Marine Plan for Northern Ireland
Sustainability Appraisal

Volume 3: Appendices

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Appendix A – Summary of Environmental Protection Objectives

The table below provides a summary of the environmental protection objectives relevant to the Marine Plan. The SA topic to which the legislation/Plan/Strategy document primarily relates is identified but it should be noted that some documents cover multiple topics.

SA Topic	Jurisdiction	Legislation/Plan/ Strategy	Summary/Objectives
General (multiple SA Topics)	**International**	UN Convention on the Law of the Sea 1982 (UNCLOS)	The Law defines the rights and responsibilities of nations in their use of the world's oceans, establishing guidelines for businesses, the environment, and the management of natural resources.
	European	Marine Strategy Framework Directive (MSFD) 2008/56/EC	The aim of the MSFD is to protect more effectively the marine environment across Europe. It extends the requirements of the Water Framework Directive (WFD) into seas beyond 1nm. The MSFD requires Member States to "take necessary measures to achieve or maintain good environmental status in the marine environment by the year 2020 at the latest".
		Maritime Spatial Planning Directive 2014/89/EU	European Parliament and the Council adopted legislation to create a common framework for maritime spatial planning in Europe. While each EU country will be free to plan its own maritime activities, local, regional and national planning in shared seas would be made more compatible through a set of minimum common requirements.
		European Integrated Maritime Policy 2007 (updated 2014)	Aims to deliver a sustainable development approach for Europe's oceans and sea and a coherent approach to maritime issues.
		EU Common Fisheries Policy	The Common Fisheries Policy is a set of rules for managing fishing fleets and conserving fish stocks, the policy includes proposals for the protection and certain fish species.
	United Kingdom	Marine and Coastal Access Act 2009	The Act provides the legal mechanism to ensure clean, healthy, safe, productive and biologically diverse oceans. The key issues covered by the Act comprise: the creation of a Marine Management Organisation (MMO); planning in the marine area; licensing activities in the marine area; marine nature conservation; managing marine fisheries; reform of inland and migratory fisheries;

SA Topic	Jurisdiction	Legislation/Plan/ Strategy	Summary/Objectives
			modernisation and streamlining of enforcement powers; administrative penalties scheme for domestic fisheries offences; and access to coastal land. The Marine and Coastal Access Act 2009 requires that marine plans are prepared for the UK marine area (0 to 200 nautical miles). The devolved administrations (the Scottish Government, the Welsh Government and the Northern Ireland Executive) have jurisdiction over marine planning matters from 0 to 12 nautical miles.
		Marine Strategy Regulations 2010	The Marine Strategy Regulations transpose the Marine Strategy Framework Directive into UK Law.
		UK Marine Policy Statement 2011	The UK Administrations (UK Government, Scottish Government, Welsh Government and Northern Ireland Executive) share a common vision of having clean, healthy, safe, productive and biologically diverse oceans and seas. Joint adoption of a Marine Policy Statement provides a consistent high level policy context for the development of marine plans across the UK to achieve this vision. Such marine plans must be in accordance with the Marine Policy Statement.
	Northern Ireland	Marine Act (Northern Ireland) 2013	The Marine Act sets out a new framework for Northern Ireland's seas based on: a system of marine planning that will balance conservation, energy and resource needs; improved management for marine nature conservation and the streamlining of marine licensing for some electricity projects. The Marine Act applies to the Northern Ireland inshore region (out to 12 nautical miles). This area includes all the tidal rivers and sea loughs.
Biodiversity, Flora and Fauna	**International**	UN Convention on Biological Diversity (1992)	Requires that all parties to the Convention develop national biodiversity strategies, plans or programmes, and that they seek to integrate the provisions of these across other policy sectors. The Convention also requires the identification of key resources and their protection and the monitoring of potentially damaging processes and activities to establish representative networks of protected areas in the maritime environment by 2012.
		The Ramsar Convention The Convention of Wetland of International	Protection and conservation of wetlands, particularly those of importance to waterfowl as waterfowl Habitat. The Convention has designated wetland sites.

SA Topic	Jurisdiction	Legislation/Plan/ Strategy	Summary/Objectives
		Importance (1971 and amendments)	
		Bern Convention on the Conservation of European Wildlife and Natural Habitats (1979)	Conservation of wild flora and fauna and cooperation between states to ensure the protection of biodiversity.
		Bonn Convention on the Conservation of Migratory Species an Wild Animals (1979)	Conservation of terrestrial species and wildlife on a global scale.
		The Convention for the Protection of the Marine Environment of the North-East Atlantic (the "OSPAR" Convention)	This Convention has led to establishment of a cross-regional commission promoting an ecosystems approach to marine management, including establishment of a network of Marine Protected Areas. Its five work areas are biodiversity and ecosystems, eutrophication, hazardous substances, offshore industry, and radioactive substances). Climate change is also a key cross-cutting theme. Also includes a Biological Diversity and Ecosystems Strategy.
		Agreement on the Conservation of African-Eurasian Migratory Waterbirds 1995 (AEWA)	An independent international treaty developed under the auspices of the UNEP/Convention on Migratory Species. The AEWA covers 255 species of birds ecologically dependent on wetlands for at least part of their annual cycle, including species of divers, grebes, cormorants, herons, ducks, swans, geese, waders, gulls, and terns. An action plan addresses issues including: species and habitat conservation, management of human activities, research, monitoring, education and implementation.
		Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas 1992 (ASCOBANS)	An agreement on the protection of small cetaceans, noting that the migratory nature of dolphins, porpoises and whales means that they can be vulnerable to a range of marine activities and issues.
		UN Agreement on Straddling Fish Stocks and Highly Migratory Fish Stocks 2001	Sets out principles for the conservation and management of specified fish stocks and establishes that such management must be based on the precautionary approach and the best available scientific information. The Agreement elaborates on the fundamental principle, established in UNCLOS that States should co-operate to ensure conservation and promote the objective of the optimum utilisation of fisheries resources both within and beyond the exclusive economic zone.
		International Plan of	The objective of the IPOA-SHARKS is to

SA Topic	Jurisdiction	Legislation/Plan/ Strategy	Summary/Objectives
		Action for the Conservation and Management of Sharks 1999	ensure the conservation and management of sharks and their long-term sustainable use.
	European	Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive)	Established a commitment to designating networks of sites of ecological importance across Europe. These are known as Natura 2000 sites and include special protection areas (SPAs) designated under the Birds Directive and special areas of conservation (SACs) designated under the Habitats Directive.
		Directive 2009/147/EC on the conservation of wild birds (codified version) of Directive 79/409/EEC on the conservation of wild birds (the Birds Directive)	Protects all wild birds (together with their nests and eggs) and their associated habitats. Commitment to the designation of SPAs (included in Natura 2000 sites network).
		Bern Convention on the Conservation of European Wildlife and Natural Habitats (1979)	Conservation of wild flora and fauna and cooperation between states to ensure the protection of biodiversity.
		The Pan-European Biological and Landscape Diversity Strategy (1995)	The Strategy aims to reverse the decline of landscape and biological diversity, by promoting innovation and proactive policy making. It supports preceding measures for protecting natural heritage, and aims to supplement this by further promoting a number of action themes relating to different environmental resources. Emphasises the rapid decline of some key characteristics and resources, including traditional human-made landscapes, coastal zones, marine areas, wetlands, mountains and grassland.
		EU Biodiversity Strategy 2020	The European Commission has adopted an ambitious new strategy to halt the loss of biodiversity and ecosystem services in the EU by 2020. There are six main targets, and 20 actions to help Europe reach its goal. The six targets cover: § Full implementation of EU nature legislation to protect biodiversity; § Better protection for ecosystems, and more use of green infrastructure; § More sustainable agriculture and forestry; § Better management of fish stocks; § Tighter controls on invasive alien species; and, § A bigger EU contribution to averting

SA Topic	Jurisdiction	Legislation/Plan/ Strategy	Summary/Objectives
			global biodiversity loss.
	United Kingdom	Wildlife and Countryside Act 1981 (as amended)	Provides the framework for protection of species other than European Protected Species. Sets out protection objectives for specified birds and wild animals. The Act's various schedules detail the species that are protected under the Act, including dolphins, porpoises, and numerous birds such as geese and ducks. This was reviewed and updated in December 2008 and it was recommended that several further species of marine fish should be added to the lists attached to the Act, including shark, seahorse and ray species.
		The Offshore Marine Conservation (Natural Habitats, &c) Regulations 2007 (the Offshore Marine Regulations)	The Regulations extend protection to important species and habitats under the Birds and Habitats Directives beyond UK territorial waters (outside 12nm). They give protection to marine species, wild birds and habitats, mainly through the creation of offences and site protection mechanisms.
		The UK Post-2010 Biodiversity Framework 2012	This succeeds the UK Biodiversity Action Plan 1994 (UKBAP) which described the UK's biological resources and commits a detailed plan for the protection of these.
	Northern Ireland	The Wildlife (Northern Ireland) Order 1985 (as amended)	Makes it an offence to intentionally kill, injure, or take any wild bird or their eggs or nests.
		The Wildlife and Natural Environment Act (Northern Ireland) 2011	This amends the Wildlife Order by giving protection to a wider range of plants, animals and birds and providing additional enforcement powers and increased penalties for wildlife relation offences.
		Environment (Northern Ireland) Order 2002	Provides the power to declare areas of land as Areas of Special Scientific Interest (ASSI)
		The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended)	Provides for the designation, protection and management of European Sites', the protection of 'European Protected Species' and the adaptation of planning and other controls for the protection of European Sites
Water and Soils	**International**	IMO International Convention for the Prevention of Pollution from Ships 1973 (MARPOL)	Aims to prevent marine pollution from ships and in part from oil rigs and production platforms. It includes annexes covering pollution by oil, noxious liquids, harmful substances, sewage, garbage and air pollution. Recent changes focus on reducing the sulphur content and particulate emissions from fuel in the shipping sector.
		International Convention on Oil Pollution	Provides a framework for international co-operation in combating major incidents or threats of marine pollution.

SA Topic	Jurisdiction	Legislation/Plan/ Strategy	Summary/Objectives
		Preparedness, Response and Co-operation, 1990	
		London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 (as amended)	Prohibits the dumping of certain hazardous materials, requires a prior special permit for the dumping of a number of other wastes, and a prior general permit for other wastes or materials. It also creates a basis in international law to allow and regulate carbon capture and storage (CCS) in sub-seabed geological formations.
	European	Water Framework Directive 2000/60/EC	This provides an overarching strategy, including a requirement for EU Member States to ensure that they achieve 'good ecological status' by 2015. River Basin Management Plans (RBMPs) were defined as the key means of achieving this. The Directive applies to 1nm. Coastal waters beyond 1nm are covered by the Marine Strategy Framework Directive.
		Bathing Waters Directive 2006/7/EEC	Aims to protect the public and the environment from faecal pollution at waters used for bathing by large numbers of visitors. Achieves this by making information on quality public, and setting standards to be met by 2015.
	United Kingdom	The Merchant Shipping Regulations 2009	Implements Directive 2005/35/EC
		Merchant Shipping Act 1995	General provisions for merchant shipping, seamen, and safety. Part VI focuses on prevention of pollution, including oil pollution. Sets out responsibilities and liabilities. Also covers international incidents. Other issues include lighthouses, salvage and wrecks.
		Environmental Protection Act 1990	Covers pollution control and waste management. Also covers litter, radioactive substances and genetically modified organisms. Pollution at sea is specifically controlled.
		Pollution Prevention and Control Act 1999	Implements Directive 96/61/EC (Integrated Pollution Prevention and Control). Regulating industrial and commercial activities which may cause environmental pollution and to prevent and control emissions that are capable of causing any pollution.
	Northern Ireland	The Water (NI) Order 1999	The Order promotes the conservation of the water resource and the cleanliness of surface and ground water, establishes powers to make regulations for the control of water abstraction and requires consent for

SA Topic	Jurisdiction	Legislation/Plan/ Strategy	Summary/Objectives
			any discharges to the aquatic environment during construction and operational activities.
		Abstraction and Impoundment (Licensing) Regulations (Northern Ireland) 2006	Implements requirements under both the Water Framework and Habitats Directives, to establish a water resource management, assessment and licensing regime.
		Control Of Pollution (Oil Storage) Regulations (NI) 2010	Contributes to the implementation of the Water Framework Directive by complementing and enhancing existing water pollution controls. Sets minimum design standards for new and existing above ground oil storage facilities, providing a legal requirement for the standards to be met.
		The Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2017	Implements the Water Framework Directive in Northern Ireland.
		The Quality of Bathing Water Regulations (Northern Ireland) 2008 (as amended)	Implements Bathing Waters Directive within Northern Ireland.
Air Quality	**International**	World health organisation (WHO) Air Quality Guidelines (1999) and Guidelines for Europe (1987)	Seek the elimination or minimisation of certain airborne pollutants from protection of human health.
		Montreal Protocol (UN September 1987)	Sets out the protection of the ozone layer and the phasing out of ozone depleting substances.
		Geneva Convention on Long- Range Transboundary Air Pollution 1979	Controls and reduces environmental damage caused by transboundary air pollution.
	European	Directive 2008/50/EC of the European Parliament and of the Council on ambient air quality and cleaner air for Europe	Ambient air quality and cleaner air for Europe New air quality and includes objectives for PM2.5 (fine particles) including the limit value and exposure related objectives – exposure concentration obligation and exposure reduction target
	United Kingdom	UK Air Quality Strategy for England, Scotland, Wales and Northern Ireland	Strategic Framework for Air Quality Objectives for key air pollutants.
		The Air Quality Standards Regulations 1989	Implements EU Directives 80/779/EEC, 82/884/EEC and 85/203/EEC on air quality limit values and guide values for sulphur dioxide, suspended particulates, lead and nitrogen dioxide.
		Environmental Protection Act 1990	Establishes the framework for the control of emissions from regulated processes.

SA Topic	Jurisdiction	Legislation/Plan/ Strategy	Summary/Objectives
		Environment Act 1995	Protects and improve air quality, including the Air Quality Strategy and the Local Air Quality Management (LAQM) regime.
	Northern Ireland	Air Quality Limit Value (Amendment) Regulations (Northern Ireland) 2004	Sets out air quality limit or guide values for specified pollutants to be achieved by local authorities
		Air Quality Standards Regulations (Northern Ireland) 2010	Requires the local authority to designate an Air Quality Management Area (AQMA).
Climate Factors	**International**	UN Kyoto Protocol	The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change, which commits its Parties by setting internationally binding emission reduction targets.
		Convention on Climate Change (UNFCCC)	Alleviate the impacts of climate change and reduce global emissions of Green House Gases.
		Integrated Energy and Climate change package 2007	A comprehensive package of measures to establish a new Energy Policy for Europe to combat climate change and boost the EU's energy security and competitiveness. The package of proposals set a series of ambitious targets on greenhouse gas emissions and renewable energy and aim to create a true internal market for energy and strengthen effective regulation.
	European	Emissions Trading System Directive 2009/29/EC	Replaces Directive 2003/87/EC revising the emissions trading system to fight climate change and promote renewable energy. The Directive implements the Integrated Energy and Climate change package 2007 and makes a more efficient and greater contribution to tackling climate change, and creates more predictable market conditions and improved certainty for industry.
	United Kingdom	Electricity Act 1989	Provides the legislative background within which the energy sector functions. Sets out the framework within which applications for marine energy development should seek consent.
		Energy Act 2004	Covers the civil nuclear industry, sustainability and renewable energy sources. Aims to achieve diversification of supply in favour of renewable sources. Augments the system for determining developments within territorial waters. Provided the Crown Estate with rights to license the generation of renewable energy and grant leases for development sites out to 200nm.

SA Topic	Jurisdiction	Legislation/Plan/ Strategy	Summary/Objectives
	Northern Ireland	Northern Ireland Climate Change Adaption Programme 2014	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.
Socio-Demographics	**International**	Aarhus Convention	Right for everyone to see public information that is held by public authorities. Right for everybody to participate in environmental decision making
		The Stockholm Convention (2001)	Global treaty to protect human health and the environment from persistent organic pollutants (POPs)
	European	Directive 2002/49/EC (the Environmental Noise Directive	Avoid, prevent or reduce on a prioritised basis the harmful effects, including annoyance, due to exposure to environmental noise
	United Kingdom	Food and Environment Protection Act 1985	Part II protects the marine ecosystem and human health by controlling the deposit of articles or materials or scuttling of vessels in the sea or tidal waters.
	Northern Ireland	Environmental Noise Regulations (Northern Ireland) 2006	Requires Authorities to deliver their obligations under the Environmental Noise Directive
Uses and Activities	**International**	UN Agreement on Straddling Fish Stocks and Highly Migratory Fish Stocks 2001	Sets out principles for the conservation and management of specified fish stocks and establishes that such management must be based on the precautionary approach and the best available scientific information. The Agreement elaborates on the fundamental principle, established in UNCLOS that States should co-operate to ensure conservation and promote the objective of the optimum utilisation of fisheries resources both within and beyond the exclusive economic zone.
	Northern Ireland	Fisheries Act (Northern Ireland) 1966	The Act makes provision for the licensing of fish and shellfish farms and the development and improvement of fisheries.
Cultural Heritage	**International**	World Heritage Convention 1972	Requires the UK to integrate the protection of cultural heritage into comprehensive planning programmes.
		The United Nations Convention on the Law of the Sea (1982)	The legal framework relating to the marine environment. Article 303 (paragraph 1) states that signatories 'have a duty to protect objects of an archaeological and historical nature found at sea and shall cooperate for this purpose'.

SA Topic	Jurisdiction	Legislation/Plan/ Strategy	Summary/Objectives
	European	The European Landscape Convention, Florence, 2004	The convention is the first international instrument devoted exclusively to the protection, management and planning of landscape in its entirety. It specifically recognises the role of landscape as a basic component of cultural heritage and identity as well as an important contributor to quality of life.
		European Convention on Protection of the Archaeological Heritage (Revised), Valletta, 1992	The convention includes provisions for the identification and protection of archaeological heritage, conservation and control of excavations.
	United Kingdom	Joint Nautical Archaeology Policy Committee (JNAPC) Code of Practice for Seabed Developers (JNAPC 2008)	The JNAPC Code is voluntary but provides a framework that seabed developers can use in conducting their activities in an archaeologically sensitive manner. A guidance note on protocols to deal with the marine historic environment developed specifically for the offshore renewable energy sector has also been prepared.
		Protection of Wrecks Act 1973	The 1973 Act provides protection for designated wrecks and for the designation of dangerous sites.
		Ancient Monuments and Archaeological Areas Act 1979	Provides for the protection of archaeological heritage, including the scheduling of 'monuments'. The Act primarily deals with terrestrial locations but there is provision to designate submarine sites.
		Protection of Military Remains Act 1986	Identifies scope for protected places and controlled sites, covering vessels. This reflects the status of these sites as war graves.
	Northern Ireland	Historic Monuments and Archaeological Objects (NI) Order 1995	Provides for the protection of all archaeological sites and objects.
		Planning (NI) Order 1991	Provides protection to listed buildings within Northern Ireland.
		Planning Policy Statement 6, Planning Archaeology and the Built Heritage.	This PPS sets out the planning policies for the protection and conservation of archaeological remains and features of the built heritage.
Landscape and Seascape	**European**	Council of Europe, European Landscape Convention 2000	States that landscapes across Europe make an important contribution to quality of life and cultural identity, but that they are being transformed as a result of a number of factors, including town planning, transport and infrastructure and the economy. Requires Member States to develop more comprehensive frameworks to protect and enhance landscapes. Notes that landscape

SA Topic	Jurisdiction	Legislation/Plan/ Strategy	Summary/Objectives
			has no boundaries and that people are central to its management. Includes inland water and marine areas in its coverage and emphasises the importance on non-designated landscapes in addition to those which are protected.

Appendix B – Alternatives

Appendix B1: Alternatives Considered

Step 1 - Do Not Develop a Plan

Assumptions

Under this option, a Marine Plan for Northern Ireland would not be developed. Instead, the existing policy framework governing NI waters would remain in place. This includes the Marine Policy Statement and European Directives such as the Marine Strategy Framework Directive, Water Framework Directive and Habitats Directive as well as international commitments, e.g. OSPAR Convention. Existing decision-making bodies, such as other marine relevant NI Departments and The Crown Estate would continue to exercise their functions.

However, the level of decision-making to be filled by the existence and adoption of the Marine Plan would not be filled, meaning that there would be a gap between high-level UK marine planning and policies and regional and local marine decision-makers. Also, given the directional role a Marine Plan for NI should fulfil to any future NI marine plans for specific localities, the absence of a marine plan would create uncertainty as to whether such marine plans would be prepared and adopted.

Implications for Environment		Implications for Economy		Implications for Social		Implications for Governance		Implications for Sound Science	
Obj 5	**o**	Obj 1	**-**	Obj 4	**-**	Obj 9	**-**	Obj 10	**o**
Obj 7	**o**	Obj 2	**-**	Obj 5	**-**				
Obj 8	**o**	Obj 3	**-**	Obj 6	**o**				
		Obj 5	**-**						
Environmental protection would still continue to be provided through existing European UK & NI legislation and policy framework. However producing the Marine Plan would contribute towards a beneficial regional marine clarity and increased co-ordination / integration and awareness between environmental, economic and social considerations.		The existing policy framework would still continue to direct certain sectors towards sustainable growth. However it would do so in the perceived absence of the necessary integration that contributes towards the sustainable growth of the marine economy, while seeking to ensure balance between the different marine sectors/ industries. The development of the Marine Plan would contribute towards this integration and in addition actively promote the safeguarding and creation of marine related			Currently, there is public / stakeholder perception that there is an uncoordinated approach to promoting access to the coast / Rathlin for coastal and marine recreation and thereby contributing towards vibrant, accessible and sustainable coastal communities. The Marine Plan would assist in delivering this coordinated integration and ultimately contribute to the economic resilience and cohesion of our coastal / Rathlin communities.		The current absence of a marine plan and a plan-led system for NI marine activities, which would provide the framework within which decisions on future proposals would be taken, creates uncertainty for marine users and prospective developers / investors about marine priorities. The production of a single marine plan document, covering both our inshore and offshore regions, should reduce the regulatory burden for prospective developers / investors and give them more		In the absence of a marine plan, marine related data will still continue to be gathered and analysed by many different organisations and for a variety of purposes. An uncoordinated gathering of marine data risk increases the risk of organisations: 1 - duplicating work; 2 – being unaware of the data held by other organisations; 3 – being unaware of data gaps; and 4 – ineffective use of resources.	

Step 1 - Do Not Develop a Plan				
	employment.		confidence to proceed with individual proposals.	

Summary
The option would result in a lack of direct benefits for the economy, coastal communities, population and human health. There is a comprehensive range of existing environmental protection legislation and policy which is positive for the environment; however without a marine plan there would be a lesser degree of integration between environmental and economic considerations.

Outcome
The creation of a Marine Plan for Northern Ireland is a requirement of the Marine (NI) Act 2013 and the Marine and Coastal Access Act 2009, and therefore this option of not developing a marine plan, is not considered to be a viable alternative.

Step 2 – A Strategic Level Plan

Assumptions

This option supports development of individual marine economic sectors but within environmental and social parameters and constraints. It provides some guidance on preferred locations for different types of development (with a focus on marine renewables) but in the main sets out policy considerations in terms of sustainable development which need to be recognised by marine decision makers and any future marine plans that may be produced for specific NI marine areas. The overarching rationale behind the plan is the inclusion of of environmental, social and economic policies requiring the equal consideration of these factors into the marine planning decision making process.

Implications for Environment		**Implications for Economy**		**Implications for Social**		**Implications for Governance**		**Implications for Sound Science**	
Obj 5	+	Obj 1	+	Obj 4	+	Obj 9	+	Obj 10	+
Obj 7	+	Obj 2	+	Obj 5	**o / +**				
Obj 8	+	Obj 3	+	Obj 6	**o / +**				
		Obj 5	**+ / -**						
The requirement for environmental gain / environmental mitigation within the plan as part of the decision making process means that this option is largely positive in relation to the plan's environmental objectives.		This alternative promotes a sustainable marine economy and associated employment by supporting the sustainable development of the individual marine economic sectors, whilst at the same time respecting the requirements of other marine interests. While promoting a sustainable marine economy, it is unclear how, at the same time, this alternative will be able to simultaneously promote the differing requirements of the various marine based economic sectors. Similarly it is unclear if and to what extent environmental consideration and respecting other marine users may create obstacles for those in the marine economic sectors.		This option is largely positive for communities, population and human health. The Marine Plan proactively seeks the development of vibrant accessible and sustainable coastal communities, whilst also promoting the marine resource and its associated social, economic, heritage and environmental benefits. Accordingly, a marine plan which proactively supports marine related tourism and recreation will also benefit the greater marine economy and those coastal communities which depend on it.		The production of a single Marine Plan document, covering both our inshore and offshore regions, should reduce the regulatory burden for prospective developers / investors and give them more confidence to proceed with individual proposals. The production of a high level Marine Plan and its associated assessments will give all Departments in NI with marine responsibility and adjoining marine administrations an opportunity to effectively and meaningfully participate in the plan development.		Production of a Marine Plan will require a coordinated approach to data collection and management amongst those actively engaged in this area to ensure data gaps are identified and resources are not used to duplicate data gathering. The clearest benefit of the production of a Marine Plan for sound science will be the introduction of a Marine Plan Portal whereby all relevant marine data will be collated into a central point and accessible to all to enable them to see how up to date is being used to underpin marine decision making.	

Step 2 – A Strategic Level Plan
Summary This option is largely positive across the three topics of environment, economy, communities, population and human health through the emphasis on economic development of the individual marine sectors and the inclusion of the mitigating policies. **Outcome** This is the preferred option identified for the Marine Plan for Northern Ireland.

Step 2: A Detailed Zoning Plan

Assumptions

This option provides a clear indication of the locations where certain marine economic activities can take place, including where different activities are compatible within the same locations.

Key aspects of this approach include:

- Availability and gathering of sufficient information to ensure sound decision making within the plan preparation process;
- Weighting of environmental and economic considerations against each other to identify the best use of different areas;
- Identifying the carrying capacity of different marine environments; and,
- Understanding of market influences on different marine industries.

The Marine Plan would provide certainty in relation to the extent of available resource for different marine economic sectors. It is assumed that this approach provides positive protection for the environment within the context of sustainable economic development.

Implications for Environment		Implications for Economy		Implications for Social		Implications for Governance		Implications for Sound Science	
Obj 5	**o**	Obj 1	**+**	Obj 4	**+ / -**	Obj 9	**+**	Obj 10	**+**
Obj 7	**+**	Obj 2	**+**	Obj 5	**+ / -**				
Obj 8	**o**	Obj 3	**+ / -**	Obj 6	**+ / -**				
		Obj 5	**+ / -**						
It is assumed that the directing of certain activities to spatially zoned areas would be undertaken with a full environmental consideration. This marine plan alternative would focus activity within certain areas and this alternative could be largely positive for environmental topics. No perceivable benefits are foreseen in terms of climatic factors and air quality if this alternative were to be adopted.		This alternative has mixed implications in relation to the objectives. It promotes a sustainable marine economy through providing certainty to prospective developers / investors by identifying suitable areas for economic activity while at the same time integrating environmental considerations. Conversely certain marine sectors may not be suitable for co-location with others and therefore may be excluded from their preferred location. This alternative		This alternative increases the certainty about economic development opportunities being permitted in certain areas with the NI marine area. Accordingly it could be perceived to be beneficial therefore in terms of developing and maintaining transport links to certain coastal areas. However it does not proactively contribute to promoting vibrant, accessible and sustainable coastal communities. In favouring certain localities e.g. in terms of tourism and recreation, others		The production of a single Marine Plan document, covering both our inshore and offshore areas, should reduce the regulatory burden for prospective developers / investors and give them more confidence to proceed with individual proposals. The production of a high level Marine Plan and its associated assessments will give all Departments in NI with marine responsibility and adjoining marine administrations an opportunity to effectively and meaningfully participate in the plan development.		Production of a Marine Plan will require a coordinated approach to data collection and management amongst those actively engaged in this area to ensure data gaps are identified and resources are not used to duplicate data gathering. The clearest benefit of the production of a marine plan for sound science will be the introduction of a Marine Plan Portal whereby all relevant marine data will be collated into a central point and accessible to all to enable them to see how up to date is being used to underpin marine

Step 2: A Detailed Zoning Plan				
	offers less certainty in terms of job creation overall and the implications for those potential jobs that could be lost if certain marine proposals are considered unsuitable to be co-located with existing sectors in specific areas. Such a situation could have an associated detrimental impact on nearby coastal communities if potential jobs were to be lost in such a manner.	outside these specific areas may feel disadvantaged.		decision making.

Summary
This option has some environmental benefits through zoning activities and taking environmental considerations into account, but is not strongly positive. It has some potential negative effects on the economic objectives as a result of constraint on the location of activities and creation of barriers to development. The option has some positive effects in relation to communities through creating certainty in acceptable locations for economic development and opportunities for recreation and tourism, but there would also be reduced opportunity for local planning/ decision-making.

A Marine Plan that creates zones, would conflict with the future need for more localised marine plans.

Outcome
The preferred option has not taken a zoning approach, but has set out the broad policy direction. The zoning approach does not bring particular benefits across the appraisal topic areas, and would require a high degree of information gathering and analysis (which is a key purpose and benefit of regional marine planning).

Step 3: A Strategic Level Plan with determining weight applied to economic considerations.

Assumptions

This option explores the possible measures which would achieve greatest economic benefit. Key aspects of this approach include:

- reducing environmental regulation and licensing;
- supporting marine economic activity through a variety of active measures; such as designating enterprise areas;
- encouraging investment in marine activities with greatest economic benefit;
- expanding all marine based activity;
- using a market driven approach to locate marine development activities;
- taking a short term view of fisheries;
- exploiting all marine resources;
- marketing the marine environment for use by other countries;
- charging for recreational use;
- protecting environmental resources where these provide economic benefit; through e.g. green tourism;
- expanding infrastructure within ports and harbours; and,
- protecting coasts through hard defences.

Implications for Environment		Implications for Economy		Implications for Social		Implications for Governance		Implications for Sound Science	
Obj 5	-	Obj 1	o /-	Obj 4	o / -	Obj 9	-	Obj 10	-
Obj 7	-	Obj 2	+ / -	Obj 5	-				
Obj 8	-	Obj 3	+ / -	Obj 6	o / -				
		Obj 5	+ / -						
This alternative is likely to have significant implications for the Marine Plan's environmental objectives. Environmental protection would be limited to those species / habitats & ecosystems that "pay their way" in terms of eco-tourism or are required to be protected under legislation. In doing so, such protection for eco-tourism purposes may be at variance with the Marine Plan's overall economic objectives. Active promotion of those activities that prioritise economic		Certain significant marine economic sectors rely on a healthy, productive and managed marine environment. A "free for all" scenario with reduced environmental controls and increased catches / production is likely to make the marine environment ultimately unsustainable in the long term. Despite being short –term positive for sectors such as fisheries and aquaculture, the long term outlook with likely environmental damage and declining numbers		It is considered that such an approach would be short-term positive for our coastal communities as they capitalise on the back of an economically focused marine boom. Infrastructure development and increasing employment levels will improve the viability of such communities, potentially in the short run. However the short-term gains need to be assessed against the long term implications: - impact on traditional fisheries based communities as fish stock		The reduction in environmental regulation and licensing may negatively impact on those other NI Departments with a marine function and responsibility. Adjoining administrations may also be affected. The choice of a plan route which clearly prioritises activities which deliver economic benefits is likely to be considered at odds in relation to the principles of sustainable development and the UK High Level Marine Objectives to which NI has signed up.		Whereas data will still need to be gathered, analysed and monitored, it is likely that it may become increasingly sidelined in terms of assisting with decision making. It is possible that the use of data may only become a priority in assisting in the determination of significant proposals which are likely to be regionally contentious.	

Step 3: A Strategic Level Plan with determining weight applied to economic considerations.				
benefits may adversely impact on air quality / greenhouse gas emissions and water quality however existing legislation would afford some degree of protection. An economic drive, with an associated development thrust, at the expense of environmental considerations would also likely impact on our archaeological coastal heritage and create landscape / seascape issues.	of breeding target species would be untenable. This alternative is likely to have a short-term positive impact for job creation in certain sectors but long-term, the numbers created will be unsustainable as over production / over fishing leads to environmental damage and a fall in marine ecosystem productivity. An economic drive may create a scenario whereby certain sectors will be able to monopolise their position as market leaders to exclude other sectors from attempting to co-locate within specific areas.	decline due to reduced environmental regulations and over fishing. A possible reduction in water quality due to increased economic development and reduced environmental regulation. Decreasing water quality may exacerbate fish stock viability and reduce the tourism / recreation draw of an area with knock on consequences for coastal communities. The alternative allows for the exclusive use of sea areas for different economic activities. Although providing certainty for marine developers / investors, this could impact negatively on the accessibility and connectivity of coastal communities.		

Summary
Although this option has a strong economic focus, it is not strongly positive in relation to the economic objectives which seek to reflect sustainability, balancing different marine economic interests, job creation and avoiding barriers. This option does not place sufficient emphasis on protecting environmental quality which is inherent in supporting a large proportion of marine economic activities. It also does not reflect the complex interactions between different marine economic activities or recognise how one area of activity can adversely affect another. The option also reflects a short term view which is inherently unsustainable and will result in a lack of future economic opportunity.

Outcome
The influence of the findings of this option can be seen in the preferred option which largely results in positive effects for the economic objectives through supporting sustainable economic development, seeking a balance between different marine economic interests, avoiding creation of barriers and therefore supporting the associated jobs.

Step 3 – A Strategic Level Plan with determining weight applied to environmental considerations.

Assumptions

This option prioritises protection of all aspects of the environment including habitats and species, water, air, cultural heritage and landscape/seascape.

Key aspects of this approach include:

- A more stringent approach to environmental regulation and licensing and the use of the precautionary approach when allowing development;
- Increased environmental regulation, including protection of landscape and cultural heritage;
- Adoption of a precautionary approach;
- Supporting climate change adaptation through coastal realignment;
- Reducing environmental impacts of fishing activity through managing types of fishing, target species, and use of sustainable quotas;
- Locating marine economic activity based on environmental appraisal;
- Avoiding noise disturbance and regulating the vessels which cause noise disturbance;
- Managing non-native and invasive species;
- Protecting ecosystem services; and,
- Protecting habitats and species, water quality, air quality, landscape capacity, cultural heritage.

Implications for Environment		**Implications for Economy**		**Implications for Social**		**Implications for Governance**		**Implications for Sound Science**	
Obj 5	**+**	Obj 1	**+ / -**	Obj 4	**+ / -**	Obj 9	**-**	Obj 10	**o / -**
Obj 7	**+**	Obj 2	**+**	Obj 5	**+ / -**				
Obj 8	**+**	Obj 3	**+ / -**	Obj 6	**+ / -**				
		Obj 5	**+ / -**						
This approach would be strongly compatible with all the environmental objectives. Species / habitats / water and air quality / cultural history and landscape would all be afforded the relevant protection.		This alternative enables a sustainable marine economy by protecting the underpinning environmental conditions which facilitate certain marine economic sectors i.e. fisheries, aquaculture and recreation and tourism activities. This alternative also protects in the short–term, those jobs in the above sector, however strenuous environmental regulation and licensing to conserve fish stocks and protect species may create a ceiling for future job creation in these sectors.		This alternative would be broadly supportive in terms of the plans social objectives. An environmental focus would support those coastal communities whose sustainability depends on 'green' economic activities e.g. fishing, recreation & eco-tourism vitality, however the increased environmental regulation may impact to some degree on the promotion of certain recreational / tourist marine activities which could be considered as environmentally		A marine plan with a purely environmental benefits priority may potentially be at variance with other NI Departments with a marine responsibility and those adjoining marine administrations with a less stringent priority for the environment. The resulting implications e.g. for climate change adaptation, seeking changes in fishing activities and boat types and marine economic activity location may significantly adversely impact on other plans and programmes adopted by other		Production of a Marine Plan will require a coordinated approach to data collection and management amongst those actively engaged in this area to ensure data gaps are identified; resources are not duplicated when data gathering; and only science is used to underpin marine decision making. For a purely environmental focused plan, there is the potential that the gathering and use of social and economic data could become secondary in importance and environmental data	

Step 3 – A Strategic Level Plan with determining weight applied to environmental considerations.				
	Strict regulations may potentially impact negatively for job creation in other marine economic sectors.	damaging. Accordingly this may impact on the accessibility and sustainability of some coastal communities.	marine relevant NI Departments or adjoining administrations. To risk their 'buy-in' through these potentially adverse implications would compromise the development of a marine plan.	could be perceived by many as being the sole arbiter for decision making.

Summary
This option is strongly positive in relation to environmental objectives but is also partly positive in relation to the economic objectives. There are however some tensions between the benefits for marine economic industries which rely on good environmental quality and those which do not. The impacts on communities, population and human health are partially linked to the environmental objectives, where positive effects for environmentally dependent marine industries support communities reliant on these. The option is also potentially restrictive in relation to access for marine tourism and recreation which has a negative impact for coastal communities.

Outcome
The benefits of an environmentally focused marine plan are clearly reflected in the preferred option which largely recognises that sustainable economic development is also reliant on good environmental quality, but does not involve environmental controls which are unnecessarily restrictive to economic activity.

Appendix B2: Marine Plan Objectives used for Alternatives Analysis (November 2013)

Objective 1: To promote the sustainable development of economically productive activities while respecting the requirements of other marine interests.

Objective 2: To help realise the potential of energy and energy storage in the marine area while respecting the requirements of other marine interests.

Objective 3: To promote activities that create employment at all skill levels including established and future marine operations and activities while respecting the requirements of other marine interests.

Objective 4: To promote the development of vibrant, accessible and sustainable coastal communities.

Objective 5: To promote the marine resource, its recreational value and the wider social, economic and environmental benefits to all.

Objective 6: To promote the preservation and enjoyment of marine related heritage assets.

Objective 7: To promote a healthy, resilient and adaptable marine ecosystem and an ecologically coherent network of Marine Protected Areas.

Objective 8: To contribute towards climate change mitigation and adaptation.

Objective 9: To encourage compatibility with other plans (including those in adjacent administrations) relevant to the regulation and management of key activities and issues.

Objective 10: To continue to develop the marine evidence base in a coordinated manner to increase understanding and to support the development, monitoring and review of marine planning.

Appendix C – Baseline Information

Figures

Tables

Images

1. Introduction

This Appendix was originally produced in 2014, to accompany the Marine Plan for Northern Ireland – Sustainability Appraisal Scoping Report and provides the baseline for each of the SA topics along with the key issues, problems and trends.

The baseline information was collected in 2014 with further updates in 2015, 2016 and 2017 to reflect the change in public administration in Northern Ireland, changes in economic strategy indicators for Northern Ireland and updates to ecological designations. Table A provides an overview of the changes made to the baseline document between scoping and this submission.

Table A: Updates Made to Baseline Chapter

SA Topic	Date Amended	Paragraph/Heading	Updates/Changes made
Biodiversity, Flora and Fauna	September 2015	Protected Sites	Text added on a range of data sources and interpretation of transboundary sites.
	September 2015	European Overview	JNCC commissioned research on harbour porpoise distribution information added. UK Statutory Nature Conservation Bodies on SPAS added.
	September 2015	National Overview	NHAs removed and Marine Plan Authority text added. References to NHAs in RoI added.
	September 2015	Protected species	Annex 1 Habitats and Annex II Species text added.
	February 2017	Protected species	Designation table updated and text added regarding the designation of five UK harbour porpoise Special Areas of Conservation (SACs).
	September 2015	Benthic and Intertidal Ecology	Text added and data sources updated.
	September 2015	Fish and Shellfish	Text and data sources added.
	September 2015	Marine Mammals	Text and data sources added.
	September 2015	Birds	Text and data sources added.
	February 2015	Mudflats	More mudflats text added.
	February 2015	Baseline description	Table of Summary of Protected Sites within the Northern Ireland marine area updated.
Water and Soils	September 2015	WFD	WFD information updated.

SA Topic	Date Amended	Paragraph/Heading	Updates/Changes made
Climate Factors	February 2015 / September 2015	Climatic Factors	Data sources amended to include remove old and include new (2012 UK Greenhouse Gas Emissions removed, Sustainable Development Good Practice Report added, Everyone's Involved added, First Steps Towards sustainability 2006 removed.
	September 2015	Baseline Description of climate change	Main greenhouse gas is carbon dioxide figure updated.
	September 2015	Northern Ireland Climate Change Adaptation Programme	Programme updated.
	September 2015	Project Climate Change	New paragraph added in.
	September 2015	Greenhouse gases	2012 data removed and new paragraph inserted on 2013-2014 data.
Air Quality	September 2015	AQMAs	Table updated to include new council areas (after reform) and revised pollutants.
Socio-Demographics	September 2015	Intro	Text added on data collected for both the original 26 LGDs and the new 11 LGDs.
	September 2015	General demography	Northern Ireland Environmental Statistics Report 2014 removed and the updated 2015 report added. New paragraph and table added on 2014 data and new council area data.
	September 2015	Deprivation	Not updated as no new Northern Ireland Multiple Deprivation Measure taken.
	September 2015	Neighbourhood Renewal	Not updated as no 2014/2015 found.
	September 2015	Education	New tables added of 2013 data of new council areas.
	September 2015	Housing	Text removed and updated with 2014 data.
	June 2016	Northern Ireland Economy	Section updated with Key Performance Indicators from the Northern Ireland Economic Strategy.
	June 2016	Housing	Section removed, as none of the policies in the Plan will affect housing.
	June 2016	Coastal Communities Fund	Section removed, as none of the policies in the Plan will affect the Coastal Communities Fund.
	June 2016	Life Expectancy and Median Age of Death	Section removed, as none of the policies in the Plan affect will Life Expectancy and Median Age of Death.
	June 2016	Neighbourhood Renewal	Section removed, as none of the policies in the Plan will affect Neighbourhood Renewal.
Uses and	September	Recreation and	Added the 2014 Northern Ireland Environmental

SA Topic	Date Amended	Paragraph/Heading	Updates/Changes made
Activities	2015	Tourism	Statistics Report. Water sports table added in. 2014 data on overnight trips, employee jobs and top 10 visitor attractions added in. 2016 Funded events table added in.
	September 2015	Aviation	New data on 2013 terminal passengers added in.
Material Assets	September 2015	Underground Offshore Gas Storage	Islandmagee information update added in.
	September 2015	Petroleum Exploration Licensing	Text on the Appropriate Assessments of Blocks applied for in the 28th Offshore Oil and Gas Licensing Round added in.
	September 2015	Offshore Renewable Energy	Text update relating to First Flight Renewables added in.
	September 2015	Waste Water Treatment and Industrial Discharges	New column of 2013 data added to Summary of compliance of water utility sector WWTWs table.
Cultural Heritage	September 2015		Existing information reviewed and no updates required.
Landscape and Seascape	September 2015		Existing information reviewed and no updates required.

The main reasons for updates are to reflect the change in public administration in Northern Ireland in 2015, updates to financial targets for the Northern Ireland Executive and updates to ecological designations which have been ongoing since the publication of the scoping report in 2014. Where figures have been produced to illustrate the information identified, their references have been integrated into the text.

Once a draft of the Marine Plan became available for assessment, the baseline information collected and published as part of the scoping exercise was reviewed. Based on the content of the draft Marine Plan provided for assessment, the biodiversity section was identified as requiring additional information because of ongoing updates to ecological designations in the marine area, which are still (as of February 2017) being designated and where available, have been included in the biodiversity section of the baseline.

In all other cases, the baseline information collected in 2014 and updated in 2015 and 2016 has been considered of sufficient detail to complete the assessment.

In May 2016, the number of government departments which made up the Northern Ireland Executive was reduced from 12 to nine. In the context of the policies within the Marine Plan, the changes in department structure are not envisaged to affect how the core and activity policies will be interpreted or implemented by public authorities and/or other stakeholders. The changes in departments have also been incorporated into the Marine Plan text.

As the 12 original Northern Ireland Executive departments are referenced in this baseline section, Table B provides an overview of how the responsibilities of the original 12 departments have been redistributed to the nine current departments. Table B also provides information about where information which was originally published on departmental websites would now (in 2017) be accessed using the 2016 Northern Ireland Executive department websites.

Table B: 2016 Department names and changes in responsibility

2016 Northern Ireland Executive department name	2016 Northern Ireland Executive Department responsibility in comparison to original Northern Ireland Departments referenced in this document	Relationship to baseline reference sources.
Executive Office	Some of the functions of the former Office of the First Minister and Deputy First Minister (OFMDFM) plus the Strategic Policy and Innovation Unit.	The baseline section does not reference information from OFMDFM.
Department of Agriculture, Environment & Rural Affairs (DAERA)	The functions of the former Department of Agriculture and Rural Development (DARD), excluding Rivers Environmental functions from the former Department of Environment (DOE) Inland fisheries from the former Department of Culture, Arts and Leisure (DCAL) Policy responsibility for Sustainable Strategy The environmental functions that transferred from DOE included regulation, but excluded the Northern Ireland Environment Agency's built heritage function.	Where DOE is identified as a reference source for information (excluding cultural heritage and strategic planning), the information identified will be available within the DAERA website (www.daera-ni.gov.uk).
Department for Infrastructure (DfI)	The functions of the former Department for Regional Development (DRD) Vehicle regulation, road safety & Driver and Vehicle Agency (DVA) functions from DOE Strategic planning from DOE Rivers from DARD Inland waterways from DCAL Crumlin Road Gaol Programme-Project management from OFMDFM St Lucia (ex-Ministry of Defence site) from OFMDFM	In the baseline, where references are made to information produced by DRD or DARD Rivers Agency, this information will now be available from the DfI website (www.infrastructure-ni.gov.uk)
Department for the Economy (DfE)	The functions of the former Department of Enterprise, Trade and Investment (DETI) The functions of the former Department of Employment and Learning (DEL) with the exception of the Employment Service	Where information has originally been referenced to DETI, if it has been digitally published, it is available from the DfE website (www.economy-ni.gov.uk).

