5 BASELINE ENVIRONMENT

5.1 INTRODUCTION

This section examines the relevant aspects of the current state of the environment within the North Eastern RBD 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 North Eastern RBD, the baseline data is focused at the RBD level. 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

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

5.3.1 Flora, Fauna and Biodiversity

5.3.1.1 Designated Sites

Northern Ireland has designated sites and species of conservation value and/or concern in an effort to protect its biodiversity resource. Designated conservation areas are areas containing habitats or species of national or international conservation importance. There are four types of designation considered here for the NERBD: Special Areas of Conservation; Special Protection Areas; Ramsar sites; and Areas of Special Scientific Interest. 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. According to the State of the Environment Report there are 52 sites designated as SACs, 12 sites designated as SPAs and 19 sites designated as Ramsars in Northern Ireland as a whole, with some of these designations applying to the same sites.

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, of which there are 224 in Northern Ireland as a whole. **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	14
Special Protection Areas	9
Ramsar	8
Areas of Special Scientific Interest	74

* *includes proposed / candidate 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 water dependent habitats or species including Special Areas of Conservation and Special Protection Areas. In the NERBD there are 60 reaches and 3 lakes designated as salmonid water bodies under the EU Freshwater Fish Directive (2006/44/EC). There are also 13 water dependent SACs and nine water dependent SPAs designated within the NERBD. Only the SACs that contain water dependent species and habitats have been included within the Register.

5.3.1.3 Shellfish Growing Areas

The following five protected shellfish growing areas are found in the NERBD as delineated by the Food Standards Agency (Northern Ireland):

- Dundrum Bay;
- Marlfield Bay;
- Skate Rock;
- Larne Lough; and
- Paddys Point & Reagh Bay.

5.3.1.4 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 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. In Northern Ireland there are currently 272 plant and animal species (identified as Priority Species) and 40 Priority Habitats that require conservation action. There are also 457 species on the Northern Ireland Species of Conservation Concern (SOCC) list.

The Significant Water Management Issues (SWMI) document for the NERBD 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.

Invasive non-native plant and animal species are one of the greatest threats to biodiversity in Northern Ireland. Invasive alien species negatively impact 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 problem alien species present in the North Eastern RBD are Australian Swamp Stonecrop (*Crassula helmsii*), Common Cord Grass (*Spartina anglica*), Japanese Seaweed (*Sargassum muticum*), Water Fern (*Azolla filiculoides*), Parrot's Feather (*Myriophyllum aquaticum*) and Floating Pennywort. Australian Swamp Stonecrop forms dense carpets, shading out other flora, depleting oxygen resources and competing with native aquatic plants. Japanese Seaweed out-competes local species, such as seagrasses and kelp, for space and light, while Common Cord Grass replaces native mudflat vegetation with a less diverse sward, reducing feeding resources for birds and altering the coastal landscape. Water Fern and Floating Pennywort form thick layers, covering the surface of slow moving water, reducing light levels and causing die off of submerged native plants. Parrot's Feather is a vigorous plant that can choke ponds and waterways, blocking channels and drainage ditches.

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 as it relates to water quality issues. Principally it relates to drinking water and bathing water quality.

The population of Northern Ireland in 2006 was over 1.7 million, and is increasing at ever growing rates. However the population density is still relatively low from a European perspective and the overall population on the island remains below that in the early 19th century.

Over 0.7 million people live in the North Eastern RBD, which includes the most densely populated region of Northern Ireland, the Belfast Metropolitan Area, and its surrounding commuter areas. Lisburn, Newtownabbey, Carrickfergus, Bangor, Newtownards. Larne, Downpatrick and Newcastle are the main urban centres outside of the Belfast area (see **Figure 5.3**). Most of the main urban areas are located beside rivers or on the coast. In rural areas, many people live in small villages or single

dwellings. In addition, to Belfast and Lisburn City there are 23 towns, 30 minor towns and a large number of villages within the NERBD.

5.3.2.2 Population

Table 5.2 shows the population of each Ward within the North Eastern RBD. The greatest increase in population was experienced in the Carrickfergus District (15%) between the intercensal period 1991 to 2001, while Ards District (13.1%), Londonderry/ Derry (10.2%), Down (10%) and Lisburn (9.3%) also experienced significant population increases. The only area to experience a population decrease was Belfast, where the population fell by 6.6%. Most of the study area has a low population density, while higher population densities are present around Belfast, Lisburn and the main towns, in particular Carrickfergus and Larne.

Table 5.2 Census Populations 1991 and 2001 for District Council Areas, part or all of which lie within NERBD

Area	1991	2001*	% Increase 1991 - 2001
Antrim	44,516	48,366	8.6
Ards	64,764	73,244	13.1
Belfast	279, 237	277,391	-6.6
Carrickfergus	32,750	37,659	15
Castlereagh	60,799	66,488	9.4
Londonderry/ Derry	95,371	105,066	10.2
Down	58,008	63,828	10
North Down	71,832	76,323	6.3
Larne	29,419	30,823	4.8
Lisburn	99,458	108,694	9.3
Moyle	14,789	15,933	7.7
Newtownabbey	74,035	79,995	8.1

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

5.3.2.3 Drinking Water Quality

Throughout 2007 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 12 Council Areas within the Northern Ireland portion of the NERBD. These represent some 38 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 one of the zones (Killylane); an authorised departure was granted while water treatment upgrade works were carried out. There were also recurring iron contraventions due to cast-iron water mains at one zone (Limavady). There was further investigation and a survey of water mains in the area carried out, followed by an interim flushing programme with long term action planned to include water main rehabilitation. 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. 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 Northern 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 in 2013 to 10 micrograms per litre. 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 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 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 within the NERBD reduced somewhat between 2006 and 2007, with specific declines at Ballyholme (from excellent - poor) and Newcastle (from good - poor). More detail as to bathing water quality in the District is provided in the appendix to this chapter.

5.3.2.7 Existing Environmental Pressures / Problems: Population and Human Health

The economy on the island of Ireland as a whole has experienced unprecedented economic growth since the early 1990's. Construction and consumer spending have increased and tourism, including recreational fishing and golf holidays, is a major growth industry throughout the island.

The increasing population within the NERBD is resulting in pressure on the systems that deliver and treat water including water supply and wastewater treatment systems. Tourist populations create extra seasonal treatment demand in some areas, such as Portrush, Portaferry and Bangor.

In addition, more people and increased household water usage have required bigger water supply schemes. Demand for more food and industrial goods has led to more intensive or expanded activities with higher water demand and pollution threats. Additional homes means 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.

New individual houses and housing clusters, reliant on septic tanks, threaten water quality. In Northern Ireland more than 110,000 properties (20% of the total) are currently without public sewerage provision, representing around 0.3 million people (a fifth of Northern Ireland's population), and generating around 65 million litres of wastewater a day. This 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.

5.3.3 Water

5.3.3.1 Surface Waters

The principal river systems in the NERBD include the River Bush and River Lagan (**Figure 5.4**). The River Lagan flows into Belfast Lough, the largest sea inlet in the district. The second major sea inlet is Strangford Lough, which the River Quoile flows into. Smaller basins include those draining the Glens of Antrim and the County Down coastline, including the Ards peninsula.

In Northern Ireland the General Quality Assessment (GQA) chemical and biological classification of rivers was previously used to establish river water quality. 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 showed a reduction in the percentage of river length in the highest quality class between 1995 and 2005.

The three main lakes within the RBD are Silent Valley Lake, which is a major public water supply reservoir, Clea Lake and Lough Mourne (**Figure 5.4**).

Marine waters account for just over 1,000 km^2 in the NERBD, with the district containing most of Northern Ireland's coastline. Belfast Lough and Strangford Lough are the largest sea inlets in the district. Coastal waters of the North Channel include the surrounds of Rathlin Island, the Maidens and the Copelands. There are three transitional waterbodies in the NERBD and 16 coastal waterbodies.

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 waterbody. 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 5.3** shows surface water quality status in the NERBD.

Table 5.3 Surface Water Status in the North Eastern District*

Surface Water Category	High	Good	Moderate	Poor	Bad	Unknown
Rivers and Canals (% of total number of bodies)	0.9	12.6	51.4	15.3	5.4	14.4
Lake (% of total area)	0.0	43.4	0.0	26.1	30.5	0.0
Transitional (% of total area)	0.0	0.0	0.0	0.0	0.0	100.0
Coastal (% of total area)	0.0	63.3	36.4	0.0	0.4	0.0

** As of 27/11/08*

In the NERBD the water status was found to be generally poor to good in the river waterbodies and generally bad, poor or good in the lake waterbodies. Coastal waterbodies were found to be mainly good to moderate. No transitional waterbodies were assessed at the time of writing. Based on the current water status results 86% of the rivers, 57% the lake area, 37% of the coastal waterbody area and all the transitional waters in the NERBD 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 NERBD. In the NERBD there

were four groundwater body types identified, based on flow regime of the aquifer, being Poorly Productive Bedrock, Productive fissured bedrock aquifers, Karstic Aquifers and Gravel. The classification resulted in eight groundwater bodies being delineated in the District.

Groundwater status in the NERBD waterbodies is given in **Table 5.4.** In the NERBD the groundwater status was found to be mainly good. Only 6% of the groundwater area failed to meet good chemical status and 20% failed to meet good quantitative status under the WFD. **Figures 5.7 and b** show the groundwater status in the NERBD.

Table 5.4 Groundwater Status in the NERBD*

Groundwater	Good	Failing to Achieve Good Status
Chemical Status (% of total area)	94%	6%
Quantitative Status (% of total area)	80%	20%

*As of 27/11/08

5.3.3.3 Important Water Resources

Register of Protected Areas

All of the areas requiring special protection in the District have been identified, mapped and listed in a register of protected areas. They include areas such as Strangford, Belfast and Larne Loughs.

Article 6 of the WFD requires each Member State to establish a register of protected areas. This register for Northern Ireland was split into six categories. **Table 5.5** summarises the existing protected areas throughout the RBD. Each of these categories is discussed in further detail in other related sections.

Table 5.5 Areas of the NERBD designated under the Register of Protected Areas

Protected Area	River Water Bodies	Lake Water Bodies	Transitional Water Bodies	Coastal Water Bodies	Ground Water Bodies	Total Designated Areas	Related Section in Chap 5
Drinking Waters	16	8	-	-	8	32	5.3.2
Economically Significant Aquatic Species	72	8	-	-	-	80	5.3.7
Recreational and Bathing Waters	-	-	-	12	-	12	5.3.7
Nutrient Sensitive Waters	-	7	-	-	-	7	5.3.8
Protection of Habitats	-	-	-	-	-	-	5.3.1
Water Dependent SACs	-	-	-	-	-	9	5.3.1

Protected Area	River Water Bodies	Lake Water Bodies	Transitional Water Bodies	Coastal Water Bodies	Ground Water Bodies	Total Designated Areas	Related Section in Chap 5
Water Dependent SPAs	-	-	-	-	-	5	5.3.1

Source: North Eastern RBD Article 5 Characterisation – Technical Summary Report (NS Share T9 9(1) -3.0)

Heavily Modified 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. In the NERBD, 37 water bodies are designated as HWMBs (Rivers-18, Lakes-3, Transitional-3 and Coastal-13). Examples of heavily modified water bodies in the District include Belfast Harbour and the Lagan Navigation. There are currently no surface waters designated as artificial water bodies in the District.

5.3.3.4 Existing Environmental Pressures / Problems: Water

The main pressures on surface and groundwater quality within the NERBD 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 North Eastern District as a whole, estimates indicate that municipal and industrial discharges produce over 33% of the yearly phosphorus load and less than 10% of the nitrogen load. However, in the densely populated Lagan and Belfast Lough catchment, nutrient contributions from municipal and industrial discharges are much higher. Most of the District's growing population lives near the coastline, relying on treatment plants around Belfast and North Down.

Landfills, Mines, Quarries and Contaminated Sites (Industry and Other Businesses and 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 continue to threaten groundwater and surface waters. There is concern about the potential impacts of such sites in the District. One example is the illegal dumping that occurs along the border 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) and organic pollution from animal slurry/manure and silage effluent. A third, pesticides, is covered under dangerous substances. In the North Eastern District, agriculture is an important activity, using about 70% of the land. Estimates of nutrient input indicate that agriculture produces over 40% of the yearly phosphorus load and 75% of the nitrogen load, but in certain rural catchments, for example the Quoile and Strangford Lough system, nitrogen loading from agriculture is in excess of 90%.

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. In Northern Ireland more than 110,000 properties (20% of the total) are currently without sewerage provision. 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

Public and private forestry areas cover less than 5% of the land area within the North Eastern District. 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. Some afforested areas are situated in sensitive salmon and trout spawning areas in upland headwaters. Many of the current water problems associated with afforestation are a legacy of old practices, which have been subsequently amended.

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.

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 North Eastern District include Belfast and Larne Ports, impoundments and weirs on the River Lagan, tidal control systems on the Quolie estuary and water supply reservoirs at Silent Valley in the Mourne Mountains.

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. Temperature changes may give invasive alien species a competitive advantage.

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 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. These Regulations replace 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).

The Department of Environment and Local Authorities are responsible for air quality monitoring in Northern Ireland. The DOENI and some local authorities compile and publish annual reports on air quality.

The EU has recently adopted the CAFE 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 CAFE Directive includes a target value for $PM_{2.5}$. As yet, the Directive has not been transposed into UK law.

5.3.4.2 Air Quality

The Department of the Environment (NI) reports on ambient air quality in Northern Ireland. The NERBD is rural in nature with some major urban centres such as Belfast, Carrickfergus and Lisburn. 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 NERBD. These include:

- **AQMA 1**: An area encompassing the M1 / Westlink corridor from the Belfast City boundary at Sir Thomas and Lady Dixon Park to the end of the Westlink at the junction with Great George's Street and York Street including Stockman's Lane and Kennedy Way. The main source of pollution is traffic. The AQMA is declared for nitrogen dioxide and particulate matter.
- **AQMA 2**: Cromac Street to the junction with East Bridge Street and then from East Bridge Street to the junction with the Ravenhill and Albertbridge Roads and Short Strand. The AQMA is declared for nitrogen dioxide.
- **AQMA 3**: The Upper Newtownards Road from the North Road junction to the Belfast City boundary at the Ulster Hospital incorporating the Knock Road to the City boundary at Laburnum Playing Fields and Hawthornden Way. The AQMA is declared for nitrogen dioxide.
- **AQMA 4:** The Ormeau Road from the junction with Donegall Pass to the Belfast City boundary at Galwally. The AQMA is declared for nitrogen dioxide.

Belfast City Council has prepared an Air Quality Action Plan designed to improve air quality throughout the City and particularly in the AQMA.

5.3.4.3 Baseline Climatic Factors

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.

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 as a whole.

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.

5.3.4.4 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 greenhouse gases in general is currently the focus of emission reduction programmes under the UK's Kyoto Protocol agreements. In addition, the potential changes in climate predicted as a result of anthropogenic greenhouse gas emissions are expected to result in pressures on water quantity and precipitation regimes, as discussed in the previous section.

5.3.5 Cultural Heritage

5.3.5.1 Introduction

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.

5.3.5.2 Sites and Monuments Record

The Sites and Monuments Record (SMR) is a statutory list of all known sites and monuments in Northern Ireland. Within the North Eastern District as a whole there are over 5,000 of these recorded sites and monuments, ranging from megalithic tombs to windmills. Within the North Eastern District, there are 81 sites listed on the SMR, both water and non-water related, within 10m of rivers (see **Figure 5.8**). The most common type of sites and monuments are sites such as cropmarks and linear features making up 13 of the 81 sites in total. There are also eight non-antiquity sites, seven standing stones and six souterrian sites with several other types of sites including megalithic tombs, mounds, settlement sites, urn burials and enclosures. Other water-related features included in the SMR and within this 10m buffer are jettys, slipways, intertidal walls, and wells. These types of features represent the sites at greatest risk of potential impacts from the implementation of the RBMP.

5.3.5.3 Engineering Heritage

There are a number of water-related sites listed for their engineering importance within the Industrial Heritage Register. There are 307 of these sites within 10m of rivers in the NERBD, the majority of which are bridges (188). The remaining places of industrial heritage are made up of a variety of sites such as flax mills, distilleries, GNR buildings and piers.

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 (1 mile). In Northern Ireland a database is available and there are a number of wrecks and historical features marked on the Hydrographic charts for the region; however, these are primarily marked for navigational rather than cultural heritage importance. This database includes over 2,000 wrecks in the NERBD region. Much of the island's inshore cultural marine heritage is unrecorded and there are estimated to be thousands of wrecks in these 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

The NERBD also contains 209 listed buildings and 49 protected Gardens, within a 10m radius of rivers, which include sites such as Tullymore Park in Co. Down, Glenarm Castle in Larne, Beardiville in Coleraine and Dunluce Castle in Moyle District Council.

5.3.5.6 International

The NERBD contains sites of international cultural heritage importance including proposed UNESCO world heritage sites, such as the Causeway Coast, which is owned and operated by the National Trust.

5.3.5.7 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. Cumulatively, this results in impacts on the overall cultural heritage resource.

5.3.6 Landscape

5.3.6.1 Introduction

The North Eastern RBD takes in most of County Down, the east and north coast of County Antrim, and a small portion of County Londonderry/ Derry. The district covers a range of landscapes which includes the Causeway Coast, the Lagan Valley and the Ards Peninsula. The NERBD incorporates 58 of the 130 Landscape Character Areas within Northern Ireland.

5.3.6.2 Protected Landscape Areas

The Northern Ireland Environment Agency records nine Areas of Outstanding Natural Beauty (AONBs) in Northern Ireland, six of which are partly or wholly within the NERBD. 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 NERBD are the Causeway Coast, the Antrim Glens and Coast, the Lecale Coast, the Lagan Valley, the Mournes and Strangford Lough. The Causeway Coast is an 18-mile stretch of coastline of dramatic cliffs and headlands, broken up by sandy beaches and dunes. 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 Lecale Coast is the coastal area between Strangford Lough and the Mournes, which incorporates many headlands and secluded sandy beaches. The Lagan Valley AONB lies mostly within the Lagan Valley Regional Park, and is mainly riverbank scenery, meadows, woods and pastoral land. 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. Finally, the Strangford AONB is an almost landlocked inlet of the sea, set within a diverse lowland topography. Within the Lough, tips of drowned drumlin hills create a myriad of islands, while on shore the hills form a rolling landscape.

5.3.6.3 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 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 NERBD 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 nine impoundments in the NERBD, all of which provide public water supplies. Six of these are located on rivers (Altnahinch, Ballysallagh, Conlig, Copelands, Foffany reservoir and Silent Valley) while the remaining three are on lakes (Lough Cowey, Lough Mourne and the Woodburn Impoundment System). The largest of these impoundments is Silent Valley, which is over 22km^2. The locations of these impoundments are shown on **Figure 5.9**.

Abstractions within the NERBD are taken from a mix of groundwater, lake and river sources and are used for both public and private water supplies. There are 86 abstractions within the NERBD and their locations are shown on **Figure 5.9**. There are also 15 operational water treatment works within the NERBD, which are mainly based around Belfast Lough and the Greater Belfast Area.

Wastewater Treatment Works

There are 167 operational wastewater treatment works (WWTW) and 132 known operational septic tanks within the NERBD. The majority of these discharge to rivers; however, a few discharge to lakes, transitional and coastal waters. The locations of the WWTW within the NERBD are shown on **Figure 5.9**.

Coastal Defences

Coastal defences with the NERBD are present in six locations, being Kinnegar (1km in length to protect esplanade and railway), Newtownards (4.6km in length to reclaim mudflats), Kilnatierny (465m in length to protect low lying land), Ballyurnanellan (430m in length to protect low lying land), Quoile

(190m in length and 27m barrier to protect low lying land) and Strand Lough (18m in length to protect low lying land).

Flood Defences

There are approximately 69 km of flood defences managed by the Department of Agriculture and Rural Development (DARD) Rivers Agency within the NERBD. The majority of this infrastructure in the NERBD is in north Antrim around the River Bush.

Dams, Weirs and Hydroelectric Power

Within the NERBD there are 32 dams, 17 fords, 21 sluices and 59 weirs. Of particular interest are areas where waterbodies have been modified to provide sources of hydroelectric power. There are 14 hydroelectric power plants in the North Eastern District, four of which are on the River Quolie.

Navigable Waters and Canals

Within the NERBD there was one main navigation system; the Lagan Navigation. This water system is no longer in use as a navigational route; however is used recreationally by smaller boats.

Fisheries and Shellfish Waters

In the NERBD there are eight inland aquaculture sites, which are used for Salmon and Trout farming. There are also five protected shellfish areas in the District at Dundrum Bay, Larne Lough, Marlfield Bay, Paddys Point & Reagh Bay and Skate Rock. **Figure 5.10** shows the location of aquaculture and shellfisheries within the NERBD.

Harbours and Ports

The North Eastern RBD is a relatively small catchment, which has a relatively large coastline. There are a number of marine morphological features present on the north and eastern coastline of Northern Ireland, including one commercial port at Belfast and one at Larne. Belfast Harbour is an extremely busy port, second only in Ireland to Dublin in terms of total traffic. There are two international ferry ports in the NERBD, with routes between Belfast and Douglas, Troon, Liverpool and Strabane, and routes between Larne and Troon, Cairnryan and Fleetwood. There are also three main local ferry crossings in the NERBD; Donaghadee – Copeland, Ballycastle – Rathlin Island and Strangford – Portaferry. Finally, there are three main fishing harbours within the RBD, Kilkeel and Ardglass in the south of the RBD, and Portavogie on the Ards peninsula.

Recreational Use of Waters

Due to the relatively large coastline in the North Eastern RBD there are a large number of protected bathing waters in the District. Seventeen of the twenty protected bathing waters in Northern Ireland are in the NERBD, while nine of the thirteen Blue Flag Beaches in Northern Ireland are within the District. The majority of these blue flag and protected beaches are in the Portrush area, the Ards Peninsula and Dundrum Bay. Recreational sailing is prevalent throughout Belfast, Larne and Strangford Loughs. Finally, the north coast of Northern Ireland has become one of the main surfing areas in Ireland within the past 10 years, particularly around the Portrush beaches.

5.3.7.3 Non-Water Related Material Assets

Roads and Rail Infrastructure

There is over 4,500km of public road in the NERBD. Of these roads approximately 1% are classed as Motorway, 9% as either Primary Dual or Primary Routes, 8% are classed as A Roads and 14% are classed as B Roads. The remaining road infrastructure within the NERBD is comprised of minor roads and unclassified urban roads. In addition, there is approximately 120km of active rail infrastructure in the district.

Landfills, Mines and Quarries

There are mines and quarries within the NERBD, as discussed in Section 5.3.8, Soils. As of 2005 there were 75 licensed landfills in Northern Ireland as a whole; seven of which are located in the NERBD and subject to sampling by the NIEA Water Management Unit.

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

There are four main soil types within the North Eastern RBD. The soils of the south and south east of the district, encompassing all of the Ards Peninsula, are mostly well drained Acid Brown Earths. The southwest and northeast of the RBD are dominated by imperfect and poorly drained Gley soils. The majority of the north of the RBD is poorly drained, persistently wet Blanket Peats, while some well drained Brown Earths are present in the far north west of the district.

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. 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 for Northern Ireland (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.

Soil Contamination

In Northern Ireland, Part III of the Waste and Contaminated Land (NI) Order 1997, the provisions of which are yet to be implemented, covers the management of contaminated land. The regulations and guidance for its implementation, when published, will bring into force a framework for the identification and remediation of land where contamination causes unacceptable risks. Some 12,000 sites in Northern Ireland have been 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. The Department of the Environment has proposed the implementation of a contaminated land regime to cover the determination and remediation of contaminated land.

Slope Stability and Landslide Potential

The island of 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 the past. 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

The northern area of the NERBD is dominated by tertiary basalt bedrock (including the Causeway tholeitic basalts). Ordovician greywackes including various sandstones, siltstones and shales feature predominantly in the southern areas of the NERBD (County Down). The Mourne Mountains are made up of granites; and greywacke sandstones. Coastal areas to the east and within the Lagan Valley are characterised by Triassic marl or mudstones. Drift deposits in the highland areas (uplands and waterlogged hollows) to the north of the NERBD are generally peat. There are localised drift deposits of sands and gravels concentrated mainly in the vicinity of Greater Belfast and throughout the NERBD in general. Much of the city centre of Belfast is underlain by a deposit of soft grey mud, silt and fine sand. This was deposited at a time of elevated sea level in the estuary of Belfast Lough and is graphically known as "sleech". It is over 15m thick in the docks area of the city and 3-10m in the commercial and inner city areas. In the NERBD the most productive aquifer units are the Permo-Triassic sandstones within the Lagan and Enler Valleys and the numerous Quaternary sand and gravel deposits located mainly within the river valleys. The district is bound to the north and north east by the North Channel. The Antrim Mountains and Glens of Antrim also lie to the north and north east. The Mourne Mountains are situated to the south east.

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 Northern Ireland by the Geological Survey of Northern Ireland (GSNI), as shown on **Figure 5.11**. Groundwater vulnerability ranges across the District, with large areas subject to high levels of groundwater vulnerability, particularly in the north (Ballycastle to Carnough) and south east of the district (around Strangford Lough). Most of the rest of the district is of low groundwater vulnerability; however a sliver of medium groundwater vulnerability is prevalent along the sandstones of the Lagan Valley.

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. It should also be noted that the entire island of Ireland has been designated as a Protected Area for Groundwater under the WFD.

Mineral and Sand and Gravel 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 NERBD is contained within the Longford-Down Massif and 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, limestones 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.

Within the NERBD there is one mine present, being the Kilroot Salt Mine, which has been mining De-Icing Rock Salt since 1965. There are also 29 quarries in the North Eastern District, which are mainly for basalts and igneous rocks, clay and shale, sandstone, and sand and gravel. **Figure 5.12** illustrates the known mineral deposits located within the NERBD.

5.3.8.3 Land Use

The NERBD includes the most densely populated area of Northern Ireland, the Belfast urban area encompassing Belfast and Lisburn. The population in the NERBD is estimated at 695,000 based on

Census estimates (2004) for the District Councils that lie wholly or partly within it. The majority of industries are located within the Belfast Urban Area.

The primary land use within the NERBD is agriculture, covering an approximate 70% of the region. Of this, some 59% is in use as pastures. Forests and semi natural areas cover approximately 12.6% of the NERBD, with 66% of this comprised of scrub and herbaceous vegetation. Wetlands cover some 8.7% of the NERBD, 71% of which is peat bog. Relative to the other RBD's across the Island the North Eastern District has the highest (relative) percentage of artificial land use types covering 8.43% of the land. **Figure 5.13** shows the distribution of land uses in the NERBD.

As discussed in **Section 5.3.2, Population**, the largest urban area within the NERBD is the Belfast Metropolitan Area, which is located in the mid-east of the study region. This city and surrounding area contain the highest density of population within this RBD. In addition, there are the smaller urban centres of Lisburn, Bangor, Larne, Downpatrick and Newtownards.

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 are 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 5.6** highlights the key interrelationships identified in this SEA. 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 5.6 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 NERBD 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 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, thus the cumulative and synergistic impacts on water of increasing population figures across the District would remain unknown.

The pressures identified in the *Significant Water Management Issues* 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 Planning Policy Statements 1 to 18 and the Regional Development Strategy. 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. This is of the utmost importance within the NERBD, which currently has high population and development pressures being imposed on the existing water infrastructure.

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.

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.

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.

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 waterbodies as part of the Plan would not occur, potentially avoiding interference with water dependent features, such as mills and weirs.

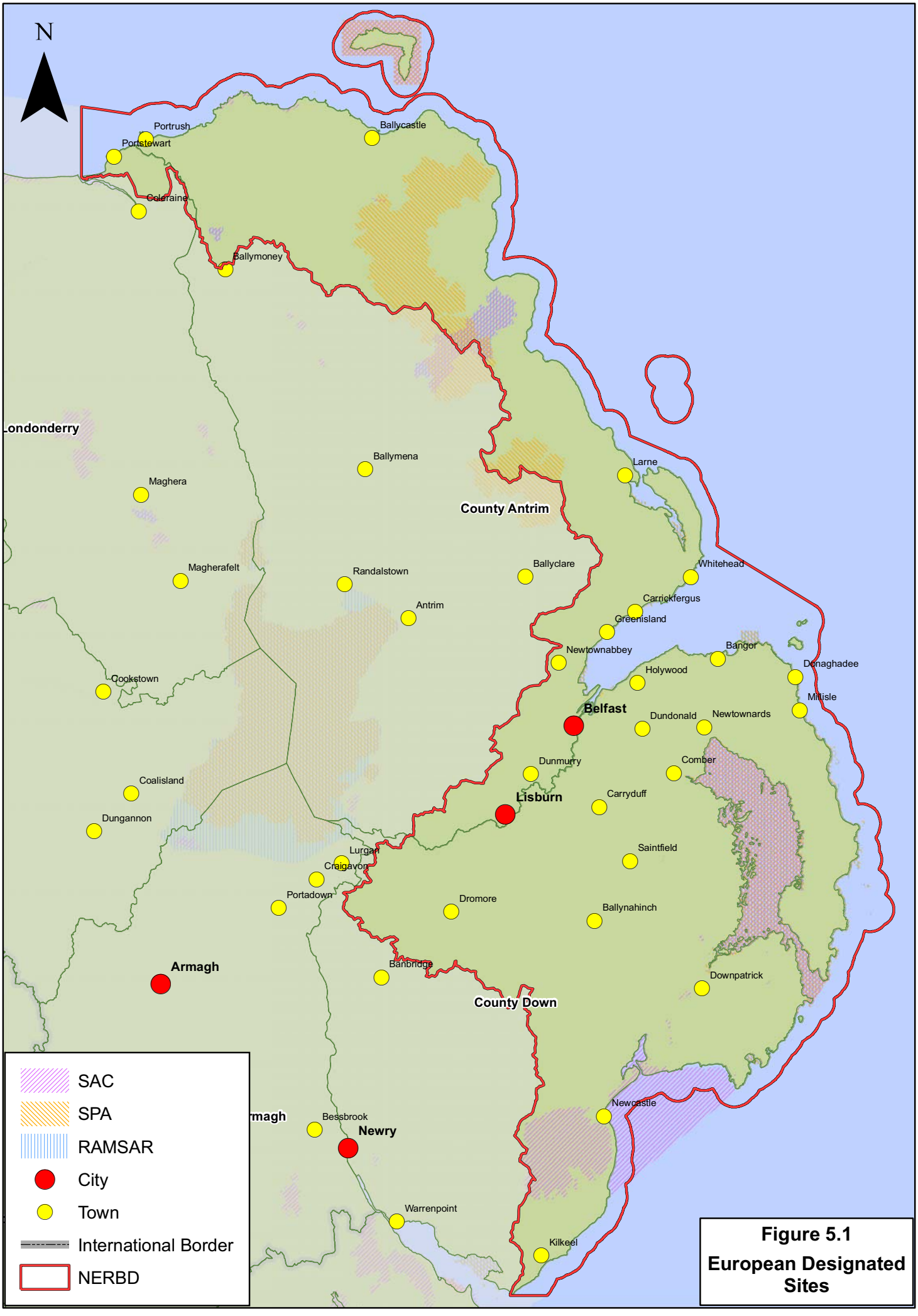
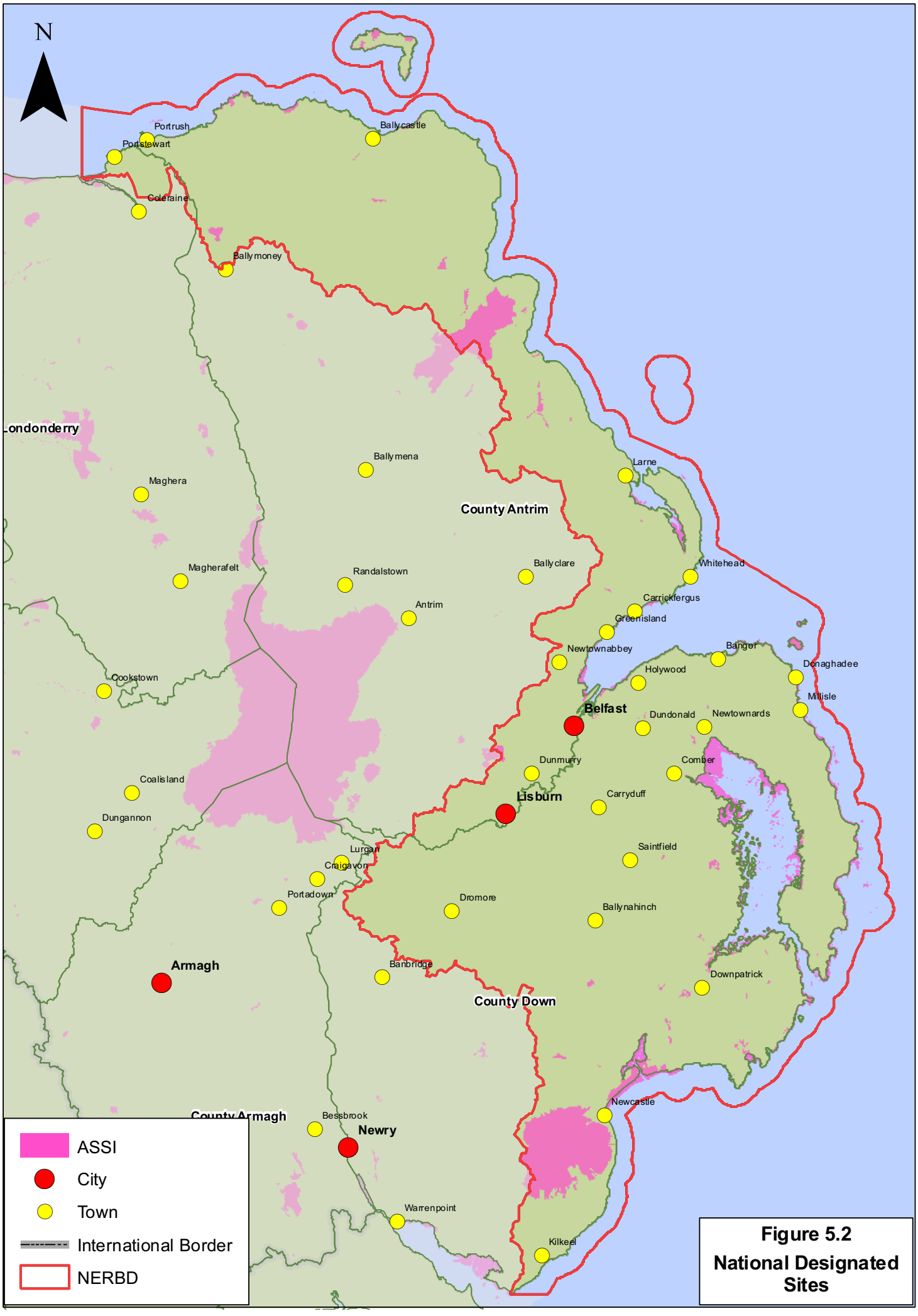


