



1. INTRODUCTION



Northern Ireland has a close connection with the sea. We have over 650 kilometres of coastline and our largest towns are associated with ports. As an island society, the sea has always had an important role to play, offering a source of recreation and a place of work to many. Fishing communities depend upon the sea for their livelihoods and shipping forms a vital bridge for commerce with the wider world, sustaining our ports and relying on safe navigation through our waters.

The sea is home to an amazing variety of marine life, some of which are found nowhere else in the world. The seabed is an archaeological repository of our maritime heritage; in the future it could also be an important source of minerals. Increasingly, there are new pressures in our marine environment. The growing demand for 'green' energy drives the search for new ways to harness the power of tides, waves and offshore wind.

The vision of clean, healthy, safe, productive and biologically diverse oceans and seas was

outlined in the first UK Government report on marine stewardship, *Safeguarding our Seas*⁽¹⁾ and is particularly relevant to Northern Ireland.

The sea is not a limitless resource and as pressure on our marine area grows, so does the potential for conflict between different activities. These activities vary in their compatibility with each other and the extent to which they affect the marine environment.

Therefore, we need to develop an approach to regulating these activities so as to allow their sustainable management. It is for this reason that the UK Government and the Devolved Administrations are developing policies that will provide a framework for a new system of marine planning.

In Northern Ireland this framework will be achieved through 3 interlocking pieces of legislation presented in Table 1.1.

Full references to all the legislation cited in this report are provided in Appendix II.

Legislation	Comments
UK Marine and Coastal Access Act 2009 (the UK Act)	Received Royal Assent on 12 November 2009. It introduces a new framework for managing the seas of the UK
EC Marine Strategy Framework Directive	Transposed into UK law on 15 July 2010. A European framework for the management of the marine environment with the goal of meeting Good Environment Status by 2020
Northern Ireland Marine Bill	This Bill should be introduced to the Northern Ireland Assembly in 2011. It will enable the implementation of those sections of the UK Act which are devolved

Table 1.1 New Marine Legislation

How much of the sea area around Northern Ireland is managed by the Northern Ireland Executive?

The responsibilities of each of the jurisdictions within the UK are summarised in Figure 1.1.

The Northern Ireland devolved area is small and intensively used, presenting many challenges for marine planning. The UK and Republic of Ireland have never reached a clear agreement on jurisdiction within the cross-border areas of Lough Foyle and Carlingford Lough.

However, these areas are often now managed as 'shared waters' between two neighbouring European Member States with two-way consultation.

Fisheries issues are managed by the cross-border body, Loughs Agency. For the purposes of this report, all available information in the cross-border area will be presented. Some areas of responsibility, like marine safety are not devolved and are managed on a UK-wide basis by the Maritime and Coastguard Agency (MCA), an agency of the UK Department of Transport.

Who looks after the marine environment around Northern Ireland?

The responsibility for the management of the marine environment is split between many government Departments and their Agencies.

The Department of the Environment (DOE) has a lead role in the protection and conservation of the whole water environment. Many of its responsibilities are exercised through the Northern Ireland Environment Agency (NIEA), an Agency within the DOE. The role in respect to the preservation of maritime archaeology is carried out in partnership with the University of Ulster, Coleraine, through its Centre