2016 Northern Ireland Executive department name	2016 Northern Ireland Executive Department responsibility in comparison to original Northern Ireland Departments referenced in this document	Relationship to baseline reference sources.
Department of Education (DE)	The functions of the former Department of Education Policy responsibility and a range of services (excluding child protection) for children and young people Policy responsibility for the Childcare Strategy from OFMDFM	The baseline report does not reference the former Department of Education as an information source. The information used to produce the "education" section of the baseline report was taken from information now available on www.daera-ni.gov.uk.
Department of Finance (DoF)	The functions of the former Department of Finance and Personnel (DFP) The NIdirect Central Editorial Team from OFMDFM The Government Advertising Unit from OFMDFM	The baseline report does not reference information from the former Department of Finance and Personnel.
Department of Health (DoH)	The Department of Health encompasses the functions of the former Department of Health, Social Services and Public Safety (DHSSPS).	The baseline report does not reference the former Department of Health, Social Services and Public Safety.
Department of Justice (DOJ)	The functions of the former Department of Justice (DOJ) Planning Appeals Commission and Water Appeals Commission administrative support from OFMDFM	The baseline report does not reference any information accessed through the former Department of Justice website.
Department for Communities (DfC)	The functions of the former Department for Social Development (DSD) The functions of DCAL, including PRONI (but excluding inland fisheries & waterways) Employment Service from DEL Local government from DOE, including Built Heritage from NIEA Debt advice from DETI Financial Capability Strategy from DETI Economic Inactivity Strategy from DEL Policy responsibility for Older People, Active Ageing Strategy, sponsor branch for the Commissioner for Older People with	The cultural heritage section of the baseline report references both published and unpublished information. Where information is sited from publically available reports, this can be viewed on https://www.communities-ni.gov.uk/.

2016 Northern Ireland Executive department name	2016 Northern Ireland Executive Department responsibility in comparison to original Northern Ireland Departments referenced in this document	Relationship to baseline reference sources.
	the exception of the appointment of the Commissioner Policy responsibility for Disability Strategy, Anti-Poverty and Child Poverty, coordinating work across departments Sponsor branch for Commissioner for Children and Young People with the exception of the appointment of the Commissioner Policy responsibility for gender and sexual orientation	

In July 2016, the Department of Energy and Climate Change (DECC) became part of the Department for Business, Energy and Industrial Strategy. Where information has been cited from a DECC source, if online, it can be retrieved from www.gov.uk.

2. Biodiversity, Flora and Fauna

2.1 Introduction

Biodiversity, Flora and Fauna has been split into the headings which encompass nature conservation and ecological features within the coastal and marine area. These headings are:

- Protected sites;
- Benthic and intertidal ecology;
- Plankton;
- Fish and shellfish;
- Marine mammals;
- Marine reptiles;
- Birds; and,
- Marine noise.

2.2 Protected Sites

The following data sources have been used to characterise the protected sites within the Northern Ireland marine area:

- World Heritage Sites (WHS) (United National Educational Scientific and Cultural Organisation, (UNESCO));
- Giant's Causeway and Causeway Coast World Heritage Site (Environmental and Heritage Service, 2005);
- Existing and proposed protected sites (Special Areas of Conservation (SACs), Sites of Community Importance (SCI) Special Protected Areas (SPAs), Ramsar Sites, Marine Nature Reserves (MNRs), National Nature Reserves (NNRs) and Areas of Outstanding Natural Beauty (AONB);
- Northern Ireland Environment Agency (NIEA) Protected areas and NIEA biodiversity pages;
- Joint Nature Conservation Committee (JNCC) website;

- Marine Reserves in Northern Ireland: The way forward. World Wildlife Fund (WWF) and Ulster Wildlife Trust (UWT) (Thurstan et al., 2008);
- Northern Ireland Coastal Zone - Indicators of Sustainable Development (DOE, 2011);
- Marine Conservation Zone (MCZ) Areas of Search;
- Draft guidance on selection and designation of Marine Conservation Zones (MCZs) in the Northern Ireland Inshore Region. A consultation Document. October 2013. Department of the Environment Northern Ireland. (DOE, 2013);
- Defra, 2014. Department for Environment, Food and Rural Affairs Marine Conservation Zones: Update February 2014; https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/285304/pb14141-mcz-update-201402.pdf; and,
- Irish Sea Conservation Zones website http://www.irishseaconservation.org.uk/MCZ-recommendations.

It is recognised that international, European, national and local designations in adjacent UK devolved administration jurisdictions, the Isle of Man and in neighbouring Member States, namely the Republic of Ireland (RoI), could also be indirectly affected by the Marine Plan. There is a range of data sources that characterise protected sites and identify the threats and pressures that face biodiversity in these other jurisdictions, including, for example:

- The Status of EU Protected Habitats and Species in Ireland 2013 (NPWS, 2013);
- National Parks and Wildlife Service (NWPS) publications. http://www.npws.ie/publications/;
- National Parks and Wildlife Service (NWPS) Protected Sites webpages. http://www.npws.ie/protectedsites/;
- Scottish Environment Protection Agency (SEPA) website. Protected areas and species http://www.sepa.org.uk/water/hydropower/supporting_information/protected_areas_and_species.aspx;
- Joint Nature Conservation Committee (JNCC) website;
- Ireland's Marine Atlas http://atlas.marine.ie/#/Map; and,

· Natural Resources Wales (NRW) designated sites information. http://naturalresourceswales.gov.uk/policy-and-guidance/designated-sites/?lang=en.

2.2.1 Baseline Description

The coastal and marine area in and around Northern Ireland supports a diverse range of flora and fauna. Figure 1 illustrates the marine plan area.

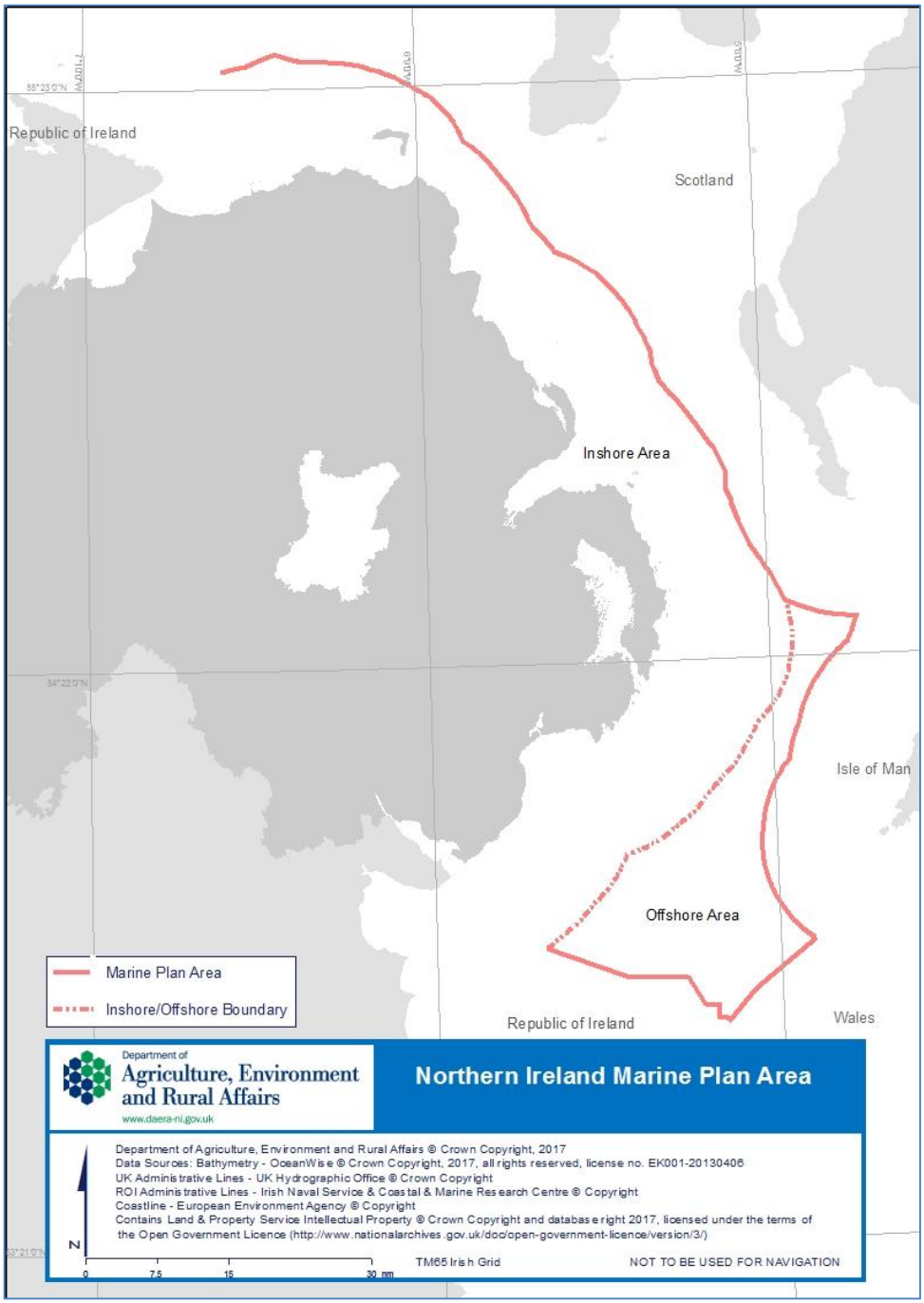

Figure 1: Northern Ireland Marine Plan Area (DAREA)

As a result, a large percentage of the area is designated or proposed for designation for nature conservation interest under national, European and international legislation. The existing and proposed protected sites within The Northern Ireland marine area are shown in Figure 2. These have been reviewed in more detail in the following sections.

International Overview

The two distinct types of internationally protected sites occurring within the Northern Ireland marine area are as follows:

- Ramsar Sites – wetlands of international importance designated under the Ramsar Convention on Wetlands (1971); and,
- World Heritage Sites - designated under the United Nations Educational, Scientific and Cultural Organisation (UNESCO).

The Ramsar Convention is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. The Ramsar convention is the only global environmental treaty that deals with a particular ecosystem. Ramsar sites are designated to protect wetland conservation due to their importance to biodiversity conservation and anthropogenic well-being. The Ramsar sites that occur within the Northern Ireland marine area are shown on Figure 2.

There is one World Heritage Site in Northern Ireland, The Giant's Causeway and Causeway Coast, which was designated in 1986 because of its geological and geomorphological value[1]. The site is situated on the north coast of County Antrim and extends for 6km between Causeway Head and Benbane Head (Figure 2). The site is made up of some 40,000 massive black basalt regular polygonal columns which were formed due to volcamarine areanic activity during the Tertiary period.

World Heritage Sites (WHS) are non–statutory designations and their management plans are implemented within the context of the local, regional, national and international policies. The Giant's Causeway and Causeway Coast has a Management Plan in place. The Management Plan provides an agreed framework for the management of the site with

[1] Designated under criteria (vii) to contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance; and (viii) to be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features

the aim of achieving a sustainable future by guiding current and future actions on and around the site (Environment and Heritage Service, 2005).

European Overview

The following types of European protected sites, also referred to as Natura 2000 sites, occur within the Northern Ireland marine area:

- Special Areas of Conservation (SACs) - designated under the EC Habitats Directive (92/43/EEC); and,
- Special Protection Areas (SPAs) - designated in accordance with Article 4 of the EC Birds Directive (79/409/EEC).

SACs are part of a European wide network of important high quality conservation sites that will make a significant contribution to conserving the 189 habitat types and 788 species identified in Annexes I and II of the Habitats Directive.

SPAs are classified for rare and vulnerable birds (listed in Annex I of the Birds Directive) and for regularly occurring migratory species. Each of the sites have Conservation Objectives that ensure Member States take appropriate steps in avoiding the deterioration of interest features for which the site is designated for. The existing and proposed European protected sites that occur within the Northern Ireland marine area are shown in Figure 2.

National Overview

The following types of nationally protected sites occur within the Northern Ireland marine area:

- National Nature Reserve (NNR) - designated under the Amenity Lands Act (Northern Ireland) 1965;
- Areas of Outstanding Natural Beauty (AONB) - originally designated under the Amenity Lands Act (Northern Ireland) 1965 but are now designated under the Nature Conservation and Amenity Lands Order (Northern Ireland) 1985;
- Areas of Special Scientific Interest (ASSI) - designated under Amenity Lands Order (Northern Ireland) 1985. Measures to improve ASSI protection and management are contained within the Environment (Northern Ireland) Order 2002; and,

- Marine Protected Areas (MPAs) designated under national legislation Marine Act (Northern Ireland) 2013. These MPAs are termed Marine Conservation Zones (MCZs).

National Nature Reserves (NNRs) contain examples of the most important natural and semi-natural terrestrial and coastal ecosystems in the UK. They are managed in order to conserve their habitats or to provide special opportunities for scientific study. The NNRs that occur within the Northern Ireland marine area are shown in Figure 2.

Areas of Outstanding Natural Beauty (AONB) are primarily designated to conserve natural beauty which includes wildlife, physiographic features and cultural heritage as well as landscapes and scenery. Notice is also taken of the need to conserve agriculture, forestry and other rural industries and the economic and social needs of local communities. The AONBs that occur within the Northern Ireland marine area are shown in Figure 2.

Areas of Special Scientific Interest (ASSIs) are the equivalent to SSSIs[2] in England, Scotland and Wales. They provide statutory protection for the best examples of flora, fauna or geological or physiographical features. They are also used to underpin other national and international nature conservation designations. ASSI designation may extend to the intertidal areas out to the jurisdiction limit of local authorities, which is generally Mean Low Water. The ASSIs that occur within the Northern Ireland marine area and overlap with a number of international and European protected sites are shown in Figure 2

Natural Heritage Areas (NHA) are the basic designation for wildlife in the Republic of Ireland and are comparable to ASSIs in Northern Ireland. The Wildlife (Amendment) Act 2000 makes legal provision for the designation and protection of a national network of NHAs. These sites protect areas which are important for the habitats present, or which hold species of plants and animals whose habitat need protecting. Potential NHA (pNHAs) are sites which are significant for wildlife and habitats and have the potential to become designated sites. Some of these sites are very small, such as a roosting place for rare bats. Designation will proceed on a phased basis over the coming years.

The UK has signed up to international agreements that aim to establish an 'ecologically coherent network of Marine Protected Areas (MPAs)' by the end of 2012. This network will be made up of current MPAs as well as a new type of MPA called a Marine Conservation

[2] Sites of Special Scientific Interest.

Zone (MCZ). The MCZs that occur in the Northern Ireland marine area are shown in Figure 2.

Protected Habitats and Species

Habitats that are listed in Annex I of the Habitats Directive and occur outside of European designated sites are also considered to be protected. These include sandbanks which are slightly covered by seawater all the time, estuaries, mudflats and sandflats not covered by seawater at low tide, large shallow inlets and bays, reefs and saltmarsh.

European marine protected species (marine EPS) are those listed in Annex IV of the Habitats Directive whose natural range includes any area in Great Britain. In UK waters, these consist of several species of cetaceans (whales, dolphins and porpoises), turtles and the Atlantic Sturgeon. The Habitats Directive is transposed into UK law under the Habitat Regulations, which make it an offence to kill, injure, capture or disturb marine European protected species that are listed in Annex IV of the Habitats Directive. Guidance on the protection of marine EPS in their natural range from injury and disturbance has been developed by JNCC et al. (2010) as required by Article 12 of the Habitats Directive.

Harbour porpoise and Bottlenose Dolphin are also protected under Annex II of the Habitats Directive 1992 which require SACs to be designated. In addition, harbour porpoise is also listed as an OSPAR threatened species listed in Appendix II of the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals) 1982.

All cetacean species are also protected under the Bern Convention and Schedule 5 of the Wildlife and Countryside Act (1981), as amended by the Countryside and Rights of Way Act (2000) whereby it is an offence to take, injure or kill these species. Disturbance in their place of rest, shelter or protection is also prohibited.

Pinnipeds (seals) are protected under the Conservation of Seals Act 1970 (taking effect in England, Scotland, Wales). Grey and common seals are also listed in Annex II of the EU Habitats Directive 1992 and are protected from disturbance both inside and outside the designated sites. In addition, Grey seal is listed as an Appendix III species under the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) 1979, which prohibits the deliberate disturbance/capture/killing of species and disturbance of their breeding grounds.

Cheloniids (turtles) are protected under the Wildlife and Countryside Act 1981 (and amendments), under which it is an offence to take, injure or kill these species. Species of

turtle are also protected under the EU Habitats Directive (1992) in Annex II and IV of the Bern Convention, 1979.

The Habitats Directive is transposed into Irish Law by the European Communities (Birds and Natural Habitats) Regulations. All marine mammals are protected wild animals under the Fifth Schedule, which includes all cetacean and seal species, of the Wildlife Act (39 of 1976) and Amendments. Under Section 23 (as amended in 2000), it is an offence to kill, injure or wilfully interfere with or destroy the breeding place or resting place of any protected wild animal. In addition, it should be noted that consent cannot be given by the Consenting Authority under Regulation 63 (7) of the European Communities (Birds and Natural Habitats) Regulations 2011 without consideration of the potential interaction with these species.

2.2.2 Key Issues, Problems and Future Trends

The restoration of features of protected sites that are currently in unfavourable condition can take time. In relation to ASSIs, for example, the Northern Ireland Environmental Agency (NIEA) is working with landowners and other stakeholders, in particular the Department of Agriculture and Rural Development (DARD) to ensure that sympathetic management of ASSIs is in place (DOE, 2011). The condition assessments of the ASSIs, however, are considered to be representative of the favourable condition status of overlapping European/Ramsar sites.

Anthropogenic stressors on the marine area are increasing in number and magnitude. Of particular concern is the impact of climate change on the number and severity of occurrences of invasive non-native species (Thurston et al. 2008). A consequence of these cumulative stressors is that the resilience of the ecosystem is declining i.e. the ability of the ecosystem to recover from disturbance is reduced (Nellemann et al. 2008). In an attempt to manage this potential decline in marine ecosystem resilience, conservation bodies such as the NIEA are identifying more MCZs which will be conserved and protected under statutory law. Due to the location of some proposed MCZs, it may be necessary to include an assessment of their social and economic importance prior to designation. At time of writing, this assessment was currently being undertaken.

2.3 Benthic and Intertidal Ecology

The following data sources have been used to characterise the benthic and intertidal ecology within the Northern Ireland marine area:

- Northern Ireland Habitat Action Plans (HAPs);
- SEA 6 Environmental Report. Strategic Environmental Assessment of Draft Plan for a 24th Seaward Round of Offshore Oil and Gas Licensing (DTI, 2005);
- An Introduction to the Benthic Ecology of the Rockall - Hatton Area (SEA 7) (Davies et al., 2006);
- Northern Ireland Sublittoral Surveys (1980s and 2006-2008) (Goodwin et al., 2011);
- Mapping European Seabed Habitats (MESH) Project GIS maps;
- Northern Irelands' Priority Species and Species of Concern list (National Museums Northern Ireland, 2006-7);
- Joint Nature Conservation Committee (JNCC) Marine Recorder database;
- Northern Ireland Habitat Action Plan Saline Lagoons (2003);
- Bamber, R.N., Gilliland, P.M. & Shardlow, E.A. (2001). Saline Lagoons: A guide to their management and creation; and,
- UK SeaMap 2010 (JNCC website).

It is recognised that benthic and intertidal ecology features in adjacent UK jurisdictions, the Isle of Man, and in neighbouring Member States, namely the Republic of Ireland (RoI), could also be indirectly affected by the Marine Plan. There is a range of data sources that characterise protected habitats and species and identify the threats and pressures that face biodiversity in these other jurisdictions, including, for example:

- The Status of EU Protected Habitats and Species in Ireland (NPWS, 2013);
- National Biodiversity Data Centres;
- Format for a Prioritised Action Framework (PAF) for Natura 2000. For the EU Multiannual Financing Period 2014-2020. Ireland (http://www.npws.ie/sites/default/files/publications/pdf/PAF-IE-2014.pdf);
- Strategic Environmental Assessment (SEA) of Offshore Renewable Energy Development Plan in the Republic of Ireland (2010);
- Strategic Environmental Assessment (SEA) of Plans for Wind, Wave and Tidal Power in Scottish Marine Waters (2013);
- Charting Progress 2;

- UK Offshore Energy Strategic Environmental Assessment (OESEA2) Appendix 3 Environmental baseline. Future Leasing/Licensing for Offshore Renewable Energy, Offshore Oil & Gas, Hydrocarbon Gas and Carbon Dioxide Storage and Associated Infrastructure. February 2011. https://www.gov.uk/government/publications/uk-offshore-energy-strategic-environmental-assessment-2-environmental-report; and,
- Marlin Website http://www.marlin.ac.uk/speciesfullreview.php?speciesID=4278.

2.3.1 Baseline Description

Northern Ireland boasts a high diversity of benthic and intertidal marine life and environments which range from northern rocky shores to sheltered inland sea loughs. A number of the SACs that occur within the Northern Ireland marine area are designated for the protection of certain benthic habitats.

Northern Ireland's coastal and marine area is rich and diverse. 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. Predicted broadscale benthic habitats in the wider Marine Plan area, based on UKSeaMap 2012 modelling[3], are shown in Figure 3. Based on this model, the main broad scale habitat in Northern Ireland's waters are deep circalittoral mud (EUNIS A5.37) in the south-eastern part of the Northern Ireland marine area and deep circalittoral coarse sediment (EUNIS A5.15) towards the northeast and deep circalittoral sand (EUNIS A5.27) in the north.

The sections below provide further detail on the most prevalent fully marine priority habitats that are known to occur in the Northern Ireland marine area. This information has been extracted from the Northern Ireland HAPs.

Tidal Rapids

This habitat is defined as 'strong tidal streams resulting from a constriction in the coastline such as at the entrance to, or within the length of an enclosed body of water such as a sea lough, and also areas of very strong tidal streams on the open coast or between islands'

[3] UKSeaMap 2012 predicts benthic habitats based on seabed geology, water depths and energy regime (JNCC website). It builds on the previous work of MESH (2008), UKSeaMap 2006 (Connor et al., 2006) and the Irish Sea Pilot (Vincent et al., 2004).

(NIEA, 2003a). This habitat occurs in a large range of high energy environments, ranging from rocky seabeds to gravel in deep tidal streams and tide-swept habitats.

A rich biodiversity is associated with tidal rapid habitats which includes soft corals, hydroids, bryozoans, large sponges, anemones and dense mussels and brittle star beds. Bedrock and boulders often support kelp and sea oak plants, which may grow very long in the tidal currents and are often found with encrusting fauna such as *Tubularia spp.* and *Verruca stroema*.

Within the Northern Ireland marine area, tidal rapids are found at the following locations:

- Strangford Narrows;
- Entrance to Carlingford Lough;
- Dundrum Channel;
- Killough harbour mouth;
- Maiden Islands;
- Entrance to Larne Lough;
- Between Barney's Point and the Magheramourne spoil tip;
- Outer coast of Rathlin Island;
- Entrance to Lough Foyle between Greencastle and Magilligan Point;
- Outer coast of the Skerries; and,
- Copeland Islands.

Seagrass Beds

Within the Northern Ireland marine area seagrass beds occur on shallow, sheltered intertidal and subtidal sediments and are largely confined to sea loughs. Around Britain and Ireland five Seagrass species are found; three species of eelgrass (namely *Zostera marina*, *Z. angustifolia* and *Z. noltii*) and two species of tassel weed (*Ruppia maritima* and *R. cirrhosa*) (NIEA, 2003b).

Seagrass beds are highly productive and an important keystone habitat. They support a wide range of flora and fauna by providing nursery grounds for a diversity of fish species (some of which are commercially valuable) and an important food source for overwintering wildfowl.

Surveys and documentation on the distribution of seagrass could be enhanced. The most extensive research on *Zostera spp* distribution has been carried out on Strangford Lough where the majority of the *Zostera spp* were found in the northern part of the Lough on the northern sandflats. *Zostera spp* distribution mapping by the RSPB on Lough Foyle also found *Zostera spp* on the upper half of the shore (NIEA, 2003b).

Within the Northern Ireland marine area, seagrass beds are known to occur at Strangford Lough and Lough Foyle.

Maerl Beds

Maerl is a collective term that describes several species of non-jointed coralline red algae (*Corallinaceace*) (Hall-Spencer et al, 2010). Maerl grows slowly as unattached nodules on the seabed and can form extensive beds in coarse clean sediments of gravels and clean sands or muddy sediments. Over long periods of time the dead calcareous skeleton can accumulate into deep deposits which are overlain by a thin pink layer of living maerl (NIEA, 2003c).

Maerl beds occur either on the open coast, in tide-swept channels or in sheltered areas of marine inlets (Hall-Spencer et al, 2010). Currents need to be strong enough to remove fine sediments but weak enough not to break or disperse the brittle maerl branches (NIEA, 2003c). As maerl requires light to photosynthesise, they are generally found in shallower waters, with the depth restricted by the turbidity of the water.

Maerl beds support a rich flora and fauna and may be an important nursery area for commercially valuable molluscs and crustaceans (Hall-Spencer et al, 2010). In addition, maerl can be used in agriculture, cosmetics, pharmaceutical and other industries.

Although several research studies have been undertaken on various aspects of local maerl habitats, the location and condition of maerl beds within the Northern Ireland marine area could be improved. They are, however, known to occur at the following locations:

- Strangford Lough;
- The Maidens;
- Garron Point;
- Ballygally Head;
- Church Bay;

- Ringfad Point;
- Cushendun Bay;
- Carlingford Lough; and,
- North Coast of County Antrim.

Saline Lagoons

Saline lagoons are bodies of water that have a restricted connection to the sea which creates an environment where the salinity of the water body is considered to be neither marine or fresh but may vary from brackish to fully saline or hyper-saline. The salinity of any particular lagoon depends on the specific hydrodynamics associated with that lagoon and may show considerable variation in both time and space (NIEA, 2003d).

As saline lagoons are so variable, the diversity of the flora and fauna usually consists of highly specialised species that are able to cope with varying conditions. These species can be spilt into three groups:

- Marine species that are tolerant of low salinity;
- Freshwater species that are tolerant of high salinity; and,
- Lagoonal specialists.

Saline lagoons are important habitats for large numbers of wildfowl and waders as they provide important locations for high tide roosts and offer a habitat for migrating birds.

Within the Northern Ireland marine area saline lagoons are not common, with 30 being reported by Bamber et al. (2001). Most that have been surveyed are considered to be artificial. Artificial lagoons are formed when engineering works cut off part of an estuary or the sea from direct tidal influences and/restricts the movement of the tide in and out of this body of water.

Mudflats

Mudflats are intertidal habitats created by sedimentary deposition in low energy coastal environments, particularly in estuaries and other sheltered areas such as sea loughs (NIEA, 2003e). Due to the low energy system, the substrate is formed of fine silts and clays and has a high organic content. When mudflats occur in higher energy systems, the

percentage of sand in the substrate increases. Mudflats are often a transitional habitat that links to other coastal habitats such as soft cliffs and saltmarshes (NIEA, 2003d).

Mudflats dissipate wave energy and, therefore, have an important role in reducing the risk of erosion of saltmarshes, and protecting coastal defences from damage and reducing the risk of flooding of low-lying land. They also play an important role in intertidal nutrient cycling by sequestering contaminants within the organic sediments (NIEA, 2003d).

Mudflats support a high abundance of organisms but tend to have low macrofaunal diversity. The composition of the mudflat biota reflects environmental conditions. For example, if salinity is low, large numbers of oligochaetes occur, and if there is a high proportion of sand, a wider diversity of polychaetes is present. Mudflats are productive habitats which are important to large numbers of migratory, overwintering and breeding waterfowl and Annex I bird species.

Within the Northern Ireland marine area mudflats are found at the following locations:

- Lough Foyle;
- Bann Estuary;
- Larne Lough;
- Belfast Lough;
- Strangford Lough;
- Inner Dundrum Bay; and,
- Carlingford Lough.

Sheltered Muddy Gravels

Sheltered muddy gravel habitats occur principally in estuaries, rias and sea loughs in areas protected from wave action and strong tidal streams. In the marine area this habitat is very species rich due to the complex nature of the substrate being able to support a high diversity of infauna and epifauna. Polychaetes and bivalve molluscs are the dominant species. Moving into the lower salinity estuarine environment, there is a sharp reduction in species richness (NIEA, 2003f).

Within the Northern Ireland marine area sheltered muddy gravels are found at the following locations:

- Carlingford Lough;
- Strangford Lough;
- Belfast Lough;
- Larne Lough; and,
- Lough Foyle.

Mud Habitats in Deep Water

Deep water mud is associated with relatively stable conditions. The presence of strong tidal streams within Northern Ireland waters prevents the formation of this habitat in much of the Northern Ireland marine area. The largest area of mud deposits lies off the east coast extending towards the Isle of Man and the Irish coast (NIEA, 2005a).

The relatively stable conditions associated with deep mud habitats often lead to the establishment of communities of burrowing megafauna, where deep water (>200m) species may occur with coastal species. The burrowing megafaunal species include burrowing crustaceans such as Dublin Bay prawns *Nephrops norvegicus* which is commercially important and *Calianassa subterranea*. Mud habitats in deep water can also support seapen populations including *Virgularia mirabilis* and *Pennatula phosphorea*. Epibenthic scavengers include *Asterias rubens*, *Pagurus bernhardus* and *Liocarcinus depurator*. Brittlestars may be present and the infauna can include richly diverse populations of polycheates and bivalves.

Surveys of the west of the Irish Sea undertaken by Department of Agriculture and Rural Development (DARD)[4] found that the deeper sites are dominated by the burrowing crustacean Calocaris macandreae and the heart urchin *Brissopsis lyrifera*, while the shallower eastern side is dominated by the starfish *Asterias rubens* and more mobile taxa such as the swimming crab, *Liocarcinus depurator*, suggesting the habitat supports a diverse range of crustacea and echinoderms (NIEA, 2005a). Mud habitats in deep water are used by several Northern Ireland priority species, including the sea pen *Virgularia mirabilis*, rugose squat lobster *Munida rugosa* and the sea cucumber *Ocnus planci*.

The habitat is associated with and supports the Dublin Bay Prawn *Nephrops norvegicus* which has been recorded off Kilkeel and Newcastle at depths of between 26 and 39m.

[4] http://www.doeni.gov.uk/niea/mudindeepwater-4.pdf

This probably represents the fringes of the Irish Sea Nephrops fishery. An exception to this are the Nephrops beds in Strangford Lough, where the deep mud habitats are not currently fished and are relatively undisturbed.

Sabellaria alveolata Reefs

The polychaete worm *Sabellaria alveolata* lives in tubes constructed of sand grains cemented together which may occur in dense aggregations (reefs). These reefs are generally limited to areas of hard substratum including cobble, adjacent to sand and with moderate to considerable wave exposure within the intertidal zone and in areas where there is sufficient water movement to hold sand grains in suspension (NIEA, 2005b).

The species has a rapid growth rate which is increased with higher concentrations of suspended sand and an increase in temperature. The typical lifespan of worms in colonies or reefs has been recorded to be 4-5 years with a likely maximum of 9 years. There is evidence that intertidal reefs appear to be relatively unstable and undergo a natural cycle of development and decay (NIEA, 2005b).

S. alveolata reefs are not particularly diverse communities. The older, more stable reef colonies are known to support a higher diversity of fauna and flora than the younger less stable ones.

Within the Northern Ireland marine area, *S. alveolata* reefs have occasionally been recorded in the subtidal at Glassdrumman.

Sabellaria spinulosa Reefs

Similar to *S. alveolata*, the polychaete worm *Sabellaria spinulosa* builds tubes made of sand and shell fragments. Most commonly *S. spinulosa* occurs as a solitary worm and does not form reefs over the majority of its range. It can, however, form thin crusts or large reefs up to several metres across and 60cm high. The reef form of the species is highly protected Annex I habitat under the Habitats Directive. *S. spinulosa* reefs occur in turbid waters between a few meters to up to 40m depth (NIEA, 2005c) and are generally found subtidally but have occasionally been recorded in the intertidal.

S. spinulosa reefs can support a range of epibenthic species including specialised ‘crevice’ infauna.

Very few reefs are known to occur in the Northern Ireland marine area. The most important site is offshore of Magilligan Strand on the low lying pitted bedrock outcrops from mobile

sand (NIEA, 2005c). There are two other sites, Rinnagree Point near Portstewart and at Portstewart Point, that have ‘occasional’ recorded reefs.

Sublittoral Sands and Gravels

This habitat is found within a wide range of physical environments, from sheltered gravels to mobile sandbanks. The sediments range from muddy sand, through to gravel, including combinations of the two. The sediments may be very thick but in large areas they may form only small deposits overlying bedrock (NIEA, 2005d).

A wide range of biotopes are associated with sublittoral sands and gravels. The presence of these communities is influenced by a range of factors including tidal currents, wave action, salinity, larval supply and stability of the seabed and particle size. For example, in areas where coarse sand is present and the habitat is exposed to wave action or tidal streams, the habitat would be dominated by polychaetes, burrowing bivalves and amphipods. In contrast, in areas where cobbles or pebbles occur, the organisms present are more likely to comprise hydroids and bryozoans. The variation in sediment structure and extensive range of this key habitat type is reflected in the fact that it includes in a total of 17 sublittoral biotopes as defined in the JNCC Marine Nature Conservation Review (MNCR) biotope classification scheme (version 97.06) (NIEA, 2005d).

An area of particular significance with regard to this habitat is Outer Church Bay on Rathlin Island. This area has been recorded as being very stable and undisturbed, supporting some of the most important sand communities in Northern Ireland (NIEA, 2005d). Another area of significance in terms of sand deposits is Dundrum Bay. Here extensive dune systems have been formed overlying shingle ridges and separating the Inner Bay from the Outer Bay.

On the North coast, plains of highly mobile, soft, clean, well-sorted sand are present. In deep water this causes mega ripples but these are much less pronounced in shallower water. Within the Northern Ireland marine area shoals of sand eels are present in the sand and very little other life occupies the area.

Clean, firm, rippled sand with Sea Potato *Echinocardium cordatum* is present in a number of bays around the coast and is most frequent on the north coast and in Dundrum Bay. The burrowing brittlestar *Amphiura brachiata* and the crab *Corystes cassivelaunus* are also associated with the sea potato but are much less frequent. A number of bays and

loughs which also contain clean, fine rippled sand are characterised by the worm *Arenicola marina* which is usually found in shallow water above 10m (NIEA, 2005d).

Sand habitat is also present as muddy, fine sand, which can support beds of the sea pen *Virgularia mirabilis* in association with the burrowing brittle stars *Amphiura chiajei* and *Amphiura filiformis*. Muddy fine sand also supports extensive Common Mussel *Mytilus edulis* beds in Lough Foyle and Dublin Bay prawn *Nephrops novegicus* populations in the deep water off Kilkeel and Newcastle.

Extensive beds of gravel are found in a number of areas off the Northern Ireland coast. They tend to occur where strong tidal currents or wave action prevent the deposition of finer material. Most gravel beds are in water deeper than 10m, where boulder slopes inshore give way to gravel plains. In many cases, these beds are circalittoral and animal dominated. Where they occur in the infralittoral, the communities present vary considerably depending on the composition of the gravel, the strength of the tide and the level of wave exposure (NIEA, 2005d).

Modiolus modiolus Beds

The horse mussel *Modiolus modiolus* is a long lived slow reproducing marine bivalve mollusc. True horse mussel beds forming distinctive biotopes are much more limited with only four bed areas known in Northern Ireland (NIEA, 2005e). Large beds occur in Strangford Lough and there is an extensive bed off the Millisle/Ballywalter coastline. Smaller beds occur in Carlingford Lough and inside the Skerries at Portrush. Where it forms biogenic reefs, these can vary greatly in size, density, thickness and form and provide a hard substratum in a usually sedimentary area, therefore significantly modifying the local habitat. The height and size of the reef can depend on the build up of biogenic sediments and water flow regimes. Horse mussel beds can occur in large continuous reefs or as isolated scattered clumps and occur between 5 and 50m depth.

M. modiolus beds can support a range of epibenthic species, increasing the biodiversity of the area. The Strangford Lough Ecological Change Investigation (SLECI) (Roberts et al., 2004) found a total of 272 species living on or in the *M. modiolus* beds in Strangford Lough, including the variegated scallop *Chlamys varia*, queen scallop *Aequipecten opercularis*, black brittlestar *Ophiocomina nigra*, common brittlestar *Ophiothrix fragilis* and the rugose squat lobster *Munida rugosa*.

Littoral and Sublittoral Chalk

Northern Ireland only has chalk of Upper Cretaceous age and is known as the Ulster White Limestone. These chalks are generally of high carbonate purity, typically greater than 95% calcium carbonate (NIEA, 2005f). In contrast to the often relatively soft chalks of England, the chalk found in Northern Ireland exhibits secondary calcite cementation within the pore spaces making it very resistant to erosion with limited potential for solution. The sedimentary rock chalk, is formed from the remains of invertebrate and algal exoskeletons, such as foraminiferans (protozoans), particles of bivalves and particularly coccolithophores.

Associated chalk habitats are considered to be of nature conservation importance because of their unusual features and specialised communities. Distinctive rock boring invertebrates and algal communities are found within the littoral zone, such as spionid worms, e.g. *Polydora sp*, and Piddocks (bivalves), e.g. *Pholas dactylus*. The porous, water retaining nature of the rock enables algae and lichen to bore into the surface layers allowing them to exist several metres above the high water mark. Many of the unusual algal species which are not found elsewhere on other rocky habitats (with few exceptions such as some calcareous sandstones), form some of the most interesting and scarce shoreline communities.

In the Northern Ireland marine area, chalk is exposed on the seabed off the Antrim coast where faults are present, and off Rathlin there are spectacular, deep subtidal cliffs affected by strong tidal currents. The White Rocks near Portrush, exhibit the best example of coastal chalk morphology in Northern Ireland with cliffs, arches, platforms and caves representing a diversity of sublittoral, littoral and supra-littoral habitats.

2.3.2 Key Issues, Problems and Future Trends

Although many benthic habitats are well studied, understanding of the location and scale of benthic habitats across the entire Marine Plan area could be improved. Long term survey work and surveys undertaken at the project-level will continue to characterise the area and further our scientific understanding of factors affecting distribution. For example, in the Sublittoral Survey of Northern Ireland (May 2006- May 2008) (Goodwin et al. 2011) new species to science were found in areas that were revisited.

In terms of future trends, water quality should improve with ongoing implementation of the Water Framework Directive (WFD) (including reductions in concentrations of pollutants

and nutrients), which will have the potential to result in an increase in the diversity of benthic habitats. Climate change, however, presents various pressures to benthic habitats in terms of the likely increase in natural storms and sea level rise, and the potential for changes in water temperature and elevated threat from invasive non-native species. Ocean acidification is also an issue for benthic and intertidal ecology with rising carbon dioxide concentrations in the sea. Coastal squeeze of intertidal sediment habitats due to rising sea levels and presence of immobile coastal defence structures is likely to continue to cause habitat loss.

Other ongoing activities which directly disturb the seabed and directly or indirectly impact benthic communities include trawling, dredging, coastal and offshore development (including ports, coastal defence, marine cables, marine renewables), yacht moorings, port and harbour works, bait digging and shellfish (e.g. periwinkles) collection.

2.4 Plankton

The following data sources have been used to characterise the Marine Plankton community within the Northern Ireland marine area:

- SEA 6 Environmental Report. SEA of Draft Plan for a 24thh Seaward Round of Offshore Oil and Gas Licensing. (DTI, 2005);
- SEA 7 Environmental Report. 25th Offshore Oil and Gas Licensing Round. (DTI, 2007);
- UK Offshore Energy SEA. Future Leasing for Offshore Wind Farms and Licensing for Offshore Oil & Gas and Gas Storage. Environmental Report. (DECC, 2009); and,
- UK Offshore Energy Strategic Environmental Assessment 2: Environmental Report (DECC, 2011)

2.4.1 Baseline Description

A review of plankton ecology in the Irish Sea area has been undertaken based on data provided by the Continuous Plankton Recorder (CPR) survey, regional surveys and scientific literature (DTI, 2005). CPR coverage is limited in the northern Irish Sea. However, a number of relevant survey stations and transects have been operated by Port Erin Marine Laboratory (PEML) and the Environment Agency.

Plankton is a general term which covers a wide range of free-floating plants (phytoplankton) and animals (zooplankton). They form the base of most trophic

interactions within the marine area and changes in their distribution and abundance have important consequences for higher trophic levels. Due to their limited mobility, plankton distribution and abundance is strongly influenced by hydrographic factors such as depth, tidal mixing, temperature stratification and currents.

Phytoplankton

Coastal waters of the western Irish Sea tend to have spring chlorophyll values of 15-25µg/l, whilst offshore waters in the western Irish Sea tend not to exceed 15µg/l (DTI, 2005). In the western Irish Sea the spring bloom develops between March and May, and is dominated by diatom species, including *Chaetoceros spp.*, *Thalassiosira spp.*, *Leptocylindrus danicus* and *Leptocylindrus minimus* (DECC, 2009). By June the phytoplankton populations begin to decline. By this time the western central Irish Sea develops a strong thermocline associated with the development of the western Irish Sea gyre. After stratification has been established, nutrients are soon consumed by the phytoplankton and greater phytoplankton biomass is found at depth where there is nutrient exchange across the pycnocline. During the summer months, dinoflagellates dominate the community, with important genera including *Ceratium, Gymnodinium* and *Scrippsiella*, as well as the bloom forming *Noctiluca scintillans* (DECC, 2009).

In the north-east Atlantic, there have been a large scale changes in phytoplankton colour which reflects spatiotemporal changes in the patterns of sea surface temperature (DTI, 2007). These changes can be partly explained by trends in the North Atlantic Oscillation (NAO) and are most likely a reflection of opposing responses to wind mixing, sea surface temperature and other hydrodynamic factors although this is poorly understood.

Zooplankton

The most abundant zooplankton are copepods, small crustaceans ranging in size from 0.5-6.0mm. These generally feed on phytoplankton and are themselves the main food source for many organisms higher in the food chain such as larval and juvenile fish. Copepods constitute almost 70% of the zooplankton with smaller species (e.g. *Pseudocalanus elongatus*, *Temora longicornis* and *Acartia clausi*) dominating in the Irish Sea (DTI, 2005; DECC, 2009). Other species such as *Calanus helgolandicus* and *C. finmarchicus* were still an important component of the community but much less abundant. A similar population pattern is found the North Channel.

Crustacean decapod larvae (e.g. Crabs, Shrimps etc) are an important seasonal element of the meroplankton constituting about 9% of the zooplankton in the western Irish Sea survey. The larval forms of other benthic organisms including cirripedes (Barnacles), echinoderms (Urchins, Starfish) and gastropod molluscs were present at lower levels (1-2%). Other elements of the zooplankton include fish eggs and larvae, chaetognaths (Arrow Worms) as well as a range of gelatinous zooplankton including larvaceans, salps, doliolods, ctenophores and coelenterates.

General copepod distributions in the Irish Sea show a consistent pattern of elevated numbers west of the Isle of Man. The western Irish Sea gyre has been shown to retain organisms within this region (e.g. Dickey-Collas et al. 2006) and could be one reason for the elevated copepod abundances. Numbers of Nephrops larvae are greatest in the western Irish Sea probably as a result of the adults being confined to muddy substrates.

Recently, a large scale reorganisation in the calanoid copepod biodiversity has been detected in the north eastern North Atlantic and adjacent seas (DTI, 2007). Strong biogeographical shifts in all copepod assemblages were found with a northward extension of more than 10 degrees in latitude of warm-water species associated with a decrease in the number of colder-water species. These changes have been attributed to regional sea surface temperature warming.

2.4.2 Key Issues, Problems and Future Trends

Plankton assemblage appears to be changing with range extension of warmer water species and restriction of colder water species. Furthermore, the duration of the main spring/summer phytoplankton bloom in the Irish Sea and surrounding waters appears to have lengthened and the intensity of the spring bloom also appears to have increased. There is also considerable variation in the timing of the spring bloom (Kennington & Rowlands 2005). Long-term signals in phytoplankton biomass and phytoplankton community shifts have been correlated with sea surface temperatures, Northern Hemisphere Temperature Anomaly and changes in the North Atlantic Oscillation (NAO) index (Edwards et al. 2001, Beaugrand & Reid 2003).

