



# Marine Plan for Northern Ireland - Sustainability Appraisal

## Volume 2: Sustainability Appraisal Report

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# 1 Introduction

## 1.1 Purpose of Report

This report presents the findings of the Sustainability Appraisal (SA) of the Marine Plan for Northern Ireland (the Marine Plan).

The Marine Plan Authority<sup>1</sup> has prepared the Marine Plan and has appointed AECOM and APBmer to complete the SA. The SA will be used to inform the final Marine Plan and to assess the likely environmental, social and economic effects arising from the Marine Plan's implementation.

This Sustainability Appraisal is required under Schedule 1, paragraph 10 of the Marine Act (Northern Ireland) 2013 and Schedule 6, paragraph 10 of the Marine and Coastal Access Act 2009 which states that:

*“10 (1) The Department must carry out an appraisal of the sustainability of its proposals for inclusion in any marine plan.*

*(2) The Department may proceed with those proposals only if it considers that the results of the appraisal indicate that it is appropriate to do so.*

*(3) The Department must publish a report of the results of the appraisal.*

*(4) The report is to be published when the Department publishes the consultation draft under paragraph 11.”*

In addition to the SA, a Strategic Environmental Assessment (SEA) is required. The process of SEA was introduced under the European Directive 2001/42/EC ‘*the assessment of certain plans and programmes on the environment*’, commonly referred to as the ‘*SEA Directive*’. The SEA Directive was transposed into domestic law through the Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004 (S.R. 280/2004). The objectives of the SEA Directive, as set out in Article 1, are “*to provide a high level of protection to the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development*”. This SA Report incorporates the SEA.

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<sup>1</sup> Department of Agriculture, Environment and Rural Affairs (DAERA)

## 1.2 The Marine Plan Area

The Northern Ireland marine area comprises both an inshore and an offshore region<sup>2</sup>. The marine area comprises all marine waters including sea bed, subsoil, sea loughs and tidal rivers so far as the tide flows at Mean High Water Spring Tide<sup>3</sup>.

The inshore region<sup>4</sup> extends from the Mean High Water Spring Tide mark out to, at most, 12 nautical miles (nm) and includes tidal rivers and sea loughs. The offshore region<sup>5</sup> is the area that extends south-eastwardly from the 12nm territorial limit to the outer boundary of the Northern Ireland marine area (31nm at the farthest point). The Northern Ireland marine area abuts the marine areas of Scotland, Wales, the Isle of Man and the Republic of Ireland. Figure 1.1 shows the extent of the Northern Ireland marine area.

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<sup>2</sup> The outer limit of the Northern Ireland Marine Area is defined in the Adjacent Water Boundary (Northern Ireland) Order 2002 (<http://www.legislation.gov.uk/uksi/2002/791/contents/made>) and the Exclusive Economic Zone 2013 (<http://www.legislation.gov.uk/uksi/2013/3161/contents/made>).

<sup>3</sup> <http://www.legislation.gov.uk/ukpga/2009/23/section/42>

<sup>4</sup> <http://www.legislation.gov.uk/ukpga/2009/23/section/322>

<sup>5</sup> <http://www.legislation.gov.uk/ukpga/2009/23/section/322>

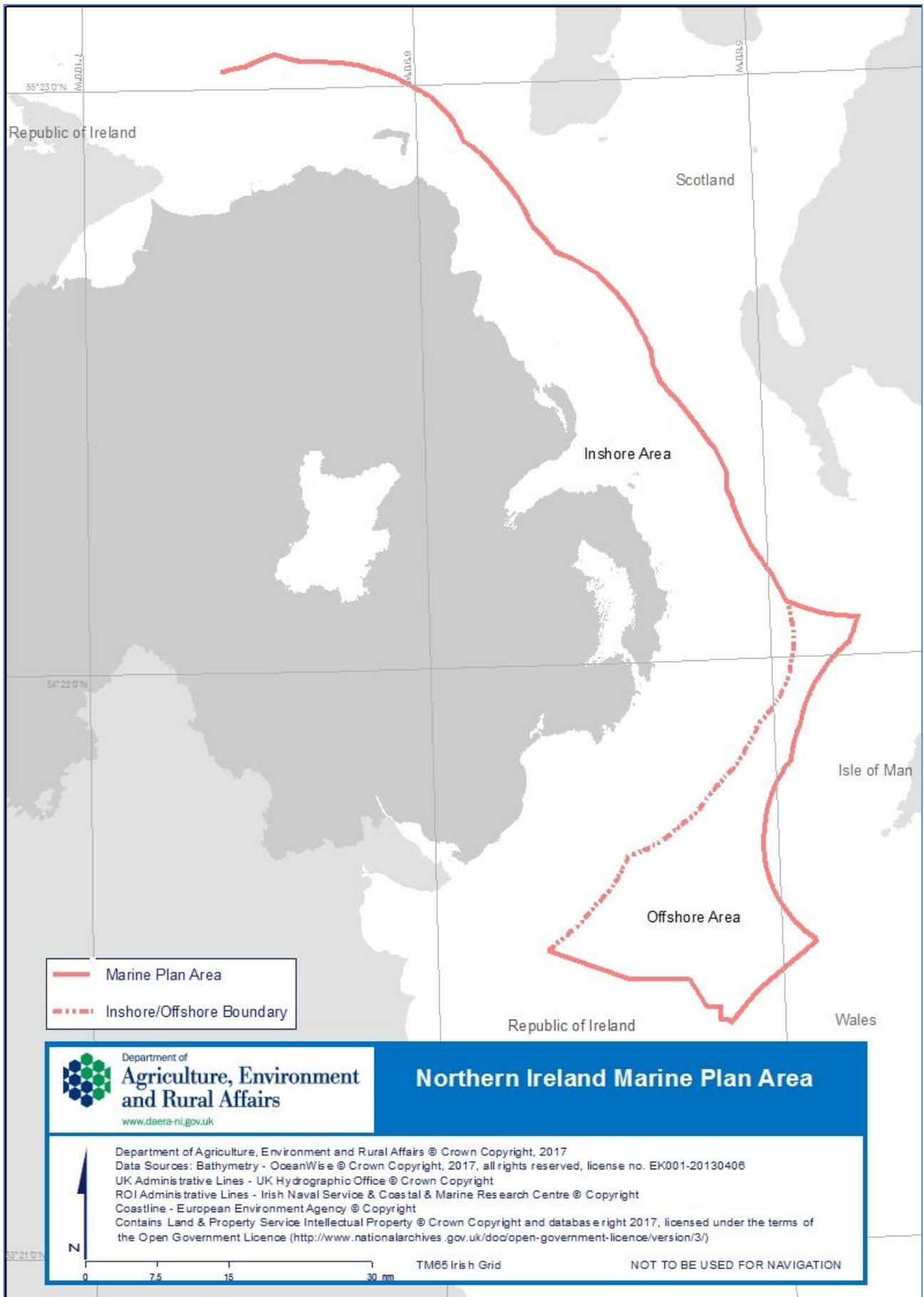


Figure 1.1: Northern Ireland Marine Plan Area (Source: DAERA)

### 1.3 The Marine Plan for Northern Ireland

The Marine Plan is being prepared in accordance with the:

- Marine Act (Northern Ireland) 2013;
- Marine and Coastal Access Act 2009; and,
- Maritime Spatial Planning Directive 2014<sup>6</sup>.

The Marine Plan consists of two plans in one document; one for the inshore region and one for the offshore region which together form the Marine Plan for Northern Ireland.

### 1.4 Content of the Sustainability Appraisal

This report is in three volumes which are structured as follows:

#### **Volume 1: Non-technical Summary**

#### **Volume 2: Sustainability Appraisal Report (this report)**

**Chapter 1** comprises of this introduction.

**Chapter 2** provides a brief summary of the Marine Plan, its scope and objectives and a summary of the alternatives that were considered.

**Chapter 3** provides information on the scope of the assessment and the methods used for assessing effects.

**Chapter 4** provides a summary of the baseline information in the SA study area.

**Chapter 5** presents the results of the sustainability appraisal.

**Chapter 6** outlines the proposed monitoring framework for the Marine Plan.

#### **Volume 3: Appendices**

**Appendix A** – Summary of environmental protection objectives.

**Appendix B** – Alternatives.

**Appendix C** – Baseline information and associated figures.

**Appendix D** – Assessment tables.

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<sup>6</sup> Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning.



## 2 Marine Plan for Northern Ireland

### 2.1 Marine Plan for Northern Ireland

This chapter provides a summary of the Marine Plan. Northern Ireland's vision for the marine area is for *“A healthy marine area which is managed sustainably for the economic, environmental and social prosperity of present and future generations”*.

### 2.2 Legislative and Policy Context and Environmental Protection Objectives

The Marine and Coastal Access Act 2009 (MCAA) and the Marine Act (Northern Ireland) 2013 (The Marine Act), require DAERA as the Marine Plan Authority, to prepare Marine Plans for the better management of the Northern Ireland marine area, which will facilitate its sustainable development. A map of the Northern Ireland marine area is shown on Figure 1.1 above.

Marine Plans contribute to the UK implementation of the Maritime Spatial Planning Directive 2014/89/EU (the MSP Directive) which establishes a framework for Maritime Spatial Planning across the EU. This Directive requires marine plans to be prepared by 31 March 2021.

The Marine Plan is in conformity with the UK Marine Policy Statement (UK MPS). The Marine Plan for Northern Ireland and other marine policy documents will inform and guide the regulation, management, use and protection of the Northern Ireland marine area. It will support and complement other existing legislation, policies, plans and strategies, including the Northern Ireland Executive's Programme for Government, Regional Development Strategy, Going for Growth, the Strategic Energy Framework and the Common Fisheries Policy. It also takes account of the Floods Directive, Flood Risk Management Plans, River Basin Management Plans that implement the Water Framework Directive, and will complement the Marine Strategy Framework Directive's (MSFD) Programme of Measures. Consequently, it will contribute to the achievement of Good Ecological Status and Good Environmental Status respectively. It will also contribute to the implementation of the Integrated Coastal Zone Management Strategy. All reasonable steps have been taken to ensure that the Marine Plan is compatible with Local Development Plans.

The Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004 requires responsible authorities to identify the broader policy context and the environmental protection objectives relevant to the plan that is being assessed. The

broader policy context is described above with further information on existing environmental protection objectives summarised in Appendix A<sup>7</sup>.

### **2.3 Purpose and Scope**

The Marine Plan presents policies that reflect, clarify and signpost current policy measures and practices from the UK MPS and across NI and UK Government Departments.

The Marine Plan reflects the unique character of the Northern Ireland marine area and the needs of its users. It will ensure that decisions taken in relation to the marine area, contribute to the delivery of national and regional policy objectives. A Marine Mapviewer has also been developed to illustrate the areas of opportunity and constraint within the Marine Plan area. It is a living document that will continue to evolve as the effectiveness of its policies are monitored and reviewed and the evidence base develops.

The Marine Plan and the Marine Mapviewer:

- Promote sustainable development of the Northern Ireland marine area by supporting key activities and uses;
- Apply a presumption in favour of sustainable development in decision making, in line with the UK MPS;
- Promote the co-existence of multiple use of the Northern Ireland marine area, in line with the UK MPS;
- Advocate an ecosystem-based approach to decision making, in line with the UK MPS;
- Guide and inform proposers and public authorities about the most suitable locations for different activities and uses by providing information on the current uses, activities, resources, constraints and designations in the marine area;
- Provide a single reference source for public authorities, marine users and stakeholders;
- Provide greater clarity over the range of policies and legislation that relate to the Northern Ireland marine area using language that is clear and accessible to a wide audience; and,

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<sup>7</sup> All appendices are presented in Volume 3

- Promote a holistic approach to decision making that considers all of the benefits and impacts of the current and future uses and activities in the Northern Ireland marine area.

The Marine Plan combines the Plans for both the Inshore and Offshore regions into one document.

## **2.4 Links with Terrestrial Planning**

Marine planning sits alongside and interacts with the existing terrestrial planning regime.

The Northern Ireland marine area physically overlaps with the terrestrial planning area in the intertidal area. The Marine Plan boundary extends up to the Mean High Water Spring Tide while generally terrestrial planning boundaries extend down to Mean Low Water Spring Tide. This overlap ensures that marine and terrestrial planning will address the whole of these environments respectively.

In the development of the Marine Plan, the Department had regard to the Regional Development Strategy, the Strategic Planning Policy Statement and Planning Policy Statements, to ensure the two regimes complement each other.

The Marine Plan, taking account of its strategic level, has been drafted to ensure that it is compatible with Development Plans and the Regional Development Strategy when its provisions prevail.

## 2.5 Marine Plan Objectives

The Marine Plan Authority, in consultation with other Departments and those with an interest in the marine area, developed eight integrated and crosscutting objectives for the Marine Plan, reflecting the full range of the High Level Marine Objectives from Our Seas: a shared resource, high level marine objectives (HM Government, 2009). The Marine Plan objectives are set out below:

- Objective 1:** To promote the sustainable development of productive activities, which support employment at all skill levels while fully considering the requirements of other marine interests.
- Objective 2:** To help realise the potential of energy resources and energy storage within the marine area, while fully considering the requirements of other marine interests.
- Objective 3:** To promote the development of vibrant, accessible and sustainable coastal communities.
- Objective 4:** To promote the marine resource, its recreational value and its wider economic, environmental and social benefits to all.
- Objective 5:** To promote the preservation and enjoyment of marine related heritage assets.
- Objective 6:** To promote a healthy, resilient and adaptable marine ecosystem and ecologically coherent network of Marine Protected Areas.
- Objective 7:** To contribute towards climate change mitigation and adaptation measures.
- Objective 8:** To continue to develop a sound marine evidence base in a co-ordinated manner, to increase understanding and to support the development, monitoring and review of marine plans.

All the policies in the Marine Plan will contribute in some way to meeting all of the objectives and to achieving the Vision.

## **2.6 Marine Plan Policies**

The Marine Plan contains two categories of policies; Core Policies and Key Activity Policies.

### **Core Policies**

These policies cover the general issues to be considered by public authorities, on all proposals. The core policies are:

- Stakeholder Engagement;
- Air Quality;
- Climate Change;
- Coastal Processes;
- Co-Existence;
- Cumulative Impacts;
- Heritage Assets;
- Invasive Alien Species;
- Land and Sea Interaction;
- Marine Litter;
- Marine Noise;
- Natural Heritage;
- Seascape;
- Use of Evidence; and,
- Water Quality.

## **Key Activity Policies**

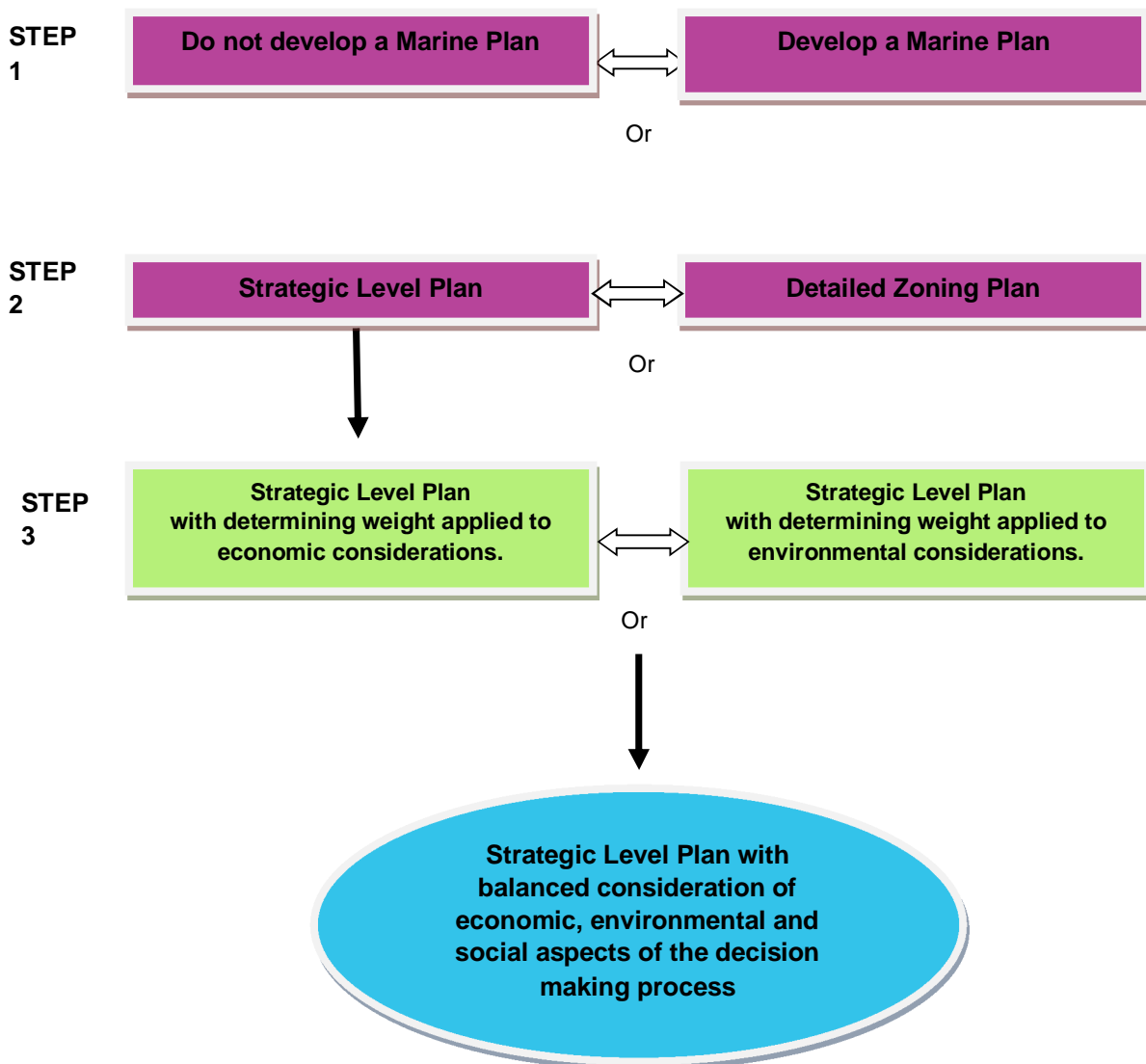
These policies support or safeguard a particular activity without undue impact on the marine area, its ecosystem services and the users that rely on them. The key activity policies are:

- Aquaculture;
- Carbon Capture and Storage;
- Commercial Fishing;
- Defence and National Security;
- Dredging;
- Energy;
- Marine Aggregates;
- Ports, Harbours and Shipping;
- Telecommunications Cabling; and,
- Tourism and Recreation.

