

Strategic Environmental Assessment
for the Water Framework Directive
River Basin Management Plans and
Programmes of Measures -
Eastern RBD

Updated Environmental
Report and Appendices

NON-TECHNICAL SUMMARY

INTRODUCTION

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

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

METHODOLOGY INCLUDING CONSULTATION (Chapter 2 and 4)

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

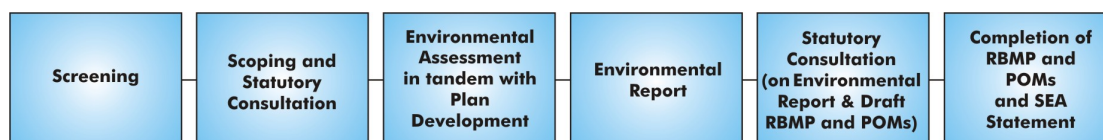


Figure 1: Summary of SEA stages

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

SCOPING THE RELEVANT ENVIRONMENTAL ASPECTS

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

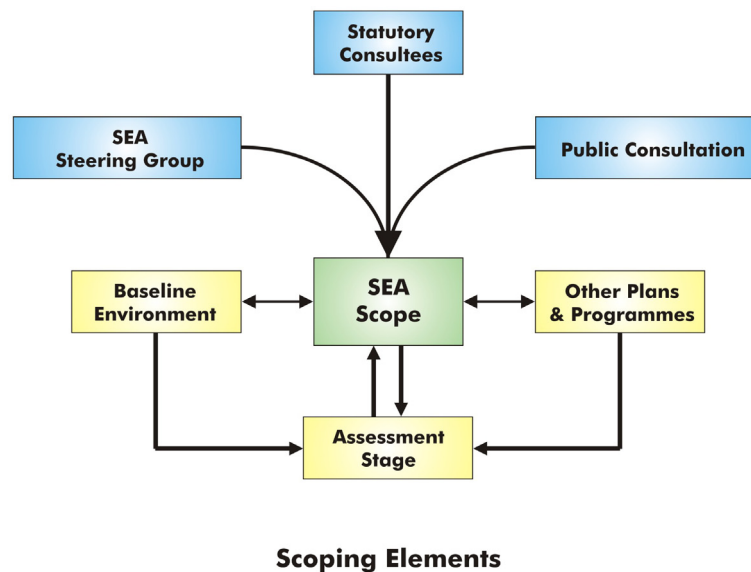


Figure 2: Overview of the Scoping Process

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

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

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

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

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

Table 1 Contents of the Environmental Report

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

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

Habitats Directive Assessment Consultation (Chapter 4)

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

DESCRIPTION OF THE PLAN (Chapter 3)

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

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

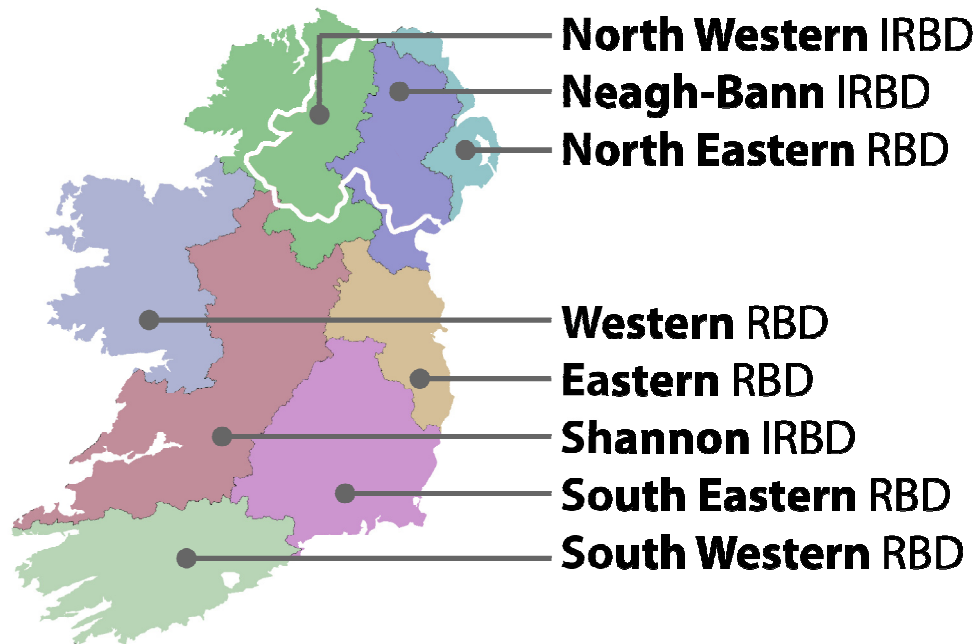


Figure 3 River Basin Management areas of Ireland

The Eastern RBD incorporates all or part of twelve local authority areas. The Eastern RBD includes all of Dublin City, Fingal, South Dublin and Dún Laoghaire-Rathdown, the vast bulk of County Meath, County Kildare, and County Wicklow as well as smaller portions of County Louth, County Cavan, County Westmeath, County Offaly and County Wexford. Each of the local authorities for these areas is a competent authority for the Eastern RBD, with Dublin City Council the statutorily designated co-ordinating authority for the Eastern RBD.

The draft Plan outlines measures to tackle key water pressures in the District. Some issues of concern in the ERBD for which measures are proposed in the draft Plan include: spread of invasive alien species; pressure on fisheries; presence of heavily modified and artificial water bodies; point and diffuse pollution from wastewater treatment plants, licensed discharges, mines, landfills, quarries and contaminated lands; agriculture; unsewered properties; forestry; physical modifications; and abstraction. In particular the Avoca River is located within the ERBD and has been identified by the EPA (2008) as the most severely affected river in Ireland. The overall objectives of the Plan are based on the objectives of the WFD and can be summarised as follows:

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

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

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

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

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

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

- The Kyoto Protocol;
- The EIA Directive (85/337/EEC as amended);
- The EU Habitats (92/43/EEC) and Birds Directives (79/409/EEC);
- The Groundwater Directive (2006/118/EC); and
- The EU Floods Directive (2007/60/EC).

THE BASELINE ENVIRONMENT (Chapter 5)

As this strategic environmental assessment deals with a plan for the Eastern RBD, the baseline data is focused at the RBD level.

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

Table 2 Baseline Environment and Existing Environmental Pressures

Aspect	Existing Environmental Pressures
Biodiversity, Flora and Fauna	<p>Throughout the island of Ireland there has been a decline in many of the native species through habitat loss, competition, development and agriculture.</p> <p>Wastewater discharges, runoff from agriculture, leachate from landfills, mines and contaminated sites and nutrient/pesticide input from forestry can all have detrimental effects on water quality resulting in subsequent impacts to biodiversity.</p> <p>Annex II species such as freshwater pearl mussel and salmon are particularly sensitive to pollution.</p> <p>Widespread development on shorelines and floodplains (e.g. the Nanny/Delvin) and the associated infilling of wetlands, is a potential environmental problem within this District.</p> <p>Invasive non-native plant and animal species are one of the greatest threats to biodiversity in Ireland.</p>
Population and Human Health	<p>Ireland's economy has experienced unprecedented economic growth since the early 1990's.</p> <p>New individual houses and housing clusters, reliant on septic tanks, threaten water quality.</p> <p>Demand for more food and industrial goods has led to more intensive or expanded activities with higher water demand and pollution threats.</p> <p>Pressure from abstractions can reduce flow in springs and lower water levels in lakes, wetlands and wells.</p> <p>Concerns have been raised about the capacity of water supplies in the Eastern district, where the rapid pace of development, population and commercial activities- is leading to shortage in some areas.</p>
Water	<p>The main pressures on surface and groundwater quality within the RBD are point and diffuse, physical modifications, climate change and other local issues. Point and diffuse sources include; wastewater and industrial discharges, landfills, quarries, mines and contaminated sites, agriculture, wastewater from unsewered properties, forestry; and discharge of dangerous substances.</p>
Air and Climate	<p>Currently there are no significant concerns with regard to air quality at the River Basin District level.</p> <p>With regard to climate, inputs of greenhouses gasses from water management activities in the River Basin District, which require the use of fossil fuels, add to the carbon dioxide emissions produced on the island.</p>
Cultural Heritage	<p>Development of water-related infrastructure, in addition to development resulting from economic growth and increasing population, is placing pressure on sites or features of architectural, archaeological or cultural heritage interest.</p>
Landscape and Visual	<p>Existing pressures on landscape and visual resources as a result of water management activities are limited and are primarily related to impacts to sensitive views and landscapes resulting from the siting of development, including water related infrastructure, without sensitivity to these resources.</p>
Material Assets	<p>Increased development including residential and industrial expansion continues to put pressure on existing water sources with regards to quantity as well as on the treatment facilities used to treat both raw water for drinking and other purposes and wastewater.</p> <p>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.</p>
Soils and Land Use	<p>Precipitation changes, predicted as one of the global warming impacts on Ireland, could have serious implications for slope stability and landslides and their resultant impacts on water management activities.</p> <p>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.</p>

Aspect	Existing Environmental Pressures
Soils and Land Use (cont.)	<p>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.</p> <p>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.</p>

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

Table 3 Potential Inter-Relationships Between SEA Topics

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

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 continue. According to a recent EPA report (2008) trends in water quality in Ireland show an overall improvement; however, the rate of this improvement in surface waters is not sufficient to meet the requirement of having good status in all waters by 2015 as required

by the Water Framework Directive. The pressures identified in the *Water Matters – Have Your Say Report also known as the Significant Water Management Issues or SWMI* report would continue to impact on water quality and quantity, perpetuating the indirect impacts associated with these on biodiversity, flora and fauna, population and human health. Development may continue to take place in a dispersed manner, though some control would be provided by existing controls in plans such as the National Spatial Strategy and the National Development Plan. 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. As a result of manmade greenhouse gas emissions, climate change is predicted to occur in the future regardless of action. The potential impacts from sea level increases, increased flooding, summer droughts, etc., will impact on water management. Some cultural heritage features would continue to be at risk from water pollution. However, planned changes to the morphology of certain waterbodies as part of the Plan would not occur, potentially avoiding interference with water dependent features, such as mills and weirs.

ENVIRONMENTAL OBJECTIVES, TARGETS AND INDICATORS (Chapter 7)

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

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

Box 1: Strategic Objectives Selected

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

Objective 2: Contribute to sustainable development. (Population)

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

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

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

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

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

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

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

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

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

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

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

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

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

ALTERNATIVES (Chapter 8)

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

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

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

- a) **reduce** the inputs of contaminants;
- b) **replace or upgrade** infrastructure; or
- c) **relocate** the pressure to an alternative and less sensitive location.

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

ASSESSMENT (Chapter 9)

The following scenarios have been assessed in this SEA:

- (i) Business as Usual;
- (ii) Business as Usual plus Other Required Measures; and
- (iii) Individual Additional Measures.

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

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

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

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

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

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

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

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

Table 4 Summary Assessment Table

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

** It should be noted that there are currently no designated catchments for Freshwater Pearl Mussel within the boundaries of the ERBD*

MITIGATION AND MONITORING (Chapter 10)

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

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

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

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

NEXT STEPS (Chapter 11)

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

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1 INTRODUCTION

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

1.1 BACKGROUND

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

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

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

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

1.2 EASTERN RIVER BASIN DISTRICT

The Eastern RBD is home to rich agricultural land, holiday coastline, the city of Dublin and the towns that form Greater Dublin and its commuter belt. With land area of around 6,300km² the Eastern RBD covers about one tenth of the country with a further 350km² of marine waters. Around 1.3 million people, (40% of Ireland's population) live in the RBD. The population is growing every year, partly due to the internal and external migration to live and work around Dublin.