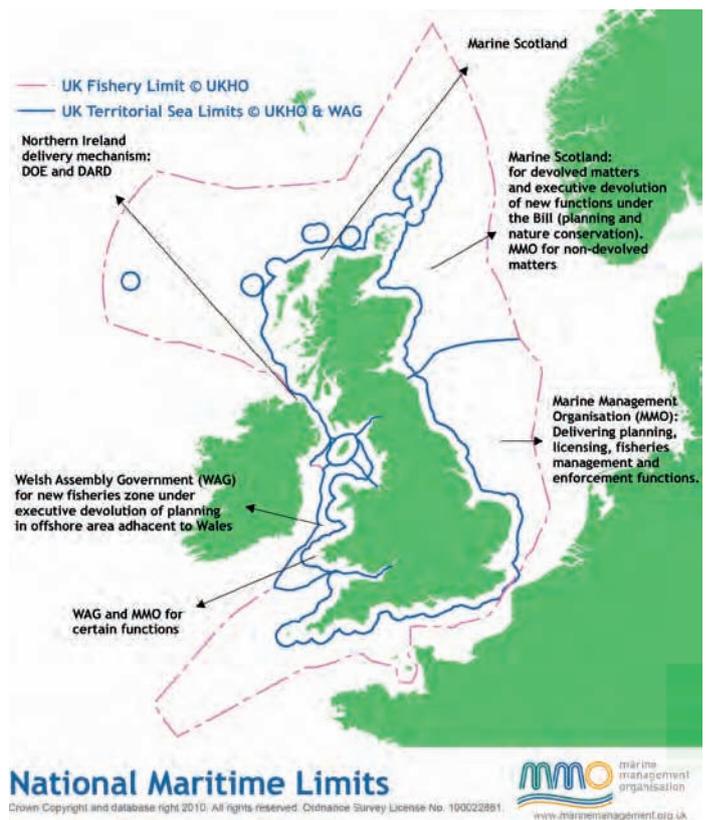


Figure 1.1 UK arrangements for the management of the marine environment

for Maritime Archaeology. Under the new legislation, DOE will be the marine authority in the future.

The Department of Agriculture and Rural Development (DARD) has the lead role in managing fisheries and aquaculture (Figure 1.4) in our waters. The Agri-Food and Biosciences Institute (AFBI), a DARD-sponsored non-departmental public body, provides the necessary scientific advice to DARD to enable them to exercise their role effectively. The Rivers Agency, an executive Agency of DARD, has responsibility for flood defence including some of our main sea defences. DARD also has a role in the management of the main fishing ports around our coast at Portavogie,

Ardglass and Kilkeel. This is exercised through the Northern Ireland Fishery Harbour Authority (NIFHA), a DARD sponsored non-departmental public body.

Responsibility for the management of fisheries within the cross-border area around Foyle and Carlingford, lies with the Loughs Agency, a cross-border body. Powers to cover the licensing of aquaculture in the cross-border area are also due to be transferred to Loughs Agency soon.

The conservation and protection of salmon and inland fisheries is the responsibility of the Department of Culture, Arts and Leisure (DCAL). There are strong links with marine management in that species like salmon, trout and eels have marine phases in their lifecycle. Again, AFBI provides the scientific support to DCAL.

The Department for Regional Development (DRD) has a role in the management of our ports and harbours.

The MCA is a UK-wide agency of the Department of Transport and has a lead role in maritime safety. It also has the lead role in reducing pollution from ships. The MCA oversees all the oil spill contingency planning across the UK. NIEA leads on this within Northern Ireland.

The Crown Estate has a management role as the owner of most of the seabed around Northern Ireland.

The primary responsibility for the monitoring and assessment of our marine environment falls to NIEA, AFBI, DARD Fisheries and the Loughs Agency.

Why is the marine environment of Northern Ireland important?

The marine environment of Northern Ireland is important for a variety of reasons. Marine life in the seas surrounding Northern Ireland is rich and varied and includes marine mammals such as harbour seals, whales and dolphins, seabirds, waterfowl and other species that migrate here such as salmon and eels, (both of which are endangered).

The coastline also includes productive and biologically diverse ecosystems, with features which serve as critical natural defences against storms, floods and erosion.

In recognition of the importance of our environmental resources, many areas have been designated for additional protection for habitats, species, shellfish and bathing waters under national and European legislation. The European protected areas are shown in Figure 1.2.

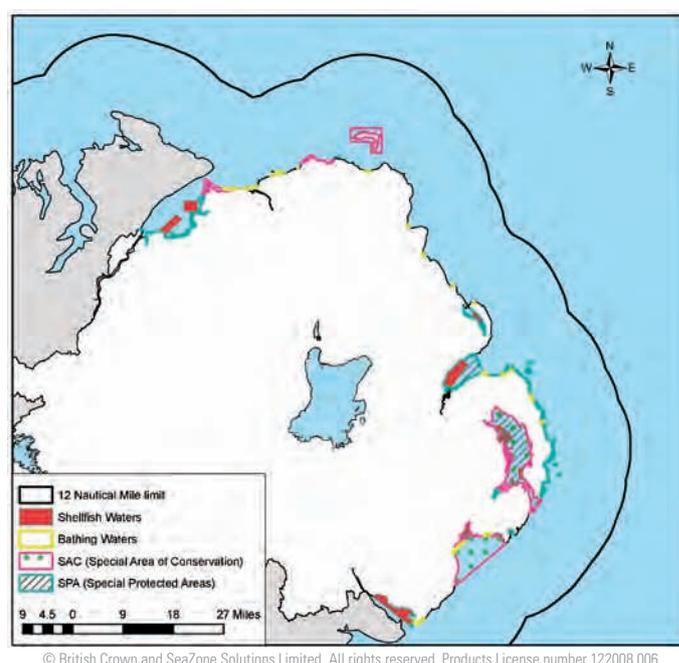


Figure 1.2 The marine and coastal environmental resources in Northern Ireland protected by European legislation.