Figure 5.1

European Designated Sites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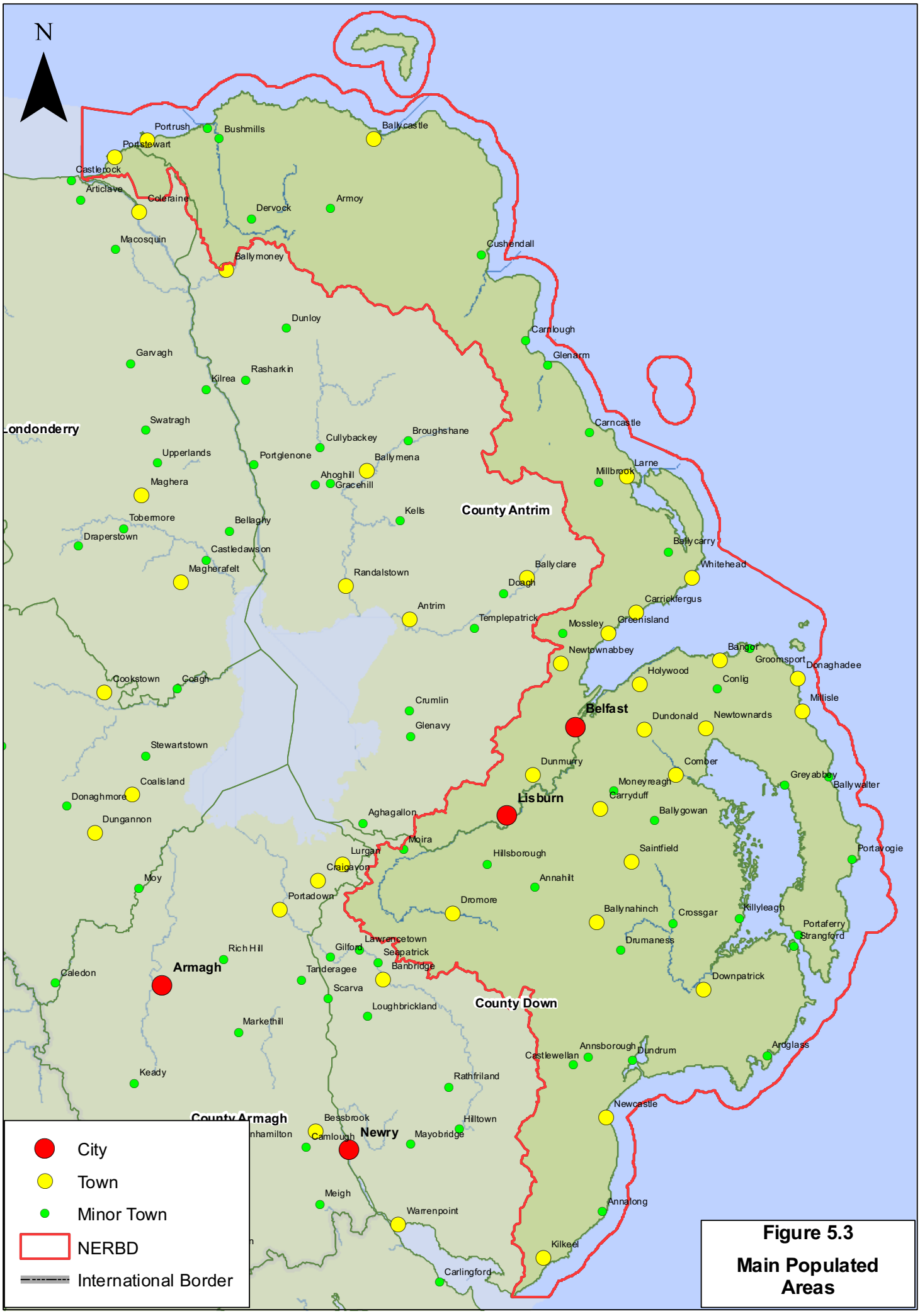
Whitehead
Antrim
Carrickfergus
Greenisland
Newtownabbey
Bangor
Donaghadee
Holywood
Cookstown
Millisle
Belfast
Dundonald
Newtownards
Dunmurry
Comber
Coalisland
Lisburn
Carryduff
Dungannon
Saintfield
Lurgan
Craigavon
Portadown
Dromore
Ballynahinch
Armagh
Banbridge
Downpatrick
County Down
Newcastle
County Armagh
Bessbrook
Newry
Warrenpoint
Kilkeel
ASSI
City
Town
International Border
NERBD
Figure 5.2
National Designated Sites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Dunloy
Carnlough
Garvagh
Glenarm
Rasharkin
Kilrea
Londonderry
Swatragh
Carncastle
Cullybackey
Broughshane
Upperlands
Portglenone
Ballymena
Larne
Millbrook
Maghera
Ahoghill
Gracehill
Kells
County Antrim
Tobermore
Bellaghy
Ballycarry
Draperstown
Castledawson
Whitehead
Magherafelt
Randalstown
Ballyclare
Doagh
Carrickfergus
Antrim
Templepatrick
Greenisland
Mossley
Newtownabbey
Bangor
Groomsport
Donaghadee
Holywood
Conlig
Cookstown
Coagh
Millisle
Crumlin
Belfast
Dundonald
Newtownards
Glenavy
Stewartstown
Dunmurry
Comber
Greyabbey
Coalisland
Moneyreagh
Ballywalter
Donaghmore
Carryduff
Lisburn
Dungannon
Ballygowan
Aghagallon
Moira
Saintfield
Portavogie
Lurgan
Hillsborough
Craigavon
Annahilt
Moy
Portadown
Dromore
Ballynahinch
Crossgar
Killyleagh
Portaferry
Strangford
Drumaness
Rich Hill
Gilford
Lawrencetown
Seapatrick
Armagh
Caledon
Tanderagee
Banbridge
Downpatrick
Scarva
County Down
Loughbrickland
Markethill
Annsborough
Dundrum
Ardglass
Castlewellan
Keady
Rathfriland
Newcastle
County Armagh
Bessbrook
Hilltown
Camlough
Newry
Mayobridge
Meigh
Annalong
Warrenpoint
Kilkeel
Carlingford
City
Town
Minor Town
NERBD
International Border
Figure 5.3
Main Populated Areas

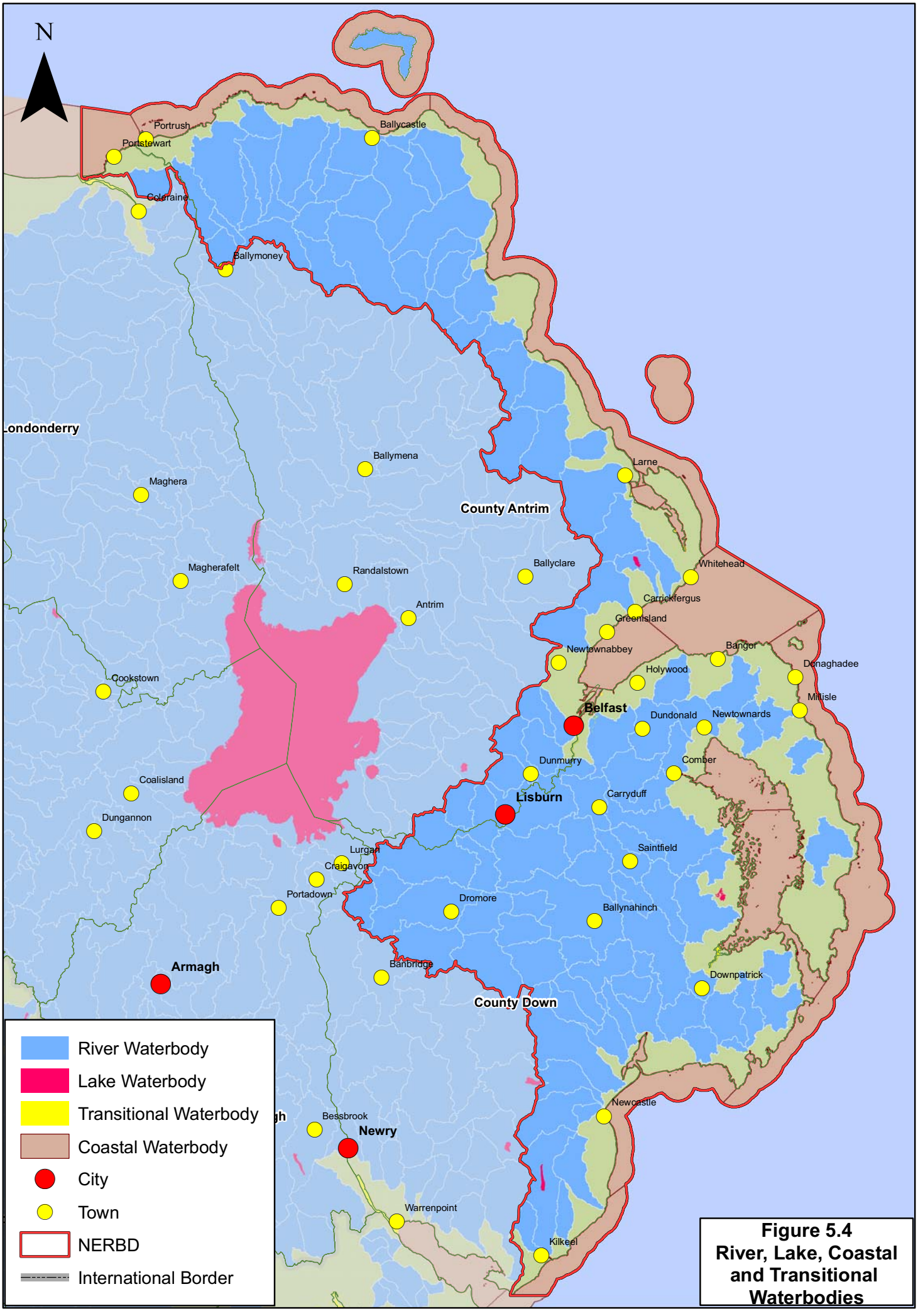


Figure 5.4
River, Lake, Coastal and Transitional Waterbodies

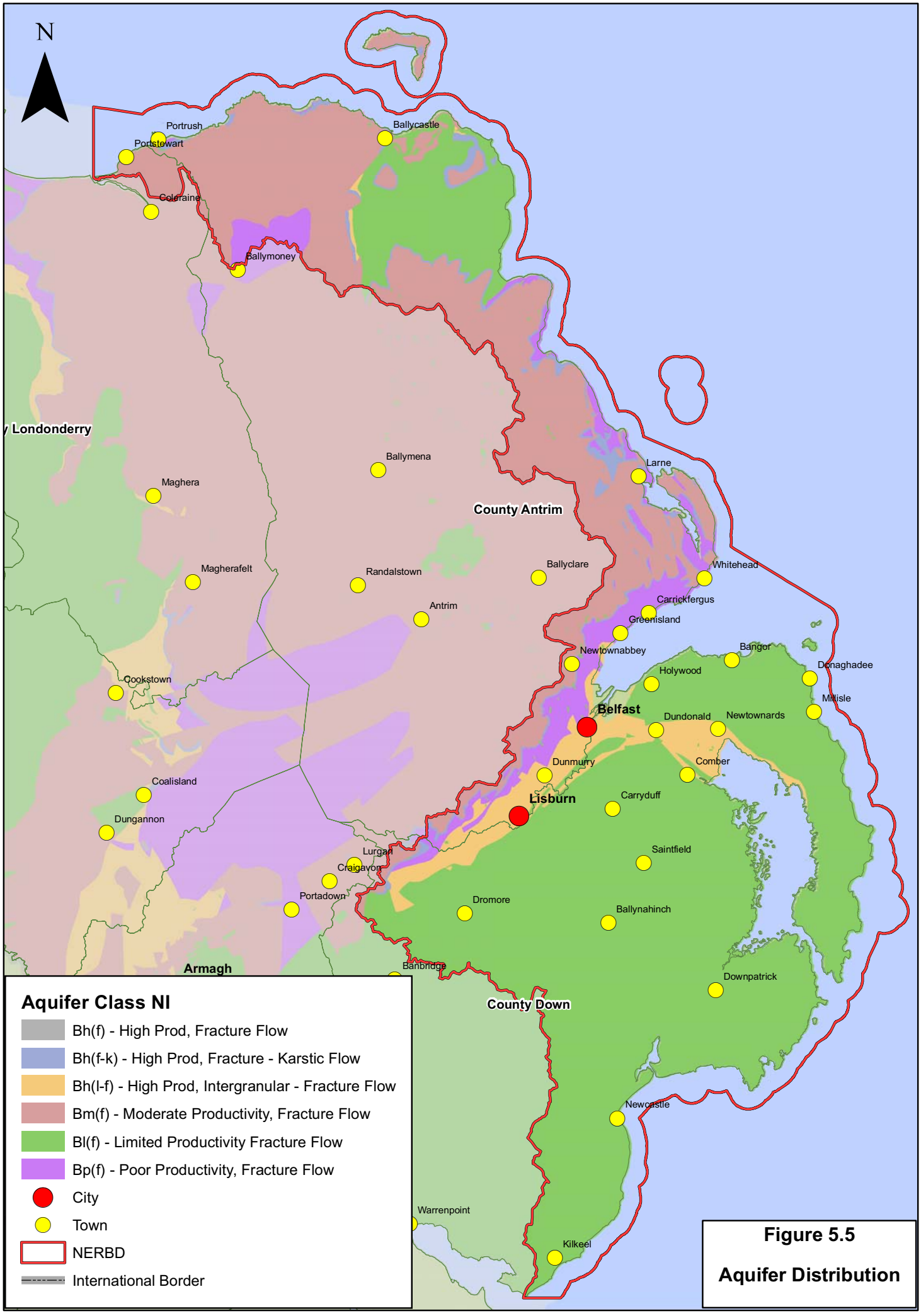
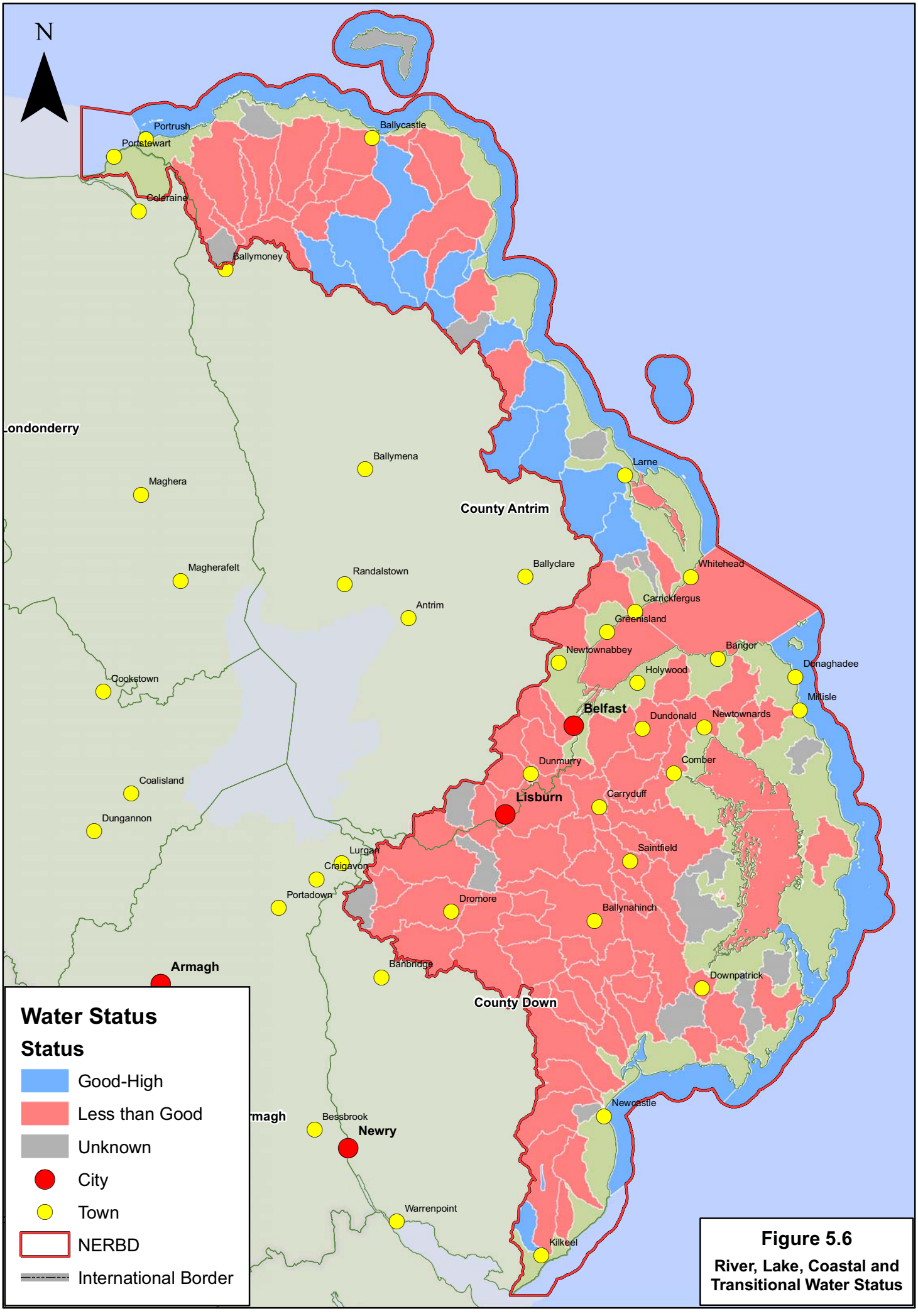


Figure 5.5

Aquifer Distribution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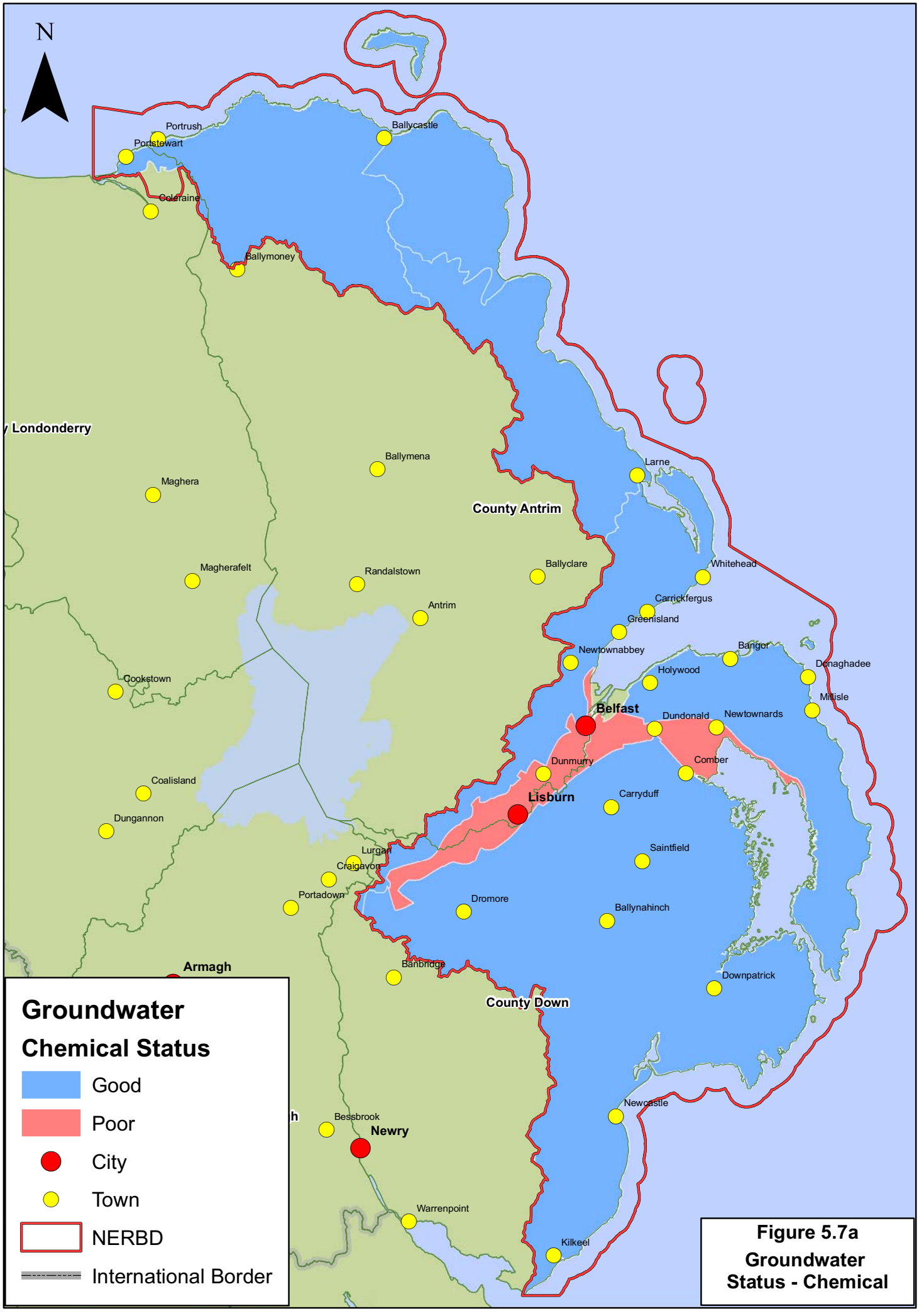
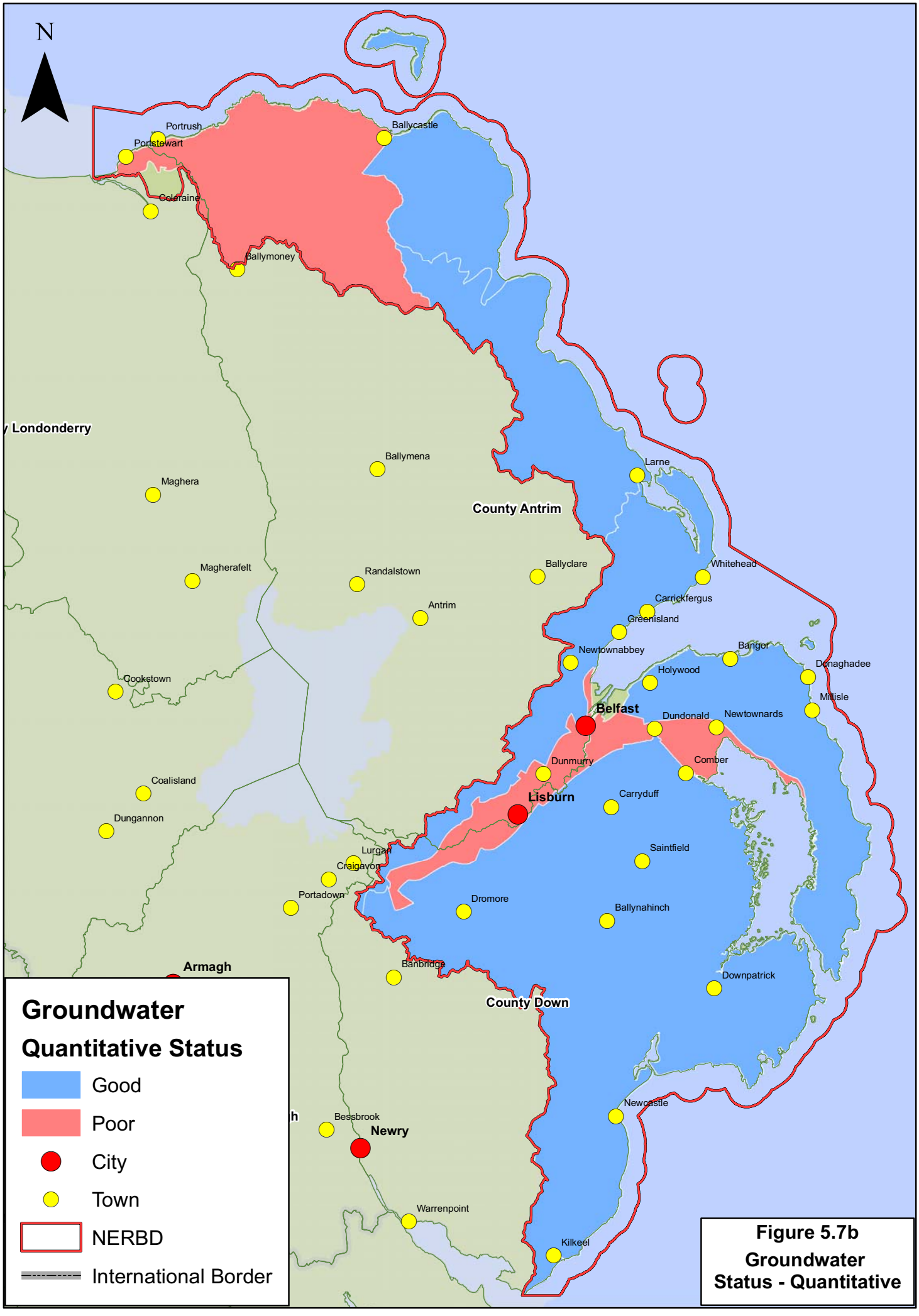
Carrickfergus
Greenisland
Newtownabbey
Bangor
Donaghadee
Holywood
Cookstown
Millisle
Belfast
Dundonald
Newtownards
Dunmurry
Comber
Coalisland
Lisburn
Carryduff
Dungannon
Saintfield
Lurgan
Craigavon
Portadown
Dromore
Ballynahinch
Armagh
Banbridge
Downpatrick
County Down
Newcastle
Bessbrook
Newry
Warrenpoint
Kilkeel
Water Status
Status
Good-High
Less than Good
Unknown
City
Town
NERBD
International Border
Figure 5.6
River, Lake, Coastal and Transitional Water Status


N
Portrush
Portstewart
Ballycastle
Coleraine
Ballymoney
Londonderry
Ballymena
Maghera
Larne
County Antrim
Magherafelt
Randalstown
Ballyclare
Whitehead
Antrim
Carrickfergus
Greenisland
Newtownabbey
Bangor
Cookstown
Holywood
Donaghadee
Millisle
Belfast
Dundonald
Newtownards
Dunmurry
Comber
Coalisland
Lisburn
Carryduff
Dungannon
Saintfield
Lurgan
Craigavon
Portadown
Dromore
Ballynahinch
Armagh
Banbridge
Downpatrick
County Down
Newcastle
Bessbrook
Newry
Warrenpoint
Kilkeel
Groundwater
Chemical Status
Good
Poor
City
Town
NERBD
International Border
Figure 5.7a
Groundwater
Status - Chemical


N
Portrush
Portstewart
Ballycastle
Coleraine
Ballymoney
Londonderry
Ballymena
Larne
Maghera
County Antrim
Magherafelt
Randalstown
Ballyclare
Whitehead
Antrim
Carrickfergus
Greenisland
Newtownabbey
Bangor
Cookstown
Holywood
Donaghadee
Belfast
Millisle
Dundonald
Newtownards
Dunmurry
Comber
Coalisland
Lisburn
Carryduff
Dungannon
Saintfield
Lurgan
Craigavon
Portadown
Dromore
Ballynahinch
Armagh
Banbridge
Downpatrick
County Down
Newcastle
Bessbrook
Newry
Warrenpoint
Kilkeel
Groundwater
Quantitative Status
Good
Poor
City
Town
NERBD
International Border
Figure 5.7b
Groundwater
Status - Quantitative