The Eastern RBD incorporates all or part of twelve local authority areas. The Eastern RBD includes all of Dublin City, Fingal, South Dublin and Dún Laoghaire-Rathdown, the vast bulk of County Meath, County Kildare and County Wicklow as well as smaller portions of County Louth, County Cavan, County Westmeath, County Offaly and County Wexford. Each of the local authorities for these areas is a competent authority for the Eastern RBD, with Dublin City Council the co-ordinating authority for the Eastern RBD.

1.3 STRATEGIC ENVIRONMENTAL ASSESSMENT

Strategic Environmental Assessment (SEA) is a process for evaluating, at the earliest appropriate stage, the environmental effects of plans or programmes before they are adopted. It also gives the public and other interested parties an opportunity to comment and to be kept informed of decisions and how they were made. An early consideration of environmental concerns in the planning process creates an opportunity for environmental factors to be considered explicitly alongside other factors such as social, technical or economic aspects.

The European Directive (2001/42/EC) on the Assessment of the Effects of Certain Plans and Programmes on the Environment (the SEA Directive), was transposed into national legislation the

European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (S.I. 435/2004) and the Planning and Development (Strategic Environmental Assessment) Regulations 2004 (S.I. 436/2004). River Basin Management Plans fall under the remit of S.I. No. 435 of 2004. **Figure 1.1** shows an overview of the SEA Process.

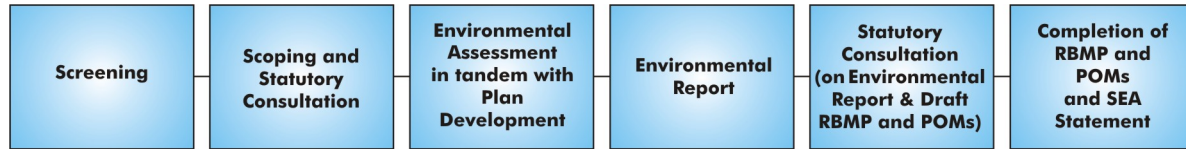


Figure 1.1 Overview of SEA Process

1.4 RESPONSIBLE AUTHORITIES FOR THE EASTERN RBD

This SEA is being carried out on behalf of the 12 [competent](#) authorities for the Eastern RBD, which includes the county councils of Cavan, Dún Laoghaire/Rathdown, Fingal, Kildare, Louth, Meath, Offaly, South Dublin, Westmeath, Wexford and Wicklow as well as Dublin City Council, [which is the coordinating authority for the Eastern RBD](#).

1.5 STUDY TEAM

The study team for the SEA of the draft Plan and POM for the Eastern RBD comprises RPS, an environmental and engineering consultancy, working with an SEA Steering Group comprised of representatives from the following organisations:

- Northern Ireland Environment Agency (NIEA);
- Department of the Environment, Heritage and Local Government (DEHLG);
- Environmental Protection Agency (EPA);
- Department of Agriculture, Fisheries and Food (DAFF);
- North South Share Project; and
- Coordinators from each of the River Basin Districts (Ray Earle, ERBD Co-ordinator).

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

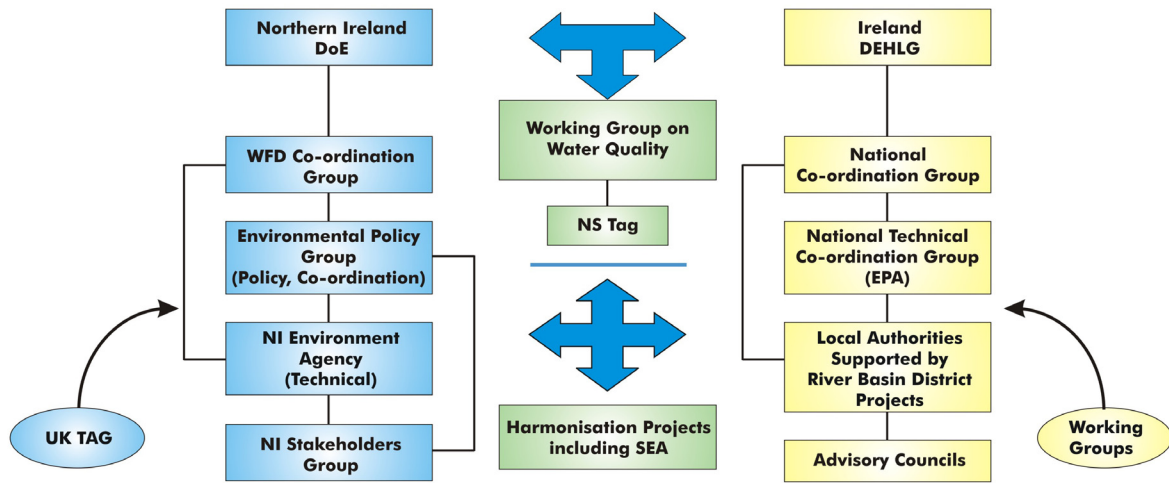


Figure 1.2 Organisational Structure for the River Basin Districts

2 METHODOLOGY

2.1 INTRODUCTION

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

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

2.2 GUIDANCE

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

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

2.2.1 Ireland

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

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

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

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

2.2.2 Other

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

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

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

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

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

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

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

2.3 KEY STEPS IN STRATEGIC ENVIRONMENTAL ASSESSMENT

2.3.1 SCOPING

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

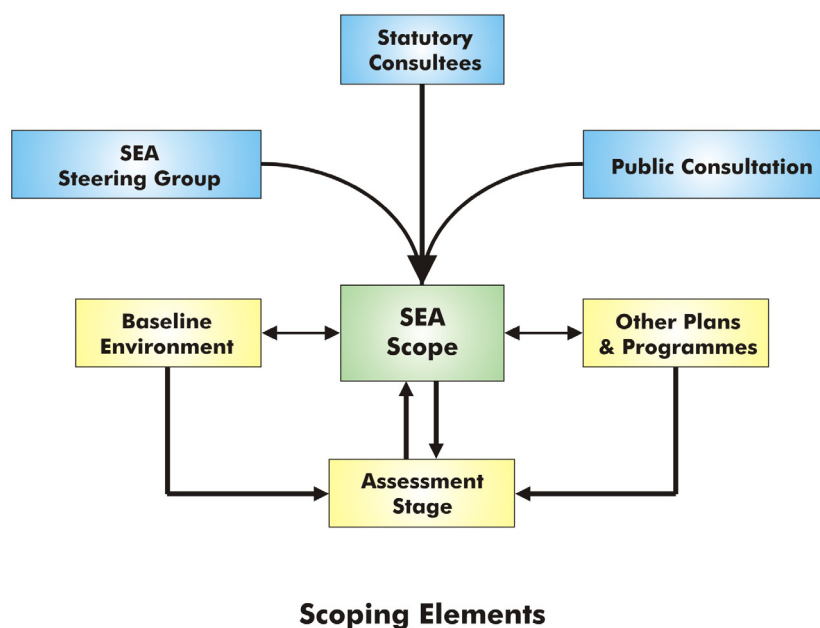


Figure 2.1 Overview of the Scoping Process.

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

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

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

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

2.3.1.1 DEFINING THE SCOPE

Table 2.1 Scope of the SEA

Geographic Scope	The Eastern RBMP and POM is a regional plan for the Eastern RBD (see Figure 3.2) and as such the assessment has been limited geographically to activities occurring within the functional area of the Plan. While recognition will be given within the Plan to the issue of water management in the adjacent RBDs, no separate assessment has been undertaken of these areas in this SEA. A separate SEA will be carried out for each of the seven remaining (I)RBDs.										
Temporal Scope	The first RBMP and POM will cover the period from 2009 up to 2015, with an interim review after three years. However, the Plan also considers the horizons of 2021 and 2027, which are the end of the second and third 6-year plan cycles, respectively. In line with the SEA Directive, short, medium and long-term impacts must be considered during the assessment. However, it is considered that short-term assessment may not be very constructive as implementation of the RBMP, and the associated POM, will take time to show effect; therefore, the results of such an assessment are likely to be similar to a 'business as usual' scenario for the short-term. As such, assessments have been made for 2015 (as a medium term horizon) and 2030 (as a long term horizon), which is beyond the end of the third RBMP cycle.										
Level of Detail of the Plan and POM	The level of detail of the Environmental Report is determined by the content and level of detail of the Plan and POM. As the Plan is on a regional scale, the majority of the data relates to overall national and regional performance. The Plan delivers over-arching policy recommendations - including the general type of infrastructure required for water management - that to a large extent are implemented on a practical basis by bodies such as government agencies and local authorities.										
Level of Detail of Assessment	This exercise is based on a broader judgement as to whether effects would be better assessed under lower level plans and/or programmes. This SEA, for example, does not examine site-specific impacts due to development of water infrastructure, since that is outside the scope of this regional level plan. As portions of the Plan and POM will be implemented within other regional or local plans, or through infrastructure projects, the local environmental concerns related to these may be examined through subsequent SEAs on these plans or Environmental Impact Assessment (EIA) at the project level.										
Assessment Parameters	Cumulative / synergistic and secondary, permanent and temporary effects have been assessed. Medium and long-term impacts were also assessed.										
Scoping of SEA Environmental Topics	All of the environmental topics listed in the SEA Directive have been scoped in for the assessment of the RBMP and the associated POM. These are: <table border="0" style="width: 100%;"> <tr> <td>Biodiversity, Flora and Fauna</td> <td>Air</td> </tr> <tr> <td>Population</td> <td>Climatic Factors</td> </tr> <tr> <td>Human Health</td> <td>Material Assets</td> </tr> <tr> <td>Soil</td> <td>Cultural, Architectural and Archaeological Heritage</td> </tr> <tr> <td>Water</td> <td>Landscape</td> </tr> </table>	Biodiversity, Flora and Fauna	Air	Population	Climatic Factors	Human Health	Material Assets	Soil	Cultural, Architectural and Archaeological Heritage	Water	Landscape
Biodiversity, Flora and Fauna	Air										
Population	Climatic Factors										
Human Health	Material Assets										
Soil	Cultural, Architectural and Archaeological Heritage										
Water	Landscape										

2.3.1.2 Climate Change

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

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

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

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

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

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

2.3.1.3 Flooding

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

consequences for human health, the environment, cultural heritage and economic activity associated with floods in the Community”.

The Directive came into force in November 2007 and is required to be transposed into Irish law before 26 November 2009. The Directive requires Member States to first carry out a preliminary assessment by 2011 to identify the river basins and associated coastal areas at risk of flooding. For such zones they would then need to draw up flood risk maps by 2013 and establish flood risk management plans focused on prevention, protection and preparedness by 2015. The Directive applies to inland waters as well as all coastal waters across the whole territory of the EU.

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

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

It is likely that during the second round (2015 – 2021) of RBMP drafting, when the Floods Directive is in force in Member States, the coherence of the two Directives and their resultant Plans and measures can be tested and adjustment made, where necessary.

2.3.2 ENVIRONMENTAL ASSESSMENT AND ENVIRONMENTAL REPORT

2.3.2.1 Contents of the Environmental Report

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

Table 2.2 Key Elements of the Environmental Report

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

2.3.2.2 Environmental Assessment

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

Table 2.3 SEA Environmental Assessment

Environmental Receptors	Is it Quantifiable?
Biodiversity, Flora and Fauna	Quantitative assessment may be possible, e.g. % loss of habitat, number of EU designated sites impacted, if sufficient detail is available from the draft Plan / POMs.

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

2.3.3 SEA STATEMENT

The main purpose of the SEA Statement is to provide information on the decision-making process and to document how environmental considerations, i.e. the views of consultees and the recommendations of the Environmental Report, have been taken into account in the adopted Eastern River Basin Management Plan and Programme of Measures. The SEA Statement illustrates how decisions were taken, making the process more transparent.