Our fishing industry depends mainly on fishstocks in the Irish Sea and North Channel with an increasingly important inshore sector. The industry consists of 251 vessels whose catch in 2008 was valued at £23.2 million by DARD. Salmon are also farmed off the Antrim coast and our sea loughs are an important resource for shellfish aquaculture, which now forms a significant addition to our marine harvest.

DARD is responsible for the management of fisheries and aquaculture in Northern Ireland waters out to the 12 nautical mile (nm) limit and a small area beyond this to the south west of the Isle of Man known as the Northern Ireland zone. There are a number of fisheries protected areas where management measures and restrictions are in place Figure 1.3.

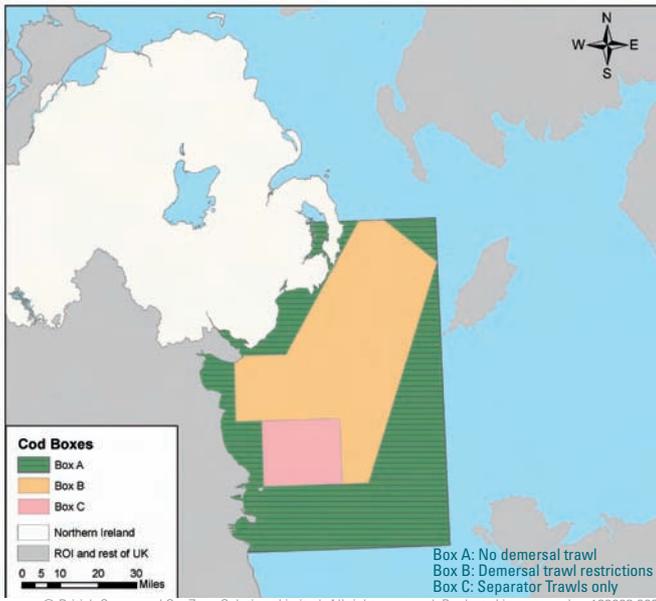


Figure 1.3 Fisheries protected areas off Northern Ireland.

How important is coastal tourism?

Tourism and leisure interests in the sea are increasing and provide an important source of income and local employment based on coastal resorts, beaches and scenic drives. Many other tourism activities take place on the water or along the coast. A chain of harbours and marinas along the coast of Northern Ireland, form the base for recreational boating. We are beginning to attract people from further afield and in 2009, 36 cruise ships brought 57,000 visitors to Belfast worth £16 million to the local economy. In addition, more than one million people visited National Trust coastal properties in 2009.

Why are our ports important?

The globalisation of world trade and the integration of Northern Ireland into the logistic chains of the major UK supermarkets have served to increase our dependence on sea transport. The 4 commercial trust ports at Belfast, Londonderry, Warrenpoint and Coleraine collectively handle 84% of our seaborne trade. The remainder is handled by the privately owned Port of Larne.

What emerging industries are likely to be important in the future?

There is considerable potential for marine renewables around our coast (Figure 1.5). There are currently no marine wind farms in Northern Ireland but the potential is considerable.

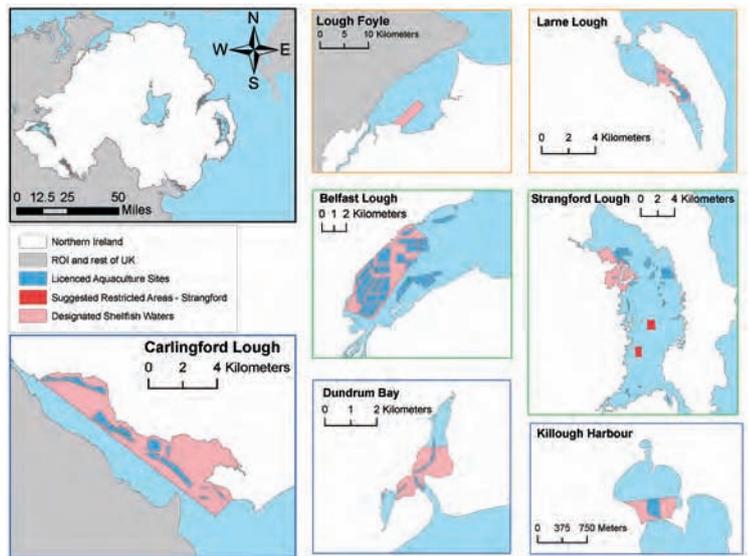


Figure 1.4 Aquaculture sites and shellfish designated areas in Northern Ireland sea lochs.