## 2.7 Alternatives Considered

As required by the SEA Directive<sup>8</sup> and the Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004 reasonable alternatives were considered.

Consideration of alternatives was developed through a stepped process, during the early stages in the preparation of the Marine Plan for Northern Ireland. This process is set out in Figure 2.1 below.



**Figure 2.1: Development of Alternatives**

<sup>8</sup> 2001/42/EC “on the assessment of the effects of certain plans and programmes on the environment”

### 2.7.1 Step 1

The Marine Plan Authority initially gave consideration to:

- Developing a marine plan; or,
- Not developing a marine plan.

Not developing a marine plan was considered to be an unreasonable alternative, as the creation of a marine plan is a legal requirement of the Marine and Coastal Access Act (2009) and the Marine Act (Northern Ireland) 2013<sup>9</sup>. It is also a key part of developing a plan-led system under the UK MPS.

### 2.7.2 Step 2

In developing the Marine Plan, the Marine Plan Authority engaged with the relevant departments to assist in determining which of two options should be developed. These are:

- A strategic level plan; or,
- A detailed zoning plan.

During ongoing engagement on the development of the Marine Plan at this time, the majority of stakeholders favoured a strategic level plan. This approach was viewed as the optimum route to help ensure the sustainable development of the marine area. It would be flexible enough to incorporate specific spatial elements where they are known such as renewable energy zones and designated areas.

### 2.7.3 Step 3

The final step was the consideration of an appropriate direction for the Marine Plan. Early engagement had indicated that there were two main directions that stakeholders thought the Marine Plan could take and this was confirmed at a stakeholder engagement event in November 2013. These included:

- Providing additional determining weight to economic considerations, where appropriate; and,
- Providing additional determining weight to environmental considerations, where appropriate.

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<sup>9</sup> At this time, only the MCAA 2009 was in place and the Marine Act was under preparation.



Following consideration of each direction, it was concluded that the best method for contributing to the sustainable development of the marine area would be a balanced consideration of the economic, environmental and social aspects of the decision making process.

It was deemed reasonable to develop a strategic plan with spatial elements included (where appropriate) and to guide the users of the Marine Plan to apply a balanced approach in considering the relative weight of any economic, environmental or social considerations in the exercise of their functions.

The Marine Plan Authority sought views of this approach from stakeholders in March 2014 and no objections or concerns were raised.

Appendix B1 provides details of the various options that were considered and how these were assessed by the Marine Plan Authority. These tables show the consideration of the Marine Plan objectives at that time<sup>10</sup>, against five principles of sustainability<sup>11</sup> for each alternative.

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<sup>10</sup> The alternatives were considered against the original ten Marine Plan objectives, as set out in Appendix B2. As a result of ongoing stakeholder engagement the Marine Plan objectives were revised through amalgamation to nine and ultimately to the eight now included in the Marine Plan.

<sup>11</sup> Implications for environment, economy, society, governance and sound science

### 3 Assessment Methods

#### 3.1 Introduction

This chapter summarises the main stages of the SA process, the scope of the assessment, and details the methods that have been used to assess the effects of the Marine Plan.

#### 3.2 Key SA Stages

The main stages and tasks followed in completing the SA are set out in Table 3.1 below. All stages up to and including the publication of this report have been completed.

The publication of this SA Report will be followed by a period of consultation.

**Table 3.1: SA Stages and Tasks**

SA Stages	Description of main tasks
Setting the Context, Establishing the Baseline and Deciding the Scope	<ul style="list-style-type: none"> <li>• Identification of spatial and temporal scope of assessment;</li> <li>• Identification/collection of baseline data;</li> <li>• Identification of key environmental, social and economic issues/problems;</li> <li>• Identification of relevant plans, programmes and their associated environmental, social and economic protection objectives to characterise the existing legislative and policy environment;</li> <li>• Development of a method for assessing potential environmental, social and economic effects;</li> <li>• Consultation with statutory authorities with environmental, social and economic responsibilities on scope of SA (i.e. Northern Ireland Environment Agency, Northern Ireland departments and United Kingdom departments and agencies with marine responsibilities) and transboundary consultations with bordering countries and devolved administrations; and,</li> <li>• Assessment by the Marine Plan Authority of the strategic alternatives which are available at this stage of the Marine Plan development process.</li> </ul>
Assessing Effects	<ul style="list-style-type: none"> <li>• Identification of the likely environmental, social and economic effects of the Marine Plan;</li> <li>• Use significance criteria to evaluate the predicted effects (positive, negative, cumulative and transboundary);</li> <li>• Outlining the potential measures to mitigate environmental, social and economic effects; and,</li> <li>• Proposal of measures to monitor the environmental, social and economic effects throughout the implementation of the Marine Plan.</li> </ul>
Preparing the Sustainability Appraisal Report	<ul style="list-style-type: none"> <li>• Preparation of the Sustainability Appraisal Report, presenting the findings of the SA of the Marine Plan; and,</li> <li>• Preparation of a Non-Technical Summary encompassing the results of the SA.</li> </ul>

SA Stages	Description of main tasks
Consultation and Decision Making	<ul style="list-style-type: none"> <li>· Publish Sustainability Appraisal Report with draft Marine Plan for consultation;</li> <li>· Consultation with the public, community groups, authorities with marine responsibilities and/or interests. Transboundary consultation;</li> <li>· Incorporate comments received from consultation and findings of the Sustainability Appraisal into development of the Marine Plan; and,</li> <li>· Issue a statement on how the findings of the Sustainability Appraisal and responses from consultation were incorporated into the Marine Plan.</li> </ul>
Monitoring Implementation of the Marine Plan	<ul style="list-style-type: none"> <li>· Develop aims and methods for monitoring the Marine Plan's implementation; and,</li> <li>· Respond to adverse effects.</li> </ul>

### 3.3 Scope of Assessment

The SA Scoping Report was published in August 2014. The SA Scoping Report set out the main objectives and deliverables of the SA, the approach to the assessment, the SA topics that were to be covered in the assessment, the baseline data sources proposed and the consultation approach. The Scoping Consultation Report was produced in October 2014<sup>12</sup>. In summary, the main comments on the Scope were as follows:

- The proposed SA topics and subtopics to be covered in the assessment were agreed with stakeholders. Further information on the SA topics is provided in Section 3.3.1 below.
- In relation to the main objectives and deliverables of the SA, where statutory consultees commented, they were satisfied with what was proposed.
- In relation to the relevant policies, plans and programmes; Northern Ireland Environment Agency (NIEA) SEA Team and Natural England provided comment regarding the legislation and other plans referred to in the Scoping Report.
- With respect to the approach to the assessment; NIEA SEA Team, Scottish Environment Protection Agency (SEPA) and Natural England agreed with the approach proposed. However, NIEA SEA Team noted that policy alternatives may exist for the policies proposed within the Marine Plan and SEPA noted that environmental effects should be clearly recorded and not amalgamated with socio-economic issues. It was also noted by consultees that benefits associated with the

<sup>12</sup> The Marine Plan SA Scoping Report and Summary of Responses can be found at <https://www.daera-ni.gov.uk/publications/marine-plan-scoping-and-scoping-consultation-reports>

Marine Plan should also be identified in the assessment and Environmental Protection Agency (EPA), the Republic of Ireland's statutory body for the protection and management of the environment, suggested that the transboundary perspectives of the SA topics be considered.

- In relation to baseline data sources, NIEA SEA Team, SEPA and Natural England were generally content with the baseline data sources. NIEA SEA Team identified that a suite of UK marine SPAs may emerge during the drafting of the Marine Plan; Natural England noted that biodiversity action plan habitats and species should be included and EPA provided a link to EPA reports and datasets for transboundary purposes.
- In relation to consultation approach and duration; NIEA SEA Team and SEPA were content with the approach to SA consultation and duration. EPA suggested other organisations that could be consulted. The publication of the Marine Plan and SA Report will be followed by a period of consultation.

### **3.3.1 SA Topics Covered within the Scope of the Assessment**

As stated in Chapter 1, the SA encompasses the requirements of the SEA Directive as well as the need to consider other social and economic issues. Our proposed approach to undertaking the SA is therefore based on the methods widely used to undertake assessments under the SEA Directive but with the addition of further social and economic elements as presented in Table 3.2 below.

For each of the SA topics, subtopics and important factors have been identified (Table 3.3 below) to provide further definition of the scope of the assessment and to provide a focus for baseline data collection.

The scope of the SA covers environmental, social and economic issues. As shown on Table 3.3 there is considerable overlap between environmental, social and economic issues. For the purpose of this assessment environmental issues are represented by the SEA topics, social issues are represented under socio-demographics, and economic issues are represented under socio-demographics, uses and activities and material assets.

**Table 3.2: SA Topics Covered in this Assessment and Alignment with SEA Directive Topics**

SEA Directive and SA Topics	Topic covered in this SA
Biodiversity, flora and fauna*	Biodiversity, flora and fauna
Water*	Water and Soils
Soil*	Water and Soils
Air*	Air Quality
Climate Factors*	Climate Factors
Human Health*	Socio-Demographics
Population*	Socio-Demographics
Economic Interests	Uses and Activities, Material Assets, Socio-Demographics
Material Assets*	Material Assets
Cultural Heritage*	Cultural Heritage
Landscape*	Landscape and Seascape

\*SEA Directive Topic

**Table 3.3: SA Topics and Subtopics Included within the Scope of the Assessment**

SA Topics	Subtopics/Important Factors
<b>Biodiversity, Flora and Fauna</b>	<ul style="list-style-type: none"> <li>· Protected Sites (International, European and National Conservation Sites)</li> <li>· Marine Mammals</li> <li>· Benthic and Intertidal Ecology</li> <li>· Marine Reptiles</li> <li>· Plankton</li> <li>· Birds</li> <li>· Fish and Shellfish</li> <li>· Marine Noise</li> </ul>
<b>Water and Soils</b>	<ul style="list-style-type: none"> <li>· Bathymetry and hydrography (including circulation and tides)</li> <li>· Geology, geomorphology and sediment processes (including coastal and marine processes)</li> <li>· Sediment and Water Quality</li> </ul>
<b>Air Quality</b>	<ul style="list-style-type: none"> <li>· Air, (including, Air Quality Management Areas (AQMAs) and Registered Pollutant Releases)</li> </ul>
<b>Climate Factors</b>	<ul style="list-style-type: none"> <li>· Climate Factors (including, greenhouse gas releases and vessel fuel emissions)</li> </ul>
<b>Socio-Demographics</b>	<ul style="list-style-type: none"> <li>· General Demography/Population</li> <li>· Northern Ireland Economy</li> <li>· Deprivation (including health)</li> </ul>

SA Topics	Subtopics/Important Factors
<b>Uses and Activities</b>	<ul style="list-style-type: none"> <li>· Commercial Fisheries</li> <li>· Aquaculture</li> <li>· Ports, Shipping, Navigation, Dredging and Disposal</li> <li>· Recreation and Tourism</li> <li>· Aviation</li> <li>· Military Activity</li> <li>· Coastal Defences</li> <li>· Noise</li> <li>· Lighting</li> <li>· Marine Litter</li> </ul>
<b>Material Assets</b>	<ul style="list-style-type: none"> <li>· Cables and Pipelines</li> <li>· Terrestrial Transport Network</li> <li>· Aggregates</li> <li>· Underground Offshore Energy Storage</li> <li>· Petroleum Exploration Licensing</li> <li>· Offshore Renewable Energy</li> <li>· Carbon Capture and Storage</li> <li>· Compressed Air Energy Storage</li> <li>· Waste Water Treatment and Industrial Discharges</li> </ul>
<b>Cultural Heritage</b>	<ul style="list-style-type: none"> <li>· Cultural Heritage</li> <li>· Wrecks</li> <li>· Submerged Prehistory</li> <li>· Coastal and Intertidal Archaeology</li> <li>· Terrestrial Cultural Heritage</li> </ul>
<b>Landscape and Seascape</b>	<ul style="list-style-type: none"> <li>· Landscape and Seascape</li> </ul>

Over the course of the assessment it was identified that a number of the subtopics identified within the Socio-Demographic topic in the Scoping Report could not be assessed because none of the policies within the Plan had any interaction with them. As a result subtopics listed in the SA Scoping Report “Life Expectancy and Median Age of Death”, “Neighbourhood Renewal”, “Education”, “Housing” and the “Coastal Communities Fund” were removed from the Socio-Demographic topic.

### 3.4 Assessment Methods

A stepped approach has been used to assess the effects of the Marine Plan, consisting of:

- An individual assessment of the Core and Key Activity policies contained in the Marine Plan;
- An assessment of all screened-in policies (in-combination) for each SA topic;
- An ecosystems services assessment of all screened-in policies; and,
- A statement on cumulative and transboundary effects.

### 3.4.1 Individual Policy Assessment

The policy assessment was completed in two stages:

**Stage 1:** A screening review was undertaken of all Marine Plan policies against existing policy to identify which of the policies would augment or change existing policy. Policies considered to augment or change existing policy were taken forward (screened-in) for further assessment. Policies that fully reflect existing policy, and would therefore not result in changes to baseline conditions, were not subject to further assessment.

**Stage 2:** Each policy screened-in was subject to assessment against all of the SA topics as set out in Section 3.3.1 above. For each policy the following were addressed:

- i. What is the potential effect of the policy subject area on the SA topic/subtopic?
- ii. What does the policy do in addition to existing policy provision/commitments? (based on the Stage 1 policy review)
- iii. What is the resulting effect of the change in existing policy on the SA topic/subtopic?
- iv. What is the likely effect on the baseline conditions of the SA topic/subtopic and why?

### 3.4.2 In-combination Policy Assessment

Based on the results of the individual policy assessments the overall effect of all the screened-in policies, in-combination, was assessed. This section is structured around the SA topics and the likely significant effects on each SA topic is described.

### 3.4.3 Ecosystem Services Assessment

The UK National Ecosystem Assessment (NEA) has developed a framework for considering marine ecosystem services (Figure 3.1). This framework identifies the linkages between marine ecosystem components and processes and how these contribute towards marine ecosystem services and the benefits that humans derive from marine ecosystems. The framework identifies four main types of ecosystem services or 'sub-services' – provisioning, regulating, cultural and supporting.