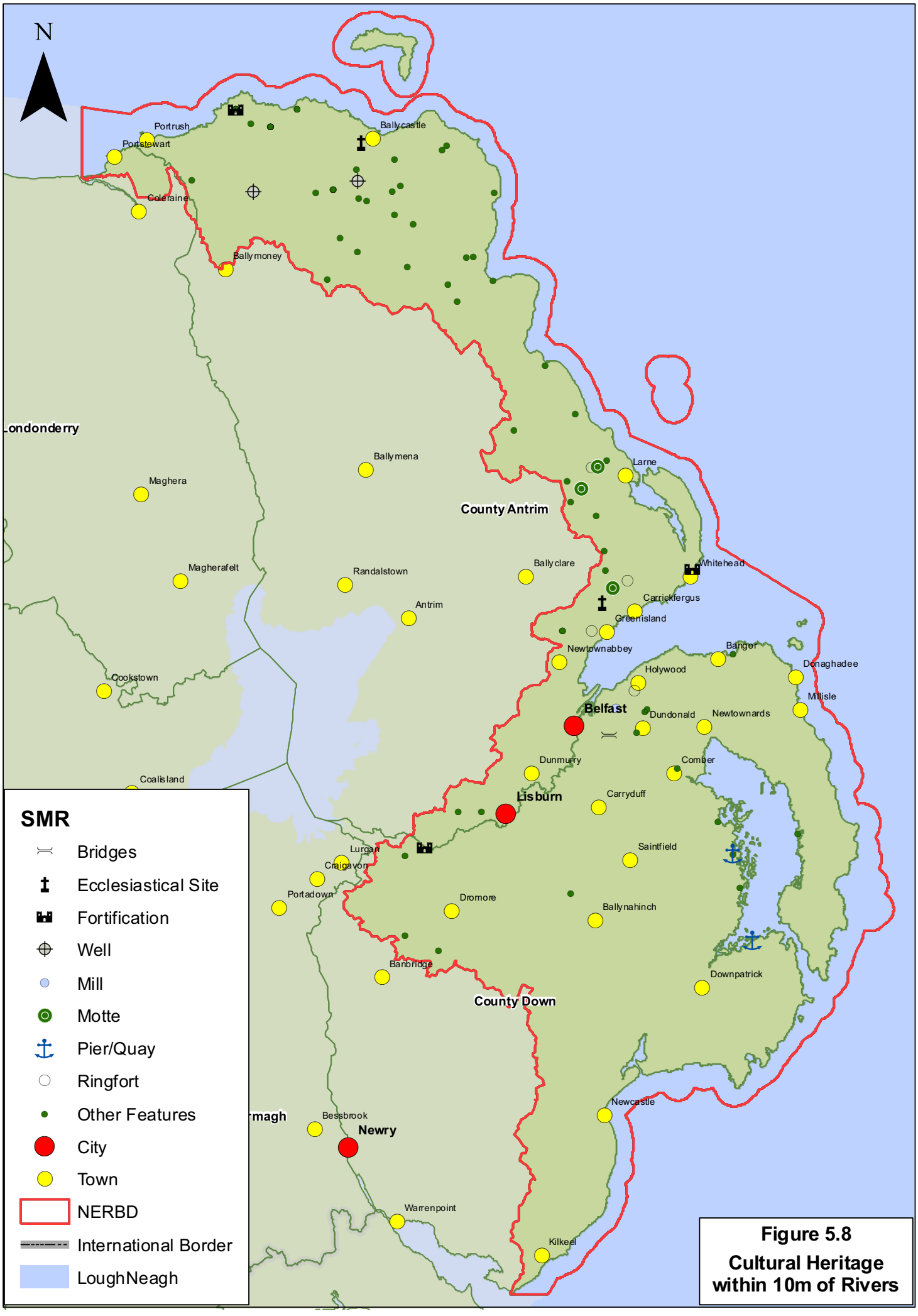


Figure 5.8
Cultural Heritage within 10m of Rivers

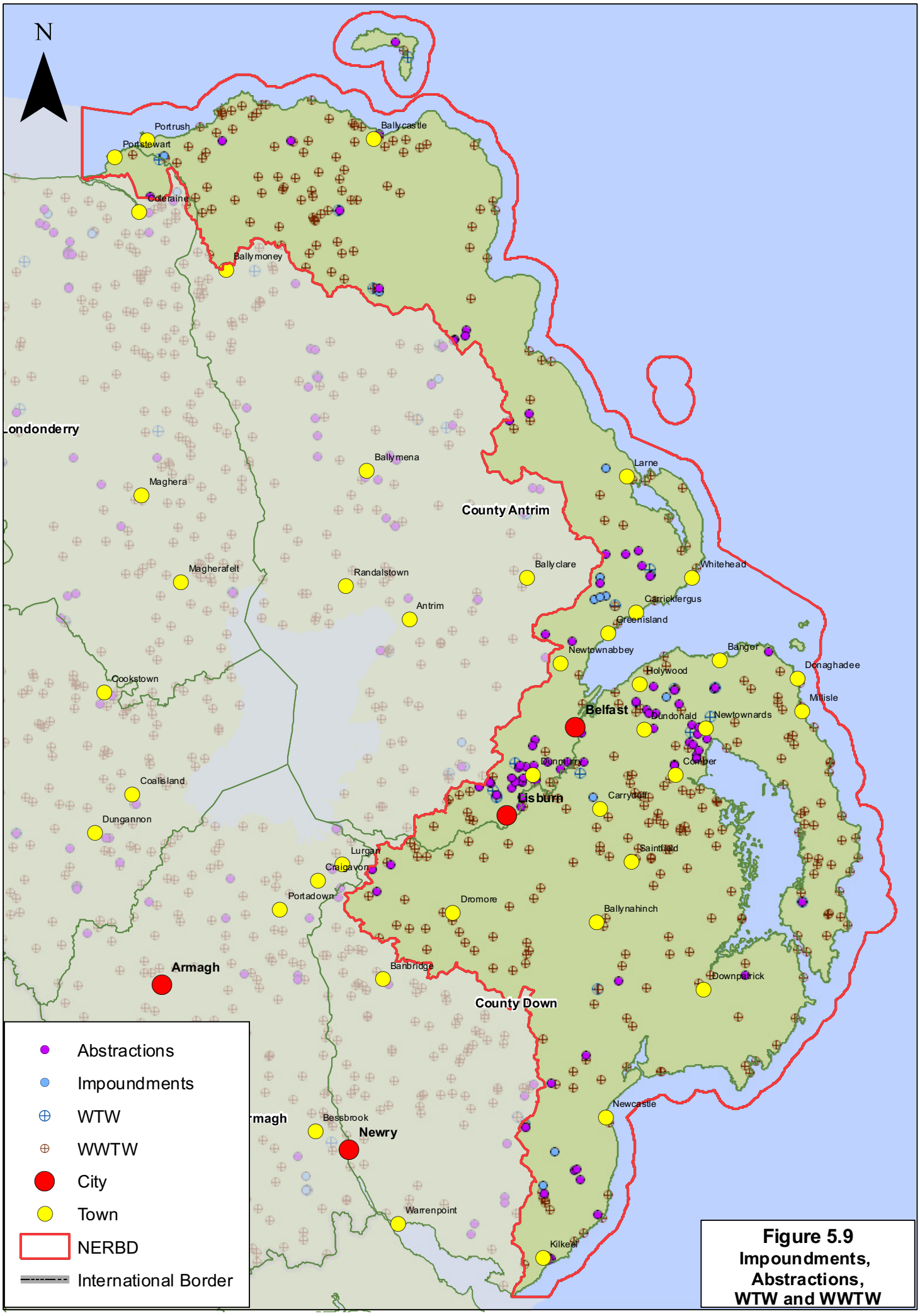


Figure 5.9
Impoundments, Abstractions, WTW and WWTW

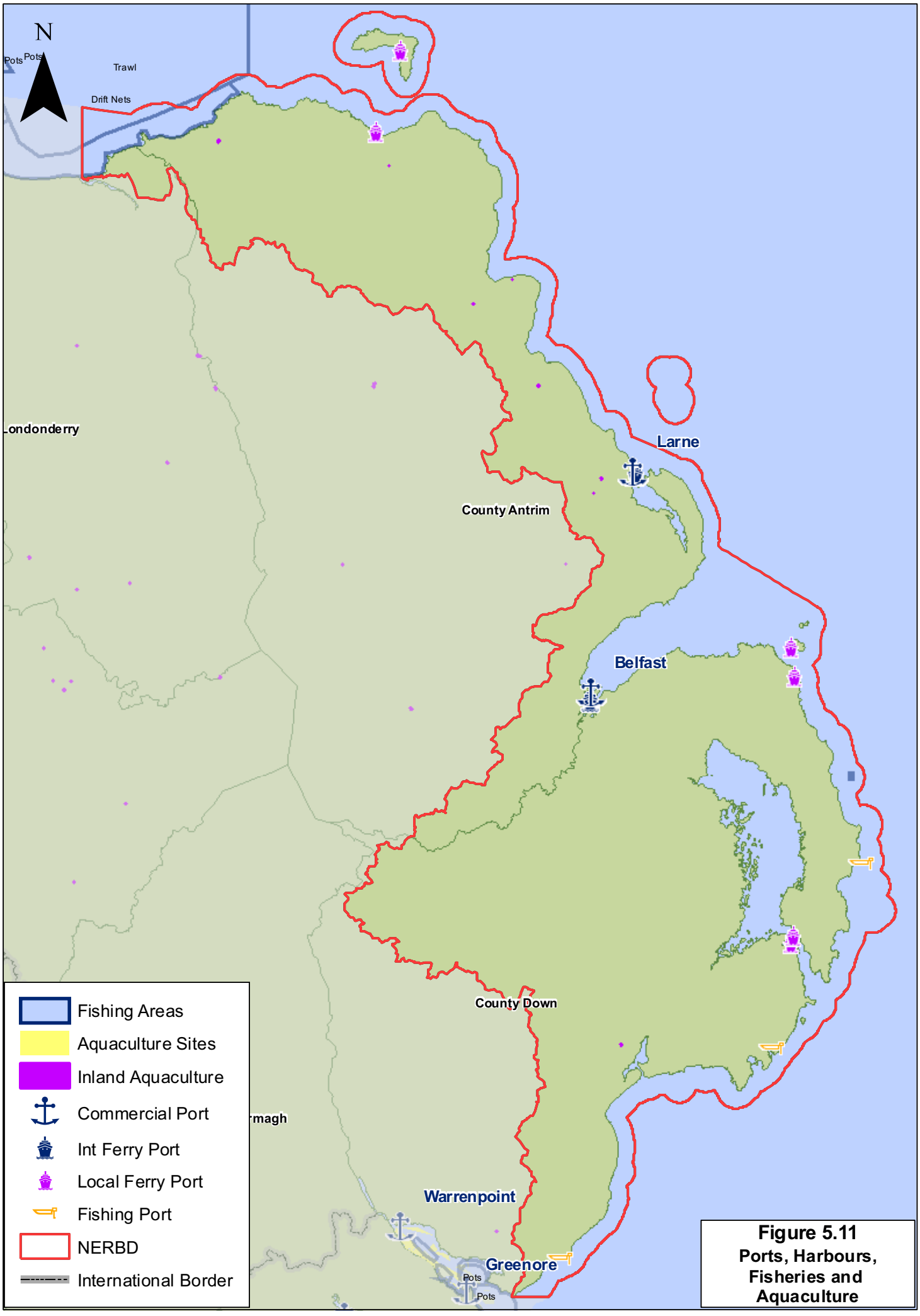


Figure 5.11
Ports, Harbours, Fisheries and Aquaculture

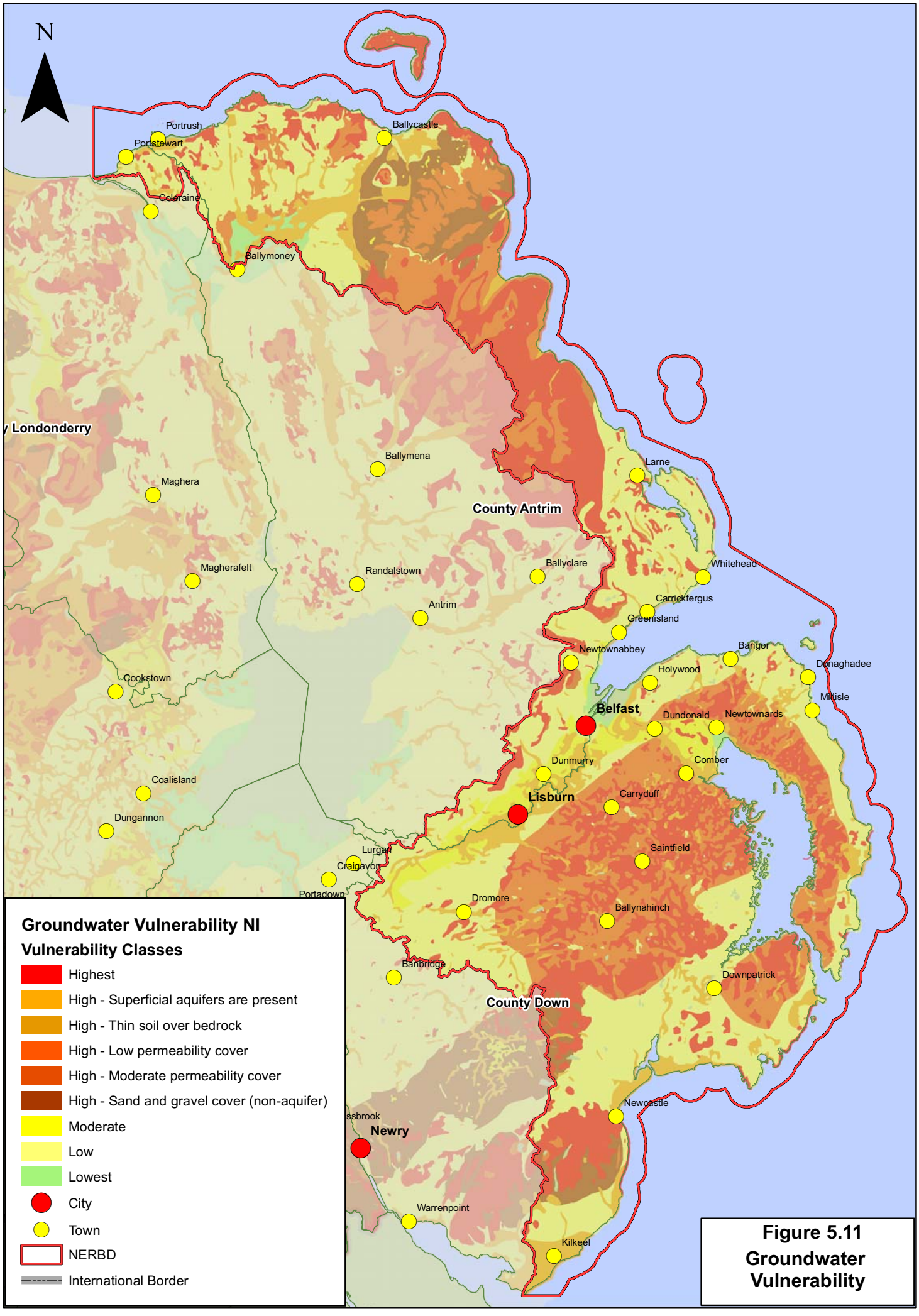


Figure 5.11
Groundwater Vulnerability

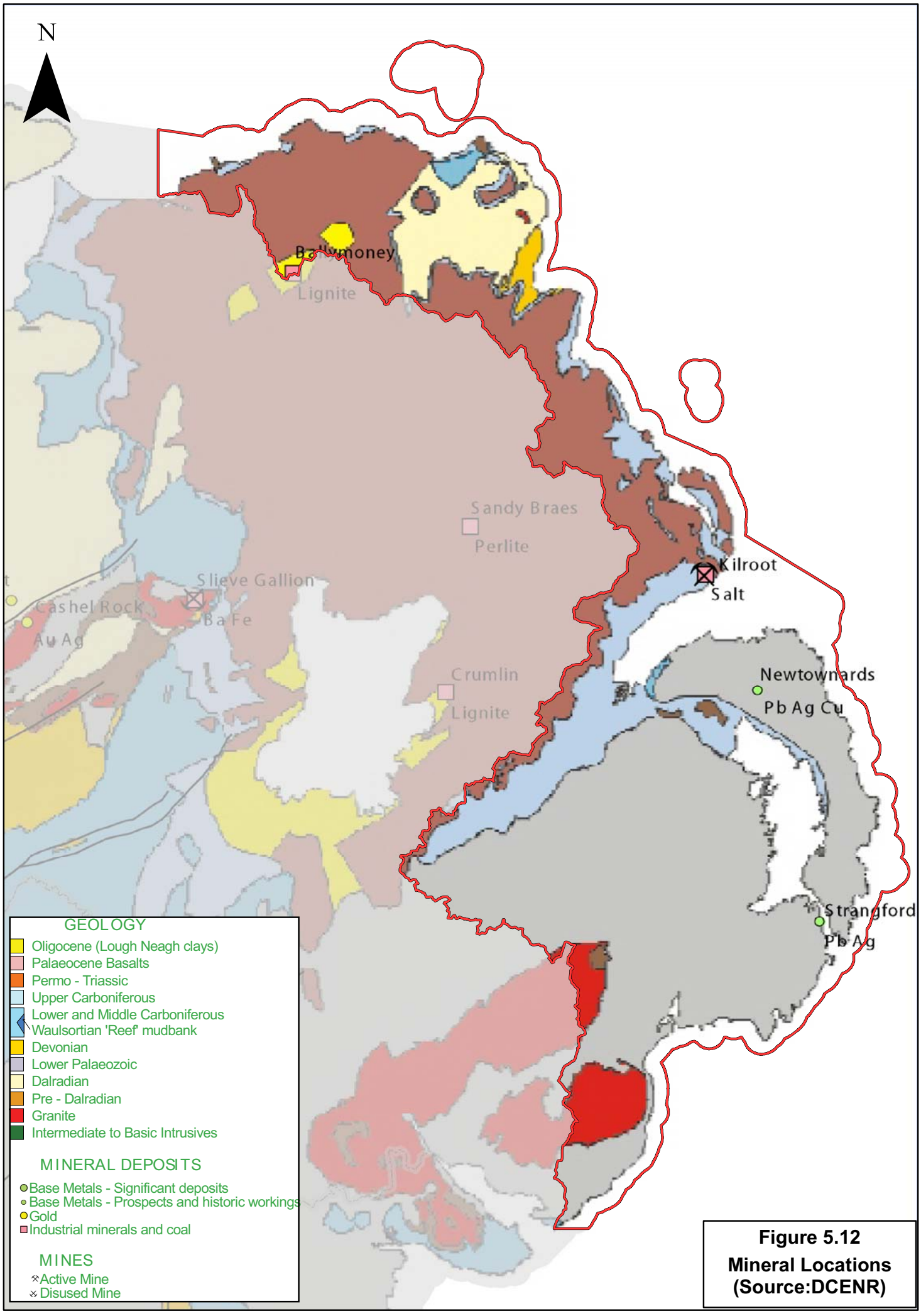
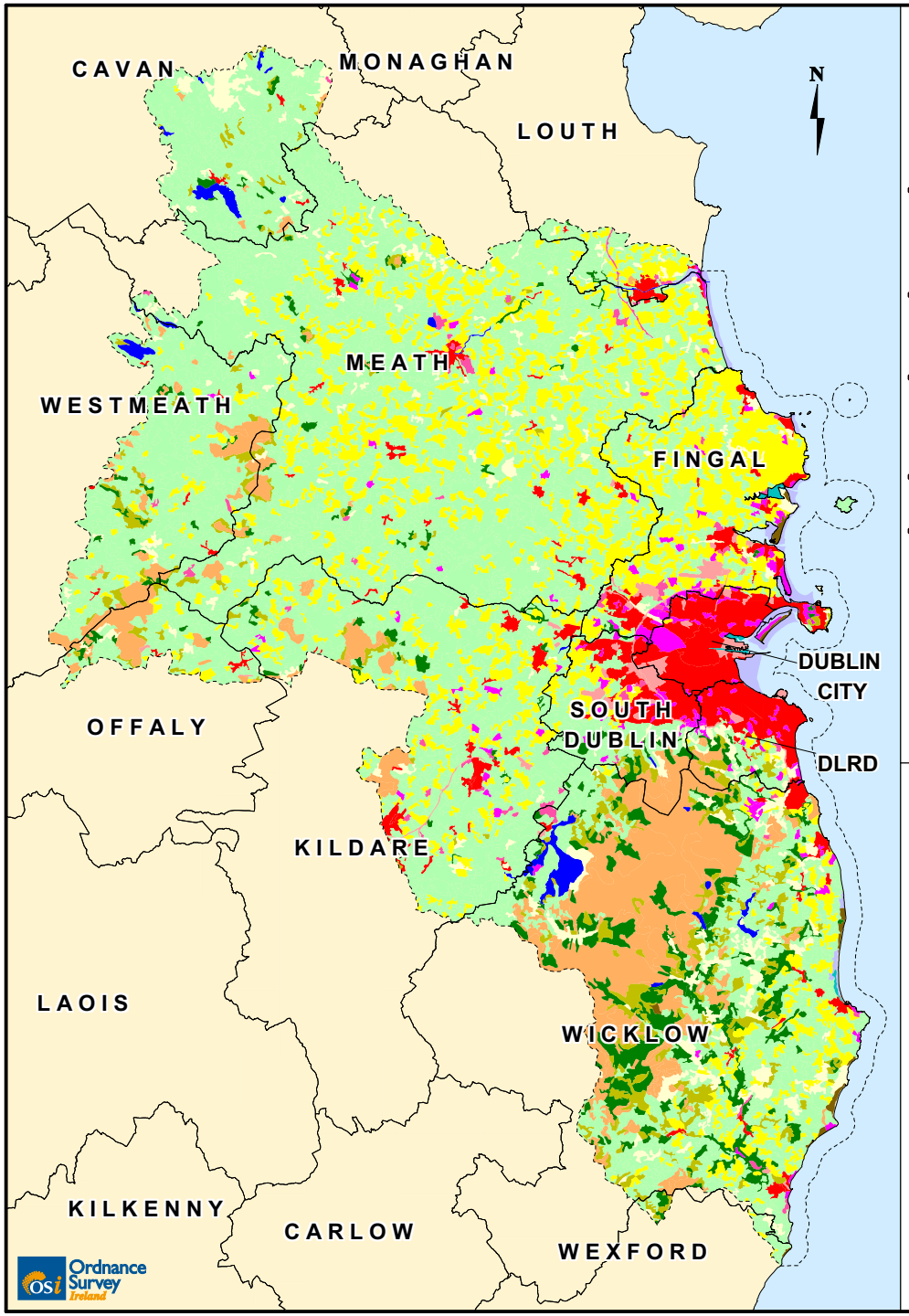


Figure 5.12
Mineral Locations
(Source:DCENR)

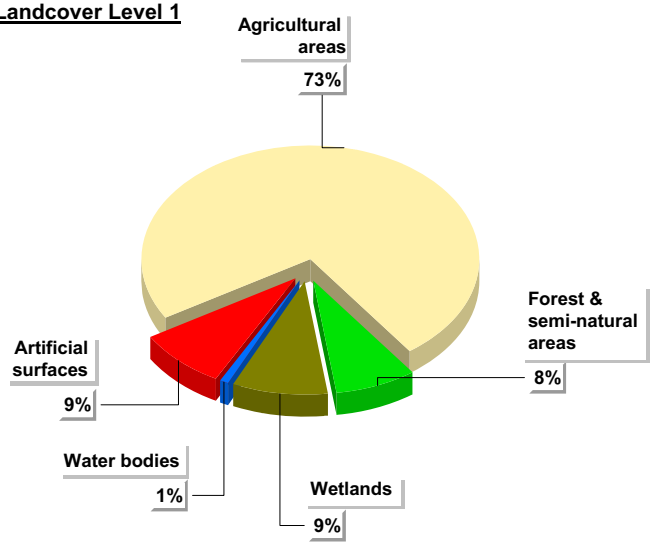


LEGEND:

Corine Landcover

Level 1	Level 2	Level 3
Artificial Surface	Urban fabric	Continuous urban fabric Discontinuous Urban Fabric
	Industrial, commercial and transport units	Industrial or commercial units Roads and rail network Airports
	Mine, dump and construction sites	Mineral extraction sites Construction sites
	Artificial, non-agricultural vegetated areas	Sport and leisure facilities
Agricultural Areas	Arable land	Non-irrigated arable land
	Pastures	Pasture
	Heterogeneous agricultural areas	Complex cultivation patterns Land principally occupied by agriculture
Forest and Semi-Natural Areas	Forests	Broadleaf Forest Coniferous Forest Mixed forest
	Scrub and/or herbaceous vegetations	Natural grasslands Moors and heathland Transitional woodland/scrub
	Open spaces with little or no vegetation	Beaches dunes sands
Wetlands	Inland wetlands	Inland Marshes Peat Bogs
	Coastal wetlands	Intertidal flats Salt marshes
Water Bodies	Continental waters	Water Bodies
	Marine waters	Estuaries

Corine Landcover Level 1



Data Source: EPA

Project *Eastern River Basin Management Plan SEA*

Title

Corine Landcover for Eastern RBD

Figure 5.13

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West Pier Business Campus
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Co. Dublin
Ireland
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Issue Details			
Drawn:	S. K.	Project No.	MDE0751
Checked:	M.C	File Ref.	
Approved:	M.C		MDE0751MI0008F01
Scale:	NTS	Drawing No.	Rev.
Date:	22/08/2008	MI0008	F01

Notes

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2. All levels are referred to Ordnance Datum, Malin Head.
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6 REVIEW OF RELEVANT POLICIES, PLANS AND PROGRAMMES

The objective of the SEA Directive is "to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations in the preparation and adoption of plans and programmes with a view to promoting sustainable development".

In order to meet the requirements of the Directive in this respect, environmental assessment must "identify the environmental protection objectives, established at International, Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation".

The purpose of this review is to take into consideration the policy and legislative framework within which the North Eastern River Basin Management Plan and Programme of Measures is being developed. Consideration of the key statutory and non-statutory plans, programmes and policies relevant to the RBMP and associated POM was undertaken in order to inform the SEA of the environmental objectives and targets of these other plans, policies and programmes. As the scope of the Plan has been set at River Basin District level the review includes national, European and International plans and programmes. In reviewing other plans, the following questions were asked:

(i) Does the Plan contribute to the fulfilment of objectives and goals set in other Plans?

(ii) To what degree are the goals and objectives set in other plans and programmes impacted by the Plan?

Tables 6.1 to 6.3 below summarise the key legislation, Plans and Programmes considered most relevant to the RBMP and POM. The full list of legislation, plans and programmes considered is included in the appendix to this chapter.

Table 6.1 outlines the key **international** legislation, plans and programmes of relevance.

Table 6.2 includes key **European Union** legislation, plans and programmes covering all relevant aspects of environmental protection.

Table 6.3 presents the key legislation, plans and programmes in **Northern Ireland**; these overlap somewhat with the European level plans and programmes.

Table 6.1 Key Conventions, Legislation, Plans, Policies and Programmes - International

Topic	Title	Summary of Objectives	Links to Plan	Where are these Objectives addressed in the Plan?
Biodiversity	Ospar Convention (1992) The Convention for the Protection of the Marine Environment of the North-East Atlantic	The current instrument guiding international cooperation on the protection of the marine environment of the North-East Atlantic. Objectives include the protection of the marine environment.	The purpose of the Plan is to achieve good water quality status in all water bodies, including coastal water bodies, or maintain high quality or good status in those bodies currently achieving these. As such the Plan will aim to prevent pollution of the marine environment.	The POM, which is an integral part of the Plan, includes specific measures aimed at addressing pollution of the marine environment. It should be noted however that these measures are restricted to the one-nautical mile radius boundary identified in the Plan.
	UN Convention on Biological Diversity (1992)	Objectives include the maintenance and enhancement of Biodiversity.	The Plan should aim to minimise impacts on biodiversity. The impacts of the Plan on biodiversity are largely expected to be positive, with potential negative impacts likely occurring only at a site level (e.g. construction of new infrastructure). The favouring of infrastructure that carry a lower risk of damage to biodiversity could however be emphasised in the Plan.	These objectives are addressed in several places in the POM as these are aimed at protecting and improving water quality in order to protect aquatic environments and the species dependent on these. In addition, the POM includes measures aimed at maintaining the quantity of water available for aquatic habitats and species as well as maintaining the required morphological conditions.
	The Ramsar Convention The Convention on Wetlands of International Importance (1971 and amendments)	Objectives include protection and conservation of wetlands, particularly those of importance to waterfowl as Waterfowl Habitat.	The impacts of the Plan on wetlands are largely expected to be positive, due to the water quality objectives included in the Plan.	See above.
Climate	UN Kyoto Protocol The United Nations Framework Convention on Climate Change (UNFCCC) Kyoto Protocol 1997	Objectives seek to alleviate the impacts of climate change and reduce global emissions of GHGs.	Impacts related to climate change should be considered during development of the Programme of Measures for the Plan.	Several mitigation measures included in the SEA recommend mechanisms to reduce GHG emissions associated with water management. These are aimed at achieving the objectives of this Protocol.

Topic	Title	Summary of Objectives	Links to Plan	Where are these Objectives addressed in the Plan?
Environment / Pollution Prevention	The MARPOL Convention International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78).	Objectives include for the protection of the marine environment.	The purpose of the Plan is to achieve good water quality status in all water bodies, including coastal water bodies, or maintain high quality or good status in those bodies currently achieving these. As such the Plan will aim to prevent pollution of the marine environment.	The POM, which is an integral part of the Plan, includes specific measures aimed at addressing pollution of the marine environment. It should be noted however that these measures are restricted to the one-nautical mile radius boundary identified in the Plan.
Human Health / Air	The Stockholm Convention (2001)	Objectives seek to protect human health and the environment from persistent organic pollutants (POPs).	The Plan should aim to prevent such pollution. The impacts of the Plan on human health are largely expected to be positive due to the water quality objectives included in the Plan.	The items in the POM aimed at reducing inputs of dangerous substances are, in part, aimed at reducing the impact of POPs and thus the impact to water quality, human health and the general environment.

Please see the appendix to this chapter for the full list of legislation, plans and programmes considered.

Table 6.2 Key Legislation, Plans, Policies and Programmes – European Union

Topic	Title	Summary of Objectives	Links to Plan	Where are these Objectives addressed in the Plan?
Biodiversity	The EU Habitats Directive (92/43/EEC)	Objectives seek to prevent and eliminate the causes of habitat loss and maintain and enhance current levels of biodiversity.	The measures required under this Directive must be incorporated in the Programme of Measures included in the Plan as required under Annex VI Part A of the WFD.	See UN Convention on Biodiversity. In addition, the requirement to carry out appropriate assessment, prior to implementation of specific projects related to the POM, is aimed at addressing the objectives of this Directive.
	The EU Birds Directive (as modified) (79/409/EEC)	Objectives seek to prevent and eliminate the causes of bird species loss and maintain and enhance current levels of biodiversity.	The measures required under this Directive must be incorporated in the Programme of Measures included in the Plan as required under Annex VI Part A of the WFD.	See EU Habitats Directive.

Topic	Title	Summary of Objectives	Links to Plan	Where are these Objectives addressed in the Plan?
	The EU Freshwater Fish Directive (78/659/EEC)	Objectives seek to protect those fresh water bodies identified by Member States as waters suitable for sustaining fish populations. For those waters it sets physical and chemical water quality objectives for salmonid waters and cyprinid waters.	Under the WFD, waters containing economically significant aquatic species are to be designated as protected and be addressed as part of the Plan.	See EU Habitats Directive.
Human Health	The EU REACH Initiative Registration, Evaluation and Authorisation of Chemicals (REACH)	Objectives seek to limit the harmful effects to the environment and human health from certain chemicals through improved analysis and data collection.	The Plan should aim to prevent the harmful effects of chemicals identified under REACH. The impacts of the Plan on human health are largely expected to be positive due to the water quality objectives included in the Plan.	The items in the POM aimed at reducing pollution discharges to water, including dangerous substances are, in part, aimed at reducing impacts to water quality, from chemicals identified under the REACH Initiative.
	The EU Shellfish Directive (79/923/EEC)	Objectives seek to maintain those coastal and brackish waters, which need protection or improvement, in order to allow shellfish to develop and to contribute to the high quality of shellfish products intended for human consumption.	Under the WFD, waters containing economically significant aquatic species are to be designated as protected and be addressed as part of the Plan.	The measures included in the POM are primarily aimed at improving and/or preserving water quality. The shellfish areas identified within the Register of Protected Areas are identified in the Plan and are subject to specific measures to protect their water quality.
	The Plant Protection Products Directive (91/414/EEC)	Objectives seek to harmonise the overall arrangements for authorisation of plant protection products within the European Union. This is achieved by harmonising the process for considering the safety of active substances at a European Community level by establishing agreed criteria for considering the safety of those products. Product authorisation remains the responsibility of individual Member States.	The measures required under this Directive must be incorporated in the Programme of Measures included in the Plan as required under Annex VI Part A of the WFD.	The measures included in the POM include a. comprehensive suite of obligations under eleven key European Directives of which the Plant Protection Products Directive is one.

Topic	Title	Summary of Objectives	Links to Plan	Where are these Objectives addressed in the Plan?
	The Major Accidents (Seveso) Directive (96/82/EC as amended)	Objectives seek to prevent major accidents involving dangerous substances and limit their consequences for man and the environment, with a view to ensuring high levels of protection throughout the Community.	The measures required under this Directive must be incorporated in the Programme of Measures included in the Plan as required under Annex VI Part A of the WFD.	The measures included in the POM include a. comprehensive suite of obligations under eleven key European Directives of which the Major Accidents (Seveso) Directive is one.
Soils	The Soils Directive (Draft)	The proposed Directive lays down a framework for the protection and sustainable use of soil based on the principles of integration of soil issues into other policies, preservation of soil functions within the context of sustainable use, prevention of threats to soil and mitigation of their effects, as well as restoration of degraded soils to a level of functionality consistent at least with the current and approved future use of the land.	Elements of the Plan that could create direct and indirect impacts on soils should be included in the assessment.	The items in the POM aimed at reducing pollution discharges to water are, in part, aimed at reducing impacts both to soils and from soils, including for example soil erosion and land contamination. In addition, the requirement to carry out environmental impact assessment, including impacts to soils and geology, prior to implementation of specific projects related to the POM, is aimed at addressing the objectives of Draft Directive.
Sustainable Development	The SEA Directive (2001/42/EC)	Objective is to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development, by ensuring that, in accordance with this Directive, an environmental assessment is carried out of certain plans and programmes which are likely to have significant effects on the environment.	Under the SEA Directive, the Plan requires an SEA. The Plan must take account of protection of the environment and integration of the Plan into the sustainable planning of the island as a whole.	The preparation of the Environmental Report as part of the overall implementation of the SEA process is aimed at achieving the objectives of the SEA Directive.