Rising carbon dioxide concentrations in the sea are expected to reduce levels of calcification by marine organisms, by lowering the calcium carbonate saturation state of seawater. However, there is also evidence to suggest that coccolithophore *Emiliania huxleyii* calcification and primary production has increased with CO_2 partial pressures

(DECC, 2011). Meanwhile, field evidence shows there has been a 40% increase in average coccolithophore mass over the last 220 years, evidence of a rapid and impressive response from coccolithophores to ocean acidification. Under certain conditions (e.g. rapid reproduction, reduced grazing pressures, favourable environmental factors) blooms can occur involving nuisance or noxious species (DECC, 2009). These are referred to as Harmful Algal Blooms (HABs). The most common and abundant group of planktonic organisms that form cysts are the dinoflagellates and in the Irish Sea over 45 dinoflagellate cyst taxa have been identified (Marret & Scourse 2002). Dinoflagellates form cysts during either adverse environmental conditions or following sexual reproduction. These cysts sink to the seabed and tend to be concentrated in fine rather than coarse sediments. They can be transported a considerable distance by water currents, especially during winter storms (Marret & Scourse 2002). More information on the distribution of these cysts could assist tracking the potential for harmful algal blooms (cysts of the genus *Alexandrium*, associated with paralytic shellfish poisoning (PSP) have been observed in the Irish Sea (Marret & Scourse 2002) and/or exceptional blooms which cause nuisance/eutrophication events.

Further, the introduction of new marine species from ballast waters has increased and is now thought to be responsible for about 20% of all new species introduced to the marine area in Britain (Kennington & Rowlands 2005). Many of these invasive species travel as cysts in ballast water tanks. Information on the distribution of these cysts following introduction would allow a more targeted response.

2.5 Fish and Shellfish

The following data sources have been used to characterise the fish and shellfish populations within the Northern Ireland marine area:

- Spawning and nursery ground of selected fish species in UK waters. (Coull et al, 1998; Ellis et al, 2012);
- MarLIN website;
- Northern Irelands' Priority Species and Species of Concern list (National Museums Northern Ireland 2006-7);
- DARD/MFA fisheries statistics (MFA 2009);
- Position statement on sharks, skates and rays in Northern Ireland waters. (Agri-Food & Biosciences Institute, 2009); and,

- National Report for Ireland on Eel Stock Recovery Plan. Including River Basin District Eel Management Plans. The Department of Communications, Energy and Natural Resources, Inland Fisheries Division (DCENR, 2008).

It is recognised that fish are mobile and transboundary features in adjacent UK jurisdictions, the Isle of Man and in neighbouring Member States, namely the Republic of Ireland (RoI). These features could be directly and/or indirectly affected by the Marine Plan. There is a range of data sources that characterise fish in these other jurisdictions, including, for example:

- Inland Fisheries Ireland website (http://www.fisheriesireland.ie/);
- Inshore Fisheries and Conservation Authorities (IFCA) website;
- Marine Scotland (2013). Fish and Shellfish Stocks 2013 Edition;
- MarLIN website (www.marlin.ac.uk) [Accessed on 8 August 2014];
- National Parks and Wildlife Service (NWPS) publications; http://www.npws.ie/publications/; and,
- Wales Marine Planning Portal wales.gov.uk/topics/environmentcountryside/fisheries/marine/marine-planning/latest-news/marine-planning-update-2/?lang=en.

2.5.1 Baseline Description

Northern Ireland's coastal waters are home to approximately 100 species of regularly occurring marine fish. The key spawning and nursery grounds for cod, herring, mackerel, plaice, sand eel, sole, thornback ray, tope shark and whiting are shown in Figure 4. 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.

There is limited baseline data on the presence, distribution and population of sharks and rays in Northern Ireland. A recent survey to try to address this evidence gap has provided records of 17 species of elasmobranchs which includes 11 shark species and 6 ray species. This study highlighted the importance of a number of areas off the Northern

Ireland coast as nursery grounds for several ray species. These hotspots included Belfast Lough, Carlingford Lough and off Dundrum Bay. Despite the status of some rays being stable or increasing in overall terms in the Northern Ireland marine area, their susceptibility to local depletions should be recognised.

The priority fish and crustacean shellfish species occurring in the Northern Ireland marine area are included in Table C. In addition, Atlantic salmon is internationally protected and a qualifying interest feature of a number of inland SACs in Northern Ireland. The Northern Ireland marine area is also known to support priority species of molluscs (e.g. Fan Mussel and Flat Oyster).

European eel is another important fish species in Northern Ireland. The latest scientific advice from the International Council for the Exploration of the Sea (ICES) concerning European eel is that the Irish stock is outside safe biological limits and that current fisheries are not sustainable (DCENR, 2008). ICES have recommended that a recovery plan be developed for the whole stock of European eel as a matter of urgency and that exploitation and other human activities affecting the stock be reduced to as close to zero as possible. In recognition of their importance, DARD has invested in an eel processing plant in 2013/14 for the Lough Neagh Fisherman's Cooperative under the European Fisheries Fund. In addition, protection is being afforded through an eel management plan in Lough Neagh/River Bann for the period 2010-2015.

Table C: Priority Fish and Shellfish Species within the Northern Ireland Marine Area

Species Name	Conservation Information	Distribution Description
Basking Shark (*Cetorhinus maximus*)	Listed as Vulnerable on the IUCN Red List of threatened species, on Appendix 11 of CITES, Appendix 1 and 11 of the Bonn Convention on Migratory Species and Schedule 5 of the UK Wildlife and Countryside Act 1981. Listed as a UK Priority species and its UK Species Action Plan for this species was published in 1999.	May be seen in coastal waters from May to September where there is a good supply of plankton. The sea around Rathlin Island, County Antrim and the waters off Strangford Lough, County Down are areas where basking sharks are regularly seen. Actual population size is unknown.
Common Skate (*Dipturus batis)*	UK Priority species and has declined substantially. Classified as Critically Endangered on the IUCN Red List 2006. In 1976 the Irish Specimen Fish Committee (all-Ireland remit) removed the common skate from the list of eligible species in order to discourage capture and killing of large individuals by anglers.	Found occasionally throughout Northern Ireland especially on the north coast. Unlikely to be seen except by sea anglers. Egg cases can be found washed up on the beach.
Allis Shad (*Alosa alosa*)	Listed as a UK Priority Species. Current status is unknown and requires urgent investigation. Irish Red Data Book classified as Vulnerable. There is a UK Species Action Plan which was published in 1995.	Recorded from Lough Foyle and off the County Down coast. Found in the lower reaches of river and in estuarine and coastal waters. It is not known if spawning has ever occurred in Northern Ireland.
Twaite Shad (*Alosa fallax*)	Listed as a UK Priority Species and in the Irish Red Data Book classified as Vulnerable. The current status of twaite shad in the Northern Ireland marine area in unknown and requires urgent investigation. UK Species Action Plan which was published in 1995.	Recorded from Lough Foyle, Belfast Lough and the County Down coast. Spawns from May to June. Its preferred habitat is estuarine or coastal waters.
Smelt (*Osmerus eperlanus*)	An Irish Red Data Book and is classified as Vulnerable. Species has declined in other parts of European therefore it is likely that it has in Northern Ireland as well.	Found in shallow coastal and estuarine waters and recorded in Lough Foyle, Larne Lough and Belfast Lough. Spawns (February – March) in the lower reaches of rivers around the tidal limit.
Hermit Crab (*Cestopagurus timidus*)	Priority species as Northern Ireland is its only known Irish site, but it is not legally protected. There is no UK Habitat Action Plan for this species, but there is for seagrass, its preferred habitat.	Only known location is Rathlin Island. Preferred habitat is intertidal and shallow subtidal muds and sands with eelgrasses and algal beds.

Species Name	Conservation Information	Distribution Description
Rugose Squat Lobster (*Munida rugosa*)	Has no legal protection. This species is widespread but the exact conservation status of this species is lacking. Its supporting habitat of sands and other sediments have declined, implying that numbers of this species may also be declining.	Widespread and common species throughout the Northern Ireland marine area. Found at low intertidal to about 100m depth on muddy/sandy substrate with stone and rocks. Key locations include Portrush Skerries, all round Rathlin, the Maidens, off Muck Island, Larne and the Gobbins, in the north end of Strangford Lough Narrows, and widely in its interior.
Crawfish (*Palinurus elephas*)	A priority species due to its scarcity and decline. It has no legal protection but is covered by fisheries regulations administered by the Fisheries Division of DARD(NI).	Only known to be found around Rathlin Island. It is vulnerable to impacts from fishing and its Northern Ireland population is declining. Preferred habitat is subtidal rock faces, rocky seabed and occasionally open terrain.
Crab (*Atelecyclus rotundatus*)	It is a widespread species and has no legal protection. Although widespread, the species is listed as declining due to habitat loss.	Widely distributed, found in areas of sands and gravels extending to moderate depths. This habitat is vulnerable to disturbance from mobile fishing gear.
Crab (*Inachus leptochirus*)	Widespread and has no legal protection.	Found in sublittoral muds and muddy sands around the north-eastern and eastern coast of Northern Ireland, including Rathlin Island, Ballycastle, Garron Point, Red Bay, Larne, Donaghadee, and Strangford Lough.

Source: Northern Irelands' Priority Species and Species of Concern List. National Museums Northern Ireland 2006-7.

2.5.2 Key Issues, Problems and Future Trends

The key issues faced by fish populations within the Northern Ireland marine area are overfishing and habitat loss. Some of the commercially valuable species are being fished at unsustainable levels, especially those which are slow growing and become sexually mature later. Some fisheries are partially non-selective and consequently catch non-target species (by-catch). This extra catch is often discarded, particularly if the fish have no commercial value, are under-sized or over quota. Habitat loss from development can result either through removal of habitat or smothering of benthic communities. The ability of species to avoid potential harm will depend to some extent on the mobility of the species at various stages of their life cycle.

Spawning grounds are selected due to the substrate and hydrodynamics of the region as these factors create a greater chance of fertilisation and/or egg and larvae distribution

(dependent upon the species life cycle) and thus successful recruitment. If such habitats are lost, it is likely that this could lead to a reduction in fish population. Nursery grounds are also important to the success of a population. These are often intertidal sheltered areas where the threat of predation is reduced (Ellis et al, 2012) and, therefore, provide a valuable mechanism for increasing recruitment success. Juveniles are confined within these coastal and estuarine habitats, and therefore recruitment levels and population size can be affected by habitat loss.

Both spawning and nursery grounds could be affected by the impacts of fishing gear. Demersal otter trawls are designed to catch fish and shrimps that stay above the sea bed, from close to the bottom to several metres from the bottom. Beam trawls[5] and scallop dredges, on the other hand, are used to target species that stay on the bottom or that are partly buried in the sediment. Accordingly, the tickler chains of a beam trawl and the teeth of a dredge are specifically designed to disturb the seabed surface and penetrate the upper few centimetres of the sediment. This has the potential to damage the substrate or any biogenic structures present, making the region a less valuable spawning or nursery ground.

Elasmobranchs (e.g. basking sharks) are particularly vulnerable to a decrease in population from a relatively small amount of disturbance given that they are slow growing and therefore reach sexual maturity later and have low fecundity (K-selected species) (Agri-Food and Biosciences Institute, 2009). The main pressures and impacts on these species in Northern Ireland waters are from targeted fishing, accidental by-catch and habitat issues relating to spawning and nursery areas. Some of the species were found to be in a state of rapid decline. More baseline data needs to be collected to complement information from recreational and commercial fisheries catch data, and help improve our scientific understanding of these species, as well as inform population studies and modelling of species dynamics. These in turn could be used to produce meaningful conservation management and mitigation measures.

2.6 Marine Mammals

The following data sources have been used to characterise the marine mammals within the Northern Ireland marine area:

- Irish Whale and Dolphin Group website;

[5] Although beam trawlers are not currently used by Northern Ireland's commercial fisheries they may be used in the future.

- Monitoring cetaceans in Irish Waters (Berrow et al, 2010);
- Wall D., Murray C., O'Brien J., Kavanagh L., Wilson C., Ryan C., Glanville B., Williams D., Enlander I., O'Connor I., McGrath D., Whooley P. and Berrow S. (2013). Atlas of the distribution and relative abundance of marine mammals in Irish offshore waters 2005 - 2011. Irish Whale and Dolphin Group, Merchants Quay, Kilrush, Co Clare;
- Atlas of the Marine Mammals of Wales (Baines and Evans, 2012);
- Scientific advice on matter related to the management of seal populations (SCOS, 2012);
- Results of the thermal image survey of seals around the coast of Northern Ireland (Callan and Duck, 2006);
- Small Cetaceans in the European Atlantic and North Sea (SCANS II) Final Report;
- Discrete or not so discrete: Long distance movements by coastal Bottlenose Dolphins in UK and Irish waters. (Robinson et al, 2012);
- A review of cetacean bycatch in pelagic trawls and other fisheries in the north-east Atlantic (Whale and Dolphin Conservation Society (WDCS), undated); and,
- Second Report by the United Kingdom under Article 17 on the implementation of the Directive from January 2001 to December 2006 (JNCC, 2007).

It is recognised that marine mammals are mobile transboundary features that occur in adjacent UK jurisdictions, the Isle of Man and in neighbouring Member States, namely the Republic of Ireland (RoI). There is a range of data sources that characterise marine mammals in these other jurisdictions, including, for example:

- National Biodiversity Data Centre Atlas of Irish Mammals (http://mammals.biodiversityireland.ie/);
- National Parks and Wildlife Service (NWPS) publications. http://www.npws.ie/publications/;
- National Parks and Wildlife Service (NWPS) marine reports. http://www.npws.ie/marine/marinereports/;
- IAMMWG (2013). Management units for marine mammals in UK waters (June 2013);

- JNCC (2007). Second Report by the United Kingdom under Article 17 on the implementation of the Directive from January 2001 to December 2006; and,
- Wales Marine Planning Portal http://wales.gov.uk/topics/environmentcountryside/fisheries/marine/marine-planning/latest-news/marine-planning-update-2/?lang=en (Accessed on 8 January 2015).

2.6.1 Baseline Description

27 species of marine mammal have been recorded within the Northern Ireland marine area: 24 cetaceans, 2 seals and the otter (Irish Whale and Dolphin Group website). Of these, 7 species of cetacean, 2 species of seal and the otter either inhabit or migrate annually to the Northern Ireland marine area. The 7 species of whale and dolphin that are regularly sighted include the Harbour Porpoise, the Common Dolphin, the Bottlenose Dolphin and the Minke Whale. Occasionally Killer Whales, Humpback Whales, Fin Whales and Risso's Dolphin are also sighted. There have been 16 different species of cetacean stranded along the Northern Ireland coast which include the Atlantic White Sided Dolphin, Cuviers Beaked Whales and a single recording of a Blue Whale stranding at Magilligan in 1907 (DAERA website).

Harbour Seal

Harbour Seals are found around the coasts of the North Atlantic and North Pacific from the subtropics to the Arctic. This is the smaller of the two native UK seals measuring up to approximately 1.85m in length and typically weighing 80-100 kg. Approximately 30% of the European population is found in the UK, of which 5% are within Northern Ireland (SCOS, 2012).

Genetic analysis on Harbour Seals in European waters has found evidence of significant genetic differentiation between different areas. Goodman (1998) identified six distinct population units: Ireland-Scotland, English east coast, Wadden Sea, western Scandinavia (Norway-Kattegat-Skagerrak-west Baltic), east Baltic and Iceland. Within the Ireland-Scotland population there is probably occasional movement of animals between regions, but there is no evidence from satellite telemetry of any long-range movements (for example, between the east and west coasts of Scotland) comparable to those observed in grey seals. Similarly, studies of the movements of branded seals in the Kattegat/Skagerrak indicate that there is only limited movement within the western

Scandinavia population. However, satellite telemetry has revealed some interchange between the Wadden Sea and the English east coast populations outside the breeding season (SCOS, 2012). This evidence and the fact that the phocine distemper virus spread rapidly throughout European Harbour Seal populations indicates that movement of individuals between locations does occur, but reproduction does not occur in the regions they visit (SCOS, 2012).

Harbour Seals are widespread throughout the region but are most abundant in sheltered waters around County Down in particular Strangford Lough which is an important pupping site. Harbour Seals are part of large mobile populations that move around the Northern Ireland marine area and along the Irish coast to the west coast of Scotland. They are protected under the EU Habitats Directive and the Wildlife (Northern Ireland) Order 1985.

Adult seal populations at Strangford Lough have fluctuated over recent years, but the 2012 population was recorded as 202 which is close to the average (199) for the last 10 years (DOE, 2013). The number of pups recorded in 2012 was 28, which was higher than the count the previous year of 19 (DOE, 2013).

Grey Seal

The Grey Seal is the larger of the two seal species found in British waters, with males reaching a length of 2.45m and weighing over 300kg. Grey Seals give birth to their pups from September to early November.

Within Europe there are two apparently reproductively isolated populations, one that breeds in the Baltic, usually pupping on sea ice in the spring, and has a population of approximately 15,177; and one that breeds outside the Baltic, usually pupping on land in Autumn and early winter and has an estimated population of 111,300. These populations appear to have been reproductively isolated at least since the Last Glacial Maximum (between 26,500 and 19,000-20,000 years ago). The vast majority of European grey Seals breeding outside the Baltic breed around Britain (88%) (SCOS, 2012).

A range of studies have shown that Grey Seals can undertake long distance travel between different haul-out sites but foraging trips are generally much smaller. For example, Thompson et al. (1996) found that four seals tracked from the Moray Firth moved to haul-out sites 125-365km away, and provided evidence of interchange between the Moray Firth and other Grey Seal breeding areas in Orkney, the Firth of Forth and the Farne Islands. Those Grey Seals which foraged within Moray Firth travelled up to 145km from haul-out sites.

Grey Seals are most common on rugged and exposed sites of County Antrim. Grey Seal pup production estimates for the main colonies surveyed in 2010 recorded 100 pups (SCOS, 2012). Similarly to harbour seals, Grey Seals are part of large mobile populations that move around the Northern Ireland marine area and along the Irish coast to the west coast of Scotland. They are protected under the EU Habitats Directive and the Wildlife (Northern Ireland) Order 1985. The only protected site in the Northern Ireland marine area which is designated for Grey Seal is The Maidens SCI.

Harbour Porpoise

Harbour Porpoise distribution is restricted to temperate and sub-arctic (primarily 5-14ºC) seas of the Northern Hemisphere. The Harbour Porpoise is the most commonly recorded cetacean in UK waters, primarily occurring on the continental shelf. In coastal waters, Harbour Porpoise are often encountered close to islands and headlands with strong tidal currents. They may often show large seasonal variations in distribution (Read & Westgate, 1997 and Sveegard et al, 2011). These seasonal changes may be linked to migrations/changes in the distribution of prey (Sveegaard et al, 2011).

Bottlenose Dolphin

The Bottlenose Dolphin has a worldwide distribution in tropical and temperate seas of both hemispheres in shelf and coastal waters. In coastal waters, bottlenose dolphins favour river estuaries, headlands and sandbanks, mainly where there is uneven bottom relief and/or strong tidal currents (DECC, 2009). Bottlenose dolphins in the North Atlantic appear to consist of two forms, coastal and offshore. The better known coastal form is locally common in the Irish Sea (particularly Cardigan Bay), the west coast of Ireland (particularly the Shannon Estuary) and off north east Scotland (particularly the inner Moray Firth), and in smaller numbers in the Hebrides (west Scotland), and off south west England. Little is known about the offshore form of bottlenose dolphins, including the

relationship between the offshore and coastal forms (Clark et al., 2010). In Ireland there are two distinct populations, a resident population in the Shannon Estuary and a wide ranging coastal population.

Common Dolphin

Although known to be common in deep water, this species is most frequently sighted in shallow (<200m) shelf waters in Northern Ireland off headlands during the summer. They are known to feed on a variety of fish and squid. The Common Dolphin is protected under a range of legislation including Annex IV of the EC Habitats Directive (see protected sites section above).

Risso's Dolphin

Risso's Dolphin is sighted regularly all year long around the Irish coast. They generally prefer deep offshore water but have been seen inshore during the summer months and have also been sighted off the coasts of Co. Down and Co. Antrim (IWDG). In UK and Irish waters, Risso's Dolphins are most abundant over shelf waters and in coastal waters, particularly of the SW and SE coast of Ireland, around the Isle of Man and between Wexford and Pembrokeshire in the South Irish Sea (Jefferson et al., 2014; Wall et al., 2013). They may use deeper waters of the continental shelf slope and offshore banks on a seasonal basis. Risso's Dolphin is protected under a range of legislation including Annex IV of the EC Habitats Directive (see protected sites section above).

Killer Whale

The biggest concentrations of Killer Whales occur over the continental shelf. These are nomadic species in their distribution and have been known to hunt inshore and up rivers following salmon runs. The vast majority of Northern Ireland sightings relate to the 'west coast' killer whale community which numbers just 10 animals. These killer whales feed predominantly on seals but also on fish (Beck et al., 2014; Foote et al., 2009; Foote et al., 2010). Killer Whales are protected by a range of legislation including Annex IV of the EC Habitats Directive (see protected sites section above).

Baleen Whales (Minke, Sei and Humpback Whales)

The Minke Whale is the smallest and most common of the baleen whales found around the coast of Northern Ireland. Sightings have increased over recent years as whale-watching has become more popular. The best places for whale-watching are headlands, islands and bays when the sea is calm between May to October. There is data showing that Humpback Whales occur each summer at low densities off the north and east coasts of Northern Ireland, particularly in July (IWDG 2014). Fin whales have also been recorded on occasion off the NI coast in the summer months. (Wall et al., 2013). Sei whales have been recorded on two occasions just prior to stranding but are not known to occur regularly in Northern Ireland waters (IWDG 2014).All cetacean species are protected under a range of legislation including Annex IV of the EC Habitats Directive (see protected sites section above).

Otter

Otters are a good indicator of water quality as they need clean unpolluted water with a large and varied supply of food. Both riparian and coastal habitats support otters, as do coastal islands. Otters live at far higher densities in coastal habitats than riparian habitats, predominantly due to a high abundance of food in coastal habitats. Northern Ireland has a healthy population of otters and require consideration in a coastal context as significant numbers may be present on the Northern Ireland coast.

2.6.2 Key Issues, Problems and Future Trends

In 1988 and 2002 there were outbreaks of Phocine Distemper Virus (PDV) which caused significant mortality (estimates of about 50% of the total population) of harbour seals across Europe. Although present UK seal populations seem to be slowly recovering to pre-2002 numbers, if such an outbreak were to happen again a similar outcome is considered likely. In addition to disease, seals are also at risk from chemical pollution, in particular from oil pollution and also organochlorines which affect seal reproduction.

Marine mammals are at risk from by-catch and becoming entangled in fishing gear. The cetacean species caught in the greatest numbers in the north-east Atlantic are the Common Dolphin and the Harbour Porpoise (WDCS, undated). Between 2000 and 2004, post mortems of stranded Common Dolphin indicated that 61.1% of these died as a result of by-catch and a further 15.3% as a result of live strandings (Jepson, 2006, cited in JNCC, 2007). Additionally, two incidences of death as a result of gas emboli were also

reported during this period (Jepson et al., 2005, cited in JNCC, 2007). The Harbour Porpoise is particularly vulnerable to bottom-set gillnet fisheries. Observer monitoring in some areas has recorded large and unsustainable bycatch levels: some 2,200 porpoises per year in the Celtic Sea (WDCS, undated). By-catch has nevertheless decreased in the last few years, due to a combination of reduced fishing effort and the use of acoustic "pingers" (Seafish 2003, 2006, cited in JNCC, 2007).

The UK has been concerned about the levels of cetacean by-catch in fisheries for a number of years, funding research to identify which fisheries are responsible for by-catch and research on mitigation measures to reduce this by-catch to as low a level as possible. As most fisheries in which cetacean by-catch is an issue are also targeted by other Member States of the European Union, it is important that coordinated action is taken such as that proposed by Regulation 812/2004.

Otters in Northern Ireland are particularly threatened by water pollution (farm waste, pesticides and oil spills in coastal areas) and loss of habitat (removal of bankside vegetation and drainage of wetlands), as well as accidental death (e.g. drowning in fishing nets/traps).

Climate change issues, such as changes in temperature, can have significant consequences for marine mammals because of changes that may occur in the food web and consequently prey availability. This can lead to changes in distribution, abundance, health and reproduction, thus potentially affecting whole populations.

2.7 Marine Reptiles

In assessing the marine reptiles within the Northern Ireland marine area, the following data sources have been used:

- Review of marine turtle records in Northern Ireland. (King, 2006);
- Northern Ireland’s Priority Species and Species of Concern list; and,
- SEA on Offshore Wind and Marine Renewable Energy in Northern Ireland (2009).

2.7.1 Baseline Description

Two species of turtle have been observed in Northern Ireland waters: Leatherback Turtles and Loggerhead Turtles, with leatherback being the most frequently observed.

Turtles are classified as critically endangered on the IUCN Red List, listed in Appendix I of CITES, listed in Appendix I and II of the Convention on Migratory Species, listed in

Appendix II of the Bern Convention and listed in Annex IV of the EC Habitats Directive. They are also collectively listed in a Grouped Species Action Plan within the UK BAP.

2.7.2 Key Issues, Problems and Future Trends

There are significant gaps in scientific knowledge of the distribution of marine reptiles and their functional use of marine areas, so predicting future trends for these species is challenging. Some of the major issues these species face are eating marine litter such as plastic bags when they are mistaken for jellyfish which causes blockages on the gut and eventual death. Ship strikes are a key threat to marine reptiles. Marine reptiles have to come to the surface to breathe, making them vulnerable to being struck by a ship and/or its propeller. Turtles are also very susceptible to entanglement in fishing gear which can lead to drowning.

A change in temperature and a rise in sea level have the potential to affect marine reptile food availability and distribution. Jellyfish and algae are both major food sources for marine reptiles, and there is evidence that abundance of these species is changing as a result of climate change (Lynam, et al, 2010). The study provided evidence that the abundance of jellyfish is increasing, primarily due to climate change but also because the numbers of jellyfish predators are being overfished.

2.8 Birds

The following data sources have been used in assessing the status and prospects of birds within the Northern Ireland marine area:

- Seabird Population Trends and Causes of Change: 2012 Report (JNCC 2012);
- Waterbirds in the UK 2010/2011: The Wetland Bird Survey. (BTO 2011);
- WeBS Alert Reports (BTO 2009);
- Northern Ireland’s Priority Species and Species of Concern list;
- An Atlas of seabird distribution in north-west European waters. (JNCC);
- OSPAR List of Threatened and/or Declining Species and Habitats;
- Birds of Conservation Concern 3 (BOCC3) (based on Eaton et al 2009);
- Birds of Conservation Concern Ireland (BOCCI) (based on Lynas et al 2009);

- RSPB website publications (http://www.rspb.org.uk/ourwork/policy/marine/fisheries/bycatch.aspx, http://www.rspb.org.uk/Images/longlinefishing_tcm9-163197.pdf);
- ASSI and SPA Citation documents; and,
- Northern Ireland Species Action Plans.

It is recognised that birds are mobile transboundary features that migrate to and/or forage in adjacent UK jurisdictions, the Isle of Man and in neighbouring Member States, namely the Republic of Ireland (RoI). There is a range of data sources that characterise birds in these other jurisdictions, including, for example:

- The status and trends of Ireland's bird species – Article 12 Reporting (http://www.npws.ie/status-and-trends-ireland%E2%80%99s-bird-species-%E2%80%93-article-12-reporting);
- Format for a Prioritised Action Framework (PAF) for Natura 2000. For the EU Multiannual Financing Period 2014-2020. Ireland (http://www.npws.ie/sites/default/files/publications/pdf/PAF-IE-2014.pdf);
- BirdWatch Ireland website (http://www.birdwatchireland.ie/);
- 'Seabird 2000' (1998-2002) data from the JNCC website;
- The RSPB's FAME (Future of the Atlantic Marine Environment www.fameproject.eu) and STAR (Seabird Tracking and Research) seabird tracking data sets http://www.rspb.org.uk/whatwedo/projects/details.aspx?id=365020;
- Joint Nature Conservation Committee (JNCC) online Seabird Monitoring Plan (SMP) database http://jncc.defra.gov.uk/page-1550;
- National Parks and Wildlife Service (NWPS) publications http://www.npws.ie/publications/; and,
- Wales Marine Planning Portal http://wales.gov.uk/topics/environmentcountryside/fisheries/marine/marine-planning/latest-news/marine-planning-update-2/?lang=en.

2.8.1 Baseline Description

The wide range of coastal habitats available around the coast of Northern Ireland presents a similarly wide range of opportunities for exploitation by bird populations. Use of the different habitats varies between seasons, as breeding, wintering, roosting and migration stopover sites. Some sites may be occupied throughout the year; estuaries and sea loughs may fulfil all the functions noted above. Use of other sites may be more or less restricted to a single function; for example vertical cliffs may support intensive breeding activity by large numbers of birds only during the summer months. This wide variation means that habitats, seasonality, and the differences in bird behaviours and requirements between species must all be considered when the potential impacts of developments in coastal and marine areas are assessed.

Northern Ireland coastal and marine areas support nationally and internationally significant numbers of birds. In some cases the significance depends on the numbers of a single species or small number of species; elsewhere it is the total number of birds of a large number of species that make a site important. Where these numbers exceed defined thresholds, sites are designated as Special Protection Areas (SPAs) under the Birds Directive, or as Areas of Special Scientific Interest (ASSIs) under the Environment (Northern Ireland) Order 2002 or its predecessor instruments.

The SPAs that occur within the Northern Ireland marine area are shown in Figure 2. The majority of SPAs have been designated as Ramsar sites. SPAs are also protected as ASSIs, and bird species are also designation features of a number of additional ASSIs.

Because of the large number of species that use Northern Ireland's marine and coastal waters, and littoral habitats, and the wide range of available habitats as outlined above, the following baseline description discusses groupings of bird species. Groupings are based on bird families or closely related families. Individual species accounts are given for those species that are most dependent on the marine area or are of particular conservation importance.

Shearwaters and petrels

Two species, Manx Shearwater *Puffinus puffinus* and Fulmar *Fulmaris glacialis*, breed in Northern Ireland, while a number of other species occur on migration, during post-breeding dispersion or as vagrants. Two colonies of Manx Shearwater are known, both on the Copeland Islands, where an estimated 4,633 pairs were counted during the Seabird 2000

census, or around 1.5% of the UK population. Large numbers of shearwaters breed on Rum, and it is therefore likely that Northern Ireland waters are used frequently by birds migrating, dispersing or foraging from this, as well as other, colonies. The species is a summer visitor, and is generally absent from the North Atlantic in winter.

Fulmars breed on cliffs along both the east and north coasts of Northern Ireland, but around 60% of the Northern Ireland population breeds on Rathlin. Seabird 2000 suggested that around 3000 nest sites were occupied in Northern Ireland at that time, which equates to around 1.1% of the UK population. There has been a recent decline of this species, following an almost constant increase during the twentieth century. Numbers at Rathlin in 2011 were around 25% lower than in 1999 (JNCC website). As a result the species is Amber-listed in BOCC3. Declines are likely to be related to decreases in discards and offal from fishing fleets, and declines in natural prey that may be caused or moderated by climate change. Densities at sea are generally low.

Storm Petrels *Hydrobates pelagicus* occur regularly around the Irish coast but are not known to breed in Northern Ireland. The species is most frequent at sea, albeit at low densities, in July and August. A small number of shearwater species occur as migrants or vagrants in small numbers, the most frequent being Sooty Shearwater *Puffinus griseus*.

Gannet

Gannet *Morus bassanus* does not breed in Northern Ireland, but breeds in small numbers in Galloway (around 40 km to the east) and in large numbers on Ailsa Craig, (60km to the east). The species is mainly a summer visitor and frequently uses Northern Ireland offshore waters for foraging, and may enter the inner waters of Belfast Lough. Other birds are likely to use local waters during migration and as a route to foraging areas in the wider Atlantic. The species is most frequent at sea between May and August, when Ailsa birds are incubating or rearing chicks. The species is Amber-listed in BOCC3 because of its restricted distribution in the UK.

Cormorant and shag

These two species are present in Northern Ireland waters throughout the year. Cormorant *Phalacrocorax carbo* breeds at a limited number of coastal sites, the largest being Sheep Island and Strangford Lough. Numbers have generally increased over recent years, but the population at Sheep Island has declined, against the UK trend, for reasons that are at present unclear. During the Seabird 2000 census an estimated 663 breeding individuals

were counted, comprising around 5.8% of the UK population. Densities at sea are low outside inshore waters, and there is a notable concentration around Belfast Lough during much of the year. Shag *P. aristotelis* breeds on cliffs and in caves around all coasts, and is almost exclusively maritime in its habits. Numbers declined between the Seabird Colony Register (SCR) count (1985-88) of 440 apparently occupied nests to 301 in 1998-2002, and this decline appears to be continuing. Densities at sea are generally low, with greatest densities around the North Channel. The species is Amber- listed in BOCCI.

Auks

The members of the auk family that breed in Northern Ireland are the Guillemot *Uria aalge*, Razorbill *Alca torda*, Puffin *Fratercula arctica* and Black Guillemot *Cepphus grylle*. Guillemots breed in large numbers on Rathlin – 130,445 individuals were counted at the colony in 2011, making it the largest in the UK. Significant numbers also breed at The Gobbins, while smaller numbers occur along the north coast. Breeding populations have varied considerably in recent years, probably reflecting annual differences in the abundance of prey species. Foraging and loafing birds are concentrated in the general areas of breeding sites, but following breeding birds disperse widely over the North Atlantic. There are concentrations at sea in late summer around Rathlin and off the south east coast, in the vicinity of the Irish Sea Front. Small numbers are then generally present in Northern Ireland waters in winter. The species is Amber-listed in both BOCC3 and BOCCI.

Razorbill has a similar breeding distribution to Guillemot and has also shown great variability in breeding population over recent years. However, a count in 2011 of 22,975 individuals suggested that Rathlin is now the largest colony in the UK. The species shows a similar seasonal dispersion pattern to guillemot. Summer concentrations occur off the north west coast, around the location of the Islay front. The species is Amber-listed in both BOCC3 and BOCCI.

Rathlin held 98% of the Northern Ireland population of puffins in 2002. Numbers were declining at that time, and this trend has continued, with only 695 apparently occupied burrows at the colony in 2011, compared with 1,579 in 1999. Elsewhere, small numbers breed at The Gobbins. Following breeding, birds disperse widely over the North Atlantic and the species is virtually absent from Northern Ireland waters during winter. The species is Amber-listed in both BOCC3 and BOCCI.

Black Guillemot breeds in small numbers at many cliff or boulder sites around the Northern Ireland coasts, but larger number are concentrated in man-made structures such as piers, jetties and harbour walls. Numbers declined at Rathlin between 2003 and 2007, but it is not known whether this is part of a general pattern or whether this population has continued to decline. Birds generally remain within the vicinity of breeding sites throughout the year. The species is Amber-listed in both BOCC3 and BOCCI.

Gulls

Seven species of gull breed in Northern Ireland – Kittiwake *Rissa tridactyla*, Black-headed Gull *Chroicocephalus ridibundus*, Mediterranean Gull *Larus melanocephalus*, Lesser Black-backed Gull *Larus fuscus*, Herring Gull *Larus argentatus* and Great Black-backed Gull *Larus marinus*. Species vary considerably in their lifestyles, and consequently make different uses of the marine and littoral habitats.

Kittiwake is an exclusively maritime species, generally only coming to land to breed. The species has around 13 colonies in Northern Ireland, but by far the largest is at Rathlin, with 9,896 apparently occupied nests in 2007. Colony size in Northern Ireland has been relatively stable when compared with elsewhere in the UK, but numbers have fallen recently. This may reflect low productivity as recorded at Rathlin in a number of recent years. Following breeding, birds disperse widely, although storm-driven birds may be frequent in Northern Ireland waters at times. Higher densities occur in late summer off the south east coast in the vicinity of the Irish Sea front. The species is on the OSPAR List of Threatened and/or Declining Species and Habitats and is Amber-listed in both BOCC3 and BOCCI.

Black-headed Gull has more catholic requirements for breeding sites and is as likely to nest inland as on the coast. However the largest colony is at Strangford Lough, where numbers have tended to vary considerably, although with an overall upward trend in recent years. In the Seabird 2000 census, an estimated 4,037 breeding individuals, equating to 5.1% of the UK population, were counted in Northern Ireland. Many birds use the coast during the non-breeding season, and numbers are augmented by immigrants from the continent. Birds are infrequent at sea, although there may be increased densities in the North Channel during migration periods. The coast is therefore used extensively throughout the year. The species is Amber-listed in BOCC3, but is Red-listed in BOCCI due to historic declines.

Mediterranean Gull nests in very small numbers in Counties Antrim and Down, and is not a significant constituent of the coastal avifauna of Northern Ireland. However, it is Amber-listed in BOCCI due to its small population.

Of approximately 30 colonies of Lesser Black-backed Gulls in Northern Ireland, around half are coastal. The species has increased in recent years, from a total of 1,033 apparently occupied nests at the time of the Seabird 2000 census. In the main, the species is a summer visitor, with reduced numbers present in coastal waters in winter. There are widespread, but low densities of birds at sea during the summer months. The species is Amber-listed in both BOCC3 and BOCCI because of localised breeding populations.

Herring Gull has in the recent past had frequent small coastal colonies, but it has declined severely since the 1980s, when there were around 16,000 apparently occupied nests in Northern Ireland. The Seabird 2000 census found 709 nests, and some colonies became extinct. Botulism has been implicated as a major cause of this decline. Consequently, the species is Red-listed in both BOCC3 and BOCCI. Distribution is mainly coastal during the summer months, but extends into, particularly, the North Channel in winter.

Colonies of Great Black-backed Gulls around Northern Ireland generally contain few birds, but the colony in Strangford Lough holds some tens of pairs. The species has recovered somewhat from recent declines, but is Amber-listed in both BOCC3 and BOCCI. Densities at sea are generally low during the breeding season, although there is some concentration of birds near the Irish Sea front. Larger concentrations occur here and off the north coast in winter, presumably reflecting increases due to immigration from the north and east.

Terns

Four species of Tern, Sandwich Tern *Sterna sandvicensis*, Common Tern *S. hirundo*, Roseate Tern *S. dougallii* and Arctic Tern *S. paradisaea*, currently breed in Northern Ireland. There are approximately seven colonies of Sandwich terns in Northern Ireland. Population numbers vary widely at both the country and the colony scale, but there has been a decline in recent years. The population at the time of Seabird 2000 was 1,954 apparently occupied nests. Distribution at sea is dominantly coastal; the species is absent during the winter months. It is Amber-listed in both BOCC3 and BOCCI as a bird of European concern, a restricted distribution and recent decline.

Apparently occupied nests of common tern were estimated at 1,704 during the Seabird 2000 census, but have declined somewhat since. However, species abundance fluctuates considerably over time, and low site faithfulness means that birds frequently move between colonies, so that local variability is not unexpected.

There are around ten Arctic Tern colonies in Northern Ireland, with a recently variable population of 1,500-2,000 pairs. Most colonies are small, but that on Copeland consists of 800-1,000 pairs. Maritime distribution of both common and Arctic tern is predominantly coastal. The species are Amber-listed in both BOCC3 and BOCCI because of localised breeding populations.

There is a single Roseate Tern colony in Northern Ireland, in Larne Lough, where it has declined to near extinction in recent years. The species is Red-listed in BOCC3, Amber-listed in BOCCI and is on the OSPAR List of Threatened and/or Declining Species and Habitats.

Waders

Around 16 species of waders occur in substantial numbers along the coasts of Northern Ireland at one or more stages of their annual cycle, while a further five species occur regularly in small numbers. The largest numbers occur during migration and winter periods, when significant numbers of Oystercatcher, Ringed Plover, Golden Plover, Grey Plover, Lapwing, Knot, Sanderling, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Whimbrel, Curlew, Redshank and Greenshank use the intertidal of muddy and sandy estuaries and sea loughs as migration stopovers or wintering sites. A number of species such as Purple sandpiper and Turnstone *Arenaria interpres* also use rocky and shingle shorelines at these times. The most important of these sites have been designated as SPAs, Ramsar sites and/or ASSIs.

Wader species generally have specialised foraging requirements, so that different species may exploit different parts of the intertidal and littoral zones. However, different species may also exploit different food resources within the same area, and a wide range of species may share high tide roost sites close to their foraging habitats.

Two wader species, Ringed Plover and Oystercatcher, breed regularly around the coasts of Northern Ireland. The former is restricted to sites that have areas of shingle that are used as nest sites, while the former nests on both bare and vegetated shorelines. Both

species are vulnerable to increasing recreational use of the coast and have declined as breeding species in Northern Ireland.

Wildfowl

This group includes Swans, Geese and Ducks. Three species occur at sites on the Northern Ireland coast in internationally important numbers. Whooper Swan (Annex I of the Birds Directive) occurs in large numbers in the close vicinity of Lough Foyle, where short-term concentrations of up to 3,000 birds may occur during autumn pulses of immigration of Icelandic birds. Birds may use both the shallow waters of the lough or adjacent agricultural fields as arrival points. Birds that winter around the lough use the relatively safe waters of the lough as an overnight roost.

Pale-bellied Brent Goose winters almost exclusively around the coasts of Ireland, with at least 75% of the population generally occurring in Northern Ireland in the autumn, primarily in Strangford Lough. The species mainly forages in the intertidal zone, but may also graze on littoral grasslands. Shelduck forages mainly in the intertidal zone, and reaches internationally important numbers in winter in Strangford Lough (around 4,000 birds). The species also breeds coastally around Northern Ireland.

A number of duck species use the, mainly, inshore waters of Northern Ireland, and are among the designation features of a number of protected sites. A number of surface-feeding ducks also use the, mainly intertidal, zone, particularly of the sea loughs. Most duck species are winter visitors, but eider breeds in substantial numbers around the Northern Ireland coast. Other duck species generally breed in inland sites.

Divers and Grebes

Divers are almost exclusively maritime species during the winter months. Red-throated Diver *Gavia stellata* is the most numerous diver species around Northern Ireland. Although recorded in generally small numbers, over 100 birds are present on occasion in Lough Foyle, and there are indications that the species uses the offshore waters of outer Belfast Lough in locally significant numbers. Great Northern Diver *Gavia immer* may occur in a few tens at a few sites around the coast, particularly Lough Foyle and Carlingford Lough. Occasional Black-throated Divers *Gavia arctica* may occur almost anywhere, perhaps most reliably in Strangford Lough. All diver species are Amber-listed in BOCC3, while Red- and Black-throated Divers are Amber-listed in BOCCI.

Great Crested Grebe *Podiceps cristatus* occurs in substantial numbers, in excess of 1,000 and occasionally over 2,000 birds, in inner Belfast Lough during the winter months. Smaller numbers are also present in other sea loughs at that time. The species is Amber-listed in BOCCI. Small numbers of Slavonian Grebes *Podiceps auritus* occur, particularly in Lough Foyle, in winter. This species is Amber-listed in both BOCC3 and BOCCI.

Other species

A number of other bird species use the coast of Northern Ireland at some stage in their annual cycle, but rarely as a significant proportion of their Northern Ireland populations. Examples are Heron *Ardea cinerea*, present throughout the year, and Kingfisher *Alcedo atthis*, present mainly in winter.

2.8.2 Key Issues, Problems and Future Trends

As can be seen from the above account, a high percentage of the bird species using the marine and littoral environments are listed as of conservation concern because of population declines or because of their reliance on a limited number of sites for wintering or breeding. Key issues affecting their conservation status are not restricted to factors affecting Northern Ireland waters alone; many bird species that use Northern Ireland marine and littoral habitats are wide-ranging and may be affected by distant events. Key issues include:

- Coastal development, which can remove habitats from use either as a result of direct destruction of breeding, foraging or roosting areas, or indirectly as a result of increased disturbance;
- Increasing use of the coast for recreation, which can cause disturbance and, particularly during cold weather, can lead to excessive energy consumption by disturbed birds, with consequent potentially increased mortality;
- Increasing storminess as a result of climate change, which has the potential to result in increased mortality as birds at sea are unable to feed for prolonged periods of time;
- Declining reproductive success in some places and in some years, possibly as a result of changes in prey distribution as a result of climate change;
- Overfishing of fish and mollusc prey species, with a potential for increased mortality both of adults and young due to starvation, or failure to breed;

- Marine pollution, which can affect populations of seabirds either in their distant wintering grounds or in UK coastal and offshore waters, and may be chronic (e.g long term exposure to toxins) or acute (oil spills). Results may include lowered reproductive success or direct mortality;
- Mortality arising from bird bycatch in fixed fishing nets, or on hooked lines, generally in offshore waters;
- Increased mortality arising from diseases such as botulism, which has been suggested as a cause of significant declines in herring gull populations;
- Reduced availability of food at sea as less fisheries bycatch and offal is dumped, and on land as landfill sites are closed and/or are managed more hygienically;
- Management of coastal areas that will allow human and bird interests to co-exist, including the provision of protected areas and control on development; and,
- "Short-stopping" of migrant wader and wildfowl species, as birds that would normally winter around Northern Ireland do not need to travel so far as climate amelioration allows them to stay on wintering grounds nearer their Arctic or eastern breeding areas.