There has been promising progress in the past few years with testing of different devices to harvest wave and tidal energy - for example, the Marine Current Turbine project in Strangford Lough in 2008 was the world's first commercial scale project to generate electricity for the national grid. This innovative project has drawn international attention to the potential of the seas around Northern Ireland and a number of national and international companies have indicated their interest in investing and developing marine renewable projects here. It is estimated that by 2020 the value of this sector could be as much as £880 million⁽²⁾.

There are significant sand and gravel resources around our shores, which are not currently

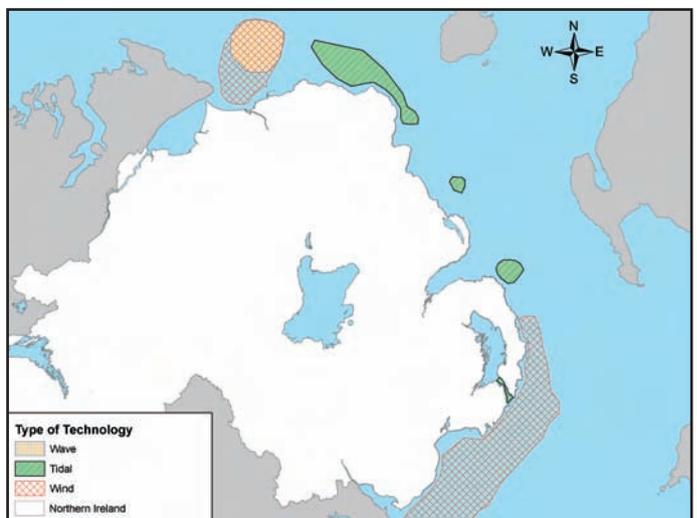


Figure 1.5 Potential Marine renewable energy resource areas around Northern Ireland. Source DETI



Giant's Causeway

exploited. Any strategy to meet future demand for aggregates will need to assess both land and marine resources.

How is our coastline described geographically?

The 650 kilometres of coastline stretching from the tidal River Foyle in the north-west to Newry in the south-east represents only 2.7% of the whole coast of the United Kingdom. However this small area is very diverse in character incorporating 3 broad types of landscape.

The first type is found in the north and north-east, having a rugged and open character with rocky headlands and cliffs interspersed with beaches of boulders, gravel or sand. The north coast, in particular, is exposed to the waves and swell of the Atlantic Ocean which has a major influence on the environment. To the north of Rathlin Island, the seabed drops to a maximum depth of about 240 metres. West of Rathlin Island, off the north-east coast of Donegal, the overall seabed gradient is relatively gentle.

Between east Antrim and Scotland is the North Channel, where the Beaufort's Dyke reaches a maximum depth of 315 metres off the Scottish Coast. The importance of the landscape here has been reflected in the designation of three Areas of Outstanding Natural Beauty, the

Antrim Coast and Glens, the Causeway Coast and Binevenagh. These areas are shown in Figure 2.4. The world famous Giant's Causeway is a United Nations Educational Scientific and Cultural Organisation (UNESCO) World Heritage site.

The coast of much of County Down is gentler and lower lying representing the second geographical type. Any cliffs that do exist are mostly relics of the last ice age and made up of soft material easily eroded by the sea. The shore here is composed of sand or gravel beaches or rocks. This coastline is washed by the Irish Sea and varies in depth between 20 -100 metres over much of its extent with a deeper channel, exceeding 100 metres, running north to south between Northern Ireland and the Isle of Man. The seabed shelves relatively gently off the south-east coast of County Down reaching about 100 metres at the 12 nautical mile limit.

The third landscape type is the great indentations of the coast that form our sea loughs. The sheltered shores within the loughs are usually composed of fine sand or muddy sediments. Together, the sea loughs have an area of 522 square kilometers and drain over 40% of the land area of Northern Ireland.



Strangford Lough

The main physical properties of the sea loughs are summarised in Table 1.2 opposite.

Lough Foyle forms the north western border between Northern Ireland and the Republic of Ireland. A large volume of freshwater flows in from the rivers Foyle, Roe and Faughan with the result that the water has only about two thirds of the salinity of the open sea. Seventy-five percent of the land draining into it is in Northern Ireland. Lough Foyle is our largest true estuary.

Strangford Lough is our deepest sea lough with a maximum depth of 59 metres. The Strangford Narrows connect the Lough to the Irish Sea. Water is forced through the Narrows at speeds reaching up to 9 knots at full tidal flow. The main freshwater sources to the Lough are the Comber River in the north-west and the Quoile River in the south-west.