Topic	Title	Summary of Objectives	Links to Plan	Where are these Objectives addressed in the Plan?
	The EIA Directive (85/337/EEC) as amended by Directive 97/11/EC	Objective is to require Environmental Impact Assessment of the environmental effects of those public and private projects, which are likely to have significant effects on the environment.	The measures required under this Directive must be incorporated in the Programme of Measures included in the Plan as required under Annex VI Part A of the WFD.	Some of the projects required pursuant to implementation of the POM for the Plan may require EIA under the provisions of the EIA Directive. This process would meet the objectives of the EIA Directive.
Water	The Water Framework Directive (2000/60/EC)	Objectives seek to maintain and enhance the quality of all surface waters in the EU.	The RBMPs and POMs are a requirement of this directive.	The Plan and POM has been prepared in response to the requirements of this Directive.
	Groundwater Directive (2006/118/EC)	This directive establishes a regime, which sets underground water quality standards and introduces measures to prevent or limit inputs of pollutants into groundwater.	The purpose of the Plan is to achieve good water quality status in all water bodies or maintain high quality or good status in those bodies currently achieving these. As such the Plan should have regard to the standards and measures included in this Directive.	The measures included in the POM are primarily aimed at improving and/or preserving water quality, including groundwater.
	EU Floods Directive (2007/60/EC)	The Floods Directive applies to river basins and coastal areas at risk of flooding. With trends such as climate change and increased domestic and economic development in flood risk zones, this poses a threat of flooding in coastal and river basin areas.	The Plan should not result in an increase in flood events or severity.	The mitigation measures required to achieve the requirements of SEA Objectives 2, 7 and 8 are aimed, in part, at meeting the objectives of this Directive.
	Bathing Water Directive (2006/7/EC)	The overall objective of the revised Directive remains the protection of public health whilst bathing, but it also offers an opportunity to improve management practices at bathing waters and to standardise the information provided to bathers across Europe.	The measures required under this Directive must be incorporated in the Programme of Measures included in the Plan as required under Annex VI Part A of the WFD.	The measures included in the POM include a. comprehensive suite of obligations under eleven key European Directives of which the Bathing Water Directive is one.

Topic	Title	Summary of Objectives	Links to Plan	Where are these Objectives addressed in the Plan?
	The Nitrates Directive (91/676/EEC)	This Directive has the objective of reducing water pollution caused or induced by nitrates from agricultural sources and preventing further such pollution.	The measures required under this Directive must be incorporated in the Programme of Measures included in the Plan as required under Annex VI Part A of the WFD.	The measures included in the POM include a. comprehensive suite of obligations under eleven key European Directives of which the Nitrates Directive is one.
	The Urban Wastewater Treatment Directive (91/271/EEC) as amended by Directive 98/15/EEC	The primary objective is to protect the environment from the adverse effects of discharges of urban wastewater, by the provision of urban wastewater collecting systems (sewerage) and treatment plants for urban centres. The Directive also provides general rules for the sustainable disposal of sludge arising from wastewater treatment.	The measures required under this Directive must be incorporated in the Programme of Measures included in the Plan as required under Annex VI Part A of the WFD.	The measures included in the POM include a. comprehensive suite of obligations under eleven key European Directives of which the Urban Wastewater Treatment Directive is one.
	The Sewage Sludge Directive (86/278/EEC)	Objective is to encourage the use of sewage sludge in agriculture and to regulate its use in such a way as to prevent harmful effects on soil, vegetation, animals and man. To this end, it prohibits the use of untreated sludge on agricultural land unless it is injected or incorporated into the soil.	The measures required under this Directive must be incorporated in the Programme of Measures included in the Plan as required under Annex VI Part A of the WFD.	The measures included in the POM include a. comprehensive suite of obligations under eleven key European Directives of which the Sewage Sludge Directive is one.
	IPPC Directive (96/61/EC) as amended by Directive 2008/1/EC	Objective is to achieve a high level of protection of the environment through measures to prevent or, where that is not practicable, to reduce emissions to air, water and land. The Directive provides an integrated approach to establish pollution prevention from stationary "installations". This codified act includes all the previous amendments to the Directive 96/61/EC and introduces some linguistic changes and adaptations.	The measures required under this Directive must be incorporated in the Programme of Measures included in the Plan as required under Annex VI Part A of the WFD.	The measures included in the POM include a. comprehensive suite of obligations under eleven key European Directives of which the IPPC Directive is one.

Topic	Title	Summary of Objectives	Links to Plan	Where are these Objectives addressed in the Plan?
	Drinking Water Directive (80/778/EEC) as amended by Directive 98/83/EC	The primary objective is to protect the health of the consumers in the European Union and to make sure drinking water is wholesome and clean.	The measures required under this Directive must be incorporated in the Programme of Measures included in the Plan as required under Annex VI Part A of the WFD.	The measures included in the POM include a. comprehensive suite of obligations under eleven key European Directives of which the Drinking Water Directive is one.
	EU Dangerous Substances Directive (76/464/EEC)	The objective is to regulate potential aquatic pollution by thousands of chemicals produced in Europe. The Directive covers discharges to inland surface waters, territorial waters, inland coastal waters and groundwater.	The purpose of the Plan is to achieve good water quality status in all water bodies or maintain high quality or good status in those bodies currently achieving these. As such the Plan should have regard to the standards and measures included in this Directive.	See the Stockholm Convention.

Please see the appendix to this chapter for the full list of legislation, plans and programmes considered.

Table 6.3 Key Legislation, Plans, Policies and Programmes - Northern Ireland

Topic	Title	Summary of Objectives	Links to Plan	Where are these Objectives addressed in the Plan?
Biodiversity	The Environment (Northern Ireland) Order 2002 (SI No. 3153 of 2002)	The main aim of the Order is to make provision for a variety of environmental issues, with specific regard to pollution prevention and control, air quality and Areas of Special Scientific Interest (ASSI). Part 4 of the Order sets out provisions for ASSIs, with particular regard to their declaration and how they are managed.	The Plan should aim to minimise impacts on ASSIs; however, the impacts of the Plan on ASSIs are largely expected to be positive, with potential negative impacts likely occurring only at a site level (e.g. construction of new infrastructure). The favouring of infrastructure that carries a lower risk of damage to ASSIs could be emphasised in the Plan.	The requirement to carry out environmental assessment, including ecological and geological impact assessments, prior to implementation of specific items in the POM is aimed at addressing the objectives of this order.

Topic	Title	Summary of Objectives	Links to Plan	Where are these Objectives addressed in the Plan?
	The Nature Conservation and Amenity Lands (Northern Ireland) Order (NCALO) 1985 (SI No. 170 of 1985)	The Order makes provisions for the protection and management of important sites in Northern Ireland such as the designation of National Parks, Areas of Outstanding Natural Beauty (AONB), and national, marine and local nature reserves.	The Plan should aim to minimise impacts on such sites; however, the impacts of the Plan on these sites are largely expected to be positive, with potential negative impacts likely occurring only at a site level (e.g. construction of infrastructure). The favouring of infrastructure that carries a lower risk of damage to these sites could be emphasised in the Plan.	The requirement to carry out environmental assessment, including assessment of impacts to these sites, prior to implementation of specific projects related to the POM is aimed at addressing the objectives of this order.
	Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (SR No. 380 of 1995 as amended by SR No. 435 of 2004, SR No. 46 of 2003 and SR No. 345 of 2007	The regulations set out measures for the conservation of natural habitats and of wild flora and fauna, in order to implement the Habitats Directive in NI	See EU Habitats Directive	See EU Habitats Directive.
	The Wildlife (NI) Order 1985 (SI No. 171 of 1985) as amended by SI No. 380 of 1995	This Order aims to protect wild animals, birds, plants and their habitats. It makes it an offence to interfere with endangered species of wild animals and plants. It also provides for the designation of areas of special protection.	The Plan should aim to minimise impacts on biodiversity; however, the impacts of the Plan on biodiversity are largely expected to be positive, with potential negative impacts likely occurring only at a site level (e.g. construction of infrastructure). The favouring of infrastructure that carries a lower risk of damage to biodiversity could be emphasised in the Plan.	The requirement to carry out environmental assessment, including ecological impact assessments, prior to implementation of specific items in the POM is aimed at addressing the objectives of this order.

Topic	Title	Summary of Objectives	Links to Plan	Where are these Objectives addressed in the Plan?
	UK Biodiversity Action Plan	The UK Biodiversity Action Plan sets out the governments commitments to the Convention on Biological Diversity signed in 1992. It provides a detailed plan for the protection of these resources and includes Species Action Plans, Habitat Action Plans and Local Biodiversity Action Plans.	The Plan should aim to minimise impacts on biodiversity; however, the impacts of the Plan on biodiversity are largely expected to be positive, with potential negative impacts likely occurring only at a site level (e.g. construction of infrastructure). The favouring of infrastructure that carries a lower risk of damage to biodiversity could be emphasised in the Plan.	See the UN Convention on Biodiversity.
	Surface Waters (Fishlife) (Classification) (Northern Ireland) Regulations 1997 (SR No. 488 of 1997) as amended by SR No. 194 of 2003 and SR No. 405 of 2007	The regulations set out a system for classifying the quality of inland waters, which need either protection or improvement so they can support fishlife.	See EU Freshwater Fish Directive.	See EU Freshwater Fish Directive.
Cultural Heritage	The Planning (Northern Ireland) Order 1991 (SI No. 1220 of 1991) as amended by SI No. 430 of 2003	Under this Order the DOE is required to compile and maintain a list of buildings of special architectural or historic interest.	The impacts of the Plan on listed structures are largely expected to be associated with site level impacts (e.g. change in hydrologic regime, construction of new infrastructure). The favouring of sites and measures that carry a lower risk of impacts to listed structures could be emphasised in the Plan.	The mitigation measures recommended to achieve SEA Objective 12 is aimed at achieving the objectives of this Order.
Human Health	Quality of Bathing Water Regulations (Northern Ireland) 1993. SR No. 205 of 1993	Give effect to Council Directive No. 76/160/EEC concerning the quality of bathing water. Prescribe bathing water quality standards, requirements for sampling programmes and the methods of analysis and inspection to be used to determine compliance with the standards.	See EU Bathing Water Directive	See EU Bathing Water Directive.

Topic	Title	Summary of Objectives	Links to Plan	Where are these Objectives addressed in the Plan?
	Water Supply (Water Quality) Regulations (Northern Ireland) 2007. SR No. 147 of 2007	Give effect to provisions of EU Council Directive 98/83/EC on the quality of water intended for human consumption. All water supplied for domestic purposes must be wholesome, and therefore must not contain any element, organism or substance at a concentration or value which could harm public health.	See EU Drinking Water Directive.	See EU Drinking Water Directive.
	Surface Water (Shellfish) (Classification) Regulations (Northern Ireland) 1997. SR No. 489 of 1997	Give effect to Council Directive 79/923/EEC of 30 October 1979 on the quality required of shellfish waters. Prescribe quality standards for shellfish waters and designate the waters to which they apply, together with sampling and analysis procedures to be used to determine compliance with the standards.	See EU Shellfish Directive.	See EU Shellfish Directive.
Planning	The Planning (Northern Ireland) Order 1991 (SI No. 1220 of 1991) as amended by SI No. 430 of 2003	Allows for the Department of the Environment to make determinations on planning applications and applications for consent, take enforcement action against breaches of planning control and produce planning policies and development plans.	The Plan must take into account the proper planning and sustainable development of the RBD and Northern Ireland as a whole.	The mitigation measures recommended to achieve SEA Objective 2 are aimed at achieving the objectives of this Order.
	Northern Ireland Regional Development Strategy	Guides the future development of Northern Ireland to 2025 and helps meet the needs of a fast growing region. It sets strategic guidance on a range of Social, Economic and Environmental matters.	The Plan should, where possible, have regard to the objectives of the Regional Development Strategy and consider the adequacy of existing infrastructure to accommodate the proposed level of future development.	The mitigation measures recommended to achieve SEA Objective 2 are aimed at achieving the objectives of the Regional Development Strategy.
	Rural Development Programme 2007 - 2013	Aims to give detailed proposals of a range of rural development support measures as part of the overarching DARD Rural Strategy.	The Plan must take into account the proper planning and sustainable development of the RBD and Northern Ireland as a whole.	The mitigation measures recommended to achieve SEA Objective 2 are aimed at achieving the objectives of this Programme.

Topic	Title	Summary of Objectives	Links to Plan	Where are these Objectives addressed in the Plan?
	Planning Policy Statements 1 - 18	Policies on land-use and other planning matters that apply to the whole of Northern Ireland.	The Plan must take into account the proper planning and sustainable development of the RBD and Northern Ireland as a whole.	The mitigation measures recommended to achieve SEA Objective 2 are aimed at achieving the objectives of these policies .
Sustainable Development	Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004. SR No. 280 of 2004	Give effect to Council Directive 2001/42/EC. Objectives include protection of the environment and integration of plan making processes into sustainable planning of NI.	See EU SEA Directive.	See EU SEA Directive.
Environment	Environmentally Sensitive Areas Designation Order (Northern Ireland) 2005. SR No. 276 of 2005.	Aims to conserve and enhance designated natural beauty areas, to conserve flora and fauna and geological and physiographical features of those areas; and to protect buildings and other objects of archaeological, architectural or historic interest in those areas.	The Plan should aim to minimise impacts on designated natural beauty areas. The impacts of the Plan on these areas are largely expected to be positive due to improved water quality, with potential negative impacts likely occurring only at a site level (e.g. construction of new infrastructure). The favouring of infrastructure that carries a lower risk of damage to designated natural beauty areas could be emphasised in the Plan.	The mitigation measures recommended to achieve SEA Objectives 1, 5, 12 and 13 are aimed at achieving the objectives of this Order.
	The Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 1999. SR No. 73 of 1999.	Defines activities that require an Environmental Impact Assessment, and the preferred methods and contents of the assessment.	See EIA Directive	See EIA Directive.

Topic	Title	Summary of Objectives	Links to Plan	Where are these Objectives addressed in the Plan?
Water	The Surface Waters (Dangerous Substances) (Classification) Regulations (NI) 1998 (SR 397 of 1998)	Prescribe a system of classifying the quality of inland freshwaters, coastal waters and relevant territorial waters. It creates a system for classifying waters according to the presence in them of concentrations of the dangerous substances listed in the Schedules. Sampling requirements are prescribed in regulation 4. Regulation 5, by modifying section 4C of the Water Act (Northern Ireland) 1972, requires (and enables) the Department of the Environment to establish water quality objectives for those dangerous substances by applying the classifications prescribed in the Regulations.	See EU Dangerous Substances Directive.	See EU Dangerous Substances Directive.
	The Groundwater Regulations (Northern Ireland) 1998	This legislation aims to prevent pollution of groundwater. Before certain listed substances including used sheep dips and waste pesticides are disposed of by land spreading, authorisation must be obtained from Department for the Environment's NIEA.	The purpose of the Plan is to achieve good water quality status in all water bodies or maintain high quality or good status in those bodies currently achieving these. As such the Plan should have regard to the standards and measures included in this Regulation.	See EU Groundwater Directive.
	Phosphorus (Use in Agriculture) Regulations (Northern Ireland) 2006	This established limits on the amount of chemical fertiliser to be applied to crop requirement taking into account phosphorus available from soil and organic manures.	The purpose of the Plan is to achieve good water quality status in all water bodies or maintain high quality or good status in those bodies currently achieving these. As such the Plan should have regard to the standards and measures included in this Regulation.	The items in the POM aimed at reducing pollution discharges to water are, in part, aimed at reducing inputs of phosphorus from chemical fertilisers.

Topic	Title	Summary of Objectives	Links to Plan	Where are these Objectives addressed in the Plan?
	The Nitrates Action Programme Regulations (Northern Ireland) 2006	As eutrophication is recognised as a major problem, legislation covering all farms in Northern Ireland was considered the best option for implementing the Nitrates Directive. An action programme was agreed between the Department and stakeholders and accepted by the European Commission in October 2006. This resulted in the Nitrates Action Programme Regulations (Northern Ireland) 2006, coming into operation on 1 January 2007.	See EU Nitrates Directive.	See EU Nitrates Directive.
	The Industrial Pollution Control (Northern Ireland) Order 1997 (No. 2777 (N.I. 18))	Aims to prevent or minimise environmental pollution by prescribed substances from certain industrial processes. Best Available Techniques Not Entailing Excessive Cost (BATNEEC) must be used to minimise releases.	The purpose of the Plan is to achieve good water quality status in all water bodies or maintain high quality or good status in those bodies currently achieving these. As such the Plan should have regard to the standards and measures included in this Regulation.	The items in the POM aimed at reducing impacts from industrial pressures are, in part, aimed at achieving the objectives of this order.
	The Water (Northern Ireland) Order 1999 (No. 662 (N.I. 6))	Contains a number of provisions to combat and prevent pollution affecting waterways and groundwater. It is an offence under the Water Order to make a polluting discharge or deposit either directly or via a drain into a waterway or the underground strata. It is also an offence to make an effluent discharge from a septic tank or treatment plant into a waterway or a soak-away without the consent of the Department of Environment (DOE).	The Plan should aim to prevent such pollution and promote a scenario that would minimise the emission of the pollutants specified under the Order.	One purpose of the Plan and POM is to result in a reduction in pollution discharges to surface and groundwaters. The POM specifically addresses inputs from point source and diffuse discharges and unsewered properties.

Topic	Title	Summary of Objectives	Links to Plan	Where are these Objectives addressed in the Plan?
	The Water and Sewerage Services (Northern Ireland) Order 2006	Aims at transferring responsibility of water and sewerage services to a government owned company. New regulation of these services to be implemented. Sets out the framework for the introduction of domestic charging for water and sewerage services.	The purpose of the Plan is to achieve good water quality status in all water bodies or maintain high quality or good status in those bodies currently achieving these. As such the Plan should have regard to the provisions of this Order in setting out measures aimed at improving water quality, including the regulatory framework in which water and sewerage services are provided.	The Plan and POM includes measures specifically aimed at addressing the regulatory framework in which water and sewerage services are provided. Also, see the EU Urban Waste Water Treatment Directive.

Please see the appendix to this chapter for the full list of legislation, plans and programmes considered.

In addition, certain plans at the regional and local level will need to have regard to the objectives of the NERBD RBMP at such time as they are reviewed / amended. These plans include: Land Use and Spatial Planning Plans; Conservation Measure Plans; Water Services Strategic Plans; Pollution Reduction Plans; Sludge Management Plans; Forest Management Plans; Heritage Plans; and several others. In addition, the RBMP and its associated POM should have regard to the objectives of these plans, where appropriate. For a summary of the relevant plans and programmes in Northern Ireland please see the document Appendix 14 - Register of Plans and Programmes, which is available on the NIEA website (www.ni-environment.gov.uk).

7 STRATEGIC ENVIRONMENTAL OBJECTIVES, TARGETS AND INDICATORS

7.1 INTRODUCTION

Because SEA is, as its name suggests, set at a strategic level, it is not possible for the baseline environment to be described (and assessed) in as much detail as could be done for a project-level environmental impact assessment. Instead, SEA uses a system of *objectives*, *targets* and *indicators* to rationalise information for the purposes of assessment.

In order to streamline the assessment process, this report has used broad themes, based on the environmental topics listed in the SEA Directive, to group large environmental data sets, e.g., human health, cultural heritage and climate. Assigned to each of these themes is at least one high-level Strategic Environmental Objective that specifies a desired direction for change, e.g. reduce CO_2 emissions, against which the future impacts of the Plan and POM can be measured. These high-level Strategic Environmental Objectives are then paired with specific Targets. The progress towards achieving these specific Targets is monitored using Indicators, which are measures of identified variables over time.

Section 7.2 describes the Strategic Environmental Objectives, Targets and Indicators used in assessing the Plan/POM.

7.2 DEVELOPMENT OF STRATEGIC ENVIRONMENTAL OBJECTIVES, TARGETS AND INDICATORS

7.2.1 Strategic Environmental Objectives

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 reflect the existing environmental issues relevant to water management. They are focussed on protecting and enhancing the natural and human environment and on minimising negative effects. The objectives were developed to be consistent with

environmental protection objectives established by International, European and national environmental policies, objectives and standards.

The selected Strategic Environmental objectives for this SEA are set out in **Table 7.1**. These environmental objectives are based on the current understanding of the key environmental issues identified. In addition, the selection of the environmental objectives had regard to the environmental protection objectives contained within the existing 11 Directives listed in Annex IV of the WFD as well as the indicative list of environmental protection objectives outlined in the document *A Practical Guide to the Strategic Environmental Assessment Directive* (Office of the Deputy Prime Minister, 2005). Selection was also based on consultation with statutory consultees and stakeholders during the scoping stage as well as on discussions during a workshop on November 10, 2008 between the SEA and Plan Teams.

Also, included in **Table 7.1** are Detailed Assessment Criteria, which represent the issues that will be considered during the assessment of whether the RBMP and POM, including the proposed alternatives, will contribute to meeting the Strategic Environmental Objectives.

Table 7.1 Strategic Environmental Objectives

Objective	Detailed Assessment Criteria* – To what extent will the RBMPs and POMs:	Related to SEA Topic(s)
Objective 1 Prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species	• Provide effective protection of international and nationally designated biodiversity sites? • Sustain, enhance or where relevant prevent the loss of ecological networks or parts thereof which provide significant connectivity between areas of biodiversity? • Avoid loss of relevant habitats, geological features, species or their sustaining resources in national and international designated ecological sites? • Support delivery of national Biodiversity Action Plan strategies and objectives? • Reduce water related impacts by alien species? • Contribute to the impact of floods and / or droughts on habitats, species and wetlands of international importance?	Biodiversity, Flora and Fauna (BFF)
Objective 2 Contribute to sustainable development.	• Guide land use planning? • Ensure adequate water and wastewater treatment infrastructure capacity is in place? • Reduce water quality? • Reduce water quantity in an unsustainable manner? • Improve the provision of treatment services to those areas where deficiencies exist at present? • Contribute to floods and droughts on established populations	Population (P)

Objective	Detailed Assessment Criteria* – To what extent will the RBMPs and POMs:	Related to SEA Topic(s)
Objective 3 Protect and reduce risk to human health in undertaking water management activities	• Protect drinking water areas (including private abstractions), bathing waters, economic shellfish waters and fisheries?	Human Health (HH)
Objective 4 Avoid damage to the function and quality of the soil resource in the River Basin District	• Accelerate or reduce erosion due to Plan implementation? • Result in impacts on the productivity of agricultural land? • Safeguard soil quality, quantity and function?	Soil (S)
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 groundwaters to at least good status, as appropriate to the WFD	• Provide effective protection of drinking water sources, as required by the WFD? • Reduce the impacts from point source pollution, diffuse source pollution, abstraction, impoundment, flow regulation, direct discharges to groundwater, priority substance pollution, physical modifications, accidental pollution incidents and other activities with an impact on the status of water, as required by the WFD? • Reduce impact from physical modifications on habitat and fish passage? • Provide effective protection of "protected areas" as defined in the WFD?	Water (W)
Objective 6 Minimise emissions to air as a result of Plan activities	• Increase air emissions (e.g. methane and NO_x)? • Increase odour nuisance problems?	Air (AQ)
Objective 7 Minimise contribution to climate change by emission of greenhouse gasses associated with Plan implementation	• Contribute to reducing GHG emission from water management activities? • Provide for measures that are vulnerable climate change? • Encourage improved energy efficiency?	Climatic Factors (C)
Objective 8 Maintain level of protection provided by existing morphological infrastructure, e.g. flood defences, coastal barriers, groynes, etc.	• Interfere with existing infrastructure – e.g. flood defences, coastal barriers, groynes, etc.? • Provide for measures that are vulnerable to the effects of climate change?	Material Assets (MA1)
Objective 9 Provide new and upgrade existing water management infrastructure to protect human health and ecological status of water bodies	• Make more efficient use of water management infrastructure? • Encourage the planned phased introduction of critical infrastructure including wastewater treatment, water supply and surface water drainage?	Material Assets (MA2)
Objective 10 Support economic activities within the District without conflicting with the objectives of the WFD	• Result in a loss of land available for economic activity? • Result in significant changes to an existing economic activity, which would render it unviable?	Material Assets (MA3)

Objective	Detailed Assessment Criteria* – To what extent will the RBMPs and POMs:	Related to SEA Topic(s)
Objective 11 Protect water as an economic resource.	• Provide for efficient and sustainable use of water for consumption, as a tourism and recreational resource and for other economic activities, e.g. commercial aquaculture? • Maintain the economic benefit of water associated with navigation and trade activities?	Material Assets (MA 4)
Objective 12 Avoid damage to cultural heritage resources in the River Basin District	• Interfere with archaeological, architectural or cultural heritage features?	Cultural Heritage (CH)
Objective 13 Avoid damage to designated landscapes in the River Basin District	• Interfere with designated landscape areas?	Landscape (L)

*Detailed criteria are cited where appropriate and these will be used to ensure consistent application of the objectives.

7.2.1.1 Internal Compatibility of Strategic Environmental Objectives

The internal compatibility of the Strategic Environmental objectives has been examined to identify potential areas of conflict in relation to each objective so that subsequent decisions can be well based. As shown in **Figure 7.1**, below, generally the twelve objectives above are compatible. For example, the objectives for air quality and climate change are consistent with protecting and enhancing biodiversity and protecting human health. In some cases there is no obvious relationship between the objectives, e.g. no direct link between enhancing soil quality and function and making efficient use of water management infrastructure. Potential conflict arises for Objectives 1, 12 and 13 as a number of the other objectives, e.g. 3 and 5, may require increased treatment and construction of infrastructure and, depending on siting and design, this could have impacts on designated landscapes (Objective 13), cultural heritage features (Objectives 12) and biodiversity (Objective 1). This is explored further in **Chapter 8**.

Figure 7.1 Matrix of SEA Objective Internal Compatibility

	Objective 1 BFF	Objective 2 P	Objective 3 Human Health	Objective 4 S	Objective 5 W	Objective 6 AQ	Objective 7 C	Objective 8 MA1	Objective 9 MA2	Objective 10 MA3	Objective 11 MA4	Objective 12 CH	Objective 13 L
Objective 1 BFF													
Objective 2 P	Y / N												
Objective 3 HH	Y / N	Y											
Objective 4 S	Y	Y	Y										
Objective 5 W	Y / N	Y	Y	Y									
Objective 6 AQ	Y	Y	Y / N	Y	Y / N								
Objective 7 C	Y	Y	Y / N	Y	Y / N	Y							
Objective 8 MA1	Y / N	Y	Y	Y	Y / N	Y	Y						
Objective 9 MA2	Y / N	Y	Y	Y / N	Y	Y / N	Y / N	Y					
Objective 10 MA3	Y / N	Y / N	Y	Y / N	Y / N	Y / N	Y / N	Y	Y				
Objective 11 MA4	Y / N	Y	Y	Y	Y	Y	Y	Y	Y	Y / N			
Objective 12 CH	Y / N	Y / N	Y / N	Y	Y / N	Y	Y	Y	Y / N	Y	Y		
Objective 13 L	Y / N	Y / N	Y / N	Y	Y / N	Y	Y	Y	Y / N	Y	Y	Y	

Key: Y = Yes, compatible N = No, not compatible 0 = Neutral Y/N = May be compatible depending on how it is implemented

7.2.1.2 Compatibility with Plan Objectives

The compatibility of the environmental objectives and the Plan objectives was also examined using a compatibility matrix (see **Table 7.2**). The Plan objectives are based on the objectives of the Water Framework Directive. The Plan objectives are broadly compatible with the environmental objectives. However, it is recognised that some Plan objectives may only be compatible with the SEA objectives depending on how they are implemented, e.g. impacts to protected landscapes or cultural heritage features may occur if new infrastructure is required to achieve the Plan objectives and environmental conflicts arise due to the sensitivity/ vulnerability of the proposed location.

Table 7.2 Compatibility of Strategic Plan Objectives and Strategic Environmental Objectives

SEA / PLAN	Objective 1 BFF	Objective 2 P	Objective 3 HH	Objective 4 S	Objective 5 W	Objective 6 AQ	Objective 7 C	Objective 8 MA1	Objective 9 MA2	Objective 10 MA3	Objective 11 MA4	Objective 12 Cultural Heritage	Objective 13 Landscape
Enable waters supporting protected areas* to achieve their stricter status standards	Y	Y	Y	Y	Y	Y / N	Y / N	Y / N	Y	Y / N	Y / N	Y / N	Y / N
Prevent deterioration, and in particular maintain high or good status (surface water)	Y	Y	Y	Y	Y	Y / N	Y / N	Y / N	Y	Y / N	Y / N	Y / N	Y / N
Improve waters where appropriate to achieve at least good standards (surface water)	Y	Y	Y	Y	Y	Y / N	Y / N	Y / N	Y	Y / N	Y / N	Y / N	Y / N
Progressively reduce chemical pollution (surface water)	Y	Y	Y	Y	Y	0	0	Y / N	Y	Y / N	Y / N	Y	0
Limit Pollution Inputs and prevent deterioration (groundwater)	Y	Y	Y	Y	Y	0	0	Y / N	Y	Y / N	Y / N	Y	0
Improve chemical quality and quantity where appropriate to achieve good status (groundwater)	Y	Y	Y	Y	Y	Y / N	Y / N	Y / N	Y	Y / N	Y / N	Y	0
Reverse increasing pollution trends (groundwater)	Y	Y	Y	Y	Y	0	0	Y / N	Y	Y / N	Y / N	Y	0

Key: Y = Yes, compatible N = No, not compatible 0 = Neutral Y/N = May be compatible depending on how it is implemented

* *drinking, bathing and shellfish waters, nutrient sensitive areas, protected habitats and species*

7.2.2 Strategic Environmental Indicators and Targets

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 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 **Table 7.3**.

Table 7.3 Strategic Environmental Objectives, Targets and Indicators

SEA Topic	SEA Objective	SEA Target	SEA Indicators	Data Source
Biodiversity, Flora & Fauna (BFF)	**Objective 1** Prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species.	Halt spread of Alien Species and their associated impact to the aquatic environment.	Interim Indicators: Geographical spread of Alien Species in the District.	Invasive Species Ireland (joint project, NPWS and NIEA)
		Halt deterioration of habitats or their associated species due to water quality related issues by 2015, in line with the Water Framework Directive. *	Status of Northern Ireland Priority Species as reported in the UK Biodiversity Action Plan (every 3 years).	NIEA
		(* This aligns with the Northern Ireland Biodiversity Strategy target to halt loss of biodiversity by 2016.)	Status of Northern Ireland Priority Habitats listed under the Northern Ireland Biodiversity Strategy (every 3 years).	NIEA
			Long term Indicators: Report by the UK under Article 17 on the implementation of the Habitats Directive (reports due every 6 years, second report in 2007).	JNCC
			Condition of Selection Features in sites designated for nature conservation (SACs, SPAs, Ramsar and ASSIs) (reported on every six years).	NIEA

SEA Topic	SEA Objective	SEA Target	SEA Indicators	Data Source
Population (P)	**Objective 2** Contribute to sustainable development.	Provide adequate water and wastewater treatment infrastructure capacity to all urban and suburban areas (cities, towns and villages) within the District by 2015.	Amount of new development in urban and suburban areas where adequate water and wastewater treatment infrastructure capacity is not in place.	DOENI
		Strictly control rural development with the provision of individual wastewater treatment units in accordance with the conditions relating to quality and quantity of effluent discharge as part of the consent to discharge effluent granted by the DOENI.	Number of domestic discharge consent conditions applications granted by NIEA with conditions formulated to ensure sustainable discharges to waterways or soakaway to underground strata.	DOENI
		Mapping of large unsewered populations and method development to calculate the vulnerability of receiving waters to loading of on-site systems.	Number of septic tanks mapped, calculated loads and priority areas identified.	DOENI

SEA Topic	SEA Objective	SEA Target	SEA Indicators	Data Source
Human Health (HH)	**Objective 3** Protect and reduce risk to human health in undertaking water management activities.	All drinking water areas (including groundwater), as identified on the register of protected areas, to achieve good status, or maintain high status, by 2015.	Interim Indicators: Compliance with Drinking Water Standards.	NIEA for all
		All bathing waters, as identified on the register of protected areas, to achieve good status, or maintain high status, by 2015.	Compliance with Bathing Water Standards.	
		All economic shellfish waters, as identified on the register of protected areas, to achieve good status, or maintain high status, by 2015.	Compliance with the Quality of Shellfish Waters Regulations.	
		All water bodies designated for salmonids, as identified on the register of protected areas, to achieve good status, or maintain high status, by 2015.	Condition of salmonids in water bodies designated for these.	
			Long Term Indicator: Parameters to be measured in accordance with the environmental quality standards to determine Good Status.	
Soil (S)	**Objective 4** Avoid damage to the function and quality of the soil resource in the River Basin District.	Interim Targets: Reduce the number of fields with a P-index of 3 or above (i.e. with excess P).	Interim Indicators: Soil Phosphorus levels by P-Index for Managed Grassland Soils.	Agri-Food and Biosciences Institute
		Long term Target: Achieve risk reduction targets as detailed in the Soil Directive for areas identified as at risk (not yet established).	Long Term Indicator: Monitoring programme as established under the requirements for the Soil Directive. (Once established)	Not yet established

SEA Topic	SEA Objective	SEA Target	SEA Indicators	Data Source
Water (W)	**Objective 5** Prevent deterioration of the status of water bodies with regard to quality and quantity and improve water body status* for rivers, lakes, transitional and coastal waters and groundwaters to at least good status, as appropriate to the WFD. * Please note water quality status is based on chemical and biological data as well as morphology of the water body	No deterioration in status of waters currently with high or good status (WFD Objective). Restoration to good status of waters currently at moderate, poor or bad status (WFD Objective). Progressively reduce chemical pollution in waters (WFD Objective). Limit pollution inputs to groundwaters and prevent deterioration (WFD Objective).	Interim Indicators: Environmental Quality Statistics relating to water quality published in the Northern Ireland Environmental Statistics Report. (to be published annually). Long Term Indicator: Water status in 2015 report.	NISRA NIEA
Air Quality (AQ)	**Objective 6** Minimise emissions to air as a result of Plan activities.	Minimise total emissions to air associated with nutrient management.	Distance / number of vehicle trips used to transport nutrients; to be used as a proxy indicator for emissions associated with nutrient management activities, such as removal by tanker of slurry in areas of nutrient surplus. * * The purpose of this indicator is to determine whether the measures aimed at reducing the input of nutrients to water result in indirect effects in emissions to air	Not currently compiled – monitoring of this would need to be integrated into the Waste Licences for operators of these activities
		Compliance with odour criteria to prevent deterioration in amenity beyond the site boundary as set out in license for new or upgraded wastewater infrastructure.	Number of complaints received related to odour.	Monitored by the DOENI as part of the IPPC licence process.
		Compliance with odour criteria to prevent deterioration in amenity beyond the site boundary due to changes in industrial practices due to plan implementation.	Number of complaints received related to odour.	Monitored by the DOENI as part of the IPPC licence process.