Future trends affecting marine and littoral bird species are speculative because in some instances (bird mortality records from hooked lines) are not reported within the public domain. Climate amelioration is likely to continue to be an important issue affecting seabird productivity, as prey species distributions change. There is a potential for some breeding seabirds to undertake longer foraging trips, which may affect reproductive success. If there is a general trend for important prey species to shift northwards there is a potential for some seabird colonies to become unsustainable because of increased distances between breeding and feeding areas. Climate change will interact with fisheries policy and practice, as new fish populations are exploited, other populations are overfished, and fish population recovery may be complicated by interspecific competition. Climate change thus has the potential affect seabird distribution both for breeding and wintering species.

Sea level rise associated with climate change may affect wintering wader and duck species using Northern Ireland littoral habitats, and seabirds that nest in low-lying coastal habitats. Habitats may be squeezed, and benthic and intertidal prey species composition and distribution may change. Elsewhere, there is a potential for coastal realignment to

provide new habitats for feeding and breeding birds as vulnerable coastal areas are allowed to flood.

Short-stopping may become accentuated, as distant breeding birds are able to winter nearer to their breeding grounds. Fewer birds from the Arctic and eastern Europe/western Asia may thus reach Northern Ireland. However, this phenomenon may be reliant to an unknown extent on land use policies elsewhere, as it will be important that sites are available in these new preferred wintering areas for these increased numbers of birds to exploit.

The provision of Marine Nature Reserves both as a conservation measure to support breeding seabirds and as a measure to allow fish populations to expand may counteract some of the effects of climate change. By allowing damaged ecosystems to recover and conserving ecosystems that are at present relatively intact, reserves have the potential to have a significant impact on the viability of Northern Ireland seabird populations.

At present there are no offshore or coastal windfarms around Northern Ireland, but future exploitation of the wind environment has the potential to affect wintering, breeding and migrant bird species. There will be a potential for collision of birds arriving, leaving or passing through Northern Ireland. Coastal windfarms sited in the vicinity of seabird colonies have the potential to affect breeding success as birds may be intercepted between colonies and feeding grounds. For some species, offshore windfarms may provide additional feeding areas as seabed habitats are changed, with a potential to become more productive, and become less likely to be fished commercially. Conversely, large wind farms in shallow sea areas may conflict with the feeding distributions of seabirds, notably seaducks, if these are displaced due to disturbance and consequently excluded from their main feeding areas. Offshore windfarms also have the potential for barrier effects, with consequences for the energy budgets of birds commuting between feeding and breeding areas and possible effects on breeding success.

2.9 Marine Noise

As part of the MSFD, Member States are required to seek to achieve GES including in relation to the introduction of energy (Description 11). This descriptor includes consideration of anthropogenic noise in the marine area. As a result, it is accepted that the assessment of the Marine Plan should include the impact of marine noise resulting from the policies within the Marine Plan. To facilitate this assessment, baseline information sources include:

- Assessment of the environmental impact of underwater noise (OSPAR Commission 2009); and,
- Northern Ireland State of the Seas Report (NIEA and AFBI, 2011).

2.9.1 Baseline Description

As a result of the Environmental Noise Directive (2002/49/EC), preliminary noise mapping has been produced for Northern Ireland. Within the Marine Plan study area, noise data was collected for Derry, Limavady, Coleraine, Larne, Belfast and Bangor. From this information, noise mapping has been undertaken in relation to transport and industry.

There is little information on background underwater noise levels within the Northern Ireland marine area. It is considered likely that some areas, like the north Antrim coast, to be naturally noisy from strong wave action and currents whilst we might expect port areas, like Belfast, may be impacted by noise from man-made (anthropogenic) sources (e.g. shipping, dredging and port activities).

AFBI undertakes underwater acoustic surveys off the north Antrim coast using sensitive listening devices (AFBI, 2011). These surveys have identified the potential for future acoustic monitoring in population studies of whales and dolphins, in addition to the assessment of background noise levels.

Although there is little knowledge or monitoring of background underwater noise, noise reduction and avoidance have been a condition of many marine licences. Marine construction projects are often prohibited during known sensitive periods of the year in order to protect the passage of migratory fish. This mitigation approach is reasonably successful where the behaviour of the animals is known. However, for many fish or marine mammals, relatively little is known about movements and behaviour.

2.9.2 Key Issues, Problems and Future Trends

There is considerable uncertainty about the impacts of the long-term continuous underwater noise that is anticipated in the growth of the marine renewable energy industry. Up until now, even noisy sea areas like ports have quiet periods within their operation. Information on the impacts of ambient anthropogenic noise will increasingly be needed as marine renewable energy installations will operate around the clock. However, it is important to note that the oil and gas sector has been operating in the marine area for many years and will also be contributing to the background noise in a continuous manner.

In the recent licensing of a marine current turbine within Strangford Lough, one of the conditions of the licence is to record and interpret sound information. Observations have shown that the Harbour Seal *Phoca vitulina* will show avoidance behaviour around the turbine. It is not yet clear if this is due to the noise emitted from the turbine. Further studies are required over time to see whether the avoidance behaviour could result in long-term effects on the seal population.

Further information is needed on background underwater noise levels, the noises of marine activities such as shipping and renewables and also on the impact of man-made noise on marine ecology receptors.

3. Water and Soils

3.1 Introduction

Water and Soils has been split into the headings which encompass physical processes and sediment and water quality within the coastal and marine area. Due to the linkages between sediment processes and water quality, these headings have been reported in their combined state to highlight their interconnected nature. These are:

- Bathymetry and hydrography (including circulation and tides).
- Geology, geomorphology and sediment processes (including coastal and marine processes).
- Sediment and water quality.

3.2 Bathymetry and Hydrography (including circulation and tides)

The following data sources have been used to characterise the bathymetry and hydrography (including circulation and tides) of the Northern Ireland marine area:

- Oceanwise Digital Elevation Model (DEM) data;
- Quality Status Report 2000. Region III – Celtic Seas (OSPAR Commission, 2000);
- Joint Irish Bathymetric Survey (JIBS) 2008 data (Marine Institute website);
- Charting Progress 2 (Defra, 2010);
- Dickey-Collas, M., Brown, J., Fernand, L., Hill, A.E., Horsburgh K.J. and Garvine, R.W. (2006). Does the western Irish Sea gyre influence the distribution of pelagic juvenile fish? Journal of Fish Biology 1: 206-229;
- Horsburgh, K.J., Hill, A.E., Brown, J., Fernand, L., Garvine, R.W., and Angelico, M.M.P. (20002). Seasonal evolution of the cold pool gyre in the western Irish Sea. Progress in Oceanography 46: 1-58; and,
- The Western Irish Sea Front – A Potential MPA (WWF, undated).

3.2.1 Baseline Description

Bathymetry

The Northern Ireland marine area borders the Irish Sea to the east, the North Channel to the northeast and the Malin Sea to the north. The Irish Sea is a small regional sea, about

58,000 km^2 in area. In character, it has the form of a fairly shallow basin, with depths ranging from 20 - 100m over considerable areas, and with a deeper channel, extending north to south in the western part of the Irish Sea, and reaching a maximum depth of 315m in the North Channel (See Figure 5). This deeper channel connects with the Celtic Sea via St George's Channel in the south, and with the Malin Sea via the North Channel. The bathymetry of the Northern Ireland marine area is shown in Figure 5.

Hydrography –Circulation

Water generally moves from south to north from the Atlantic Ocean (Image 1), although in the Irish Sea there are complex intermediate water movements. Surge and density-driven currents both contribute significantly to the overall long-term mean circulation of the Irish Sea (Defra, 2010). 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.

The Western Irish Sea Front (WISF) represents a distinct, though temporal, oceanographic feature (WWF, undated). Research has indicated high productivity in the area and associated important feeding grounds for a number of marine species. The high productivity identified with the front may result in modifications of associated communities and ecosystems, particularly benthic communities. The WISF forms seasonally in the late springtime (at approximately March/April) and persists throughout the summer until September or October. The WISF marks the boundary between tidally mixed water to the southeast, and stratified water to the north-west. The front remains in a relatively static position throughout the summer and develops particularly along the southern and eastern edge.

As a consequence of the stratified water development and the tidal mixing front between the Isle of Man and Dublin there is restricted flushing in the bottom water of this region. Thus winter water persists for much of the spring and summer as a dome of cold water overlying the deep (>100m) basin of the western Irish Sea, to the immediate north-west of the front. The resulting density structure and geostrophic forces generate a cyclonic gyre of near surface water (Dickey- Collas et al., 2006; Horsburgh et al., 2000). This gyre dominates the circulation of the region during late spring and summer and is characterised by anticlockwise current speeds which exceed 0.2 m/s, after removal of tides (Dickey-Collas et al., 2006). This western Irish Sea gyre tends to retain material in that area (e.g. plankton, fish larvae and juveniles) and means there is a southerly flow along the Irish

coast (OSPAR Commission, 2000). Following the breakdown of stratification in autumn, the mean flow is then weakly northwards until the following spring.

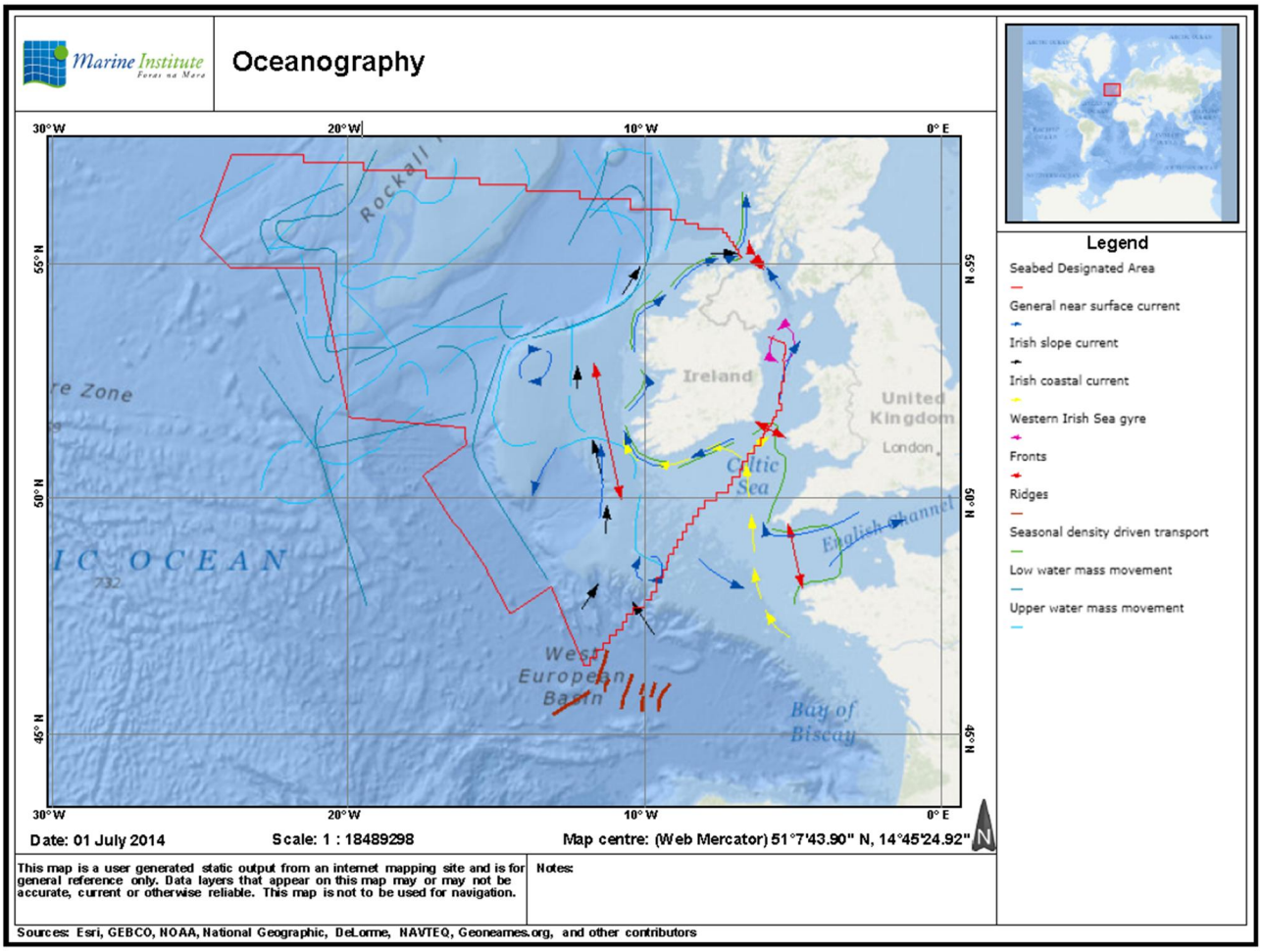

Image 1: General Circulation on and around the Irish Shelf (Source: Marine Institute website)

Tides

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). Mid-water mean peak spring tidal currents of <0.5 m/s occur in areas of mud, >1m/s occur in most areas of sandy gravel, and >1.25m/s occur in areas of gravel and exposed rock and diamicton (BGS, 2005, Image 2).

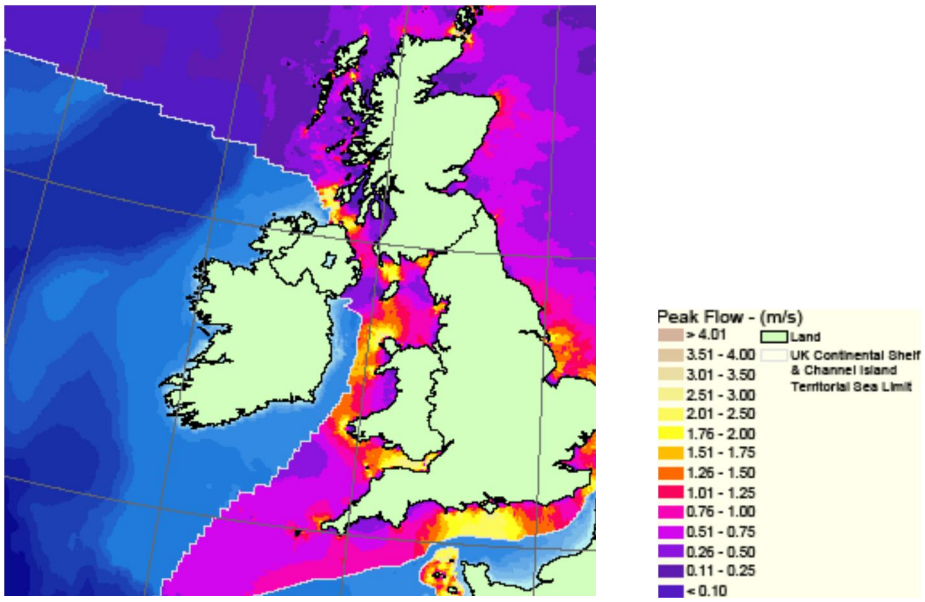

Image 2: Peak Flow for a Mean Spring Tide (Source: Atlas of Marine Renewable Energy Resources, 2004)

3.2.2 Key Issues, Problems and Future Trends

Circulation is subject to a wide range of natural variability on many time-scales. Whilst certain types of seabed development, such as capital and maintenance dredging, and marine installations may result in localised changes to bathymetry, there is no evidence to suggest human activities have substantially altered flow patterns or characteristics within Northern Ireland waters.

Some change in the Atlantic Meridional Overturning Circulation which influences the climate of NW Europe, can be expected this century, as indicated in climate model experiments. Such changes will influence existing circulation patterns in the Northern Ireland marine area and these will be detectable, given sufficient time, by the array of monitoring equipment deployed in recent years in UK shelf seas (Defra, 2010).

3.3 Geology, geomorphology and sediment processes (including coastal and marine processes)

The following data sources have been used to characterise the Geology, geomorphology and sediment processes (including coastal and marine processes) within the Northern Ireland marine area:

- JNCC Coastal Directories Series: Region 17 Northern Ireland (JNCC, 1997);
- JNCC Coastal Directories Series: Region 13 Northern Ireland (JNCC, 1996);

- The Geology of the Malin - Hebrides sea area; The geology of the Irish Sea. BGS UK Offshore Regional Reports. (BGS, 1993);
- The geology of the Irish Sea. BGS UK Offshore Regional Reports (BGS, 1995);
- Technical report on seabed and geology from DTI SEA 6 & 7 (BGS, 2005);
- BGS chart and GIS data;
- ASSI/SSSI designations for geology (JNCC website);
- MB 0102 data layers for geomorphological features. Mapping of Geological and Geomorphological Features. (Brooks, et al., 2009); and,
- SEA of Offshore Wind and Marine Renewable Energy in Northern Ireland (DETI, 2009a).

3.3.1 Baseline Description

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 area around Lough Foyle is underlain by poorly-exposed rocks of Carboniferous and Mesozoic age, but the geomorphology of most of the rest of the coastline north of Belfast is determined by the Tertiary basalt lavas and Ulster White Limestone, which protect the underlying Mesozoic rocks from erosion. The basalt and limestone cliffs of County Antrim are unstable and huge portions of the cliff show the effects of rotational landslip due to slippage in the underlying Lias clays (JNCC, 1997). South-west from Belfast, Lower Palaeozoic rocks (Ordovician and Silurian) underlie most of the area.

Geology

The geological environment of the area can be spilt into three main groups based on age:

- Bedrock (solid geology): This is material which is more than 1.8 million years old and formed before the last ice age. Along the coast of Londonderry and Antrim, Tertiary basalts are present with a series of faults exposing Jurassic and Cretaceous rocks. In north-east Antrim Dalradian rocks occur and extend several kilometres offshore, although between Antrim and the Mull of Kintyre these are covered by sedimentary Permo-Triassic deposits. Large areas of the Irish Sea comprise sedimentary basins

with thick sequences of Mesozoic sediments that extend onshore into southern Antrim. Ordovician and Silurian rocks extend offshore from the entire coast of County Down to the area between the Isle of Man and the Irish coast, where they are covered by Carboniferous rock. Folded rocks of the Carboniferous age underlay the majority of the north-west Irish Sea, with a few areas of Lower Palaeozoic rock embedded within.

- Pleistocene: This is material which is between 1.8 million – 10,000 years old. This material was deposited at the start of the last ice age. During the Pleistocene era the Earth's surface experienced a number of glacial and inter-glacial climatic cycles which led to rapid changes in sea level. These extreme changes in climatic conditions acted upon the bedrock and superficial sediments and are largely responsible for the bathymetry of the offshore area. There is extensive drift material across the Northern Ireland marine area due to the retreat of the last major ice-sheet about 10,000 years ago. Four distinct lithologies are present in the Northern Ireland marine area. Most dominant in this region are glacial tills, extending several kilometres off the coast of Down, and soft muds, comprising large areas between the Isle of Man and Down and south of the Mull of Kintyre, along with smaller areas between Magilligan and Portrush. Additional Pleistocene deposits include an area south-east of Dundrum Bay and channel fill in Beaufort's Dyke in the North Channel (JNCC, 1997). The majority of the till here is less than 10m thick, although further south between the Isle of Man and the Down coast sediments are thicker, from 30m up to 100m thick (JNCC, 1997).
- Holocene: material which is less than 10,000 years old. This group represents the youngest material and is formed from reworking of either the Pleistocene or Bedrock material, river inputs of sediments or the creation of new material such as biogenic shells. These gravelly sediments occur extensively in the Irish Sea (JNCC, 1997). They tend to occur in places of strong tidal current and/or wave action. Within the Northern Ireland marine area there are two significant coastal deposits of sand: One along the northern coast which extends eastwards from Lough Foyle along the Antrim coast. This is a typical Holocene site, formed between the periods of high sea level 7,000 – 6,500 years ago and the present sea level between 2,000 – 1,500 years ago. The second is across Dundrum Bay. At this site mud deposits lie offshore of the

sand deposits at Dundrum Bay and expand to the Isle of Man. There is a smaller area of muddy deposits that extends across Belfast Lough.

Geomorphology

The seabed is composed of outcrops of bedrock and glacigenic 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). Seabed bedforms can be broadly classified into static and dynamic bedforms.

Static bedforms are important because they provide stable sites for distinctive biota and, where occurring in isolation, they contribute to the local diversity and patchiness of the seabed habitat. By redirecting the stress imposed on the seabed by the directed currents, the static bedforms also generate useful indicators of the direction of bedload sediment transport. Excepting shipwrecks, pipelines, power cables, telephone cables and the static bedforms built up by living biota (bioherms or reefs), the static bedforms provide snapshots of former terrestrial, submarine, glacial, periglacial and early postglacial features and processes (Figure 6). The main static bedforms of the Northern Ireland marine area are as follows:

· Rock and Diamicton: The largest areas of outcrops of rock, rock and sediment and diamicton (unsorted sediment consisting of gravel, sand and mud) occur with rough and very varied seabed topography, usually with seabed gravels, in areas of very high seabed stress and seabed scour (BGS, 2005). The location of rock outcrops are shown in Figure 6. Some of these outcrops, such as the roche moutonnee, were formed subglacially. An unusual environment is found where rock outcrops occur, with a thin layer of seabed sediments covering the upstanding rock. In this case, the rock outcrop is not an indication of a very high energy environment, rather it is isolated because it has not yet been buried by mud deposited from suspension (BGS, 2005). The exposed rock faces are swept clean of fine-grained muddy sediments because of acceleration of weak near-bed currents around the feature. The Pisces Reef, which has been designated as a candidate Special Area of Conservation (cSAC) provides an example of such an environment. The reef provides a refuge habitat, partly because the upstanding rock is hazardous to near-bed commercial fishing operations. Other isolated and upstanding seabed crops of

rock and diamicton that are set in unconsolidated sediments also provide discrete patches of diverse habitats set in otherwise relatively uniform seabed.

- Narrow Enclosed Deeps: Narrow enclosed deeps are static bedforms relict from subglacial ice gouging. These features are depicted as glacial bathymetric deeps in Figure 6.
- Pockmarks: The seabed is eroded when methane gas or other fluids are expelled from point sources on the seabed and when sediment particles are also vertically entrained by the fluids into suspension by seawater. The suspended particles are then be carried away laterally by near-bed currents. Over a period of time this process erodes the seabed into hollows or 'pockmarks'. Although they are commonly elongated in the direction of dominant tidal current flow, the pockmarks are essentially static bedforms (BGS, 2005). Pockmarks are typically identified in areas with an overall smooth seabed consisting of Holocene very soft mud or silty very fine-grained sand. Fields of such pockmarks occur in the Western Irish Sea within the Northern Ireland marine area (Figure 6). Most of the pockmarks are currently inactive and relict. In the active pockmarks, an increase in the biological production of carbonate occurs in the gas conduits buried in shallow sediments below seabed and at the locations of gas expulsion from the seabed into the water column.
- Bioherm Features: The Northern Ireland marine area has living reefs, bioherms, of the bivalve Modiolus and tube-building polychaete Sabellaria (Figure 6). These features are important habitats and are described in terms of their ecological function in the Biodiversity, Flora and Fauna Section. Modiolus bioherms form stacks of pebble-size bivalves, the ridge-axes of which are aligned transversely to the near-bed currents. They do not occur in the extremely high-energy scour environments. Modiolus is also absent from areas of relatively low seabed stress where there is a high risk of the biota being covered by deposited sediment.

Mobile bedforms mainly occur between extremes of high seabed stress typified by static bedforms of rock and diamicton outcrop at the seabed and the lowest seabed stress associated with a smooth seabed, typically consisting of large areas of essentially static seabed in the mudbelts. The main mobile bedforms that occur in the Northern Ireland marine area are as follows:

- Sand Ribbons: Sand ribbons are sometimes connected to the downstream side of static seabed obstacles such as pebbles, cobbles, boulders, upstanding rock outcrop, and commonly feature in areas of seabed scour and very high seabed stress (BGS, 2005). In this environment they usually align parallel to the peak tidal streams. Thus the smaller sand ribbons are mobile in the sense that they may change positions in response to changes in the amount and direction of seabed stress with the cycles of flood and ebb tides. The location of sand ribbon fields in the Northern Ireland marine area are shown in Figure 7.
- Transverse Sandwaves and Sandbanks: The bedforms that are formed transversely to tidal streams include sand ripples and sandwaves. Sandbanks are commonly formed sub-parallel to the prevailing tidal streams and in wave dominated areas sub-parallel to longshore drift. The location of these features in the Northern Ireland marine area are shown in Figure 7.
- Sand Patches: There is a relatively large area of sand patches off the north coast of Northern Ireland (Figure 7). The distribution patterns of sand patches interdigitate with those of transverse sandwaves (Figure 7). Because of the interdigitation of the sandwaves with sand patches it is thought possible that some sand patches may have formed by a process of sandwave flattening following the imposition of stress transmitted from seawaves to the seabed (BGS, 2005).

Coastal Processes

Coastal change in Northern Ireland is generally not as rapid as in some parts of England. The coasts of Northern Ireland are 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).

Marine Processes

Sediment grains are winnowed on the seabed depending on how strong the near-bed currents are in relation to the threshold speeds of near-bed currents required for grain suspension into seawater and grain bedload transport (BGS, 2005). The seabed-sediment grain-size distribution patterns reflect the exposure of the seabed to physical processes, which are driven by the stress put on the seabed by directional ocean, wind, storm surge and tidal currents and by non-directional currents from wind and swell waves. The trend in the Northern Ireland marine area is for sediment grains to move across or away from

seabed with higher stress towards the seabed with a lower stress. The amount of stress imposed on the seabed and thus the amount and type of sediment imported into, deposited, or exported out of the Irish Sea varies with position and time. As a result, in areas of seabed scour and grain bedload transport, there are continuous processes of sediment reworking and redistribution resulting in 'seabed polishing'. These sediment processes result in large areas of (a) exposed bedrock and diamicton and (b) muddy sediment. Large areas of exposed rock and diamicton are swept clean of unconsolidated sand in the most highly stressed seabed environments, perhaps leaving some pebbles, cobbles and boulders (collectively termed gravel). Areas of least seabed stress are characterised by more or less stable fine-grained muddy sediments, significant proportions of which have been deposited from suspension in conditions where there are very low seabed currents.

There is an overall very strong correlation between the annual mean peak tidal currents and annual mean seabed stress in the Northern Ireland marine area. The strong correlation between the distribution patterns of coarser sediments and the stronger mean peak spring tidal currents establishes that the stress put on the seabed by the tidal currents is a major influence on sediment composition. The positive correlation between the stronger mean peak tidal currents and seabed stress with constrictions to tidal flow by coastal configuration also means that on the open continental shelves of the Irish Sea and the North Channel there is little regional correlation between the water depth and sediment composition (BGS, 2005).

Net sand-transport pathways and directions in the Northern Ireland marine area are complex and are shown in Image 3. These have been predicted from observations of the geometries of the mobile bedforms and bedforms generated around static obstacles. Image 3 shows the there is a sand parting zone in the North Channel. This zone 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 (Image 3). The sand-grade sediment moves along near the seabed while the mud-grade sediment moves largely in suspension.

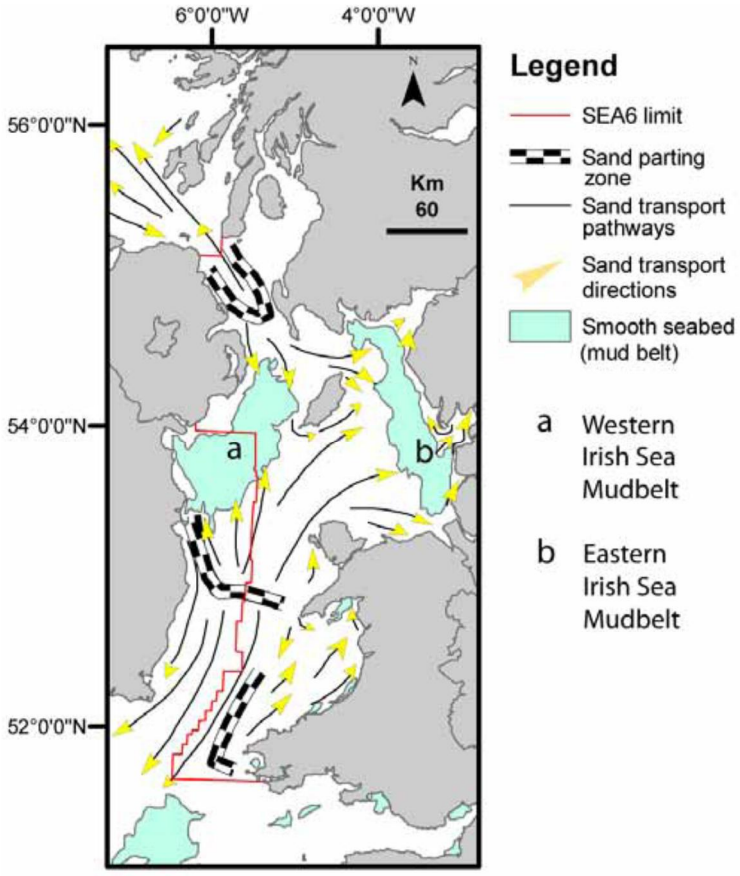

Image 3: Net Sand Transport Pathways and Directions (Source: BGS, 2005)

3.3.2 Key Issues, Problems and Future Trends

Within the Northern Ireland marine area, capital and maintenance dredging will have short term localised impacts on marine sedimentary processes (DETI, 2009). Developments on the seabed, such as marine renewables, have the potential to change the sediment dynamics of the region. However, these structures are temporary and so there will be little long term effect.

The main issue that could impact the geomorphology of the area is climate change. There is the potential for climate change to cause an increase in extreme weather and waves, which in turn will have an influence on the sediment and hydrodynamics of the region and result in sediment transport changes (erosion and deposition patterns).

The rapid evolution of the seabed in the Northern Ireland marine area has resulted in superficial strata below the seabed sediments having significantly different properties to those of the seabed sediments. As a result, new developments which require foundations set below the seabed could encounter geohazards that might affect the safety and cost of seabed and shallow sub-seabed development operations (BGS, 2005).

3.4 Sediment and Water Quality

The following data sources have been used to characterise sediment and water quality within the Northern Ireland marine area:

- Sensitive Areas under UWWTD (DAERA website);
- Northern Ireland, regional report of the National Marine Monitoring Programme (Marine Pollution Monitoring Group, MPMMG, undated);
- UK National Marine Monitoring Programme - Second Report 1999 – 2001 (Marine Environmental Monitoring Group, 2004);
- Monitoring of the quality of the marine environment, 2004-2005 (Centre for Environment, Fisheries and Aquaculture Science (CEFAS), 2005);
- Percentage of identified bathing waters that complied with the European Community Bathing Water Directive (DAERA website);
- Quality Status Report 2000 Region III Celtic Seas, Chapter 4, Chemistry (OSPAR, 2000);
- Northern Ireland State of the Seas Report (NIEA and AFBI, 2011);
- North Eastern River Basin Management Plan (NIEA, 2009);
- Northern Ireland Environmental Statistics Report (DOE, 2013);
- Northern Ireland Coastal Zone - Indicators of Sustainable Development (DOE, 2011);
- Northern Ireland Bathing Water Compliance (1998-2014) (DAERA website); and,
- SEA of Offshore Wind and Marine Renewable Energy in Northern Ireland (DETI, 2009a).

3.4.1 Baseline Description

Sediment Quality

Within the Northern Ireland marine area, the sediment quality is generally good, which is due both 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.

In order to monitor and assess the marine sediment quality in Northern Ireland, Northern Ireland Environment Agency (NIEA) and Agri-Food and Biosciences Institute (AFBI) have 14 stations which have been monitored for over 10 years (NIEA and AFBI, 2011). These sites form part of the UK monitoring network for the Clean Seas Environmental Monitoring Programme (CSEMP) which is a network of almost 500 sites around the UK. At the Northern Ireland sites, there has been a general reduction in the concentration of metals, in line with the trend in inputs.

All 14 sites have shown a reduction in the level of contamination with the greatest reductions observed in Belfast Lough. In the past this has been Northern Ireland's most industrialised Lough but improvements in sediment quality, with particular emphasis on Zinc, Mercury, Cadmium and Lead, have been observed in cores and surveys at the site (NIEA and AFBI, 2011). The decrease in the concentration of metals can be linked to industrial closures in the 1980s. Most of the metals in the area are now similar to background levels. Only Chromium persists at a higher concentration, which may be due to the underlying geology of the region (NIEA and AFBI, 2011).

The lowest levels of man-made inorganic substances such as PAHs and PCBs occur in Strangford Lough (NIEA and AFBI, 2011) and off the north coast. Sites offshore tended to have concentrations 2 to 4 times the background concentration, with little change year on year.

In 2010, a quality status assessment of the area was conducted which found that the concentration of radionuclides had reduced in the region with respect to the previous survey which was carried out in 2000. The main source of contamination of radionuclides comes from the discharges at Sellafield on the Cumbrian coast in England. As a result, the more elevated levels of radionuclides are confined to the eastern part of the Irish Sea (DETI, 2009a). Tributyltin (TBT) levels were also found to be at an acceptable level, but were still of concern in some harbours and busy shipping lanes.

There may be military waste present on the seabed in the Northern Ireland marine area as a result of:

- Intentional disposal (official and unofficial);
- Live firing ranges and naval exercise areas;
- Wrecks of military vessels and some merchant ships;

- Minefields; and,
- Migration from the original deposition site.

The density and distribution of military waste varies over the area depend upon whether the area has been or is currently used for military operations. Between WWII and the 1970s the deep water channel (Beaufort's Dkye) between Northern Ireland and south west Scotland was used as a dumping ground for military munitions. It is possible that during this period 1,000,000 tonnes of all types of munitions were deposited (DETI, 2009a). Some experts are worried about the risk of explosion from these dumping grounds as the munitions start to erode with time (BBC News Article, http://news.bbc.co.uk/1/hi/sci/tech/4032629.stm [Accessed March 2013]).

As well as military waste, there are also wartime wrecks, both military (including aircraft) and merchant vessels. While the positions of some wrecks are known, there are many others, particularly in deeper waters, where the locations are unknown. Some munitions may have migrated away from wreck sites overtime and, therefore, it should be assumed that the Northern Ireland marine area is potentially at risk from unswept mines from WWI and WWII (DETI, 2009a).

Water Quality

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 of retaining particles, including nutrients, with implications for water quality. Direct inputs of contaminants in the Northern Ireland marine area consist of mainly industrial and municipal sources, which are centred on 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. In terms of the longer-term, concentrations of carbon dioxide (CO_2) are increasing in the atmosphere and the oceans are acting as net sink for CO_2 in a process that is known as ocean acidification. This process is substantially reducing the rate of increase in the atmosphere but making the oceans more acidic with implications for marine fauna.

Many standards for water quality are regulated at EU level through a range of environmental directives. The most relevant to the Northern Ireland marine area are reviewed in the following sections.

The following sections detail the Directives under which better planning can be achieved for water quality.

Water Framework Directive

The EU Water Framework Directive (WFD) (2000/60/EC) establishes a legal framework for the protection, improvement and sustainable use of all waterbodies across Europe, including rivers, canals, lakes, estuaries (transitional waters) and coastal waters as well as groundwater (European Commission, 2000). In Northern Ireland, the WFD covers inland, transitional and coastal waters out to 1nm offshore (from territorial baseline). Within the Northern Ireland marine area, there are 7 transitional and 20 coastal water bodies.

The main objective of the Directive is to protect and improve the aquatic environment throughout the EU (WISE, 2008). This includes a commitment to prevent the deterioration of aquatic ecosystems and, where possible, restore surface waters damaged by pollution, water abstraction and dams and engineering activities to at least 'good ecological status' or 'good ecological potential' by 2015. This is being achieved through River Basin Management Plans (RBMPs), consistent management standards and improved monitoring. Each RBMP has a reporting cycle of six years. The RBMPs that cover the Northern Ireland marine area are the North Eastern, North Western and Neagh Bann RBMPs. The updated plans were published in December 2015.

In 2012, 17% of transitional and coastal water bodies were classified as high status, 72% at good status and the remaining 11% at moderate status (DOE, 2013). In 2011, these figures were 17%, 31% and 52% respectively indicating that the overall water quality has improved over this period (DOE, 2011).

The NIEA (formally Environment and Heritage Service Northern Ireland (EHSNI)) has developed a WFD monitoring plan. This involves appropriate ongoing classification and compliance assessment programmes, which not only ensure surface waters comply with the WFD objectives, but also with other international conventions and agreements which includes OSPAR, the Environmental Change Network (ECN) and the National Marine Monitoring Programme. There are new contaminants entering the environment from various sources and there is less information on newer pollutants that may accumulate in the sediments. As such, new detection techniques are being developed to help assess and monitor these new pollutants (NIEA and AFBI, 2011).

Shellfish Water Directive

Shellfish Waters are designated under the Shellfish Waters Directive 2006/113/EC, in order to ensure a suitable environment for shellfish growth. There is close cooperation between NIEA, who monitor shellfish waters and shellfish for compliance with the Shellfish Waters Directive, and the Food Standards Agency, who monitor shellfish flesh for compliance with the Food Hygiene Regulations (NIEA, 2009).

The Shellfish Waters Directive was subsumed by the Water Framework Directive in 2013 (DAERA website). Mandatory and guideline standards were associated with the Shellfish Waters Directive and monitoring was carried out before and after spawning within designated shellfish waters. These standards have now been superseded by the environmental quality standards developed for WFD.

During 2009 the DOE, following consultation, identified several new shellfish waters and amalgamated many small ones into larger areas. Additional sites in Belfast Lough and Killough were designated in 2009. In the past, pollution reduction programmes for shellfish waters have guided discharge standards for wastewater treatment works and sewerage systems. In addition, tighter controls on agricultural practices have been introduced through the Nitrates Action Programme across the total territory of Northern Ireland, which will contribute to better shellfish water quality. Pollution reduction programmes are currently being revised to reflect these changes and to incorporate the new designations (NIEA, 2009).

There are currently 10 Shellfish Waters in Northern Ireland and all of these achieved the mandatory standard in 2011 (DOE, 2013).

Bathing Water Directive

Bathing Waters are areas protected for recreational bathing use and must meet mandatory and guideline standards for microbiological quality in order to protect human health. Waters that comply with the guideline standards are termed excellent quality and waters complying with the mandatory standard are termed good quality. Those bathing waters that fail to comply with the mandatory standards are recorded as poor and this constitutes a failure under the Bathing Water Directive 2006/7/EC, which has replaced Directive 76/160/EEC. The water quality standards of the Bathing Waters Directive are used to set discharge limits for coastal waste water treatment works and sewerage systems. In addition, tighter controls on agricultural practices have been introduced through the

Nitrates Action Programme across the total territory of Northern Ireland, which will contribute to better bathing water quality (NIEA, 2009).

In Northern Ireland there are 23 designated bathing waters. In 2013, 20 of Northern Ireland's bathing water beaches (87%) passed with excellent water quality and no beaches failed standards. This is an improvement of around 17% from the 2012 results. Only two months of 2014 monitoring data are available for 2014 at the time of writing and these indicate a further improvement in water quality, with 21 out of the 23 bathing waters reaching at least excellent quality (see Table D).

Urban Waste Water Treatment Directive

Nutrient sensitive areas comprise nitrate vulnerable zones and polluted waters designated under the Nitrates Directive and areas designated as sensitive areas under the Urban Waste Water Treatment Directive in relation to nutrient enrichment.

A total territory approach has been adopted in Northern Ireland under the Nitrates Directive (NIEA, 2009). Under the Urban Waste Water Treatment Directive, there are 17 areas that have been designated as sensitive, including Inner Belfast Lough, the Tidal Lagan and the River Lagan catchment, the River Bush Catchment, the north end of Strangford Lough, the River Enler catchment, and the Quoile Pondage and catchment (Table D). Waste water treatment works 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 the designation.

Table D: Summary of Sensitive Areas in Northern Ireland

Sensitive area name	Identification date	Sensitive Area type	Length (km)	Area (ha)
Upper and Lower Lough Erne	1994	Eutrophic Water	2,346.26	13,600.00
Lough Neagh	1994	Eutrophic Water	4,617.91	38,200.00
Inner Belfast Lough	2001	Eutrophic Water	-	5,295.27
Tidal River Lagan	2001	Eutrophic Water	-	37.36
Quoile Pondage	2001	Eutrophic Water	-	59.15
Foyle (freshwater catchment)	2006	Eutrophic Water	2,037.01	-
Roe catchment	2006	Eutrophic Water	567.17	-
Faughan catchment	2006	Eutrophic Water	326.75	-

Sensitive area name	Identification date	Sensitive Area type	Length (km)	Area (ha)
River Lagan catchment	2006	Eutrophic Water	436.48	-
Lower Bann catchment	2006	Eutrophic Water	1,026.65	-
Enler catchment	2006	Eutrophic Water	108.45	-
Bush catchment	2006	Eutrophic Water	441.52	-
Newry River catchment	2006	Eutrophic Water	264.34	-
Strangford Lough (north end)	2006	Eutrophic Water	-	1,117.46
Newcastle	2006	Bathing Water	-	10.01
Ballyholme	2011	Bathing Water	-	23.5
Paddy's Point, Reagh Bay	2006	Shellfish Water	-	1,069.22

Source: Defra website

Floods Directive

The Floods Directive (2007/60/EC) includes the regulation of drainage and flood risk in Northern Ireland. The Directive identifies the three principles of flood risk management as prevention, protection and preparedness. As part of the implementation of the Directive enabling legislation, the Preliminary Flood Risk Assessments identified 20 Significant Flood Risk Areas (SFRAs) in Northern Ireland. Within the on shore study area of the Marine Plan, Table E identifies the urban areas which were identified as SFRA and in relation to the WFD, which River Basin District they are in.

Table E: SFRAs within the Study Area

SFRA	River Basin District
Strabane	North Western
Derry / Londonderry	North Western
Coleraine	Neagh Bann
Ballymena	Neagh Bann
Antrim	Neagh Bann
Carrickfergus & Kilroot Power Station	North Eastern
Bangor	North Eastern
Belfast	North Eastern
Banbridge	Neagh Bann

SFRA	River Basin District
Newtownards	North Eastern
Downpatrick	North Eastern
Newcastle	North Eastern
Newry	Neagh Bann

3.4.2 Key Issues, Problems and Future Trends

Over the last three decades, coastal sediment and water quality has improved dramatically, in particular, as a result of the application of full treatment to sewage discharges, improved treatment of industrial effluents, and work to reduce diffuse pollution. Despite this, the following key pressures have been identified in all of the RBMPs in the Northern Ireland marine area:

- Abstraction and flow regulation;
- Diffuse pollution from rural and urban land, including nutrient enrichment;
- Point source pollution from sewage and industry;
- Changes to morphology (physical habitat); and,
- Invasive alien species.

In addition to the list above, marine fish farming has grown in extent and value in Northern Ireland. Potential pressures this industry could bring on the sediment and water quality of the area include an increase eutrophication and anoxic conditions.

DfI Rivers has certain obligations as a result of the Floods Directive, including the eventual publication of the Flood Risk Management Plan for Northern Ireland which will result in policies that influence flood risk within coastal regions.

In the longer term, it is predicted that the acidity of the surface ocean will double by 2100 (Defra, 2010). This is because dissolving CO_2 gas in water releases hydrogen ions, increasing acidity and reducing pH. Such acidification is a major threat to marine resources, with impacts on ecosystem function across the spectrum from molecular processes to food web dynamics affecting large organisms.

4. Air Quality

4.1 Introduction

Air quality within the onshore Study Area for the Marine Plan is regulated by a designation framework which requires LGDs 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. The following data sources have been used to characterise the air quality within the coastal environment:

- Air Quality Management Areas (AQMAs),
- The United Kingdom Pollutant Release and Transfer Register (UK PRTR): and,
- Vessel Fuel Emissions.

4.1.1 Baseline Description

Air Quality Management Areas (AQMAs)

Areas and locations where there are air quality issues will generally have been identified through the AQMA designation and monitoring process. Given the nature of air quality issues, AQMAs are generally designated in urban areas, however within the rural environment they are generally designated as a result of high traffic flows. Table F shows the number of AQMAs designated in the District Councils which abut the coastline.

Table F: Summary of AQMAs within the Coastal LGDs

District Council	Number of AQMAs	Designation pollutant
Newry, Mourne and Down	2	Nitrogen Dioxide/Particulate Matter < 10um
Belfast	4	Nitrogen Dioxide/Particulate Matter < 10um
Antrim and Newtownabbey	1	Sulphur dioxide/Nitrogen Dioxide/Particulate Matter < 10um
Derry and Strabane	6	Nitrogen Dioxid /Particulate Matter < 10um
Causeway Coast and Glens	1	Particulate Matter <10um
Mid and East Antrim	2	Particulate Matter <10um

The United Kingdom Pollutant Release and Transfer Register 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. The information used in this section is taken from year 2013.

County Antrim had information provided under all three gas types, with six facilities recorded as emitting chlorinated substances, five types of facility emitted greenhouse gases and four facilities emitting "other" gases.

County Down had information provided under the greenhouse gases and "other" gases headings, four facilities emitted greenhouse gases and two facilities emitting "other" gases.

County Londonderry also had information provided under the greenhouse gases and "other" gases headings, four facilities have been emitting greenhouse gasses and two facility emitting "other" gases.

Vessel Fuel Emissions

Emissions from ships are an important source of air pollutants including sulphur dioxide (SO_2) and nitrogen oxides (NO_x). International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL) is the main international convention covering prevention of pollution of the marine area by ships from operational or accidental causes. Annex VI of this convention covers the "Prevention of Air Pollution from Ships". The regulations in this annex set limits on sulphur dioxide and nitrogen oxide emissions from ship exhausts and prohibit deliberate emissions of ozone depleting substances.