The framework has been used to carry out a high level assessment of the impact of the marine plan policies on the benefits that humans derive from marine ecosystem services. This focuses on provisioning, regulating and cultural services and does not consider

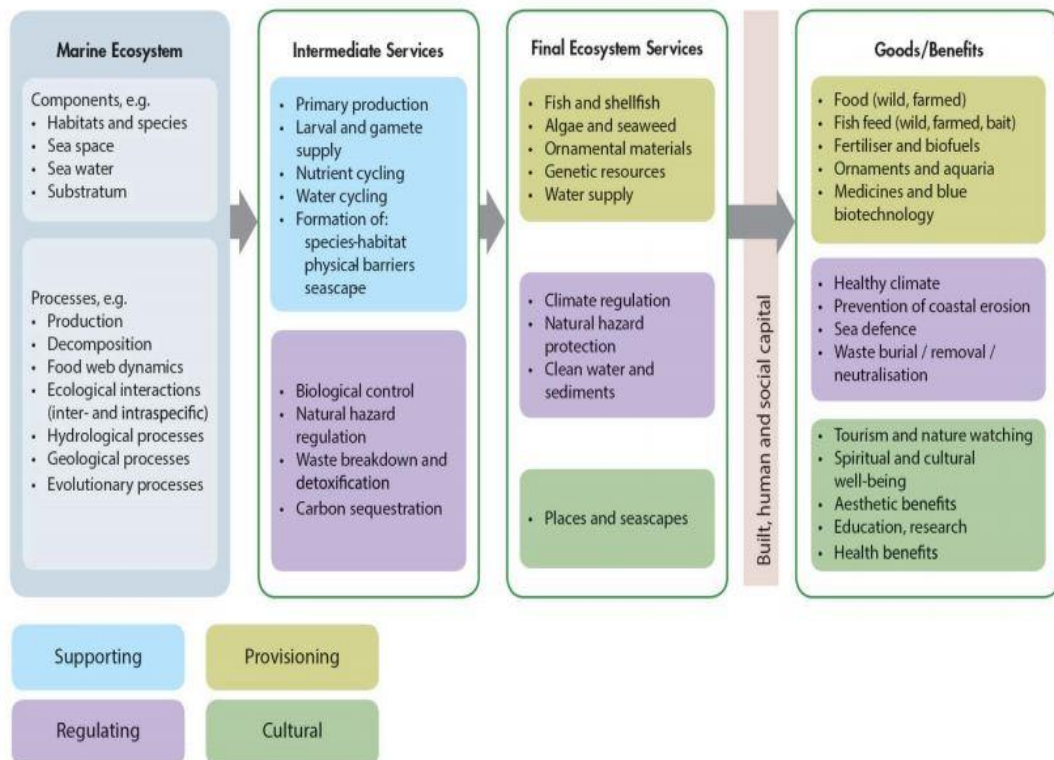
supporting services because these services support the provision of the other three service categories and therefore the supporting services assessment is integrated into the assessment of the other three service categories.

This ecosystem service assessment follows on from the outputs of the individual policy assessment and the in-combination policy assessment. The assessment is high level as detailed impacts are dependent on the outcome of individual decisions taken by regulators in relation to specific proposals. It is therefore not possible to provide quantitative analysis of how the policies will interact with ecosystem services and there is only opportunity for a qualitative comparison, based on assumptions about how and the extent to which the Marine Plan and Marine Plan policies will lead to changes in the marine environment. It is recognised that there is limited scientific understanding of the impact of human activity pressures on the levels of marine ecosystem services; there is also limited understanding of the monetary values for marine ecosystem services in Northern Ireland waters.

The assessment of the impact of the Marine Plan and Marine Plan policies on marine ecosystem services has therefore been largely based on expert judgement taking account of the following criteria:

- The scale of benefit that is currently derived from the ecosystem service in Northern Ireland, based on available evidence;
- The screened-in Marine Plan policies that are relevant to each marine ecosystem service; and,
- The extent to which the Marine Plan and Marine Plan policies are assessed as having a significant impact on SA topics compared to the baseline (continuation of existing policies but with no Marine Plan).





**Figure 3.1: The Classification of Ecosystem Services and Goods and Benefits for Coastal and Marine Ecosystems for the UK NEAFO (National Ecosystem Assessment Follow On)**

Using the methods proposed within Work Package Report 4 of the NEA, the goods/benefits associated with the Marine Plan in relation to Provisioning, Regulating and Cultural services have been assessed under the criteria proposed above. The assessment identifies the benefits or dis-benefits associated with the Marine Plan in relation to these criteria. One of the limitations of the framework is that the definitions of each sub-service overlap. An example of this is within the cultural service, where activities and services which promote or aid spiritual and cultural well-being may also have health benefits. The cost and scale of the benefit may not be directly attributed to spiritual and cultural well-being but instead the benefits may be indirect and less tangible. While these benefits cannot be readily categorised, they should not be ignored either.

In light of this perceived “double counting”, this assessment does not include supporting services, as the importance of these intermediate services is integrated into resulting goods and benefits. For example, without larval and gamete supply, there cannot be food but this service may be considered twice as part of supporting services and provisioning.

In this example, only provisioning has been considered as this is a good or benefit to humans.

In relation to the other sub-services (i.e. provisioning, regulating and cultural), statistics are not currently collected to identify a value for benefits but there is substantial anecdotal evidence to identify how the Marine Plan will interact with the marine ecosystem.

The main part of the ecosystem services assessment has been a qualitative description of the expected changes in the welfare associated with ecosystem services based on an assessment of changes to marine SA topics.

#### **3.4.4 A Statement on Cumulative and Transboundary Effects**

The assessment in Chapter 5 of this Plan provides commentary on cumulative and transboundary effects:

- Cumulative effects are those effects that could occur as a result of the Marine Plan together with the effects of other plans or programmes.
- Transboundary effects are effects that could occur in other jurisdictions as a result of the Marine Plan. The Northern Ireland marine area abuts the marine areas of Scotland, Wales, the Isle of Man and the Republic of Ireland.

#### **3.5 Assessment Criteria**

The SA assesses the likely significant effects of the Marine Plan (effects can be adverse or beneficial). For the purpose of this assessment the criteria set out in Table 3.4 below have been used to assess the significance of effects. The assessment has not attempted to differentiate between major, moderate or minor significance of effects as there is not sufficient information available to accurately determine any variation between these given the high level of the Marine Plan.

**Table 3.4: Assessment Criteria**

Effect	Assessment Criteria
<b>Significant Positive</b>	<p>The key factors influencing the potential for a significant positive effect to occur are likely to include:</p> <ul style="list-style-type: none"> <li>· Permanent, long term or irreversible improvement in baseline conditions;</li> <li>· Direct and indirect effects on baseline conditions of international or European importance; and,</li> <li>· Direct effect on baseline conditions of national importance.</li> </ul>
<b>Positive (Not Significant)</b>	<p>The key factors influencing the potential for positive (not significant) effect to occur are likely to include:</p> <ul style="list-style-type: none"> <li>· Temporary, short term or reversible improvement in quality of baseline conditions;</li> <li>· Indirect improvement on baseline conditions of national importance; and,</li> <li>· Direct improvement on baseline conditions that are not protected under international, European or national legislation.</li> </ul>
<b>Negligible</b>	<p>There is likely to be change in baseline conditions but the level of change/effect will be indiscernible from other influences. Negligible effects may be positive or negative.</p>
<b>No effect</b>	<p>There will be no change in baseline conditions as a result of the Marine Plan.</p>
<b>Adverse (Not Significant)</b>	<p>The key factors influencing the potential for a negative (not significant) effect to occur are likely to include:</p> <ul style="list-style-type: none"> <li>· Temporary, short term or reversible change in baseline conditions;</li> <li>· Indirect effect on baseline conditions of national importance; and,</li> <li>· Direct effect on baseline conditions that are not protected under international, European or national legislation but which are known to be sensitive to certain types of marine, coastal or intertidal proposals.</li> </ul>
<b>Significant Adverse</b>	<p>The key factors influencing the potential for a significant adverse effect to occur are likely to include:</p> <ul style="list-style-type: none"> <li>· Permanent, long term or irreversible change in baseline conditions;</li> <li>· Direct and indirect effects on baseline conditions of international or European importance; and,</li> <li>· Direct effect on baseline conditions of national importance.</li> </ul>

### 3.6 Assessment Assumptions

Within the Marine Plan, proposals are defined as: “Proposals include (but not restricted to) any plan, project, activity, use, development that requires a decision by a public authority”. Given the broad nature of this definition of a proposal, the assessment cannot be confined to activities which would result in an effect on the marine area, like activities which would require marine licensing.

The Marine Act (Northern Ireland) 2013 under Section 8 defines “decisions affected by a marine plan” as any of the following:

- 1) A public authority must have regard to any appropriate marine plan in taking any decision:
  - a. Which relates to the exercise of any function capable of affecting the whole or any part of the Northern Ireland inshore regions; but,
  - b. Which is not an authorisation or enforcement decision.
- 2) An “authorisation or enforcement decision” is any of the following:
  - (a) The determination of any application (whenever made) for authorisation of the doing of any act which affects or might affect the whole or any part of the Northern Ireland inshore region;
  - (b) Any decision relating to any conditions of such an authorisation;
  - (c) Any decision about extension, replacement, variation, revocation or withdrawal of any such authorisation or any such conditions (whenever granted or imposed);
  - (d) Any decision relating to the enforcement of any such authorisation or any such conditions; or,
  - (e) Any decision relating to the enforcement of any prohibition or restriction (whenever imposed) on the doing of any act, or of any act of any description, falling within paragraph (a).

This definition of “proposal” along with the legislative definition of “decision affected by a marine plan” would require the policies within the Marine Plan to be considered in relation to the following examples: decisions that relate to the zoning of land in the preparation of Local Development Plans; terrestrial planning decisions by local councils and the Department for Infrastructure; licensing decisions on renewable energy projects; environmental designations such as those for protected areas and heritage assets or use of publicly managed beaches for sporting or cultural activities which may result in an act that affects or might affect the whole or any part of the Northern Ireland marine area.

### **3.7 Approach to Mitigation**

The Marine Plan has been prepared following an ecosystem based approach and promotes the sustainable development of the Northern Ireland marine area. Measures to prevent or reduce any significant adverse effects have been built into both the core and

key activity policies of the Marine Plan. The conclusion of the assessment, presented in Chapter 5 below, is that the effects of the Marine Plan will be no higher than negligible. No further mitigation is therefore required.

## **4 Summary of Baseline Information**

### **4.1 Introduction**

This Chapter provides a summary of the baseline for each SA topic based on the information contained in Appendix C. Appendix C provides more detailed information for sub topics, key issues, problems and trends.

The baseline information contained in this report was collected in 2014 with further updates in 2015, 2016 and 2017 to mainly reflect the change in public administration in Northern Ireland and updates to ecological designations.

### **4.2 Biodiversity, Flora and Fauna**

The coastal and marine area in and around Northern Ireland is varied and supports a diverse range of flora and fauna. Intertidal habitats comprise muddy habitat on sheltered coasts and sea loughs, exposed and sheltered rocky shores, and sandy shingle and gravel shores. Subtidal habitats comprise sheltered mud occurring mainly in the sheltered sea loughs, subtidal sand habitats off the north coast, subtidal gravel and cobble habitat, and rocky habitat characterised by bedrock or boulders colonised by kelp beds.

The Northern Ireland marine area is home to approximately 100 species of regularly occurring marine fish. The southern region of the Northern Ireland marine area is a high intensity spawning area for plaice and cod, and low intensity spawning area for mackerel, sand eel, sole and whiting. The eastern and southern regions of the Northern Ireland marine area are high intensity nursery grounds for cod, herring and whiting and low intensity nursery grounds for mackerel, plaice, thornback ray and tope shark.

Twenty seven species of marine mammal have been recorded within the Northern Ireland marine area comprising 24 cetaceans, two seals and otter. The cetaceans and seals that either inhabit or migrate annually into the Northern Ireland marine area include Harbour Porpoise, Common Dolphin, Bottlenose Dolphin, Minke Whale, Grey Seal and Harbour Seal. Two species of turtles have been observed in the Northern Ireland marine area: Leatherback Turtles and Loggerhead Turtles, with leatherback being the most frequently observed.

The coastal habitats present a wide range of opportunities for bird populations. Use of the different habitats varies between seasons, as breeding, wintering, roosting and migration stopover sites.

The diversity of flora and fauna is recognised by the fact that a large proportion of the marine area is designated or proposed for designation for nature conservation interest under national, European and international legislation.

In addition to protected sites, there is a range of priority habitats that occur within the Northern Ireland marine area, including habitats that are listed in Annex I of the Habitats Directive and occur outside of European designated sites. There are also a number of protected species such as cetaceans (whales and dolphins), pinnipeds (seals) and cheloniids (turtles).

The baseline report has focussed on the protected sites and ecological features that occur within the Northern Ireland marine area. It is, however, recognised that protected sites and species also occur in adjacent UK devolved administration jurisdictions, the Isle of Man and in neighbouring Member States, namely the Republic of Ireland and therefore these sites and features could potentially also be affected by the Marine Plan.

### **4.3 Water and Soils**

Water generally moves from south to north from the Atlantic Ocean, although in the Irish Sea there are complex intermediate water movements. Flows are strongest in winter and spring but can be overwhelmed during periods of strong winds. Most regions of the Irish Sea are continuously mixed because tidal currents are strong. Tides propagate from the Atlantic Ocean, northwards through the Celtic Sea and southwards through the North Channel. Tidal fronts meet adjacent to the Isle of Man and these areas are characterised by weak peak tidal currents (OSPAR, 2000).

Northern Ireland has a greater variety of geology than any other area of similar size in Britain (NIEA and AFBI, 2011). Every geological system from the Precambrian to the Quaternary, apart from the Cambrian period, is represented, much of which is exposed along the coast (JNCC, 1997). The geology of the seabed is composed of outcrops of bedrock and glacial sediments that form relict seabed features. In the other areas, relatively thin mobile seabed sediments transit across a variety of thick relict sediments (BGS, 2005).

The coast of Northern Ireland is subject to a wide range of wave and tidal regimes, with the north coast being affected by Atlantic swells while the east coast is influenced by the more local wave climate generated in the Irish Sea (JNCC, 1997).

In terms of marine processes, there is a strong correlation between the distribution patterns of coarser sediments and the stronger mean peak spring tidal currents. This indicates that the stress put on the seabed by the tidal currents is a major influence on sediment composition. Net sand-transport pathways and directions in the Northern Ireland marine area are complex. There is a sand parting zone in the North Channel which separates the northern section of the Northern Ireland marine area, where the direction of sand transport is in a northerly direction, from the southern section of the Northern Ireland marine area, where the direction of sand transport is in a southerly direction. There is also a sand divergence zone between the North Channel and across the Irish Sea west of Anglesey.

Within the Northern Ireland marine area, sediment quality is generally good, which is due both to the absence of significant contamination sources and the energetic nature of the marine area. The underlying rocks of Northern Ireland tend to underpin the sediment chemical composition of the surface soils and coastal sediments. This is seen in areas dominated by the Antrim basalts which have elevated levels of metals such as nickel and chromium. Areas of historic military waste and dumping grounds (e.g. Beaufort's Dyke) in particular are likely to have elevated levels of sediment contamination and also pose an explosion risk as munitions start to corrode with time.

Waters within the Northern Ireland marine area are generally well mixed and deoxygenation is rare (OSPAR, 2000). However, the Western Irish Sea Front and Gyre have a tendency to retain particles, including nutrients, with implications for water quality. Direct inputs of contaminants in the Northern Ireland marine area consist mainly of industrial and municipal sources, which are resultant from the highly populated industrial centres of the North West of England, the Clyde and Belfast and also agricultural sources. Any contaminants in Northern Ireland's waters are, therefore, considerably diluted. Standards for water quality are regulated at EU level through a range of environmental directives, including the Water Framework Directive (WFD), Bathing Water Directive (BWD), Urban Waste Water Treatment Directive (UWWTD) and Marine Strategy Framework Directive (MSFD).

#### **4.4 Air Quality**

Air quality within the onshore Study Area for the Marine Plan is regulated by a designation framework which requires Northern Ireland's District Councils (DC) to designate Air Quality Management Areas (AQMAs). AQMAs are the result of degradations in air quality



standards against European quality standards. There is no such designation framework for marine air quality.

Areas and locations where there are air quality issues will have been identified through the AQMA designation and monitoring process. Given the nature of air quality issues, AQMAs are typically designated in urban areas, however within the rural area they may be designated as a result of high traffic flows. Newry, Mourne and Down DC, Belfast City Council, Antrim and Newtownabbey DC, Derry City and Strabane DC, Causeway Coast and Glens DC, and Mid and East Antrim DC all have a number of AQMAs which pollutants including Nitrogen Dioxide, Sulphur Dioxide, and Particulate matter (DAERA, 2016).

Pollutant Release and Transfer Registers (PRTRs) are inventories of pollution from industrial sites and other sources. A PRTR is a national environmental database or inventory of potentially hazardous chemical substances and/or pollutants released to air, water and soil and transferred off-site for treatment or disposal.

In Northern Ireland, PRTR information is collated on a county basis. Within the study area for the Marine Plan, data has been collected for the three counties which encompass the coast (Counties Down, Antrim and Londonderry). Information has been collated for emissions to air which contain chlorinated substances, greenhouse gases and “other” gases.