Belfast Lough is the third largest of our sea loughs and the most heavily industrialised. This Lough is semi-enclosed with 96% of its area sub-tidal. Belfast lies at its western end where the River Lagan enters.

Carlingford Lough is the most southerly of the five sea loughs. It is mostly less than 5 metres deep with a deeper narrow channel along its

centre. Like Lough Foyle, it is a cross-border system. Its only significant freshwater source is the Newry river which carries a relatively small volume of water even in winter.

Larne Lough is our smallest sea lough enclosed to the east by the peninsula of Islandmagee, with Larne at its seaward end. The Glynn and Larne rivers which flow into it drain a relatively small land area.

Water flows are governed by the tides and wind. In the main, water enters the Irish Sea in the south through the Celtic Sea and flows out to the north through the North Channel although some Atlantic water may flow southward along the Antrim coast. Tidal currents are strongest in the North Channel and around the north coast. These currents and waves control the amount and type of sediment on the seabed.

In some parts of the sea, sediment is accumulating on the sea floor, in others, it is eroding away. Where it is eroding, the sediment may be less than 2 metres thick, but in areas where it is depositing, it is much thicker. Off Portrush, there are spectacular underwater sand waves up to 20 metres in height. Between the Isle of Man and Irish

System	Carlingford Lough	Strangford Lough	Belfast Lough	Larne Lough	Lough Foyle	Total
Volume (x10 ⁶ m ³)	460	1537	1548	27	752	4324
Area (km ²)	49	149	130	8	186	522
Mean Depth (m)	6.1	11.7	8.9	1.9	4.2	-
Maximum depth (m)	35	65	16	7	18	-
Catchment area (km ²)	474	772	900	115	3700	5961
Temperature (°C)	3-20	2-19	2-21	4-18	2-20	-
Mean salinity	32.5	33	28	33	21	-
River flow (m ³ s ⁻¹)	1-9	3.5	32	3.2	105	-

Table 1.2 Main physical properties of the five sea loughs.

coast, tides are very weak which allows sediment to accumulate, forming a large area of soft mud. During the summer months as the top layers of water warm up, an anti-clockwise circulation or gyre develops which serves to retain larvae of fish and the Dublin Bay Prawn *Nephrops norvegicus*, forming the basis for the area's valuable fisheries.

How is this report structured?

The aim of this report is to give an account of the current state of our seas as we understand it.

This report complements the recent UK-wide report 'Charting Progress 2 – The State of UK Seas'⁽³⁾ which provides a comprehensive assessment of UK seas within 8 sea regions. Charting Progress 2 was compiled by the UK Marine Monitoring and Assessment community, in which both NIEA and AFBI actively participate.

Our report complements Charting Progress and draws out issues specific to Northern Ireland.

The way in which we report on the marine environment is changing. In July 2008, a new Marine Strategy Framework Directive was adopted by the European Union. This was transposed into UK legislation in July 2010.

The aim of the new Directive is to give more effective protection to the marine environment

across Europe. It aims to achieve good environmental status of marine waters by 2020 and to protect the resource base upon which marine-related economic and social activities depend.

The Marine Strategy Framework Directive constitutes the vital environmental component of the European Union's future maritime policy. It is designed to achieve the full economic potential of oceans and seas in harmony with the marine environment.

The concept of good environmental status, encapsulates the desired state for 11 aspects of marine environmental quality, ranging from fish and food webs, to marine litter and underwater noise. These categories form the backbone of this report. Each category is to be assessed against a so-called "descriptor". The full list of the 11 descriptors is presented in Appendix I.

On 1 September 2010, the European Commission published a decision on the criteria for good environmental status⁽⁴⁾. Where possible, these build on existing obligations. However, while some criteria are fully developed and operational, others require further refinement. The decision is seen as a starting point in establishing precise objectives, which will be under discussion at both a UK and European level.



This report will enable us to identify where our knowledge is good and where further work is needed to comply with the new Directive requirements. In addition to the 11 categories with descriptors, this report contains chapters on bathing waters, marine archaeology and

ports. These are important topics which are not explicitly included in the new Directive. There is no specific chapter reporting on climate change. However, many of the datasets reported on are important in our local understanding of climate change.

References

- (1) DEFRA 2002 'Safeguarding our Seas – A Strategy for the Conservation and Sustainable Development for our Marine Environment.'
- (2) DETI 2009 'Consultation on Offshore Renewable Energy Strategic Action Plan 2009-2020'.
- (3) DEFRA 2010 'Charting Progress 2 – The State of UK Seas'.
- (4) Official Journal of the European Union 2010 'Commission Decision of 1 September 2010 on criteria and methodological standards on good environmental status of marine waters.'