Emissions of SO_2 from the maritime sector in Europe are projected to surpass total emissions from all land-based sources by 2020 according to the European Commission's Clean Air for Europe (CAFE) emission estimates, assuming no action is taken. This is due in a large part to considerable reductions made by shoreside industry and other terrestrial sources. To address the significant health and environmental impacts of ship emissions,

the Commission adopted an EU strategy in November 2002 to reduce such emissions. The strategy resulted in an amended Directive, known as the Sulphur Content of Marine Fuels (SCMF) Directive (2005/33/EC) which came into force in July 2005. The basic obligations of the SCMF Directive included:

- A 1.5% sulphur limit for fuels used by all ships in the SO_x Emission Control Areas of the Baltic Sea and the North Sea and English Channel;
- A 1.5% sulphur limit for fuels used by passenger ships on regular services between EU ports;
- A ban on the marketing of marine diesel oils with sulphur content exceeding 1.5% by mass; and,
- A ban on the marketing of marine gas oils with sulphur content exceeding 0.1% by mass, from 1 January 2010.

As an alternative to the use of low sulphur marine fuels to comply with Articles 4a and 4b of the Directive, Member States can allow trials of unapproved and, use of approved, emission abatement technologies as an alternative to low sulphur fuel provided that these ships '…continuously achieve emission reductions which are at least equivalent to those which would be achieved through the limits on sulphur in fuel specified in this Directive.' (Article 4c, paragraph 4).

The Merchant Shipping (Prevention of Air Pollution from Ships) (Amendment) Regulations 2010 implement the marine fuel elements of the Sulphur Content of Marine Fuels (SCMF) Directive (2005/33/EC) (henceforth referred to as "the Directive"). The UK is a party to Annex VI of the MARPOL Convention which contains provisions on the sulphur content of liquid fuels and is implemented by the Regulations.

4.1.2 Key Issues, Problems and Future Trends

The management of air quality in Northern Ireland is based on the requirements of EU Air Quality Directives (Directives 2008/50/EC and 2004/107/EC) and the UK Air Quality Strategy. In 2012 the levels of nitrogen dioxide and particulate matter in the atmosphere were within national objectives (aside from Belfast); however levels of ozone in Northern Ireland do not appear to be decreasing. While this issue does have a weather variable, exceedences are possible. If exceedences become the norm, AQMAs may be designated

because of ground level ozone. For other pollutants, downward trends have been measured and are predicted.

In relation to industrial emissions, the majority of emission source sectors have measured a decreasing trend since 2008 (base year).

Where coastal LGDs which have ports activity, see an increase in this activity (particularly in relation to freight) one of the impacts associated with the increase would relate to air quality.

5. Climate Factors

5.1 Introduction

The following data sources have been used to characterise climatic factors within the Northern Ireland marine area:

- Greenhouse Gas Inventories for England, Scotland, Wales and 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. (Aether & Ricardo AEA, 2015);
- Everyone's Involved – A Sustainable Development Strategy for Northern Ireland (DOE, 2010);
- Sustainable Development Good Practice Report (DOE, 2014);
- Digest of UK Energy Statistics 2012, (DECC, 2012);
- Guidelines to Defra/DECC's Greenhouse Gas Conversion Factors for Company Reporting (Defra and DECC, 2012);
- Offshore wind – economies of scale, engineering resource and load factors (Garrad Hassan, 2003);
- European Commission;
- UK Climate Projections 2009 (UKCP09);
- Turn down the heat. Why a 4ºC warmer world must be avoided (The World Bank, 2012);
- A climate change risk assessment for Northern Ireland (2012);
- Northern Ireland Climate Change Adaptation Programme (2014);
- Marine Climate Change Impacts Partnership (MCCIP) 2009;
- Cross-Departmental Working Group on Climate Change (DOE, 2014);
- Coastal Erosion in MCCIP Annual Report Card 2010-11, (Masselink and Russell, 2010);
- Flood and coastal erosion risk management policy evolution in Northern Ireland: "Incremental or leapfrogging?" (Dodds et al., 2010);

- Air Pollution Information System website http://www.apis.ac.uk/overview/regulations/overview_shipping_emissions.htm; and,
- Devolved Administrations' Emissions (Committee on Climate Change website http://www.theccc.org.uk/charts-data/devolved-administrations-emissions/).

There are many aspects to climate change that should be considered. These include the following:

- The release of greenhouse gases, such as carbon dioxide, methane and nitrous oxide, into the atmosphere, which is generally considered the driving force behind climate change;
- Changes to the climate itself and the physical environment such as sea level rise, change in temperature and extreme weather with consequences for the frequency and intensity of storms, storm surges and extreme wave conditions;
- The potential for ocean acidification in the longer-term;
- The vulnerability of ecosystems and infrastructure; and,
- Society's reaction to these changes, such as risk assessment and adaptation measures.

5.1.1 Baseline Description

Climate change has primarily being brought about by the burning of fossil fuels and the consequent emission of greenhouse gases. The main greenhouse gas is carbon dioxide (CO_2), accounting for about 66% of the total NI greenhouse emissions in 2012. 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).

Climate change takes place at a global scale but may result in locally variable results. In the UK in the context of coastal processes, the parameters which may be affected are:

- Winds;
- Wave;
- Surges;
- Mean Sea Level; and,
- Rainfall and runoff through rivers.

Projections of UK coastal absolute sea level rise (not including land movement) for 2095 are in the range from approximately 24.5 - 40cm (UKCP09 website). There is also predicted to be a slight increase in seasonal mean and extreme waves to the SW of the UK and a decrease towards the North of the UK. 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. These tentative projections are, however, based on maps with a very coarse grain, and considerable uncertainty is reported.

The most up to date evidence base for the UK's future climate predictions is provided by the UK Climate Projections 09 (UKCP09). For Northern Ireland, the medium emissions scenario predictions are shown in Table G. The medium scenario for all years predicts that there will be warmer, wetter winters and warmer, drier summers. Overall, average annual temperatures in Northern Ireland could increase by up to 3ºC by 2080 and mean sea levels could rise by between 9cm and 69cm (UKCP09).

Whilst flooding is regarded as a major hazard in the United Kingdom (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). Government administrative arrangements for Flood and Coastal Erosion Risk Management (FCERM) in Northern Ireland operate in the absence of any statutory provision for coastal erosion, as well as without formal or strategic shoreline management planning and any integrated flood and coastal erosion risk management policy (Dodds et al., 2010).

Table G: UKCP09 Medium Emissions Scenario Prediction for Mean Winter and Summer Temperature and Precipitation Changes for Northern Ireland

Year	Mean Winter Temperature Change	Mean Summer Temperature Change	Winter Mean Precipitation Change	Summer Mean Precipitation Change
2020	1.1 ºC	1.3 ºC	4%	-5%
2050	1.7 ºC	2.2 ºC	9%	-13%
2080	2.3 ºC	3.2 ºC	11%	-15%

Source: UKCP09

Northern Ireland Climate Change Risk Assessment

The first Climate Change Risk Assessment (CCRA) for Northern Ireland, published in 2012, identified that the entire population of Northern Ireland lives within approximately 35 miles from the coast and that approximately three quarters of the coastline has some type of environmental designation, ranging from local to world status. It has also identified potential consequences of climate change along coastal areas, which are as follows:

- Loss of existing beaches, foreshores, salt marches and sand dunes, due to more frequent flooding of the existing floodplain; higher extreme flood levels and potentially greater erosion. It is anticipated up to 100 hectares of beach may be lost by the 2080s.
- An increase in cliff instability and weakening of existing sea defences, due to coastal erosion. It is anticipated this will impact cultural heritage sites, infrastructure and the coastal landscape.
- Changes in species migration patterns, which may impact on biodiversity and tourism activities.
- A longer tourism season with more visitors and increased tourism revenues with effects to limited natural assets and infrastructure.

In addition to the impacts on the coast, the consequences to coastal waters and marine areas have also been predicted and they are as follows:

- An increase in harmful algal and jellyfish blooms, affecting both people and wildlife.
- Damage to aquaculture and sea fisheries (including shellfish) due to sea level rise, a deterioration in water quality and ocean acidification.

- A shift in marine species, resulting in changes to biodiversity that may include a reduction in commonly fished species and the introduction of new species.
- An increase in non-native species, which could have significant economic and environmental consequences where they occupy the same niche as native or commercial species if they become invasive.
- The opening of the North East and North West Arctic passages, providing new opportunities for shipping routes.

Northern Ireland Climate Change Adaptation Programme

The Adaptation Programme 2014-2019 contains the Government's response to the risks and opportunities identified in the CCRA for Northern Ireland. 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. The adaptation programme will be updated every five years and has identified adaptation under the following headings:

- Flooding;
- Water;
- Natural Environment; and,
- Agriculture and Forestry.

Projected Climate Change

There are a wide variety of results for Northern Ireland that can be drawn from UKCP09. Assuming a medium emission scenario and central probabilistic estimates, the future climate of Northern Ireland in the 2050's would be likely to exhibit:

- Increase in winter mean temperature of approx 1.7 °C;
- Increase in summer mean temperature of approx 2.2°C;
- Change in winter mean precipitation of approx + 9%;
- Change in summer mean precipitation of approx -13%; and,
- Sea level rise for Belfast of approx 14.5cm above the 1990 sea level.

Overall climate projections for Northern Ireland show that we can expect warmer, wetter winters and hotter, drier summers. Extreme weather events, such as short periods of

intense rainfall, are also likely to become more variable and more frequent, leading to greater risk of flooding and associated impacts.

Greenhouse Gases

On a global scale, the effects of greenhouse gas emissions reported by the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment (AR5) in 2013 have continued to intensify. The report states that since the 1950s, many of the observed changes in climate are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gases have increased. The atmospheric concentrations of carbon dioxide, methane, and nitrous oxide have increased to levels unprecedented in at least the last 800,000 years. Carbon dioxide concentrations have increased by 40% since pre-industrial times, primarily from fossil fuel emissions and secondarily from net land use change emissions. The ocean has absorbed about 30% of the emitted anthropogenic carbon dioxide, causing ocean acidification. The atmospheric concentrations of the greenhouse gases carbon dioxide (CO_2), methane (CH^4), and nitrous oxide (N_2O) have all increased since 1750 due to human activity. In 2011 the concentrations of these greenhouse gases were 391 ppm, 1803 ppb, and 324 ppb, and exceeded the pre-industrial levels by about 40%, 150%, and 20%, respectively. Concentrations of CO_2, CH^4, and N_2O now substantially exceed the highest concentrations recorded in ice cores during the past 800,000 years. The mean rates of increase in atmospheric concentrations over the past century are, with very high confidence, unprecedented in the last 22,000 years.

The Kyoto Protocol is an international agreement which commits its parties by setting internationally binding emission reduction targets. The Protocol entered into force in February 2005 and the first commitment period ran from 2008-2012. In 2012, UK emissions of six greenhouse gases covered by the Kyoto Protocol were provisionally estimated to be 573.5 million tonnes carbon dioxide equivalent. This was 3% higher than the 2011 figure of 554.9 million tonnes (Aether & Ricardo AEA , 2014). This increase is said to be predominantly driven by a shift from natural gas to coal in the power generation sector due to the impact of changes in global fuel prices, and an increase in the consumption of natural gas in the residential sector due to colder average temperatures. In 2012 the ‘Doha Amendment to the Kyoto Protocol’ was adopted which included new commitments for Parties which will run from 2013-2020. During this second commitment

Parties (of which the UK and Northern Ireland is part of) have committed to reduce greenhouse gas emissions by at least 18% below 1990 levels.

At the European level, in addition to the commitments as part of the Kyoto Protocol, the European Union (EU) as part of the Europe 2020 growth strategy has offered to increase its emissions reduction to 30% by 2020 if other major emitting countries in the developed and developing world commit to undertake their fair share of a global emission reduction target. EU leaders have also endorsed an aim of cutting Europe's greenhouse gas emissions by 80-95% by 2050 (EC Website).

Within the UK, the Climate Change Act 2008 provides an additional impetus towards decarbonising the economy. It requires carbon emissions to be reduced by 80% (from 1990 baseline) by the year 2050, with an interim target of a 34% reduction by 2020.

In June 2015, the Northern Ireland emission figures were published for 2013. Northern Ireland's 2013 greenhouse gas emissions are estimated at 22 million tonnes of carbon dioxide equivalent, similar to 2012 and only a small increase (1.2%) on the 2011 estimate. a significant drop in emissions was observed in the Land Use, Land-Use Change and Forestry (LULUCF) sector as the previous year had included emissions from exceptional forest wildfires. In the waste sector there was also a notable reduction in emissions from landfill. However, emissions in the energy supply sector saw a large increase as global fuel prices are causing a shift in power generation from burning natural gas to coal. Across all sectors, the 2013 emission levels show a longer term decrease of 16% since the base year.

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).

5.1.2 Key Issues, Problems and Future Trends

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. DAERA takes the lead role in delivering this

through the Ministerially chaired Cross-Departmental Working Group on Climate Change that has representation from all government departments.

The Northern Ireland 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).

The Department for the Economy is encouraging increased levels of renewable power generation and is working with the independent Northern Ireland Utility Regulator, Northern Ireland Electricity (NIE)[6] and SONI[7] on the development of associated new electricity infrastructure necessary to improve Northern Ireland's security of energy supply and manage increase renewable energy levels as set out in the Strategic Energy Framework 2010. Emissions associated with the power sector have already decreased by almost 24% from 1990 levels and are predicted to decrease by over 60% by 2025 (Aether Ricardo-AEA 2015).

The Department for Infrastructure (DfI) sets the vision and long term framework for regional development, regional transportation and sustainable travel (DETI, 2012). A major role of this department is reducing greenhouse gas emissions from road transport. In 2012 road transport emissions increased by almost 25% from 1990 levels (Aether and Ricardo-AEA, 2014) and are predicted to have increase from 1990 levels by around 9% by 2025 (DOE, 2013). A slight decrease in road transport emissions in the last few years has been seen since a peak in 2007 and it is predicted that this decrease will continue to 2025, with the levels being around 13% lower in 2025 compared with 2012 (DOE, 2013).

The Department for Communities (DfC) aims to reduce domestic energy costs by introducing the Warm Homes scheme which has already seen a reduction in 2009 emissions compared to 1990. Following these improvements emissions from the domestic sector heating are projected to decrease by 22% on 1990 levels by 2025 (DOE, 2013).

The role of the Department of Agriculture, Environment and Rural Affairs (DAERA) is to balance sustainable development with the challenges climate change presents to agriculture worldwide i.e. the need to produce more food and non-food products whilst

[6] NIE is the owner of the transmission assets and distribution system operator in Northern Ireland.
[7] SONI is the transmission system operator and is owned by Eirgrid plc (Eirgrid).

reducing the impact on the local and global environment. To achieve this, DAERA will work closely with agriculture, forestry and environmental representatives within an Implementation Partnership to promote Northern Ireland sustainable development and demonstrate both issues can be effectively addressed.

6. Socio-Demographics

6.1 Introduction

Under the heading of socio-demographics, there is a basic overview of population change within the coastal LGDs and general information about general population projections within Northern Ireland. The section continues with an overview of various aspects of general socio-demographics.

Data was collected for both the original 26 LGDs and the new 11 LGDs were information was readily available.

6.2 General Demography

The general demography section contains an overview of population change along with information about deprivation and education standards within Coastal LGDs. The following information sources have been used to characterise the Northern Ireland marine area:

- NISRA website; and,
- Northern Ireland Environmental Statistics Report 2015.

6.2.1 Baseline Description

Within the coastal LGDs of Northern Ireland, there has been steady population change, which since 2001 has resulted in an older population within coastal LGDs without replacement from the younger generations.

Table H shows the 2012 components of population change for each coastal LGDs and Northern Ireland as a whole.

Table H: Component of Population Change (2012)

	2012						
LGD	**Mid Year Estimate**	**Births**	**Deaths**	**Natural Change**	**Internal In Migration**	**Internal Out Migration**	**Net Internal Migration**
Northern Ireland	1823634	25324	14235	11089	53194	53194	0
Ards	78550	927	645	282	2108	1883	225
Belfast	280537	4134	2696	1438	12115	13269	-1154
Carrickfergus	39096	479	319	160	1078	1167	-89
Coleraine	58993	689	483	206	2651	2631	20
Derry	108586	1646	791	855	1779	1777	2
Down	70440	989	540	449	1649	1403	246
Larne	32191	341	291	50	743	738	5
Limavady	33761	452	227	225	701	788	-87
Moyle	17129	195	154	41	522	517	5
Newry and Mourne	100858	1524	682	842	1662	1768	-106
Newtownabbey	85322	1116	678	438	3220	3195	25
North Down	79420	932	761	171	2129	1869	260
Strabane	40033	544	293	251	646	760	-114

Data from the original 26 LGDs

Northern Ireland population at 30 June 2014 is estimated to be 1.840 million people. Over the year mid-2013 to mid-2014, the number of people living in Northern Ireland increased by 10,800 people (0.6%). 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,
- 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% between July 2013 and June 2014. Combined with an increase in the number of people coming to Northern Ireland to live (5.5%), this lead to a net population gain of 1,600 people due to migration.

Trends in the changing age structure of the population continue. In the year ending mid-2014, the population aged under 65 increased at a moderate rate (0.3%) reaching 1,554,600 in mid-2014, whilst the population aged 65 and over increased by 2.4% in the same period to 285,900 in mid-2014.

The population in the new 11 Local Government Districts increased over the year ending mid-2014, ranging from 0.2% in North Down & Ards to 1.3% in Lisburn and Castlereagh. Table I provides the population estimates for 11 new Local Government Districts.

Table I: Population Estimates for 11 New Local Government Districts 2014

Local Government District	Estimated Population
Causeway Coast and Glens	142,300
Mid and East Antrim	136,600
Antrim and Newtownabbey	140,000
Belfast	336,800
Lisburn and Castlereagh	130,000
North Down and Ards	157,900
Armagh, Banbridge and Craigavon	205,700
Newry, Mourne and Down	175,400
Mid Ulster	142,900
Fermanagh and Omagh	115,000
Derry and Strabane	149,200

6.2.2 Key Issues, Problems and Future Trends

The 2012 components of population change mid year estimate calculated that 56% of Northern Ireland population live in coastal LGDs. The highest numbers of births are projected for Belfast, which may be a function of the demography of the area (this area has the largest number of women in their child bearing years).

6.3 Deprivation

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 the original 26 councils/local government districts. 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. There are also pockets of deprivation in Strabane LGD. The majority of areas in the least deprived decile8 are in the east of Northern Ireland.

6.3.1 Baseline Description

The Northern Ireland Multiple Deprivation Measure (NIMDM) 2010 provided information on seven types of deprivation and an overall multiple deprivation measure comprising a weighted combination of the seven types of deprivation. The seven types of deprivation and associated weightings are as follows:

- Income Deprivation (25%);
- Employment Deprivation (25%);
- Health Deprivation and Disability (15%);
- Education Skills and Training Deprivation (15%);
- Proximity to Services (10%);
- Living Environment (5%); and,
- Crime and Disorder (5%).

Income Deprivation

The purpose of the Income Deprivation type was to identify the proportion of the population experiencing income deprivation. This was calculated by obtaining a non-overlapping count of individuals living in households in receipt of income related benefits and tax credits.

[8] Decile – one of the values of a variable that divides the distribution of the variable into ten groups having equal frequencies.

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 income deprivation affecting children is broadly similar to the income domain distribution. Belfast and Derry LGDs contain much of the most deprived decile of areas. The least deprived areas are located mostly in the east of Northern Ireland as was the case with the income deprivation domain.

As with income deprivation and income deprivation affecting children, Belfast and Derry LGDs contain the majority of the areas in the most deprived decile for income deprivation affecting older people.

Employment Deprivation

The employment deprivation domain was defined as involuntary exclusion of the working age population from work.

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.

Health Deprivation and Disability

The health deprivation and disability domain identified areas with relatively high rates of premature deaths and areas where relatively high proportions of the population's quality of life is impacted by poor health or who are disabled.

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 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.

Education Skills and Training Deprivation

The education skills and training deprivation domain measured 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.

Proximity to Services

The purpose of this domain is to measure the extent to which people have poor geographical access to key services, including statutory and general services.

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.

Living Environment

The living environment domain is to identify areas experiencing deprecation in terms of the quality of housing, access to suitable housing, and the outdoor physical environment.

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.

Crime and Disorder

The crime and disorder domain measured the rate of crime and disorder, which included recorded crime, deliberate fires and incidents of anti-social behaviour. This domain has two subdomains of crime and disorder. The crime subdomain includes violence, robbery and public order, burglary, vehicle theft and criminal damage. The disorder sub domain includes information regarding deliberate primary and secondary fires and anti-social behaviour incidents.

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.

6.3.2 Key Issues, Problems and Future Trends

To address deprivation in Northern Ireland, the Programme for Government 2011-15 contains priority two "Creating Opportunities, Tackling Disadvantage and Improving Health and Well-being". Priority two "*seeks to address the challenges of disadvantage and inequality that afflict society and to address the relatively poor health and long-term shorter life expectancy of our population; its purpose is to stimulate interventions that break the cycle of deprivation, education under-achievement, and to address health inequalities and poor health and well being as well as economic disengagement*".

Some of the key commitments within priority two are:

- "provide £40 million to address dereliction and promote investment in the physical regeneration of deprived areas through the Social Investment Fund (SIF)".
- "invest £40 million to improve pathways to employment, tackle systematic issues linked to deprivation and increase community services through the SIF".
- "Deliver a range of measures to tackle poverty and social exclusion through the Delivering Social Change delivery framework".

The SIF is a fund which will run until March 2016 and has been allocated £80 million by the Northern Ireland Executive. The first projects to be funded through the programme include 12 capital projects and 11 revenue projects, which aim to tackle poverty and deprivation through improved community based services and facilities. The initial projects have been allocated £33million.

6.4 Northern Ireland Economy

The baseline information sources used to characterise the Northern Ireland economy are:

- Northern Ireland Economic Strategy (DETI 2012);
- Northern Ireland Economic Strategy – 1st Annual Monitoring Report (DETI 2013); and,

· Economy and Jobs Initiative (DETI 2012).

6.4.1 Baseline Description

The Northern Ireland Assembly through DfE has identified the need to rebalance the Northern Ireland economy to reduce dependency on public sector employment. The strategic framework aims to increase employment and wealth by building a larger and more export-driven private sector. To achieve this, it was planned to:

· Stimulate innovation, R&D and creativity so that we widen and deepen our export base;

· Improve the skills and employability of the entire workforce so that people can progress up the skills ladder, thereby delivering higher productivity and increased social inclusion;

· Compete effectively within the global economy and be internationally regarded as a good place to live and do business;

· Encourage business growth and increase the potential of our local companies, including within the social and rural economies; and,

· Develop a modern and sustainable economic infrastructure that supports economic growth.

The first annual monitoring report for the Northern Ireland Economic Strategy was published in 2013. As part of the monitoring report, the key performance indicators have been collated (Table J).

Table J: Northern Ireland Economic Strategy: Key Performance Indicators (February 2016)

Indicator	Baseline	Update	Target
Business Expenditure on Research and Development (BERD) as a % of GVA	1.1% (2010)	1.2% (2014)	1.2% (2015)
% of Firms that are innovation active	31% (2006-2008)	40% (2010-2012)	32% (2015)
Gross Expenditure on R and D (GERD) as a % of GVA	1.7% (2010)	1.8% (2014)	1.9% (2015)
% of those qualifying from NI HE Institutions with graduate and post graduate qualifications in STEM	18.0% (2010/2011)	21.8% (2014/2015)	At least 22% (2020)
% of school leavers GCSE A*-C or equivalent (inc English & Maths)	59.0% (2009/10)	63.5% (2013/14)	66% (2014/15); 70% (2019/20)
% of those people in employment with level 2 skills and above.	74.0% (2010)	75.8% (Q3 2015)	At least 84.0% (2020)
Manufacturing Export Sales	£5.70bn (2010/11)	£6.03bn (2014/15)	£6.84bn (2014/15)
Manufacturing Exports to emerging economies	£231m (2010/11)	£267m (2014/15)	£369m (2014/15)
% of Foreign Direct Investment (FDI) Jobs promoted by Invest NI above Private Sector Median (PSM)	74.8% (2008-2011)	72% (2011-2015)	75% (2011-2015)
Total visitor revenue	£640m (2011)	£751m (2014)	£676m (2014); £1 billion (2020)
% of Jobs in locally owned companies supported by Invest NI above PSM	N/A (2008-2011)	70% (2011-2015)	50% (2011-2015)
% of Large Scale Investment Planning Decisions made within 6 months	N/A (2011)	74% (December 2014)	90% (14/15)
Journey Times on Key Transport Corridors (compared to 2003 baseline)	1.4% below 2003 baseline (2009)	3% below 2003 baseline (2014)	2.5% below 2003 baseline (2015)
% of premises able to access a broadband service of at least 2 mbps	77%	94%	100%

Indicator	Baseline	Update	Target
	(2011)	(2015)	(2015)
% of electricity consumption from renewable sources	12.54% (2011/12)	20% (March 2015)	20% (2015);
Jobs promoted through the Invest NI Jobs Fund	N/A	10,792 (March 2015)	6300 (2011-2015)
Working age benefit clients into employment	97,000 (2008-2011)	151,099 (2011 –March 2015)	114,000 (2011-2015)

In addition to the indicator update, further initiatives to rebalance and rebuild the local economy, these include:

- A new Innovation Strategy for NI;
- A new strategy to tackle economic inactivity;
- Further actions to build on what we are already doing to improve business access to finance;
- Further detail on the actions we will take to boost our trade performance;
- A strategic action plan to support further growth in the agri-food sector; and,
- A review of apprenticeships and youth training.

6.4.2 Key Issues, Problems and Future Trends

The Northern Ireland economy as a whole is considered to be over dependent on public sector employment and the KPIs identified in Table J are used as to identify when and how rebalance in the local economy can continue. As the KPIs 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.

7. Uses and Activities

7.1 Introduction

The Uses and Activities section has been split into the headings which encompass a range of uses and activities within the coastal and marine area. These headings are:

- Commercial Fisheries;
- Aquaculture;
- Ports, Shipping, Navigation, Dredging and Disposal;
- Recreation and Tourism;
- Aviation;
- Military Activity;
- Coastal Defences;
- Noise;
- Lighting; and,
- Marine Litter.

7.2 Commercial Fisheries

The following data sources have been used to characterise commercial fisheries within the Northern Ireland marine area:

- DARD/MFA fisheries landings statistics 2007 to 2012 (DARDNI website);
- Report of the International Bottom Trawl Survey Working Group (IBTSWG) (ICES, 2011);
- Northern Ireland Fleet Futures Analysis 2004-2013 (Tingley, 2006) and 2008-2013 update (Tingley, 2009);
- United Kingdom Sea Fisheries Statistics 2011 (MMO, 2012a; b; c);
- UK Offshore Energy SEA technical reports (DECC, 2009);
- SEA 6 Environmental Report. Strategic Environmental Assessment of Draft Plan for a 24th Seaward Round of Offshore Oil and Gas Licensing (DTI, 2005);
- An Introduction to the Benthic Ecology of the Rockall – Hatton Area (SEA 7) (Davies et al., 2006);
- Marine Irish Digital Atlas Fishing Areas (Marine Irish Digital Atlas website);
- 2012 Survey of the UK Seafood Processing Industry (Curtis and Barr, 2012);
- Development of spatial information layers for commercial fishing and shellfishing in UK waters to support strategic siting of offshore windfarms (ABPmer, 2009);

- Charting Progress 2 (Defra, 2010);
- Northern Ireland Coastal Zone – Indicators of Sustainable Development (DOE, 2011);
- Mapping the Spatial Access Priorities of the Northern Ireland Fishing Fleet (Yates, 2012. The Diverse Seas Project, Environmental Science Research Institute, University of Ulster, Northern Ireland); and,
- SEA of Offshore Wind and Marine Renewable Energy in Northern Ireland (DETI, 2009a).

7.2.1 Baseline Description

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 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. Yates (2012) sought to map the spatial access priorities of the Northern Ireland fishing fleet. The maps were based on interview data that represented almost half of the active fleet and scaling the results up to reflect the entire fleet, using data supplied by DARD. These maps indicate that the most important fishing area to the fleet is in the south-eastern part of the Northern Ireland marine area.

In 2011 there were around 12,400 fishermen in the UK, down 17% since 2001. Of these, 700 were based in Northern Ireland (up 23%). Part-time fishermen accounted for 19% of the total, a proportion that has changed little over the last ten years (MMO 2012a). There has been a change in the composition of the Northern Ireland fishing fleet between 1995 and 2011 as shown in Table K. In 2011, a much larger percentage of the fleet was made up of smaller vessels. This reflects the fact that the inshore commercial fisheries sector is becoming more important. Additional evidence is shown in Table L which summarises the Northern Ireland landings of demersal and pelagic fish and shellfish from 2007 to 2011. Demersal fish decreased in both tonnage and value over this period. Pelagic fish increased slightly in tonnage but increased more significantly in value by 135% and shellfish increased in tonnage landed and value by 39% between 2007 and 2011. Table M shows the landings in quantity (tonnes) and value (£'s) to the major ports within the

Northern Ireland marine area. Ardglass has significantly higher landings than the other major ports.

Table K: Change in composition of Northern Ireland fishing fleet from 1995-2011

Vessel Size	Year	
	1995	**2011**
Vessels <10m	161 (44%)	231 (61%)
Vessels >10m	206 (56%)	148 (39%)
Total	367	379

Table L: Landings into Northern Ireland by UK Vessels: 2007- 2011

	Quantity ('000 tonnes)					Value (£million)				
	2007	2008	2009	2010	2011	2007	2008	2009	2010	2011
Brill	-	-	-	-	-	0.1	0.1	-	0.1	0.1
Cod	0.4	0.5	0.4	0.3	0.2	1.0	1.2	0.8	0.6	0.3
Dogfish	0.1	-	0.1	-	-	0.1	-	0.1	-	-
Haddock	0.5	0.5	0.3	0.4	0.3	0.5	0.5	0.3	0.4	0.3
Hake	0.1	0.2	0.2	0.2	0.1	0.4	0.6	0.4	0.4	0.2
Monks/Anglers	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.2	0.2	0.3
Plaice	-	0.1	-	-	-	-	-	-	-	-
Pollack	-	-	-	0.1	-	-	0.1	0.1	0.1	0.1
Stakes and Rays	0.1	0.1	0.1	0.1	0.1	-	0.1	-	0.1	0.1
Sole	-	-	-	-	-	0.1	0.1	0.1	-	-
Turbot	-	-	-	-	-	0.1	0.1	0.1	0.1	0.1
Witch	0.1	0.1	0.1	-	0.1	-	-	-	-	-
Other Demersal	0.1	0.1	0.1	-	0.1	-	0.1	-	-	-
Total Demersal	1.7	1.9	1.5	1.3	1.1	2.6	3.2	2.3	2.2	1.7
Herring	5.1	5.7	5.3	5.5	4.7	0.9	1.3	1.4	1.6	2.1
Horse Mackerel	-	-	-	0.1	0.1	-	-	-	-	0.1
Mackerel	1.6	1.8	2.7	2.7	2.5	1.2	1.3	2.4	2.1	2.5
Other Pelagic	-	-	-	-	0.2	-	-	-	-	-
Total Pelagic	6.7	7.5	8.1	8.2	7.6	2.0	2.6	3.8	3.7	4.7
Cockles	-	0.1	0.1	-	-	-	0.2	0.1	-	-
Crabs	1.4	1.1	1.2	1.5	1.4	1.3	1.0	1.1	1.4	1.2
Lobsters	0.1	0.1	0.1	0.1	0.1	0.6	0.5	0.5	0.6	0.6
Mussels	1.0	1.0	-	-	0.2	0.4	0.6	-	-	0.1
Nephrops	6.2	7.9	7.2	7.0	7.2	11.7	14.1	10.3	10.7	15.4
Scallops	0.6	0.6	1.7	3.9	4.2	0.7	0.9	1.5	2.5	2.9
Shrimps and	-	-	-	-	-	-	-	0.1	0.1	0.1

	Quantity ('000 tonnes)					Value (£million)				
	2007	**2008**	**2009**	**2010**	**2011**	**2007**	**2008**	**2009**	**2010**	**2011**
Prawns										
Squid	-	-	-	-	-	-	-	-	-	0.1
Whelks	0.1	0.1	0.1	-	0.1	0.1	0.1	0.1	-	0.1
Total Shellfish	9.5	10.9	10.4	12.5	13.2	14.8	17.5	13.8	15.4	20.54
Total All Species	17.8	20.3	19.9	22.1	21.9	19.4	23.3	19.9	21.3	26.8

Source: MMO (2012b)

Table M: Landings into Major Ports in Northern Ireland by UK Vessels 2011

Species	Northern Ireland Ports											
	ARDGLASS		KILKEEL		PORTAVOGIE		BALLYCASTLE		OTHERS NI		TOTAL NI	
	Quantity (tonnes)	Value (£'000)	Quantity (tonnes)	Value (£'000)	Quantity (tonnes)	Value (£'000)	Quantity (tonnes)	Value (£'000)	Quantity (tonnes)	Value (£'000)	Quantity (tonnes)	Value (£'000)
Bass	-	-	..	..	..	..	-	-	-	-	..	..
Brill	3	14	6	32	5	22	..	..	..	..	14	67
Catfish	-	-	-	-	-	-	-	-	-	-	-	-
Cod	8	14	89	197	58	132	..	..	-	-	156	343
Conger Eels	..	..	6	5	7	4	-	-	-	-	14	9
Dabs	-	-	-	-	-	-	-	-	-	-	-	-
Dogfish	12	2	23	5	5	1	-	-	-	-	39	7
Flounder or Flukes	-	-	-	-	-	-	-	-	-	-	-	-
Gurnard	7	5	20	15	3	2	-	-	-	-	30	22
Haddock	12	9	241	252	56	74	..	..	-	-	309	336
Hake	6	9	25	62	65	147	..	..	-	-	95	218
Halibut	-	-	..	..	-	-	-	-	-	-	..	..
Halibut, Greenland	-	-	-	-	-	-	-	-	-	-	-	-

Species	Northern Ireland Ports											
	ARDGLASS		KILKEEL		PORTAVOGIE		BALLYCASTLE		OTHERS NI		TOTAL NI	
	Quantity (tonnes)	Value (£'000)	Quantity (tonnes)	Value (£'000)	Quantity (tonnes)	Value (£'000)	Quantity (tonnes)	Value (£'000)	Quantity (tonnes)	Value (£'000)	Quantity (tonnes)	Value (£'000)
Lemon Sole	1	1	2	3	..	1	-	-	-	-	3	4
Ling	10	6	22	17	7	6	..	..	-	-	39	29
Megrim	..	..	1	1	-	-	..	..	-	-	1	1
Monks or Anglers	23	66	57	171	15	40	..	..	..	..	96	278
Plaice	6	3	38	23	2	1	..	..	-	-	46	27
Pollack (Lythe)	1	2	19	38	22	46	-	-	-	-	43	87
Redfish	-	-	-	-	-	-	-	-	-	-	-	-
Saithe	..	..	1	1	1	1	-	-	-	-	2	2
Sand Eels	-	-	-	-	-	-	-	-	-	-	-	-
Skates and Rays	10	13	49	67	7	8	-	-	-	-	66	87
Sole	1	7	4	27	3	16	..	..	..	..	8	49
Torsk (Tusk)	-	-	-	-	-	-	-	-	-	-	-	-
Turbot	3	26	6	46	5	29	..	..	-	-	14	101

Species	Northern Ireland Ports											
	ARDGLASS		KILKEEL		PORTAVOGIE		BALLYCASTLE		OTHERS NI		TOTAL NI	
	Quantity (tonnes)	Value (£'000)	Quantity (tonnes)	Value (£'000)	Quantity (tonnes)	Value (£'000)	Quantity (tonnes)	Value (£'000)	Quantity (tonnes)	Value (£'000)	Quantity (tonnes)	Value (£'000)
Whiting	1	1	10	10	1	1	-	-	-	-	12	11
Witch	20	11	33	20	10	3	..	..	-	-	62	34
Other Demersal (a)	8	2	44	9	..	..	-	-	-	-	52	11
Fish Roes	-	-	2	2	..	..	-	-	-	-	2	3
Total Demersal	130	189	698	1,001	274	534	..	1	..	..	1,103	1,725
Blue Whiting	-	-	-	-	-	-	-	-	-	-	-	-
Herring	4,581	2,064	31	8	-	-	-	-	117	28	4,728	2,099
Horse Mackerel	-	-	-	-	-	-	-	-	102	54	102	54
Mackerel	2,459	2,447	4	3	-	-	-	-	17	13	2,480	2,463
Sardines	-	-	-	-	-	-	-	-	-	-	-	-
Sprats	248	44	-	-	-	-	-	-	-	-	248	44
Tuna	-	-	-	-	-	-	-	-	-	-	-	-
Other Pelagic	-	-	-	-	-	-	-	-	-	-	-	-

Species	Northern Ireland Ports											
	ARDGLASS		KILKEEL		PORTAVOGIE		BALLYCASTLE		OTHERS NI		TOTAL NI	
	Quantity (tonnes)	Value (£'000)	Quantity (tonnes)	Value (£'000)	Quantity (tonnes)	Value (£'000)	Quantity (tonnes)	Value (£'000)	Quantity (tonnes)	Value (£'000)	Quantity (tonnes)	Value (£'000)
Total Pelagic	7,288	4,554	35	10	-	-	-	-	236	96	7,559	4,660
Cockles	-	-	-	-	-	-	-	-	..	..	..	..
Crabs	77	64	556	452	172	205	81	73	546	453	1,433	1,246
Cuttlefish	-	-	-	-	-	-	-	-	-	-	-	-
Lobsters	3	25	8	73	4	43	7	85	41	416	63	642
Mussels	-	-	10	5	..	..	-	-	168	85	178	90
Nephrops	2,312	4,736	2,952	6,238	1,948	4,316	5	11	10	59	7,228	15,360
Oysters	-	-	-	-	-	-	-	-	..	..	..	..
Periwinkles	-	-	-	-	-	-	-	-	-	-	-	-
Scallops	159	235	1,785	1,135	218	394	1,737	775	265	336	4,164	2,875
Shrimps and Prawns	..	6	1	7	..	2	-	-	3	38	4	54
Squid	7	20	25	70	9	22	-	-	..	..	41	112
Whelks	-	-	1	1	4	1	-	-	105	79	110	81
Other Shellfish	-	-	1	1	..	..	-	-	-	-	1	1

Species	Northern Ireland Ports											
	ARDGLASS		KILKEEL		PORTAVOGIE		BALLYCASTLE		OTHERS NI		TOTAL NI	
	Quantity (tonnes)	Value (£'000)	Quantity (tonnes)	Value (£'000)	Quantity (tonnes)	Value (£'000)	Quantity (tonnes)	Value (£'000)	Quantity (tonnes)	Value (£'000)	Quantity (tonnes)	Value (£'000)
Total Shellfish	2,559	5,086	5,338	7,981	2,356	4,983	1,830	944	1,139	1,467	13,222	20,461
Total All Species	9,977	9,829	6,071	8,992	2,630	5,518	1,830	944	1,375	1,563	21,883	26,846

Source: MMO (2012b)

Nephrops

In terms of both landings and value, Nephrops is the most important species targeted by the Northern Ireland fishing fleet (see Table M) through deployment of single-rig and twin-rig trawl gears by vessels larger than 10m. The fishery is concentrated on an expansive area of muddy sediment between Northern Ireland and the Isle of Man which extends from inshore waters to well outside the 12nm limit. Nephrops trawlers are active year-round with the greatest catches during the summer months and during periods of weak tide.

The management of Nephrops stock in the Northern Ireland marine area is assessed on the basis of Total Allowable Catch (TAC) throughout the International Council for Exploration of the Seas (ICES) Sub-Area Area VII which includes stocks from the Irish Sea, Celtic Sea, Porcupine Bank and the Aran ground of western Ireland. In order to gain estimates of abundance, sophisticated underwater video survey techniques have been developed. The ICES advice for 2010 resulted in a reduction to the TAC by 9% in Sub-Area Area VII because of particular concern about the status of the Porcupine Bank stock. The Nephrops stock in the western Irish Sea has maintained a stable size composition and sex ratio during the past four decades, suggesting that the stock is harvested sustainably. This is supported by the perception of most fishermen that consider the Nephrops stock to be stable (Yates, 2012).

Potting Fisheries

Potting takes place along the entire Northern Ireland coast, targeting lobster, brown crab, velvet crab, whelk and some pot-caught Nephrops. The County Antrim coast from Rathlin to Larne is the principal lobster fishing area in Northern Ireland waters while the County Down coast is considered to be the most productive area for brown crab.

Lobster numbers have been conserved through V-notching programmes which have been in operation for over 10 years. Through this scheme any berried female (egg-bearing) landed is marked by cutting a ‘V’ in one of the uropods of the tail of the lobster before returning it to the sea. If these lobsters are subsequently caught they should not be landed but returned to the sea to protect the breeding stock. By doing this the fishermen are compensated by receiving half the market value of each lobster released. There are currently two such V-notching schemes in Northern Ireland: North Coast and North East Coast (Yates, 2012).

The geographic range of the pot fishery is limited by the size of the vessels. Most vessels are less than 10m and, therefore, tend to involve day trips as they cannot venture far from their harbour base. Additionally, in the south east, the use of pots is restricted to the inshore area due to trawling activity for Nephrops in muddy substrates offshore.

Scallops

Due to a rapid growth rate and high market value (see Table M), the scallop fishery is of high economic importance. Fishing for King scallops has occurred in Northern Ireland since 1935 although commercial exploitation of Queen scallops did not occur until the 1970s. The fishing technique for King and Queen scallops reflects their differing behaviour (King scallops bury into the sediment whilst Queen scallops are active swimmers). King scallop is taken in Northern Ireland waters by small vessels towing a group of spring loaded dredges with 8 or 9 teeth placed vertically along the front of the dredge which is attached to a beam. Queen scallops tend to swim if disturbed and so are fished using skid dredgers or otter trawls. These dredgers do not have teeth, rather a tickler chain which disturbs the Queen scallops (AFBI website).

Up to 15 County Down based vessels represented by the Northern Ireland Scallop Fishermen's Association operate mostly off the east coast. A small number of Scottish and Isle of Man boats also participate in this fishery, dredging the east Antrim coast during November/December. In addition, small quantities of scallop are taken by divers around the Copeland Islands. Key areas that are harvested for scallop are the south-eastern inshore part of the Northern Ireland marine area (Yates, 2012). Landings of scallop into Northern Ireland ports since 2007 are shown in Table L.

Fishing restrictions for scallops were put in place in 2008, reducing the permitted daily fishing time, limiting the number of dredges used by each boat and extending regulation to 'fishing by any means' including divers. In addition, scallops must have a minimum shell length of 110mm to be legally landed for commercial use. This minimum legal landing size within ICES rectangle VIIa ensures that scallops spawn at least twice before becoming vulnerable to direct fishing mortality. Fishermen perceive these restrictions to be helping to manage stocks, although there is still concern that an ever increasing number of fishermen are diversifying into scallops to subsidise other fishing activities (mainly Nephrops), and that this will put too much pressure on the stocks (Yates, 2012).

Finfish

The types of catch that Northern Ireland fishing vessels are landing has changed in recent years. Restrictions to the fishing of whitefish such as cod, due to the collapse or near collapse of stocks within the Irish Sea, has led local fishermen focussing efforts on catching shellfish. The Cod Recovery Plan that has been in force for the Irish Sea since the year 2000 has seen severe restrictions being placed upon the number of days that fishermen can spend at sea here and on the type and quantity of fish they can catch. In this regard, it is very clear that the TAC figures and Cod Recovery Plan have had and continue to have a very direct effect on both the size, profitability and target species of the Northern Ireland fishing industry (Northern Ireland Assembly, 2011).

Whitefish are targeted by trawlers (>15m in length) using semi-pelagic gear in the Irish Sea, North Channel and along the north coast to the west of Rathlin Island. The Irish Sea and North Channel grounds are fished mainly by County Down based vessels while the north coast area is exploited by vessels from Greencastle and Moville in County Donegal and some smaller boats from Portrush and Portstewart. Landings of the main demersal species are presented in Table M. Whilst not all fish landed are taken from the Northern Ireland marine area, the table can give some idea of the level of catch of the main species together with landings of non-quota species.

The main species of interest are cod, haddock, hake, whiting, plaice and sole, although as discussed above, landings have declined significantly due to the deteriorating state of Irish Sea stocks and the lowering of TACs, most notably for cod (see Image 4). Over the period between 2000 and 2007, there has been a reduction in spawning stock biomass estimates for cod since 2002, with estimates falling 73% to 1,658 tonnes by 2007 (DOE, 2011). Spawning stock biomass estimates for sole have also experienced a downward trend over this period since 2001, with estimates dropping 58% to 1,492 tonnes by 2007. However, plaice spawning stock biomass estimates indicate an upward trend, with a 72% increase from 3,953 tonnes in 2000 to 6,802 tonnes in 2007 (Source: AFBI & ICES Stock Assessments (WGCSE 2010 report), cited in DOE, 2011).