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

2.4 HABITATS DIRECTIVE ARTICLE 6 ASSESSMENT

The Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora) obliges member states to designate Special Areas of Conservation (SACs) to protect and conserve habitats and species of importance in a European Union context. Article 6 is one of the most important articles of the Habitats Directive in determining the relationship between conservation

and site use. Article 6(3) requires that “Any plan or project not directly connected with or necessary to the conservation of a site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site’s conservation objectives.”

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

2.5 DIFFICULTIES AND DATA GAPS

The following difficulties and data gaps were encountered:

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

3 DESCRIPTION OF THE PLAN

3.1 RIVER BASIN PLANNING AND THE EASTERN RBD

As stated in **Section 1, Introduction**, the purpose of the WFD is to maintain the “high and good status” of waters where it exists, prevent deterioration in existing status of waters and to achieve at or restore at least “good status” in relation to all waters by 2015. The mechanism by which this is to be achieved under the WFD is through the adoption and implementation of River Basin Management Plans (RBMPs) and Programmes of Measures (POMs) for each of the eight identified RBDs (see **Figure 3.1**)

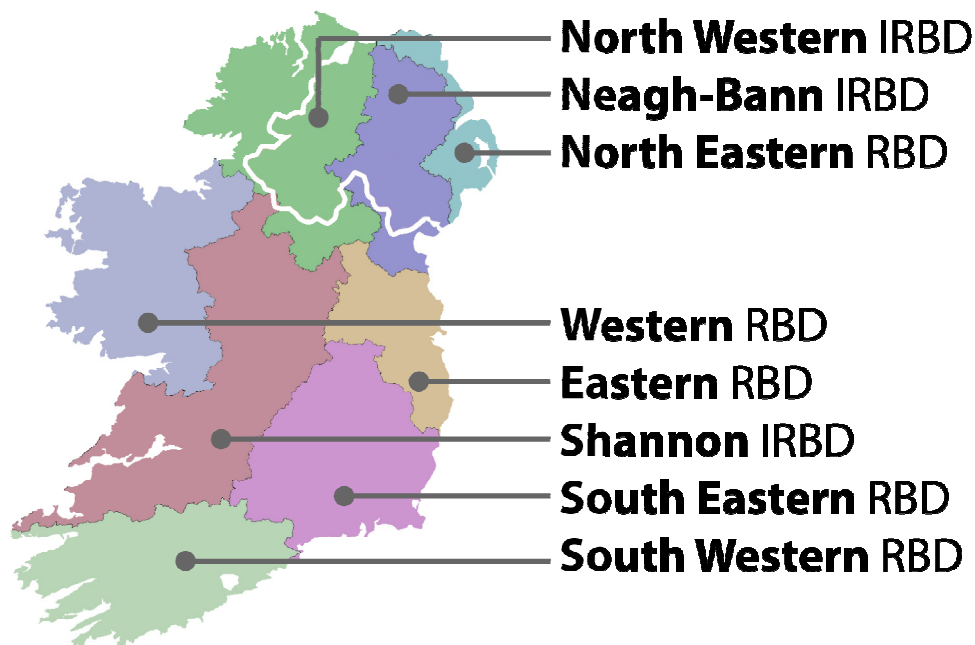


Figure 3.1 River Basin Management areas of Ireland

As stated previously, the Eastern RBD incorporates all or part of twelve local authorities: Dublin City, County Westmeath, County Meath, County Cavan, County Kildare, County Offaly, Fingal, South Dublin, Dún Laoghaire-Rathdown, County Wicklow and a small portion of County Wexford and County Louth. Dublin City Council is the co-ordinating authority for the ERBD. The geographic scope of the Eastern RBD is shown in **Figure 3.2**.

The distribution and activities of people in the District varies from rural agricultural communities to the City of Dublin and its expanding commuter belts. The population density is high compared to the rest of Ireland, and the region has seen over 10% population growth over the past ten years. Only 8% of the land area in the Basin is urban, 75% agricultural and the remainder natural (17%). Within the last

five years the population in Dublin has increased by 4% whilst Dublin commuter towns have expanded at rates as high as 51% in Balbriggan. The greatest population increases were in villages in Dublin, Meath, Kildare and Wicklow with populations of between 50 and 1,500 people. These villages grew by over a third, twice as fast as villages elsewhere.



Figure 3.2 Eastern RBD

The high proportion of agricultural land has in turn given rise to a thriving food manufacturing industry. The Basin's rivers support fishing and boating activities and the coastline is popular as a holiday resort.

In addition, some areas of the RBD contain rare and vulnerable habitats and wildlife. These areas include parts of the Boyne, Liffey, Nanny/Delvin and Avoca/Vartry rivers as well as their estuaries. In addition, many coastal sites have been identified to protect recreational bathing areas and habitats of importance.

3.2 CURRENT WATER MANAGEMENT SITUATION IN THE ERBD

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

Local authorities also provide licences or consents for small-scale commercial and industrial discharges to sewer systems and/ or waters under Section 16 and Section 4, respectively, of the Water Pollution Act 1977. The Environmental Protection Agency (EPA) administers the Integrated Pollution Prevention Control (IPPC) licensing system, which covers all operations, including discharges, carried out in connection with licensed large-scale industrial and agricultural activities. The EPA is also responsible for processing licences in the waste management sector.

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

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

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

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

3.3 STEPS TO RIVER BASIN MANAGEMENT PLANNING

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

Table 3.1 Steps to RBMP and POM Development

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

Questions	Details	Where has this been answered
	to select ones that are practical, feasible and of significant benefit.	Economic Baseline and Guidance Background Documents Draft River Basin Management Plan
What Additional Measures Will Achieve?	Again we need to review how far the required plus the additional measures will take us towards achieving our objectives. In some cases, even after considering every possible action, we may not be able to restore waters and objectives must be refined.	WFD Objectives & Exemptions Background Document Artificial and Heavily Modified Water Bodies Background Documents Draft River Basin Management Plan
Our Objectives in the Eastern District	We have set out the particular waters in the Eastern District where we have proposed alternative objectives. The timescales for achieving improvements in our waters are also demonstrated.	Draft River Basin Management Plan Water Maps (electronic tool)
Our Plan For The Eastern District	The outcome of this planning process is an action programme for the Eastern District to achieve these improvements. We have proposed a detailed action plan setting out what, where and when actions are needed and who will do them.	Draft River Basin Management Plan River Basin Management System (electronic tool)

Further information on the supporting documents, [Water Maps](#) and [the River Basin Management System](#) is available on www.wfdireland.ie/ and www.erbd.ie

3.4 RISK ASSESSMENT OF WATER BODIES IN THE EASTERN RBD

3.4.1 Introduction

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

Table 3.2 Waterbody Risk Categories

Category	Description
(1a) Water bodies at significant risk – “At Risk”	Water bodies for which consideration of appropriate measures to improve status can start as soon as practical
(1b) Water bodies probably at significant risk – “Probably at Risk”	Focus for more detailed risk assessments (including, where necessary, further characterisation) aimed at determining whether or not the water bodies in this category are at significant risk in time for

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

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

3.4.2 Surface Water Bodies Risk Assessment Summary

Tables 3.3 to 3.6 provide a summary of the 2005 risk assessment for each of the water body types considered, e.g. river, lakes, coastal and transitional. Overall, 87% of the river water bodies in the District were classified as either At Risk or Probably At Risk. A total of 20 lake water bodies were classified as either At Risk or Probably at Risk in the ERBD and all of the transitional water bodies (12) within the ERBD were classified as either At Risk or Probably At Risk. Five of the eight coastal water bodies included within the ERBD were classified as either At Risk or Probably at Risk, comprising 52% of the coastal water body area.

Table 3.3 River Water Bodies Risk Assessment Summary

Reporting Category	Number of Water bodies	% of Number	km Affected
1a – At Risk	207	58	1274
1b – Probably At Risk	112	29	399
2a – Probably Not At Risk	31	9	115
2b – Not At Risk	14	4	72
Total At Risk (1a + 1b)	319	87	1673

Source: *Eastern River Basin District Final Characterisation, September 2005*

Table 3.4 Lake Water Bodies Risk Assessment Summary

Reporting Category	Number of Water bodies	% of Number	% Area of Lakes
1a – At Risk	13	50	41.2
1b – Probably At Risk	7	26	56.5
2a – Probably Not At Risk	3	12	1.3
2b – Not At Risk	3	12	1.0

Total At Risk (1a + 1b)	20	76	97.7
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Source: *Eastern River Basin District Final Characterisation, September 2005*

Table 3.5 Transitional Water Bodies Risk Assessment Summary

Reporting Category	Number of Water bodies	% of Number	% Area of Trans Waters
1a – At Risk	8	67	64
1b – Probably At Risk	4	33	36
2a – Probably Not At Risk	0	0	0
2b – Not At Risk	0	0	0
Total At Risk (1a + 1b)	12	100	100

Source: Table 4.4, *Eastern River Basin District Final Characterisation, September 2005*

Table 3.6 Coastal Water Bodies Risk Assessment Summary

Reporting Category	Number of Water bodies	% of Number	% Area of Coastal Waters
1a – At Risk	4	50	39.2
1b – Probably At Risk	1	12.5	12.8
2a – Probably Not At Risk	2	25	44.9
2b – Not At Risk	1	12.5	3.1
Total At Risk (1a + 1b)	5	62.5	52

Source: *Eastern River Basin District Final Characterisation, September 2005*

3.4.2.1 Groundwater Risk Assessment Summary

The WFD sets objectives of good quantitative and chemical status for groundwaters. As shown in **Table 3.7**, **some 71%** of groundwater bodies in the ERBD were considered to be either At Risk or Probably At Risk.

Table 3.7 Groundwater Bodies Risk Assessment Summary

Reporting Category	Number of Water bodies	% of Number
1a – At Risk	2	2.7
1b – Probably At Risk	51	68
2a – Probably Not At Risk	18	24
2b – Not At Risk	4	5.3
Total At Risk (1a + 1b)	53	70.7

Source: *Eastern River Basin District Final Characterisation, September 2005*

3.4.2.2 Other Issues of Concern

Alien Species. Alien species are non-indigenous invasive flora and fauna, which threaten the native ecology of the ERBD by competing for habitats and / or food. Japanese Weed, Giant Knotweed, and Himalayan Balsam have all been identified in the Liffey.

Fisheries. Fishery activities have started to be addressed. Amongst the freshwater fish species, salmon (and trout) are subjected to the greatest fishing /angling pressures in Ireland. The main designation that is applicable is salmonid waters. A total of 4 water bodies have been designated as protected areas on this basis. [There are two designated shellfish waters in the ERBD as designated under the European Communities \(Quality of Shellfish Waters\)\(Amendment\) Regulations 2009 \(SI 55 of 2009\).](#) These are Malahide and Balbriggan/Skerries.

Bathing Water Standards. Bathing Waters are areas protected for use as recreational bathing and must meet standards for microbiological quality in order to protect human health. There are 21 designated bathing waters within the ERBD. Risk categories were assigned to recognised bathing waters according to results of monitoring carried out in these waters. Where a bathing water failed to meet the requirements of the EU and national bathing water standards as 'at risk' designation was assigned. At the time the Article 5 Characterisation was carried out, four of these designated bathing waters were classified as At Risk, one was classified as Probably At Risk and two classified as Probably Not At Risk.

Heavily Modified and Artificial Water bodies. Surface water bodies that are unlikely to achieve good status because of physical alterations to facilitate human activities including navigation, water abstraction and regulation, flood protection and land drainage have been identified for special consideration under the WFD. The Directive recognises that there are cases where the benefits of such uses need to be retained and permits identification and designation of Artificial Water bodies (AWB) and Heavily Modified Water bodies (HMWB). There are 12 water bodies designated as HMWB in the Eastern RBD and seven water bodies designated as AWB.