#### **4.5 Climate Factors**

Climate change is the result of emissions of greenhouse gases associated with the combustion of fossil fuels. Emission sources include agriculture and transport. In 2010, Northern Ireland had a 3.7% share of UK total net greenhouse gas emissions, and the trend since the base year has been a decline of 16.0% (Aether & Ricardo AEA, 2014). The largest sources of emissions in 2013 are agriculture (29%), transport and energy supply (both making up 18% each) and residential (13%). All sectors, except for transport, show a decreasing trend since the base year with the greatest decreases in emissions observed in the energy supply and waste sectors (decreasing by around 1.3 and 1.1 million tonnes respectively).

For Northern Ireland, the medium emissions scenario predictions are that there will be warmer, wetter winters and warmer, drier summers. Overall, average annual temperatures in Northern Ireland could increase by up to 3°C by 2080 and mean sea levels could rise by

between 9cm and 69cm (UKCP09). In the waters around Northern Ireland, the projected trends suggest a decrease in wave height to the North and no significant change in the Irish Sea.

Whilst flooding is regarded as a major hazard in the UK, to date Northern Ireland's experiences of coastal flooding have been infrequent and less severe compared to those in England and Wales (Dodds et al., 2010). Coastal erosion occurs along 20% of Northern Ireland's coastline (Masselink and Russell, 2010).

The first Climate Change Risk Assessment (CCRA) for Northern Ireland, published in 2012<sup>13</sup>, identified potential consequences of climate change along coastal areas, coastal waters and marine environments. The Adaptation Programme 2014-2019 contains the Government's response to the risks and opportunities identified in that CCRA. It provides the strategic objectives in relation to adaptation to climate change, the proposals and policies by which each department will meet these objectives, and the timescales associated with the proposals and policies identified.

UK legislation requires the UK to reduce Green House Gas (GHG) emissions by 80% by 2050. This contributes to the EU Energy and Climate Framework to reduce EU GHG emissions by 40% by 2030 and is the commitment made by the EU as its contribution towards the 2015 global Paris Agreement. The NI Executive has also approved the Strategic Energy Framework (DETI, 2010) which sets a target of 40% of Northern Ireland's electricity consumption to come from renewable resources and 12% with regard to renewable heat by 2020. Higher levels of renewable energy within the overall energy mix will increase the diversity and security of Northern Ireland's energy supply and reduce carbon emissions (DETI, 2010).

#### **4.6 Socio-Demographics**

Northern Ireland population at 30 June 2014 is estimated to be 1.840 million people (NISRA, 2015). Over the year mid-2013 to mid-2014, the number of people living in Northern Ireland increased by 10,800 people (0.6 per cent). This increase was due to:

- Natural growth of 9,800 people (24,200 births minus 14,300 deaths);
- Net growth of 1,600 people due to migration (24,400 people came to Northern Ireland to live and 22,800 people left Northern Ireland to live elsewhere); and,

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<sup>13</sup> A 2017 CCRA Evidence Report has since been published.

- Net loss of 600 people due to changes in Her Majesty's Forces.

The year mid-2013 to mid-2014 was the first year since the year ending mid 2010 that the number of people coming to live in Northern Ireland was greater than the number of people leaving. The number of people leaving Northern Ireland to live elsewhere was at its lowest level in five years, falling by 10.3 per cent between July 2013 and June 2014. Conversely, there was an increase in the number of people coming to Northern Ireland to live (5.5 per cent). This increase resulted in a net population gain of 1,600 people due to migration.

Spatial measures of deprivation have been used to inform policy and target areas of need in Northern Ireland since the 1970s. The Northern Ireland Multiple Deprivation Measure (NIMDM) report was published in 2010 before the council reform and the reduction of 26 councils to 11 councils. The next update on the NIMDM is due in mid-2017 and will reflect the new 11 councils. The following data provides statistics on the original 26 councils/local government districts (LGDs). In relation to deprivation in coastal LGDs, the top nine most deprived areas in Northern Ireland are within the Belfast LGD and number ten is in the Derry LGD (based on old council areas and not the revised boundaries from 2015). There are also pockets of deprivation in Strabane LGD. The majority of areas in the least deprived decile<sup>14</sup> are in the east of Northern Ireland.

The distribution of income deprivation is similar to the distribution of multiple deprivation in Northern Ireland with Belfast and Derry LGDs containing the majority of areas in the most deprived decile. Newry and Mourne, Strabane and Newtownabbey LGDs contain clusters of deprived areas. The least deprived areas are generally located in the east of Northern Ireland with the majority located in Ards, Belfast, Newtownabbey and North Down LGDs.

The distribution of employment deprivation is similar to the distribution of multiple deprivation in Northern Ireland with Belfast and Derry LGDs containing the majority of areas in the most deprived decile. Newry & Mourne, Newtownabbey and Strabane LGDs also contain clusters of the most deprived areas in Northern Ireland. The least deprived areas tend to be located in the east of Northern Ireland with a cluster of areas with low levels of deprivation evident in Coleraine LGD.

The distribution of health and disability deprivation is similar to the distribution of multiple deprivation. Belfast and Derry LGDs contain a large number of the areas in the most

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<sup>14</sup> Decile – one of the values of a variable that divides the distribution of the variable into ten groups having equal frequencies.

deprived decile. The least deprived areas tend to be in the east of Northern Ireland with clusters of low deprivation also visible the Coleraine LGD.

The education skills and training deprivation domain measure the extent of deprivation in education, skills and training at the small area level for both children and working age adults. The most deprived areas are located in Belfast and Derry LGDs. Belfast LGD contains clusters of areas in both the most and least deprived deciles in Northern Ireland. A large proportion of the remaining least deprived areas are located in the east of Northern Ireland, in Ards, Newtownabbey and North Down LGDs.

The distribution of proximity to services deprivation is unlike all of the other domains and captures an important aspect of deprivation. The highest concentrations of deprivation with respect to proximity to services occur outside of towns and cities. There are deprived areas on the outskirts of towns in Strabane, Down and Newry and Mourne LGDs. The least deprived areas are located in Belfast and Derry LGDs.

The highest concentrations of deprived areas are located in Belfast and Derry LGDs and in the north. Clusters of deprived areas exist in the Larne LGD. The least deprived areas are spread across most of Northern Ireland with particular clusters of areas with low levels of deprivation visible in the North Down LGD.

The crime and disorder domain measure the rate of crime and disorder, which include recorded crime, deliberate fires and incidents of anti-social behaviour. The most deprived areas are clustered in towns and cities while the least deprived areas are rural. The majority of areas in the most deprived decile are in Belfast LGD with clusters visible in large towns and cities. The least deprived areas are generally located away from towns and cities and involve many LGDs across all of Northern Ireland with the exception of the Greater Belfast area.

The Northern Ireland economy as a whole is considered to be over dependant on public sector employment. Key Performance Indicators are used to identify when, and how, rebalance in the local economy will continue. As the Key Performance Indicators are regional, they are applicable across the province, not just in coastal areas. The overall economic condition of Northern Ireland relates to and interacts with the programme for government, the RDS 2035 and the Sustainable Development Strategy.

## 4.7 Uses and Activities

A range of uses and activities occur in or adjacent to Northern Ireland's marine area including Commercial Fisheries; Aquaculture; Ports, Shipping, Navigation, Dredging and Disposal; Recreation and Tourism; Aviation; Military Activity; Coastal Defences; Noise; Lighting; and Marine Litter. The baseline information presented in this summary on these sub-topics was collected in 2014 and is considered sufficient for the purpose of assessing the effects of the Marine Plan at a strategic level. There are likely to be more up to date figures, however these will not affect the overall SA.

Commercial fishing is a historic and significant industry in Northern Ireland. It is based largely around the three east coast ports of Ardglass, Kilkeel and Portavogie, from which the majority of the fleet of vessels in excess of 10m length operate. Landings (by weight) are dominated by Nephrops, scallops and whitefish. In addition to Nephrops, the main species in terms of value of landings are crab, lobster and scallop.

There are 50 farms covering 57 sites licensed for the cultivation of shellfish. There is also one marine salmon farm operating from two licensed sites, one in Glenarm Bay and one in Red Bay.

Northern Ireland has a high dependence on its sea ports, providing gateways for trade with Ireland and Great Britain, as well as mainland Europe and the rest of the world. There are five commercial ports in Northern Ireland. These include the four public trust ports of Belfast, Coleraine, Londonderry and Warrenpoint, and one port in private ownership, Larne. Northern Ireland's commercial ports play a crucial economic role, handling some 95% of Northern Ireland's external trade (AFBINI, 2010).

Dredged material from port and navigation channel excavation and coastal engineering works constitutes the majority of material that is eligible for disposal at sea (Metoc, 2007)<sup>15</sup>. Dredged material derived from maintenance and capital dredging may only be licensed for disposal at sea if it can be demonstrated to be free of contamination (DAERA website)<sup>16</sup>.

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<sup>15</sup> Metoc (2007). Offshore Energy Strategic Environmental Assessment Programme. Technical Report on the other users of the SEA 8 Area. Report No. R1673, REV 1. Issued 29 May 2007. Available online at:

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/197019/SEA8\\_TechRep\\_OtherUsers.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/197019/SEA8_TechRep_OtherUsers.pdf)

<sup>16</sup> <https://www.daera-ni.gov.uk/articles/marine-licensing>

The practice of dumping sewage sludge is prohibited, but the disposal of fish waste can still be licensed if the risk to the environment and other users is considered to be within safe limits.

Marine and coastal recreational activities in Northern Ireland include sailing and boating, scuba diving, sea angling, walking, canoeing, surfing, bird watching, and visiting coastal attractions such as castles and archaeological features. It is difficult to capture the principal market value obtained from recreation and tourism because some activities, such as swimming, do not result in a marketable good or paid-for service. Although this sector is likely to have a high value of economic activity, uncovering the economic contribution is hampered by the number of activities, their wide distribution and the lack of centrally available statistics. Such issues also make it difficult to fully assess spatial pressures (Defra 2010).

In 2014, Belfast International Airport was the 12th busiest commercial airport in the UK with 4.0 million terminal passengers. This accounted for 2% of all UK terminal passengers. George Best Belfast City airport was the 17th busiest UK commercial airport with 2.6 million terminal passengers in 2014. Other airports with safety zones that overlap with the Northern Ireland marine area are the City of Derry and Newtownards Airports. The Northern Ireland marine area is within the range of Search and Rescue (SAR) helicopters, although there are no SAR helicopter bases in Northern Ireland.

Military activity occurs extensively throughout the Northern Ireland marine area, particularly by the Navy who use Practice and Exercise Areas for submarine, general surface fleet and aircraft exercises. There are no air force training areas within the Northern Ireland marine area. The UK Low Flying System (LFS) allows training within the whole of the UK airspace and surrounding seas, to 3nm, from the surface to 2,000 feet above the ground or mean sea level. Two weapons ranges are located in the Northern Ireland marine area, the Magilligan and Ballykinler ranges which are controlled by the Army.

Northern Ireland's coast is protected by both natural and man-made defences. In 2006, 68% (521km) were natural and 32% (243km) were man-made (DOE, 2011). The most common man-made structures are concrete sea walls which comprise 14% of the coastline followed closely by rock armour which comprises 12%. Currently no single public authority has lead responsibility for the effects of coastal erosion. Information on public or

private expenditure or employment resultant from coastal management activities is not readily available.

Noise mapping has been undertaken as set out in the Environmental Noise Regulations (Northern Ireland) 2006 for all agglomerations with more than 100,000 inhabitants. As part of the Belfast agglomeration, Belfast Harbour is included because the harbour site contains approximately 117 individual industrial sites. In 2013, Belfast Harbour did not receive any noise nuisance complaints. In relation to the activities within the Northern Ireland marine area, it is expected that terrestrial noise will be relevant to marine activities which interact with ports (either fishing or freight).

Lighting in the marine and terrestrial environment poses a potential nuisance to people, and disturbance to species of conservation interest.

Marine litter consists of items arising from human activity, deliberately discarded or unintentionally lost, which end up in the sea and on beaches. Keep Northern Ireland Beautiful undertook the first systematic survey of litter on the coastline of Northern Ireland during the period September 2012 to April 2013. The average number of pieces of litter observed per kilometre surveyed was 4,033. Beaches adjacent to fishing harbours surveyed had a much higher average of 9,545 items/km. DAERA has carried out surveys of identified bathing beaches throughout the bathing season which runs from 1st June through to the 15th September since 1999. Over that time, an average of 8,198 items has been recorded annually, 42% of which was packaging and 39% was plastic.

#### **4.8 Material Assets**

Material Assets in Northern Ireland encompass a range of existing and proposed infrastructure pressures within the coastal and marine area. These include Cables and Pipelines; Terrestrial Transport Network; Aggregates; Underground Offshore Energy Storage; Petroleum Exploration Licensing; Offshore Renewable Energy; Carbon Capture and Storage; Compressed Air Energy Storage; and, Waste Water Treatment and Industrial Discharges.

A number of telecommunications cables in the Northern Ireland marine area form an integral part of Northern Ireland's communications network, linking Northern Ireland with the USA, the UK and the Isle of Man.

There are three major sub-sea electricity interconnectors in the Northern Ireland marine area:

- The Rathlin interconnector connects Rathlin Island to the island of Ireland electricity grid;
- The Moyle interconnector links Great Britain and the island of Ireland grids across the North Channel; and,
- The Western Link traverses the Northern Ireland marine area (but does not make landfall in Northern Ireland) and provides a High Voltage Direct Current connection from Scotland to Wales.

There are three major gas pipelines within the Northern Ireland marine area. The Scotland to Northern Ireland natural gas transmission Pipeline (SNIP) operated by Premier Transmission Ltd runs from Corsewall Point in Scotland to Larne in Northern Ireland across the North Channel. In addition, two pipelines cross the offshore Northern Ireland marine area and connect Scotland to the Republic of Ireland. There is also a pipeline known as the Belfast pipe-line which traverses both Belfast and Larne Loughs.

Ensuring a Sustainable Transport Future (DRD, 2011)<sup>17</sup> identifies strategic aims and associated objectives. The higher aims are:

- Support the growth of the economy;
- Enhance the quality of life for all; and,
- Reduce the environmental impact of transport.

The Crown Estate (TCE) has identified potential aggregate resource areas within the Northern Ireland marine area (fine aggregates/fine sands). However, there is no publically available information on the economic viability of the resources identified. There are no licensed aggregate extraction sites in the Northern Ireland marine area (TCE 2014) and there are also no landings of sand and gravel dredged from the UK Continental Shelf into Northern Ireland (TEC 2014).

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<sup>17</sup> DRD (2011). Ensuring a Sustainable Transport Future: a New Approach to Regional Transportation. Date published 23 June 2011. Available online at: <https://www.infrastructure-ni.gov.uk/publications/ensuring-sustainable-transport-future-new-approach-regional-transportation>



In October 2012, the landward development of a subsea natural gas storage facility in Islandmagee was given planning permission. The facility is still subject to a marine licence determination, Water Order consent and a seawater abstraction licence.

In the 27th Offshore Licensing Round, DECC awarded a licence covering five blocks in the North Channel. At present, there are currently no licensed blocks for oil and gas explorations or production, although blocks could be licensed within the lifetime of the Marine Plan.

SeaGen, the world's first commercial scale grid connected demonstration tidal stream turbine generator was installed at Strangford Lough in 2008. Decommissioning of this test facility began in June 2016. Strangford Lough also hosts a pilot quarter scale kite design prototype, operated by Minesto.

Following the completion of a Strategic Environmental Assessment (SEA) of the draft Offshore Renewable Energy Strategic Action Plan, The Crown Estate opened the first Northern Ireland offshore renewable energy leasing round and, in October 2012, announced development rights for offshore renewable energy sites. These include:

- Tidal Ventures Limited, which is a joint venture between OpenHydro Group and Bord Gais Energy for a potential 100MW tidal opportunity at Torr Head. This proposal has recently obtained a marine licence; and,
- DP Marine Energy Limited with DEME Blue Energy for a further potential 100MW tidal stream energy project off Fair Head. This proposal is under consideration for a marine licence.

The technical and economic viability of Carbon Capture and Storage (CCS) has still to be fully demonstrated at a commercial scale in the UK.

There is potential for subsurface energy storage facilities within the thick salt beds beneath the onshore area around Larne Lough and Islandmagee. Compressed Air Energy Storage (CAES) can be used to help balance energy security of supply and demand by storing surplus energy generated from wind or other time-variable energy sources, which can then be made available at times of higher demand. This project is currently under consideration for both a marine licence and planning permission.