Species	Biomass	Exploitation	Trend	Irish Sea TAC 2010	2010 ICES assessment of state of stock
cod			▲	674t	Harvested unsustainably since the late 1980's. The stock has had reduced reproductive capacity since the mid-1990s. After 7 years of some of the lowest recruitments in the time series, the 2009 year class is estimated to be more abundant and is estimated by surveys to be the largest since 2001
haddock			▲	1,424t	Stock trends indicate an increase in spawning biomass over the time-series but a decrease since 2008. Total mortality appears relatively stable
plaice			▲	1,627t	The spawning biomass trends show an increase in stock size since the mid-1990's to a stable level. Total mortality shows a declining trend since the early 1990's
sole			▼	402t	Spawning biomass has continuously declined since 2001 to low levels and recruitment reached its lowest level in 2008. A large reduction of fishing mortality in recent years reflects a reduction in fishing effort
whiting			▼	157t	The present stock size is extremely low. Landings have seen a declining trend since the early 1980s, reaching lowest levels in the 2000s. Survey results indicate a decline in relative spawning biomass
herring			▲	4,800t	Spawning biomass is close to its highest abundance in the 17 year time-series. The current fishing pattern shows no signs of being detrimental to the stock

Biomass: reproductive capacity impaired; at risk of suffering reduced reproductive capacity; at full reproductive capacity

Exploitation: overfished; at risk of becoming unsustainably fished; sustainably fished

Trend: ▲ state improving; ▶ stable; ▼ state deteriorating

Image 4: Status of the Main Commercially Exploited Fish Stocks in the Irish Sea, 2010 (Source: AFBI and NIEA, 2011)

Herring spawns in the autumn and, in the Irish Sea, comprises two separate stocks: Manx and Mourne. The Manx stocks spawn east of the Isle of Man (Clupea website) and so are beyond the boundary of the Northern Ireland marine area. The Mourne herring spawns off the east coast of Northern Ireland/Republic of Ireland, in an area extending approximately from St John's Point (County Down) south to Dunany Point (County Louth). Herring spawning stock biomass are much higher than that for cod, plaice and sole (Image 4). Spawning stock biomass estimates have fluctuated over the period between 2000 and 2007, but a threefold increase occurred between 2006 and 2007, from 16,332 tonnes to 51,819 tonnes (DOE, 2011). This increase was driven by a particularly good recruitment event (fish reaching a certain size or reproductive stage). Spawning stock biomass has continued to increase in recent years (Image 4), so much so that ICES now regards the stock as stable (AFBI and NIEA, 2011).

International scientific research has shown that Atlantic salmon populations are currently under threat. Numbers of salmon returning to many Northern Ireland rivers are too low to be sustainable. The 2007 commercial salmon catch in Northern Ireland was 6,178kg compared with 31,353kg in 1997, an 80% reduction over the ten year period (DOE, 2011). These values do not include salmon caught in the Foyle catchment, which are mainly landed in the Republic of Ireland or salmon caught by recreational rod and line fisheries. The reduction in the numbers of salmon caught post 2001 can mainly be attributed to reduced fishing effort resulting from the Commercial Salmon Fishermen's Voluntary Buy-out Scheme. As the level of commercial fishing has reduced, the average price of wild salmon per kg has increased almost threefold, from £4.27/kg in 1997 to £12/kg in 2007 (DOE, 2011).

7.2.2 Key Issues, Problems and Future Trends

Historically, Ireland's coasts have been rich in marine resources and as such many of the fisheries have been over fished, including oyster beds and herring. This 'fishing down the food web' has occurred all over the Northern Hemisphere in the last 50 years (Pauly et al., 1998) causing population declines of commercially value fish stocks. Today, the Northern Ireland fisheries are relatively diverse with the overall composition of catches dominated by invertebrates. The most economically important fishery in the area is the Nephrops fishery (Thurston et al., 2008). While the volume of Nephrops landed has increased in recent years, the landings of many whitefish and flatfish have declined in the last 35 years.

Whitefish populations have suffered significant declines due to overfishing and over-exploitation. In an effort to revive populations the EU has taken a number of measures, one of which includes the restriction of whitefish fishing in certain areas, including large parts of Northern Ireland territorial waters, at certain times of the year to seek to improve spawning success (Marine Irish Digital Atlas website).

As discussed in Biodiversity, Flora and Fauna Section, the key issues faced by fish populations within the Northern Ireland marine area are overfishing and habitat loss. Some of the commercially valuable species are being fished at unsustainable levels, especially those which are slow growing and become sexually mature later.

Fisheries are potentially impacted by both environmental and anthropogenic factors, including:

- Climate change effects (warming seas), which may result in the decline of stocks of cold-water species, such as cod, in waters around the UK as the stocks move northwards. However, new opportunities for warmer-water species may emerge as these species extend northwards into UK seas. Existing more southerly stocks such as red mullet, John Dory and bass may also experience improved productivity in years with higher average sea temperatures (UKMMAS, 2010);
- Anthropogenic effects such as permanent structures, dumping at sea, oil and chemical spills, and the effects of the fisheries themselves, which may impact on the habitats where the fish live; and,
- Profitability and political effects.

Fisheries management will continue to focus on bringing down rates of exploitation to Maximum Sustainable Yield (MSY) targets. The majority of scientifically assessed stocks continue to be fished at rates well above the levels expected to provide the highest long-term yield (Defra, 2010), therefore, there is increasing downward pressure on the levels of exploitation allowed. Management measures will need to reduce bycatch and discards, and be more responsive to changing patterns of fish migration and movement.

The reform of the Common Fisheries Policy (CFP which came into force on 1st January 2014) and will be an influencing factor on the management of fisheries within the Northern Ireland marine area. As a result of the reforms, the UK Government is committed to:

- Changing the way fisheries are managed including a more local approach to quota management and publishing a register of fixed quota allocations;
- Working with sea anglers to improve data;
- Preparing a report for Parliament regarding the conduct and operation of the Inshore Fisheries and Conservation Authorities (IFCAs); and,
- Funding research projects and fisheries science partnership.

By bringing fish stocks back to sustainable levels, the new CFP aims to provide EU citizens with a stable, secure and healthy food supply for the long term. It seeks to bring new prosperity to the fishing sector, end dependence on subsidies and create new opportunities for jobs and growth in coastal areas. At the same time, it fosters the

industry's accountability for good stewardship of the seas. The certification of sustainable fisheries by the Marine Stewardship Council (MSC) may bring marketing advantages in a climate of increasing public and commercial awareness of sustainability issues, and where there is a desire to source fish and shellfish from environmentally responsible businesses. Currently, there are eight UK fisheries in UK waters with MSC accreditation, including fisheries for Dover sole, herring, mackerel, sardine, queen scallop, mussels and cockles. There are currently no certified fisheries within the Northern Ireland marine area (MCS website).

7.3 Aquaculture

The following data sources have been used to characterise aquaculture within the Northern Ireland marine area:

- The Rising Tide – A Review of the Bottom Grown (BG) Mussel Sector on the Island of Ireland (Bottom Grown Mussel Review Group, undated);
- (Draft) European Maritime and Fisheries Fund Regulation;
- (Draft) Seafood Development Programme 2014 – 2020 (Department of Agriculture, Food and the Marine, 2013);
- Sustainable Mariculture in Northern Ireland Lough Ecosystems (Smile) report (Ferreira et al. 2007);
- Current list of Classified Shellfish Harvesting Areas in Northern Ireland 2012 (Food Standards Agency website);
- List of Northern Ireland authorised finfish and shellfish aquaculture installations (DARDNI website); and,
- Charting Progress 2 (Defra, 2010).

7.3.1 Baseline Description

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 each authorised to produce 450 tonnes of salmon. The locations of licensed aquaculture areas in Northern Ireland are shown in Figure 8. Shellfish production in 2013 (excluding Lough Foyle) is included in Table N. The marine aquaculture sector currently employs 49 full time and 29 part time employees (DARD).

Table N: Shellfish Production in 2013 (excluding Lough Foyle)

Species	Production (Tonnes)	Value (£)
Mussels Bottom grown	3,227	5,594,000
Mussels (Rope/Trestle grown)	97	185,100
Pacific oysters (Market)	11	30,942
Pacific oysters (On-growing)	127	315,585
Other shellfish (scallops, Periwinkles etc)	2	3,335
Total Shellfish	3,464	6,101,962

The main secondary activity is fish processing, which has about 350 full term employees according to a survey conducted in 2012. When compared to other regions in the UK, Northern Ireland has a very small number of sea fish processing units totalling 17 in comparison to the 325 in the whole of the UK (Curtis and Barr, 2012).

7.3.2 Key Issues, Problems and Future Trends

Aquaculture continues to be the world's fastest-growing animal-food-producing sector and makes a significant contribution to the production of aquatic food worldwide. World fish consumption also continues to increase driven by a combination of population growth, rising incomes and urbanisation. The UK aquaculture sector has increased dramatically in recent years with an increased demand for the resource as wild fish stocks become increasingly under pressure and unsustainably fished. The economic contribution in the UK from fish and shellfish farming alone increased by 132% from 2000-2006 (Defra, 2010). In addition to the more established finfish species, emerging aquaculture species such as tilapia, barramundi, bass and bream along with the growing organic finfish sector may also increase the size of the UK finfish aquaculture market (Defra, 2008).
The UK is committed to supporting sustainable growth for aquaculture. This support for growth has new impetus at EU level. The Commission is keen to use the opportunities presented by the Common Fisheries Policy (CFP) Reform and the European Maritime and Fisheries Fund (the financial instrument to support CFP implementation) to boost aquaculture growth and has asked Member States to produce Multi-annual National Plans outlining how they intend to foster growth in the aquaculture sector. Opportunities exist, including possible co-location with marine energy installation. Further development will

however be dependent on the outcome of competition for available space and reducing potential environmental impacts.

In April 2013, the Northern Ireland Agri-Food Strategy Board published the “Going for Growth Strategy”. The Strategy sets challenging targets that reflect the industry’s ambition for increased sales, as well as job creation and overall contribution prosperity and contains a number of recommendations aimed at accelerating the growth of fishing and aquaculture.

7.4 Ports, Shipping, Navigation, Dredging and Disposal

The following data sources have been used to characterise ports and shipping within the Northern Ireland marine area:

- Maritime Statistics. All UK ports, all freight traffic, by port and direction: 1965 – 2012 (Department for Transport (DfT), 2013);
- Potential Marine Environmental High Risk Areas (MEHRAs) (Maritime and Coastguard Agency (MCA) website);
- Northern Ireland State of the Seas Report (NIEA and AFBI, 2011);
- Northern Ireland Ports Traffic 2011 and 2012 (Northern Ireland Statistics and Research Agency, 2012; 2013) Available from DETI website http://www.detini.gov.uk/deti-stats-index/forms_other_surveys/stats-ports-traffic.htm;
- Belfast Harbour Commissioners website;
- Belfast Harbour Annual Report and Accounts (2013);
- Regional Locational Guidance (RLG) for Offshore Renewable Energy Developments in NI Waters (Department of Enterprise, Trade and Investment (DETI), 2011);
- Belfast Renewable Energy Park (DONG Energy website);
- Ships’ routeing information (International Maritime Organisation (IMO) website);
- Ferry services information (NI Direct website);
- Charting Progress 2 (Defra, 2010);
- The economic impact of the UK Ports Industry (Oxford Economics, 2010);
- Managing the Water Environment in Northern Ireland (Environmental and Heritage Service (EHS), 2000);

- Oceanwise data;
- Northern Ireland Coastal Zone – Indicators of Sustainable Development (DOE, 2011);
- Marine Guidance Note (MGN) 275. Proposed UK Offshore Renewable Energy Installations (OREI) – Guidance on Navigational Safety Issues (Maritime and Coastguard Agency, 2004); and,
- Mapping UK Shipping Density and Routes from Automatic Identification System (AIS) (MMO, 2014).

7.4.1 Baseline Description

Ports

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). Over 22 million tonnes of cargo were handled through these five ports in 2012 (DfT, 2013), and over the last six years this value has been consistently around this value (Table O). The total tonnage comprised approximately 15 million tonnes of inward traffic and 8 million tonnes of outward traffic in Northern Ireland (Northern Ireland Statistics and Research Agency, 2013). In addition, the Northern Ireland commercial fishing industry is concentrated at the three fishing ports of Ardglass, Kilkeel and Portavogie, located on the East coast (see Commercial Fisheries Section).

Table O: Freight traffic through Northern Ireland's Five Main Ports by Direction from 2007 to 2012 (thousand tonnes)

Port	Traffic	Year					
		2007	2008	2009	2010	2011	2012
Belfast	Inward Traffic	9,704	9,143	8,407	8,600	8,614	9,731
	Outward Traffic	3,712	3,897	3,643	4,227	4,947	5,455
	All Traffic	13,416	13,040	12,050	12,827	13,561	15,186
Coleraine	Inward Traffic	20	10	2	1	-	-
	Outward Traffic	54	51	31	40	39	-
	All Traffic	74	61	33	41	39	39
Larne	Inward Traffic	2,890	2,749	2,299	2,419	2,306	1,482
	Outward Traffic	2,574	2,417	1,998	2,194	2,089	1,431
	All Traffic	5,464	5,166	4,297	4,614	4,395	2,913
Londonderry	Inward Traffic	1,836	1,786	1,542	1,696	1,583	1,563
	Outward Traffic	98	54	77	61	157	96
	All Traffic	1,934	1,839	1,619	1,757	1,740	1,659
Warrenpoint	Inward Traffic	1,259	1,305	961	1,337	1,346	1,343
	Outward Traffic	740	813	880	990	1,079	1,087
	All Traffic	1,999	2,119	1,841	2,327	2,425	2,429
Total	Inward Traffic	15,709	14,993	13,211	14,052	13,850	14,119
	Outward Traffic	7,178	7,232	6,629	7,513	8,311	8,069
	All Traffic	22,888	22,224	19,840	21,565	22,161	22,226

Source: DfT (2012)

The majority of freight traffic moving through Northern Ireland's ports passes through Belfast. In 2012, over 68% (15.2 million tonnes) of cargo was handled at Belfast, with 13% (2.9 million tonnes) passing through Larne, 11% (2.4 million tonnes) through Warrenpoint, 7% (1.6 million tonnes) through Londonderry and <1% (39 thousand tonnes) through Coleraine (Table O). In 2012, the majority of total Northern Ireland traffic again came through the Belfast Port (65%), while almost 12% of total traffic came through the Port of

Larne. Cargo tonnage handled by the ports is mainly in the form of bulk cargo (liquid and dry bulk cargo that must be loaded individually) and unit loads (freight vehicles and containers).

A report conducted by the Centre for Economics and Business Research in 2007 concluded that 13% of Northern Ireland's workforce is employed by businesses which trade through the Port of Belfast or are based in the Harbour Estate. In 2009, there were 13,700 people employed by ports in Northern Ireland (Oxford Economics, 2011). These businesses generate £3.8 billion of gross value added (GVA) or £4.2 billion worth of gross domestic product (GDP) equivalent to 15.7% of the Northern Ireland total (NIEA and AFBI, 2011). Furthermore, the UK ports industry enables a whole range of other industries to function, such as fishing and dredging. The activities of industries, which are heavily reliant on the import/export of bulk raw materials are also crucially facilitated by UK ports.

In late 2012, construction finished of a new tailor-made offshore wind installation and pre-assembly facility at Belfast Harbour. DONG Energy took the lease, which was initially used for the construction of the West of Duddon Sands offshore wind farm in the Irish Sea (DONG Energy, 2013). The completion of the DONG Energy facility further enhances Belfast Harbour's ambition to become one of the leading UK Renewables hubs and will complement other Harbour Estate Renewables related activities undertaken by Harland and Wolff, NI Advanced Composites Centre, Ridgeway Renewables and Belfast Metropolitan College amongst others. In addition to the 150 construction related jobs sustained during the building of the facility up to a further 300 jobs have been created to serve the West of Duddon Sands project ranging from welders to electricians to engineers.

Driven in part by its renewable related investments, Belfast Harbour is currently experiencing significant growth with a 16% increase in trade tonnage in 2013 building on an 11% increase in 2012. One area of particular growth has been the cruise ship market with cruise calls increasing from 32 to 45 to 59 over the last three years bringing in over 100,000 visitors per annum.

Shipping – Passenger Routes

Northern Ireland's ports are important for passenger traffic with over 2 million domestic sea passengers (see Table P) passing through each year (DfT, 2012). In terms of tourist traffic, 484,620 tourist vehicles passed through Northern Ireland ports in 2012. Compared with a

figure of 509,534 in 2011, this represents a decrease of 4.9% (Northern Ireland Statistics and Research Agency, 2013).

Major ferry routes link with Cairnryan and Troon (Figure 9). In addition, there has been an increase in the number of cruise ships visiting Belfast in recent years. In 2013, a record 59 cruise ships will bring over 100,000 visitors to the port (Belfast Harbour Commissioners, 2013).

Table P: Domestic Sea Passenger Movements (thousands) from GB to Northern Ireland, 2007-2013

Sea Crossing	Year						
	2007	2008	2009	2010	2011	2012	2013
Cairnryan – Larne	646	628	602	611	631	524	501
Cairnryan – Belfast	-	-	-	-	96	1,116	1,150
Fleetwood – Larne	61	58	54	51	-	-	-
Liverpool – Belfast	187	190	187	221	235	207	241
Stranraer – Belfast	1,217	1,104	1,101	1,084	922	-	-
Troon – Larne	231	206	213	225	208	169	180
Other routes	9	9	11	16	20	17	15
Total	2,351	2,194	2,167	2,207	2,113	2,033	2,086

Source: DfT (2014)

Other smaller routes include the year-round Rathlin Island ferry crossing from Ballycastle, as well as fishing, aquaculture and tourist pleasure cruises from Cushendall. Regular ferry crossings also exist within Strangford Lough, Lough Foyle and Carlingford Lough (NI Direct website).

Shipping – Commercial Routes

Northern Ireland's waters are a busy shipping area with merchant vessels using distinct routes around the coast. Larger vessels, including tankers and some cargo ships, tend to pass in a north-south direction via the North Channel accessing major ports in and around the Irish Sea. Tankers may also deviate from their north-south transit to make port calls to Lough Foyle and to the Port of Belfast. Cargo vessels have less defined routes through the Northern Ireland marine area; their movements appear to be concentrated on the east coast with east-west routes connecting Larne and Belfast Port to the ports of Scotland,

England and the Isle of Man and south-westerly routes to Ireland. High resolution Automatic Identification System (AIS) data is included in Figures 9 which show that the greatest number of shipping movements is concentrated in the Belfast area. The transit routes of different types of vessels are shown on Figure 10.

Shipping – Navigation

The North Channel is a 'recognised sea lane essential to international navigation' and as such development consent cannot be granted where installations (e.g. offshore renewable energy installations) would be likely to cause interference (MCA, 2004).

IMO routeing measures also include a vessel traffic separation scheme (TSS) in the North Channel between Rathlin Island and the Mull of Kintyre. TSSs detail specific routes for traffic to aid navigation of certain ships or ships with certain cargoes. The practice of following predetermined routes for shipping originated in 1898 and was adopted, for reasons of safety, by shipping companies operating passenger ships across the North Atlantic (IMO, 2013). There are no other IMO measures in the Northern Ireland marine area although there is an area noted for the movement of high speed craft (in this case high speed ferries) also within the North Channel area.

Marine Environmental High Risk Areas (MEHRAs) have been identified in areas where there is a perceived risk of pollution from shipping combined with an environment considered sensitive to such pollution. MEHRAs are notified by a Marine Guidance Note to mariners, who will be expected to exercise an even higher degree of care than usual when passing through them. The only MEHRA within the Northern Ireland marine area is Islandmagee which is on the northern edge of Belfast Lough with adjacent shipping routes to and from the nearby ports of Belfast and Larne.

Dredging and Disposal

A new marine licensing regime which was introduced in 2011 regulates the deposit of material in the sea within Northern Ireland territorial waters. The location of open disposal sites are shown relative to the Marine Plan area on Figure 11. 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)[9]. The majority of sites receive

[9] Metoc (2007). Offshore Energy Strategic Environmental Assessment Programme. Technical Report on the other userusl 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

chemically unmodified geological material derived from the adjacent coastline. 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)[10]. The practice of dumping sewage sludge is now 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.

7.4.2 Key Issues, Problems and Future Trends

The UK Government policy for ports was set out in the Interim Report of the ports policy review published in 2007 (DfT, 2007). This report stated that the Government sought to 'encourage sustainable port development to cater for long-term forecast growth in volumes of imports and exports by sea with a competitive and efficient port industry capable of meeting the needs of importers and exporters cost effectively and in a timely manner'. This provides confirmation that the ports industry is supported by Government policy into the future, providing assurance of sustained development.

The main commercial ports in Northern Ireland are Belfast, Larne, Londonderry and Warrenpoint. These ports will need to develop their capacity to ensure that future growth in trade can be handled efficiently. These developments are needed to cater for the operational requirements resulting from changes in shipping technology, including the move to larger container ships.

The increase in offshore renewable activities provides a potential source of income for ports. This is both as a base for industrial processes including manufacture of offshore renewable devices, and as a service provider for the craft needed to install and maintain offshore renewable sites during the construction and operation. Market potential is driven by the location of offshore renewable developments, and the accessibility of ports for the types of craft involved in installation and maintenance activities.

Attracting DONG Energy and Scottish Power Renewables to Belfast Harbour has given the port a strong advantage, enabling it to market prospective development lands within the Harbour area for further offshore renewable energy opportunities.

The increased investment in ports as a result of both future offshore renewable development projects and growth in trade will inevitably lead to increased vessel

[10] https://www.daera-ni.gov.uk/articles/marine-licensing

movements within Northern Irelands inshore and offshore waters and throughout the UK. It will also be important to take account of the potential for offshore energy development to affect shipping routes and for offshore wind turbines to interfere with marine radar and shore based radar systems used by ports.

Shipping volumes bear a direct relationship to the global economic market. As markets react to the changing financial situation, shipping lines respond with services to move goods and people. The most notable variable to affect the volume and intensity of shipping into the future will be the technology and innovations used to design future shipping. Ship design seeks for bigger, faster and more economic transhipment of goods and people.

The introduction of bigger ships places expectations on existing ports to increase the depth of water in entrance channels and alongside berths to accommodate changing ship requirements. This implies that investment is necessary in port infrastructure, both in terms of shore side facilities and access to the ports. Channel widths may need to increase to take account of the wider ship beam, which in addition may lead to the requirement for turning circles to be enlarged to take account of greater vessel length. Although all of these pressures have to be taken into account, probably the most significant factor to challenge traditional ports in the context of their ability to accommodate bigger ships is sea access, and in particular vessel draught.

A list of extant development proposals requiring a marine licence is provided on the DOE website. Those of relevance to this sector include Kilkeel Maintenance Dredge and Modifications to Albert Quay at Belfast Harbour. Northern Ireland Fishery Harbour Authority has applied to renew the dredging disposal licence for Kilkeel Harbour. Belfast Harbour Commissioners (BHC) propose to undertake redevelopment works to the existing Albert Quay Roll-on Roll-off (Ro-Ro) Berth in Belfast Harbour, to facilitate larger vessels and provide new sea routes between Belfast, Heysham and Liverpool.

7.5 Recreation and Tourism

The following data sources have been used to characterise recreation and tourism within the Northern Ireland marine area:

- Royal Yachting Association (RYA) coastal atlas of Recreational Boating (RYA website);
- Recreational Cruising Routes, Sailing and Racing Areas within the SEA 6 Area (RYA website);

- UK offshore energy SEA technical reports (DECC, 2009);
- SEA 6 Environmental Report. Strategic Environmental Assessment of Draft Plan for a 24th Seaward Round of Offshore Oil and Gas Licensing (DTI, 2005);
- UK Leisure, Super yacht and Small Commercial Marine Industry. Key Performance Indicators 2010/11 (British Marine Federation, undated);
- The Annual Water Sports & Leisure Participation Survey 2013, Executive Summary. (British Marine Federation, MCA, Lifeboats, RYA, British Canoe Union and MMO, undated);
- Recreational data layers (Marine Irish Digital Atlas website);
- Charting Progress 2 (Defra, 2010);
- Northern Ireland Environmental Statistics Report (DOE, 2014);
- Northern Ireland Coastal Zone – Indicators of Sustainable Development (DOE, 2011);
- Northern Ireland Bathing Water Compliance (1998-2014) (DAERA website);
- SEA of Offshore Wind and Marine Renewable Energy in Northern Ireland (DETI, 2009a);
- UK MPS (HM Government et al., 2011);
- Northern Ireland Tourism Board (NITB) website http://www.nitb.com/Destinations.aspx;
- NITB Events Strategic Vision to 2020 (http://nitb.com/BusinessSupport/FundingOpportunities/EventsFunding.aspx);
- Sustainable Development Strategy for Northern Ireland's Inshore Fisheries (AFBI, 2013);
- Trends in Outdoor Recreation (1995-2008) Towards a New Outdoor Recreation Strategy for Northern Ireland (Noble and Ballo, 2009) Study funded by SportNI and NITB;
- Good Beach Guide (MCS website); and,
- Activities Tourism – Sharing Success (NITB, 2011).

7.5.1 Baseline Description

Many different recreation and tourism activities in the UK make use of the marine area. 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).

The MPS notes that “the UK Administrations’ aim for tourism is to take steps to improve the competitiveness of the tourism industry, recognising the important part it plays in the national economy and to encourage growth within environmental limits. Tourism is one of the top three growth sectors of the UK economy and supports 1.5 million jobs and contributed nearly £90bn to the UK economy in 2009. Seaside tourism makes an important contribution. It supports 21,000 jobs and contributes £3.6bn to the UK economy. A similar picture exists for recreation where, for example, the estimated economic contribution of recreational boating to the UK economy was £1.042bn in 2009/10 and employed nearly 35,000 in this sector.”

The recreation and tourism sector is characterised by a diverse array of principal activities. They range from those that interact relatively passively with the marine area (e.g. whale watching) to those that interact more directly (e.g. recreational fishing). These are supported by an even greater range of ancillary economic activities including construction, manufacturing, and management (Defra, 2010). Secondary activities that benefit from leisure and recreation include accommodation and other hospitality industries. 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. The key activities are described in more detail in the following sections.

Water Sports

Participation rates of water sports activities have increased significantly from 2009 to 2011 for those living in Northern Ireland (Annual Water Sports & Leisure Participation Survey, 2011). A UK wide survey found that Northern Ireland residents participate more in water

sports (58.83%) than any other region of the UK. Activities with the highest participation rate are canoeing and small sail boat activities.

Yachting is popular in the more sheltered coastal waters, bays and sea loughs, and in addition particular routes are used to traverse the coast, and between islands. There are 25 RYA clubs and seven RYA marinas along the coast of Northern Ireland. The east coast from south of Carlingford Lough round to Ballygalley, including Carlingford Lough, Strangford Lough and Belfast Lough is identified by RYA as a general sailing area.

In the 2011 survey, 21,450 divers were recorded in Northern Ireland (Annual Water Sports & Leisure Participation Survey, 2011). Particular areas of interest include the historic wrecks of HMS Drake, MV Alastor and Girona, and the areas of Portstewart, Portmuck, Causeway coast, Whitehead and Rathlin Island.

The majority of coastal surf shops and outdoor activity operators within the Northern Ireland marine area are located on the north coast in the vicinity of Portrush, or along the coast of Belfast Lough. These centres offer a range of marine related activities including surfing, wind surfing, kayaking and angling. The coast of Northern Ireland receives swell waves from the Atlantic Ocean. The combination of shop/operators and suitable swell has lead to an estimated 9,600 windsurfers, 19,900 surfers and 6,700 kitesurfers being active in Northern Ireland in 2011 (Annual Water Sports & Leisure Participation Survey, 2011). The main surfing areas are situated along the stretch of coast between Magilligan in the west to Ballycastle in the east, with the most popular surfing location around Portrush.

Table Q illustrates the results of the 2013 Water Sports Participation Survey.

Table Q: 2013 Water Sports Participation Survey

Water Sports Activity	Northern Ireland Percentage (%)
Any Activity	69.9
Any boating activity	8.7
Small sail boat racing	0.3
Small sail boat activity	0.7
Yacht cruising	1.3
Yacht Racing	0.3
Using personal watercraft	1.4

Water Sports Activity	Northern Ireland Percentage (%)
Motor boating/cruising	2.0
Power boating	0.6
Canal boating	0.5
Water skiing/wakeboarding	0.8
Canoeing	2.1
Rowing/sculling	0.3
Windsurfing	0.2
Surfboarding	0.8
Kite surfing	0.0
Angling	8.3
Cliff climbing	1.7
Coastal walking	33.0
Leisure time at beach	56.1
Outdoor swimming	7.7
Coasteering	0.6
Leisure sub-aqua diving	0.5
Northern Ireland Adult Population	1,562
Unweighted base	401

Sea Angling and Inshore Fishing

Sea Angling is a popular activity in Northern Ireland with a 3 year average of 18,513 boat anglers and 15,847 shore anglers recorded in the 2013 Water Sports and Leisure Participation Survey.

In 2007, an Inshore Review was carried out to advise DARD on the management of Northern Ireland inshore fisheries. A draft strategy was produced for consultation in response to this review (AFBI, 2013). Inshore fisheries are a valuable resource, worth an estimated £4.4 million in 2010. However, this sector is facing a number of issues which threaten both its development and sustainability. The best way of achieving effective management is considered to be the setting up of a representative Inshore Fisheries

Advisory Group involving those who use the inshore fisheries (AFBI, 2013). This will ensure communication across the sector when discussing issues and appropriate management measures. Through the co-operation of Government, commercial fishermen, recreational fishermen, NGO's and scientists the inshore should remain a lucrative fishery for those who use it commercially and recreationally, for environmental, cultural or economic reasons.

Recreational Beach Use

In the 2013 Water Sports and Leisure Participation Survey general leisure time at the beach was 37% higher than in 2012, reflecting better summer weather in 2013.

In 2013, 20 of Northern Ireland's bathing water beaches (87%) passed with excellent water quality and no beaches failed standards. This is an improvement of around 17% from the 2012 results. Only two months of 2014 monitoring data are available for 2014 at the time of writing. These indicate that to date, 21 out of the 23 bathing waters are reaching at least excellent quality (see Table R).

In addition to the official bathing waters results, the Marine Conservation Society also publishes the Good Beach Guide which is based on the results of the beaches surveyed in 2013. The guide stated that of the 23 beaches sampled, all met the minimum standards, with 15 being assessed as having excellent water quality (http://www.goodbeachguide.co.uk/search-results). Beaches and marinas are also awarded Blue flag status. In 2014, 8 beaches and 2 marinas were awarded Blue Flag status in Northern Ireland. An additional 13 beaches have received the Seaside Award.

Table R: Northern Ireland Bathing Water Directive Compliance 2010-2014

Bathing Water	2014*	2013	2012	2011	2010
Magilligan (Benone)	E	E	E	E	E
Magilligan (Downhill)	E	E	E	E	E
Castlerock	E	G	E	E	G
Portstewart	E	E	E	E	E
Portrush (Mill) West	E	E	E	E	E
Portrush (Curran) East	E	E	E	E	E
Portrush (Whiterocks)	E	E	E	E	E
Portballintrae (Salmon Rock)	E	E	G	E	E
Ballycastle	E/G	G	E	E	E
Waterfoot	E	E	G	E	
Carnlough	E	E	G	E	E
Ballygalley	E	E	G	G	E
Brown's Bay	E	E	E	G	G
Helen's Bay	E	E	E	E	E
Crawfordsburn	E	E	G	E	G
Ballyholme	E	G	G	G	F
Groomsport	E	E	E	E	G
Millisle	E	E	E	E	G
Ballywalter	E	E	E	E	E
Tyrella	E	E	E	E	E
Murlough Co. Down	E	E	E	E	E
Newcastle Co. Down	E	E	F	G	G
Cranfield	E	E	E	E	G
*Results available for May and June 2014.					

Bathing Water	2014*	2013	2012	2011	2010
E – compliance with Guideline standards, Excellent; G – compliance with Mandatory standards, Good; and F – failure to comply with Mandatory standards, Fail.					

Tourism

The Northern Ireland Tourist Board (NITB) has developed tourism and its marketing over the last few years. Tourism performance statistics have also been developed significantly over the last few years and the NITB website includes:

- Annual and quarterly visitor statistics;
- Local authority tourism estimates;
- Visitor attraction surveys;
- Tourism intelligence reports; and,
- A tourism industry barometer.

In 2014 overnight trips by all visitors (domestic and external) stood at 4.5 million, up 11% on 2013. Associated expenditure increased by 4% (to £751m in 2014);

- In 2014 external (outside NI) overnight trips increased by 4% to 2.2m. However spend linked with these trips fell by 3% to £514m;
- Over 15 million visits were made to local visitor attractions in 2014, a 3% increase on 2013. The top attractions of Giant's Causeway (0.788 million visits) and Titanic Belfast (0.634 million visits) both experienced 5% increases;
- Hotel room occupancy stood at 65% up from 64% in 2013. In total 1.85 million hotel room nights were sold in 2014;
- Last year, 69 cruise ships docked here with up to 121,000 passengers/crew on board. The number of cruise ships docking here has doubled over the last three years; and,
- The increase in all external overnight trips to NI was 4%; this is less than the equivalent increase in the UK (up 6%) or the RoI (up 9%). However, within this

group, NI witnessed a 12% increase in external holiday makers, greater than in the UK (up 8%) or RoI (up 9%).

Table S: Top 10 Visitor Attractions NI 2014 (excluding country parks/parks/forests/gardens)

Visitor Attraction	Visitor Number
Giant's Causeway	788,000
Titanic Belfast	634,000
Ulster Museum	466,000
Derry Walls	370,000
W5	324,000
Carrick-a-rede-rope bridge	323,000
Guildhall	299,000
Belfast zoo	253,000
Pickie Fun Park	243,000
Murlough Reserve	241,000

DETI, NI, 2014

The most recent NI Census of Employment figures indicated a 3% increase in employee jobs in tourism related industries between 2011 and 2013. This increase was mainly in accommodation for visitors and food and beverage serving industries. Around one in ten of all employee jobs are in tourism related industries. A breakdown of these 58,000 jobs is given in Table T.

Table T: Employee Jobs in Tourism Related Industries (2013)

Employee Job	Total Percentage in tourism related industry
Food and Beverage Serving Activities	57%
Accommodation for Visitors	17%
Sporting and Recreation	12%
Transport	6%
Other	7%

The numbers of overseas visitors participating in activities has fallen since 2007, in line with a decline in the wider tourism sector (NITB, 2011). The number of participants fell by 13% between 2007 and 2009, compared to a 9% drop in overall overseas visitor numbers. However, though the overseas tourism market is highly important, the majority of participation in activities comes from domestic tourists and from RoI tourists. The recession has seen consumers less able to afford a holiday, while those that still take one are cutting down on the activities they undertake in order to limit their spending. Walking is the most popular activity, as well as being one of the most resistant to the economic conditions. Some 63% of activities were made up by walking. Furthermore the numbers participating in walking increased by 57% between 2005 and 2009 (NITB, 2011).To reinvigorate the Northern Ireland tourist market, NITB launched "NITB Northern Ireland Home of Great Events – Events Strategic Vision to 2020", which is part of the framework for how events will promote Northern Ireland until 2020. The Northern Ireland Tourism Strategy changed in 2012, with the 'ni2012;our time, our place' programme, where emphasis was placed on high quality event hosting in Northern Ireland. Table U details the tourism projections until 2020.

Table U: 2012 Baseline and 2020 Projections

	2012 Baseline	**2020 Projection**
Number of Visitors per annum	4 million	4.5 million
Visitor spend per annum	£683 million	£1 billion
Numbers employed through tourism	40,000	50,000

As part of the Northern Ireland Home of Great Events – Events Strategic Vision to 2020, Table V shows the 2015/2016 events schedule for the coastal LGDs.

Table V: NITB Funded Events 2015/2016

Project Name	**Award**	**Town**	**LGD**
The Hilden Beer and Music Festival	£9,000	Lisburn	Lisburn & Castlereagh City Council
A Wilde Weekend by Lough Ernest	£15,000	Enniskillen	Fermanagh & Omagh District Council
Eastside Arts Festival	£15,000	Belfast	Belfast City Council
Lughnasa International Friel Festival	£15,000	Belfast	Belfast City Council
GI Jive Festival 2015	£16,000	Kilkeel	Newry, Mourne & Down District Council

Project Name	Award	Town	LGD
Tandragee 100 National Motorcycle Road Races	£16,000	Armagh	Armagh City, Banbridge & Craigavon Borough Council
The Maiden City Festival	£16,938	Derry	Derry City & Strabane District Council
Belfast Childrens Festival	£17,500	Belfast	Belfast City Council
Good Life	£17,500	Craigavon	Armagh City, Banbridge & Craigavon Borough Council
Festival Lough Erne	£20,000	Enniskillen	Fermanagh & Omagh District Council
Hillsborough International Oyster Festival	£20,000	Hillsborough	Lisburn & Castlereagh City Council
Hughes Insurance Foyle Cup	£20,000	Derry	Derry City & Strabane District Council
Shanes Castle Vintage Steam Fair	£20,000	Antrim	Antrim & Newtownabbey Borough Council
The Belfast Tattoo 2015	£20,000	Belfast	Belfast City Council
The Out to Lunch Festival 2016	£20,000	Belfast	Belfast City Council
The Royal 13th	£20,000	Scarva	Armagh City, Banbridge & Craigavon Borough Council
Sunflowerfest 2015	£20,250	Hillsborough	Lisburn & Castlereagh City Council
7 Hills Blues Festival	£22,500	Armagh	Armagh, Banbridge & Craigavon
Balmoral Show	£22,500	Lisburn	Lisburn & Castlereagh City Council
Bank of the Foyle Halloween Carnival	£22,500	Derry~Londonderry	Derry City & Strabane District Council
Culture Night Belfast	£22,500	Belfast	Belfast City Council
Feile an Earraigh	£22,500	Belfast	Belfast City Council
Festival of Light	£22,500	Mount Stewart	Ards & North Down Borough Council
Music City/Celtronic 2015	£22,500	Derry	Derry City & Strabane District Council
Rathlin Sound Maritime Festival	£22,500	Rathlin	Causeway Coast & Glens District Council
River to Lough Festival	£22,500	Lough Neagh	Various
Sea Bangor	£22,500	Bangor	Ards & North Down Borough Council
The Race of Legends	£22,500	Armoy	Causeway Coast & Glens District Council

Project Name	Award	Town	LGD
15th Belfast Film Festival	£25,000	Belfast	Belfast City Council
Air Waves Portrush	£25,000	Portrush	Causeway Coast & Glens District Council
Belfast Mela 2015	£25,000	Belfast	Belfast City Council
Carnival of Colours	£25,000	Derry~Londonderry	Derry City & Strabane District Council
City of Derry Jazz and Big Band Festival	£25,000	Derry~Londonderry	Derry City & Strabane District Council
Dalriada Festival	£25,000	Glenarm	Mid & East Antrim Borough Council
Festival of Flight	£25,000	Newcastle	Newry, Mourne & Down District Council
Festival of Fools 2015	£25,000	Belfast	Belfast City Council
Garden Show Ireland	£25,000	Antrim	Antrim & Newtownabbey Borough Council
Georgian Day Armagh	£25,000	Armagh	Armagh City, Banbridge & Craigavon Borough Council
Irish Game Fair & Flavour Fine Food Festival	£25,000	Antrim	Antrim & Newtownabbey Borough Council
Open House Festival Bangor 2015	£25,000	Belfast	Belfast City Council
Dale Farm Milk Cup	£56,700	North Coast	Various
CQAF	£60,000	Belfast	Belfast City Council
Saint Patricks International Festival	£79,120	Various	Various
NI Open	£82,000	Galgorm	Mid & East Antrim Borough Council
Ulster Grand Prix	£95,000	Dundrod	Lisburn & Castlereagh City Council
August Feile	£100,000	Belfast	Belfast City Council
International North West 200	£100,000	North Coast	Causeway Coast & Glens District Council
Happy Days International Beckett Festival	£115,050	Enniskillen	Fermanagh & Omagh District Council
Circuit of Ireland Rally	£140,000	Various	Various
Gran Fondo	£160,000	Various	Various
Belfast International Arts Festival	£170,000	Belfast	Belfast City Council
Tall Ships	£400,000	Belfast	Belfast City Council

While the Belfast Destination includes the Titanic and maritime heritage, the focus is more on the capital city as a destination. Detailed Destination Plans from 2012/3-2017/8 are available for these areas from the NITB website.

7.5.2 Key Issues, Problems and Future Trends

Whilst marine recreation has experienced recent growth, future growth and stability of the sector is dependent upon the general health of the UK economy (Defra, 2010). A strong economy results in consumers having more disposable income to spend on recreation and tourism activities. As a result of the global economic downturn, it is likely there will be some short-term fluctuations in participation in recreation and tourism activities. The largest growth in activity tourism can be expected to come from soft adventure activities such as walking, cycling and canoeing (NITB, 2011). Within the public domain, there is very little geospatial data relating to the location of these activities, however organisations like walking and canoeing produce electronic guides for trails in and around the Northern Ireland coast.

With infrastructure and technology in place to support the sector, it is expected to continue to grow over the long term. Furthermore, the availability of cheaper sports equipment is likely to continue to have a positive impact on participation levels in a number of sports, including canoeing, surfing and mountain biking (Noble and Ballo, 2009).

Climate change may also play a small part in increasing overall participation numbers. As the frequency of months when conditions are more comfortable for tourism in North-West Europe (MCCIP, 2009) improve, the warmer weather is more likely to attract visitors to coastal locations in Northern Ireland. The net result will be an extension of the tourist season beyond its traditional limits and opening up new destinations. Climate change as a positive influencing factor must be balanced against predictions of increased storminess, and the severity of storms. Provided increased storminess is predominantly in the winter months, this may not be a factor in future recreational boating trends.

The water quality of the Northern Ireland marine area is improving year on year despite the increase in recreational use of the marine and coastal environment in recent years. This increase is expected to continue into the future and, therefore, the importance of continuing high standards in beach water quality will be essential in maintaining the recreational value of the Northern Ireland marine area.

There is little information on future levels of recreational angling activity and countryside sports like wildfowling. Levels of activity are likely to vary in response to trends in the overall economy, changes in fish stocks as a result of improved fisheries management and changes in fish distributions in response to climate change. The nature and direction of these changes remains unclear.

7.6 Aviation

The following data sources have been used to characterise aviation within the Northern Ireland marine area:

- National Air Traffic Services (NATS) En Route plc (NERL) operational infrastructure interference maps/data (NATS website);
- UK Aviation Forecasts (DfT, 2011);
- Self assessment maps (NATS);
- Civil Aviation Authority (CAA) safeguarding maps (DECC website);
- CAA Policy and Guidelines on Wind Turbines (CAA, 2012);
- UK Aviation Forecasts (DfT, 2011); and,
- DTI Wind Energy and Aviation Interests - Interim Guidelines (CAA website).

7.6.1 Baseline Description

Air space and some specific aviation related sites are statutorily safeguarded from radar interference in the interests of national security and safe operation of passenger and military aviation by the Ministry of Defence (MoD), Civil Aviation Authority (CAA) and National Air Traffic Services (NATS). In order to make this process easier for developers and anyone planning on carrying out any activity that may interfere with radar, CAA and NATS En Route plc have created safeguarding maps and made them publically available so that any developer, or other activity sector, can clearly see if their particular activity may cause any radar interference.

Safeguarding maps produced for civilian sites indicate areas within which consultation is required before a development takes place. Consultation is required where development is proposed within (CAA, 2012):

- 30km of an aerodrome with a surveillance radar facility;
- 17km of non-radar equipped aerodromes with runways of 1100m or more;

- 5km of non-radar equipped aerodromes with runways of less than 1100m;
- 4km of a non-radar equipped unlicensed aerodrome with a runway of more than 800m; and,
- 3km of a non-radar equipped unlicensed aerodrome with a runway of less than 800m.

Similarly NERL has an interest in safeguarding communications, navigation and surveillance (CNS) facilities. Early consultation allows both aerodromes and en-route service providers to assess any impact that proposed developments may have on their CNS systems.

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. The location of the airports and the safety zones surrounding them overlap with the Northern Ireland marine area and are at Belfast City, Belfast International, the City of Derry and Newtownards Airports. The city of Derry airport is located on the south bank of Lough Foyle and has a 17km consultation area. Belfast International airport is located on the east coast of the Northern Ireland marine area. Given that it is a larger airport than Derry city and has its own surveillance facility, it has a 30km consultation zone which extends 10km offshore from approximately Larne in the north to Portavogie in the south, including the Lough's of Belfast, Strangford and Larne.

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, with the nearest being the naval base HMS Gannet at Prestwick, near Glasgow.

7.6.2 Key Issues, Problems and Future Trends

The number of air passengers using UK airports is forecast to recover from the recent downturn. It is predicted that in Northern Ireland, the number of passengers will rise to 7.9 million in 2020 and 15.5 million by 2050 (DfT, 2013). The new building and expansion of any airports in Northern Ireland may lead to increases in the safety zone areas, and potentially further overlap with the Northern Ireland marine area.

7.7 Military Activity

The following data sources have been used to characterise military activity within The Northern Ireland marine area:

- UKHO Practice and Exercise Area charts. Available in both digital and paper formats this data provides information relating to military activity within 6he Northern Ireland marine area (UKHO website); and,
- Oceanwise data layers for Military Practice Areas (2013).