3.4.2.3 Economics Baseline

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

In Ireland, an initial economic characterisation was carried out for each of its RBDs, the results of which are published in the report, *Economic Analysis of Water Use in Ireland*.

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

4 CONSULTATION

4.1 CONSULTATION DURING SCOPING STAGE

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

Table 4.1 Consultees in the SEA Scoping Process

Consultee	Statutory / Non-Statutory	Tier
Environmental Protection Agency	Statutory	First
Minister for Environment, Heritage and Local Government	Statutory	First
Minister for Communications, Energy and Natural Resources	Statutory	First
Ireland River Basin District Project Coordinators	Non-Statutory	Second
Ireland River Basin Advisory Councils	Non-Statutory	Second
Ireland River Basin Management Groups	Non-Statutory	Second
Ireland River Basin Steering Groups	Non-Statutory	Second

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

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

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

- Health and Safety Executive, Ireland;
- Northern Ireland Freshwater Task Force;
- Office of Public Works, Ireland;

- Harbour Master Shannon Estuary;
- Coillte;
- Friends of Irish Environment;
- National Parks and Wildlife Service; and
- Department of the Environment, Heritage and Local Government.

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

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

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

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

4.2 CONSULTATION DURING ENVIRONMENTAL ASSESSMENT STAGE

To ensure that timely consultation with the statutory consultees and non-statutory consultees continued throughout the evolution of the RBMP/ POM and the SEA process, it was decided to circulate a paper discussing the preliminary alternatives being considered as well as the proposed assessment methodology. The purpose of this discussion paper was to inform key stakeholders about the proposed alternatives to be considered as part of the SEA and to elicit comment on these.

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

Table 4.2 Key Issues Raised at SEA and Plan Integration Workshops

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

4.3 INTEGRATION OF RIVER BASIN MANAGEMENT PLANNING AND STRATEGIC ENVIRONMENTAL ASSESSMENT

This Environmental Report was developed in parallel with the Eastern River Basin Management Plan and Programme of Measures. The SEA process commenced in September 2007, and while the initial stages of the planning process began in 2004 with the start of the characterisation of the RBD, consultation on the issues to be addressed in the Plan began in June 2006 with the publication of a timetable and work programme for production of the Plan. This was followed by consultation on the [Water Matters – Have Your Say](#) report for the District published in 2007. The elements of the River Basin Management Plan and SEA are presented schematically below (**Figure 4.1**).

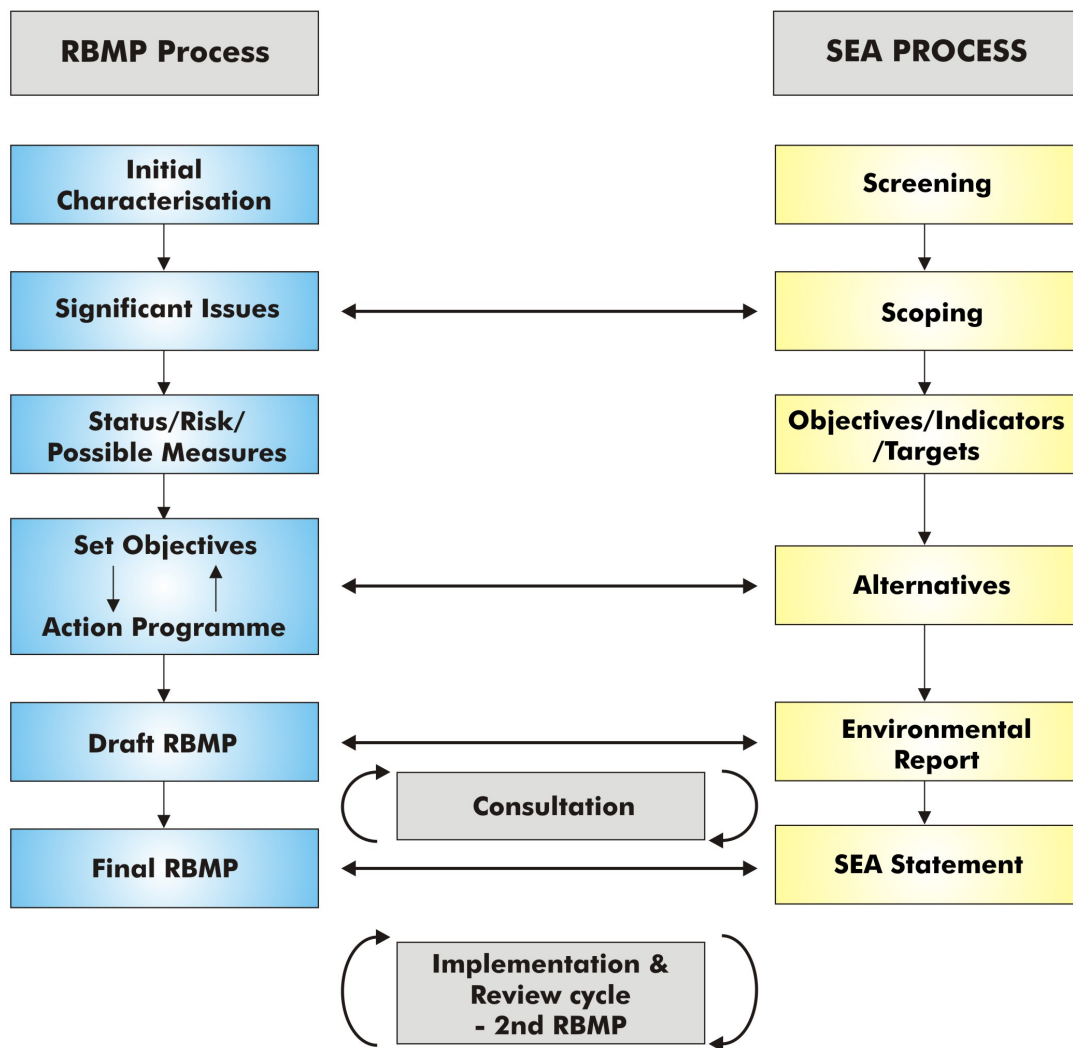


Figure 4.1 Building Blocks of the River Basin Management Plan and POM

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

4.4 PROPOSED CONSULTATION ON DRAFT PLAN, POM AND ENVIRONMENTAL REPORT

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

Table 4.3 Consultation Requirements under the WFD and SEA Directive

Water Framework Directive	SEA Directive	Comments
6 months (Article 14(2))	In Ireland, a consultation period of not less than 4 weeks is required for the Environmental Report (S.I. 435/2004 Article 13(2)(a))	Consultation on the Environmental Report prepared as part of the SEA will last for 6 months and run in parallel with the consultation on the draft Plan.

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

4.5 HABITATS DIRECTIVE ASSESSMENT CONSULTATION

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

5 BASELINE ENVIRONMENT

5.1 INTRODUCTION

This section examines the relevant aspects of the current state of the environment within the 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 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 - IRELAND

According to recent EPA publications (EPA, 2008), Ireland's natural environment, although under increasing pressure, generally remains of good quality and represents one of the country's most essential national assets. In the EPA's *2020 Vision – Protecting the Irish Environment* document it is noted that pressures on the environment have increased significantly. As Ireland's economy has grown in the past 10 years these pressures have accelerated at a rate that far exceeds that observed in other EU countries.

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

Challenges	Components	Relationship to WFD
Limiting and Adapting to Climate Change	Mitigating the causes and effects of climate change Adapting to climate change impacts Improving our understanding of climate change	The measures in the Plan have been assessed, to determine the potential impacts on them from climate change and their ability to adapt, based on European recommendations.

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

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

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

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

5.3 BASELINE AND RELEVANT ENVIRONMENTAL PROBLEMS IN THE ERBD

5.3.1 Flora, Fauna and Biodiversity

5.3.1.1 Designated Sites

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 in the Eastern RBD: Special Areas of Conservation; Special Protection Areas; Ramsar sites; and Natural Heritage Areas. 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), together these form the backbone of the Natura 2000 network. Ramsar sites are wetlands of international importance designated under the Ramsar Convention, an intergovernmental treaty which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. Natural Heritage Areas (NHAs) are protected under the Wildlife Act 1976 (as amended 2000). NHAs are areas considered important for the habitats present or which hold species of plants and animals whose habitat needs protection. **Table 5.1** gives the numbers and types of each designation present in the District, while 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	33
Special Protection Areas	16
Ramsar	6
Natural Heritage Areas	99

* 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 of water dependent habitats or species including Salmonid waters, Special Areas of Conservation and Special Protection Areas. The protected areas for Salmonid species are listed in the Salmonid Regulations (S.I. 293 / 1988), which designate “waters capable of supporting salmon (*Salmo salar*), trout (*Salmo trutta*), char (*Salvelinus*) and whitefish (*Coregonus*)” as protected. The

Natural Habitat Regulations (S.I. 94 / 1997) separately protect the habitats of Atlantic Salmon. In total there are three salmonid designated water bodies in the Eastern RBD, all of which are rivers.

There are 33 SACs and 16 SPAs designated as water dependent within the ERBD. Only the SACs that contain water dependent species and habitats have been included within the Register.

5.3.1.3 Freshwater Pearl Mussel (*Margaritifera margaritifera*)

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

There has been a considerable decline in species distribution and numbers. *Margaritifera* is not present in any river systems within the Eastern District, although the Derreen River, which is located on the southern border of the district within the South Eastern RBD, does contain *Margaritifera*.

5.3.1.4 Shellfish Growing Areas

The following shellfish growing areas are found in the Eastern River Basin District as delineated by the by the Sea Fisheries Protection Authority:

- Malahide;
- Gormanston/Laytown; and
- Skerries.

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

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

Throughout the island of Ireland there has been a decline in many of the native species through habitat loss, competition, development and agriculture. Irish legislation protects some of these species. In Ireland there are 18 species of plant and animal identified as endangered and a further 52 recorded as vulnerable.

The [Water Matters – Have Your Say](#) document for the Eastern RBD highlighted the main pressures/problems facing the water environment within the river basin. These pressures are listed in **Section 5.3.3, Water**.

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

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

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

Invasive non-native plant and animal species are one of the greatest threats to biodiversity in Ireland. Invasive alien species negatively impact Irish biodiversity through competition, herbivory, predation, habitat alteration and introduction of parasites or pathogens and poses a risk to the genetic integrity of our 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. Three particular species of concern are present in the Eastern RBD, Japanese Knotweed (*Fallopia japonica*), Giant Knotweed (*Fallopia sachalinensis*) and Himalayan Balsam (*Impatiens glandulifera*). Japanese Knotweed out-competes local species, such as sea grasses and kelp, for space and light.

5.3.2 Population and Human Health

5.3.2.1 Introduction

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

The population of Ireland was over 4.2 million in 2006, and has been increasing at ever growing rates. However the population density is still relatively low from a European perspective and the overall population still remains below that of the island in the early 19th century. Around 1.3 million people, (40% of Ireland's population) live in the Eastern RBD. The population is growing every year, partly due to the internal and external migration to live and work around Dublin.

The Eastern RBD incorporates all of Dublin City and all or part of Counties Westmeath, Meath, Cavan, Kildare, Offaly, Fingal, South Dublin, Dún Laoghaire-Rathdown and Wicklow and small portions of Wexford and Louth (see **Figure 5.3**). The distribution and activities of people in the District varies from rural agricultural communities in the counties surrounding Dublin to the industry and commerce of Dublin itself.

5.3.2.2 Population

Table 5.2 shows the population of each County within the Eastern RBD. During the intercensal periods of 1996 to 2002 and 2002 to 2006, all counties experienced population increases. Counties Kildare and Meath both experienced significant population increases, rising by over 20%, between 1996 and 2002, and 21.5% and 13.7%, respectively, between 2002 and 2006.