There has been a positive trend in compliance of water utility sector Waste Water Treatment Works (WwTWs) between 2007 and 2012. In 2007 Northern Ireland Water

(NIW) compliance was assessed against numeric standards set for discharges from 244 WwTWs, serving a population equivalent (PE) greater than 249. Numeric compliance was also assessed in 2009 for WwTWs operated under Public Private Partnership (PPP) contracts. The overall compliance of WwTWs has risen from 84% in 2007 to 93% in 2012. Numeric compliance was also assessed against the requirements of the Urban Waste Water Treatment Regulations (Northern Ireland) 2007 for the 79 WwTWs that qualified under the Regulations in 2012. Overall compliance has consistently improved since 2007 and now stands at 98%.

As a result of consolidation of WwTW by NIW at Glenarm, Ballystrudder, Portballintrae and Whitehead, the number of WwTW with descriptive consents (Coastal) has reduced from 22 to 18 and the level compliance has increased from 84% in 2007 to 93% in 2012. WwTW discharging into these areas, with a population equivalent greater than 10,000, are required to have nutrient reduction, or another form of further treatment, in place within seven years of identification under the Urban Waste Water Treatment Regulations (Northern Ireland) 2007. In Northern Ireland one agglomeration greater than 10,000, (Ballycastle) that discharges to coastal waters is currently without secondary treatment, however upgrading works are currently in progress.

#### **4.9 Cultural Heritage**

Northern Ireland's archaeological record spans the last 9,000 years. In the context of the SA, it encompasses cultural heritage assets both with a terrestrial and marine context.

In Northern Ireland, protection of cultural heritage assets is facilitated by the Historic Monuments and Archaeological Objects 1995 Order (HMAO) and its powers can be extended to the seabed, out to 12nm. Wrecks below the high water mark (HWM) may also be protected under The Protection of Wrecks Act 1973. The number of features within 30km inland of the coast and within the Northern Ireland marine area includes:

- Monuments in State Care: 71 in State Care, 58 in State Care and Scheduled and 5 in State Care with proposed scheduling;
- Scheduled Historic Monuments: 1129;
- Listed Buildings: 8997;
- Parks, Gardens and Demesnes: 112 registered, 61 supplementary list;
- Sites and Monuments Record: 10,000 on record, 13 Descheduled, 12 Listed, 6 Proposed for scheduling; and,

- Wrecks: ~300 known shipwrecks.

#### 4.10 Landscape and Seascape

There are 31 landscape character areas (LCAs) out of a total of 130 that have a coastal element. They are listed as follows:

32 Derry Slopes	84 Mourne Foothills	114 Three and Six Mile Water Valleys
33 Lough Foyle Alluvial Plain	85 Newcastle Valleys	119 Ballycastle Glens
35 Magailligan Lowlands	86 Tyrella Coastal Dunes	120 Fair Head
36 Binevenagh	92 Quoile Valley Lowlands	121 Moyle Glens
38 Eastern Binevenagh Slopes	93 Portaferry and North Lecale	123 Larne Glens
54 Coleraine Farmland	94 Strangford Drumlins and Islands	126 Larne Coast
57 Causeway Coast and Rathlin Island	97 Belfast/Lisburn	127 Larne Ridgeland
69 Newry Basin	99 Outer Ards Coast	128 Islandmagee
73 Kilkeel Coast	100 Ards Farmlands and Estates	129 Carrickfergus Shoreline
74 The Kingdom of Mourne	101 Scrabo	
75 Mourne Mountains	103 Bangor Coastline	

The Giants Causeway and Causeway Coast is designated as a World Heritage Site by the United National, Educational, Scientific and Cultural Organisation (UNESCO). The site is of international importance because it represents major stages of the Earth's geological development and occupies approximately 230 hectares of land, shore and sea.

Northern Ireland has nine AONBs designated for their distinctive landscape character and high scenic value, with two other potential AONBs identified. Nearly 20% of the total area of Northern Ireland is covered by AONBs, which is equal to almost 300,000 hectares across various parts of the region.

In addition to LCAs, Seascape Character Areas (SCAs) have also been described, and like landscape, the character area is described in terms of its key characteristics, condition and sensitivity to change. They are listed as follows:

1 Foyle Estuary	9 Northern Glens Coast*	18 Dundrum Bay*
2 Lough Foyle*	10 Southern Glens Coast*	19 Mourne Coast*
3 North Coast Strand and Dunes*	11 The Gobbins	20 Carlingford Lough*
4 The Skerries and Dunluce Castle*	12 Larne Lough	21 Newry Estuary*
5 Causeway Coast*	13 Belfast Lough	22 Atlantic
6 Ballycastle Coast*	14 Belfast Harbour	23 North Channel
7 Rathlin*	15 Ards Peninsula*	24 Irish Sea (South Down)
8 Torr Head Coast*	16 Strangford Lough*	
	17 Lecale Coast*	

\*Of the 24 SCAs, there are 16 bound AONBs and these are highlighted with an asterisk above.

## 5 Results of Sustainability Appraisal

### 5.1 Introduction

This chapter provides the results of the sustainability appraisal and includes:

- An individual assessment of the effects of each Core and Key Activity policy in the Marine Plan;
- An assessment of the effects of all screened-in policies (in-combination) for each of the SA topics;
- An ecosystem services assessment of all screened-in policies; and,
- A statement of cumulative and transboundary effects.

Detailed assessment tables are provided in Appendix D.

### 5.2 Individual Policy Assessment

This section provides an assessment of the individual core and activity policies in the Marine Plan. As described in Section 3.4 above, a two stage approach was undertaken, as follows:

**Stage 1:** The review of the Plan's policies against existing policies is set out in Appendix D1 and summarised in Table 5.1 below. Thirteen policies were identified as providing minor augmentations to existing policy and were taken forward for further assessment in Stage 2.

**Stage 2:** The results of the individual policy assessment is provided in Appendix D2 and summarised in Table 5.2 below.

For all assessed policies the results are either that no effect will occur, typically because the subject the policy covers will not have an influence on baseline conditions (e.g. marine litter does not influence the baseline conditions of local air quality) or that the effect will be negligible. Negligible effects are where the change in baseline conditions will be indiscernible from other influences such as other policies or legislation, economic conditions or natural changes.

Several SA topics consist of numerous subtopics and more than one assessment score has been assigned where relevant e.g. the aquaculture policy is predicted to have negligible effects on all uses and activities with the exception of the subtopic aviation where no effect will occur.

**Table 5.1: Summary Review of Individual Plan Policies against Existing Policy**

<b>Plan Policy</b>	<b>Outcome of review</b>
Presumption in favour of sustainable development	No change
<b>Stakeholder Engagement</b>	<b>Minor</b>
Air Quality	No change
Climate Change	No change
Climate Change <i>Climate Change Mitigation</i>	No change
Climate Change <i>Climate Change Adaptation</i>	No change
Coastal Processes	No change
Coastal Processes <i>Resilience to Coastal Processes</i>	No change
<b>Co-existence</b>	<b>Minor</b>
Cumulative Impacts	No change
Natural Heritage <i>International and National Designated Sites and Protected Species</i>	No change
Natural Heritage <i>Other Habitats, Species or Features of Importance</i>	No change
Heritage Assets	No change
Heritage Assets <i>Designated Heritage Assets</i>	No change
Heritage Assets <i>Undesignated Heritage Assets</i>	No change
<b>Invasive Alien Species</b>	<b>Minor</b>
<b>Land and Sea Interaction</b>	<b>Minor</b>
<b>Marine Litter</b>	<b>Minor</b>
<b>Marine Noise</b>	<b>Minor</b>
<b>Seascape</b>	<b>Minor</b>
<b>Use of Evidence</b>	<b>Minor</b>
Water Quality	No change
<b>Aquaculture</b>	<b>Minor</b>
<b>Commercial Fishing</b>	<b>Minor</b>
Defence and National Security	No change
<b>Dredging</b>	<b>Minor</b>
Energy	No change
Marine Aggregates	No change
Ports, Harbours and Shipping <i>Proposals with the potential to impact on navigational safety</i>	No change
<b>Ports, Harbours and Shipping <i>Proposals with the potential to impact on</i></b>	<b>Minor</b>

<b>Plan Policy</b>	<b>Outcome of review</b>
<b><i>shipping</i></b>	
Ports, Harbours and Shipping <i>Ports and Harbours</i>	No change
<b>Telecommunications Cabling</b>	<b>Minor</b>
Tourism and Recreation	No change



**Table 5.2: Summary of Assessment of Screened-in Policies** (for all other Marine Plan policies there would be no effect as determined in Stage 1)

Plan Policy	Biodiversity, Flora and Fauna	Water and Soils	Air Quality	Climate Factors	Socio-Demographics	Uses and Activities	Material Assets	Cultural Heritage	Landscape and Seascape
Stakeholder Engagement	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Co-existence	Negligible	Negligible	Negligible	No effect	Negligible	Negligible	Negligible	Negligible	Negligible
Invasive Alien Species	Negligible	Negligible/ No effect	No effect	No effect	Negligible	Negligible/ No effect	Negligible	No effect	No effect
Land and Sea Interaction	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Marine Litter	Negligible	Negligible/ No effect	No effect	No effect	No effect	Negligible/ No effect	Negligible	Negligible	Negligible
Marine Noise	Negligible	No effect	No effect	No effect	Negligible	Negligible/ No effect	Negligible	No effect	Negligible
Seascape	Negligible	Negligible	No effect	No effect	Negligible	Negligible/ No effect	Negligible	Negligible	Negligible
Use of Evidence	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Aquaculture	Negligible	Negligible	No effect	No effect	Negligible	Negligible/ No effect	Negligible	Negligible	Negligible
Commercial Fishing	Negligible	Negligible	No effect	No effect	Negligible	Negligible/ No effect	Negligible	No effect	No effect
Dredging	Negligible	Negligible	No effect	Negligible	No effect	Negligible/ No effect	Negligible/ No effect	Negligible	No effect

<b>Plan Policy</b>	<b>Biodiversity, Flora and Fauna</b>	<b>Water and Soils</b>	<b>Air Quality</b>	<b>Climate Factors</b>	<b>Socio-Demographics</b>	<b>Uses and Activities</b>	<b>Material Assets</b>	<b>Cultural Heritage</b>	<b>Landscape and Seascape</b>
Ports, Harbours and Shipping	Negligible	Negligible	No effect	Negligible	Negligible	Negligible/ No effect	Negligible/ No effect	No effect	No effect
Telecommunications Cabling	Negligible	Negligible	No effect	No effect	Negligible	Negligible/ No effect	Negligible/ No effect	Negligible	Negligible

### **5.3 In Combination Policy Assessment**

The tables below provide an assessment for each SA topic against all screened-in policies in the Marine Plan. Detailed assessments of the screened-in policies can be found in Appendix D2. Each of the tables below summarises:

- The policies in the Marine Plan where an effect of negligible or greater has been assessed based on the individual policy assessment presented above;
- An overall assessment grading the effect on the SA topic; and,
- The effect on the SA topic and the reasons for the overall assessed score.

The SA covers environmental, social and economic issues. For the purpose of this assessment; environmental issues are represented by the SEA topics, social issues are further represented under socio-demographics, and economic issues are represented under socio-demographics, uses and activities and material assets.

For all SA topics the overall effect of the Marine Plan is predicted to be negligible.

**Table 5.3: Biodiversity, Flora and Fauna**

<b>Policies with potential effects</b>	<b>Predicted Effect</b>	<b>In-combination Assessment</b>
Stakeholder Engagement	Negligible	<p>For all assessed policies the effect on biodiversity, flora and fauna is predicted to be negligible. Policies in the Marine Plan reflect existing commitments and decision making processes. Policies also require that proposals avoid, minimise and/or mitigate potential adverse impacts.</p> <p>Presenting the policies (including any specific provisions) in a written form may help to ensure that due consideration is given to biodiversity, flora and fauna, in the concept, planning and design of proposals and in decision making processes. This may help prevent or reduce any potential adverse impact on biodiversity, flora and fauna.</p> <p>The policies clarify the evidence requirements of decision making processes. This may lead to more effective and efficient decision making, thus reducing the risk of uncertainty and increasing the potential for a positive outcome.</p> <p>Key activity policies that include additional spatial guidance/direction will also help limit any potential adverse impact on biodiversity, flora and fauna.</p> <p>In addition, the Marine Mapviewer presents for the first time marine related data, covering a wide range of topics, uses and activities in a publicly accessible web-based form for the Northern Ireland marine area. This will improve access to up-to-date evidence relating to, or affected by, biodiversity flora and fauna and may improve the concept, planning and design of proposals and decision making processes.</p> <p>Overall, the change in baseline conditions for biodiversity, flora and fauna as a result of the Marine Plan will be negligible.</p>
Co-existence	Negligible	
Invasive Alien Species	Negligible	
Land and Sea Interaction	Negligible	
Marine Litter	Negligible	
Marine Noise	Negligible	
Seascape	Negligible	
Use of Evidence	Negligible	
Aquaculture	Negligible	
Commercial Fishing	Negligible	
Dredging	Negligible	
Ports, Harbours and Shipping	Negligible	
Telecommunications Cabling	Negligible	
<b>Overall assessment</b>	<b>Negligible</b>	

**Table 5.4: Water and Soils**

<b>Policies with potential effects</b>	<b>Predicted Effect</b>	<b>In-combination Assessment</b>
Stakeholder Engagement	Negligible	For all assessed policies the effect on water and soils is predicted to be negligible. Policies in the plan reflect existing commitments and decision making processes. Policies also require that proposals avoid, minimise and/or mitigate potential adverse impacts.
Co-existence	Negligible	
Invasive Alien Species	Negligible	
Land and Sea Interaction	Negligible	Presenting the policies (including any specific provisions) in a written form may help to ensure that due consideration is given to water and soils, in the concept, planning and design of proposals and in decision making processes. This may help prevent or reduce any potential adverse impact on water and soils.
Marine Litter	Negligible/ no effect	
Seascape	Negligible	The policies clarify the evidence requirements of decision making processes. This may lead to more effective and efficient decision making, thus reducing the risk of uncertainty and increasing the potential for a positive outcome.
Use of Evidence	Negligible	
Aquaculture	Negligible	Key activity policies that include additional spatial guidance/direction will also help limit any potential adverse impact on water and soils.
Commercial Fishing	Negligible	
Dredging	Negligible	
Ports, Harbours and Shipping	Negligible	In addition, the Marine Mapviewer presents for the first time marine related data, covering a wide range of topics, uses and activities, in a publicly accessible web-based form for the Northern Ireland marine area. This will also improve access to up-to-date evidence relating to, or affected by, water and soils and may improve the concept, planning and design of proposals and decision making processes. Overall, the change in baseline conditions for water and soils as a result of the Marine Plan will be negligible.
Telecommunications Cabling	Negligible	
<b>Overall assessment</b>	<b>Negligible</b>	

**Table 5:5 Air Quality**

<b>Policies with potential effects</b>	<b>Predicted Effect</b>	<b>in-combination Assessment</b>
Stakeholder Engagement	Negligible	<p>For all assessed policies the effect on air quality is predicted to be negligible or no effect. Policies in the Marine Plan reflect existing commitments and decision making processes. Policies also require that proposals avoid, minimise and/or mitigate potential adverse impacts.</p> <p>Presenting the policies may help to ensure that due consideration is given to air quality, in the concept, planning and design of proposals and in decision making processes. This may help prevent or reduce any potential adverse impact on air quality.</p> <p>Key activity policies that include additional spatial guidance/direction will also help limit any potential adverse impact on air quality.</p> <p>In addition, the Marine Mapviewer presents for the first time marine related data, covering a wide range of topics, uses and activities, in a publicly accessible web-based form for the Northern Ireland marine area. This will also improve access to up-to-date evidence relating to air quality and may improve the concept, planning and design of proposals and decision making processes.</p>
Co-existence	Negligible	
Land and Sea Interaction	Negligible	
Use of Evidence	Negligible	
<b>Overall assessment</b>	<b>Negligible</b>	Overall, the change in baseline conditions for air quality as a result of the Marine Plan will be negligible.