SEA Topic	SEA Objective	SEA Target	SEA Indicators	Data Source
Climatic Factors (C)	**Objective 7** Minimise contribution to climate change by emission of greenhouse gasses associated with Plan implementation.	Use BAT, including renewable energy, to minimise GHG from new or upgraded wastewater infrastructure in line with the UK's commitments to reduce GHG emissions under the Kyoto Protocol.	Calculated CO_2 equivalent in tonnes from new or upgraded water infrastructure, e.g. WWTW, including emissions associated with the digestion and / or incineration of sludge.	To be calculated based on changes in water infrastructure
		Use BAT, including renewable energy, to minimise GHG from changes in industrial practices due to plan implementation in line with the UK's commitments to reduce GHG emissions under the Kyoto Protocol.	Calculated CO_2 equivalent in tonnes due to changes in industrial practices.	To be calculated based on changes in industrial practices, records of which are held as part of the IPPC licence process by the DOENI.
		No net loss of CO_2 sequestering vegetation due to changes in forestry practices as a result of Plan activity.	Calculated CO_2 sequestering potential of forest vegetation based on forest cover.	National Council for Forest Research and Development for CO_2 sequestration potential. Northern Ireland Forest Service for forest cover figures.
Material Assets (MA1)	**Objective 8** Maintain level of protection provided by existing morphological infrastructure, e.g. flood defences, coastal barriers, groynes, etc.	No increase in the amount of infrastructure at risk from flooding as a result of Plan activities. In this case the length of road and rail infrastructure at risk will be used as a proxy indicator for infrastructure in general.	Interim Indicator: Number of Flood Risk Management Plans prepared in accordance with the Floods Directive (2007/60/EC).	Rivers Agency
			Long Term Indicator: Length of road and rail infrastructure at risk from flooding.	Rivers Agency
Material Assets (MA2)	**Objective 9** Provide new, and upgrade existing, water management infrastructure to protect human health and ecological status of water bodies.	Interim Target: Increase investment in water management infrastructure.	Interim Indicator: Water services investment expenditure per annum.	Northern Ireland Water
		Long Term Target: Achievement of the targets set out in the Investment Strategy for Northern Ireland 2008 - 2018 to upgrade water and wastewater treatment infrastructure to comply with current standards by 2014.	Long Term Indicator: Progress towards completion of projects Alpha (to upgrade of water treatment and delivery systems) and Omega (to upgrade of wastewater treatment and sludge disposal facilities) as laid out in the Northern Ireland Investment Strategy 2008 – 2014.	Northern Ireland Water / Utility Regulator

SEA Topic	SEA Objective	SEA Target	SEA Indicators	Data Source
Material Assets (MA3)	**Objective 10** Support economic activities within the District without conflicting with the objectives of the WFD. * * This includes, but is not limited to consideration of land uses, such as agriculture and existing residential development, as well as industrial activities, fisheries, mineral extraction and commercial port activities.	Minimise impacts to economic activity due to Plan implementation without conflicting with the objectives of the WFD.	Percent change in land cover types due to Plan implementation.	Northern Ireland Countryside Survey
Material Assets (MA4)	**Objective 11** Protect water as an economic resource.	Achieve sustainable use of water in the context of maintaining its economic benefit.	Change in economic value of water relative to the baseline report: The Northern Ireland Water Framework Directive Article 5 Economic Analysis of Water Use	Economic studies carried out as a part of the plan making process during the second cycle of river basin management planning.
Cultural Heritage (CH)	**Objective 12** Avoid damage to cultural heritage resources in the River Basin District.	No physical damage or alteration of the context of cultural heritage features due to Plan activities.	Changes in the condition of monuments on the SMR due to Plan implementation. Number of listed structures at risk due to Plan implementation.	Condition and Management Survey of the Archaeological Resource for Northern Ireland Built Heritage at Risk Northern Ireland (BHARNI) Register
Landscape (L)	**Objective 13** Avoid damage to designated landscapes in the River Basin District.	No damage to designated landscapes as a result of Plan implementation.	Number of wastewater treatment plants sited in landscapes with a high sensitivity to change. Percentage changes in land cover types in areas with a high sensitivity to change.	Northern Ireland Water Northern Ireland Countryside Survey

8 ALTERNATIVES

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 (see **Figure 8.1**).

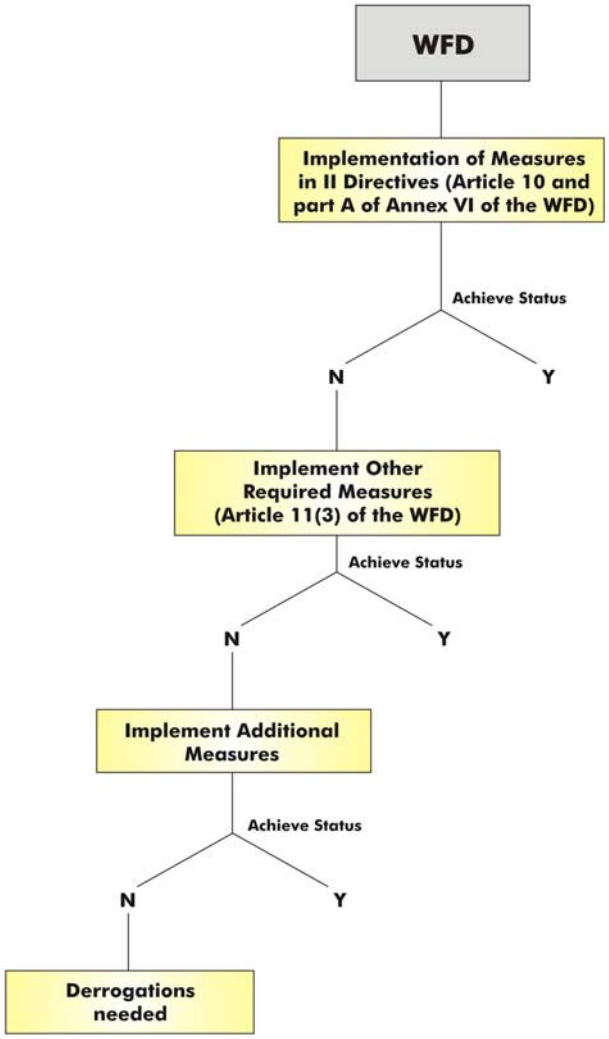

Figure 8.1 Process to Determine what Measures are Required

The terminology used to describe the measures included in the draft Plan differs slightly between the SEA and the draft Plan itself. Therefore, the following table is provided to assist the reader when comparing the SEA with the draft Plan.

SEA Terminology	Northern Ireland Plan Terminology
Required Measures Contained in Existing Water Protection Directives as listed Annex VI Part A of the WFD	Actions we are already taking
Other Required Measures as listed in Article 11(3) of the WFD	Actions we are already taking
Additional Measures	Further Actions

Based on discussion above it was determined that implementation of the legally required measures alone represented the 'business as usual' scenario, in that they would be required measures in the absence of any additional policy changes or improvements to infrastructure. Conversely, the additional measures / actions represent the **range of alternatives** that could form an element of the RBMP/ POM.

8.1 REQUIRED MEASURES

As stated above, each of the River Basin Management Plans must include a set of management measures aimed at achieving the objective of good status in all water bodies by 2015 under the WFD (some derogations are permitted).

Article 11 of the WFD sets out what must be covered by the POM for each (I)RBD. Fundamental to Article 11 are measures which implement 11 key existing European water protection directives, as laid out in Article 10 and part A of Annex VI of the WFD. These measures are mandatory and include the actions in **Table 8.1**.

In addition, Article 11(3) of the WFD proposes further measures be carried out. These further measures are also mandatory and include the actions outlined in **Table 8.2**.

Table 8.1 Required Measures Contained in Existing Water Protection Directives as listed Annex VI Part A of the WFD

Associated Regulations	Key Authorities	Actions Required
The Bathing Water Directive (76/160/EEC) as amended by Directive (2006/7/EC)		
Quality of Bathing Water Regulations (Northern Ireland) 2008 (S.R. 2008/231)	Department of the Environment	Undertake comprehensive monitoring and establish bathing water profiles. Implement measures where bathing waters are subject to pollution and poor water quality.
The Birds Directive (79/409/EEC)		
Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (S.R. 1995/380) as amended by S.R. 2004 No.435, S.R. 2003 No.46 and S.R. 2007 No. 345	Department of the Environment	Set out measures for the conservation of natural habitats and of wild flora and fauna. Selection, registration and notification of sites to be protected, development of management agreements and the requirement for appropriate assessment of plans and programmes.
Offshore Petroleum Activities (Conservation of Habitats) Regulations (S.R. 2001/1754)	UK Secretary of State	Implement Birds Directive in relation to oil and gas activities carried out wholly or partly on the UK continental shelf.
Offshore Marine Conservation (Natural Habitats etc.) Regulations (S.R. 2007/1842)	Department of the Environment (and any other NI Department with relevant functions)	Implement Birds Directive with regard to offshore marine areas, offshore marine installations and certain ships and aircraft.
The Drinking Water Directive (80/778/EEC) as amended by Directive (98/83/EC)		
Water Supply (Water Quality) Regulations (Northern Ireland) 2007 (S.R. 2007/147)	Department of Regional Development	Provide wholesome, clean water for human consumption
The Major Accidents (Seveso) Directive (96/82/EC)		
Control of Major Accident Hazards Regulations (Northern Ireland) 2000 (S.R. 2000/93), as amended by S.R. 2005 No. 305	Department of Enterprise, Trade and Investment, Northern Ireland	Operators at all sites covered by these regulations must take measures to prevent major accidents and limit their consequences to persons and the environment. They must also establish a major accident prevention policy.
Planning (Control of Major Accident Hazards) Regulations (Northern Ireland) (S.R. 2000/101)		Requires that the objectives of preventing major-accidents and limiting the consequences of such accidents are taken in to account in land use planning policies.
The Environmental Impact Assessment Directive (85/337/EEC)		
Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 1999 (S.R. 1999/73), as amended by S.R. 2008 No. 17)	Department of the Environment	Take measures necessary to make sure that projects likely to have significant effects on the environment by virtue of their nature, size or location are subject to an Environmental Impact Assessment (EIA).
Town and Country Planning (Environmental Impact Assessment) (Amendment) Regulations 2006 (S.R. 2006/3295)	UK Secretary of State	

Associated Regulations	Key Authorities	Actions Required
Roads (Environmental Impact Assessment) Regulations (Northern Ireland) (S.R. 1999/89)	Department of the Environment	
Environmental Impact Assessment (Fish Farming in Marine Waters) (Amendment) Regulations (Northern Ireland) (S.R. 2007/23)	Department of Agriculture and Rural Development	
Harbour Works (Environmental Impact Assessment) Regulations (Northern Ireland) S.R. 2003/136	Department of Regional Development & Department of Agriculture and Rural Development	
Drainage (Environmental Impact Assessment) Regulations (Northern Ireland) (S.R. 2006/34)	Department of Agriculture and Rural Development	
Environmental Impact Assessment (Uncultivated Land and Semi Natural Areas) Regulations (Northern Ireland) (S.R. 2006/90)	Department of Agriculture and Rural Development	
Environmental Impact Assessment (Forestry) Regulations (Northern Ireland) (S.R. 2006/518)	Department of Agriculture and Rural Development	
Environmental Impact Assessment and Natural Habitats (Extraction of Minerals by Marine Dredging) (England and Northern Ireland) Regulations (S.I. 2007/1067)	UK Secretary of State	
Environmental Impact Assessment (Agriculture) Regulations (Northern Ireland) (S.R. 2007/421)	Department of Agriculture and Rural Development	
Offshore Electricity Development (Environmental Impact Assessment) Regulations (Northern Ireland) (S.R. 2008/55)	Department of Enterprise, Trade and Investment	
Marine Works (Environmental Impact Assessment) Regulations (S.I. 2007/1518)	UK Secretary of State & Department of the Environment	
Offshore Petroleum Production and Pipe lines (Assessment of Environmental Effects) Regulations (S.R. 1999/360)	UK Secretary of State	

Associated Regulations	Key Authorities	Actions Required
Water Resources (Environmental Impact Assessment) Regulations (Northern Ireland) (S.R. 2005/32) as amended by S.R. 2006 No. 483	Department of the Environment	
The Sewage Sludge Directive (86/278/EEC)		
Sludge (Use in Agriculture) Regulations (Northern Ireland) 1990 (S.R. 1990/245)	Department of Agriculture and Rural Development	The Regulations prohibit the use of sewage sludge from treatment plants unless certain requirements are met. For example, soil and sludge must be tested before application to land, no fruit or vegetable crops should be growing or be harvested at the time of use, and the sludge producer must keep a register of the quantity and composition of sludge supplied.
The Urban Waste-water Treatment Directive (91/271/EEC)		
Urban Waste Water Treatment Regulations (Northern Ireland) 2007 (S.R. 2007/187)	Department of the Environment & Department of Regional Development	Provide and maintain collecting systems and treatment plants. Specific requirements for provision of treatment within specified dates.
The Plant Protection Products Directive (91/414/EEC)		
Plant Protection Products Regulations (Northern Ireland) 2005 (S.R. 200/ 526), as amended by S.R. 2007 No. 251	Department of Agriculture and Rural Development	Authorise substances for use or marketing subject to rigid controls/
The Nitrates Directive (91/676/EEC)		
The Protection of Water Against Agricultural Nitrate Pollution Regulations (Northern Ireland) 2004 (S.R. 2004/419) as amended by S.R. 2005 No. 306	Department of the Environment & Department of Agriculture and Rural Development	The regulations make provision for the Department of the Environment and the Department of Agriculture and Rural Development to adopt an action programme for territory in Northern Ireland.
Nitrates Action Programme Regulations (Northern Ireland) 2006 (S.R. 2006/489), as amended by S.R. 2008 No. 196.	Department of the Environment & Department of Agriculture and Rural Development	Introduce an action programme applicable to all farmers. The action programme will be reviewed in 2010.
The Integrated Pollution Prevention Control Directive (96/61/EC)		
Pollution Prevention and Control Regulations (Northern Ireland) 2003 (S.R. 2003/46) as amended by S.R. 2004 No. 507, S.R. 2005 No. 285, S.R. 2005 No. 454, S.R. 2006 No. 98 and S.R. 2007 No. 245	Department of the Environment	Establish a regime for the control of industrial and all other installations that have a considerable impact the environment. Develop an integrated approach to controlling pollution from industrial sources by regulating emissions into air, water and land through a permit system, based on the principal of Best Available Techniques.
Offshore Combustion Installation (Prevention and Control of Pollution) (S.I. 2001/1091)	UK Secretary of State	Impose a pollution control regime for offshore combustion installations e.
The Habitats Directive (92/43/EEC)		
Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (S.R. 1995/380) as amended by S.R. 2004 No.435, S.R. 2003 No.46 and S.R. 2007 No. 345	Department of the Environment	Set out measures for the conservation of natural habitats and of wild flora and fauna. Selection, registration and notification of sites to be protected, development of management agreements and the requirement for appropriate assessment of plans and programmes.

Associated Regulations	Key Authorities	Actions Required
Environmental Impact Assessment and Natural Habitats (Extraction of Minerals by Marine Dredging) (England and Northern Ireland) Regulations 2007 (S.I. 2007/1067)	UK Secretary of State and the Department of the Environment	Establish a scheme which regulates marine minerals dredging in English and Northern Ireland waters.
Environmental Impact Assessment (Agriculture) Regulations (Northern Ireland) (S.R. 2007/421)	Department of Agriculture and Rural Development	Require an assessment of whether projects above certain thresholds are likely to have significant effects on the environment.
Offshore Petroleum Activities (Conservation of Habitats) Regulations (S.R. 2001/1754)	UK Secretary of State	Implement Habitats Directive in relation to oil and gas activities carried out wholly or partly on the UK continental shelf.
Offshore Marine Conservation (Natural Habitats etc.) Regulations (S.I. 2007/1842)	UK Secretary of State	Implement Habitats Directive with regard to offshore marine areas, offshore marine installations and certain ships and aircraft.

Table 8.2 Other Required Measures as listed in Article 11(3) of the WFD

Implementation in N. Ireland	Actions Required	Assessed?
WFD 1: Cost recovery for water use and promotion of efficient and sustainable water use		
Currently non-domestic customers are charged for water consumption and sewerage and trade effluent discharge by Northern Ireland Water. The Northern Ireland Executive is currently considering charging methodologies to introduce charging for domestic users. The proposed Water Supply (Water Fittings) Regulations (Northern Ireland) 2009 when finalised will replace the Water Regulations (Northern Ireland) 1991 and will reduce possible contamination of the public drinking water supply through prescribing appropriate backflow prevention devices to prevent contaminated water from entering the public supplies. The proposed regulations represent the final stage in the Water Safety Plan approach and are designed to ensure that water systems in premises do not contaminate the wider mains water supply. A key priority for Northern Ireland Water is to reduce water leakage to the Economic Level of Leakage, this is a calculated level of leakage at which any further reduction in the leakage level would incur costs in excess of the benefits derived from the savings. The current figure to be achieved by March 2010 is 135.5 mega litres per day. However in accordance with industry best practice the Economic Level of Leakage figure is currently being reviewed.	Member States must adopt a cost recovery system to ensure that water pricing polices act as incentives towards efficient water usage. The WFD also requires measures to promote efficient and sustainable water use.	See **Table 9.1** for assessment.
WFD2: Protection of drinking water sources		
Northern Ireland Water (NIW) has initiated a programme to develop Drinking Water Safety Plans by 2010. As part of the development of water safety plans NIW and the Northern Ireland Environment Agency will develop a risk assessment approach to identify where action is required to reduce the risk of pollution which could affect public drinking water sources.	Protect all ground and surface waters that are used, or may be used in the future, as a source of drinking water for more than 50 people, or where the rate of abstraction is above $10m^3$ per day.	See **Table 9.1** for assessment.
WFD3: Abstraction and impoundment control		
The Department of the Environment introduced Water Abstraction and Impoundment (Licensing) Regulations (Northern Ireland) 2006 (S.R. 2006/482) in 2006. The regulations came into effect on the 1st February 2007 and involve licensing and charging for all applications above abstracting volumes above $20m^3$ per day. Abstractions below this threshold are required to adhere to Permitted Controlled Activity Conditions. The regulations also require authorisation of impounding works/structures that control water levels upstream.	Member States must have controls for significant surface water and groundwater abstractions and surface water impoundments.	See **Table 9.1** for assessment.

Implementation in N. Ireland	Actions Required	Assessed?
WFD4: Point source and diffuse source discharges control		
There are many measures and activities in place to prevent and control point and diffuse source discharges, some of these include: • Regulation of wastewater discharges under the Water and Sewerage Services (Northern Ireland) Order 2006 (S.I. 2006/3336); • Northern Ireland Water Capital Works Programme; • Regulation of industrial discharges under the Water (Northern Ireland) Order 1999 (S.I. 1999/662); • Review of discharge consents to meet WFD environmental standards; • Regulation of major industrial activities under the Pollution Prevention and Control Regulations (Northern Ireland) 2003 (S.R. 2003/46) as amended by S.R. 2004 No. 507, S.R. 2005 No. 285, S.R. 2005 No. 454, S.R. 2006 No. 98 and S.R. 2007 No. 245; • Regulation non-mains sewage under the Water Order (Northern Ireland) 1999 (S.I. 1999/662); • Nitrates Action Programme under the Nitrates Action Programme Regulations (Northern Ireland) 2006 (S.R. 2006/489), as amended by S.R. 2008 No. 196; • Phosphorus use in Agriculture Regulations (Northern Ireland) 2006 (S.R. 2006/488); • Control Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations (Northern Ireland) 2003 (S.R. 2003/319); • Control of waste under the Waste and Contaminated Land (Northern Ireland) Order 1997 (S.I. 1997/2778); • Control discharges to groundwater under the Groundwater Regulations (Northern Ireland) 1998 (S.R. 1998/401); • Surface Waters (Fishlife) (Classification) (Northern Ireland) Regulations 1997 (S.R. 1997/488) as amended by S.R. 2003 No. 194 and S.R. 2007 No. 405; • Surface Water (Shellfish) (Classification) Regulations (Northern Ireland) 1997 (S.R. 1997/489); and • Quality of Bathing Water Regulations (Northern Ireland) 1993 (S.R. 1993/205) For a comprehensive list of point and diffuse source discharge controls please refer to the Northern Ireland River Basin Management Plans (Tier 2) Programme of Measures for point and diffuse source pressures.	Prior regulation is required for point source discharges liable to cause pollution. For diffuse sources of pollution, measures to prevent or control pollutant input are also required. Controls may include: prohibition on the entry of pollutants into water; prior authorisation; or registration based on general binding rules, laying down pollutant emission controls.	See **Table 9.1** for assessment.

Implementation in N. Ireland	Actions Required	Assessed?
WFD5: Controls on physical modifications to surface waters		
There are a number of existing systems in place for the control of physical modifications in freshwater and marine waters. **Freshwaters** • General control on development under the Planning (Northern Ireland) Order 1991 • Control of culverting through consent or approval under Schedule 6 of the Drainage (Northern Ireland) Order 1973 • Regulation of the removal of material from river beds under the Fisheries Act (Northern Ireland) 1966 (c.17) as amended by 2001 (c.4). • Control of any physical modification in designated areas under the Conservation (Natural Habitats, etc.) (Amendment) Regulations (Northern Ireland) 2007 (S.R. 2007/345) **Marine waters** • In estuarine and coastal waters the deposit of articles and substances in the sea, including coastal defence structures, harbour works, land reclamation and sea disposal of dredged material require a licence under Part II of the Food and Environmental Protection Act 1985. • Control of works in harbours through the Harbour Works (Environmental Impact Assessment) Regulations (Northern Ireland) 2003 (S.R. 2003/136). • The extraction of marine minerals is controlled by a licensing system under the Environmental Impact Assessment and Natural Habitats (Extraction of Minerals by Marine Dredging (England and Northern Ireland) Regulations, 2007 (S.I. 2007/1067). • Control of any physical modification in designated areas under the Conservation (Natural Habitats, etc.) (Amendment) Regulations (Northern Ireland) 2007 (S.R. 2007/345) The Department of Environment is undertaking a review of existing legislative controls to control physical modifications to surface waters. Further detail on the outcome of the review and any proposals arising from it will be made available in the final river basin plan in 2009.	Member States must ensure that the physical condition of surface waters support required ecological standards. Controls can take the form of prior authorisation and/or registration based on general binding rules.	See **Table 9.1** for assessment.

Implementation in N. Ireland	Actions Required	Assessed?
WFD6: Prevention or reduction of the impact of accidental pollution incidents		
There are a number of existing systems in place to prevent or reduce the impact of accidental pollution incidents, they include: • The UK National Contingency Plan which sets out detailed plans to ensure there is a timely, measured and effective response to marine pollution incidents; • The Northern Ireland Coastal Contingency Plan details the actions to be taken to minimise the effects of unauthorised discharges of polluting substances to coastal waters; • NIEA's Water Pollution Response Procedures are aimed at mitigating and reducing the impact of pollution incidents; • Harbour authorities and oil handling facilities of a certain size and or turnover are required to produce Oil Pollution Preparedness, Response and Co-operation Plans to respond to pollution incidents; • In major ports and harbours the Port Marine Safety Code is implemented through Port Safety Management Systems; • NIEA uses a Pollution Risk Assessment mechanism to provide advice and in certain circumstances enforcement options under the Water Order 1999 to negate or prevent accidental pollution ; and • The Water Pollution Hotline has enabled staff from NIEA to take steps to contain pollution and in numerous cases bring successful legal action against individuals and businesses that have been proven to be responsible for pollution events.	Measures must be in place to prevent significant losses of pollutants from technical installations, and to prevent and/or to reduce the impact of accidental pollution incidents. These measures include systems to detect or give warning of events and in the case of accidents include all appropriate measures to reduce the risk to aquatic ecosystems.	See **Table 9.1** for assessment.
WFD7: Authorisation of discharges to groundwater		
The Department of the Environment introduced the Groundwater Regulations (Northern Ireland) 1998 (S.I. 1998/401) in 1998. These Regulations, along with the Water (Northern Ireland) Order 1999, require the Department of the Environment to prevent the direct or indirect discharge of list I substances to groundwater and to control pollution resulting from the direct or indirect discharge of list II substances. A consultation exercise setting out proposals to transpose the new Groundwater Daughter Directive (GWDD) (2006/118/EC) is ongoing. Following the consultation exercise new transposing Regulations incorporating the existing Groundwater Regulations and the relevant requirements of the WFD and the GWDD will be introduced in 2009.	Prior authorisation is required for reinjection of waters for a number of specific activities (such as dewatering for mining or construction, exploration for oils and injection for storage of gas). Construction or civil engineering works, which could influence the water table, also require authorisation and general binding rules.	See **Table 9.1** for assessment.

Implementation in N. Ireland	Actions Required	Assessed?
WFD8: Priority substances control		
33 Priority Substances have been identified at European level. The Daughter Directive concerning these substances is due to be published in the European Journal by December 2008. The Directive will implement new standards for these substances. After publication, the UK will have a period of up to 18 months to produce new legislation. Under the Daughter Directive, NIEA will be required to establish inventories of emissions, discharges and losses of priority substances by no later than 2010. NIEA is carrying out work to monitor for these substances and will implement the requirements for phase out or reduction of them through pollution reduction plans. The European REACH Regulation will be implemented progressively over a number of years in Northern Ireland with the most hazardous, high volume substances addressed first. Risks to the environment and human health will be identified and, where necessary, controls will be put in place to ensure a high level of protection.	Measures are required to eliminate pollution of surface waters by 33 priority substances and 8 other pollutants and must aim to progressively reduce pollution from priority substances and cease or phase out emissions, discharges and losses of priority hazardous substances.	See **Table 9.1** for assessment.
WFD9: Controls on other activities impacting on water status		
There are a number of mechanisms in place to control invasive alien species in Northern Ireland, they include: • The Wildlife Order (NI) 1985. The Order contains measures for preventing the establishment of species not native to Northern Ireland which may be detrimental to native wildlife. It is an offence under Article 15 of the Wildlife Order to "release or cause to escape into the wild" any animal that is not ordinarily resident in or is not a regular visitor to Northern Ireland in a wild state. • The Fisheries Act (NI) 1966. Section 13 of this Act is specifically relevant to the control of non-native fish species. Under the Act an order can be made prohibiting the introduction of live fish or eggs of specific species. • The Prohibition of Introduction of Fish Order (NI) 1979. This prohibits the introduction of specified species of fish into inland waters.	Measures must be put in place to deal with any other identified significant adverse impacts on water status. Controls can include prior authorisation or registration based on general binding rules.	See **Table 9.1** for assessment.

8.2 ADDITIONAL MEASURES

Where application of the mandatory measures listed in **Tables 8.1** and **8.2** will not be sufficient to achieve the WFD objective of good status in all water bodies by 2015, **additional measures** need to be identified and considered (see **Figure 8.1**). 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 and includes:

(i) legislative instruments;

(ii) administrative instruments;

(iii) economic or fiscal instruments;

(iv) negotiated environmental agreements;

(v) emission controls;

(vi) codes of good practice;

(vii) recreation and restoration of wetlands areas;

(viii) abstraction controls;

(ix) demand management measures, inter alia, promotion of adapted agricultural production such as low water requiring crops in areas affected by drought;

(x) efficiency and reuse measures, inter alia, promotion of water-efficient technologies in industry and water-saving irrigation techniques;

(xi) construction projects;

(xii) desalination plants;

(xiii) rehabilitation projects;

(xiv) artificial recharge of aquifers;

(xv) educational projects;

(xvi) research, development and demonstration projects; and

(xvii) other relevant measures.

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 Screening stage of 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 previously in **Chapter 5**. They have been set out below under each of the pressure topics 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. The range of additional measures that can be selected from is provided in **Tables 8.3 to 8.13**.

The preparation of the draft Plan for the NERBD was carried out at the same time as the other seven plans for the island. Three of the draft Plans prepared during this time were for international RBDs (i.e. the North Western IRBD, Neagh Bann IRBD and the Shannon IRBD) and as such they include the suite of additional measures generated by both the Northern Ireland and Ireland plan processes. As most of the measures proposed could be useful in both jurisdictions, it is considered appropriate that all of the proposed measures be considered in the SEA to address relevant pressures in the NERBD, regardless of the Plan in which they were originally proposed; therefore, **Tables 8.3 to 8.13** include measures considered in both the Northern Ireland and Ireland plan making processes. It is acknowledged that a few of the measures are only applicable in their specific jurisdiction, e.g. legislation; therefore, a reference to the source Plan for each measure is included on the left hand side of the table for clarity. Please see the appendix to this chapter for a breakdown (by pressure) of which measures are currently being considered in each jurisdiction as well as a summary of the measures originating from the Northern Ireland plan process.

Not all of these measures are suitable for assessment. Where a measure is unsuitable for assessment, an **X** has been shown on the left hand side of the table, with a commentary on why an assessment has not been carried out provided in the right hand column. Where a measure can be assessed, this is indicated by a check mark (√) in the left hand column, with the right hand column listing where the assessment can be found in **Chapter 9**.

It should be noted that the measures proposed in the draft Plan and POM have been developed to meet the objectives of the WFD (see **Section 1.1**) and as such will broadly have a positive impact on water quality and aquatic biodiversity, if implemented. While many of the measures proposed in the draft Plan have been fully assessed in the SEA there several that do not lend themselves to formal assessment, as stated above. Nonetheless these measures, if implemented, would be expected to contribute to the overall positive impact of the Plan/POM as they would be expected to: provide the tools, methodologies and controls to help inform key actions; allow for a more focussed response from those challenged with administration of the Plan; provide a coordinated approach to water management through the provision of standardised methodologies and controls; and increase public and industry awareness of water management issues.