Table 5.2 Trends in population for counties, part or all of which lie within the ERBD

County	1996	2002	% Change '96 - '02	2006	% Change '02 - '06
Meath	109,732	134,005	22.1	162,831	21.5
Dublin (Total)	1,058,264	1,122,821	6.1	1,187,176	5.7
Kildare	134,992	163,944	21.4	186,335	13.7
Wicklow	102,683	114,676	11.7	126,194	10.0
Westmeath	63,314	71,858	13.5	79,346	10.4
Offaly	59,117	63,663	7.7	70,868	11.3
Cavan	52,994	56,546	6.8	64,003	13.2
Louth	92,166	101,821	10.5	111,267	9.3
Wexford	104,371	116,596	11.7	131,749	13.0

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

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

The highest relative population densities in the RBD are located around Dublin City and its suburbs, and other towns within the Dublin commuter belt. These developed areas tend to be located on the coast or by rivers, such as the Rivers Liffey, Dodder, or Dargle.

5.3.2.3 Drinking Water Quality

The European Communities (Drinking Water) Regulations (No. 2), 2007 came into force in March 2007. In accordance with these regulations, the local authority must notify the EPA where there has been a failure to meet a quality standard. **Table 5.3** below presents information on the overall drinking water compliance rate within the various counties throughout ERBD, as recorded in the EPA (2008) report, *The Provision and Quality of Drinking Water in Ireland, A Report on the Years 2006 - 2007*. Specific information on microbiological and chemical compliance is included in the appendix to this chapter.

Table 5.3 Overall drinking water quality compliance within the ERBD

County	Overall Compliance Rate of Drinking Water
Meath	The overall compliance rate was down slightly from 96.7% in 2005 to 95.8% in 2006.
Dublin City	The overall compliance rate in Dublin City was 98.8%, above the national average.
South Dublin	The overall compliance rate was 99.2%, above the national average
Dún Laoghaire-Rathdown	The overall rate of compliance was 98.4%, above the national average.
Fingal	The overall rate of compliance in Fingal was 98.5% and above the national average.
Kildare	The overall compliance rate was 99.1% well above the national average
Wicklow	The overall rate of compliance was 95.0%, below the national average, mainly due to below average microbial compliance in the private water supplies.
Westmeath	The overall compliance rate 99.1%, above the national average during 2006.
Offaly	The overall compliance rate was 99% and above the national average.
Cavan	The overall compliance rate was 94.3%, below the national average but an improvement from 91.1% in 2005
Wexford	Overall compliance rate of 94.2%. Below the national average.
Louth	The overall compliance rate was 97.3%, close to the national average.

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

5.3.2.4 Risk of *Cryptosporidium* Contamination

Cryptosporidium is a protozoal parasite that causes a diarrhoeal illness in humans. Both humans and animals are potential reservoirs. Surface water supplies with inadequate treatment (chlorination only) are at risk of failing to remove *Cryptosporidium* oocysts in the treatment process if present in the raw water. The EPA has required local authorities to carry out risk assessment on all water supplies in relation to *Cryptosporidium*. From this, plants with very high and high risk have been identified. The results of this risk assessment process is guiding local authorities both in terms of their monitoring programmes and investment prioritisation under the Water Services Investment Programme. The use of turbidity meters on filtering systems has been a requirement of this programme from a monitoring perspective together with an increase in sampling and monitoring level. The EPA has also introduced the remedial action list (RAL) and this allows for the tracking of remedial action on plants identified as at higher risk from *Cryptosporidium*. There have been no recorded outbreaks of *Cryptosporidium* in the ERBD; however, inadequate treatment in some systems could result in future risks from *Cryptosporidium*, if not upgraded.

5.3.2.5 Elevated Lead Levels in Drinking Water

A recent issue throughout several counties in Ireland has been the presence of elevated lead levels in drinking water. The permitted level of lead in drinking water is 25 micrograms per litre (due to reduce to 10 micrograms per litre in 2013), compared to some of the measured levels between 35 micrograms per litre to upwards of 80 micrograms per litre in some parts of Ireland. Older lead pipes are at this time thought to be responsible for the contamination due to lead being dissolved out of pipes bringing in mains water and internal plumbing in older homes. One water supply within the District has been identified as having lead issues (EPA, 2008); these issues are currently being dealt with. The HSE, EPA and DOEHLG are developing a national strategy to deal with lead piping and measures to deal with this are anticipated.

5.3.2.6 Bathing Waters

Monitoring of water quality in the ERBD in designated bathing sites is carried out in accordance with the provisions of the European Council Directive concerning the management of bathing water (2006/7/EC). 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. Over half the bathing waters in the ERBD do not comply with the EU (Good Quality) Guide Values; however, all but one of the **twenty-one** bathing waters achieved the EU (Acceptable) Mandatory Compliance Value. An overview of the bathing water quality areas within the ERBD is provided in the appendix to this chapter.

5.3.2.7 Existing Environmental Pressures / Problems: Population and Human Health

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

More people and increased household water usage require larger water supply schemes and produce larger volumes of wastewater to treat and dispose. Demand for more food and industrial goods has led to more intensive or expanded activities with higher water demand and pollution threats.

Growing populations place greater pressure on drinking water supplies. Within the Eastern RBD in particular, concerns have been raised about the capacity of water supplies, where the rapid pace of development, population and commercial activities is leading to shortage in many areas.

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. Several local authorities are presently engaged in source option reviews to address future demands in the Greater Dublin Area. Currently the River Liffey is at its limit for safe abstraction, necessitating the search for a new source after 2016. Dublin City Council, on behalf of the local authorities in the Greater Dublin Area, has recently produced a draft Plan dealing with the possible source options to meet future water demand. The draft Plan (Water Supply Project – Dublin Region), is subject to its own Strategic Environmental Assessment.

The growth of the commuter belt in Dublin is resulting in individual houses in the countryside and housing clusters in small villages throughout much of the District. New individual houses and housing clusters, reliant on septic tanks, threaten water quality in the District. Cavan County Council's 2002 pilot survey found that more than one third of these on site systems were defective. Many tanks were poorly maintained or poorly designed; in extreme cases, wastewater was bypassing percolation systems, entering streams by channels, pipes or across the ground and in the same year septic tanks caused nearly 30% of water quality complaints investigated in the county.

Other potential pressures include possible human activities influencing flood behaviour. These include agricultural activities, such as unsuitable drainage, and the development of settlements and industries in the flood plains of rivers and coastal area. Development on floodplains also risks having adverse effects on water quality.

5.3.3 Water

5.3.3.1 Surface Waters

The longest river in the District is the Boyne (2,390 km). The other main rivers in the District include the [Liffey](#), [Avoca/Vartry](#) and [Nanny/Delvin](#) rivers (see **Figure 5.4**).

From the EPA's [Water Quality in Ireland: Key Indicators of the Aquatic Environment](#) reports (2007 and 2005), river water quality in Ireland between 2004 and 2006 showed some improvement over the 2001 to 2003 period, with 71.4% unpolluted, 18.1% slightly polluted, 10.0% moderately polluted and 0.6% seriously polluted. Based on the same EPA reports, the river water quality in the ERBD showed signs of slight deterioration between 1998-2005, followed by a resurgence in river water quality in the District between 2004-2006.

There are more than 500 natural standing waters throughout the ERBD; however the majority of these are relatively small, with only 20 lakes exceeding 10ha in size. Of the larger lakes in the RBD, 13 occur in the northwest of the Boyne catchment, in the upper reaches of the Blackwater and Deel tributaries, while the remaining seven occur in the Wicklow uplands. The WFD reporting threshold for lakes is a minimum of 50 hectares in surface area or to be located in a protected area. There are 26 areas of standing water that meet these criteria. **Figure 5.4** shows the main lakes in the ERBD.

Marine waters in the ERBD account for 350km². The [130km](#) coastline of the RBD contains the entire coastlines of Counties Meath, Fingal, Dún Laoghaire and Wicklow as well as Dublin City, and also includes small portions of the coastlines of Counties Louth and Wexford. There are 13 transitional waterbodies in the ERBD, including the Dargle Estuary (0.03km²) and the Liffey Estuary (5km²), and eight 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 5.4** demonstrates the existing surface water quality in the ERBD.

Table 5.4 Surface Water Status in the Eastern District

Surface Water Category	High	Good	Moderate	Poor	Bad	Unknown
Rivers (% of total number of bodies)	22%	21%	33%	20%	4%	0%
Lake (% of total area)	4%	12%	64%	3%	17%	0%

Surface Water Category	High	Good	Moderate	Poor	Bad	Unknown
Transitional (% of total area)	0%	0%	100%			0%
Coastal (% of total area)	58%	0%	26%			16%
Artificial water bodies (% of total number of bodies)	0%	87%	0%	13%	0%	0%

Updated from Table 3.3: Surface water ecological status/potential in the Eastern River Basin District on p. 3-7 of the final Plan

The results show that the majority of rivers and lakes in the ERBD have generally good to poor water quality status. All transitional waterbodies are classed as **moderate**, while the coastal waterbodies are classed as either of **high, moderate or unknown status**. A summary of the water body status in the ERBD is provided in **Figure 5.6**. Based on the current water status results **57%** of rivers, over **84%** of lakes, **100%** transitional waters and **42%** of coastal waterbodies in the ERBD 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 ERBD. There were four groundwater body types identified, based on flow regime of the aquifer, these are karstic, productive fissured bedrock, gravel and poorly productive bedrock. The classification resulted in 75 groundwater bodies being delineated within the ERBD.

Groundwater status in the ERBD is given in **Table 5.5** based on the new water status classification (2008). **Figures 5.7a and b** show the groundwater status in the ERBD.

Table 5.5 Groundwater Status in the ERBD

Groundwater	Good	Poor
Chemical Status (% of total area)	91%	9%
Quantitative Status (% of total area)	99%	1%
Combined Status (% of total area)	90%	10%

Updated from Table 3.5: Groundwater status in the Eastern River Basin District on p. 3-9 of the final Plan

In the ERBD groundwater status has been found to be generally good with **90%** of the groundwater bodies achieving good status. **Only eight cases were designated as being poor status; one was assigned poor status on the basis of quantitative tests while seven were on the basis of chemical status**. In order to meet the requirements of the WFD all groundwater bodies must achieve good chemical and quantitative status.

5.3.3.3 Important Water Resources

Register of Protected Areas

Article 6 of the WFD requires each Member State to establish a register of protected areas. This register for Ireland was split into **five** categories. **Table 5.6** summarises the existing protected areas throughout the RBD. Each of these categories is discussed in further detail in other related sections.

Table 5.6 Areas of the ERBD designated under the Register of Protected Areas

Protected Area	Total Designated Areas	Other Relevant Section in Chapter 5
Drinking Waters	104	5.3.2
Economically Significant Aquatic Species	0	5.3.7
Recreational and Bathing Waters	21	5.3.2
Nutrient Sensitive Waters	4	5.3.8
Protection of Habitats		
Salmonid and Shellfish waters	5	5.3.1
Water Dependent SACs	33	5.3.1
Water Dependent SPAs	16	5.3.1

Updated from Section 5, p. 5-1 of the final Plan

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. Within the ERBD these waters include the Rivers Dodder, Liffey and Vartry, which are all subject to flow regulation. Other examples of heavily modified waterbodies include impoundments such as the Poulaphouca Reservoir and Dublin Port on the Liffey Estuary.

Artificial Water Bodies

Artificial water bodies (AWB) are surface water bodies, which have been created in a location where no water body existed before and which, have not been created by the direct physical alteration, movement or realignment of an existing water body. Within the ERBD these waters include the following man-made canals: Boyne Navigation, Grand Canal Basin, Grand Canal Edenderry Branch, Grand Canal Main Line E of Lowtown, Grand Canal Main Line W of Lowtown, Grand Canal Naas & Corbally Branch and the Royal Canal Main Line. The Turlough Hill Reservoir is also classed as an AWB.