7.7.1 Baseline Description

Ministry of Defence (MoD) (Practice and Exercise Areas) can belong to the Army, Navy or Air Force and are used to practice manoeuvres, test armaments and to conduct any other general exercises. It is not possible to provide detailed information on the nature and extent of military activity throughout the Northern Ireland marine area. Therefore, when developers undertake site selection studies, consultation with the MoD will need be undertaken to obtain more detailed site specific information.

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 is no ammunition firing in the practice and exercise areas. There are also 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. No designated Tactical Training Areas (TTAs) are present over the sea in the Northern Ireland marine area. There are no Air Surveillance and Control System (ASACS) within 74km of the Northern Ireland marine area.

Two weapons ranges are located in the Northern Ireland marine area, the Magilligan and Ballykinler ranges which are controlled by the Army. Both Magilligan and Ballykinler ranges are byelawed areas, whereby certain civilian activities are restricted. The MoD is currently undertaking a review of the practice and exercise areas under byelaw and is also considering proposing new byelawed areas. No information is yet available on the location of proposed new byelawed sites.

7.7.2 Key Issues, Problems and Future Trends

Depending on the MoD's review of byelawed areas the restrictions in place at the Magilligan and Ballykinler ranges may change. There is no information about the location of submarine scuppering. When offshore developers undertake site selection studies, consultation with the MoD should be undertaken to obtain more detailed up-to-date information.

7.8 Coastal Defence

The following data sources have been used to characterise coastal defences within the Northern Ireland marine area:

- National Ecosystem Assessment (NEA): Economic Analysis. Coastal Margin and Marine Habitats (Beaumont et al. 2010);
- Coastal Erosion in MCCIP Annual Report Card 2010-11, (Masselink and Russell, 2010);
- Northern Ireland State of the Seas Report (Northern Ireland Environment Agency (NIEA) and Agri-Food and Biosciences Institute (AFBI, 2011);
- UKCP09 Marine and Coastal Projections Summary (MCCIP, 2009); and,
- Charting Progress 2 (Defra, 2010).

7.8.1 Baseline Description

Coastal defence measures are used to prevent or reduce flood risk and coastal erosion. Defences may involve hard structures such as concrete seawalls or soft engineering such as beach replenishment and managed realignment. Protection of infrastructure by sea defences is widespread in Northern Ireland.

In Northern Ireland, responsibility for dealing with coastal erosion lies with several departments. This means that information on distribution, expenditure and employment is not centrally collected for this sector. Coastal defences that reduce the risk of flooding on extensive areas of farmland, residential or commercial areas are the responsibility of DfI Rivers. DfI Rivers maintains 26km of sea defences to avoid the flooding of low-lying coastal lands. Where infrastructure is vulnerable to coastal erosion the relevant authority is responsible for maintaining defences, for example defences that protect roads are the responsibility of DfI Roads. The railway network also impinges on the coast in certain

areas and those stretches are managed by Translink (NIEA and AFBI, 2010). Otherwise individual landowners are responsible for their own coastline.

Coastal defence projects often have substantial impacts on the coastal environment, for example from construction, physical footprint, changes in geomorphology and coastal squeeze, as well as other forms of habitat degradation and loss. As such any projects are subject to rigorous assessments i.e. Environmental Impact Assessment (EIA) and regulatory review.

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). These figures do not total 650km (the total length of the coast) but 764km due to certain parts of the coastline having more than one type of defence e.g. a combination of seawalls and rock armour for maximum protection of a town, or a hard structure placed behind a beach. The most common man-made structures are concrete sea wall which comprises 14% of the coastline followed closely by rock armour which comprises 12%.

Table W: Coastal Defences on Northern Ireland Coastline: Natural and Man-made Structures

	Structure on Coast	Length of Structure along Coast (km)	Total Length (km)	Percentage of Structure along Coast (%)	Total Percentage (%)
Natural	Natural (low relief)	270	521	35	68
	Natural (sand)	131		17.21	
	Natural (high relief)	119		16	
Man-made	Seawall (concrete)	105	243	14	32
	Rock armour	95		12	
	Seawall (rocky)	20		3	
	Levees	6		<1	
	Revetments	6			
	Rubble	4			
	Groynes	4			
	Wave breaker	2			
	Slipway	1			
	Railway sleepers	1			

Source: DOE (2011)

Coastal erosion is a complex process that has a variety of causes. Coastal erosion is not a generic phenomenon, such as climate change and sea level rise which is occurring all over the world. Instead, coastal erosion is a local process as a result of many pressures acting cumulatively to produce different impacts in different areas. A large proportion of the UK coast is currently suffering from erosion (17% in the UK; 30% in England; 23% in Wales; 20% in Northern Ireland; 12% in Scotland) (Masselink G., and Russell, P. 2010). Table X shows the level of coastal erosion and protection along Northern Ireland's coastline. A substantial proportion of the Northern Ireland coastline (almost 100km) has been altered by coastal defence structures (Table X). This is particularly prevalent on soft coastlines (NIEA and AFBI, 2010).

Table X: Coastal Erosion and Protection in Northern Ireland

Coast length (km)	Coast length which is eroding (km)	Coast length which is eroding (%)	Coast length with defence works & artificial beaches (km)	Coast length with defence works & artificial beaches (%)
456	89	19.5	90	19.7
Islands with surface area of less than 1km^2 and inland shore (estuaries, loughs etc.) where the mouth is less than 1km wide are not included in the analysis.				

Source: Masselink G., and Russell, P. 2010

Coastal defence projects can cause negative impacts on geomorphology and the coastal environment. These projects can lead to the covering of geological sections and changes to the natural coastal regime, with consequent impact on other areas of coastline. It would be impractical and undesirable to protect all rock exposures, but the EIA process helps to ensure that the best and most vulnerable of the features are conserved and appropriately managed.

7.8.2 Key Issues, Problems and Future Trends

The need for coastal defences is dependent on the stability of beaches and the impacts of flooding and coastal erosion on human activities along the coast. Climate change, predicted to lead to a rise in sea levels, possible increased storminess and changes to wave conditions (MCCIP, 2009), may alter coastal erosion rates, the incidence and severity of flooding events, and increased steepening of intertidal profiles, resulting in increased demand for coastal defences.

Projections of relative sea level change in the UK, including Northern Ireland, are shown in Image 5. For the UK, the most up to date evidence base for the UK's future climate predictions is provided by the UK Climate Projections 09 (UKCP09) (MCCIP, 2009). The medium scenario for all years predicts that mean sea levels in Northern Ireland could rise by between 9cm and 69cm by 2080 (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. These tentative projections are, however, based on maps with a very coarse grain, and considerable uncertainty is reported.

In light of these projections, current spending on coastal defences will need to double by 2080. The use of managed realignment and other forms of soft coastal defence measures are likely to increase (Defra, 2010). Funding for Flood and Coastal Erosion Risk

Management (FCERM) to mitigate flood risk and to provide greater coastal resilience to climate change and its anticipated flood impacts in Northern Ireland will therefore become increasingly important.

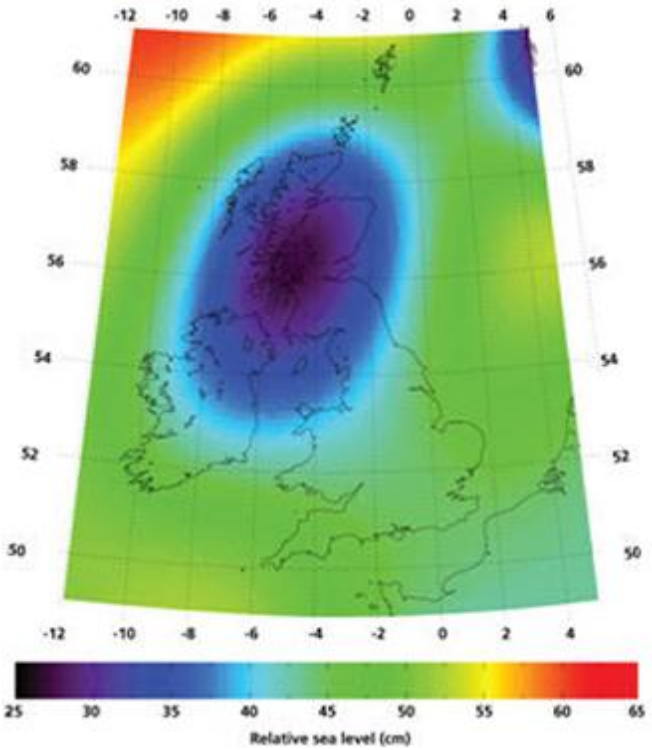

Image 5: Central estimate of relative sea level change (cm) by 2095 (medium emission scenario) (Source: MCCIP website)

7.9 Noise

Anthropogenic noise on land, baseline information sources include:

- Noise Mapping for Northern Ireland (www.noise.ni.gov.uk);
- Belfast Harbour Environmental Report 2013 (www.belfast-harbour.co.uk); and,
- Noise complaint statistics (NISRA website).

7.9.1 Baseline Description

The Environmental Noise Regulations (Northern Ireland) 2006 set out the requirements and responsibilities associated with the production of strategic noise maps and action plans as defined by European Directive 2002/49/EC. Under the Regulations, noise maps and noise action plans must be prepared over a 5 year rolling cycle. Noise mapping has been undertaken for all agglomerations with more than 100,000 inhabitants. As part of the Belfast agglomeration, Belfast Harbour was included because the harbour site contains

approximately 117 individual industrial sites. Noise mapping has been produced for areas which surround the Belfast Harbour site pertaining to daytime, evening and night time noise. In 2013, Belfast Harbour did not receive any noise nuisance complaints.

In the terrestrial environment, excessive noise is considered a statutory nuisance. In relation to the activities which the Northern Ireland marine area, it is expected that terrestrial noise will be relevant to how marine activities which interact with ports (either fishing or freight).

Of all the complaints relating to transport in Northern Ireland, originated in the coastal LGDs. Complaints relating to aircraft solely originated within Belfast LGD and all the rail transport complaints originate within the coastal LGDs.

7.9.2 Key Issues, Problems and Future Trends

Data collected on airborne noise as part of noise mapping, is primarily in relation to transport and industry. It does not include information on port noise complaints or contain information on how noise could impact communities.

For the Northern Ireland marine area, noise complaints for industrial and transport processes correlates with marine LGDs which have industrial processes within their environs.

7.10 Lighting

Like noise, lighting resulting from marine activities relates primarily to port activities, where in order to fulfil their function, they can generate disturbance which can be considered a nuisance. In relation to lighting, it is proposed the following information sources are used:

- Guidance to District Councils on Part 7 (Statutory Nuisances) of the Clean Neighbourhoods and Environment Act (Northern Ireland) 2011; and,
- Guidance for Fisheries Protection during Development Works (Foyle and Carlingford areas).

7.10.1 Baseline Description

Lighting in both the marine and terrestrial environment poses nuisance to both people and species of conservation interest. Subsection 63(1)(h) of the Clean Neighbourhood and Environment Act (Northern Ireland) 2011 relates to nuisance associated with artificial light, whereby

"Artificial light emitted from premises so as to be prejudicial to health or a nuisance".

This is not the same as light pollution, where artificial light sources interfere with someone's use of their property and/ or might be prejudicial to someone's health. Light pollution could be defined as any form of artificial light which shines outside the area it needs to illuminate, including light that is directed above the horizontal into the night sky creating sky glow or which creates a danger from glare. Within the study area of The Marine Plan, light nuisance complaints can be generated from:

- Domestic security lights;
- Commercial security lights;
- Healthy living and sports facilities;
- Domestic decorative lights;
- Exterior lighting of buildings; and,
- Decorative lighting of landscapes.

To compare this to the activities which will be managed as part of the Marine Plan, it is expected that complaints relating to commercial sources of light will be most relevant. Where a nuisance is reported, investigated and identified as statutory nuisance, an abatement notice is served which can require:

- Prevention or restriction of the occurrence of a nuisance;
- Abatement of a nuisance;
- Prevention or restriction of the recurrence of a nuisance; or,
- Abatement and prevention or restriction of the recurrence of a nuisance.

The impact of lighting from ports may have an ecological element but in the context of the Marine Plan, it is nuisance from lighting at ports which is considered most relevant.

7.10.2 Key Issues, Problems and Future Trends

There are currently no publically available statistics relating to statutory nuisance complaints from lighting relating to port activity, however increased illumination in these areas may result in adverse impacts to neighbouring communities.

7.11 Marine Litter

The following data sources have been used to characterise marine litter within the Northern Ireland marine area:

- DAERA website https://www.daera-ni.gov.uk/publications/northern-ireland-marine-litter-strategy;
- Northern Ireland State of the Seas Report (NIEA and AFBI, 2011);
- Butterworth, A., Clegg, I., & Bass, C. (2012). Untangled – Marine debris: a global picture of the impact on animal welfare and of animal-focused solutions. London: World Society for the Protection of Animals;
- Marine Survey Northern Ireland 2012/13 (Tidy Northern Ireland, 2013);
- Keep Northern Ireland Beautiful website http://www.keepnorthernirelandbeautiful.org/;
- Marine Conservation Society (MCS) website. Beachwatch Big Weekend http://www.mcsuk.org/what_we_do/Clean+seas+and+beaches/Reports+and+downloads/Reports+and+downloads;
- Oko Institute (2012). Study on land sourced litter in the marine environment. Review of sources and literature. Freiburg, Oko Institute e.V; and,
- Charting Progress 2 (Defra, 2010).

7.11.1 Baseline Description

Marine litter consists of items arising from human activity, deliberately discarded or unintentionally lost, which end up in the sea and on beaches. Typical examples are plastics, wood, metals, glass, rubber, fishing gear, clothing and paper. Semi-solid remains of various oils and other chemicals sometimes occur in the sea and on the shore but these are not defined as litter.

Litter comes from a variety of sources, including direct littering by beach visitors, discarded or lost gear from fishing vessels, illegal dumping by ships and small marine craft, discharges from combined sewer overflows and fly-tipping. Rivers and streams also carry litter into coastal waters, so urban areas can make a significant contribution to marine litter. Subsequently, around 80% of litter recorded on beaches is deemed from land-based sources (Oko Institute, 2012).

Much of the litter is deposited by incoming tides along the shoreline, whilst sand dunes, groynes, rocky areas and promenades also act as traps, allowing wind-blown litter to accumulate. Litter may be transported over long distances by currents and the wind.

Marine litter is a global problem which poses an increasing threat to human health and safety, ecosystem services and sustainable livelihoods. The Northern Ireland Marine Litter Strategy is a co-ordinated response which aims to address the problem at a local level by reducing the levels of litter entering the sea and removing litter which is already there. The Strategy contains measures designed to change attitudes and behaviour towards littering. This will be done through education, adequate provision of bins, fining offenders and collecting data on the extent of the problem.

Accurate and reliable data is essential to properly manage and assess the levels of litter present in the marine area. Data is needed to inform policy development and to evaluate progress towards meeting policy and legislative commitments such as achieving good environmental status (GES) under the Marine Strategy Framework Directive (MSFD).

Keep Northern Ireland Beautiful (formerly Tidy Northern Ireland) undertook the first systematic survey of litter on the coastline of Northern Ireland carried out in response to the requirements of descriptor 10 of the MSFD which relates to marine litter. During the period September 2012 – April 2013 three surveys were carried out on 14 reference beaches around Northern Ireland using the internationally adopted OSPAR survey methodology for reporting under the MSFD. 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, almost four times as much as on the other beaches surveyed.

Keep Northern Ireland Beautiful also works to change behaviour towards litter. They work specifically with LGDs to address beach litter through awards like the Blue Flag scheme.

DAERA carries out surveys of identified bathing beaches throughout the bathing season which runs from 1st June through to the 15th September. The survey is conducted using a rapid scan technique of counting and categorising litter while the bathing water sample is being collected. The evidence from this programme neither shows improvement nor reduction in the quantities of litter on Northern Ireland beaches (NIEA and AFBI, 2011). This programme has been in place since 1999. Over that time, an average of 8,198 items

have been recorded annually, 42% of which was packaging (food wrappers, carrier bags, paper and plastic wrapping) and 39% was plastic.

The Marine Conservation Society uses volunteers to undertake an annual survey of beach litter over a single weekend "Beachwatch Big Weekend". In 2013, the number of volunteers that took part in Northern Ireland was 115 and 5,763 items of litter were collected.

In 2009, AFBI and NIEA completed a litter survey during fisheries trawl surveys of the Irish Sea (NIEA and AFBI, 2011). This provides a useful snapshot and demonstrates that the problem with marine litter is not restricted to our coastline.

7.11.2 Key Issues, Problems and Future Trends

Marine litter poses a threat to marine animals and birds (WSPA, 2012). Marine mammals, birds, turtles, sharks and other large fish species are all documented to have ingested or become entangled in human-originated debris that has either been deliberately discarded or lost in the oceans. Plastic bags are often found in the guts of Leatherback turtles *Dermochelys coriacea* washed up on the UK's shores. When dead North Sea Fulmars *Fulmaris glacialis* were examined, 96% were found to have pieces of plastic in their stomachs (NIEA and AFBI, 2011).

Once in the environment, plastic gradually breaks down into ever smaller pieces which persist for many years, so that they will continually build up as time goes by. Added together, all these tiny pieces offer a huge surface area that can absorb chemical substances from the seawater. Marine life may mistake plastic particles for their natural food and in this way, potentially hazardous chemicals enter the marine and ultimately human food chain.

The movement of litter by ocean currents has contributed to the invasion of alien species all over the world (NIEA and AFBI, 2011). The slow movement of currents means animals and plants attached to litter are not subject to temperature shocks as they cross climate zones allowing them to survive and settle outside their natural range. In addition to harming marine life, large items of litter can damage fishing gear and vessels through collisions. Smaller items can block seawater intakes and evaporators resulting in engine failure, costly repairs and in some cases perhaps life-threatening situations.

Marine litter has economic, environmental and aesthetic impacts. What is not yet clear is the full extent of these impacts in the UK (Defra, 2010).

While there is central data regarding marine litter, there is very little information about beach litter, other than the Northern Ireland Litter Survey 2012, which contains transects on beaches.

8. Material Assets

8.1 Introduction

The Material Assets section has been split into the headings which encompass existing and proposed infrastructure pressures within the coastal and marine area. These headings are:

- 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.

8.2 Cables and Pipelines

The following data sources have been used to characterise the cables and pipelines that occur within the Northern Ireland marine area:

- UK Hydrographic Office (UKHO) digital charted data;
- Kingfisher Cable Awareness Charts (KIS-ORCA);
- UK Digital Energy Atlas Library (UKDEAL) data;
- Subsea Cables UK data;
- Marine Irish Digital Atlas website (MIDA);
- Phoenix Natural Gas Ltd. Licence for the Conveyance of Gas in Northern Ireland (undated); and,
- Charting Progress 2 (Defra, 2010).

8.2.1 Baseline Description

The UK MPS states "*Submarine cables are part of the backbone of the world's power, information and international telecommunications infrastructure, and socially and economically crucial to the UK. Submarine telecommunication cables carry more than 95% of the world's international traffic including telephone, internet and data, as well as many services for the UK's local communities, major utilities and industries. The transatlantic cables landing in the UK carry more than 70% of Europe's transatlantic traffic*."

The location of submarine telecommunications, electricity interconnectors and oil and gas pipelines within the Northern Ireland marine area are all shown in Figure 12. The main cable systems that occur within the Northern Ireland marine area are detailed in Table Y. 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.

Where the location of these communication links are publically available, they are presented on Figure 12 This direct fibre optic cable link provides Northern Ireland businesses with access to high speed data services with guaranteed pricing, availability and latency until December 2018. The link enables Northern Ireland companies to compete in the international marketplace and enhances the attractiveness of Northern Ireland as an inward investment location.

The Hibernia 'A' telecom cable, connecting Europe and the USA, also passes in and out of the Northern Ireland marine area following the territorial limit. Hibernia Networks, a provider of global communications services, completed phase one of the Project Kelvin cable deployment in 2009, directly connecting Northern Ireland to North America via a short section of cable from the north coast to the Hibernia 'A' system (Hibernia Networks website).

There are three major sub-sea electricity interconnectors in the Northern Ireland marine area. The Rathlin interconnector connects Rathlin Island to the main Northern Ireland electricity grid, the Moyle interconnector links Great Britain and Northern 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.

Table Y: Main Cable Systems Occurring in the Northern Ireland Marine Area

Cable	Flow	Operator	Infrastructure Landing Location
Rathlin interconnector	Power	NIE	-
Moyle interconnector (North & South)	Power	NIE	-
Scotland – N. Ireland 1	Telecommunications	BT	Port Patrick to Donaghadee
Scotland N. Ireland 2	Telecommunications	BT	Larne to Girvan
Manx – N. Ireland	Telecommunications	BT	Ballyhornan to Peel
Lanis 2	Telecommunications	C & W	N. Ireland to Peel
Lanis 3	Telecommunications	C & W	N. Ireland to Troon
Sirius North	Telecommunications	Virgin Media/ NTL	Ardrossan to Carrickfergus
Hibernia 'A'	Telecommunications	Hibernia Atlantic	-

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 (see Figure 12). Northern Ireland imports all of its gas through this pipeline which also supplies two of Northern Ireland's three power stations– Ballylumford at Larne and Coolkeeragh at Londonderry. Kilroot at Carrickfergus uses coal which is shipped directly to it and also via the Port of Belfast. All three power stations are located at the coast and have a total dispatchable capacity of 2286 MW. All three can also use oil as an alternative fuel which is shipped directly to the power stations.

The other two pipelines cross the offshore Northern Ireland marine area and connect Scotland to Ireland (see Figure 12). There is also a pipeline known as the Belfast pipe-line consisting of three sections, which runs for 26km from the Pressure Reduction Station at Ballylumford power station to (and including) the Pressure Reduction Station at Torytown, and for 9km across Belfast Lough from Torytown to (and including) the Knocknagoney Pressure Reduction Station, and for 3km across Larne Lough from the Pressure Reduction Station at Ballylumford power station to (and including) the Pressure Reduction Station at Curran Point, Larne (Phoenix Natural Gas Ltd., undated) (Figure 12).

8.2.2 Key Issues, Problems and Future Trends

According to Subsea Cables UK, around 95% of international trans-ocean telecommunications traffic is carried by cable and, hence, submarine cables will be vital for the foreseeable future. However, there is little information available on how this sector may change in the future. The further development of more resilient networks requires a greater reliance on a number of submarine cable routes rather than a few, and major domestic and international systems are now being installed. Future developments in telecom cables are likely to focus on upgrading and increasing the capacity of existing cables along existing routes. The extent to which new cables will be laid in Northern Ireland waters is not known.

Future offshore renewable energy projects in Northern Ireland off the north and south-east coast and elsewhere in the UK, including large wind farm developments in the Irish Sea, will require subsea cables to connect the offshore electricity generation to the onshore electricity grid. This may necessitate significant upgrades to the electricity grid system, including the development of High Voltage (HV) interconnector cables linking islands to the mainland or Northern Ireland to rest of the UK and will probably result in an increased number of subsea cables in the study area. The ISLES project, for example, is considering options for an offshore grid connecting Northern Ireland, Scotland, Republic of Ireland and Wales.

There is currently one proposed marine power cable development which crosses Northern Ireland's territorial waters (Figure 12). Scottish Power Transmission and National Grid have proposed to build the Western High Voltage Direct Current (HVDC) Link with the aim of bringing renewable energy from Scotland to Wales and England (SP Energy Networks website). As well as being the longest 2,200 megawatt (MW) capacity HVDC cable in the world, it will also be the first subsea link to use a DC voltage level of 600kV. There will be two cables, which for most of the route will be laid in a paired bundle. Where it is not possible to bundle the cables together, the separate cables will be laid up to 50m apart. The cables will be buried approximately one metre below the seabed for the entire length. At crossings with existing cables and pipelines, or where seabed conditions prevent burial of the cable, it will be laid on the seabed and covered by rock armour to protect it from damage and minimise interference with fishing activities. Geotechnical and geophysical survey work on the marine route was completed in 2012. A survey for Unexploded Ordnance (UXO) along the cable route in the Beaufort Dyke and Liverpool Bay areas was

undertaken in 2013 using ROV equipment. The HVDC link is due to be operational by 2016 (Scottish Power website).

Mutual Energy, which operate the Moyle Interconnector, plan to lay 2 new Low Voltage (LV) cables along the general route of the existing combined HV/LV Moyle interconnector cables between Northern Ireland and Scotland. It is anticipated that the new cables will be in place and operational by 2017.

The UK MPS notes "*A secure, sustainable and affordable supply of energy is of central importance to the economic and social well being of the UK. The marine area will make an increasingly major contribution to the provision of the UK's energy supply and distribution. This contribution includes oil and gas sectors which supply the major part of our current needs and a growing contribution from renewable energy and other forms of low carbon energy supply in response to the challenges of tackling climate change and energy security. Contributing to securing the UK's energy objectives, while protecting the environment, will be a priority for marine planning*."

8.3 Terrestrial Transport Network

The following datasets have been used to characterise the Transport Network in Northern Ireland, this is different baseline characterisation because the transport network links Northern Ireland to the Republic of Ireland and extends beyond the 30km buffer proposed to collect baseline information.

The following data sources have been used to characterise the terrestrial transport network in Northern Ireland:

- Regional Transportation Strategy for Northern Ireland 2002 – 2012;
- Ensuring a Sustainable Transport Future – A New Approach to Regional Transportation; and,
- Northern Ireland Climate Change Risk Assessment (CCRA) (DOE 2012).

8.3.1 Baseline Description

The Regional Transportation Strategy (RTS) for Northern Ireland 2002 – 2012 identified the strategic transportation investment priorities for the next 10 years (until 2015). This was achieved by identifying schemes to address the years of under-investment in roads infrastructure. The strategy identified transport linkages (integrating accessibility between

rail and road networks), improvements to public transport (provision of modern trains, buses, cycle routes and bus lanes) and strategic highway improvements.

Within the strategy, environmental priorities of 2002 were stated and the strategic approach to their integration was included. As a result, three further transport plans were produced:

- The Regional Strategic Transport Network Transport Plan;
- The Belfast Metropolitan Transport Plan; and,
- The Sub-Regional Transport Plan.

The Regional Strategic Transport Network Transport Plan is a framework for connecting centres of economic and social activity and the major transport hubs. The Belfast Metropolitan Transport Plan is the local transport plan for the Belfast Metropolitan Area and the Sub-Regional Transport Plan which deals with the transport needs of the whole of Northern Ireland which the exception of the Belfast Metropolitan Area.

Ensuring a Sustainable Transport Future (DRD, 2011)[11] has taken a different approach to future transport planning in Northern Ireland. Rather than identify schemes and developments which would change how traffic flows around Northern Ireland, Ensuring a Sustainable Transport Future has instead 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.

Ensuring a Sustainable Transport Future addresses greenhouse gas reduction from transport, biodiversity protection and a reduction of water, noise and air pollution. This is supposed to be synchronous with the RDS 2035.

A new approach to the long term development of regional transport in Northern Ireland was introduced with the plans in a strategic document ‘Ensuring a Sustainable Transport Future - A New Approach to Regional Transportation’ the publication sets out how the

[11] 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

Department will develop regional transportation beyond 2015 when the current transport plans reach their conclusion.

The New Approach will steer decision making on strategic transportation interventions and link to the Programme for Government and the Regional Development Strategy objectives. The New Approach will be used to make decisions on transportation investment from 2015.

8.3.2 Key Issues, Problems and Future Trends

The Regional Transportation Strategies have both addressed the social and economic implications of underinvestment in transport infrastructure by initially identifying projects to be undertaken and then identifying the funding sources to fund the changes. The strategies have also tried to address the environmental issues which can arise from transport. Though all roads resulting from the strategies have been and will be planned, particularly in relation to how they will impact existing water quality and flooding regimes, roads which are outwith the strategies have not been strategically examined in relation to climate change resilience. The transport network has been identified as vulnerable to climate change within the Northern Ireland Climate Change Risk Assessment (2012).

To illustrate this, in January 2014, a tidal surge in associated with large and powerful waves on the east coast of Northern Ireland, resulted in a 40m section of the A2 Whitechurch Road in Ballywater being undermined. The A20 Portaferry Road was also undermined by erosion. While maintenance work has been undertaken, the impact on other coastal transport infrastructure is still being addressed.

8.4 Aggregates

The following data sources have been used to characterise the aggregates within the Northern Ireland marine area:

- Marine Aggregates –Capacity & Portfolio 2013 (The Crown Estates (TCE)), 2014; and,
- The strategic importance of the marine aggregate industry to the UK. BGS, 2007.

8.4.1 Baseline Description

The Crown Estate (TCE) owns the mineral rights to the seabed extending to the edge of the UK continental shelf and issues consents for non-exclusive sampling and licences for commercial aggregate extraction. The Marine Planning and consenting process is,

however, the responsibility of Government, who through a consultation process determines whether an area can be used for aggregate extraction.

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).

There are also no landings of sand and gravel dredged from the UK Continental Shelf into Northern Ireland (TCE 2014). There has been some interest in marine aggregates within the Northern Ireland marine area in the past and an application was received proposing dredging in Northern Ireland waters (BGS, 2007). However, a decision on this application has not yet been made public.

8.4.2 Key Issues, Problems and Future Trends

Due to the commercially sensitive nature of aggregates licences, there is no information about those currently being assessed in the public domain. Aggregates at present, are not commercially extracted in Northern Ireland territorial waters but have been imported for use in Northern Ireland (Belfast Harbour). If they become available within the SA cycle, information about them will be included.

8.5 Underground Offshore Gas Storage

The following information sources have been used to characterise underground gas storage within the Northern Ireland marine area, these are:

- www.islandmageestorage.com.

8.5.1 Baseline Description

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

The Islandmagee well was drilled to a depth of 1,753m in May/June 2015. This well cored the Permian salt to enable the project front-end engineering design to be completed

8.5.2 Key Issues, Problems and Trends

The location of the Islandmagee Gas Storage facility has been determined by the local geology in the Larne area and is not expected to become a major marine industry within

the Northern Ireland coastal area. The proposed gas storage facility consists of seven storage caverns, each approximately 80m in diameter and 160m in height, created by controlled leaching, or dissolving, of rock salt beneath Larne Lough. The thick salt layer occurs at depths between approximately 1500 and 1750m beneath the lough bed. The proposed construction of the storage facility has proved contentious because of the proposal to discharge large volumes of hyper-salinated water (called brine) produced by the leaching process, into the sea off the coast of Islandmagee.

8.6 Petroleum Exploration Licensing

The following data sources have been used to characterise the petroleum licensing regime within the Northern Ireland marine area:

- DETI Oil and Gas Licensing in the Internal Waters of Northern Ireland (Belfast and Larne Loughs) SEA scoping report;
- DETI website (http://www.detini.gov.uk);
- DECC website (https://www.gov.uk/government/organisations/department-of-energy-climate-change); and,
- UK Offshore Energy Strategic Environmental Assessment (SEA) 6: Environmental Report (DECC, 2011).

8.6.1 Baseline Description

There are three active onshore petroleum licences which encompass the shoreline in Northern Ireland, these are:

- PL1/10 – Infrastrata plc, Cairn Energy plc, Brigantes Energy Ltd and Terrain Energy Ltd (Central Larne – Lough Neagh Basin Area);
- PL3/10 – Rathlin Energy Limited (Rathlin Basin mainland area); and,
- PL5/10 – Providence Resources UK Ltd (Rathlin Island area).

In addition to licence PL5/10, granted by DETI, Providence Resources UK Ltd has also gained a Frontier Licence (licence no P1885) covering six blocks in the waters surrounding Rathlin Island from the DECC which has licensing powers for the UK offshore/ territorial waters which include Northern Ireland waters (see yellow blocks in Image 6 below).

In the 27th Offshore Licensing Round, DECC awarded a licence covering five blocks in the North Channel to a consortium led by Nautical Petroleum plc (see pink blocks in Image 6).

The 28th Offshore Licensing Round was opened in January 2014 and closed in April 2014, 2728 blocks have been offered in total. While there are no details of the blocks which have been licenced, the areas in blue in Image 6 are those which have been offered as part of the 28th round. The Appropriate Assessments of Blocks applied for in the 28th Offshore Oil and Gas Licensing Round has now been issued for public consultation. An initial screening assessment (including consultation with the statutory agencies/bodies) was published in October 2014, and identified a number of whole or part Blocks as requiring further assessment prior to decisions on whether to grant licences under the 28th Round. Because of the wide distribution of these Blocks around the UKCS, the Appropriate Assessments (AA) of the Blocks are contained in five regional reports listed below:

- Southern North Sea;
- Moray Firth;
- Northern and Central North Sea;
- West of Shetland; and,
- Irish Sea and St George's Channel.

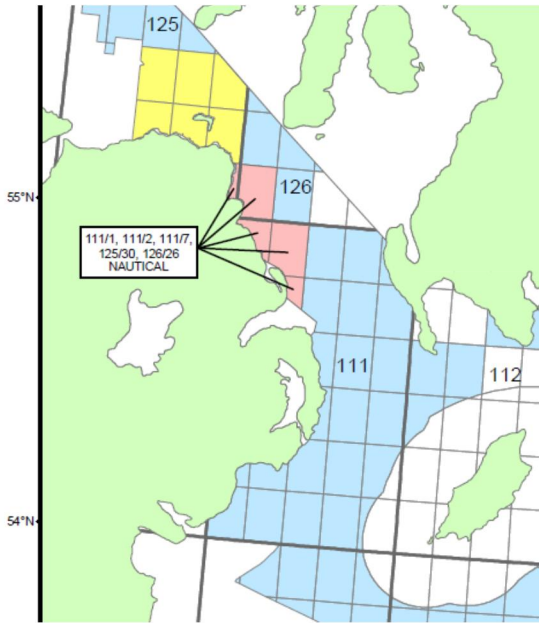

Image 6: Petroleum Licensing Blocks (Source: DETI)

In 2018, there are currently no licensed blocks for oil and gas explorations or production.

8.6.2 Key Issues, Problems and Future Trends

Within the vicinity of the Northern Ireland coast unlicensed blocks in Quadrants 108,109,111,112,125 and 126 have been made available for licensing and were included in the Offshore Energy SEA 6 (DECC, 2011).

The licensing regime for the internal waters (i.e. Belfast and Larne Loughs) is currently being progressed by DETI and may result in some or all of these waters being made available for petroleum licensing in the future, subject to the outcome of the current SEA of DETI's Plan for Petroleum Licensing in the Internal Waters of Northern Ireland.

Petroleum licensing regimes exist which may lead to oil and gas discoveries, future production and eventual decommissioning in and around the Northern Ireland marine area. It should be noted that, whilst there have been significant oil and gas shows, no commercial discoveries have yet been made in or around Northern Ireland. It is possible that future operations will be restricted to short term exploration and not lead to production facilities and as a result, there will be a limited positive impact to the Northern Ireland economy.

8.7 Offshore Renewable Energy

The following data sources have been used to characterise potential offshore renewable energy development within the Northern Ireland marine area:

- SeaGen website http://www.seageneration.co.uk/;
- The Crown Estate website www.thecrownestate.co.uk;
- Offshore Renewable Energy Strategic Action Plan 2012-2020 (DETI, 2012);
- Strategic Environmental Assessment of Offshore Wind and Marine Renewable Energy in NI (SEA) (DETI, 2009) www.offshorenergyni.co.uk;
- Habitats Regulations Assessment of the Offshore Renewable Energy Strategic Action Plan (DETI, 2011). http://www.detini.gov.uk/deti-energy-index/renewable_electricity-2/offshore.htm;
- Regional Locational Guidance (DETI, 2011) http://www.detini.gov.uk/deti-energy-index/renewable_electricity-2/offshore.htm;
- First Flight Wind http://www.firstflightwind.com;
- Tidal Ventures Ltd http://www.tidalventures.com/; and,

· Fairhead Tidal Energy Ltd http://www.fairheadtidal.com/.

8.7.1 Baseline Description

The UK has a legally binding target that 15% of its energy consumption should come from renewable sources by 2020 (EU Renewable Energy Directive, 2009). Northern Ireland's Strategic Energy Framework (SEF) (2010) target of 40% renewable electricity by 2020 will contribute to the UK Member State target. The SEF target is technology neutral and it is expected that offshore renewable will contribute by 2020 and beyond. In Northern Ireland, there are scientific projects relating to renewable energy in addition to commercial ventures (see Figure 13).

In 2009, a Strategic Environmental Assessment (SEA) of the draft Offshore Renewable Energy Strategic Action Plan was completed. A Habitats Regulations Assessment (HRA) was also carried out. In light of these assessments, it was concluded that up to 1200MW of installed capacity could be generated by 2020 from offshore wind and tidal energy in Northern Ireland waters without significant adverse effects on the environment or other marine users. The SEA identified two main offshore wind Resource Zones located off the North and the East Coasts which could potentially offer up to 900MW of installed capacity. Other locations were identified as suitable for commercial scale tidal development in the Northern Ireland marine area up to a potential of 300MW of installed capacity. Some smaller sites were considered unsuitable for commercial development but could be considered for test and demonstration purposes. Wave energy has been identified in the north/ west of the area of the Marine Plan but it is limited and is not considered as a commercial scale development opportunity.

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.

8.7.2 Key Issues, Problems and Future Trends

The Strategic Energy Framework 2010 has set a target to increase the amount of electricity from renewable sources to 40% by 2020 (DETI, 2010). This target is technology neutral but as set out in the Offshore Renewable Energy Strategic Action Plan 2012-2020, it is expected that the above projects, if successful in gaining the necessary consents and licences, will contribute to this target. These offshore projects will also contribute to carbon reduction, energy security and diversity and local economic benefits and supply chain opportunities for Northern Ireland companies and communities

In July 2014, The Crown Estate announced that it has agreed seabed rights:

- For six new wave and tidal current demonstration zones, which for the first time will enable locally-based organisations to manage and sub-let parts of the seabed to a range of wave and tidal stream developers; and,
- For five new wave and tidal current sites, each with the potential to deliver a project of between 10 and 30 MW.

The locations for the demonstration zones and project sites include one in Northern Ireland: a tidal stream project site in Strangford Lough.

8.8 Carbon Capture and Storage

The following data sources have been used to characterise the carbon capture and storage (CCS) within the Northern Ireland marine area:

- Department of Enterprise, Trade and Investment (DETI) press release 17th September 2008;
- DETI press release 12th May 2008;

- European Commission (EC) website;
- DECC website; and,
- UK MPS (HM Government et al., 2011).

8.8.1 Baseline Description

Carbon Capture and Storage (CCS) is a three step process which includes: trapping carbon dioxide as it is emitted from large point sources, compressing it and transporting it (usually via pipelines, although shipping is also a possibility) to a suitable storage site and injecting it safely in deep (at least 800m) offshore geological sites such as saline formations or depleted oil and gas fields (HM Government et al., 2011). The technologies used in CCS are not particularly new or unique. They have been used for many years individually (notably in the oil and chemical sectors) but there are no projects at commercial scale to capture and store carbon dioxide from a power station (BEIS website).

CCS is one way of reducing carbon dioxide emissions and mitigate climate change worldwide. This technology also enables the retention of fossil fuels (coal and gas) in the UK's electricity supply mix. Fossil fuels are an important part of the electricity mix (and will remain so for some time to come) because they help to balance the intermittency of wind and the inflexibility of nuclear. To comply with the UK's legally binding carbon reduction commitments virtually all fossil fuel generation will eventually need to be fitted with technology that captures carbon dioxide and permanently stores it deep underground. All new fossil fuel power stations must now be constructed Carbon Capture Ready (CCR). This programme will generate considerable volumes of carbon dioxide to be permanently stored. The UK offshore area is thought to be one of the most promising hub locations in Europe for permanent storage of carbon dioxide.

The expectation is that storage in the UK will take place almost exclusively offshore, which in turn will require the necessary infrastructure (such as pipelines and offshore structures) to be installed to transport carbon dioxide from the mainland and inject it deep below the seabed.

There is a CCS Directive and it is now EU policy to promote CCS technology. As such storage is expected to be included within the framework of the Rotterdam Capture and Storage Demonstration (ROAD) project located at the Port of Rotterdam which was

awarded €180 million of funding under the European Energy Programme for Recovery (EEPR).

The Geological Surveys of Northern Ireland (GSNI), Republic of Ireland (GSI) and the British Geological Survey (BGS), have worked with economists and engineers to assess locations where carbon dioxide could be stored safely underground around the UK and the Republic of Ireland using CCS technologies. This work has focused on a number of areas onshore and offshore around the island of Ireland, including an area offshore of East Antrim (DETI, 2010).

8.8.2 Key Issues, Problems and Future Trends

CCS is an important technology that can reduce the amount of carbon dioxide in the atmosphere and the potential for further acidification of the marine area. A recent study stated that an appropriately skilled and trained workforce, in addition to that already engaged in the engineering and offshore industries, will be an essential component of the new CCS industry in the UK and estimated that CCS could create 27,000 jobs in the UK by 2020 and increase in the following years (SCCS, 2011). This study also estimated that the UK plc share of the worldwide CCS business is potentially worth over £10 billion per year from around 2025, with the added value in the UK worth between £5-9.5 billion per year (SCCS, 2011).

Leakage from a properly selected storage site is extremely unlikely (HM Government et al., 2011). Once injected into a formation, a number of physical and chemical trapping mechanisms will retain carbon dioxide within the formation. It is possible that leakage of carbon dioxide from the injection process could take place, for example through failure of infrastructure, such as pipelines and wellheads. This could have some localised impact on benthic marine communities and possibly cause minor localised seawater acidification. However, such impacts are unlikely to be either widespread or long-term, taking into account the dilution and buffering capacity of the oceans.

If it becomes clear that viable sites for CCS are available within the Northern Ireland marine area then it is possible that these sites will be developed given the significant drive that such initiatives are being provided by European and UK policy. In the first instance, however, the most favourable storage locations around Ireland appear to be the depleted gasfields at Morecambe Bay (East Irish Sea) and Kinsale (off County Cork) although the potential of the saline aquifers in the Peel Basin (between the County Down coast and the

Isle of Man) and the Portpatrick Basin (adjacent to the Scottish coast) has also been recognised. At this stage, the technical and economic viability of CCS has still to be fully demonstrated at a commercial scale in the UK.

8.9 Compressed Air Energy Storage

The following information sources have been used to characterise compressed air energy storage within the Northern Ireland marine area, this is:

- www.gaelectric.ie.

8.9.1 Baseline Description

There is some potential for subsurface energy storage facilities within the thick salt beds beneath the onshore area around Larne Lough and Islandmagee – eg Gaelectric Energy Storage Ltd are currently assessing the viability of creating subsurface caverns for Compressed Air Energy Storage (CAES) in the Carnduff area southwest of Larne. 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. CAES would also involve leaching of salt caverns and the issue of brine disposal would again arise.

8.9.2 Key Issues, Problems and Future Trends

Thick salt beds are also present at depths of over 1000m below the seabed in several areas within a few kilometres of the east Antrim coast. It is technically possible that these offshore salt beds could host underground storage caverns although the onshore area around Larne and Larne Lough, where the current projects are proposed, are more viable on both technical and economic grounds.

8.10 Waste Water Treatment and Industrial Discharges

The following data sources have been used to characterise the urban waste water treatment and industrial discharges within the Northern Ireland marine area:

- Sensitive areas currently identified in the UK under the Urban Waste Water Treatment Directive (Defra website);
- Managing the Water Environment in Northern Ireland (Environmental and Heritage Service (EHS), 2000);
- Regulation of Water Utility Sector Discharges 2009 (NIEA, undated);

- Waste water treatment in the United Kingdom – 2012. Implementation of the European Union Urban Waste Water Treatment Directive – 91/271/EEC (Defra, 2012); and,
- 2014 Northern Ireland Water Management Facts and Figures (NIEA 2014).

8.10.1 Baseline Description

Table Z provides a summary of compliance of water utility sector Waste Water Treatment Works (WwTWs) in the Northern Ireland marine area between 2007 and 2012. There has been a positive trend in compliance 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 (Table Z). Overall compliance has consistently improved since 2007 and now stands at 98%.

Table Z: Summary of compliance of water utility sector WwTWs

	2007	2008	2009	2010	2011	2012	2013
Number of NIW WwTWs serving PEs > 249	244	232	231	237	238	239	237
% NIW compliance with discharge standards	84%	86%	87%	89%	93%	93%	92%
Number of NIW UWWT Regulation WwTWs (Number of NIW discharges)	80	77	74	79	79	79	79
% NIW compliance with UWWT	86%	92%	93%	94%	96%	96%	98%

Source: NIEA (undated)

As a result of consolidation of WwTW by NIW at Glenarm, Ballystrudder, Portballantrea and Whitehead, the number of WwTWs with descriptive consents (Coastal)[12] has reduced from 22 to 18 and the level compliance has increased from 84% in 2007 to 93% in 2012. WwTWs 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

[12] WwTW with population equivalents of 250-10,000 that discharge to coastal water are issued with Descriptive Consent conditions and are assessed as being compliant where the appropriate treatment is in place.

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. Northern Ireland Water have received planning permission for the upgrade to treatment, the land vesting for the scheme has been completed and the tendering process is being progressed to deliver secondary treatment by 2017/2018 (per comms NIW). In addition to WwTWs discharges..

Table AA shows the trends in annual private and trade discharge consent, where compliance is assessed on a 95-percentile basis (discharge must be within its consent conditions 95% of the time to comply.