It should be noted that the additional measures have been grouped by pressure. In order to maintain consistency between the 2007 SWMI document, the discussions in the SEA Scoping Document and the Environmental Report it was decided to use pressure headings similar to those included in the SWMI document for these groupings. It is acknowledged that these headings have evolved throughout the plan process and that differences, though subtle, have arisen between the headings

originally used in the SWMI and some of those now included in the Plan. Therefore, for clarity and ease of comparison between the Plan and the Environmental Report, the following table of terminology is provided. In addition, where the Plan terminology differs, the Plan heading is provided in brackets at the start of each table. It should also be noted that there are several new headings, for which there is no direct comparison to the SWMI document. These are also listed below.

SEA Terminology	Northern Ireland Plan Terminology	Ireland Plan Terminology
Wastewater	Collection and Treatment of Sewage / Urban Development	Wastewater
Industrial Discharges	Industry and Other Businesses	Industrial Discharges
Other Point Sources (landfills, quarries, mines and contaminated lands)	Industry and Other Businesses / Waste	Landfills, quarries, mines and contaminated lands
Agriculture	Agriculture	Agriculture
Wastewater from unsewered properties	Collection and Treatment of Sewage	Wastewater from unsewered properties
Forestry	Forestry	Forestry
Usage and Discharge of Dangerous Substances	Included under key sectors under pollution	Dangerous substances and chemical pollution
Physical Modifications	Freshwater Morphology/ Marine Morphology	Physical Modifications
Abstractions	Abstraction and Flow Regulation	Abstractions
Local Issues		Locally focussed and future issues
Alien Species	Alien Species	Alien Species
Cruising and Boating	N/A	Cruising and Boating
Aquaculture	Industry and Other Businesses	Aquaculture
Peat Extraction	Industry and Other Businesses	Peat Extraction
Protecting High Quality Areas	N/A	Protecting High Quality Areas
Shared Waters	N/A	Shared Waters
Fisheries*	Fisheries	N/A
Urban Development*	Urban Development	Wastewater / Industrial Discharges

* *new heading*

Table 8.3 Additional Measures for Point and Diffuse Sources: Wastewater (NI: Collection and Treatment of Sewage / Urban Development)

Source Plan	Assessed ?	Additional Measures	Comment
Reduce			
Ire	√	WW1: Measures intended to reduce loading to the treatment plant: - Limit or cease the direct importation of polluting matter (e.g. liquid wastes, landfill leachate) - Investigate extent of use and impact of under-sink food waste disintegrators and take appropriate actions - Investigate fats/oils/grease influent concentrations and take actions to reduce FOG entering the collection system - Upgrade and rehabilitate Combined Sewer Overflows (CSOs)	See Table 9.3 for assessment
Ire	√	WW2: Impose development controls using a common approach where there is, or is likely to be in the future, insufficient capacity at treatment plants	See Table 9.3 for assessment
Ire	X	WW3: Initiate investigations into characteristics of treated wastewater for parameters not presently required to be monitored under the urban wastewater treatment directive	These measures are directed at data gathering and while they provide the tools, methodologies and data required to inform key actions arising from the Plan, they are not suitable for SEA.
Ire	X	WW4: Initiate research to verify risk assessment results and determine the impact of the discharge, including impacts to groundwater	
Ire	X	WW5: Use decision-making tools in point source discharge management	This measure will ensure consistency of point discharge measure application through use of a set of consistent decision-making tools. While it is a valuable measure and will provide the required tools to inform key actions, it is not suitable for SEA
	√	WW6: Reduction in pollution at source through education campaigns	See Table 9.3 for assessment
NI	√	WW7: Reduce loading by introduction of phosphate free products	See Table 9.3 for assessment

NI	X	WW8:	Review consent conditions to ensure adequate controls and emission limits are set to achieve new water quality standards in receiving waters. Further development of mathematical models to examine cumulative impacts of discharges at a catchment scale. Detailed analysis to support the review of the consents for sewer systems and to address the volume spilt from overflows in urban areas.	This type of measure is not expected to result in significant environmental impacts and as such has not been assessed. However, impacts could occur if systems are found to be in noncompliance, and thus require upgrade. Therefore, it is anticipated that this measure would be the first step in implementation of measures such as WW10 to WW14 which have been assessed (see Table 9.3).
NI	X	WW9:	Review the environmental investment required after 2015, prioritise environmental problems and develop indicative lists.	Development of lists is part of the information gathering stage of the planning process. This measure could be linked to other measures considered and will be informed by monitoring associated with the WFD and SEA process. Assessment of this measure would be premature prior to a decision being made on the specific projects to be implemented. It should be noted that some of the projects that could be chosen, e.g. installation of higher standards of treatment, are assessed under separate measures where these have been specifically called out (e.g. WW11). It is highly recommended that when specific proposals are chosen, that these be subject to environmental assessment to identify potential impacts.
Replace / Upgrade				
Ire	√	WW10:	Install secondary treatment at plants where this level of treatment is not required under the urban wastewater treatment directive	See Table 9.3 for assessment
Ire	√	WW11:	Apply a higher standard of treatment (stricter emission controls) where necessary	See Table 9.3 for assessment
Ire	√	WW12:	Upgrade the plant to remove specific substances known to impact on water quality status	See Table 9.3 for assessment
Ire	√	WW13:	Install ultra-violet or similar type treatment	See Table 9.3 for assessment
Relocate				
Ire	√	WW14:	Relocate the point of discharge	See Table 9.3 for assessment
Ire	√	WW15:	Introduce design and construction codes for wastewater infrastructure in areas of groundwater vulnerability. These could include prioritisation of construction supervision and avoidance of Inner Source Protection Zones	The provision of design and construction codes would contribute to the overall positive impact of the POM as they provide the tools to inform key actions arising from the Plan. However, because the details of what these would include are not available at this time, it is not possible to assess the impacts associated with these. It is recommended that when the details of these are known, they are subject to an environmental assessment to identify potential impacts other than those related to water, e.g. population, etc.
Ire	√	WW16:	Implement Community Digestors for Alternative Energy	See Table 9.3 for assessment.

Ire	**X**	WW17: Implement and audit performance management systems at all WWTPs	This type of measure is not expected to result in significant environmental impacts and as such has not been assessed. However, impacts could occur if systems are found to be performing below required thresholds. Therefore, it is anticipated that this measure would be the first step in implementation of measures such as WW10 to WW14, which have been assessed (see Table 9.3).

Table 8.4 Additional Measures for Point and Diffuse Sources: Industrial Discharges (NI: Industry and Other Businesses)

Source Plan	Assessed ?	Additional Measure		Comment
Reduce				
NI	X	IND1:	Implement management controls as they become available, e.g. new or improved guidance, new or revised legislation or regulations, codes of practice These may include: proposed Environmental Impact Assessment (Fish Farming in Marine Waters) Regulations (NI) Introduction of codes of practice for potentially polluting activities and consideration of a system of Generally Binding Rules (GBR)	There are a number of management controls identified as potential measures, the details of which are not yet available. It is not possible to assess the impacts associated with these at this time; however, it is strongly recommended that when the details of these are known, they are subject to an environmental assessment to identify potential impacts other than those related to water, e.g. population, etc. The overall positive aspect of these measures should be noted as they provide the tools, methodologies and data required to inform key actions arising from the Plan. The positive effects are anticipated be to realised in the medium to long term as regulations will have to be drafted and agreed at government level following stakeholder consultation.
NI	√	IND2:	Develop oil storage regulations to reduce pollution impacts	See Table 9.4 for assessment
NI	√	IND3:	Achieve compliance with discharge consent / licence standards to reduce inputs at source	See Table 9.4 for assessment
NI	X	IND4:	Compile an inventory of management best practice and reduce peat usage	. See Table 9.4 for assessment
NI	X	IND5:	Further research into diffuse pollution modelling	This measure is directed at information / data gathering and as such is not suitable for SEA; however, the positive contribution of this measure to informing key actions arising from the Plan should be noted.
Replace / Upgrade				
Ire	√	IND6:	Introduce Best Available Techniques (BAT) for industrial discharges	See Table 9.4 for assessment
NI	√	IND7:	Improve point source discharge controls after examination of the cumulative impact of discharge consents at a catchment scale	See Table 9.4 for assessment
Relocate				
Ire	√	IND8:	Relocate discharge point	See Table 9.4 for assessment

Table 8.5 Additional Measures for Point and Diffuse Sources: Other Sources (landfills, quarries, mines & contaminated lands) (NI: Industry and Other Businesses / Waste)

Source Plan	Assessed ?	Additional Measure	Comment
Reduce			
NI	**X**	OP1: Implement management controls as they become available, e.g. new or improved guidance, new or revised legislation or regulations, codes of practice These could include: EU Mining Waste Directive Planning Policy Statement 19 on Planning Minerals (NI) Contaminated Land Regulations and Associated Guidance (NI)	There are a number of management controls identified as potential measures, the details of which are not yet available. It is not possible to assess the impacts associated with these at this time; however, it is strongly recommended that when the details of these are known, they are subject to an environmental assessment to identify potential impacts other than those related to water, e.g. population, etc. The overall positive aspect of these measures should be noted as they provide the tools, methodologies and data required to inform key actions arising from the Plan.
NI	√	OP2: Reduce pollution arising from waste management, e.g. use of Site Waste Management Plans, proper disposal of construction, demolition and electrical wastes, segregated collection	See Table 9.5 for assessment
NI	√	OP3: Introduce a Quality Protocol for the production of aggregates from inert waste to prevent water pollution from contaminated material	See Table 9.5 for assessment
NI	√	OP4: Reduce illegal disposal of waste	See Table 9.5 for assessment
Replace / Upgrade			
Ire	√	OP5: Undertake remediation projects for prioritised landfills, quarries, mines and contaminated lands, e.g. pollution containment measures and monitoring requirements	See Table 9.5 for assessment
Ire	√	OP6: Properly dispose of harbour dredgings	See Table 9.5 for assessment
Ire	X	OP7: Monitor shipping activities, including discharges	Monitoring of shipping activities is not expected to result in significant environmental impacts and as such has not been assessed. However, impacts could occur if monitoring results in actions being taken as a result of information gathered. Therefore, any actions arising from this measure should be subject to environmental assessment. It should be noted that the effectiveness of this measure might be limited by the willingness of operators to participate in the monitoring scheme.

Table 8.6 Additional Measures Point and Diffuse Sources: Usage and Discharge of Dangerous Substances (NI: Included under key sectors under Pollution)

Source Plan	Assessed ?	Additional Measure		Comment
Reduce				
Ire	**X**	DS1:	Improve administration of dangerous substances through use of awareness campaigns, improvement in product labelling, support of auditing and reporting and improved information sharing	No environmental impacts would be expected to occur as a result of implementation of this measure, aside from the positive impacts to water quality. Of all of the measures proposed within the draft Plan, those aimed at education, awareness and information sharing are perhaps the most critical as they provide for direct engagement of stakeholders and the public by providing the tools to take ownership of the Plan and the proposed measures.
Ire	X	DS2:	Review of wastewater and industrial licences	DS2 is directed at information gathering and, while an important step in the planning process, is not suitable for SEA. However, DS2 is the first step in the implementation of DS3, which is aimed at brining emissions in line with relevant standards and for which an assessment was carried out (see Table 9.6)
Ire	√	DS3:	Reduction of pollution by control of point sources through use of pollution reduction programmes	
Ire	√	DS4:	Reduce discharges, losses and emissions from diffuse sources, including in groundwater source protection zones	See Table 9.6 for assessment
Replace / Upgrade				
Ire	√	DS5:	Upgrade treatment to remove substances from effluent	See Table 9.6 for assessment
Relocate				
Ire	√	DS6:	Relocate discharge point	See Table 9.6 for assessment

Table 8.7 Additional Measures for Point and Diffuse Sources: Agriculture

Source Plan	Assessed ?	Additional Measure		Comment
Reduce				
Ire	√	AG1:	Creation of buffer strips around water bodies to prevent pollutant loss	See Table 9.7 for assessment
NI	√	AG2:	Adoption of Best Management Practices to reduce phosphorus inputs, e.g. use of feedstuffs designed to minimise phosphorus in excreta	See Table 9.7 for assessment
Ire	√	AG3:	Installation of fencing to prevent livestock access to watercourses	See Table 9.7 for assessment
Ire	√	AG4:	Reduction of agricultural intensity, e.g. lower stocking density on land, land reclamation	See Table 9.7 for assessment
Ire	√	AG5:	Require nutrient management planning	See Table 9.7 for assessment
Ire	√	AG6:	Set aside of agricultural lands	See Table 9.7 for assessment
Replace / Upgrade				
NI	X	AG7:	Identification of regions where diffuse pollution problems are most severe	This is an information gathering measure, which will allow other measures identified under this pressure heading to focus on areas where the pressure is most severe. However, while this is an important step in the planning process and will contribute to the overall positive impact of the Plan, this measure is not suitable for SEA.
Ire / NI	√	AG8:	Increase participation in rural environmental protection schemes / other agri-environment schemes, e.g. NPWS farm plans, particularly in priority catchments (Ire) and focus advice and regulatory action in areas where there is a lower uptake in agri-environment schemes (NI)	See Table 9.7 for assessment
Ire	√	AG9:	Upgrade farm management systems	See Table 9.7 for assessment

Source Plan	Assessed ?	Additional Measure	Comment
NI	X	AG10: Examine commercial/technical proposals that have the potential to bring about significant reduction in the phosphorus surplus	Examination of commercial/ technical proposals is part of the planning process and would contribute to achieving the overall positive impact of reducing phosphorus. However, assessment of this measure would be premature prior to a decision on which proposals will be implemented. Some of the technical proposals that could be chosen are assessed separately, where specified (e.g. AG12, AG13). It is highly recommended that when specific proposals are chosen, that these be subject to environmental assessment to identify potential impacts.
NI	√	AG11: Phosphorus balances on individual holdings to be introduced on a phased basis	See Table 9.7 for assessment
Relocate			
Ire	√	AG12: Removal by tanker in areas of nutrient surplus	See Table 9.7 for assessment
Ire	√	AG13: Treatment by digestors in areas of nutrient surplus	See Table 9.7 for assessment

Table 8.8 Additional Measures for Point and Diffuse Sources: Wastewater from Unsewered Properties (NI: Collection and Treatment of Sewage)

Source Plan	Assessed ?	Additional Measure	Comment
Reduce			
Ire	√	UP1: Amend Building Regulations - Code of Practice for single houses - Code of Practice for large systems - Certification of the construction of onsite wastewater treatment systems and percolation areas/polishing filters	See Table 9.8 for assessment
Ire	√	UP2: Assess applications for new unsewered systems by applying risk mapping/decision support systems and codes of practice. Notice to planning authority required immediately prior to the installation of onsite effluent treatment systems including percolation areas and polishing filters.	See Table 9.8 for assessment
Ire	X	UP3: Establish: - Certified expert panels for site investigation and certification of installed systems. A second panel of hydrogeologists is required for clusters and large systems. - National group for formulating polices and coordination of consistent approach. -A technical advice section or advisory group to coordinate and give advice on emerging and innovative technologies - Installation and maintenance training by FAS	This type of measure is not expected to result in significant environmental impacts and as such has not been assessed. However, impacts could occur if systems fail to achieve certification, and thus require upgrade. Therefore, it is anticipated that this measure would be the first step in implementation of measures such as UP8, which has been assessed (see Table 9.8).
NI	√	UP4: Change current policy and guidance to improve existing controls and modify development control and enforcement practices to reflect restrictions if required.	See Table 9.8 for assessment
NI	√	UP5: Reduce loading by introduction of phosphate free detergents	See Table 9.8 for assessment
Replace / Upgrade			
Ire	X	UP6: Carry out an inspection programme in prioritised locations for existing systems and record results in an action tracking system	UP6 is directed at information gathering and is not suitable for SEA. It should be noted that this measure would be an important step in the planning process with a potential to be a significant mechanism in contributing to reducing pollution

Source Plan	Assessed ?	Additional Measure	Comment
			potential from on-site wastewater treatment systems. However, UP6 is part of the implementation of UP7, for which an assessment was carried out (see Table 9.8)
NI	√	UP7: Following mapping of vulnerable areas, where water quality is threatened alternate treatment options, such as providing mains sewers or tank maintenance programmes, may be investigated	See Table 9.8 for assessment
Ire	√	UP8: Enforce requirements for de-sludging and codes of practice	See Table 9.8 for assessment
NI	X	UP9: Consideration of grants to improve private sewage discharges	UP9 is not expected to result in significant environmental impacts, aside from positive impacts to water quality due to improvements in private sewage discharges. As such, it does not require SEA.
Relocate			
NI	**X**	UP10: Identify areas where there are potential constraints on development and address these	Development of constraints mapping is part of the information gathering stage of the planning process. Assessment of this measure would be premature prior to a decision being made on the specific projects to be implemented. This measure could also be the first step in ensuring the zoning of lands is directly linked to the provision of adequate and appropriate wastewater treatment infrastructure. It should be noted that some of the projects that could be chosen, e.g. connection to municipal systems, are assessed under separate measures where specifically noted (e.g. UP11). It is highly recommended that when specific proposals are chosen, that these be subject to environmental assessment, where required, and Appropriate Assessment to identify potential impacts.
Ire	√	UP11: Consider connection to municipal systems	See Table 9.8 for assessment

Table 8.9 Additional Measures for Point and Diffuse Sources: Forestry

Source Plan	Assessed ?	Additional Measures		Comment
Reduce				
NI / Ire NI Ire NI	**X**	F1:	Implement management controls as they become available, e.g. new or improved guidance, new or revised legislation or regulations, codes of practice These could include: Improved guidance based on scientific research for highly sensitive areas (e.g. Pearl Mussels) Ensuring regulations and guidance are cross referenced and revised to incorporate proposed measures Development of maps indicating where forests should be developed taking account of sensitive and protected areas	There are a number of management controls identified as potential measures, the details of which are not yet available. It is not possible to assess the impacts associated with these at this time; however, as they are likely to require some changes to forestry practices e.g. reduced coup sizes or reduced harvest, it is strongly recommended that when the details of these are known, they are subject to an environmental assessment, and where required, an Appropriate Assessment to identify potential impacts other than those related to water, e.g. population, etc.
Ire	√	F2:	Acidification - Avoid or limit (to below critical thresholds) afforestation on 1st and 2nd order stream catchments in acid sensitive catchments	See Table 9.9 for assessment
Ire	√	F3:	Acidification - Restructure existing forests to include open space and structural diversity through age classes and species mix, including broadleaves	See Table 9.9 for assessment
Ire	√	F4:	Acidification - Revise the Acidification Protocol to ensure actual minimum alkalinities are detected (that is ensure sampling under high flow conditions) and revise boundary conditions for afforestation in acid sensitive areas.	See Table 9.9 for assessment
Ire	√	F5:	Eutrophication and Sedimentation - Avoid or limit forest cover on peat sites	See Table 9.9 for assessment
Ire	√	F6:	Eutrophication and Sedimentation -Change the tree species mix (for example broadleaves) on replanting	See Table 9.9 for assessment
Ire	√	F7:	Eutrophication and Sedimentation - Limiting felling coup size	See Table 9.9 for assessment
Ire	√	F8:	Eutrophication and Sedimentation - Establish new forest structures on older plantation sites (including riparian zones, drainage layouts, species mix, open areas)	See Table 9.9 for assessment

Source Plan	Assessed ?	Additional Measures	Comment
Ire	**X**	F9: Hydromorphology - Audit existing drainage networks in forest catchments	F9 is directed at information / data gathering. As such this measure is an important part of the planning process as it will inform other measures/actions under the Plan; however, this measure is not suitable for SEA. It is anticipated that F9 would be an initial step in implementation of other measures, such as F18, which have been assessed (see Table 9.9).
Ire	**X**	F10: Pesticide Use - Maintain registers of pesticide use	F10 is directed at information / data gathering, and while an important part of the planning process, as it will inform other measures/actions under the Plan, it is not suitable for SEA. It is anticipated that F10 would be a first step in implementation of other measures, such as F11 and F12, which have been assessed (see Table 9.9).
Ire	√	F11: Pesticide Use - Reduce pesticide usage	See Table 9.9 for assessment
Ire	√	F12: Pesticide Use - Pre-dip trees in nurseries prior to planting out	See Table 9.9 for assessment
Replace / Upgrade			
Ire	√	F13: Acidification - Mitigate acid impacts symptomatically using basic material (e.g. limestone or sand liming)	See Table 9.9 for assessment
Ire	√	F14: Acidification - Manage catchment drainage to increase residence times and soil wetting, including no drainage installation in some areas	See Table 9.9 for assessment
Ire	√	F15: Acidification - Implement measures to increase stream production – for example with native woodland in riparian zones.	See Table 9.9 for assessment
Ire	√	F16: Eutrophication and Sedimentation - Establish riparian zone management prior to clearfelling	See Table 9.9 for assessment
Ire	√	F17: Eutrophication and Sedimentation - Enhance sediment control	See Table 9.9 for assessment
Ire	√	F18: Hydromorphology - Enhance drainage network management – minimise drainage in peat soils	See Table 9.9 for assessment
Ire	√	F19: Pesticide Use - Develop biological control methods	See Table 9.9 for assessment

Source Plan	Assessed ?	Additional Measures	Comment
NI	**X**	F20: Assessment – Assess operations posing a significant threat to water quality on a whole catchment basis	This measure is directed at information / data gathering, and while an important part of the planning process, is not suitable for SEA. A determination with regard to the requirement for SEA for Forestry practices under the provisions of the SEA Directive should be made. A mitigation measure recommending this has been brought forward to Chapter 10 of this report.
Ire	**X**	F21: Institute a public awareness campaign in order to raise awareness of the interaction of forestry and water.	No environmental impacts would be expected to occur as a result of implementation of this measure, aside from the positive impacts to water quality. Of all of the measures proposed within the draft Plan, those aimed at education and awareness are perhaps the most critical as they provide for direct engagement of stakeholders and the public.

Table 8.10 Additional Measures for Physical Modifications (NI: Freshwater Morphology/ Marine Morphology)

Source Plan	Assessed ?	Additional Measure	Comment
Reduce			
NI / Ire Ire NI NI NI NI NI Ire	X	PM1: Implement management controls as they become available, e.g. new or improved guidance, new or revised legislation or regulations, codes of practice These could include: A code of practice for morphology Introduction of a culverting policy Review of existing legislative controls on physical modifications to surface waters Development of a protocol for maintenance dredging Implementation of a new marine licencing regime and marine planning system under the (draft) UK Marine Bill Adoption of operational protocols for impoundments Increased emphasis in EIA on morphology impacts from new development or cumulative pressures	There are a number of management controls identified as potential measures, the details of which are not yet available. It is not possible to assess the impacts associated with these at this time; however, it is strongly recommended that when the details of these are known, they are subject to an environmental assessment, where required, and Appropriate Assessment to identify potential impacts other than those related to water, e.g. population, etc.
Ire	√	PM2: Support voluntary initiatives, such as wetlands and Integrated Coastal Zone Management schemes, including through awareness campaigns	See Table 9.10 for assessment
NI	X	PM3: Complete further surveys on all water bodies following review of morphology classification results	PM3 is directed at information / data gathering, and while an important part of the planning process, is not suitable for SEA
NI	X	PM4: Carry out SEA of tidal energy reserves	If a plan or programme to develop tidal energy reserves is proposed, a determination with regard to the requirement for SEA under the provisions of the SEA Directive should be made as well as the requirement for Appropriate Assessment. A mitigation measure recommending this has been brought forward to Chapter 10 of this report.
Replace / Upgrade			
Ire	X	PM5: Channelisation investigation	PM5 is directed at further data gathering as part of the planning process and is not suitable for SEA.

Source Plan	Assessed ?	Additional Measure		Comment
Ire / NI	√	PM6:	Channelisation impact remediation schemes, such as re-meandering of straightened channels, reconstruction of pools, substrate enhancement, removal of hard bank reinforcement/revetment or replacement with soft engineering solution	See Table 9.10 for assessment
Ire / NI	√	PM7:	Over-grazing remediation, such as stabilisation of river banks	See Table 9.10 for assessment
Ire	X	PM8:	Impassable barriers investigation	PM8 is directed at further data gathering as part of the planning process and is not suitable for SEA.
Ire / NI	√	PM9:	Strategically appraise significant barriers to fish movement and introduce impassable barriers remediation schemes, such as fisheries enhancement schemes, reopening of existing culverts, removal of impoundment and de-silting of impounded reach, desiliting of affected river reaches, removal of barriers to fish migration, updating of existing fish passes and construction of new fish passes	See Table 9.10 for assessment

Table 8.11 Additional Measures for Abstractions (NI: Abstraction and Flow Regulation)

Source Plan	Assessed ?	Additional Measure	Comment
Reduce			
Ire	X	AB1: Assess water resource availability and target management priorities through modernisation of statutes and regulatory practices and policies, e.g. assigning responsibility for compiling and maintaining a comprehensive, national register of abstractions	The potential for this measure to result in significant environmental impacts depends on the actions involved. In this case, the example provided, e.g. maintaining a register of abstractions, is primarily concerned with information gathering and is not suitable for SEA though it is anticipated that it would be a first step in implementation of other measures, such as AB4, 5 and 6, which have been (see Table 9.11). The maintenance of a register would also facilitate identification of risk from cumulative impacts and the need for sub threshold SEA or EIA to address the impacts from these as well as the need for Appropriate Assessment. It is highly recommended that when the specific details as to the types of changes to statutes and regulations are proposed, that these be subject to environmental assessment to identify potential impacts.
Ire	X	AB2: Support water conservation measures, e.g. rainwater harvesting schemes, awareness campaigns, introduce best practice guidance, install appropriate devices and standards to prevent waste and misuse of water	These measures are primarily directed education and awareness, and while these are extremely valuable measures in the conservation of water resources and should be encouraged, are not suitable for SEA.
Ire / NI	X	AB3: Address data limitations and additional monitoring needs, e.g. monitor abstraction and compensation flows, assess ecology impacts associated with hydrologic changes, improve abstractions register, improve discharge register, validate and develop habitat suitability curves, improve hydrometric data, collect bathymetry data for lakes	AB3 is directed at information / data gathering, and while this measure would be essential to managing abstractions on a catchment basis as well as reducing impacts on protected habitats and species, it is not suitable for SEA
Ire	√	AB4: Examine compensation flow requirements on regulated rives and maintain minimum flow or flow variability, where applicable, to maintain good hydrological status and support ecology	See Table 9.11 for assessment
NI	√	AB5: Assess compliance of monitored abstractions and compensation flows with licence conditions	See Table 9.11 for assessment
Ire	√	AB6: Develop water budgets	See Table 9.11 for assessment

Source Plan	Assessed ?	Additional Measure		Comment
Replace / Upgrade				
Ire	√	AB7:	Reduce abstraction demand, e.g. reduce leakage and unaccounted water, modify plumbing codes to support conservation, daily metering of abstracted volumes, implement small schemes with smaller demand	See Table 9.11 for assessment
Ire	√	AB8:	Increase available water, e.g. promote infiltration of runoff, reuse of grey water or treated wastewater, identify and build infrastructure for alternate sources	See Table 9.11 for assessment
Ire	√	AB9:	Water metering and charging programmes for residential users	See Table 9.11 for assessment
Ire	√	AB10:	Reduce abstraction volumes	See Table 9.11 for assessment
Ire	√	AB11:	Altered abstraction timing	See Table 9.11 for assessment
Ire	√	AB12:	Conjunctive use	See Table 9.11 for assessment
Ire	√	AB13:	Provision of additional storage	See Table 9.11 for assessment
Relocate				
Ire	√	AB14:	Direct development to areas where capacity exists and restrict development if abstraction already at capacity	See Table 9.11 for assessment

Table 8.12 Additional Measures for Urban Development (Ire: Wastewater / Industrial Discharges)

Source Plan	Assessed ?	Additional Measure	Comment
Reduce			
NI	**X**	UB1: Development of draft strategy Managing Stormwater	Development of strategies is part of the planning process. Assessment of these measures would be premature prior to a decision on what the strategies would involve.
NI	**X**	UB2: Manage misconnections through development of a strategy	
NI	**X**	UB3: Education and awareness on applicability of SUDs	These measures are aimed at education and awareness, and while these are valuable measures and should be encouraged, they are not suitable for SEA.
	X	UB4: Introduce school education programme	
NI	**X**	UB5: Develop an extended regulatory tool kit	The details as to the management controls to be included in the regulatory toolkit are not yet available. It is not possible to assess the impacts associated with these at this time; however, it is strongly recommended that when the details of these are known, they are subject to an environmental assessment to identify potential impacts other than those related to water, e.g. population, etc.
Ire	**X**	UB6: Prepare urban asset management plans, which should include surveys, mapping, and research; codes of best practice or legislation; groundwater quality monitoring and risk assessment; improved infrastructure, including implementation of SUDs; and planning	There are a number of items identified as potential components of the urban assessment management plans, most of which are aimed at data and information gathering. The only piece of the measure, which could be suitable for SEA, is the provision for 'improved infrastructure'. However, the details as to what this would involve in the individual plans are not yet available. It is strongly recommended that when the details of these are known, the determination with regard to the requirement for a SEA is made. If an SEA is not required under the provisions of the Directive it is recommended that a focussed environmental assessment be carried out to identify potential impacts other than those related to water, e.g. population, etc.
Replace / Upgrade			
NI	**X**	UB7: Develop a diffuse pollution screening and modelling tool to assess diffuse loads and allow for prioritisation of new actions	Development of a screening tool is part of the information gathering stage of the planning process. Assessment of this measure would be premature prior to a decision being made on the specific actions to be implemented. It is highly recommended that when specific proposals are chosen, that these be subject to environmental assessment to identify potential impacts.
NI	**X**	UB8: Promote and adopt good practice with respect to storage, use and disposal of hazardous chemicals	This measure is aimed at education and awareness, and while it is an extremely valuable measure and should be encouraged, it is not suitable for SEA.

Table 8.13 Additional Measures for Local Issues

Source Plan	Issue	Additional Measure	Comment
Ire	**Protecting High Quality Areas:**	Develop national guidance and introduce a web-based register Support nature conservation projects	The development of national guidance relating to the protection of high status sites, along with the development of a web-based register, would not be expected to result in result in significant adverse environmental impacts and therefore does not require SEA. In addition, the support of nature conservation projects would not be expected to result in significant adverse environmental impacts and therefore does not require SEA.
Ire	**Aquaculture (NI: Industry and Other Businesses):**	Propose national standards Develop Shellfish Management Plans Designate additional sites	Without the detail as to what the national standards for aquaculture would contain it is not possible to assess these at this time; however it is recommended when these details are known an environmental assessment is carried out to ensure that these standards give consideration to impacts other than those related to water. The designation of additional aquaculture sites would not be expected to result in significant adverse environmental impacts in and of themselves; however, the management plans associated with these would require SEA. Specifically, the designation of Shellfish Growing Areas, currently underway in Ireland, will be subject to a separate SEA.
Ire	**Peat extraction (NI: Industry and Other Businesses):**	Enforce licensing controls Implement rehabilitation plans	The enforcement of licensing controls involves implementation of existing regulations and as such is not suitable for SEA. The implementation of rehabilitation plans on peat extraction sites should be encouraged and be subject to environmental assessment at the time the individual details of these are known to ensure that they are carried out in a holistic fashion and give consideration to impacts other than those related to water.
Ire	**Cruising and boating:**	Enforce pump out controls Enforce speed restrictions	The enforcement of existing pump out controls and speed restrictions involves the implementation rules and regulations that are currently in place. As such they are not suitable for SEA
Ire	**Shared waters:**	Increased transboundary coordination	A continuation of, and increase in, the ongoing coordination between Northern Ireland and Ireland in the area of water management is a critical step in the implementation of the RBMP and should be encouraged. However, the administrative nature of these activities would not be expected to result in significant adverse environmental impacts, aside from the positive impacts to water quality resulting from effective implementation of the RBMP, and as such do not require SEA.

NI	**Alien Species:**	Amendments to the Wildlife Order (NI) 1985 Maritime Ballast Water Convention NIEA Natural Heritage Grant Aid Programme Develop risk assessments and contingency and management plans for species that are established or are likely to become established Develop sectoral codes of practice Education and awareness programmes	Several of these measures are aimed at education, developing best practice and information gathering, and while valuable, are not suitable for SEA. The remaining measures are primarily planning related, e.g. amendments to the Wildlife Order, and without the specific details it is not possible to assess the impacts of these at this time. However, it is highly recommended that these be subject to an environmental assessment and Appropriate Assessment once the details are available.
NI	**Fisheries:**	Commercial Fishing Regulations, e.g. further restrictions on licensed commercial salmon fishermen, prohibition of the sale of rod caught salmon Angling Regulations, e.g. catch and release, use of barbless hooks, early closures and shortened season European Fisheries Fund Grants Advice, education and training Protection and restoration of salmon habitats, e.g. develop further conservation and management targets and CMPs for specific rivers, complete DNA based study to determine genetic structure of salmon populations	For the most part these measures are concerned with data gathering and education and awareness. For those measures, which involve other types of actions, e.g. angling regulations, these are not expected to result in significant environmental impacts, aside from positive impacts to water quality.