5.3.3.4 Existing Environmental Pressures / Problems: Water

The main pressures on surface and groundwater quality within the ERBD 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.

Wastewater and Industrial Discharges

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 (for example bathing waters, shellfish waters or waters supporting sensitive species). Estimates of nutrient input into waters in the Eastern Basin indicate that municipal and industrial discharges produce around 60% of the yearly phosphorus load; the remainder comes from diffuse sources including agricultural production.

Landfills, Mines, Quarries and Contaminated Sites

Waste disposal sites (including old un-lined landfills), quarries, mines, gasworks sites and industrial lands produce lesser discharges to waters than wastewater plants and industries; however, subsurface residues or waste products from previous activities [from previous activities may have seeped into the ground](#) may continue to threaten groundwater and surface waters. [The key threat to waters from these sites is potential contamination from pollutants \(mainly dangerous substances, for example metals and fuel\). These chemicals may travel through groundwater and enter surface waters, affecting the quality of both, damaging aquatic plants and animals and impairing water uses.](#) According to an EPA (2005b) report there was evidence of significant unauthorised landfilling of commercial and industrial waste and construction and demolition waste in the Greater Dublin Area in the period between 1997 and 2002. By far the greatest level of unauthorised landfilling during this period occurred in counties Wicklow and Kildare.

Another issue in the ERBD is the lowering of the water table at some quarry sites in the ERBD, which can affect nearby wet areas and can change water chemistry due to the transfer of groundwater to surface waters. A specific example is the pollution from the abandoned Avoca mines, which continues to pollute the Avoca River. Steps are being taken to monitor and control discharge from the mines to the Avoca River.

Agriculture

Two main water quality problems relating to agriculture have been identified. These are enrichment of water by nutrients (phosphorus and nitrogen), [from substances such as fertilisers \(both organic and inorganic\) as well as erosion of nutrient enriched soils](#), and organic pollution from animal

slurry/manure and silage effluent. A third, pesticides, is covered under dangerous substances. In the ERBD, agriculture is a very important activity, using about 75% of the land use. Estimates of nutrient inputs into waters indicate that agriculture produces up to 40% of the yearly phosphorus load. In particular the cumulative effect of this along the Boyne, Nanny and Delvin rivers is an issue.

Wastewater from Unsewered Properties

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. Throughout Ireland, more than 400,000 properties (20–30% of the total) are currently without public sewerage provision, representing over 1.3 million people (a third of the population), and generating around 230 million litres of wastewater a day. 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. [Where poorly maintained, designed or sited on-site systems can threaten water quality.](#)

Forestry

Forest cover now accounts for just over 10% of Ireland's land area, with an objective to expand cover to 17% in the next 30 years. Commercial forestry in the Eastern Basin covers less than 5% of the land area and affects only a small proportion of the District's waters, which are mainly in Wicklow. 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. [Forestry can cause also acidification of water through the capture of sulphur and nitrogen compounds from the atmosphere by forest canopies. Rain become more acidic as it passes through the canopies into the ground below and may worsen the chemical balance of receiving waters. Nutrient enrichment can also occur through the introduction of extra nutrients, which in naturally nutrient-poor areas, can lead to problems such as algal growth. Road-making and stream crossing as well as felling activities can cause erosion and sedimentation on susceptible soils, reducing water quality. Incorrect pesticide usage can also result in contamination of waters.](#) It should be noted that many of the current water problems associated with afforestation are a legacy of old practices, which have been subsequently amended.

Discharge of Dangerous Substances

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. Increased urbanisation within the Greater Dublin Area, as well as the high proportion of industrial land uses, and the use of pesticides and herbicides may potentially give rise to cumulative impacts in relation to the discharge of dangerous substances and the resultant impacts on drinking water sources.

Physical Modifications

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.

Hard structures, such as ports and harbours, can also replace or reduce natural habitats. The ERBD is subject to extensive shoreline pressure footprints, with almost 13% of its entire shoreline reinforced. There have also been a number of large-scale schemes in the Eastern Basin involving physical modifications; for example, Dublin Port, and the canalisation of the Liffey and Tolka. Approx 50% of the Dublin Region's water supply comes from Poulaphuca Lake on the Upper Liffey. A continuous abstraction quantity of 318Ml/d from Poulaphuca for treatment in Ballymore Eustace has been licensed as the maximum sustainable abstraction quantity for this plant. It is worth noting that there are proposals to construct a new port facility near Balbriggan as well as to expand the capacity of Dublin Port itself.

In some agricultural areas, stretches of river systems are dredged from time to time removing silt build-up to reduce flooding risk and estuaries are dredged for navigation. Approximately 38% of the transitional and coastal water body area is subject to pressures such as maintenance dredging, land claim and other similar disturbances to seabed (e.g. footprints for shellfish dredging, vessel movements, and marine cables and pipelines). Over 1% of Eastern RBD's coast has been reclaimed, a significant proportion of which is in the Dublin area. These actions can damage aquatic life and the natural balance of plant and fish species if they are not carried out in a controlled manner.

Climate Change

The impact of climate change is difficult to predict; however, there is the potential for heavier winter rainstorms to cause more flash flooding, resulting in an increase in diffuse pollution loads from soil run-off and increasing demand for flood controls. Summer droughts are considered likely and recent reports have indicated that the effects of climate change in Ireland will have serious consequences for water resources, resulting in a potential 40% reduction in drinking water supplies [by mid-century](#). Also, temperature changes may give invasive alien water 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 National Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002) transpose the first and second “Daughter” directives 1999/30/EC which relate to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air and 2000/69/EC which relate to limit values for benzene and carbon monoxide in ambient air.

Under the respective Regulations, the EPA and Local Authorities are responsible for ambient air quality monitoring in Ireland. There is continuous monitoring carried out throughout the island, [with 11 monitoring stations in the ERBD, primarily in Dublin City](#). The EPA compiles annual reports on air quality.

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

5.3.4.2 Air Quality

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

- **Zone A** - Dublin City and Environs.
- **Zone B** - Cork City and Environs.
- **Zone C** - 16 Urban areas with populations greater than 15,000.

Note: Zone C includes Galway, Limerick, Waterford, Clonmel, Kilkenny, Sligo, Drogheda, Wexford, Athlone, Ennis, Bray, Naas, Carlow, Tralee and Dundalk.

- **Zone D** is the remainder of the state excluding Zones A, B and C.

The ERBD lies in a number of Zones. Dublin is Zone A with the remainder primarily in Zone D. Air quality in Dublin is typical of major urban locations. In the city centre air pollution levels are higher primarily due to traffic-derived pollution. Results from the city centre monitoring stations indicate

compliance with the Air Quality Standards with concentrations of nitrogen oxides and particulate matter compliant but more elevated. The EPA states that higher levels of nitrogen dioxide and particulate matter in urban areas have the potential to pose a threat to compliance with the limit values.

Air quality in Zone D areas is generally very good with low concentrations of pollutants such as NO₂, PM₁₀, CO. Concentrations of ozone are higher in rural areas than in urban areas due to the absence of the nitrogen oxide in rural areas as an ozone scavenger.

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

The European Communities (Waste Water Treatment)(Prevention of Odours and Noise) Regulations 2005 (S.I. 787 of 2005) require that waste water treatment plants are designed, constructed and maintained so as to avoid causing nuisance through odours and noise. The EPA audits the facilities to assess compliance with the Regulations. The recent EPA report on 'Urban Waste Water Discharges in Ireland for Population Equivalents Greater than 500 Persons, A Report for the Years 2004 and 2005' details the findings of these audits. Examples of odour issues identified in the ERBD area are presented below.

- Ringsend WWTP: Odour complaints relating to WWTP: The EPA report states that Dublin City Council are actively addressing the odour issues.
- Stamullen WWTP: The EPA reports that Meath County Council has taken measures to address the problem.

5.3.4.3 Baseline Climatic Factors

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

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

Mean annual windspeed varies between about 4 m/sec in the east midlands and 7 m/sec in the northwest. Strong winds tend to be more frequent in winter than in summer. [Daily](#) sunshine duration

is highest in the southeast of the country. Average annual rainfall varies between about 800mm in the southeast and 2,800mm in the northwest.

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

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

Under the Kyoto Protocol, Ireland's target is to limit emissions to 13% above 1990 levels over the five-year period from 2008 through 2012, within the overall EU target to reduce emissions to 8% above 1990 levels in the same timeframe.

For the period beyond 2012, the EU Council of Ministers has recently committed to achieving at least a 20 per cent reduction of greenhouse gas emissions by 2020, compared to 1990 levels. The Council also agreed to extend this target to a 30 per cent reduction if other developed countries commit to comparable reductions. Ireland's share of the reduction target has yet to be agreed.

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. There are slightly elevated levels of vehicle emissions within the urban areas of the District; however, this is the same for all urban areas. Poor wastewater treatment infrastructure can lead to odour nuisance issues at specific plants. Dust and PM₁₀ can also be an issue locally during construction and operation.

With regard to climate, inputs of greenhouse 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 Ireland'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 where 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 Record of Monuments and Places

The Record of Monuments and Places is a statutory list of all known national monuments in Ireland. Within the ERBD there are 173 sites, both water and non-water related, located within 10m of rivers (see **Figure 5.8**). These sites consist of a range of fortifications, mills, historic weirs, ritual sites and bridges. These types of features represent the sites at greatest risk of potential impacts from the implementation of the river basin management plans.

5.3.5.3 Engineering Heritage

In addition to the industrial heritage databases, there are buildings and structures recognised for their engineering importance. These lists are maintained by the Engineering Departments of Trinity College. Most notable within the ERBD are the engineering complexes of the Grand and Royal Canals, and the Boyne Navigation, as well as the structures, lighthouses and breakwaters of Dublin Port and Dún Laoghaire.

5.3.5.4 Marine Heritage

In general, the majority of marine archaeological features occur beyond the 1 mile limit for transitional and coastal water bodies. The Underwater Heritage database is currently being compiled for Ireland. Hydrographic charts for the region mark numerous wrecks and seabed obstructions; however these are primarily for navigational rather than cultural heritage importance.

Due to the number of historic ports and settlements within the ERBD, there are several thousand wrecks in the coastal areas of the district, such as those associated with Dublin port, as well as many more in the approaches to Dalkey, around Lambay, Howth Ballbriggan and the other ports along the

coast. Some wrecks, such as the Thomas Petley, date back to the 11th Century, while the remnants of Viking trading links, ports and vessels date back to the 8th century.

Much of Ireland's inshore cultural marine heritage is unrecorded. There are estimated to be thousands of wrecks in Ireland's inshore waters. Most of these are currently unknown and difficult to detect, especially those of wooden construction, though most of these wrecks and structures are thought to be associated with historic ports and harbours and their approaches.

5.3.5.5 Sites and properties

In addition to the monument registers, there are a number of properties and areas managed by cultural heritage groups within the ERBD. These are structures or areas that have been passed to the care of responsible bodies for restoration, public access and amenity value. Two examples in the ERBD and within proximity to water bodies are:

- Battle of the Boyne site on the south bank of the Boyne, four miles north of Donore, with the recently restored 18th century Oldbridge House Boyne Visitor Centre.
- Brú na Bóinne Visitor Centre, Newgrange and Knowth Neolithic monuments of Newgrange, Knowth and Dowth, the centre at Newgrange is located two kilometres west of Donore Village on the South side of the River Boyne.

5.3.5.6 International

There are a number of sites with international importance for heritage within the ERBD area. Bull Island has been proposed as a UNESCO Biodiversity Site, and the Archaeological Ensemble of the Bend of the Boyne has been designated as a UNESCO world heritage site, and is Europe's largest and most important concentration of prehistoric megalithic art.