**Table 5.6 Climate Factors**

<b>Policies with potential effects</b>	<b>Predicted Effect</b>	<b>In-combination Assessment</b>
Stakeholder Engagement	Negligible	For all assessed policies the effect on climate factors is predicted to be negligible or no effect. Policies in the Marine Plan reflect existing commitments and decision making processes. Policies also require that proposals avoid, minimise and/or mitigate potential adverse impacts.  Presenting the policies in a written form may help to ensure that due consideration is given to climate factors, in the concept, planning and design of proposals and in decision making processes. This may help reduce greenhouse gas emissions and/or prevent or reduce any other potential adverse impact on climate factors.  Key activity policies that include additional spatial guidance/direction could reduce the potential for limiting travel distances and reduce the potential for disruption to areas of intense shipping activity and therefore limit any potential to increase vessel emissions.  In addition the Marine Mapviewer presents for the first time marine related data, covering a wide range of topics, uses and activities, in a publicly accessible web-based form for the Northern Ireland marine area. This will also improve access to up-to-date evidence relating to climate factors and may improve the concept, planning and design of proposals and decision making processes.  Overall, the change in baseline conditions for climate factors as a result of the Plan will be negligible.
Land and Sea Interaction	Negligible	
Use of Evidence	Negligible	
Dredging	Negligible	
Ports, Harbours and Shipping	Negligible	
<b>Overall assessment</b>	<b>Negligible</b>	

**Table 5.7: Socio Demographics**

<b>Policies with potential effects</b>	<b>Predicted Effect</b>	<b>In-combination Assessment</b>
Stakeholder Engagement	Negligible	For all assessed policies the effect on socio-demographics is predicted to be negligible. Policies in the Marine Plan reflect existing commitments and decision making processes. Policies also require that proposals avoid, minimise and/or mitigate potential adverse impacts.
Co-existence	Negligible	
Invasive Alien Species	Negligible	
Land and Sea Interaction	Negligible	Presenting the policies (including any specific provisions) in a written form may help to ensure that due consideration is given to socio-demographics, in the concept, planning and design of proposals and in decision making processes. This may help prevent or reduce any other potential adverse impact on socio-demographics.
Marine Noise	Negligible	
Seascape	Negligible	
Use of Evidence	Negligible	Key activity policies that include additional spatial guidance/direction may concentrate employment opportunities in areas where uses are already established, ensure the continuity of routes and services and will also help limit any potential adverse impact on socio demographics.
Aquaculture	Negligible	
Commercial Fishing	Negligible	
Ports, Harbours and Shipping	Negligible	In addition, the Marine Mapviewer presents for the first time marine related data, covering a wide range of topics, uses and activities, in a publicly accessible web-based form for the Northern Ireland marine area. This will improve access to up-to-date evidence relating to, or affected by, socio-demographics and may improve the concept, planning and design of proposals and decision making processes.
Telecommunications Cabling	Negligible	
<b>Overall assessment</b>	<b>Negligible</b>	Overall, the change in baseline conditions for socio-demographics as a result of the Marine Plan will be negligible.



**Table 5.8: Uses and Activities**

<b>Policies with potential effects</b>	<b>Predicted Effect</b>	<b>In-combination Assessment</b>
Stakeholder Engagement	Negligible	<p>For all assessed policies the effect on uses and activities is predicted to be negligible. Policies in the Marine Plan reflect existing commitments and decision making processes. Policies also require that proposals avoid, minimise and/or mitigate potential adverse impacts.</p> <p>Presenting the policies (including any specific provisions) in a written form may therefore help to ensure that due consideration is given to uses and activities, in the concept, planning and design of proposals and in decision making processes. This may help prevent or reduce any potential adverse impact on uses and activities and provide opportunities for synergies.</p> <p>The policies clarify the evidence requirements of decision making processes. This may lead to more effective and efficient decision making, thus reducing the risk of uncertainty and increasing the potential for a positive outcome.</p> <p>Key activity policies that include additional spatial guidance/direction will also help limit any potential adverse impact on uses and activities</p> <p>In addition, the Marine Mapviewer presents for the first time marine related data, covering a wide range of topics, uses and activities, in a publicly accessible web-based form for the Northern Ireland marine area. This will improve access to up-to-date evidence relating to, or affected by, uses and activities and may improve the concept, planning and design of proposals and decision making processes.</p> <p>Overall, the change in baseline conditions for uses and activities as a result of the Marine Plan will be negligible.</p>
Co-existence	Negligible	
Invasive Alien Species	Negligible/No effect	
Land and Sea Interaction	Negligible	
Marine Litter	Negligible/No effect	
Marine Noise	Negligible/No effect	
Seascape	Negligible/No effect	
Use of Evidence	Negligible	
Aquaculture	Negligible/No effect	
Commercial Fishing	Negligible/No effect	
Dredging	Negligible/No effect	
Ports, Harbours and Shipping	Negligible/No effect	
Telecommunications Cabling	Negligible/No effect	
<b>Overall assessment</b>	<b>Negligible</b>	

**Table 5.9: Material Assets**

<b>Policies with potential effects</b>	<b>Predicted Effect</b>	<b>In-combination Assessment</b>
Stakeholder Engagement	Negligible	<p>For all assessed policies the effect on material assets is predicted to be negligible or no effect. Policies in the Marine Plan reflect existing commitments and decision making processes. Policies also require that proposals avoid, minimise and/or mitigate potential adverse impacts.</p> <p>Presenting the policies (including any specific provisions) in a written form may help to ensure that due consideration is given to material assets, in the concept, planning and design of proposals and in decision making processes. This may help prevent or reduce any potential adverse impact on uses and activities and provide opportunities for synergies.</p> <p>The policies clarify the evidence requirements of decision making processes. This may lead to more effective and efficient decision making, thus reducing the risk of uncertainty and increasing the potential for a positive outcome.</p> <p>Key activity policies that include additional spatial guidance/direction will also help limit any potential adverse impact on material assets.</p> <p>In addition, the Marine Mapviewer presents for the first time marine related data, covering a wide range of topics, uses, activities and material assets, in a publicly accessible web-based form for the Northern Ireland marine area. This will improve access to up-to-date evidence relating to, or affected by, material assets and may improve the concept, planning and design of proposals and decision making processes.</p> <p>Overall, the change in baseline conditions material assets as a result of the Marine Plan will be negligible.</p>
Co-existence	Negligible	
Invasive Alien Species	Negligible	
Land and Sea Interaction	Negligible	
Marine Litter	Negligible	
Marine Noise	Negligible	
Seascape	Negligible	
Use of Evidence	Negligible	
Aquaculture	Negligible	
Commercial Fishing	Negligible	
Dredging	Negligible/No effect	
Ports, Harbours and Shipping	Negligible/No effect	
Telecommunications Cabling	Negligible/No effect	
<b>Overall assessment</b>	<b>Negligible</b>	

**Table 5.10: Cultural Heritage**

<b>Policies with potential effects</b>	<b>Predicted Effect</b>	<b>In-combination Assessment</b>
Stakeholder Engagement	Negligible	<p>For all assessed policies the effect on cultural heritage is predicted to be negligible. Policies in the Marine Plan reflect existing commitments and decision making processes. Policies also require that proposals avoid, minimise and/or mitigate potential adverse impacts.</p> <p>Presenting the policies (including any specific provisions) in a written form may help to ensure that due consideration is given to cultural heritage, in the concept, planning and design of proposals and in decision making processes. This may help prevent or reduce any potential adverse impact on cultural heritage.</p> <p>The policies clarify the evidence requirements of decision making processes. This may lead to more effective and efficient decision making, thus reducing the risk of uncertainty and increasing the potential for a positive outcome.</p> <p>Key activity policies that include additional spatial guidance/direction will also help limit any potential adverse impact on cultural heritage.</p> <p>In addition, the Marine Mapviewer presents for the first time marine related data, covering a wide range of topics, uses and activities, in a publicly accessible web-based form for the Northern Ireland marine area. This will improve access to up-to-date evidence relating to, or affected by, cultural heritage and may improve the concept, planning and design of proposals and decision making processes.</p> <p>Overall, the change in baseline conditions for cultural heritage as a result of the Marine Plan will be negligible.</p>
Co-existence	Negligible	
Land and Sea Interaction	Negligible	
Marine Litter	Negligible	
Seascape	Negligible	
Use of Evidence	Negligible	
Aquaculture	Negligible	
Dredging	Negligible	
Telecommunications Cabling	Negligible	
<b>Overall assessment</b>	<b>Negligible</b>	

**Table 5.11: Landscape and Seascape**

<b>Policies with potential effects</b>	<b>Predicted Effect</b>	<b>In-combination Assessment</b>
Stakeholder Engagement	Negligible	<p>For all assessed policies the effect on landscape and seascape is predicted to be negligible. Policies in the Marine Plan reflect existing commitments and decision making processes. Policies also require that proposals avoid, minimise and/or mitigate potential adverse impacts.</p> <p>Presenting the policies (including any specific provisions) in a written form may help to ensure that due consideration is given to landscape and seascape, in the concept, planning and design of proposals and in decision making processes. This may help prevent or reduce any potential adverse impact on landscape and seascape.</p> <p>Key activity policies that include additional spatial guidance/direction will also help limit any potential adverse impact on landscape and seascape.</p> <p>In addition, the Marine Mapviewer presents for the first time marine related data, covering a wide range of topics, uses and activities, in a publicly accessible web-based form for the Northern Ireland marine area. This will also improve access to up-to-date evidence relating to landscape and seascape and may improve the concept, planning and design of proposals and decision making processes.</p> <p>Overall, the change in baseline conditions for landscape and seascape as a result of the Marine Plan will be negligible.</p>
Co-existence	Negligible	
Land and Sea Interaction	Negligible	
Marine Litter	Negligible	
Marine Noise	Negligible	
Seascape	Negligible	
Use of Evidence	Negligible	
Aquaculture	Negligible	
Telecommunications Cabling	Negligible	
<b>Overall assessment</b>	<b>Negligible</b>	

## **5.4 Ecosystem Services Assessment**

Following the methodology outlined in section 3.4.3, the results of the ecosystems services assessment is presented in Table 5.12 below. The assessment identifies likely changes in the levels of marine ecosystem services specifically associated with the implementation of the Marine Plan compared to the baseline of not having a plan. As the Marine Plan will reinforce existing policies and decision making processes (which would continue in the absence of a Marine Plan), the impacts on the level of marine ecosystem services relative to the baseline are considered to be negligible.

## **5.5 Cumulative and Transboundary Effects**

Cumulative effects are those effects that could occur as a result of the Marine Plan together with the effects of other plans or programmes. As explained in Section 2.2 Policy Context, the Marine Plan supports, complements, or otherwise takes into account a wide range of existing plans, policies and strategies. This is demonstrated in Section 5.2 (and Appendix D1) which shows that the Marine Plan's policies reflect existing commitments, and where there are differences these are minor augmentations to existing policy. The Marine Plan will therefore not result in any cumulative effects.

Transboundary effects are effects that could occur in other jurisdictions as a result of the Marine Plan. The Northern Ireland marine area abuts the marine areas of Scotland, Wales, the Isle of Man and the Republic of Ireland. As the effects within the Marine Plan area are predicted to be negligible, the effects on other jurisdictions are also predicted to be negligible.

**Table 5.12: Ecosystems Services Assessment of the Marine Plan**

Ecosystems Services – Goods/Benefits	Scale of Current Benefit	SA Topics which support the provision of the Ecosystem Services	Screened-in Marine Plan policies which may potentially affect the SA Topics	Effect of marine plan policies	Assessment
Food (from wild capture fisheries and aquaculture)	A major benefit is derived from the food provisioning service. The value of this benefit is indicated by the market value (first landing value) for fish and shellfish (£26m in 2015 <sup>18</sup> ) and marine aquaculture products (an estimated £4m for mussels and Pacific oyster in 2014 <sup>19</sup> ) in Northern Ireland. There is also a small market for edible seaweed.	<ul style="list-style-type: none"> <li>- Biodiversity, flora and fauna</li> <li>- Water and soils</li> <li>- Climate factors</li> </ul>	<p><b>Key activity policies</b></p> <ul style="list-style-type: none"> <li>- Aquaculture</li> <li>- Commercial Fishing</li> <li>- Dredging</li> <li>- Ports, Harbours and Shipping</li> <li>- Telecommunications Cabling</li> </ul> <p><b>Core policies</b></p> <ul style="list-style-type: none"> <li>- Stakeholder Engagement</li> <li>- Co-Existence</li> <li>- Invasive Alien Species</li> <li>- Land and Sea Interaction</li> <li>- Marine litter</li> <li>- Marine Noise</li> <li>- Seascape</li> <li>- Use of Evidence</li> </ul>	Negligible	<p>All of the screened-in Key Activity policies identified have the potential to affect the SA topics assessed as important to underpinning the provision of the food ecosystem service (i.e. Biodiversity, flora and fauna; Water and soils; and Climate factors). The individual and in-combination policy assessments assessed the impact of these Key Activity policies on these SA topics as negligible. Therefore the impacts of these Key Activity policies on the provision of the food ecosystem service will also be negligible.</p> <p>All of the screened-in Core policies identified have the potential to impact on some or all of the SA topics assessed as vital to underpinning the provision of the food ecosystem service. The individual and in-combination policy assessments assessed the impact of these Core policies on these topics as negligible or no effect. Therefore the impacts of these Core policies on the provision of the food ecosystem service will also be negligible.</p>

<sup>18</sup> MMO (2016) UK Sea Fisheries Statistics 2015. Available online at: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/555665/UK\\_Sea\\_Fisheries\\_Statistics\\_2015\\_full\\_report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/555665/UK_Sea_Fisheries_Statistics_2015_full_report.pdf)

<sup>19</sup> ABPmer & ICF International (2016). Future Trends in the Celtic Seas, Baseline Report, ABPmer Report No. R.2584c. A report produced by ABPmer & ICF International for Celtic Seas Partnership, August 2016. Available online at: [http://futuretrends.celticseaspartnership.eu/downloads/R2584c%20Future%20Trends\\_Final%20Baseline%20Report\\_5Aug2016.pdf](http://futuretrends.celticseaspartnership.eu/downloads/R2584c%20Future%20Trends_Final%20Baseline%20Report_5Aug2016.pdf)

<b>Ecosystems Services – Goods/Benefits</b>	<b>Scale of Current Benefit</b>	<b>SA Topics which support the provision of the Ecosystem Services</b>	<b>Screened-in Marine Plan policies which may potentially affect the SA Topics</b>	<b>Effect of marine plan policies</b>	<b>Assessment</b>
Fish feed (from wild capture fisheries, aquaculture, and wild harvesting of bait species)	There is no data on the value of this service for Northern Ireland. The contribution from Northern Ireland is considered to be small.	<ul style="list-style-type: none"> <li>- Biodiversity, flora and fauna</li> <li>- Water and soils</li> <li>- Climate factors</li> </ul>	<p><b>Key Activity policies</b></p> <ul style="list-style-type: none"> <li>- Aquaculture</li> <li>- Commercial Fishing</li> <li>- Dredging</li> <li>- Ports, Harbours and Shipping</li> <li>- Telecommunications Cabling</li> </ul> <p><b>Core policies</b></p> <ul style="list-style-type: none"> <li>- Stakeholder Engagement</li> <li>- Co-Existence</li> <li>- Invasive Alien Species</li> <li>- Land and Sea Interaction</li> <li>- Marine Litter</li> <li>- Marine Noise</li> <li>- Seascape</li> <li>- Use of Evidence</li> </ul>	Negligible	<p>All of the screened-in Key Activity policies identified have the potential to affect the SA topics assessed as important to underpinning the provision of the feed ecosystem service. The individual and in-combination policy assessments assessed the impact of these Key Activity policies on these topics as negligible. Therefore the impacts of these Key Activity policies on the (potential) provision of the feed ecosystem service will also be negligible.</p> <p>All of the screened-in Core policies identified have the potential to impact on some or all of the SA topics assessed as vital to underpinning the provision of the feed ecosystem service. The individual and in-combination policy assessments assessed the impact of these Core policies on these topics as negligible or no effect. Therefore the impacts of these Core policies on the (potential) provision of the feed ecosystem service will also be negligible.</p>
Fertiliser and biofuels (from wild harvested or farmed seaweed)	There is no data on the value of this service for Northern Ireland. The contribution from Northern Ireland is considered to be small.	<ul style="list-style-type: none"> <li>- Biodiversity, flora and fauna</li> <li>- Water and soils</li> <li>- Climate factors</li> </ul>	<p><b>Key Activity policies</b></p> <ul style="list-style-type: none"> <li>- Aquaculture</li> <li>- Commercial Fishing</li> <li>- Dredging</li> <li>- Ports, Harbours and Shipping</li> <li>- Telecommunications Cabling</li> </ul>	Negligible	<p>All of the screened-in Key Activity policies identified have the potential to affect the SA topics assessed as important to underpinning the provision of the fertiliser and biofuel ecosystem service. The individual and in-combination policy assessments assessed the impact of these Key Activity policies on these SA topics as negligible. Therefore the</p>