8.3 ALTERNATIVES CONSIDERED FOR SEA

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.

In most cases a do nothing option is one of the alternatives considered as part of the environmental assessment process. However, in this case the do nothing option, i.e. no change in current practices, is not a realistic alternative as the WFD reinforces the requirement to implement the provisions of existing water protection directives, as mentioned above. The implementation of these 11 Directives is considered the **Business as Usual** scenario.

A second scenario is also assessed which includes implementation of the 11 existing Directives plus implementation of the further water protection measures listed under Article 11(3). This is termed the **Business as Usual plus Other Required Measures** scenario, i.e. the scenario in which these are the only measures required to achieve the 2015 good status objective. Consideration was given to including the further Article 11(3) measures in the Business As Usual scenario, as these measures would be required under the WFD in the absence of any additional policy changes and/or improvements included in the Plan. However, implementation of these measures is not currently required under any European based legislation other than the WFD. Therefore, as the Plan and POM are the instruments through which the WFD is to be implemented, it could be argued that without the Plan the Article 11(3) measures would not be carried out. As such, they do not form part of the business as usual scenario but instead represent new measures requiring assessment.

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. The range of Additional Measures (**Table 8.3**) is the subject of the main assessment of this SEA.

9 ASSESSMENT

As discussed above the following scenarios have been assessed in this SEA:

(i) Business as Usual;

(ii) Business as Usual plus Other Required Measures;

(iii) Individual Additional Measures.

The approach used for assessing the scenarios/alternatives for the draft Plan was an objectives led assessment. Each assessable alternative has been assessed against each of the objectives in terms of how it achieves the objective. The alternative is then allotted an assessment rating for the purposes 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 alternatives meet the Strategic Environmental Objectives and which, if any, contradict these. For the purposes of these 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.

9.1 BUSINESS AS USUAL SCENARIO

As discussed in Chapter 8, the Plan / POM includes measures required under 11 existing water protection directives, for whose implementation the Plan gives added impetus (**Table 8.1**); these are described as the **Business as Usual** scenario. While many of these measures are expected to result in improved water quality, some of the actions do not lend themselves to environmental assessment. The types of measures required under each of the 11 Directives have been grouped into themes (e.g. education and awareness, monitoring and identification); for example, the Nitrates Directive actions require monitoring to be carried out (DIR2), and the implementation of action programmes (DIR3). An explanation is provided below as to whether or not assessment of these in the context of the Strategic Environmental Objectives is practicable at this time.

DIR1: Education and Awareness Programmes	Perhaps the most important of all the measures suggested, these types of initiatives and programmes are expected to result in improved water quality through increased public and industry awareness. However, due to their intangible nature, assessment of these with regard to the SEA Objectives will not be included.
DIR2: Monitoring and Identification of Sources of Pressure	These types of measures continue to build a picture of the baseline environment begun during the Article 5 Characterisation process. As such these measures are concerned with information gathering rather than the taking of any concrete actions and as such will not be assessed. They will however ensure water management actions are fully informed and based on scientific data.

DIR3: Introduction of Plans, Programmes, Schemes, Codes of Practice, etc.	There are a number of plans, programmes, schemes, etc. identified as actions as part of the River Basin Management Plan in order to address specific issues or pressures. These include Sludge Management Plans, *Margaritifera* Plans and Mini-Catchment Plans, the details of which are not yet available; therefore, it is not possible to assess the impacts associated with these at this time. However, it is strongly recommended that at the time the details of these are known that they are subject to an environmental assessment under the SEA and Appropriate Assessment processes in order to identify any potential impacts other than those related to water, e.g. material assets, biodiversity, population, etc. The purpose of this would be to identify focussed mitigation measures aimed at offsetting or reducing any identified negative impacts.
DIR4: Review of Licensing and Introduction of Controls (DIR 1)	These measures may result in impacts on the operations of the industries affected. While specific details of any changes will be at the local level, a general assessment of these types of measures using the Strategic Environmental Objectives can be carried out at this time.
DIR5: Changes to Land Use Planning (DIR 2)	These measures may result in impacts on land use planning at the national, regional and local level, potentially resulting in impacts. A general assessment of these types of measures using the Strategic Environmental Objectives can be carried out at this time.
DIR6: Introduction of Specific Infrastructural Requirements, e.g. pre-treatment facilities (DIR 3)	These types of measures require the installation of specific types of infrastructure. Though specific information is not available, there is sufficient detail available at this time to carry out a general assessment of these types of measures using the Strategic Environmental Objectives.

9.2 BUSINESS AND USUAL PLUS OTHER REQUIRED MEASURES

In addition to the Business as Usual scenario discussed above, the WFD lists other minimum requirements to be met with under Article 11(3) that must be implemented by member states (**Table 8.2**). These are referred to in this SEA as the **Business as Usual Plus** 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.

Table 9.1 Assessment of Measures under the Existing 11 Directives and the Other Required Article 11(3) Measures

SEA Objectives	Review of Licensing Controls (DIR 4)	Changes in Land Use Planning (DIR 5)	Infrastructural Requirements (DIR 6)	Cost recovery for water use & promotion of sustainable water use (WFD 1)	Protection of Drinking Water Sources (WFD 2)	Abstraction and impoundment control (WFD 3)	Point source and diffuse source discharge (WFD 4)	Controls on physical modifications to surface waters (WFD 5)	Prevention or reduction of the impact of accidental pollution incidents (WFD 6)	Authorisation of discharges to groundwater (WFD7)	Priority substance control (WFD 8)	Controls on other activities impacting water status (WFD 9)
Objective 1 (BFF)	+ / -	+/-	+/-	+	+	+/-	+/-	+/-	+/-	+	+/-	+/-
Objective 2 (P)	+	+	+	+	+	+	+	+/-	+	+	+	+
Objective 3 (HH)	+	+	+	+	+	+	+/-	+/-	+	+	+/-	+
Objective 4 (S)	+ / -	+/-	+/-	+	+	+/-	+/-	+/-	+/-	0	+/-	+
Objective 5 (W)	+	+	+	+	+	+	+	+/-	+	+	+/-	+
Objective 6 (AQ)	+ / -	+/-	+/-	0	0	-	0/-	+/-	+	0	+/-	0
Objective 7 (C)	+ / -	+/-	+/-	+	0	-	0/-	+/-	0	0	+/-	0
Objective 8 (MA1)	0	0	0	0	0	0	0	+/-	+	0	0	0
Objective 9 (MA2)	+	+/0	+	+	0	+	+	+/-	+	0	+	0
Objective 10 (MA3)	+/-	+/-	-	-	+/-	+/-	-	+/-	+	+/-	+/-	-
Objective 11 (MA4)	+	+	+	+	+	+	+	+/-	+	+	+	+
Objective 12 (CH)	0	0	+/-	+	0	+/-	+/-	+/-	+/-	0	+/-	0
Objective 13 (L)	0	0	+/-	0	0	+/-	+/-	+/-	+/-	0	+/-	0
Key: *See Section 9.1 for further detail on what is included in DIR4 to 6 and Table 8.2 for further detail on measures WFD1 to 9*												
Discussion of Assessment												
DIR4 will result in overall positive impacts to the environment. However specific measures may result in impacts on the operations of the industries affected and as such will have potential negative impacts on economic development. Indirect negative impacts are also possible for other environmental receptors but the extent of these impacts will be dependent on required changes e.g. new infrastructure which could impact on biodiversity and soils or changes to existing practices that could impact on air quality or climate from transport or alternate treatment and disposal.												

Broadly speaking DIR5 has the potential to have positive impacts on the environment generally although it is likely that changes to land use planning will impact negatively on economic activities in the district through restrictions or limits on specific development types. Conversely, changes in land use planning that protect the economic water resource will contribute to long-term sustainability.

Potential negative impacts could occur from DIR6 depending on the siting of new infrastructure. Poorly placed infrastructure has the potential to negatively impact on biodiversity, soils, cultural heritage and landscape. Negative impacts could also be experienced by industry for installation of and operation of new infrastructure.

WFD1: This alternative focuses on conservation and sustainable water use. Lower overall requirement for water has many positive knock-on effects for the environment. Water availability is a key driver of development and economies therefore strategies to reduce consumption would result in less water requiring treatment and consequently less waste water requiring treatment. This would have indirect positive impacts on climate change as less energy will be required and lower CO2 outputs will result from such changes. Also, with lower consumption there will be reduced need to improve and provide more water management infrastructure allowing funds to be redirected to other areas. In the longer term, reduced consumption will improve capacity overall and facilitate continued growth and development in line with government policies i.e. spatial strategy. The success of such measures will be closely related to education and awareness. Cost recovery is a controversial measure. It has the potentially to significantly reduce the volumes of water used and wastewater produced. The main negative impact relates to the financial implications for economic activity. The acceptance cost recovery will be dependent on proper education and awareness to demonstrate how water can be conserved and also on the manner in recovery is rolled out.

WFD2: This alternative focuses on protection of drinking water sources. Protecting drinking water sources from pollution through the use of Water Safety Plans and/or designation of Source Protection Zones would have overall positive impacts on water quality as well as biodiversity, soil, human health and economic activities reliant on good water quality, e.g. tourism, water supply. However, specific measures may result in impacts on the operations of the commercial/industrial sectors affected and as such could have potential negative impacts on economic development.

WFD3: This alternative deals with abstraction and impoundment controls. Reducing the volume of abstractions or altering the timing of abstractions is anticipated to have positive impacts on water quality. Reduced volumes will have positive impacts for biodiversity by reducing the risk to flora and fauna from eutrophication or high levels of dangerous substances in a waterbody. Altering timing also has positive benefits for biodiversity by reducing the risk of low flows or lowering of marginal water levels where spawning takes place. This measure will also have positive impacts for human health and economic activities reliant on good water quality e.g. tourism, water supply etc.

WFD4: Details of the types of controls proposed is not available at this time however it is likely to include prevention and reduction programmes arising out of existing directives such as the Nitrates, Dangerous Substances, Groundwater, Shellfish and Bathing Water Directives. In addition, programmes focusing on IPPC and discharge authorizations are also likely. These measures are anticipated to have a positive impact on the environment through improved water quality with indirect benefit for biodiversity, soils and human health. Negative impacts are also anticipated for economic activities such as farming, forestry and industry where changes arising from prevention and reduction programmes may result in management changes or reduced productivity. In certain cases this may result in a need to import products with resulting negative impacts for air quality and climate. Negative impacts may also occur if alternate treatment / disposal result in the need for additional landfill capacity or similar.

WFD5: This alternative may include prior authorisation or registration schemes, new regulations to control physical modifications to surface waters and risk based approvals where low risk works may be simply registered while higher risk works subjected to more detailed assessment and issued more prescriptive licences. These measures have the potential to positively impact on water quality and biodiversity in particular. By introducing the need for more detailed assessment of higher risk works this will provide further protection of the environment with benefit for the environment generally if environmental

considerations (based on EIA guidance) are a required part of the assessment.

WFD6: This alternative includes for appropriate measures to reduce the risk of accidental pollution incidents. This has the potential to positively impact on water quality and also on biodiversity, human health, soils, population etc. The types of measures under consideration are not developed at this time however there is potential to negatively impact on the environment as a result of measures such as flood defence, which could impact on cultural heritage, landscape and biodiversity. It is recommended that further environmental assessment is undertaken once measures are defined.

WFD7: This alternative requires prior authorisation to be received for reinjection of waters for a number of specific activities in order to prevent discharge of certain substances to groundwater. Protecting groundwaters from pollution would have overall positive impacts on water quality as well as biodiversity, soil, human health and economic activities reliant on good water quality, e.g. tourism, water supply. However, specific measures may result in impacts on the operations of the commercial/industrial sectors affected and as such could have potential negative impacts on economic development.

WFD8: Increased awareness of the impacts of using priority dangerous substances will be essential to not only the reduction of use but also prevention of use in the first place. The measures for priority substance will include creation of inventories and collection of data on emissions, discharges and losses of the priority substances. This will provide a better understanding of the scale and extent of the issue. In addition reduction plans will be developed. Plans that target improved prevention and reduction of priority substance will result in less emissions to the environment and consequent positive impacts on the environment in particular water quality, biodiversity, soils and human health. In addition, they would contribute to the protection of the water as a resource for all. Plans may however, negatively impact on industries which current use or generate priority substance as part of their processes. Changes to how emissions, discharges and losses are dealt with by industry may result in additional costs for alternative treatment or disposal or costs associated with change of practice altogether. Changes in treatment or disposal options may require additional transport with associated air quality and climate impacts. It may also include other processes for treatment or disposal with the potential to impact on biodiversity, human health, soils, cultural heritage and landscape.. Without further detail it is not possible to elaborate on these potential impacts.

WFD9: One of the major issues for water status is invasive alien species, which successfully establish themselves in aquatic and fringing habitats and damage natural flora and fauna. This measure may include introduction of regulations to prohibit the possession or introduction of any species of wild bird, wild animal or wild flora, which may be detrimental to native species. This is anticipated to result in positive impacts to the environment generally however negative impacts will be experienced by retail sectors which trade in non-native species e.g. garden centres, and also individual and commercial bodies that use marine transport as this has the potential to transport alien species.

Mitigation

WFD4: Detailed assessment of higher risk works will include environmental considerations (based on EIA guidance). It is also recommended that lower risk work should be compelled to consider environmental issues as part of the registration process.

WFD5: It is recommended that further environmental assessment is undertaken once measures are defined.

9.3 ALTERNATIVES: ADDITIONAL MEASURES

9.3.1 Integration with the Plan Team

To assist the Plan Team in selecting from the proposed range of alternatives to apply to its RBD, a preliminary review of the proposed Additional Measures was carried in out in September 2008 to highlight potential environmental issues associated with the various measures and to identify interrelationships between issue areas. It was intended that this initial, high-level environmental review would assist the Plan Team in choosing combinations of measures for the Plan. By providing environmental review as the measures were developed, the SEA aimed to assist in the overall plan making process by ensuring environmental matters were taken into account at the earliest possible opportunity.

9.3.2 Assessments of Additional Measures by Pressure Type

The assessment of the individual Additional Measure has been grouped by pressure. Please note that the pressure headings included in the plans prepared for Ireland and those prepared for Northern Ireland differ slightly. Therefore, for clarity and ease of comparison between the Plan and the Environmental Report, where the Plan terminology differs, the Plan heading is provided in brackets at the start of each table. Please see section 8.2 for a direct comparison between the headings used in the SEA and the headings in the individual plans.

9.3.3 Assessment Parameters

Within the current scope of this SEA, temporary impacts have not been assessed. *Temporary impacts* arising from the Plan and proposals contained therein would be associated with construction phase, however, no specific location or design parameters are addressed at this strategic level. It is therefore considered that the scope of the Plan does not lend itself to an assessment of such impacts but such impacts will be addressed at the EIA level in relation to project specific details. *Permanent effects* are addressed in **Tables 9.3 to 9.12**.

The RBMP and POM will cover the period from 2009 up to 2015, with an interim review after three years. 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. Short, medium and long-term impacts are addressed in **Tables 9.3 to 9.12**.

Cumulative effects arise for instance where several developments may each have an insignificant effect but together have a significant effect or where several individual effects of the Plan have a combined effect. *Synergistic effects* interact to produce a total effect greater than the sum of the individual effects so that the nature of the final impact is different to the nature of the individual impact. Cumulative / synergistic assessment is addressed in **Tables 9.3 to 9.12**.

The primary effect of the RBMP and POM is to improve water quality and ensure good ecological status by 2015 and beyond. Many of the alternatives under consideration will have *direct* impacts on water and aquatic biodiversity as a result. However, a number of the alternatives also have the potential to directly and indirectly impact on other environmental receptors as a consequence of the alternatives in this draft Plan and POM. These *secondary and indirect* effects have been taken into account in **Tables 9.3 to 9.12**. A summary of the main secondary effects is presented in **Table 9.2.**

Table 9.2 Summary of Secondary Effects.

Secondary Effects
Biodiversity:
Physical and / or chemical alteration of habitats resulting in loss or change to flora and fauna currently present. This is particularly important for birds that may feed on biomass generated by nutrient output from wastewater treatment facilities, industry or farming. Changing the nutrient output or the physical setting may cause a change in available food sources, ultimately leading to the loss of the bird species from the area.
Changing the management of land through fencing, set-aside or buffer strips may indirectly impact on protected flora and fauna dependent on the current regime. This would be true for corncrakes, which are ground nesting birds that rely on winter flooding and a mowing regime for survival, or meadow barley, which is a plant that relies on a level of grazing in order to outcompete other non-native species.
Indirect positive impacts may occur in relation to soil biodiversity, particularly with alternatives that limit erosion, soil loss and remediate land contamination.
Population:
A number of alternatives will guide land use planning, thereby contributing to sustainable development. All of the measures are designed to improve water quality, which also contributes to sustainable development.
Human Health:
Improvements to water quality will indirectly impact on human health in relation to protection of drinking waters, bathing waters and shellfish waters. Improvements in septic tank management and upgrades to treatment facilities will also indirectly impact on human health through reduced odour nuisance.
Soil:
Soils are one of the pathways for movement of water and as such they can be indirectly impacted by many of the alternatives discussed. Indirect positive impacts to soils are likely from measures designed to reduce farming pressures, improve nutrient balances and prevent erosion. Measures to

prevent pollution of waters by chemicals will also improve soil quality and function.

Air Quality and Climate:

Air quality has the potential to interact with other environmental receptors, principally human health and climate. Increased treatment requirements may increase emissions to air from treatment and disposal facilities locally, e.g. dioxins from incineration; however air quality emissions would be subject to Emission Limit Values (ELVs) set out in IPPC and/or Waste licenses.

Emissions to air from transport also have the potential to impact on air quality and climate through release of GHG.

Material Assets:

Alternatives directed at improving water quality through upgrade of wastewater treatment infrastructure or reducing loading can indirectly impact on material assets by improving efficiency of existing infrastructure and providing new infrastructure. Indirect impacts are likely (negative) for some economic activities currently using or discharging to water but positive impacts will also be experienced by other economic activities dependent on clean water, e.g. angling, tourism etc.

Table 9.3 Assessment: Wastewater (NI: Collection and Treatment of Sewage / Urban Development)

	WW1	WW2	WW6	WW7	WW10	WW11	WW12	WW13	WW14	WW16
Overall Impact	+	+	+	+	+	+	+	+	+	+
Direct Impacts	√	√	√	√	√	√	√	√	√	√
Indirect / Secondary Impacts	√	√	√	√	√	√	√	√	√	√
Short-term Impacts		√	√	√						
Medium-term Impacts	√	√	√	√	√	√	√	√	√	√
Long-term Impacts	√	√	√	√	√	√	√	√	√	√
Mitigation Measure Recommended	√	√			√	√	√	√	√	√

*See **Table 8.3** for further details on the contents of these alternatives*

Table 9.4 Assessment: Industrial Discharges (NI: Industry and Other Businesses)

	IND2	IND3	IND4	IND6	IND7	IND8
Overall Impact	+	+	+	+	+	+
Direct Impacts	√	√	√	√	√	√
Indirect / Secondary Impacts	√	√	√	√	√	√
Short-term Impacts		√				√
Medium-term Impacts	√	√	√	√	√	√
Long-term Impacts	√	√	√	√	√	√
Mitigation Measures Recommended		√		√	√	√

*See **Table 8.4** for further details on the contents of these alternatives*

Table 9.5 Assessment: Other Point Sources (landfills, quarries, mines and contaminated lands) (NI: Industry and Other Businesses / Waste)

	OP2 / OP4	OP3	OP5	OP6
Overall Impact	+	+	+	+
Direct Impacts	√	√	√	√
Indirect / Secondary Impacts	√	√	√	√
Short-term Impacts	√	√	√	√
Medium-term Impacts	√	√	√	√
Long-term Impacts	√	√	√	√
Mitigation Measures Recommended	√		√	√

*See **Table 8.5** for further details on the contents of these alternatives*

Table 9.6 Assessment: Usage and Discharge of Dangerous Substances (NI: Included in key sectors under Pollution)

	DS3	DS4	DS5	DS6
Overall Impact	+	+	+	+
Direct impact	√	√	√	√
Indirect / Secondary Impacts	√	√	√	√
Short-term Impact				√
Medium-term Impact	√	√	√	√
Long-term Impact	√	√	√	√
Mitigation Measures Recommended	√	√	√	√

*See **Table 8.6** for further details on the contents of these alternatives*

Table 9.7 Assessment: Agriculture

	AG1 / AG3	AG2	AG4 / AG6	AG5	AG8	AG9	AG11	AG12 / AG13
Overall Impact	+	+	+	+	+	+	+	-
Direct Impacts	√	√	√	√	√	√	√	√
Indirect / Secondary Impacts	√	√	√	√	√	√	√	√
Short-term Impacts	√		√					
Medium-term Impacts	√	√	√	√	√	√	√	√
Long-term Impacts	√	√	√	√	√	√	√	√
Mitigation Measures Recommended	√		√		√			√

*See **Table 8.7** for further details on the contents of these alternatives*

Table 9.8 Assessment: Wastewater from Unsewered Properties (NI: Collection and Treatment of Sewage)

	UP1	UP2	UP4	UP5	UP7	UP8	UP11
Overall Impact	**+**	**+**	**+**	**+**	**+ / -**	**+ / -**	**+ / -**
Direct Impacts	√	√	√	√	√	√	√
Indirect / Secondary Impacts	√	√	√	√	√	√	√
Short-term Impacts				√		√	
Medium-term Impacts	√	√	√	√	√	√	√
Long-term Impacts	√	√	√	√	√	√	√
Mitigation Measures Recommended		√			√	√	√

*See **Table 8.8** for further details on the contents of these alternatives*

Table 9.9 Assessment: Forestry

	F2	F3	F4	F5	F6	F8	F11	F12	F13	F14	F15	F16	F17	F18	F19
Overall Impact	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Direct Impacts	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Indirect / Secondary Impacts	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Short-term Impacts							√	√	√	√	√	√	√	√	√
Medium-term Impacts	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Long-term Impacts	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Mitigation Measures Recommended	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

*See **Table 8.9** for further details on the contents of these alternatives*

Table 9.10 Assessment: Physical Modifications (NI: Freshwater Morphology/ Marine Morphology)

	PM2	PM6	PM7	PM9
Overall Impact	**+**	**-**	**+/-**	**-**
Direct impact	√	√	√	√
Indirect / Secondary Impacts	√	√	√	√
Short-term Impact			√	
Medium-term Impact	√	√	√	√
Long-term Impact	√	√	√	√
Mitigation Measures Recommended	√	√	√	√

*See **Table 8.10** for further details on the contents of these alternatives*

Table 9.11 Assessment: Abstractions (NI: Abstraction and Flow Regulation)

	AB4 / AB5	AB6 / AB7 / AB8	AB9	AB10 / AB11 / AB12 / AB13	AB14
Overall Impact	**+**	**+**	**+**	**+**	**+/-**
Direct impact	√	√	√	√	√
Indirect / Secondary Impacts	√	√	√	√	√
Short-term Impact		√			√
Medium-term Impact	√	√	√	√	√
Long-term Impact	√	√	√	√	√
Mitigation Measures Recommended	√	√	√	√	√

*See **Table 8.11** for further details on the contents of these alternatives*

10 MITIGATION AND MONITORING

10.1 INTRODUCTION

Article 10 of the SEA Directive requires that monitoring should be carried out in order to identify at an early stage any unforeseen adverse effects due to implementation of the Plan, with the view to taking remedial action where adverse effects are identified through monitoring. A monitoring programme is developed based on the indicators selected to track progress towards achieving strategic environmental objectives and reaching targets, enabling positive and negative impacts on the environment to be measured. The environmental indicators have been developed to show changes that would be attributable to implementation of the Plan. It is useful to note here that the monitoring programme currently being carried out under the WFD will form a substantial element of the monitoring programme required under the SEA. See **Section 7.2.2** for targets and indicators.

It should be noted that the success of the Plan in moving water bodies toward achieving the objectives of the WFD, including achieving good status by 2015, will be related to the speed at which the alternatives considered are implemented as well as choosing as a priority alternatives which result in the greatest benefit in the shortest time frame. For example, education and awareness campaigns, when implemented correctly, can provide good results, within short-time frames, for minimal relative monetary investment.

10.2 SOURCES OF INFORMATION FOR 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. **Table 10.1** presents the Environmental Monitoring Programme to track progress towards achieving strategic environmental objectives and reaching targets, and includes sources of relevant information. This follows on from the objectives, targets and indicators presented in **Table 7.3**.

From **Table 10.1**, it can be seen that the majority of information required is already being actively collected (under the WFD and other programmes), but not all of this is being gathered and reported on at a national level.

Table 10.1 Environmental Monitoring Programme

Strategic Environmental Objectives		
Objective 1 (BFF): Prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species.		
Objective 2 (P): Contribute to sustainable development.		
Objective 3 (HH): Protect and reduce risk to human health in undertaking water management activities.		
Objective 4 (S): Avoid damage to the function and quality of the soil resource in the River Basin District.		
Objective 5 (W): Prevent deterioration of the status of water bodies with regard to quality and quantity and improve water body status for rivers, lakes, transitional and coastal waters and groundwaters to at least good status, as appropriate to the WFD.		
Objective 6 (AQ): Minimise emissions to air as a result of Plan activities		
Objective 7 (C): Minimise contribution to climate change by emission of greenhouse gasses associated with Plan implementation.		
Objective 8 (MA1): Maintain level of protection provided by existing morphological infrastructure, e.g. flood defences, coastal barriers, groynes, etc.		
Objective 9 (MA2): Provide new, and upgrade existing, water and wastewater management infrastructure to protect human health and ecological status of water bodies		
Objective 10 (MA3): Support economic activities within the District without conflicting with the objectives of the WFD.		
Objective 11 (MA4): Protect water as an economic resource		
Objective 12 (CH): Avoid damage to cultural heritage resources in the River Basin District.		
Objective 13 (L): Avoid damage to designated landscapes in the River Basin District.		
Target	**Indicator**	**Data Availability, Source and Frequency**
BFF: Halt spread of Alien Species and their associated impact to the aquatic environment.	Geographical spread of Alien Species in the District.	National Invasive Species Database from Invasive Species Ireland (joint project between NPWS and NIEA). Compilation is ongoing.
BFF: Halt deterioration of habitats or their associated species due to water quality related issues by 2015, in line with the Water Framework Directive.	Interim Indicator: Status of Northern Ireland Priority Species.	UK Biodiversity Action Plan. NIEA. Published every 3 years.
	Interim Indicator: Status of Northern Ireland Priority Habitats.	Northern Ireland Biodiversity Strategy. NIEA. Published every 3 years.
	Long Term Indicator: Status of EU Protected Habitats and Species.	2nd UK Report on Implementation of the Habitats Directive. JNCC. Published every 6 years.
	Long Term Indicator: Condition of Selection Features in sites designated for nature conservation (SACs, SPAs, Ramsar and ASSIs) (based on 6 year rolling programme)	Northern Ireland Environmental Statistics Report. (Central Statistics and Research Branch (CSRB) DOE. Published annually.

P: Provide adequate water and wastewater treatment infrastructure capacity to all urban and suburban areas (cities, towns and villages) within the District by 2015.	Amount of new development in urban and suburban areas where adequate water and wastewater treatment infrastructure is not in place.	Data to be sourced from DOENI, not currently centrally compiled.
P: Strictly control rural development with the provision of individual wastewater treatment units in accordance with the conditions relating to quality and quantity of effluent discharge as part of the consent to discharge effluent granted by the DOENI.	Number of domestic discharge consent conditions applications granted by NIEA with conditions formulated to ensure sustainable discharges to waterways or soakaway to underground strata.	Data to be sourced from DOENI.
P: Mapping of large unsewered populations and method development to calculate the vulnerability of receiving waters to loading of on-site systems.	Number of septic tanks mapped, calculated loads and priority areas identified.	Data to be sourced from DOENI.
HH: All drinking water areas (including groundwater), as identified on the register of protected areas, to achieve good status, or maintain high status, by 2015.	Interim Indicator: Compliance with Drinking Water Standards. Long Term Indicator: Parameters to be measured in accordance with the environmental quality standards to determine Good Status.	Annual Drinking Water Quality Report. NIEA. Published annually
HH: All bathing waters, as identified on the register of protected areas, to achieve good status, or maintain high status, by 2015.	Interim Indicator: Compliance with Bathing Water Standards. Long Term Indicator: Parameters to be measured in accordance with the environmental quality standards to determine Good Status.	Northern Ireland Environmental Statistics Report. (Central Statistics and Research Branch (CSRB) DOE. Published annually.
HH: All economic shellfish waters, as identified on the register of protected areas, to achieve good status, or maintain high status, by 2015.	Interim Indicator: Compliance with the Quality of Shellfish Water Regulations. Long Term Indicator: Parameters to be measured in accordance with the environmental quality standards to determine Good Status.	Reporting of Shellfish Waters Directive monitoring data to EC under standardised and rationalised reporting (Reporting Decision 95/337/EC). NIEA. Reporting every three to four years.
HH: All water bodies designated for salmonids, as identified on the register of protected areas, to achieve good status, or maintain high status, by 2015.	Interim Indicator: Freshwater Fish Directive compliance. (NI) Long Term Indicator: Parameters to be measured in accordance with the environmental quality standards to determine Good Status.	Northern Ireland Environmental Statistics Report. (Central Statistics and Research Branch (CSRB) DOE. Published annually.
S: Reduce the number of fields with a P-index of 3 or above (i.e. with excess P).	Interim Indicator: Soil Phosphorus levels by P-Index for Managed Grassland soils.	Northern Ireland Environmental Statistics Report. (Central Statistics and Research Branch (CSRB) DOE. Published annually.

S: Achieve risk reduction targets as detailed in the Soil Directive for areas identified as at risk (not yet established).	Long Term Indicator: Monitoring programme as established under the requirements for the Soil Directive (once established).	Not yet established.
W: No deterioration in status of waters currently with high or good status (WFD Objective).	Interim Indicator: Environmental Quality Statistics relating to water quality. Long Term Indicator: Water status in 2015 report.	Northern Ireland Environmental Statistics Report. (Central Statistics and Research Branch (CSRB) DOE. Published annually. Water Status Report to published in 2015 as part of second RBMP cycle. NIEA
W: Restoration to good status of waters currently at moderate, poor or bad status (WFD Objective).	Interim Indicator: Environmental Quality Statistics relating to water quality. Long Term Indicator: Water status in 2015 report.	Northern Ireland Environmental Statistics Report. (Central Statistics and Research Branch (CSRB) DOE. Published annually. Water Status Report to published in 2015 as part of second RBMP cycle. NIEA
W: Progressively reduce chemical pollution in waters (WFD Objective).	Interim Indicator: Environmental Quality Statistics relating to water quality. Long Term Indicator: Water status in 2015 report.	Northern Ireland Environmental Statistics Report. (Central Statistics and Research Branch (CSRB) DOE. Published annually. Water Status Report to published in 2015 as part of second RBMP cycle. NIEA
W: Limit pollution inputs to groundwaters and prevent deterioration (WFD Objective).	Interim Indicator: Environmental Quality Statistics relating to water quality. Long Term Indicator: Water status in 2015 report.	Northern Ireland Environmental Statistics Report. (Central Statistics and Research Branch (CSRB) DOE. Published annually. Water Status Report to published in 2015 as part of second RBMP cycle. NIEA
AQ: Minimise total emissions to air associated with nutrient management.	Distance / number of vehicle trips used to transport nutrients; to be used as a proxy indicator for emissions associated with nutrient management activities, such as removal by tanker of slurry in areas of nutrient surplus.	Not currently compiled – monitoring of this would need to be integrated into the Waste Licences for operators of these activities. This information could be included in the Annual Environmental Report for each licensed facility.
AQ: Compliance with odour criteria to prevent deterioration in amenity beyond the site boundary as set out in license for new or upgraded wastewater infrastructure.	Number of complaints received related to odour.	Monitored by the DOENI as part of the IPPC license process. This information is usually included in the Annual Environmental Report for each licensed facility.
AQ: Compliance with odour criteria to prevent deterioration in amenity beyond the site boundary due to changes in industrial practices due to plan implementation.	Number of complaints received related to odour.	Monitored by the DOENI as part of the IPPC license process. This information is usually included in the Annual Environmental Report for each licensed facility.