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. [This is particularly important, as water environments are often an important source of previously unknown archaeological material, as they can preserve organic matters often missing from dry-land sites. For example, the rivers of the ERBD are potentially rich in previously unknown archaeological features, as both settlement and ritual activity \(in the form of the](#)

deposition of artefacts) are often associated with these. Cumulatively, this results in impacts on the overall cultural heritage resource.

5.3.6 Landscape

5.3.6.1 Introduction

With land area of around 6,300km² the Eastern RBD covers about one tenth of the country and is home to rich agricultural land, coastline, the city of Dublin and the towns, which form Greater Dublin and its commuter belt. The two dominant landscape features in the District are the Wicklow Mountains and the extensive coast along the Irish Sea. The Wicklow Mountains are located in the southern portion of the basin and represent a relatively large contiguous area that remains in a natural or semi-natural state. The coastline, which comprises the eastern boundary of the District, is approximately 200 miles long and includes various bays, estuaries, and portions of the Irish Sea.

5.3.6.2 Protected Landscape Areas

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

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, including water-related infrastructure, without sensitivity to these resources.

5.3.7 Material Assets

5.3.7.1 Introduction

The following is a summary of the baseline environment within the ERBD 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 eight impoundments in the ERBD, and their locations are shown on **Figure 5.9**. These include locations at Golden Falls, Broadmeadow Rail Bridge, and the reservoirs at Vartry, Pollaphuca, Glenasmole and Leixlip. Abstractions within the ERBD are taken from a mix of groundwater, lake and river sources and are used for both public and private water supplies. There are 244 known abstraction locations in the ERBD as shown on **Figure 5.9**. There are also 124 water treatment works within the ERBD, and their locations are shown on **Figure 5.9**.

Wastewater Treatment Plants

There are 62 wastewater treatment plants (WWTP) within the ERBD. The majority of these discharge to rivers; however, a few discharge to lakes, transitional and coastal waters. The locations of the WWTP within the ERBD are shown on **Figure 5.9**.

Coastal Defences

Coastal defences within the ERBD consist of a network of seawalls, embankments, revetments and boulders. These are primarily concentrated around Dublin Port (Dublin Bay), Drogheda (Boyne Estuary), Arklow and the coast between Greystones and Wicklow.

Flood Defences

No flood defence data could be sourced for the ERBD.

Dams, Weirs and Hydroelectric Power

Within the Eastern District there are 16 weirs, of which five have fish passes. No data was available on dams and hydroelectric power in the ERBD.

Navigable Waters and Canals

Navigable waters within the ERBD include the Royal canal and the Grand Canal [as well as the Boyne Navigation](#). The Royal Canal leads from Dublin to Lough Ree and the main branch is over 145km long, with 46 locks. The Grand Canal leads from Ringsend in Dublin to the River Shannon at Shannon Harbour in County Offaly, and is over 130km long with 43 locks. A short section of the River Boyne is navigable from the Boyne Estuary. The Naas Branch of the Grand Canal is also within the ERBD and is navigable to Naas Harbour.

Commercial Fishery and Aquaculture Areas

In the ERBD, commercial aquaculture activities are located at Howth and Dublin Bay, where there are four operations for shellfish beds. There are 18 main fisheries areas off the Eastern RBD coastline within the 1 mile limit, ranging from whelk and crustacean pots around Dublin Bay to mussel and scallop dredging off the Wicklow Coast. **Figure 5.10** shows the location of aquaculture and commercial fisheries within the ERBD.

Harbours and Ports

The ERBD has a relatively large number of large ports and harbours, mainly due to busy sea traffic between Ireland and the UK mainland. The three main ports are Drogheda, Dublin and Dún Laoghaire, with Dublin and Dún Laoghaire operating as international ferry ports. In 2007, Dublin Port had a total trade throughput of 30.9 million tonnes, a throughput of 1.3 million ferry passengers and a turnover of €70.5 million. Over 80% of imports through Dublin Port are consumer goods destined for retail outlets in the city and surrounding areas. The Eastern RBD is also home to six fishing ports; Balbriggan, Skerries, Howth, Dún Laoghaire, Wicklow and Arklow.

Recreational Use of Waters

[Twenty-one](#) protected bathing waters are present in the Eastern RBD, ten of which are located within the Greater Dublin Area between Malahide and Bray. Other large protected recreational water areas are near Laytown, Skerries and Brittas Bay South. The coastline of the ERBD is also very busy with recreational sailing, with the main areas being around Dublin Bay from Dún Laoghaire to the Ben of Howth, then off the coast of Bray, Arklow and Greystones, where marinas are located. The lakes

within the District are also used for recreational activities, such as salmon, trout and coarse fishing in Lough Ramor and sailing and windsurfing on Lough Lene.

5.3.7.3 Non-Water Related Material Assets

Roads and Rail Infrastructure

There is approximately 7,000km of road in the ERBD. Of these 2% are classed as Motorway, 6% as Primary Routes, 3% are classed as National Secondary Routes or A Roads, and 25% are classed as Regional or B Roads. The remaining road infrastructure within the ERBD is comprised of minor roads and unclassified urban roads.

In addition, there is approximately 500km of existing rail infrastructure in the Eastern RBD, of which some 310km are still in active use. The LUAS light-rail network is also present in Dublin City, and its suburbs, and is planned for future expansion along with provision of the fully segregated Metro mass transit system.

Landfills, Mines and Quarries

There are 90 landfills located within the ERBD. Some of these landfills are closed, or are currently non-active. Most landfills in the District are un-lined, as they predate the relevant legislation.

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

5.3.7.4 Existing Environmental Pressures / Problems: Material Assets

Increased development including residential and industrial expansion in the ERBD, especially within Dublin City, 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. The availability of water supplies in the future is in doubt due to the identified need for a new water source for the Greater Dublin Area by 2016. If a new supply is not secured there would be increased pressure on existing sources to supply demand with the possibility of water shortages resulting in impacts on commercial and industrial operations in the District.

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. There are also several proposals for expansion or introduction of new commercial port facilities in the District along with development and expansion of existing fishing ports, e.g. Greystones Harbour development, which while considered material assets may result in impacts to water quality.

5.3.8 Soil, Geology and Land Use

5.3.8.1 Soils

The most predominant soil types in the Eastern RBD are Grey Brown Podzolics, Gleys, Acid Brown Earths and Brown Podzolics (An Fóras Talúntais, 1980). Grey Brown Podzolics, Gleys, and Acid Brown Earths, found in the lowlands of the District, are naturally fertile and well suited for productive agriculture. Basin peats are widespread, while Brown Podzolics and Peaty Podzols are located on the upper flanks. Mountain top ridge zones typically contain High Level Blanket Peats and Lithosols.

The ERBD is dominated by soils with drainage properties considered to be well, moderate, and imperfect. The majority of the landscape of the ERBD is considered to have a low risk of runoff (65% of the area), with 15% and 20% rated as having moderate and high risks of runoff, respectively.

5.3.8.2 Soil Suitability

Soil suitability classification essentially consists of outlining the range of uses to which a given soil is adaptable, including determining the production potential of each soil for the normal range of farm or forest crops. This classification provides the essential link between the physical and economic aspects of the use of soils. An evaluation of soil suitability was carried out as part of the National Soil Survey of Ireland (now known as Teagasc) for a number of counties in Ireland over a period of many years. Several of these surveys were carried out in counties within the ERBD, the results of which are provided in **Table 5.7**.

Table 5.7 Amount of Class A and Class B soils mapped in counties in the ERBD

County	Class A*	Class B**
Meath	37% (85,716 ha)	41% (96,285 ha)
Westmeath	52% (70,641 ha)	8% (14,753 ha)
Kildare	49% (82,238 ha)	25% (42,715 ha)
Offaly	22% (43,125 ha)	18% (34,598 ha)

* Class A well adapted to new techniques and is mainly suitable for cultivated crops, pasture or forestry

** Class B suitability, having more limited use-range than those in Class A and being generally of only moderate suitability for cultivated crops, pasture and forestry

Nitrate Vulnerable Zones

Within Ireland, a Nitrates Action Programme has been prepared in accordance with Article 5 of the Nitrates Directive and is to be applied to the state as a whole.

Soil Contamination

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

Slope Stability and Landslide Potential

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

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

5.3.8.3 Geology

The geology of the ERBD region consists of a Palaeozoic stratigraphy ranging in age from Cambrian to Namurian (Carboniferous), containing 15 of the 28 bedrock groups represented on the national bedrock map. The older rocks occurring in the southern portion of the ERBD are predominantly metasediments of Cambrian, Ordovician and Silurian age, and an extensive area of granites and other igneous intrusive rocks from the Caledonian Orogeny. These granites and surrounding metasediments comprise the principal upland massif within the Eastern District and underlie all the river basins in this portion of the ERBD. A belt of Silurian Metasediments also occurs along the northern border of the ERBD in the north of (Hydrometric Area HA07). Younger Carboniferous sedimentary rocks (54% of the ERBD) underlay a majority of the ERBD's low-lying areas. These

sedimentary rocks are predominantly composed of limestones with a residue of sandstones, shales or undifferentiated sedimentary strata.

Groundwater Vulnerability and Protection Zones

The vulnerability of groundwater to pollution can be related back to both soil permeability and depth, i.e. the thicker and less permeable the overlying subsoil layer the lower the risk of pollution. Groundwater vulnerability zones have been mapped in Ireland by the Geological Survey of Ireland, as shown on **Figure 5.11**. Groundwater vulnerability ranges across the District, with relatively large areas subject to Extreme groundwater vulnerability, particularly in the south. It should be noted that within Ireland some areas, e.g. County Cavan, have not yet been mapped. These are classed as areas of High/Low vulnerability, until mapping is complete. In total, the majority of the groundwater area in the district is either of extreme (24.5% of total area), high (23.4% of total area), or high to low (25.1% of total area) vulnerability.

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. Thirty-three source protection zones are currently mapped within the ERBD. It should also be noted that the entire island of Ireland has been designated as a Protected Area for Groundwater under the WFD.

Mineral Potential

The island can be divided into a number of mineral provinces that are endowed with a diverse suite of base and precious metals, as well as industrial minerals. The majority of the ERBD is contained within the Central Ireland Basin and Leinster Massif, with a small section of the RBD in the Longford-Down Massif mineral province.

Thick Lower Carboniferous limestones in a number of sub-basins are the host in the Central Ireland Basin, an important zinc-lead province. Known zinc-lead deposits contain some fourteen million tonnes of zinc metal. Target horizons are stratabound Irish-type deposits in the basal Carboniferous (e.g. Navan, Tatestown, Oldcastle, Keel, Moyvoughly), the overlying Waulsortian limestones (Tynagh, Silvermines, Ballinalack, Galmoy, Lisheen) and stratigraphically higher crosscutting deposits (Harberton Bridge). Vein and massive replacement copper-silver deposits (Gortdrum, Aherlow, Mallow) are associated with the structurally controlled southern margin of the Basin. Other significant deposits include barite (Ballynoe, Tynagh), gypsum (Glangevlin), calcite (Kilbreckan) and dolomite (Bennettsbridge).

The Leinster Massif of Lower Palaeozoic metasediments and volcanics hosts the large low-grade copper-pyrite deposit at Avoca. There is sub-economic tungsten and lithium mineralization associated with the Leinster Granite, where there are also numerous minor vein-type copper and lead deposits. Also of note is the historically mined alluvial gold deposit at Gold Mines River.

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 Eastern District there is currently one active mine in Navan (zinc and lead), thirty active pits and thirty-four active quarries. **Figure 5.12** illustrates the known mineral deposits located within the ERBD.

