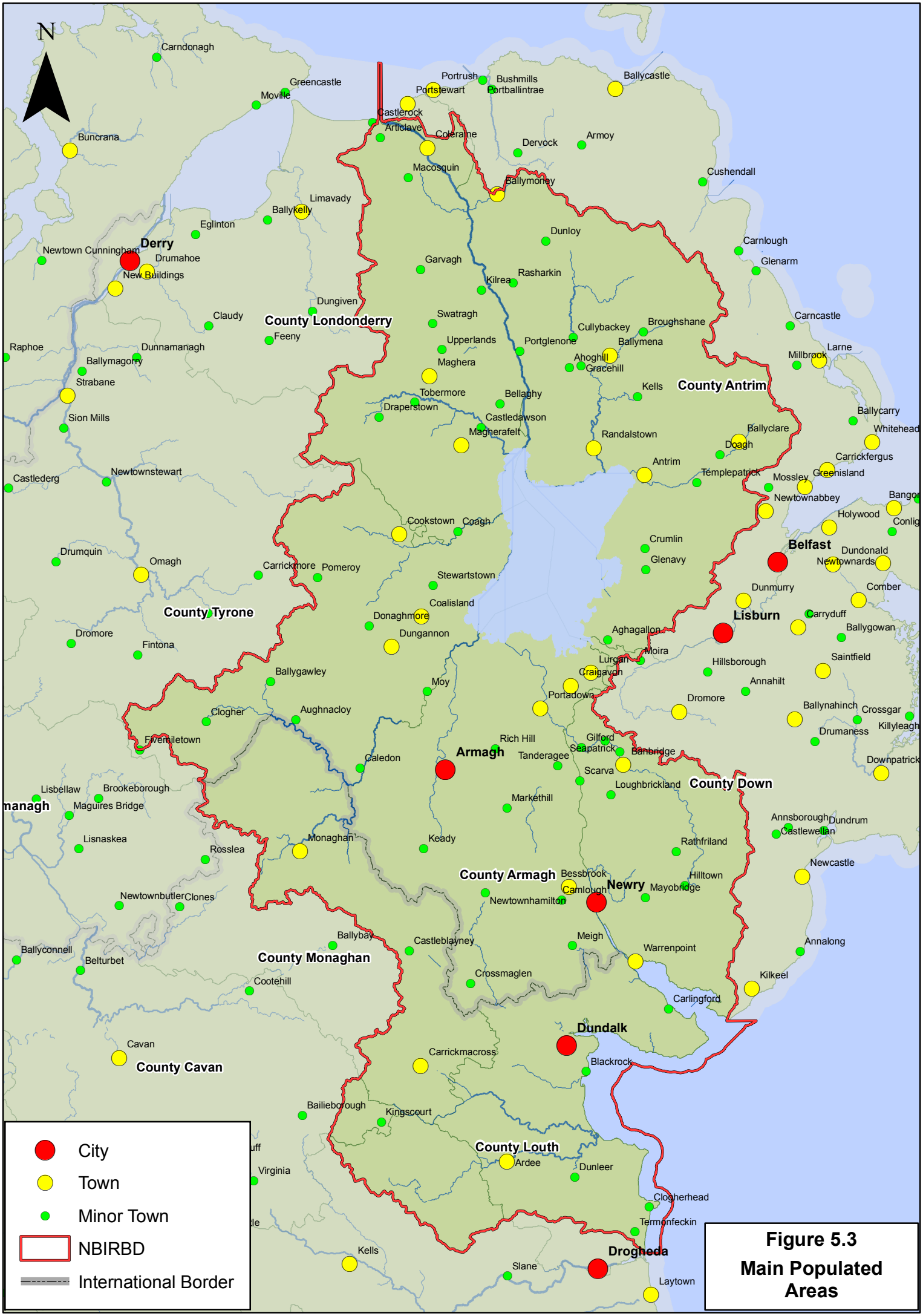

Figure 5.3

Main Populated Areas