C: Use BAT, including renewable energy, to minimise GHG from new or upgraded wastewater infrastructure in line with the UK's commitments to reduce GHG emissions under the Kyoto Protocol.	Calculated CO_2 equivalent in tonnes from new or upgraded water infrastructure, e.g. WWTP / WWTW, including emissions associated with the digestion and / or incineration of sludge.	To be calculated based on changes in water infrastructure at the second RBMP cycle in 2015.
C: Use BAT, including renewable energy, to minimise GHG from changes in industrial practices due to plan implementation in line with the UK's commitments to reduce GHG emissions under the Kyoto Protocol.	Calculated CO_2 equivalent in tonnes due to changes in industrial practices.	To be calculated at start of the second RBMP cycle in 2015 based on changes in industrial practices, records of which are held as part of the IPPC licence process by the DOENI.
C: No net loss of CO_2 sequestering vegetation due to changes in forestry practices as a result of Plan activity.	Calculated CO_2 sequestering potential of forest vegetation based on forest cover.	CO_2 sequestration potential could be sourced from the National Council for Forest Research and Development or similar source. Land cover information to be sourced from the Northern Ireland Forest Service.
MA1: No increase in the amount of infrastructure at risk from flooding as a result of Plan activities. In this case the length of road and rail infrastructure at risk will be used as a proxy indicator for infrastructure in general.	Interim indicator: Number of Flood Risk Management Plans prepared in accordance with the Floods Directive (2007/60/EC). Long Term Indicator: Length of road and rail infrastructure at risk from flooding.	Information on number prepared to be sourced from the Rivers Agency. Information flood risk to be sourced from the Rivers Agency.
MA2: Increase investment in water management infrastructure.	Water services investment expenditure per annum.	To be sourced from the Northern Ireland Water annual expenditure figures.
MA2: Achievement of the targets set out in the Investment Strategy for Northern Ireland 2008 - 2018 to upgrade water and wastewater treatment infrastructure to comply with current standards by 2014. (NI)	Progress towards completion of projects Alpha (to upgrade water treatment and delivery systems) and Omega (to upgrade wastewater treatment and sludge disposal facilities) as laid out in the Northern Ireland Investment Strategy 2008 – 2014.	To be sourced from Northern Ireland Water and Utility Regulator progress reports as they are published.
MA3: Minimise impacts to economic activity due to Plan implementation without conflicting with the objectives of the WFD.	Percent change in land cover types due to Plan implementation.	Land cover information to be sourced from Northern Ireland Countryside Survey (updated every ten years, latest survey completed in 2008, report not yet published)
MA4: Achieve sustainable use of water in the context of maintaining its economic benefit.	Change in economic value of water relative to the baseline reports: The Northern Ireland Water Framework Directive Article 5 Economic Analysis of Water Use	Economic studies carried out as a part of the plan making process during the second cycle of river basin management planning.
CH: No physical damage or alteration of the context of cultural heritage features due to Plan activities.	Changes in the condition of monuments on the SMR (Northern Ireland) due to Plan implementation.	Condition and Management Survey of the Archaeological Resource for Northern Ireland. NIEA. Updated on an ongoing basis.

	Number of listed structures at risk due to Plan implementation.	Built Heritage at Risk Northern Ireland (BHARNI) Register. NIEA and Ulster Architectural Heritage Society. Updated on an ongoing basis.
L: No damage to designated landscapes as a result of Plan implementation.	Number of water and wastewater treatment plants sited in landscapes with a high sensitivity to change.	Data on number of new wastewater treatment plants to be sourced from Northern Ireland Water
	Percentage changes in land cover types in areas with a high sensitivity to change.	Northern Ireland Countryside Survey (updated every ten years, latest survey completed in 2008, report not yet published)

10.3 MITIGATION (RECOMMENDATIONS FROM THE SEA TO FEED INTO THE PLAN)

The Environmental Report has highlighted the more significant potential positive and negative environmental impacts from the implementation of the draft Plan (including cumulative impacts). The following mitigation measures have been identified to reduce the negative impacts identified. It is recommended that the corresponding mitigation measure (as listed in **Table 10.2**) for any alternative brought forward into the final Plan, also be incorporated into the Plan. Mitigation measures required for alternatives following the Habitats Directive Article 6 report (the Appropriate Assessment) are noted in red.

Table 10.2 Mitigation Measures

Additional Measure	Mitigation Measure
WW1	This alternative should be accompanied by an education and awareness campaign for householders and commercial premises dealing with under-sink disintegration and FOG.
WW1	This alternative will require project level Appropriate Assessment* if alternative facilities for treatment of waste are constructed e.g. incinerator.
WW2	This alternative will need to link to the development planning process, e.g. by including a requirement to address wastewater capacity as part of the scope in any accompanying SEA for a Development Plan.
WW2	This alternative will need to consider whole catchment loading.
WW10/ WW11, WW12/ WW13	Negative impacts on climate associated with GHG emissions related to additional energy requirements should be offset by use of renewable energy sources or similar.
WW10 / WW11/ WW12	If these alternatives involve the building of a new plant or an extension to an existing plant an Appropriate Assessment* will be required. Prior to any proposals for a new plant, further investigation will be required to show that a new plant will have the desired improvements in water quality for which it is being built.
WW10/ WW11/ WW12/ WW16	If additional landtake is required for these alternatives, environmental studies will be undertaken to assess the impact on the environment.
WW14	An Appropriate Assessment* will be required to demonstrate that the relocation will not negatively impact on protected areas.
WW16	An Appropriate Assessment* will be required for WW16 to demonstrate that any new infrastructure will not negatively impact on protected areas.
IND3	It is important to ensure the environmental quality standards that are set for receiving waters are achieved. Particular attention should be placed on discharges to EU protected areas in case a licence requires more stringent standards.
IND6	Once clarified, BAT should be reviewed in the context of impacts to air quality and GHG emissions.
IND7	Catchment nutrient budgets should be prepared and limits set according.
IND8	A cultural heritage assessment will be required for all proposed relocation options.
IND8	Areas containing sensitive habitats and species should be avoided. An Appropriate Assessment* will be required to determine impacts on protected areas resulting from relocation.

Additional Measure	Mitigation Measure
OP2 / OP4	A programme of education and awareness is needed to tackle improper and illegal disposal of waste to support these alternatives. The Appropriate Assessment* has recommended a campaign to reduce the illegal disposal of waste, as this would have particular benefit for protected areas, which tend to be remote rural areas, e.g. bogs, used for illegal disposal of unwanted materials.
OP5	Remediation of site and containment options will need to be inclusive and linked to risk assessment to look at all pathways for contamination, not just water.
OP5	Remediation needs to look at the whole receiving environment, not just water. Remediation projects will need to work with Biodiversity Action Plans (national and local). Local projects could work with other similar habitat types in an area to create ecological networks to the benefit of flora and fauna.
OP5	Project level Appropriate Assessments* will be required for activities under this alternative.
OP5	On-site treatment of contaminated soils should be considered to reduce negative impacts to air quality and climate from transport related emissions.
OP6	Appropriate Assessment will be required for activities under this alternative
DS3 / DS4	Sector specific targeted pollution reduction programmes will need to be developed in the early stages to ensure maximum medium to long-term gains can be achieved.
DS5	An Appropriate Assessment* will be required if this alternative would involve the building of a new plant or an extension to an existing plant.
DS6	An ecological impact assessment, human health impact assessment and a cultural heritage assessment will be required for all proposed relocation options. Sensitive areas should be avoided.
DS6	An Appropriate Assessment* will be required.
AG1 / AG3	It is recommended that compensation be linked to annual upkeep of fences and management of buffers to ensure the ongoing benefit of these alternatives.
AG1 / AG3	Appropriate guidance is required for implementation of these alternatives to prevent indirect impacts to biodiversity.
AG1 / AG3	An Appropriate Assessment will be required.
AG3	A management plan for buffer strips and set aside will be required to ensure there are no detrimental impacts on locally important flora and fauna. These plans should be farm specific to take account of the locally sensitive biodiversity.
AG4	An Appropriate Assessment* will be required if a land use change is proposed in a protected area.
AG6	An Appropriate Assessment will be required.
AG6	Set aside of lands shall only be implemented in combination with appropriate guidance for agricultural lands within or adjacent to protected areas (spraying of pesticides is the key concern).
AG8	It is recommended that an information and advice campaign targeted at farmers should be implemented on a national scale. This should focus on prevention first followed by BMP as core themes. It will be important that adequate consideration is given not just to water and biodiversity but also soils and cultural heritage, as a narrowly focussed approach may lead to indirect negative impacts on these areas. It is also recommended that information campaigns highlight best practice in the sector in order to demonstrate that an economically viable farming operation is possible within such schemes. Opportunities for agri-tourism should also be highlighted as a way to supplement farm income while protecting the environment. This guidance shall also include information relating to implementation in areas protected for biodiversity.
AG10	An Appropriate Assessment* is required for any new facility. This alternative should only be implemented in areas when the intensity of farming is currently high, and should not be used as a reason to further intensify farming in protected areas.

Additional Measure	Mitigation Measure
AG12	A system of cooperation between farms at the local level would mitigate some of the impacts associated with tankering**,** including the need to move material over a large area (mitigation of air quality and climate impacts) and provision of numerous small storage areas (mitigation of landloss).
AG12	This alternative should be qualified and should only be considered as a short-term alternative as this does not resolve the issue with the pressure. An Appropriate Assessment* is also recommended for the relocation area.
AG13	Methane gas, resulting from use of digestors to treat nutrient surplus, should be captured and re-used as a fuel source to offset impacts to climate associated with generation of greenhouse gas. The resultant digestate should only be disposed of in licensed landfill facilities. Should new landfill facilities be required, the siting of these should be subject to environmental impact assessment.
AG13	An Appropriate Assessment* will be required for any new facility. This alternative should only be implemented in areas when the intensity of farming is currently high, and should not be used as a method to allow further intensification of farming in protected areas.
UP2	The pre-planning process should assess whether an Appropriate Assessment* would be required for new development within or adjacent to a protected area.
UP7 / UP8	An education programme should be carried out in tandem with new requirements for tank maintenance, including guidance on disposal of sludges.
UP8	Intelligent transport programmes should be put in place to minimise the amount of emissions associated with movement of sludges from on-site treatment systems.
UP11	Upgraded treatment works should be required to introduce BAT, including the use of renewable energy sources, in order to reduce GHG emissions and others resulting from increased demand for treatment.
UP7/ UP8/ UP11	New wastewater treatment infrastructure, including sludge disposal infrastructure, will be subject to environmental assessment at the project level to reduce indirect impacts to biodiversity, landscape, cultural heritage, air quality and climate
UP7 / UP11	An Appropriate Assessment* will be required for new structures.
F ALL	Future guidelines for forestry should be developed through a steering group represented by bodies such as Coillte, the Forest Service (Northern Ireland), the Forest Service (Ireland), National Parks and Wildlife Service, the Central Fisheries Board (Ireland), the Fisheries Conservancy Board (Northern Ireland) the Northern Ireland Environment Agency, and representatives from the relevant planning authorities to ensure that the final guidelines take a holistic approach to the environment which includes biodiversity, landscape, climate and cultural heritage interests. Consideration should be given to identifying and implementing as a priority those alternatives that can be applied to forests only starting or midway through the growth cycle.
F2-F8	It is recommended that prior to any changes in forest size or species mix, a study is carried out to determine the change, if any, in the carbon dioxide sequestering capacity of the forest. Should sequestering capacity be reduced, compensation measures will be required to offset these.
F2	The following change to the language in the Draft POM is required: Avoid afforestation on 1st and 2nd order stream catchments in acid sensitive catchments and in protected areas.
F3	An Appropriate Assessment* will be required.
F5	Change to the Draft POMs recommended: Eutrophication and Sedimentation - Avoid or limit forest cover on peat sites and on errodable soils.
F5	An Appropriate Assessment* will be required if a new plantation is proposed to be developed on peat sites or erodible soils in areas or catchments in areas protected for biodiversity (i.e. an SAC, SPA or Ramsar).
F13	The following change to the language in the Draft POM is required: Avoid the use of basic material in protected areas, particularly in sensitive freshwater pearl mussel catchments.
F13 / F14	An Appropriate Assessment* will be required.
F19	Detailed studies should be carried out prior to the introduction of any non-native species to

Additional Measure	Mitigation Measure
	be used as a biological control method.
F19	An Appropriate Assessment will be required.
F20	A determination with regard to the requirement for SEA for Forestry practices under the provisions of the SEA Directive and Appropriate Assessment under the Habitats Directive should be made.
PM2	An Appropriate Assessment will be required.
PM4	A determination with regard to the requirement for SEA for tidal energy schemes under the provisions of the SEA Directive and Appropriate Assessment under the Habitats Directive should be made.
PM6/ PM7	An Appropriate Assessment* will be required for remediation schemes.
PM6/ PM9	An archaeology, architecture and cultural heritage assessment will be required before removal of any physical modifications with potential for cultural heritage value. Mitigation measures will be in agreement with the relevant authority. This assessment should include reference to cultural heritage in the context of the existing landscape.
PM6	A flood impact assessment should be carried out for all channelisation and barrier remediation schemes to determine whether an increased risk of flooding would occur as a result.
PM7	Any voluntary schemes and/or overgrazing remediation schemes should be rolled out in tandem with an education and guidance programme to ensure that the schemes are carried out in a holistic manner.
PM9	An Appropriate Assessment* will be required for impassable barrier remediation schemes.
AB4	The assessment shall determine whether compensation flow is sufficient to meet the needs of in stream flora and fauna.
AB5	This alternative should take account of the results from AB4.
AB6/ AB7/ AB8	Although water conservation awareness campaigns have been implemented the message has not hit home for many people. It is therefore recommended that a working group be established to develop tools to promote water awareness and these tools are included in future water awareness campaigns.
AB8	An Appropriate Assessment* should be undertaken for any new infrastructure.
AB9	Suitable education and awareness campaigns are recommended to provide residential users with the tools / knowledge to reduce water consumption. It is also strongly recommended that water metering schemes promote conservation.
AB10	An Appropriate Assessment* should be carried out.
AB13	Possible storage sites should not impact negatively on sensitive habitats and species. Good quality agricultural land should also be avoided where alternatives exist. Storage options will include proposals for biodiversity enhancement and opportunities for economic benefit e.g. tourism, angling without compromising environmental sustainability. Energy required for pumping stations should be sourced from renewable sources.
AB13	A protocol for prevention of the spread of any alien species shall be developed and agreed with the relevant authority and the relevant fisheries board in advance of any inter-catchment transfers.
AB12	An Appropriate Assessment* should be carried out.
AB13	An Appropriate Assessment* should be undertaken for any proposed storage facility.
AB14	It is recommended that the Planning Authority, in directing or restricting development take account not only of the water capacity of an area but its wider capacity in terms of cultural heritage, biodiversity and landscape, etc.
AB14	An Appropriate Assessment* should be considered for new abstractions in line with the requirements of the Habitats Directive.
AB All	A focussed awareness campaign on water use will be implemented to reduce the volumes of water used / wasted, followed by leakage improvement and only then new infrastructure.

Additional Measure	Mitigation Measure
	Any new infrastructure e.g. storage should source its fuel from renewable sources.

**Note: It should be noted that in this case the term Appropriate Assessment refers to the assessment process as specified in Article 6 of the Habitats Directive. This starts with screening to determine whether a likely significant impact from the plan/programme is expected to occur to a Natura 2000/Ramsar site as a result of activities in/adjacent to/in the catchment of a Natura 2000/Ramsar site. If, in accordance with AA guidance (guidance produced by the EU, DEHLG in Ireland, and NIEA in Northern Ireland), it can be shown that there is no potential for impact at the screening stage, no further assessment may be required. However when the plan/programme being screened lies within or adjacent to a Natura 2000/Ramsar site then such a determination must be made in consultation with NPWS/NIEA. If the plan/programme is within the catchment (surface and groundwater) of a Natura 2000/Ramsar site, such consultation with NPWS/NIEA is only necessary for those water dependent Natura 2000 sites which are listed in the WFD Register of Protected Areas.*

10.4 SUMMARY OF MONITORING AND MITIGATION

The Strategic Environmental Assessment carried out on the draft Plan and POMs has ensured that any potential significant environmental impacts have been identified and given due consideration, and taken into account in the development of the Plan and POM. 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.

11 NEXT STEPS

There is still some important work to complete before this river basin management 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 Strategic Environmental Assessment. The next step in the SEA and RBMP/ 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. **Table 11.1** outlines the remaining steps in this RBMP/ POM and SEA process.

Table 11.1 Remaining Steps in the RBMP and SEA processes in Northern Ireland

Date	Milestone	
	River Basin Management Plan	**Strategic Environmental Assessment**
22 December 2008	Publication of draft River Basin Management Plan	Publication of Environmental Report
22 June 2009	End of statutory consultation	End of consultation
	Compilation of final River Basin Management Plan	Compilation of consultation report and SEA Statement
22 December 2009	Publication of final River Basin Management Plan	Publication of SEA Statement
December 2009 to 2015	First six year planning cycle	

Written submissions or observations are now invited with respect to the draft North Eastern River Basin Management Plan, associated Environmental Report and Habitats Directive Assessment. Written submissions should be forwarded for the attention of Jo Campbell on or before 22nd June 2009 (contact details below). Comments can also be sent via www.ni-environment.gov.uk/wfd. These submissions / observations will be taken into consideration before finalisation of the Plan. Early responses would be appreciated to allow more time to clarify and resolve issues that may arise.

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12 ACRONYMS

AQMA	Air Quality Management Area
ASSI	Areas of Special Scientific Interest
AWB	Artificial Water Body
BAP	Biodiversity Action Plan
BAT	Best Available Techniques
BATNEEC	Best Available Techniques Not Entailing Excessive Cost
BMP	Best Management Practice
CAFÉ	Clean Air For Europe
CH_4	Methane
CMP	Conservation Management Plan
CO	Carbon Monoxide
DAFF	Department of Agriculture, Fisheries and Food
DARD	Department of Agriculture and Rural Development
DCENR	Department of Communications, Energy and Natural Resources
DoE	Department of Environment (Northern Ireland)
DoEHLG	Department of Environment, Heritage and Local Government
EAP	Environment Action Programme
EIA	Environment Impact Assessment
ELVs	Emission Limit Values
EPA	Environmental Protection Agency
EPRTR	European Pollutant Release and Transfer Register
ERBD	Eastern River Basin District
ESB	Electrical Supply Board
EU	European Union
FOG	Fats, Oils and Greases
GBR	Generally Binding Rules
GHG	Greenhouse Gas
GSI	Geological Survey of Ireland
HMWB	Heavily Modified Water Body
HSE	Health Services Executive
ILWG	Irish Landslides Working Group
IPCC	Intergovernmental Panel on Climate Change
IPPC	Integrated Pollution Prevention and Control
IRBD	International River Basin District
JNCC	Joint Nature Conservation Committee
LNR	Local Nature Reserve
MNR	Marine Nature Reserve
NBIRBD	Neagh Bann International River Basin District

NDP	National Development Plan
NERBD	North East River Basin District
NHA	Natural Heritage Area
NIAH	National Inventory of Architectural Heritage
NIBG	Northern Ireland Biodiversity Group
NIEA	Northern Ireland Environment Agency
NIEH	National Industrial Engineering Heritage
NISRA	Northern Ireland Statistics and Research Agency
NNR	National Nature Reserve
NO_2	Nitrogen Dioxide
NPWS	National Parks and Wildlife Service
NSS	National Spatial Strategy
NWIRBD	North Western International River Basin District
OPW	Office of Public Works
$PM_{2.5}$	Particulate Matter less than 2.5 micrometers in size
PM_{10}	Particulate Matter less than 10 micrometers in size
POM	Programme of Measures
POPs	Persistent Organic Pollutants
RAL	Remedial Action List
RBD	River Basin District
RBMP	River Basin Management Plan
REACH	Registration, Evaluation, Authorisation of Chemicals (EU REACH Initiative)
RMP	Records of Monuments and Places
SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
SERBD	South Eastern River Basin District
ShIRBD	Shannon International River Basin District
SOCC	Species of Conservation Concern
SPA	Special Protection Area
SWMI	Significant Water Management Issues
SWRBD	South Western River Basin District
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change
WFD	Water Framework Directive
WHO	World Health Organisation
WRBD	Western River Basin District
WSIP	Water Services Investment Programme
WWTP	Waste Water Treatment Plants
WWTW	Waste Water Treatment Works

13 GLOSSARY

Acidification	The rough canopies of mature evergreen forests are efficient scavengers of particulate and gaseous contaminants in polluted air. This results in a more acidic deposition under the forest canopies than in open land. Chemical processes at the roots of trees, evergreens in particular, further acidify the soil and soil water in forest catchments. When the forests are located on poorly buffered soils, these processes can lead to a significant acidification of the run-off water and consequent damage to associated streams and lakes.
Alien species	Invasive alien species are non-native plants or animals that successfully establish themselves in aquatic and fringing habitats and damage our natural flora and fauna.
Appropriate Assessment	An assessment of the effects of a plan or project on the Natura 2000 network. The Natura 2000 network comprises Special Protection Areas under the Birds Directive, Special Areas of Conservation under the Habitats Directive and Ramsar sites designated under the Ramsar Convention (collectively referred to as European sites).
Aquifers:	A water bearing rock which readily transmits water to wells and springs.
Artificial water body:	A body of surface water created by human activity. It is known as a heavily modified water body if, as a result of physical alterations by human activity, it is changed substantially in character as designated by an individual Member State and in accordance with the provisions of Annex II of the Water Framework Directive.
Baseline environment**:**	A description of the present state of the environment of the P/P area.
Biodiversity:	Word commonly used for biological diversity and defined as assemblage of living organisms from all habitats including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part.
Birds Directive:	Council Directive of 2nd April 1979 on the conservation of wild birds (79/409/EEC).
Brine:	Concentrated salt water
Business as Usual Scenario:	The Business as Usual scenario is a conceptual baseline which projects what would happen in an area if there were no changes. It assumes current land use and other policies that guide or shape development remains the same, that current market-based trends continue, and that anticipated development projects occur as planned. This scenario also assumes that current demographic trends will continue as expected and future trends in urbanization and land consumption follow past patterns.
Coastal Waters:	Is that area of surface water on the landward side of a line, every point of which is at a distance of one nautical mile on the seaward side from the nearest point of the baseline from which the breadth of

	territorial waters is measured, extending where appropriate up to the outer limit of transitional waters.
Carbon Dioxide (CO_2)**:**	A naturally occurring gas which is also a by-product of burning fossil fuels and biomass, land-use changes and industrial processes. It is the principal anthropogenic greenhouse gas that affects the earth's radiative balance. It is the reference gas against which other greenhouse gases are measured and therefore has a Global Warming Potential of 1.
Cumulative effects:	Effects on the environment that result from incremental changes caused by the strategic action together with other past, present, and reasonably foreseeable future actions. These effects can result from individually minor but collectively significant actions taking place over time or space.
Designated authority:	An organisation that must be consulted in accordance with the SEA Regulations.
Diffuse sources (of pollution)**:**	These are primarily associated with run-off and other discharges related to different land uses such as agriculture and forestry, from septic tanks associated with rural dwellings and from the land spreading of industrial, municipal and agricultural wastes.
Dinantian:	Name of the Lower Carboniferous period and specifically a series of rocks in Europe which were deposited during the period.
Dystrophic:	Having brownish acidic waters, a high concentration of humic matter, and a small plant population.
Ecology:	The study of the relationship among organisms and between those organisms and their non-living environment.
Ecosystem:	A community of interdependent organisms together with the environment they inhabit and with which they interact, and which is distinct from adjacent communities and environments
Ecological status**:**	**I**s an expression of the structure and functioning of aquatic ecosystems associated with surface waters. Such waters are classified as being of good ecological status when they meet the requirements of the Directive.
Environmental assessment:	The preparation of an environmental report, the carrying out of consultations, the taking into account of the environmental report and the results of the consultations in decision-making and the provision of information on the decision (in accordance with Articles 4 to 9 of the SEA Directive).
Environmental indicator:	An environmental indicator is a measure of an environmental variable over time, used to measure achievements of environmental objectives and targets.
Environmental objective:	Environmental objectives are broad, overarching principles which should specify a desired direction of environmental change.

Environmental receptors:	Include biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage (including architectural and archaeological) and landscape as listed in the SEA Directive. This list is not exhaustive, and can include other receptors which may arise for a particular P/P.
Environmental report (ER):	A document required by the SEA Directive as part of a strategic environmental assessment which identifies, describes and evaluates the likely significant effects on the environment of implementing a plan or programme.
Eutrophic:	A eutrophic lake is a lake with high primary productivity, the result of high nutrient content.
Eutrophication:	Enrichment of water by nutrients (phosphorus and nitrogen). The nutrients accelerate plant growth, which disturbs the balance of aquatic plants and animals and affects water quality.
Fulachta fiadh:	Also called burnt mounds. They consist of horseshoe shaped heaps of heat-fractured stone mixed with charcoal and dark soil, associated with lined rectangular water troughs and hearths.
Good status:	Is a general term meaning the status achieved by a surface water body when both the ecological status and its chemical status are at least good or, for groundwater, and when both its quantitative status and chemical status are at least good.
Groundwater:	All water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil. This zone is commonly referred to as an aquifer which is a subsurface layer or layers of rock or other geological strata of sufficient porosity and permeability to allow a significant flow of groundwater or the abstraction of significant quantities of groundwater.
Greenhouse Gas**:**	Gaseous constituents of the atmosphere that absorb/trap infrared (thermal) radiation which is mainly emitted by the earth's surface and thereby influence the earth's temperature.
Habitats Directive:	Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild flora and fauna.
Hierarchy of plans:	Both higher and lower level P/P relevant to the P/P being assessed.
Hydromorphology:	A study of the quantity and dynamics of water flow within a river/channel that has variations in its width, depth, structure and substrate of bed and riparian zone
Inland Surface Waters:	All standing or flowing water on the surface of the land (such reservoirs, lakes, rivers and coastal waters) and all groundwater on the landward side of the baseline from which the breadth of territorial waters is measured.
Interrelationships:	Associations or linkages, related to environmental impact of the proposed P/P usually on environmental receptors.

Key environmental issues:	Those significant environmental issues, which are of particular relevance and significance within a P/P area and/or the zone of influence of that P/P. These issues should be identified during SEA Scoping process.
Kyoto Protocol**:**	The 1997 protocol to the Convention on Climate Change under which industrialised countries will reduce their combined greenhouse gas emissions by at least 5 per cent compared to 1990 levels by 2008–2012.
Leachate**:**	**T**he liquid produced when water percolates through any permeable material. It can contain either dissolved or suspended material, or usually both
Management Measures:	Procedures that are introduced from a management plan to mitigate against any impacts that occur from the implementation of project development
Material Assets:	Critical infrastructure essential for the functioning of society such as: electricity generation and distribution, water supply, wastewater treatment, transportation etc
Mitigation measures:	Measures to avoid/prevent, minimise/reduce, or as fully as possible, offset/compensate for any significant adverse effects on the environment, as a result of implementing a P/P.
Monitoring:	A continuing assessment of environmental conditions at, and surrounding, the plan or programme. This determines if effects occur as predicted or if operations remain within acceptable limits, and if mitigation measures are as effective as predicted. The primary purpose of monitoring is to identify significant environmental effects which arise during the implementation stage against those predicted during the plan preparation stage.
Natural Heritage Area (NHA):	An area considered important for the habitats present or which holds species of plants and animals whose habitat needs protection.
Non-technical summary:	A summary of the findings of the ER, summarised under the headings listed in Annex 1 of the SEA Directive that can be readily understood by decision-makers and by the general public. It should accurately reflect the findings of the ER.
Oligotrophic:	Term applied to water bodies that are poorly nourished, unproductive.
Otter Trawling**:**	Otter trawling derives its name from the large rectangular otter boards which are used to keep the mouth of the trawl net open. Otter boards are made of timber or steel and are positioned in such a way that the hydrodynamic forces, acting on them when the net is towed along the seabed, pushes them outwards and prevents the mouth of the net from closing.
Ooycysts:	An oocyst is the thick-walled spore phase of certain protists, such as *Cryptosporidium* and *Toxoplasma*

Percolation:	Concerns the movement and filtering of fluids through porous materials
Polluter Pays Principle:	An environmental policy principle which requires that the cost of pollution be borne by those who cause it.
Plan or Programme:	Including those co-financed by the European Community as well as any modifications to them: - which are subject to preparation and/or adoption by an authority at national, regional or local level or which are prepared by an authority for adoption, through a legislative procedure by Parliament or Government, and - which are required by legislative, regulatory or administrative provisions. In accordance with the SEA Directive, P/P that require SEA are those that fulfill the conditions listed in Article 2(a) and Article 3 of the SEA Directive.
Programme of measure:	Defines in detail those actions which are required to achieve the environmental objectives of the Directive within a river basin district.
Quantitative status:	An expression of the degree to which a body of groundwater is affected by direct and indirect abstractions. If this complies with Directive requirements the status is good.
Ramsar sites:	Sites designated as internationally important wetland habitats under the International Convention on Wetlands of International Importance (1976) (Ramsar Convention).
Reasonable alternatives:	Alternatives should take into account the objectives and geographical scope of the P/P. There can be different ways of fulfilling the P/P objectives, or of dealing with environmental problems. The alternatives should be realistic, capable of implementation and should fall within the legal and geographical competence of the authority concerned.
Reverse osmosis:	A separation process that uses pressure to force a solution through a membrane that retains the solute on one side and allows the pure solvent to pass to the other side.
River Basin:	Means the area of land from which all surface water run-off flows, through a sequence of streams, rivers and lakes into the sea at a single river mouth, estuary or delta.
River Basin Districts (RBD):	administrative areas for coordinated water management and are comprised of multiple river basins (or catchments), with cross-border basins (i.e. those covering the territory of more than one Member State) assigned to an international RBD.

Scoping: the process of deciding the content and level of detail of an SEA, including the key environmental issues, likely significant environmental effects and alternatives which need to be considered, the assessment methods to be employed, and the structure and contents of the Environmental Report

Screening: The determination of whether implementation of a P/P would be likely to have significant environmental effects on the environment. The process of deciding whether a P/P requires an SEA.

SEA Directive: Directive 2001/42/EC 'on the assessment of the effects of certain plans and programmes on the environment'.

SEA Statement: A statement summarising:

- how environmental considerations have been integrated into the P/P
- how the ER, the opinions of the public, and designated authorities, and the results of transboundary consultations have been taken into account
- the reasons for choosing the P/P as adopted in the light of other reasonable alternatives.

Sedimentation: The deposition by settling of a suspended material

Significant effects: 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.

Special Area of Conservation (SAC): Site designated according to the habitats directive.

Special Protection Area (SPA): An area designated under the European Directive on the Conservation of Wild Birds.

Statutory authority: The authority by which or on whose behalf the plan or programme is prepared.

Statutory Instrument: Any order, regulation, rule, scheme or byelaw made in exercise of a power conferred by statute.

Surface water**:** Means inland waters, except groundwater, which are on the land surface (such as reservoirs, lakes, rivers, transitional waters, coastal waters and, under some circumstances, territorial waters) which occur within a river basin.

Taxa: A name designating an organism or a group of organisms.

Transboundary Consultation:	If a plan or programme is being prepared that is likely to have significant effects on the environment in another Member State, or where a Member State likely to be significantly affected so requests, the Member State in whose territory the plan or programme is being prepared shall, before the plan or programmes adoption or submission to the legislative procedure, forward a copy of the draft plan or programme and the relevant environmental report to the other Member State.
Transitional waters:	Bodies of surface water in the vicinity of river mouths which are partly saline in character as a result of their vicinity to coastal waters, but which are substantially influenced by freshwater flows.
Water body:	A discrete and significant element of surface water such as a river, lake or reservoir, or a distinct volume of groundwater within an aquifer.
Water Framework Directive:	The Water Framework Directive is a new piece of European legislation that promotes a new approach to water management through river basin planning. The legislation addresses inland surface waters, estuarine waters, coastal waters and groundwater.

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