Sand and Gravel Potential

Unlike most other forms of development, minerals can only be worked where they are found. This means that the spatial distribution of mineral resources and thus the potential for workings is dictated by geological considerations and not by the demands of human geography. The GSI Minerals Section has begun a programme of mapping of Aggregate Potential on a county-by-county basis. Schemes for four counties have been carried out including Cavan, Meath and Wicklow, with further mapping being carried out on a prioritised regional basis. However, this level of information is not yet available for the remaining counties within the District.

5.3.8.4 Land Use

Figure 5.13 shows the distribution of land uses in the ERBD. The primary land cover (76%) within the ERBD is agriculture, with pastureland the most prevalent. Forests cover approximately 5% of the ERBD, with the majority being coniferous forests. Wetlands cover some 6.7% of the ERBD, the majority of which (90%) is peat bog. Relative to the rest of the island, a substantial amount (5.7%) of the land cover in the ERBD is artificial surfaces.

As discussed in **Section 5.3.2, Population**, the largest urban area within the ERBD is Dublin City, 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 smaller urban centres in the towns of Trim, Navan, Wicklow and Arklow.

5.3.8.5 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 already 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 5.8** highlights the key interrelationships identified in this SEA, with ✓ indicating a potential inter-relationship (either positive or negative) and X indicating limited or no inter-relationship. These potential interrelationships will be taken into account in the assessment of the different alternatives.

Of particular note is the primary interrelationship between water (quality and quantity) and biodiversity, flora and fauna, soils, human health and population. Flora and fauna rely directly on the aquatic environment as a habitat but the terrestrial environment can also be strongly impacted by the aquatic environment. Habitats, such as machair and fens, 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 5.8 Potential Inter-Relationships Between SEA Topics

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

5.4 EVOLUTION OF THE ENVIRONMENT IN THE ABSENCE OF THE PLAN

The ERBD 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 continue.

According to a recent EPA report (2008) trends in water quality in Ireland show an overall improvement; however, the rate of this improvement in surface waters is not sufficient to meet the requirement of having good status in all waters by 2015 as required by the Water Framework Directive. In the absence of the Plan the pressures identified in the [2007 Water Matters – Have Your Say](#) report would continue to impact on water quality and quantity, perpetuating the indirect impacts associated with these on biodiversity, flora and fauna, population and human health, as discussed in

the previous sections. For instance, the proposed strategies to target waters listed on the Register of Protected Areas under the WFD, e.g. plans to protect water dependent habitats and species, such as salmonids, would lack the impetus by under the RBMP/ POM.

In the absence of the Plan, development may continue to take place in a dispersed manner with increasing numbers of one-off houses and associated septic tanks being developed, which may continue to contribute to reductions in surface and/or groundwater quality. Also, those urban areas currently experiencing unsustainable development pressure would continue to grow though some control would be provided by existing controls in plans such as the National Spatial Strategy and the National Development Plan. 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 ERBD, which currently has very 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.

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

Therefore, evolution of the climatic environment in the absence of the Plan is likely to be heavier winter rainstorms causing more flash flooding, resulting in an increase in diffuse pollution loads from

soil run-off and increasing demand for flood controls. These types of flood events (though not directly addressed by the Plan) would continue to pose a risk to soils as a result of erosion and release of contaminants, thus potentially leading to further water quality problems.

Summer droughts are also likely and recent reports have indicated that the effects of climate change in Ireland will have serious consequences for water resources, resulting in a potential 40% reduction in drinking water supplies. This is of particular concern in the ERBD, where demand for drinking water is predicted to exceed supplies by 2016. 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.

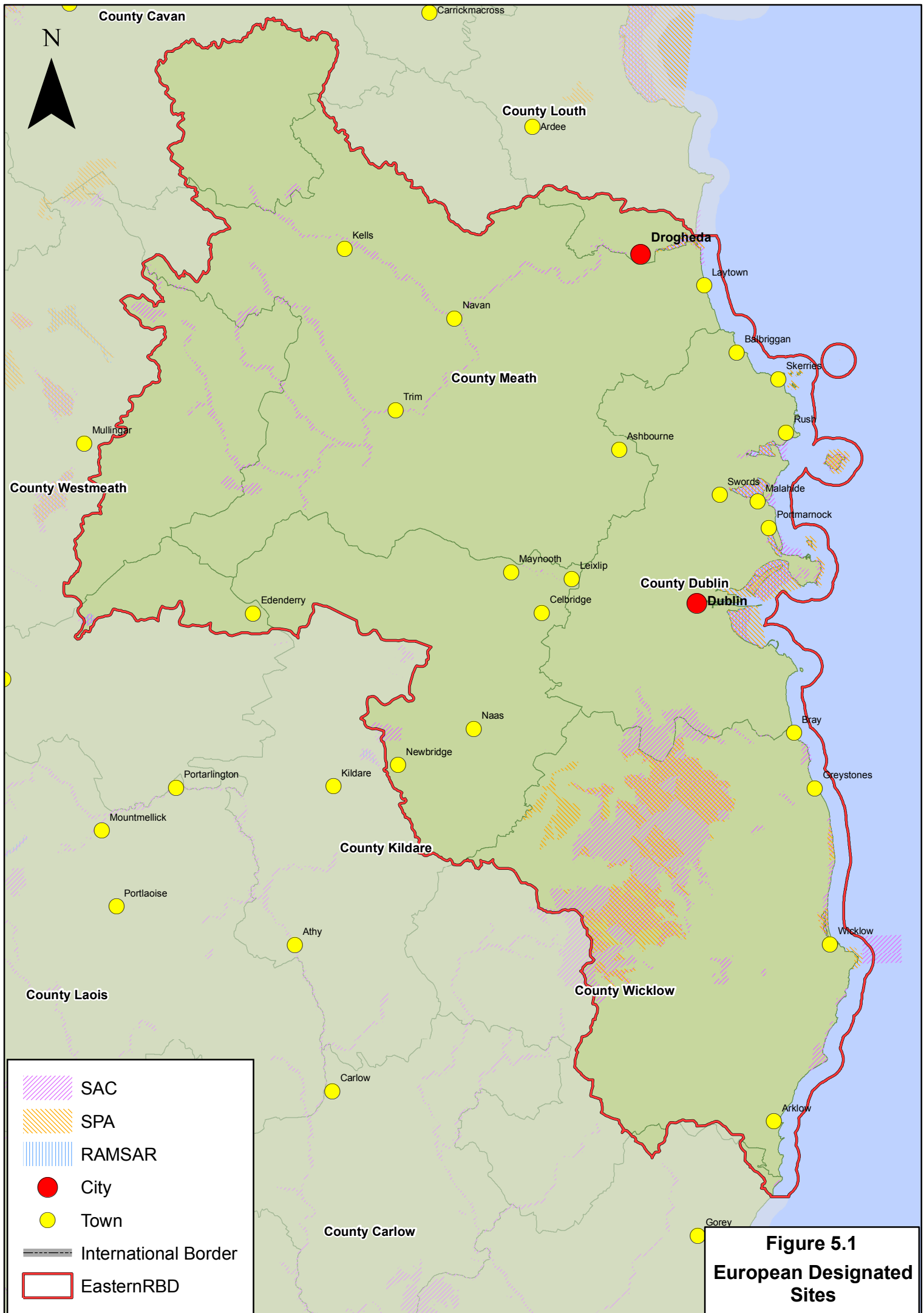
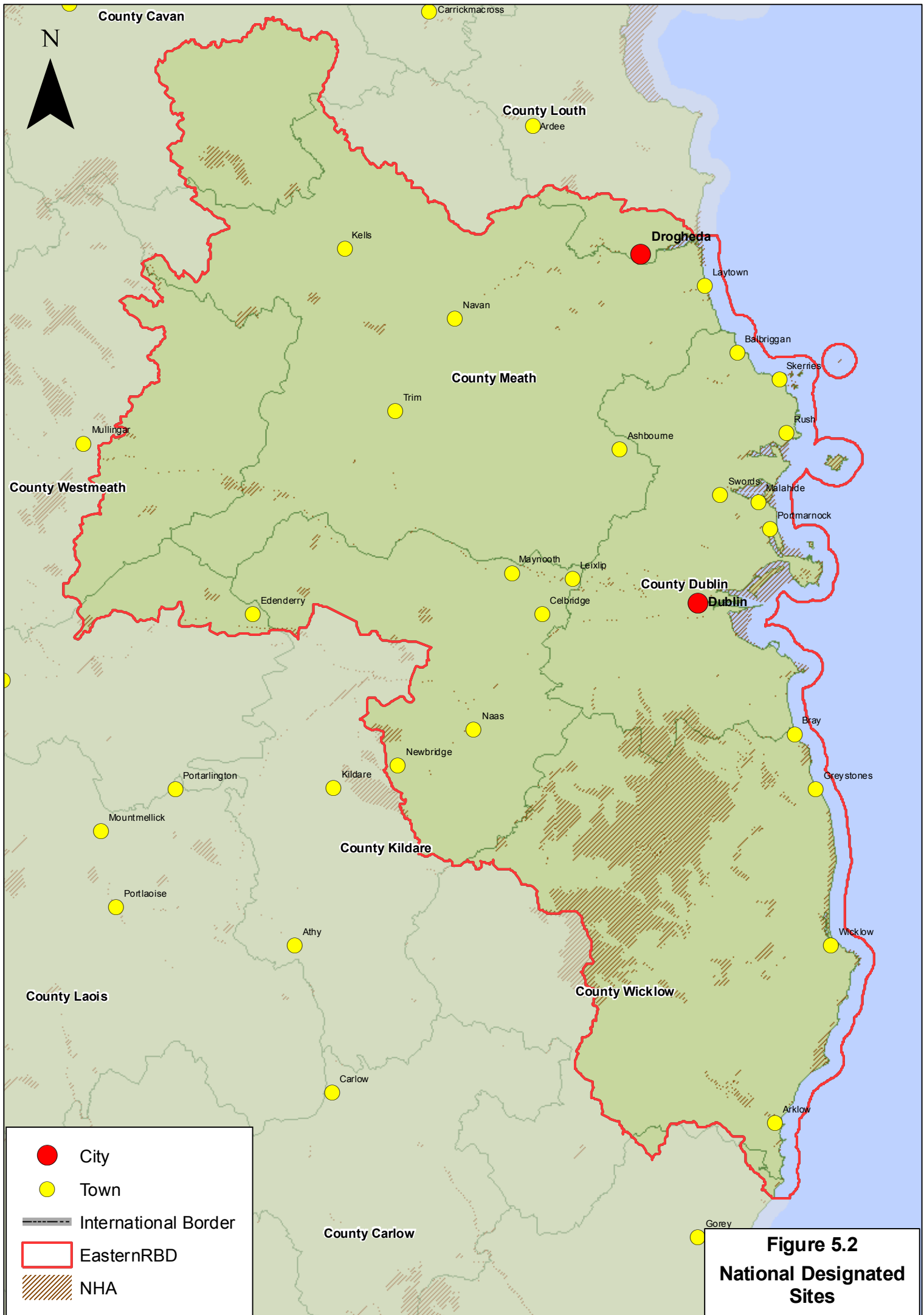


Figure 5.1
European Designated Sites



County Cavan

Carrickmacross

N

County Louth

Ardee

Drogheda

Laytown

Balbriggan

Skerries

County Meath

Kells

Navan

Trim

Ashbourne

County Westmeath

Mullingar

Swords

Malahide

Potmarnock

Edenderry

Maynooth

Leixlip

County Dublin

Dublin

Celbridge

Naas

Newbridge

Bray

Greystones

County Kildare

Portlinoon

Mountmellick

Portlaoise

Athy

Carlow

County Laois

County Wicklow

Wicklow

Afklow

County Carlow

Gorey