Ecosystems Services – Goods/Benefits	Scale of Current Benefit	SA Topics which support the provision of the Ecosystem Services	Screened-in Marine Plan policies which may potentially affect the SA Topics	Effect of marine plan policies	Assessment
			<p><b>Core policies</b></p> <ul style="list-style-type: none"> <li>- Stakeholder Engagement</li> <li>- Co-Existence</li> <li>- Invasive Alien Species</li> <li>- Land and Sea Interaction</li> <li>- Marine Litter</li> <li>- Marine Noise</li> <li>- Seascape</li> <li>- Use of Evidence</li> </ul>		<p>impacts of these key activity policies on the (potential) provision of the fertiliser and biofuels ecosystem service will also be negligible.</p> <p>All of the screened-in Core policies identified have the potential to impact on some or all of the SA topics assessed as vital to underpinning the provision of the fertiliser and biofuels ecosystem service. The individual and in-combination policy assessments assessed the impact of these Core policies on these SA topics as negligible or no effect. Therefore the impacts of these Core policies on the (potential) provision of the fertiliser and biofuels ecosystem service will also be negligible.</p>
Ornaments and aquaria (from wild harvesting or aquaculture)	There is no data on the value of this service for Northern Ireland or the wider UK. The contribution from Northern Ireland is considered to be small.	<ul style="list-style-type: none"> <li>- Biodiversity, flora and fauna</li> <li>- Water and soils</li> <li>- Climate factors</li> </ul>	<p><b>Key Activity policies</b></p> <ul style="list-style-type: none"> <li>- Aquaculture</li> <li>- Commercial Fishing</li> <li>- Dredging</li> <li>- Ports, Harbours and Shipping</li> <li>- Telecommunications Cabling</li> </ul> <p><b>Core policies</b></p> <ul style="list-style-type: none"> <li>- Stakeholder Engagement</li> <li>- Co-Existence</li> <li>- Invasive Alien Species</li> <li>- Land and Sea Interaction</li> <li>- Marine Litter</li> <li>- Marine Noise</li> </ul>	Negligible	<p>All of the screened-in Key Activity policies identified have the potential to affect the SA topics assessed as important to underpinning the provision of the ornaments and aquaria ecosystem service. The individual and in-combination policy assessments assessed the impact of these Key Activity policies on these SA topics as negligible. Therefore the impacts of these Key Activity policies on the (potential) provision of the ornaments and aquaria ecosystem service will also be negligible.</p> <p>All of the screened-in Core policies identified</p>



Ecosystems Services – Goods/Benefits	Scale of Current Benefit	SA Topics which support the provision of the Ecosystem Services	Screened-in Marine Plan policies which may potentially affect the SA Topics	Effect of marine plan policies	Assessment
			<ul style="list-style-type: none"> <li>- Seascape</li> <li>- Use of Evidence</li> </ul>		<p>have the potential to impact on some or all of the SA topics assessed as vital to underpinning the provision of the ornaments and aquaria ecosystem service. The individual and in-combination policy assessments assessed the impact of these Core policies on these SA topics as negligible or no effect. Therefore the impacts of these Core policies on the (potential) provision of the ornaments and aquaria ecosystem service will also be negligible.</p>
<p>Medicines and blue biotechnology (from wild harvesting or farming/culture of organisms/active compounds etc)</p>	<p>There is no data on the value of this service for Northern Ireland or the wider UK. The contribution from Northern Ireland is considered to be small.</p>	<ul style="list-style-type: none"> <li>- Biodiversity, flora and fauna</li> <li>- Water and soils</li> <li>- Climate factors</li> </ul>	<p><b>Key Activity policies</b></p> <ul style="list-style-type: none"> <li>- Aquaculture</li> <li>- Commercial Fishing</li> <li>- Dredging</li> <li>- Ports, Harbours and Shipping</li> <li>- Telecommunications Cabling</li> </ul> <p><b>Core policies</b></p> <ul style="list-style-type: none"> <li>- Stakeholder Engagement</li> <li>- Co-Existence</li> <li>- Invasive Alien Species</li> <li>- Land and Sea Interaction</li> <li>- Marine Litter</li> <li>- Marine Noise</li> <li>- Seascape</li> <li>- Use of Evidence</li> </ul>	<p>Negligible</p>	<p>All of the screened-in Key Activity policies identified have the potential to affect the SA topics assessed as important to underpinning the provision of the medicines and blue biotechnology ecosystem service. The individual and in-combination policy assessments assessed the impact of these Key Activity policies on these SA topics as negligible. Therefore the impacts of these Key Activity policies on the (potential) provision of the medicines and blue biotechnology ecosystem service will also be negligible.</p> <p>All of the screened-in Core policies identified have the potential to impact on some or all of the SA topics assessed as vital to underpinning the provision of the medicines and blue biotechnology ecosystem service. The individual and in-combination policy</p>

Ecosystems Services – Goods/Benefits	Scale of Current Benefit	SA Topics which support the provision of the Ecosystem Services	Screened-in Marine Plan policies which may potentially affect the SA Topics	Effect of marine plan policies	Assessment
					assessments assessed the impact of these Core policies on these SA topics as negligible or no effect. Therefore the impacts of these Core policies on the (potential) provision of the medicines and blue biotechnology ecosystem service will also be negligible.
Healthy climate (modulation of regional/local climate)	There is no data on the value of this service for Northern Ireland or the wider UK. The coasts and sea of Northern Ireland contribute to maintaining a healthy climate through their role in the carbon cycle.	<ul style="list-style-type: none"> <li>- Biodiversity, flora and fauna</li> <li>- Water and soils</li> <li>- Air Quality</li> <li>- Climate factors</li> </ul>	<p><b>Key Activity policies</b></p> <ul style="list-style-type: none"> <li>- Aquaculture</li> <li>- Commercial Fishing</li> <li>- Dredging</li> <li>- Ports, Harbours and Shipping</li> <li>- Telecommunications Cabling</li> </ul> <p><b>Core policies</b></p> <ul style="list-style-type: none"> <li>- Stakeholder Engagement</li> <li>- Co-Existence</li> <li>- Invasive Alien Species</li> <li>- Land and Sea Interaction</li> <li>- Marine Litter</li> <li>- Marine Noise</li> <li>- Seascape</li> <li>- Use of Evidence</li> </ul>	Negligible	<p>All of the screened-in Key Activity policies identified have the potential to affect the topics assessed as important to underpinning the provision of the healthy climate ecosystem service. The individual and in-combination policy assessments assessed the impact of these Key Activity policies on these topics as negligible. Therefore the impacts of these Key Activity policies on the provision of the healthy climate ecosystem service will also be negligible.</p> <p>All of the screened-in Core policies identified have the potential to impact on some or all of the SA topics assessed as vital to underpinning the provision of the healthy climate ecosystem service. The individual and in-combination policy assessments assessed the impact of these Core policies on these SA topics as negligible or no effect. Therefore the impacts of these Core policies on the provision of the healthy climate ecosystem service will also be negligible.</p>

<b>Ecosystems Services – Goods/Benefits</b>	<b>Scale of Current Benefit</b>	<b>SA Topics which support the provision of the Ecosystem Services</b>	<b>Screened-in Marine Plan policies which may potentially affect the SA Topics</b>	<b>Effect of marine plan policies</b>	<b>Assessment</b>
Prevention of coastal erosion (control of the processes leading to erosion)	There is no data on the value of this service for Northern Ireland or the wider UK. The coastline provides a natural barrier to the sea. Along some lengths of Northern Ireland’s coastline, additional protection is provided by man-made defences. Maintenance of a stable coastline provides significant benefits in facilitating economic development on land. However, this could be expensive and therefore have costs for society.	<ul style="list-style-type: none"> <li>- Biodiversity, flora and fauna</li> <li>- Water and soils</li> <li>- Climate factors</li> </ul>	<p><b>Key Activity policies</b></p> <ul style="list-style-type: none"> <li>- Aquaculture</li> <li>- Commercial Fishing</li> <li>- Dredging</li> <li>- Ports, Harbours and Shipping</li> <li>- Telecommunications Cabling</li> </ul> <p><b>Core policies</b></p> <ul style="list-style-type: none"> <li>- Stakeholder Engagement</li> <li>- Co-Existence</li> <li>- Invasive Alien Species</li> <li>- Land and Sea Interaction</li> <li>- Marine Litter</li> <li>- Marine Noise</li> <li>- Seascape</li> <li>- Use of Evidence</li> </ul>	Negligible	<p>All of the screened-in Key Activity policies identified have the potential to affect the SA topics assessed as important to underpinning the provision of the prevention of coastal erosion ecosystem service. The individual and in-combination policy assessments assessed the impact of these Key Activity policies on these SA topics as negligible. Therefore the impacts of these key activity policies on the provision of the prevention of coastal erosion ecosystem service will also be negligible.</p> <p>All of the screened-in Core policies identified have the potential to impact on some or all of the SA topics assessed as vital to underpinning the provision of the prevention of coastal erosion ecosystem service. The individual and in-combination policy assessments assessed the impact of these Core policies on these SA topics as negligible or no effect. Therefore the impacts of these Core policies on the provision of the prevention of coastal erosion ecosystem service will also be negligible.</p>
Sea defence (natural or man-made structures that attenuate the energy of water or wind)	There is no information on the value of this service in Northern Ireland. The coastline and associated habitats such as saltmarshes, dunes and	<ul style="list-style-type: none"> <li>- Biodiversity, flora and fauna</li> <li>- Water and soils</li> <li>- Climate factors</li> </ul>	<p><b>Key Activity policies</b></p> <ul style="list-style-type: none"> <li>- Aquaculture</li> <li>- Commercial Fishing</li> <li>- Dredging</li> <li>- Ports, Harbours and Shipping</li> </ul>	Negligible	All of the screened-in Key Activity policies identified have the potential to affect the SA topics assessed as important to underpinning the provision of the sea defence ecosystem service. The individual and in-combination policy assessments assessed the impact of

Ecosystems Services – Goods/Benefits	Scale of Current Benefit	SA Topics which support the provision of the Ecosystem Services	Screened-in Marine Plan policies which may potentially affect the SA Topics	Effect of marine plan policies	Assessment
	<p>shingle provide a level of protection from the risk of coastal flooding. As components of coastal processes these features also maintain the coastal position (within natural cycles) and can also serve to minimise and/or stabilise coastal change during extreme events such as storm activity.</p> <p>Along some lengths of Northern Ireland’s coastline, additional protection is provided by man-made defences. Protection of low-lying areas from the risk of coastal flooding, including natural protection provided by the coastline and associated habitats provides significant benefit. There are no specific values available for the Northern Ireland coastline. The level of benefit in Northern Ireland is considered to be moderate</p>		<ul style="list-style-type: none"> <li>- Telecommunications Cabling</li> </ul> <p><b>Core policies</b></p> <ul style="list-style-type: none"> <li>- Stakeholder Engagement</li> <li>- Co-Existence</li> <li>- Invasive Alien Species</li> <li>- Land and Sea Interaction</li> <li>- Marine Litter</li> <li>- Marine Noise</li> <li>- Seascape</li> <li>- Use of Evidence</li> </ul>		<p>these Key Activity policies on these SA topics as negligible. Therefore the impacts of these Key Activity policies on the provision of the sea defence ecosystem service will also be negligible.</p> <p>All of the screened-in Core policies identified have the potential to impact on some or all of the SA topics assessed as vital to underpinning the provision of the sea defence ecosystem service. The individual and in-combination policy assessments assessed the impact of these Core policies on these SA topics as negligible or no effect. Therefore the impacts of these Core policies on the provision of the sea defence ecosystem service will also be negligible.</p>

Ecosystems Services – Goods/Benefits	Scale of Current Benefit	SA Topics which support the provision of the Ecosystem Services	Screened-in Marine Plan policies which may potentially affect the SA Topics	Effect of marine plan policies	Assessment
	because natural habitats providing flood protection benefits along Northern Ireland’s coastline have a restricted distribution.				
Waste burial/removal /neutralisation (the modification of matter through biogeochemical processes)	There is no information on the value of this service in Northern Ireland. Processes of dilution and physical, chemical and biological degradation in the marine environment can be used to mitigate the impacts of waste disposal (including liquid discharges) to the marine environment.	<ul style="list-style-type: none"> <li>- Biodiversity, flora and fauna</li> <li>- Water and soils</li> <li>- Climate factors</li> </ul>	<p><b>Key Activity policies</b></p> <ul style="list-style-type: none"> <li>- Aquaculture</li> <li>- Commercial Fishing</li> <li>- Dredging</li> <li>- Ports, Harbours and Shipping</li> <li>- Telecommunications Cabling</li> </ul> <p><b>Core policies</b></p> <ul style="list-style-type: none"> <li>- Stakeholder Engagement</li> <li>- Co-Existence</li> <li>- Invasive Alien Species</li> <li>- Land and Sea Interaction</li> <li>- Marine Litter</li> <li>- Marine Noise</li> <li>- Seascape</li> <li>- Use of Evidence</li> </ul>	Negligible	<p>All of the screened-in Key Activity policies identified have the potential to affect the SA topics assessed as important to underpinning the provision of the waste burial/removal/neutralisation ecosystem service. The individual and in-combination policy assessments assessed the impact of these Key Activity policies on these SA topics as negligible. Therefore the impacts of these Key Activity policies on the provision of the waste burial/removal/neutralisation ecosystem service will also be negligible.</p> <p>All of the screened-in Core policies identified have the potential to impact on some or all of the SA topics assessed as vital to underpinning the provision of the waste burial/removal/neutralisation ecosystem service. The individual and in-combination policy assessments assessed the impact of these Core policies on these SA topics as negligible or no effect. Therefore the impacts of these Core policies on the provision of the waste burial/removal/neutralisation ecosystem service will also be negligible.</p>

Ecosystems Services – Goods/Benefits	Scale of Current Benefit	SA Topics which support the provision of the Ecosystem Services	Screened-in Marine Plan policies which may potentially affect the SA Topics	Effect of marine plan policies	Assessment
Tourism and nature watching	The coastal environment of Northern Ireland is important for tourism and nature watching. In 2015, the estimated total number of overnight trips to NI was 4.5 million and the annual total visitor expenditure associated with these overnight trips was £764 million <sup>20</sup> , although there is no breakdown of how many of these visits involved trips to the coast. In 2013, the economic impact of tourism to the Northern Ireland economy was 5.2% of GDP, supporting some 43,000 jobs (AECOM and ABPmer, 2014).	<ul style="list-style-type: none"> <li>- Biodiversity, flora and fauna</li> <li>- Water and soils</li> <li>- Air Quality</li> <li>- Climate factors</li> </ul>	<p><b>Key Activity policies</b></p> <ul style="list-style-type: none"> <li>- Aquaculture</li> <li>- Commercial Fishing</li> <li>- Dredging</li> <li>- Ports, Harbours and Shipping</li> <li>- Telecommunications Cabling</li> </ul> <p><b>Core policies</b></p> <ul style="list-style-type: none"> <li>- Stakeholder Engagement</li> <li>- Co-Existence</li> <li>- Invasive Alien Species</li> <li>- Land and Sea Interaction</li> <li>- Marine Litter</li> <li>- Marine Noise</li> <li>- Seascape</li> <li>- Use of Evidence</li> </ul>	Negligible	<p>All of the screened-in Key Activity policies identified have the potential to affect the SA topics assessed as important to underpinning the provision of the tourism and nature watching ecosystem service. The individual and in-combination policy assessments assessed the impact of these Key Activity policies on these SA topics as negligible. Therefore the impacts of these Key Activity policies on the provision of the tourism and nature watching ecosystem service will also be negligible.</p> <p>All of the screened-in Core policies identified have the potential to impact on some or all of the SA topics assessed as vital to underpinning the provision of the tourism and nature watching ecosystem service. The individual and in-combination policy assessments assessed the impact of these Core policies on these SA topics as negligible or no effect. Therefore the impacts of these Core policies on the provision of the tourism and nature watching ecosystem service will also be negligible.</p>

<sup>20</sup> Northern Ireland Statistics & Research Agency (2016). Northern Ireland Annual Tourism Statistics 2015. Available online at: <https://www.economy-ni.gov.uk/sites/default/files/publications/economy/2015-Annual-Publication-Revision-HTS.pdf>

Ecosystems Services – Goods/Benefits	Scale of Current Benefit	SA Topics which support the provision of the Ecosystem Services	Screened-in Marine Plan policies which may potentially affect the SA Topics	Effect of marine plan policies	Assessment
Spiritual and cultural wellbeing	There is no information on the value of this service in Northern Ireland. People enjoy spending time at the coast which is evident by the importance of the coast for tourism and recreation. There are also many cultural traditions relating to the coastal and marine environment such as fishing. People also place an intrinsic (non-use) value on the coastal and marine environment. These non-use values have been shown by some studies to be large (e.g. McVittie & Moran, 2008 <sup>21</sup> ). The non-use value of Northern Ireland’s marine environment is therefore considered to be large.	<ul style="list-style-type: none"> <li>- Biodiversity, flora and fauna</li> <li>- Water and soils</li> <li>- Air Quality</li> <li>- Climate factors</li> </ul>	<p><b>Key Activity policies</b></p> <ul style="list-style-type: none"> <li>- Aquaculture</li> <li>- Commercial Fishing</li> <li>- Dredging</li> <li>- Ports, Harbours and Shipping</li> <li>- Telecommunications Cabling</li> </ul> <p><b>Core policies</b></p> <ul style="list-style-type: none"> <li>- Stakeholder Engagement</li> <li>- Co-Existence</li> <li>- Invasive Alien Species</li> <li>- Land and Sea Interaction</li> <li>- Marine Litter</li> <li>- Marine Noise</li> <li>- Seascape</li> <li>- Use of Evidence</li> </ul>	Negligible	<p>All of the screened-in Key Activity policies identified have the potential to affect the SA topics assessed as important to underpinning the provision of the spiritual and cultural wellbeing ecosystem service. The individual and in-combination policy assessments assessed the impact of these Key Activity policies on these SA topics as negligible. Therefore the impacts of these Key Activity policies on the provision of the spiritual and cultural wellbeing ecosystem service will also be negligible.</p> <p>All of the screened-in Core policies identified have the potential to impact on some or all of the SA topics assessed as vital to underpinning the provision of the spiritual and cultural wellbeing ecosystem service. The individual and in-combination policy assessments assessed the impact of these Core policies on these SA topics as negligible or no effect. Therefore the impacts of these Core policies on the provision of the spiritual and cultural wellbeing ecosystem service will also be negligible.</p>

<sup>21</sup> McVittie, A., and Moran, D. (2008). Determining monetary values for use and non-use goods and services – Marine Biodiversity – primary valuation. Final Report 15 July 2008. Available online at: [http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwjAmpj4g6HSAhXLAsAKHeeIDDAQFggfMAA&url=http%3A%2F%2Frandd.defra.gov.uk%2FDocument.aspx%3FDocument%3DWC0605\\_7414\\_FRP.pdf&usq=AFQjCNEv-M7D9A7VrB3uUrHFz0LgJXggg&bvm=bv.147448319,d.ZG](http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwjAmpj4g6HSAhXLAsAKHeeIDDAQFggfMAA&url=http%3A%2F%2Frandd.defra.gov.uk%2FDocument.aspx%3FDocument%3DWC0605_7414_FRP.pdf&usq=AFQjCNEv-M7D9A7VrB3uUrHFz0LgJXggg&bvm=bv.147448319,d.ZG)



<b>Ecosystems Services – Goods/Benefits</b>	<b>Scale of Current Benefit</b>	<b>SA Topics which support the provision of the Ecosystem Services</b>	<b>Screened-in Marine Plan policies which may potentially affect the SA Topics</b>	<b>Effect of marine plan policies</b>	<b>Assessment</b>
Aesthetic benefits	There is no information on the value of this service in Northern Ireland. The aesthetic state of the coastal and marine environment has direct links to the tourism and recreation, quality urban and rural areas, and the perception and enjoyment of places by society. Given the underpinning nature of aesthetic quality for many uses and activities the value is considered to be large.	<ul style="list-style-type: none"> <li>- Biodiversity, flora and fauna</li> <li>- Water and soils</li> <li>- Air Quality</li> <li>- Climate factors</li> </ul>	<p><b>Key Activity policies</b></p> <ul style="list-style-type: none"> <li>- Aquaculture</li> <li>- Commercial Fishing</li> <li>- Dredging</li> <li>- Ports, Harbours and Shipping</li> <li>- Telecommunications Cabling</li> </ul> <p><b>Core policies</b></p> <ul style="list-style-type: none"> <li>- Stakeholder Engagement</li> <li>- Co-Existence</li> <li>- Invasive Alien Species</li> <li>- Land and Sea Interaction</li> <li>- Marine Litter</li> <li>- Marine Noise</li> <li>- Seascape</li> <li>- Use of Evidence</li> </ul>	Negligible	<p>All of the screened-in Key Activity policies identified have the potential to affect the SA topics assessed as important to underpinning the provision of the aesthetic benefits ecosystem service. The individual and in-combination policy assessments assessed the impact of these Key Activity policies on these SA topics as negligible. Therefore the impacts of these Key Activity policies on the provision of the aesthetic benefits ecosystem service will also be negligible.</p> <p>All of the screened-in Core policies identified have the potential to impact on some or all of the SA topics assessed as vital to underpinning the provision of the aesthetic benefits ecosystem service. The individual and in-combination policy assessments assessed the impact of these Core policies on these SA topics as negligible or no effect. Therefore the impacts of these Core policies on the provision of the aesthetic benefits ecosystem service will also be negligible.</p>
Education, research (knowledge from research of an education about the natural world)	There is no information on the value of this service in Northern Ireland. The level of benefit in Northern Ireland is considered to be moderate.	<ul style="list-style-type: none"> <li>- Biodiversity, flora and fauna</li> <li>- Water and soils</li> <li>- Air Quality</li> <li>- Climate factors</li> </ul>	<p><b>Key Activity policies</b></p> <ul style="list-style-type: none"> <li>- Aquaculture</li> <li>- Commercial Fishing</li> <li>- Dredging</li> <li>- Ports, Harbours and Shipping</li> <li>- Telecommunications Cabling</li> </ul>	Negligible	<p>All of the screened-in Key Activity policies identified have the potential to affect the SA topics assessed as important to underpinning the provision of the education, research ecosystem service. The individual and in-combination policy assessments assessed the impact of these Key Activity policies on these SA topics as negligible. Therefore the</p>



Ecosystems Services – Goods/Benefits	Scale of Current Benefit	SA Topics which support the provision of the Ecosystem Services	Screened-in Marine Plan policies which may potentially affect the SA Topics	Effect of marine plan policies	Assessment
			<p><b>Core policies</b></p> <ul style="list-style-type: none"> <li>- Stakeholder Engagement</li> <li>- Co-Existence</li> <li>- Invasive Alien Species</li> <li>- Land and Sea Interaction</li> <li>- Marine Litter</li> <li>- Marine Noise</li> <li>- Seascape</li> <li>- Use of Evidence</li> </ul>		<p>impacts of these Key Activity policies on the provision of the education, research ecosystem service will also be negligible.</p> <p>All of the screened-in Core policies identified have the potential to impact on some or all of the SA topics assessed as vital to underpinning the provision of the education, research ecosystem service. The individual and in-combination policy assessments assessed the impact of these Core policies on these SA topics as negligible or no effect. Therefore the impacts of these Core policies on the provision of the education, research ecosystem service will also be negligible.</p>
<p>Health benefits (from harvested, cultivated and synthetic medicines, aesthetic benefits, spiritual wellbeing etc.)</p>	<p>There is no information on the value of this service in Northern Ireland. Health benefits may derive from spiritual/cultural wellbeing, aesthetic benefits. The coastal and marine area provides space and opportunity of sporting and physical activity, such as walking, running and surfing. Health benefits can also be attributed to employment generated (for example in the service sector) in the coastal and</p>	<ul style="list-style-type: none"> <li>- Biodiversity, flora and fauna</li> <li>- Water and soils</li> <li>- Air Quality</li> <li>- Climate factors</li> </ul>	<p><b>Key Activity policies</b></p> <ul style="list-style-type: none"> <li>- Aquaculture</li> <li>- Commercial Fishing</li> <li>- Dredging</li> <li>- Ports, Harbours and Shipping</li> <li>- Telecommunications</li> </ul> <p><b>Core policies</b></p> <ul style="list-style-type: none"> <li>- Stakeholder Engagement</li> <li>- Co-Existence</li> <li>- Invasive Alien Species</li> <li>- Land and Sea Interaction</li> <li>- Marine Litter</li> <li>- Marine Noise</li> <li>- Seascape</li> </ul>	<p>Negligible</p>	<p>All of the screened-in Key Activity policies identified have the potential to affect the SA topics assessed as important to underpinning the provision of the health benefits ecosystem service. The individual and in-combination policy assessments assessed the impact of these Key Activity policies on these SA topics as negligible. Therefore the impacts of these Key Activity policies on the provision of the health benefits ecosystem service will also be negligible.</p> <p>All of the screened-in Core policies identified have the potential to impact on some or all of the SA topics assessed as vital to underpinning the provision of the health</p>

<b>Ecosystems Services – Goods/Benefits</b>	<b>Scale of Current Benefit</b>	<b>SA Topics which support the provision of the Ecosystem Services</b>	<b>Screened-in Marine Plan policies which may potentially affect the SA Topics</b>	<b>Effect of marine plan policies</b>	<b>Assessment</b>
	marine environment, which can lower deprivation. The level of benefit in Northern Ireland is considered to be large.		- Use of Evidence		benefits ecosystem service. The individual and in-combination policy assessments assessed the impact of these Core policies on these SA topics as negligible or no effect. Therefore the impacts of these Core policies on the provision of the health benefits ecosystem service will also be negligible.

## 6 Monitoring

### 6.1 Monitoring Effects of the Marine Plan

It is a requirement of the SEA Directive and SEA Regulations that the responsible authority monitors the significant effects of the implementation of the Marine Plan. Given that this assessment has not identified any significant adverse effects arising from the Marine Plan the focus of monitoring will be on unanticipated environmental, social or economic effects.

The Marine Plan contains a Chapter on Monitoring and Review. It states that monitoring of the Marine Plan will consist of two elements:

- Monitoring how well the content of the Marine Plan has been taken forward through decision-making processes; and,
- Monitoring the effects and effectiveness of the policies within the Marine Plan in securing objectives.

Monitoring the decision-making process will provide the Marine Plan Authority with information on general awareness of the Marine Plan; whether the Marine Plan is being implemented as intended; and whether policies need to be refined or new ones developed. In monitoring the effect and effectiveness of the Marine Plan an indicator based approach will be developed to measure wider economic, environmental and social outcomes and define the relationships between objectives, policies and these outcomes. In order to assess, the effects and effectiveness of the Marine Plan all public authorities will have a responsibility to provide evidence to the Marine Plan Authority. To minimise duplication, monitoring will draw upon existing monitoring programmes or data.

Monitoring of the Marine Plan will be overseen by the Inter-Departmental Marine Co-ordination Group and will involve consultation with public authorities and others with an interest in the marine area. The Marine Plan Authority will assess all feedback which will inform recommendations to amend or replace the Marine Plan.

## References

ABPmer & ICF International (2016), *Future Trends in the Celtic Seas, Baseline Report, ABPmer Report No. R.2584c. A report produced by ABPmer & ICF International for Celtic Seas Partnership*, Available online at:

[http://futuretrends.celticseaspartnership.eu/downloads/R2584c%20Future%20Trends\\_Final%20Baseline%20Report\\_5Aug2016.pdf](http://futuretrends.celticseaspartnership.eu/downloads/R2584c%20Future%20Trends_Final%20Baseline%20Report_5Aug2016.pdf)

Aether & Ricardo AEA (2015), *Greenhouse Gas Inventories for England, Scotland, Wales Northern Ireland: 1990-2013, Report to the Department of Energy and Climate Change, The Scottish Government, The Welsh Government and The Northern Ireland Department of the Environment*.

Agri-Food Strategy Board (2013), *Going for Growth A Strategic Action Plan in Support of the Northern Ireland Agri-Food Industry*, Available online at

<http://www.agrifoodstrategyboard.org.uk/uploads/Going%20for%20Growth%20-%20Web%20Version.PDF>

British Geological Survey (BGS) (2005), *Technical report on seabed and geology from DTI SEA 6 & 7*.

Department of Agriculture, Environment and Rural Affairs (DAERA) (2016), Northern Ireland Marine Plan Area, Available online at <https://www.daera-ni.gov.uk/topics/marine>

Department of Agriculture, Environment and Rural Affairs (DAERA) (2016), Marine Licensing, Available online <https://www.daera-ni.gov.uk/articles/marine-licensing>

Department of Agriculture, Environment and Rural Affairs (DAERA) (2016), Air Quality Management Areas (AQMAs), Available online at <http://www.airqualityni.co.uk/laqm/aqma>

Department of Enterprise, Trade and Investment (DETI) (2010), *The Strategic Energy Framework*, Available online at <https://www.economy-ni.gov.uk/sites/default/files/publications/deti/sef%202010.pdf>

Department of Environment (DoE) (2011), Northern Ireland Coastal Zone - Indicators of Sustainable Development.

Department for Environment, Food and Rural Affairs (DEFRA) (2010), *Charting Progress 2*.

Department for Regional Development (DRD) (2011), *Ensuring a Sustainable Transport Future*, Available online <https://www.infrastructure-https://www.infrastructure->

[ni.gov.uk/publications/ensuring-sustainable-transport-future-new-approach-regional-transportation](http://ni.gov.uk/publications/ensuring-sustainable-transport-future-new-approach-regional-transportation)

Department for Regional Development (DRD) (2010), *Regional Development Strategy 2035: Building a Better Future*, Available online at <http://www.planningni.gov.uk/index/policy/rds2035.pdf>

Directive 2014/89/EU (2014), *Maritime Spatial Planning Directive*, <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32014L0089>

Dodds et al., (2010), *Flood and coastal erosion risk management policy evolution in Northern Ireland: "Incremental or leapfrogging?"*

Environmental and Heritage Service (EHS), (2000), *Managing the Water Environment in Northern Ireland*.

The Environmental Assessment (Northern Ireland) Regulation (2004), Available online at <http://www.legislation.gov.uk/nisr/2004/280/regulation/12/made?view=plain>

European Directive 2001/42/EC (2001) SEA Directive, <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32001L0042>

HM Government (2009), *Our Seas: a shared resource, high level marine objectives*, Available online at [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/182486/ours\\_eas-2009update.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/182486/ours_eas-2009update.pdf)

Joint Nature Conservation Committee (JNCC) (1997), *JNCC Coastal Directories Series: Region 17 Northern Ireland*.

Marine Act (Northern Ireland) (2013), *Schedule 1, Section 10*, Available online at <http://www.legislation.gov.uk/nia/2013/10/contents>

Marine and Coastal Access Act (2009), *Schedule 6, Section 10*, Available online at <http://www.legislation.gov.uk/ukpga/2009/23/contents>

McVittie, A., and Moran, D. (2008). *Determining monetary values for use and non-use goods and services – Marine Biodiversity – primary valuation*. Available online at: [http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwjAmpj4g6HSAhXLAsAKHeelDDAQFggfMAA&url=http%3A%2F%2Frandd.defra.gov.uk%2FDocument.aspx%3FDocument%3DWC0605\\_7414\\_FRP.pdf&usg=AFQjCNEEnv-M7D9A7VrB3uUrHFz0LgJXggg&bvm=bv.147448319,d.ZG](http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwjAmpj4g6HSAhXLAsAKHeelDDAQFggfMAA&url=http%3A%2F%2Frandd.defra.gov.uk%2FDocument.aspx%3FDocument%3DWC0605_7414_FRP.pdf&usg=AFQjCNEEnv-M7D9A7VrB3uUrHFz0LgJXggg&bvm=bv.147448319,d.ZG)

Masselink and Russell (2010), *Coastal Erosion in MCCIP Annual Report Card 2010-11*.

Metoc (2007), *Offshore Energy Strategic Environmental Assessment Programme*.

*Technical Report on the other users of the SEA 8 Area. Report No. R1673, REV 1*

Available online at:

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/197019/SEA\\_8\\_TechRep\\_OtherUsers.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/197019/SEA_8_TechRep_OtherUsers.pdf)

MMO (2016), UK Sea Fisheries Statistics 2015. Available online at:

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/555665/UK\\_Sea\\_Fisheries\\_Statistics\\_2015\\_full\\_report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/555665/UK_Sea_Fisheries_Statistics_2015_full_report.pdf)

Northern Ireland Environment Agency (NIEA) and Agri-Food Biosciences Institute (AFBI) (2011), *Chapter 13 Maritime Archaeology - State of the Seas Report*.

Northern Ireland Statistics and Research Agency (NISRA) (2015), The Northern Ireland Multiple Deprivation Measure (NIMDM) Report 2010, Available online at

[http://www.nisra.gov.uk/deprivation/nimdm\\_2010.htm](http://www.nisra.gov.uk/deprivation/nimdm_2010.htm)

Northern Ireland Statistics and Research Agency (NISRA) (2015), The Population of Northern Ireland, Available online at <http://www.nisra.gov.uk/>

Pollutant Release and Transfer Registers (2012), Available online at

<https://www.gov.uk/guidance/uk-pollutant-release-and-transfer-register-prtr-data-sets>

The Crown Estates (TCE), (2014) *Marine Aggregates –Capacity & Portfolio 2013*.

UK National Ecosystem Assessment Follow On (2013), *Coastal and marine ecosystem services: principles and practice*, Available online at [http://uknea.unep-](http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=IJEp3mJSVBw%3D&tabid=82)

[wcmc.org/LinkClick.aspx?fileticket=IJEp3mJSVBw%3D&tabid=82](http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=IJEp3mJSVBw%3D&tabid=82)