Table AA: Trends in annual private and trade discharge consent compliance (% compliance)

	2006	2007	2008	2009	2010	2011	2012
Private Sewage Compliance	82	77	86	82	88	78	79
Trade Effluent Compliance	87	88	87	88	91	91	90

Source: 2014 Northern Ireland Water Management Facts and Figures

Waste water treatment, improvements to treatment and the ongoing maintenance of collection systems and waste water treatment plants and other sewerage infrastructure require significant capital construction and ongoing operational costs. In Northern Ireland, the Northern Ireland Executive sets out its investment priorities for the water and sewerage industry price control period (Defra, 2012). These priorities form the basis of the Water Industry Price Control process which determines the level of funding Northern Ireland Water needs to efficiently maintain and enhance its water and sewerage infrastructure. The economic regulator's final determination then informs public expenditure bids for each period. Table AB sets out investments in Northern Ireland from 2010 to 2015.

Table AB: Investments in sewerage services

	Sewerage Infrastructure	Sewerage Non-infrastructure	Total
PC10 (April 2010 – Mar 2013)	£81m	£208m	£289m
PC13 (Apr 2013 – Mar 2015)	£42m	£135m	£177m

Source: NI Water (2014)

8.10.2 Key Issues, Problems and Future Trends

Surface waters are not only affected by discharges from urban water or industrial treatment plants and combined sewer overflows as point source pollution only. They are also affected by diffuse pollution from surface water drainage, urban run-off from brownfield sites, (former industrial sites that often have contaminated, toxic soils that can also leach pollutants to waters), roads, and run-off from land in rural areas. Addressing the many sources of both point source and diffuse pollution from human activities present a considerable challenge. The Water Framework Directive (WFD) aims to do this by applying a holistic approach. In Northern Ireland, a range of proposals to address point source and diffuse pollution have been set out in the Programme of Measures (POM) of the River Basin Management Plans (RBMPs).

Investment from NIW has resulted in consolidation of the waste water treatment facilities around the coast which is resulting in year on year increases in compliance with water quality standards.

9. Cultural Heritage

9.1 Introduction

This section provides an overview of cultural heritage in Northern Ireland inclusive of marine and terrestrial archaeology. Cultural heritage has been spilt into the following headings:

- Northern Ireland Historic Environment Record;
- Marine Archaeology;
- Submerged Prehistory;
- Coastal and Intertidal Archaeology; and,
- Terrestrial Cultural Heritage.

The following data sources have been used to characterise cultural heritage within the Northern Ireland marine area:

- Northern Ireland Historic Environment Record (HER);
- Chapter 13 Maritime Archaeology - State of the Seas Report (NIEA/AFBI 2011);
- National Trust. 2008. Shifting Shores. Living with a Changing Coastline (Northern Ireland);
- Northern Ireland Environment Agency (NIEA). 2012. Our Passion, Our Place: Strategic Priorities 2012-2022; and,
- Northern Ireland Environment Agency (NIEA). 2013. From Evidence to Opportunity: A Second Assessment of the Sate of Northern Ireland's Environment.

9.2 Northern Ireland Historic Environment Record

9.2.1 Baseline Description

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. Regardless of location, all archaeological remains and their context are protected under the Valletta Convention. The UK MPS (2011) reiterates this position for the marine area. The locations of intertidal and marine heritage in Northern Ireland are shown in Figure 14.

Section 2.6.6 of the MPS also details how consideration of the historic environment should be incorporated into Marine Plans for the UK administrations and while it identifies the importance of designated sites, it also states:

> *Many heritage assets with archaeological interest in these areas (marine areas) are not currently designated as scheduled monuments or protected wreck sites but are demonstrably of equivalent significance. The absence of designation for such assets does not necessarily indicate lower significance and the marine plan authority should consider them to be of the same policy principles as designated heritage assets based on information and advice from the relevant regulator and advisors.*

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. Wrecks below the high water mark (HWM) may also be protected under The Protection of Wrecks Act 1973.

Table AC provides an overview of the range and number of cultural heritage assets within 30km of the coast and inclusive of the marine area. This information has been derived from the DOE Historic Environment Record (HER).

Table AC: Number of Features and Description of Cultural Heritage with 30km of the Coast

Feature	Number	Description
Monuments in State Care	State Care – 71 State Care and Scheduled – 58 State Care with proposed scheduling – 5	Monuments in State Care are historic monuments which are fully maintained by the state. They are among the sites and monuments which are of greatest importance within Northern Ireland. They may be fully owned by the state or within its guardianship.
Scheduled Historic Monuments	1129	Scheduled Historic Monuments are also considered to be of great importance to Northern Ireland. They include megalithic tombs, large and small prehistoric ritual earthworks, occupation sites and defensive earthwork structures. More recent features include complex church sites, stone castles and abbeys from the medieval period.
Listed Buildings	8997	Listed Buildings are defined as buildings of special architectural or historic interest and date principally to the past three hundred years. They include many structures from post boxes, bridges, simple thatched cottages, and large stately homes, to commercial and industrial buildings. The purposed of the listing is to protect the special interest of the building.
Parks, Gardens and Demesnes	112 registered 61 supplementary list	The effect of design over time and of a high quality on an area of land is at the basis of the designation of an historic park, garden or demesne. These may vary considerably in style, age and size, and are typically associated with an historic building of similar heritage value.
Sites and Monuments Record	10,000 On record 13 Descheduled 12 Listed 6 Proposed for scheduling.	Sites and monuments include megalithic tombs, large and small prehistoric ritual earthworks, occupation sites and defensive earthwork structures. Maritime Records are also contained within the SMR. The most significant examples are protected as Scheduled Historic Monuments.
Wrecks	Approx. 300* known shipwrecks	Wreck sites are generally defined as sunken ships and aircraft, and any material associated with such vessels.

*This information was not gathered from available desk based sources but from communications with Marine Division as part of the scoping workshop. The figure in Table AC represents the number of actual known wrecks rather than the total number of documented casualties.

The surveys which populate the Historic Environment Record (HER) have been undertaken since 1969 and these have largely targeted the terrestrial environment. The surveys required to produce a complimentary record for the marine have been only been undertaken since 1993. As a result, there is still a limited understanding of the nature, location and character of marine heritage assets.

9.2.2 Key Issues, Problems and Future Trends

There are increasing pressures on the historic environment in Northern Ireland relating to its condition and conservation. Terrestrial sites have an established framework of designation, protection and condition assessment. As a result, there are proven mitigation strategies available to record, protect and conserve terrestrial sites. Due to the relatively recent survey period for marine archaeology, information is still emerging about the location of marine cultural heritage sites, the best mechanism to protect them and how the context of their setting reflects wider historical and archaeological changes around Northern Ireland. Marine archaeology is under threat from both natural and human factors. Natural factors include seabed and coastal erosion driven by waves, tides and storms which can result in damage to, or destruction of heritage assets. Although these are natural processes, there is a possibility that future climate change, principally rising sea-levels and intensified storms, will result in increased erosion placing increased numbers of assets at risk (National Trust 2008; McNeary & Westley 2013). Human factors resulting from increased human use of the seabed and coastal zone relate to activities including cable or pipe laying, oil and gas drilling, trawling, aggregates extraction, offshore renewable energy developments.

9.3 Marine Archaeology

The following section provides information about wrecks, submerged prehistory and coastal and intertidal archaeology. This information has been gathered from UK wide sources and academic journals.

Wrecks

Information sources from wrecks are as follows:

- UK Hydrographic Ocean Wise Dataset;
- Breen, C. & W. Forsythe. 2001. Management and protection of the maritime cultural resource in Ireland. Coastal Management 29:41-51;
- Firth, A. 2014. ‘UK Safeguarding of Underwater Cultural Heritage: factual Background’, unpublished briefing paper for BA/HFF Steering Committee on Underwater Cultural Heritage; and,
- Chapter 13 Maritime Archaeology - State of the Seas Report (NIEA/AFBI 2011)

9.3.1 Baseline Description

Wreck sites are generally defined as sunken ships and aircraft, and any material associated with such vessels. This includes vessels ranging from prehistoric logboats to modern metal ships and aircraft. A database of over 2600 historic wrecks has been compiled by the DOE using a range of desk-based sources. However, these data are biased towards records post-dating 1800 AD and wreck locations are frequently inaccurate. Conversely, just over 300 actual wreck remains are currently known to exist either on the seabed or in the intertidal zone.

The two principal asset-based controls for wrecks in Northern Ireland are the Protection of Wrecks Act 1973 and the Historic Monuments and Archaeological Objects Order 1995. Currently there is only one designated historic wreck in Northern Ireland waters: La Girona, a Spanish Armada galleass wrecked off Lacada Point, Co. Antrim in 1588. There is a 300m exclusion zone around the wreck, and diving is prohibited without a licence from the DOE. To-date no wrecks have been scheduled under the HMAO Order 1995.

The Protection of Military Remains Act (PMRA) 1986 can be used to control activities on two forms of designated underwater cultural heritage – 'protected areas' and 'controlled sites' – though the purpose is to protect military remains rather than cultural heritage. In addition under the provisions of the Merchant Shipping Act 1995 Northern Ireland (like the rest of the UK) has a statutory system for reporting cultural material that is 'wreck', defined as items which are over 100 years old. The Receiver of Wreck (RoW) administers the law for the Maritime and Coastguard Agency (MCA).

9.3.2 Key Issues, Problems and Future Trends

The majority of Northern Ireland wreck records are documented casualties, that is, their exact position is not known, rather than actual wrecks. It is highly probable that more 'undiscovered' wrecks exist in the waters off Northern Ireland. DAERA is currently more fully integrating the NI Wrecks Database into its HERs. Recent advancements in high resolution seafloor mapping (e.g. the Joint Irish Bathymetric Survey (JIBS) and ongoing INIS project) offer the potential to improve locational information on known wreck positions and identify anomalies which could be unrecorded wrecks. However, there remains a need for dive-truthing exercises to facilitate identification and verification of wrecks and anomalies detected by geophysical survey and to contribute to their ongoing monitoring and conservation.

The majority of wrecks also have no formal protection and a number of marine activities which have the potential to negatively impact upon them continue to go unregulated, e.g., fishing, anchoring and recreational diving (Firth 2014).

9.4 Submerged Prehistory

Information on submerged prehistory has been gathered from the following sources:

- Brooks, A., S. Bradley, R. Edwards, G. Milne, B. Horton & I. Shennan. 2008. Postglacial relative sea-level observations from Ireland and their role in glacial rebound modelling. Journal of Quaternary Science 23(2):175-192;
- McErlean, T., R. McConkey & W. Forsythe. 2002. Strangford Lough. An archaeological survey of a maritime cultural landscape. Belfast: Blackstaff Press Ltd;
- Wilson, P., K. Westley, R. Plets & M. Dempster. 2011. Radiocarbon dates from the inter-tidal peat bed at Portrush, County Antrim. Irish Geography 44(2-3):323-329; and,
- Benjamin, J., C. Bonsall, C. Pickard, & A. Fischer (eds.). 2011. Submerged Prehistory. Oxford: Oxbow.

9.4.1 Baseline Description

Submerged landscapes are tracts of seabed which were exposed by lower-than-present sea-levels at the end of the last Ice Age and therefore available for prehistoric human occupation. Around Northern Ireland, sea-levels during its earliest occupation (c. 9-10,000 years ago) were lowered by 10 to 30m (Brooks et al. 2008) and subsequently rose to near-present levels by 5-7,000 years ago. These changes meant that the landscape once extended out from the modern shoreline by hundreds of metres to tens of kilometres before being drowned. Indications that some of this landscape is preserved come in the form of submerged forests and intertidal peats which are found at a few known locations in Northern Ireland, for instance in Strangford Lough (McErlean et al. 2002) and Portrush (Wilson et al. 2011). Some intertidal areas also contain prehistoric artefacts (stone tools) apparently washed ashore, while verified finds from below low water come from Larne Lough and Lough Foyle.

9.4.2 Key Issues, Problems and Future Trends

Although the potential existence of submerged landscapes has been recognized since the 19th century systematic work has only been ongoing since 2008. This has been stimulated by the availability of new high resolution geophysical data, such as JIBS and the increasing realization that well-preserved prehistoric material can survive inundation (e.g. Benjamin et al. 2011). While it is recognised that there is the potential for submerged landscape preservation around Northern Ireland, until further survey is undertaken the precise location of areas of potential and known sites and landscapes will remain poorly understood. To-date areas of intertidal woodland have been Scheduled under the HMAO Order 1995 in Greyabbey Bay and Ards in Strangford Lough

Offshore development represents both a threat and opportunity to these poorly understood assets and locational information is required to mitigate threats and maximise opportunities.

9.5 Coastal and Intertidal Archaeology

The information sources which have been used to describe coastal and intertidal archaeology include:

- McErlean, T., R. McConkey & W. Forsythe. 2002. Strangford Lough. An archaeological survey of a maritime cultural landscape. Belfast: Blackstaff Press Ltd;
- Forsythe, W. & R. McConkey, 2012. Rathlin Island. An archaeological survey of a maritime cultural landscape. Belfast: The Stationary Office;
- McErlean, T. & N. Crothers. 2007. Harnessing the Tides: The Early Medieval Tide Mills at Nendrum Monastery, Strangford Lough. Belfast: The Stationary Office;
- McNeary, R. & K. Westley. 2013. Climate change and Cultural Heritage. Unpublished report prepared for the Northern Ireland Environment Agency: Built Heritage Division. pp. 233; and,
- McNeary, R. & K. Westley. 2013. ‘The Work of the Centre for Maritime Archaeology, University of Ulster: Past and Present’ in J. Higgins, A. Conneely and M. Gibbons (eds), Irish Maritime Heritage: Proceedings of the 3rd Galway International Heritage Conference 2013. Galway.

9.5.1 Baseline Description

Detailed surveys for coastal and intertidal archaeology have been completed for Strangford Lough and Rathlin Island (McErlean et al. 2002; Forsythe & McConkey 2012). Evidence from these surveys demonstrates considerable past human usage of the coastal zone. The Strangford survey, recorded 680 sites including the tidal mill at Nendrum monastery, which dates to early 7th Century AD and represents the oldest such structure in the world (McErlean & Crothers 2007). The Rathlin survey meanwhile identified more than 200 new sites which cover an 8000 year time span from the Mesolithic to the modern era.

9.5.2 Key Issues, Problems and Future Trends

In Northern Ireland, the mapping and recording of foreshore and coastal sites has largely been limited to Rathlin Island and Strangford Lough; the record therefore remains incomplete. This is a problem for marine planners need accurate mapping and characterisation of these areas to assist decision-making in relation to development control and sustainable management of the resource.

Coastal and intertidal sites are particularly vulnerable to future climate change in the form of flooding and erosion. They may also be at risk from human action to mitigate these problems, such as construction of fluvial and coastal defences. Given predictions of increased flooding, erosion and storm surges and resultant human mitigation measures, the likelihood is that these sites will be under increasing pressure in the near future (McNeary & Westley 2013, 21).

9.6 Terrestrial Cultural Heritage

Information on terrestrial cultural heritage has been gathered from the following source:

- Northern Ireland Environmental Statistics Report (2014).

9.6.1 Baseline Description

In February 2014, there were a total of 1,950 scheduled historic monuments, protected under Article 3 of the Historic Monuments and Archaeological Objects (NI) Order 1995, of these 39 monuments were scheduled during 2012/13. A total of 8,563 listed building have been recorded in 2012/13 but this does not include the multiple buildings which are included as part of some listings.

Where development is required which may alter or disturb the fabric of a scheduled historic monument or its ground surface, scheduled monument consent is required. The trend for consents has matched the economic downturn in Northern Ireland, where number of applications peaked to 68 at the beginning of the economic downturn in 2008/09 and then dropped quite dramatically in the middle of the downturn in 2010/11.

If scheduled structures and listed buildings are considered “at risk” because they are under threat of deterioration and/or demolition because of their condition, they are recorded on the Built Heritage at Risk in Northern Ireland (BHARNI) register. In 2012/13, there were 473 buildings and structures on the BHARNI database and 15 buildings have been removed.

9.6.2 Key Issues, Problems and Future Trends

Within the context of terrestrial cultural heritage, sites of importance are still accidentally discovered resulting in the requirement for recording, protection and conservation within HER and input into development mitigation strategies. Like marine cultural heritage, terrestrial cultural heritage is under threat from development, both in relation to destruction and degradation. While there are mechanisms which exist to protect sites and buildings, they need formal protection before these mechanisms can be utilised.

10. Landscape and Seascape

10.1 Introduction

The following data sources have been used to characterise landscape and seascape within the Northern Ireland marine area:

- Landscape Character Areas (NIEA);
- World Heritage Sites (Giant's Causeway) (NIEA) World Heritage Sites (United Nations Educational Scientific and Cultural Organization)http://whc.unesco.org/en/list/369;
- Areas of Outstanding Natural Beauty (AONB) (NIEA); and,
- Northern Ireland Regional Seascape Character Assessment Report (https://www.daera-ni.gov.uk/publications/northern-ireland-regional-seascape-character-assessment).

10.1.1 Baseline Description

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

32 Derry Slopes

33 Lough Foyle Alluvial Plain

35 Magailligan Lowlands

36 Binevenagh

38 Eastern Binevenagh Slopes

54 Coleraine Farmland

57 Causeway Coast and Rathlin Island

69 Newry Basin

73 Kilkeel Coast

74 The Kingdom of Mourne

75 Mourne Mountains

84 Mourne Foothills

85 Newcastle Valleys

86 Tyrella Coastal Dunes

92 Quoile Valley Lowlands

93 Portaferry and North Lecale

94 Strangford Drumlins and Islands

97 Belfast/Lisburn

99 Outer Ards Coast

100 Ards Farmlands and Estates

101 Scrabo

103 Bangor Coastline

114 Three and Six Mile Water Valleys

119 Ballycastle Glens

120 Fair Head

121 Moyle Glens

123 Larne Glens

126 Larne Coast

127 Larne Ridgeland

128 Islandmagee

129 Carrickfergus Shoreline

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 equal to almost 300,000 hectares across various parts of the region. In addition to LCAs, Seascape Character Areas (SCAs) have also been described (see Figure 15), 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

2 Lough Foyle

3 North Coast Strands and Dunes

4 The Skerries and Dunluce Coast

5 Causeway Coast

6 Ballycastle Coast

7 Rathlin

8 Torr Head Coast

9 Northern Glens Coast

10 Southern Glens Coast

11 The Gobbins

12 Larne Lough

13 Belfast Lough

14 Belfast Harbour

15 Ards Peninsula

16 Strangford Lough

17 Lecale Coast

18 Dundrum Bay

19 Mourne Coast

20 Carlingford Lough

21 Newry Estuary

22 Atlantic

23 North Channel

24 Irish Sea (South Down)

Of the 24 SCAs, 16 bound AONBs, areas 2 and 3 abut Binevenagh, areas 3, 4, 5, 6 and 7 abut the Causeway Coast and Rathlin, areas 8, 9 and 10 abut Antrim Coast and Glens, areas 15, 16 and 17 abut Strangford and Leacale, while areas 19, 20 and 21 abut Mourne. Area 18 (Dundrum Bay) abuts both Strangford and Lecale and Mourne AONBs.

10.1.2 Key Issues, Problems and Future Trends

The landscape and seascapes of Northern Ireland have been described. Although the characterisations exist, only 16 abut AONBs and it is only these areas that would be considered protected areas.

While LCAs/SCAs have been assigned there has not been any systematic work done on programmes of Historic Landscape Characterization (HLC) or Historic Seascape Characterization (HSC) in Northern Ireland. Historic characterization aims to manage change and may prove useful to sustainable historic environment management in the context of spatial planning.

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12. Figures

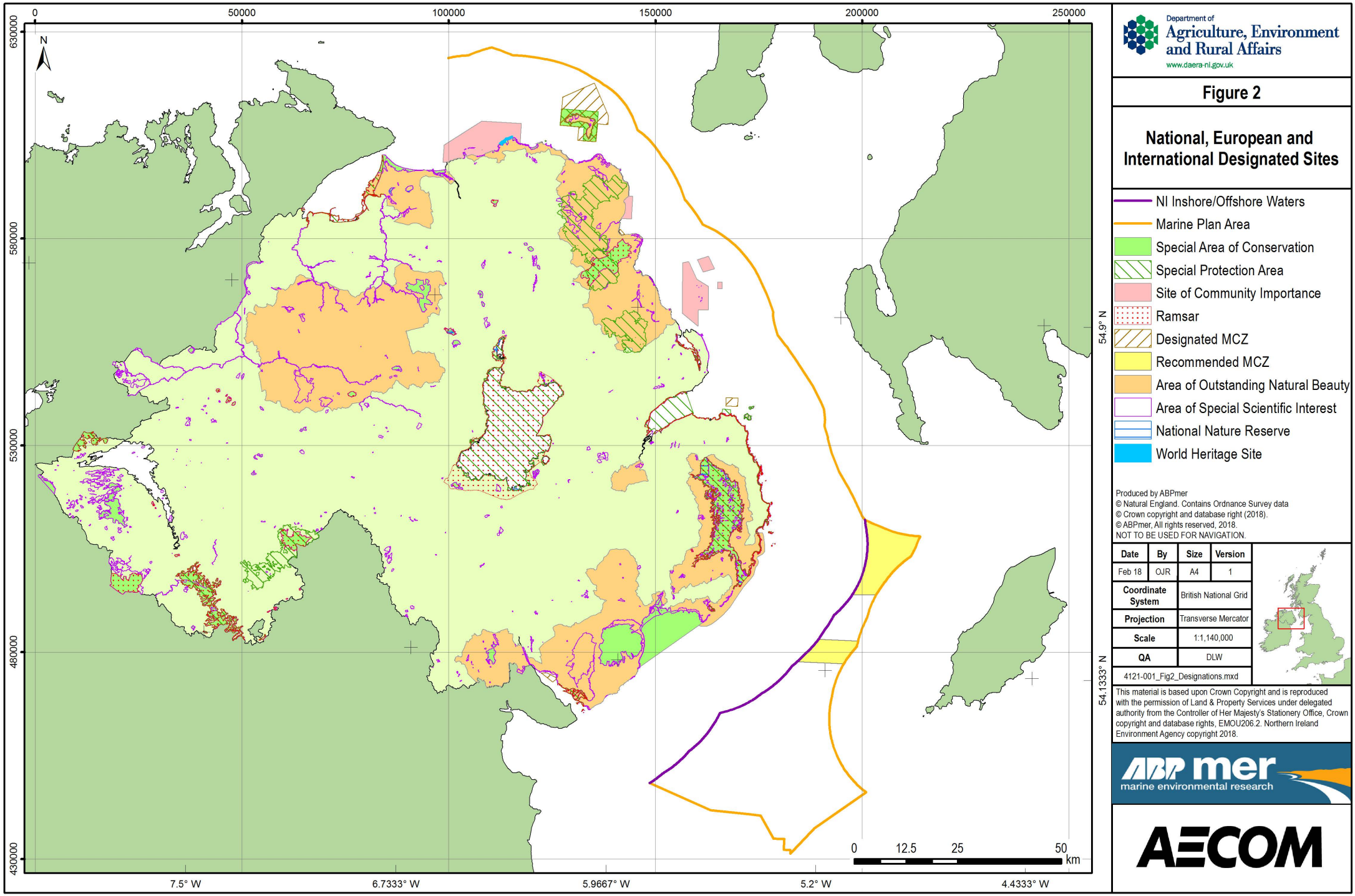

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Figure 2

National, European and International Designated Sites

- NI Inshore/Offshore Waters
- Marine Plan Area
- Special Area of Conservation
- Special Protection Area
- Site of Community Importance
- Ramsar
- Designated MCZ
- Recommended MCZ
- Area of Outstanding Natural Beauty
- Area of Special Scientific Interest
- National Nature Reserve
- World Heritage Site

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Date	By	Size	Version
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Projection		Transverse Mercator	
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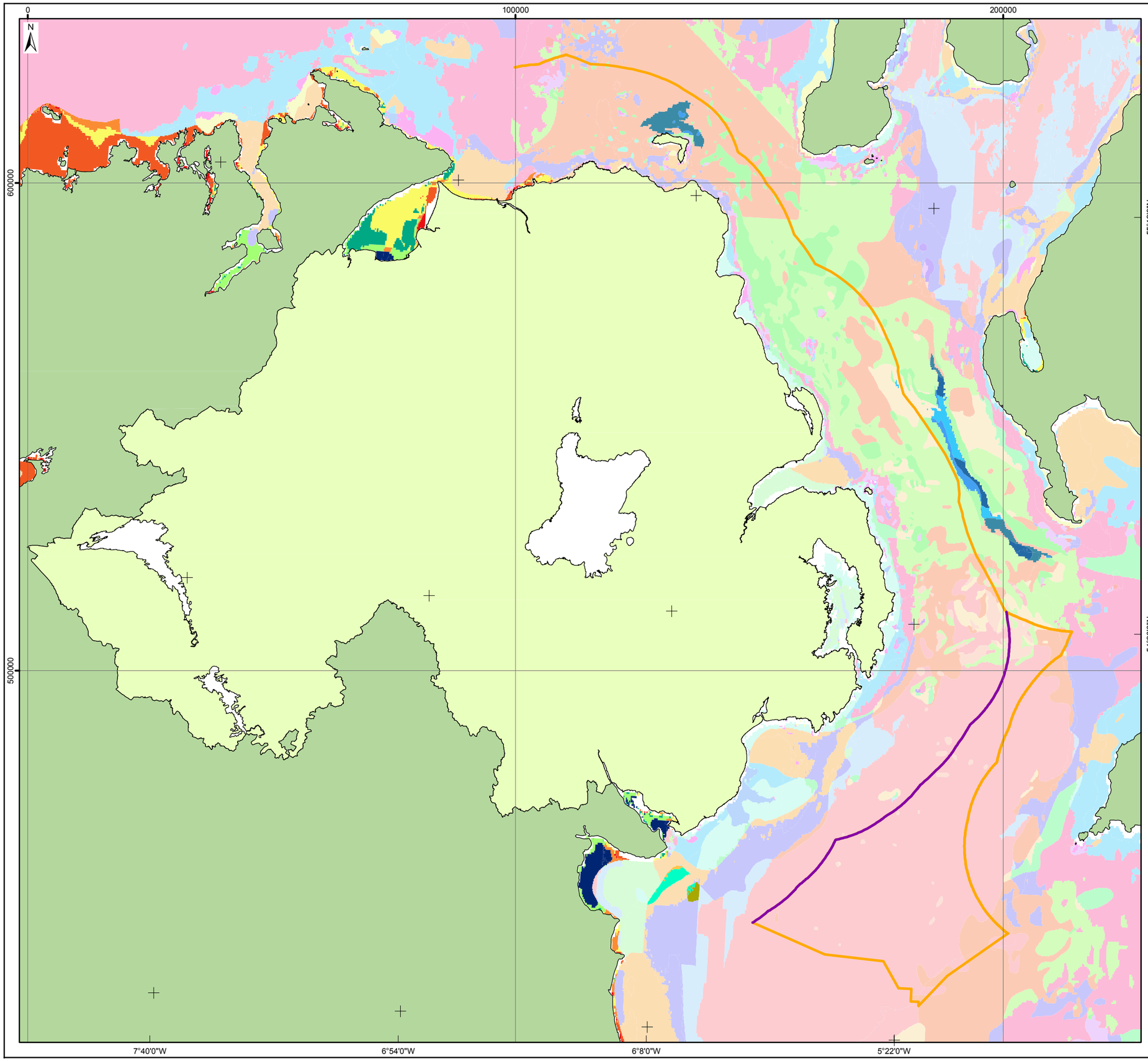

NI Inshore/Offshore Waters
Marine Plan Area

EUseamap Habitats

- A3.1: Atlantic and Mediterranean high energy infralittoral rock
- A3.2: Atlantic and Mediterranean moderate energy infralittoral rock
- A3.31: Silted kelp on low energy infralittoral rock with full salinity
- A4.11: Very tide-swept faunal communities on circalittoral rock or A4.13: Mixed faunal turf communities on circalittoral rock
- A4.12: Sponge communities on deep circalittoral rock
- A4.27: Faunal communities on deep moderate energy circalittoral rock
- A4.2: Atlantic and Mediterranean moderate energy circalittoral rock
- A4.31: Brachiopod and ascidian communities on circalittoral rock
- A4.33: Faunal communities on deep low energy circalittoral rock
- A5.13: Infralittoral coarse sediment
- A5.14: Circalittoral coarse sediment
- A5.15: Deep circalittoral coarse sediment
- A5.23: Infralittoral fine sand or A5.24: Infralittoral muddy sand
- A5.25: Circalittoral fine sand or A5.26: Circalittoral muddy sand
- A5.27: Deep circalittoral sand
- A5.33: Infralittoral sandy mud or A5.34: Infralittoral fine mud
- A5.35: Circalittoral sandy mud or A5.36: Circalittoral fine mud
- A5.37: Deep circalittoral mud
- A5.43: Infralittoral mixed sediments
- A5.44: Circalittoral mixed sediments
- A5.45: Deep circalittoral mixed sediments
- Deep circalittoral seabed
- Upper slope coarse sediment
- Upper slope mixed sediment
- Upper slope mud to sandy mud
- Upper slope rock or reef
- Upper slope sand to muddy sand
- High energy circalittoral seabed
- High energy infralittoral seabed
- Moderate energy circalittoral seabed
- Moderate energy infralittoral mixed hard sediments
- Moderate energy infralittoral seabed
- Low energy circalittoral mixed hard sediments
- Low energy circalittoral seabed
- Low energy infralittoral mixed hard sediments
- Low energy infralittoral seabed

0 5 10 20 km

Date	By	Size	Version
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QA		CRB	
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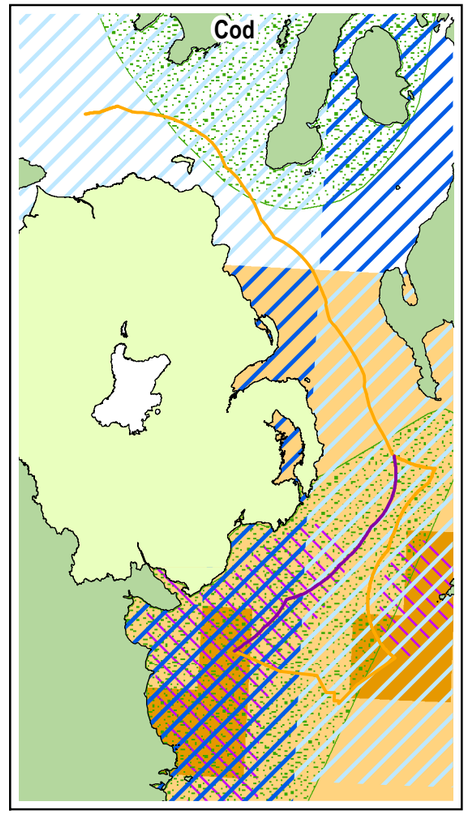
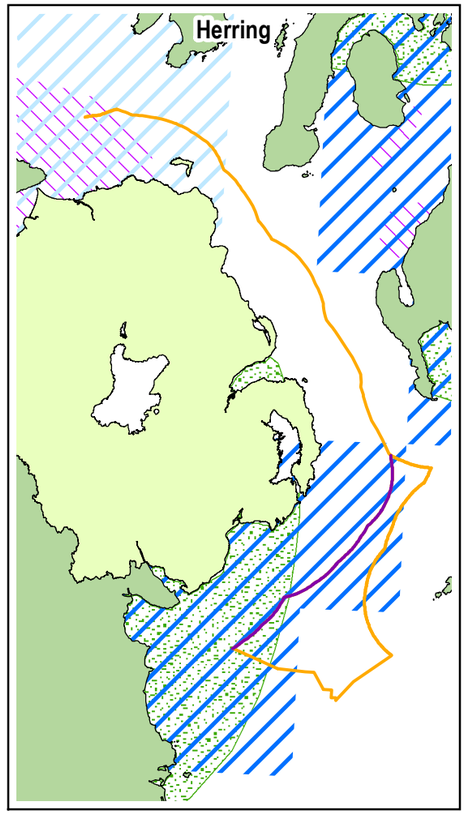
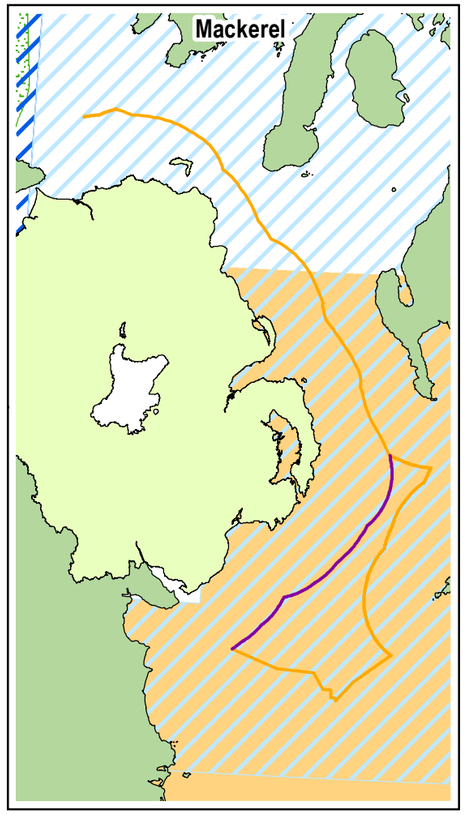
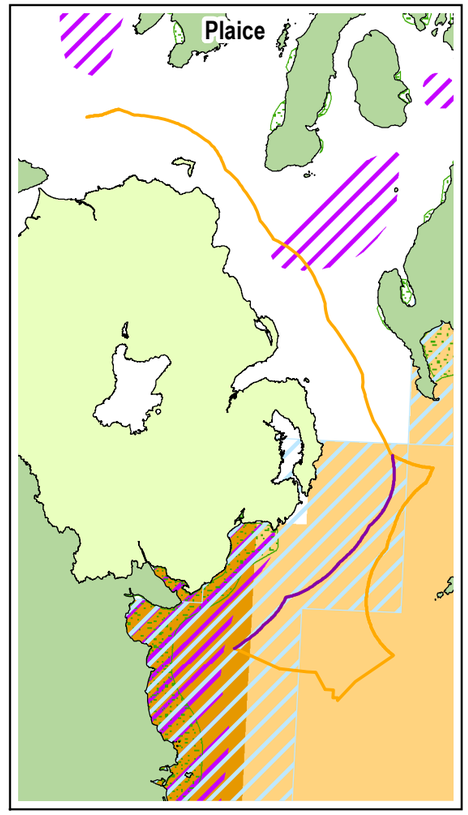
Marine Habitats (EUSeaMap 2012)

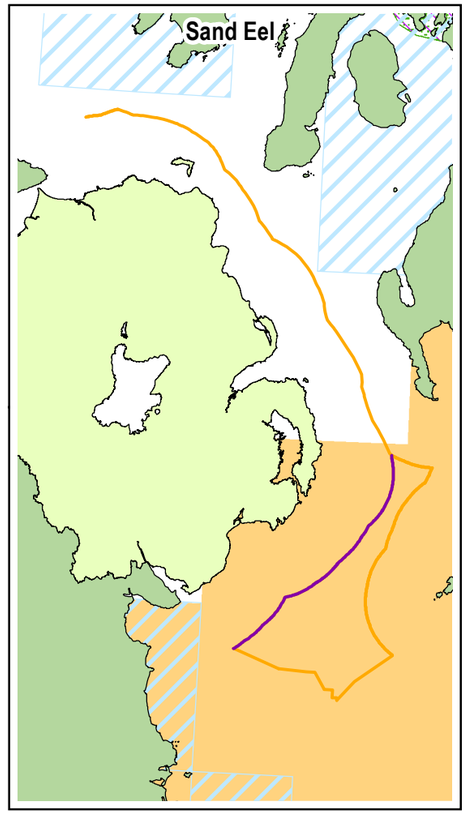
Figure 3

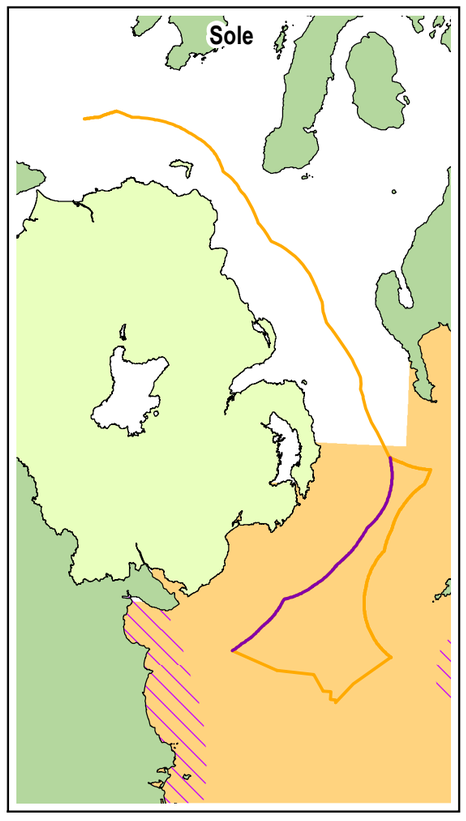


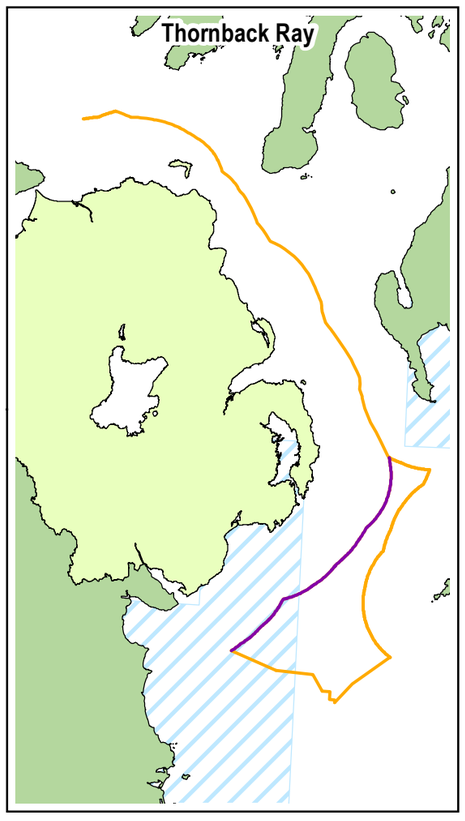


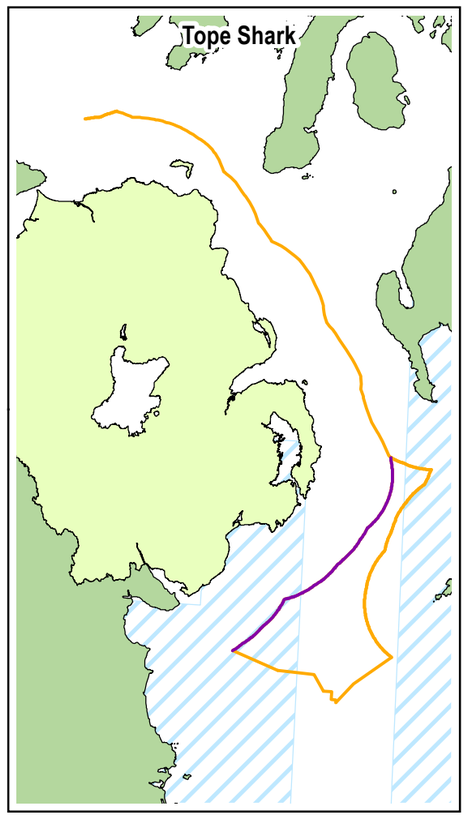


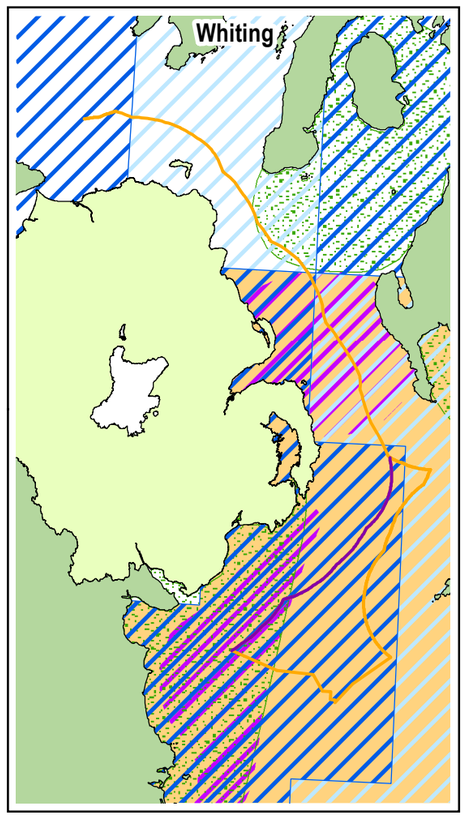












NI Inshore/Offshore Waters
Marine Plan Area

Fishing Sensitivity Areas
Nursery Grounds
Spawning Grounds

Nursery Grounds
High Intensity
Low Intensity

Spawning Grounds
High Intensity
Low Intensity

Date	By	Size	Version
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Coordinate System		British Nat. Grid	
Scale		1:2,000,000	
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Spawning and Nursery Areas

Figure 4

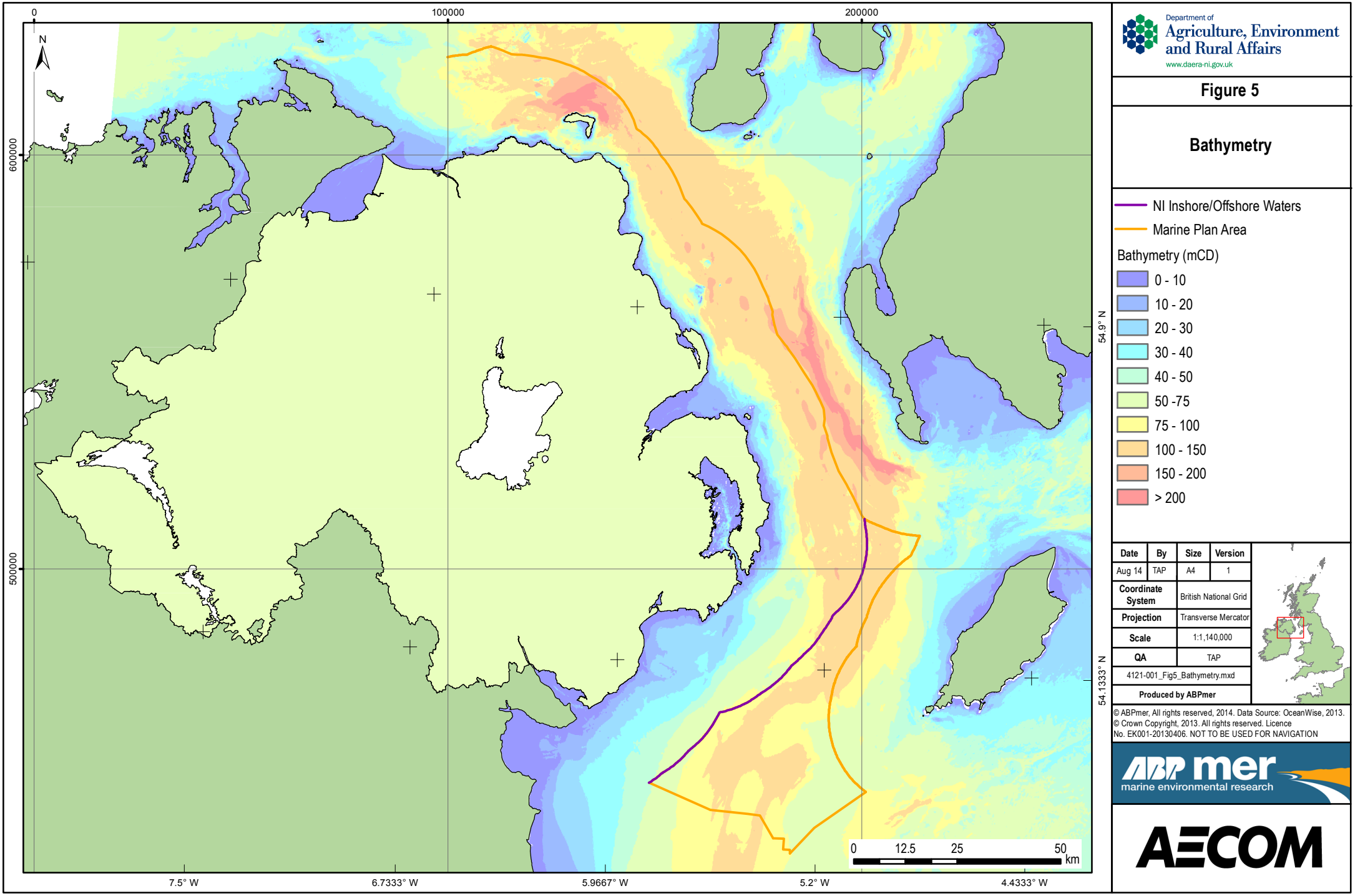

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Figure 5

Bathymetry

NI Inshore/Offshore Waters
Marine Plan Area

Bathymetry (mCD)

- 0 - 10
- 10 - 20
- 20 - 30
- 30 - 40
- 40 - 50
- 50 -75
- 75 - 100
- 100 - 150
- 150 - 200
- > 200

Date	By	Size	Version
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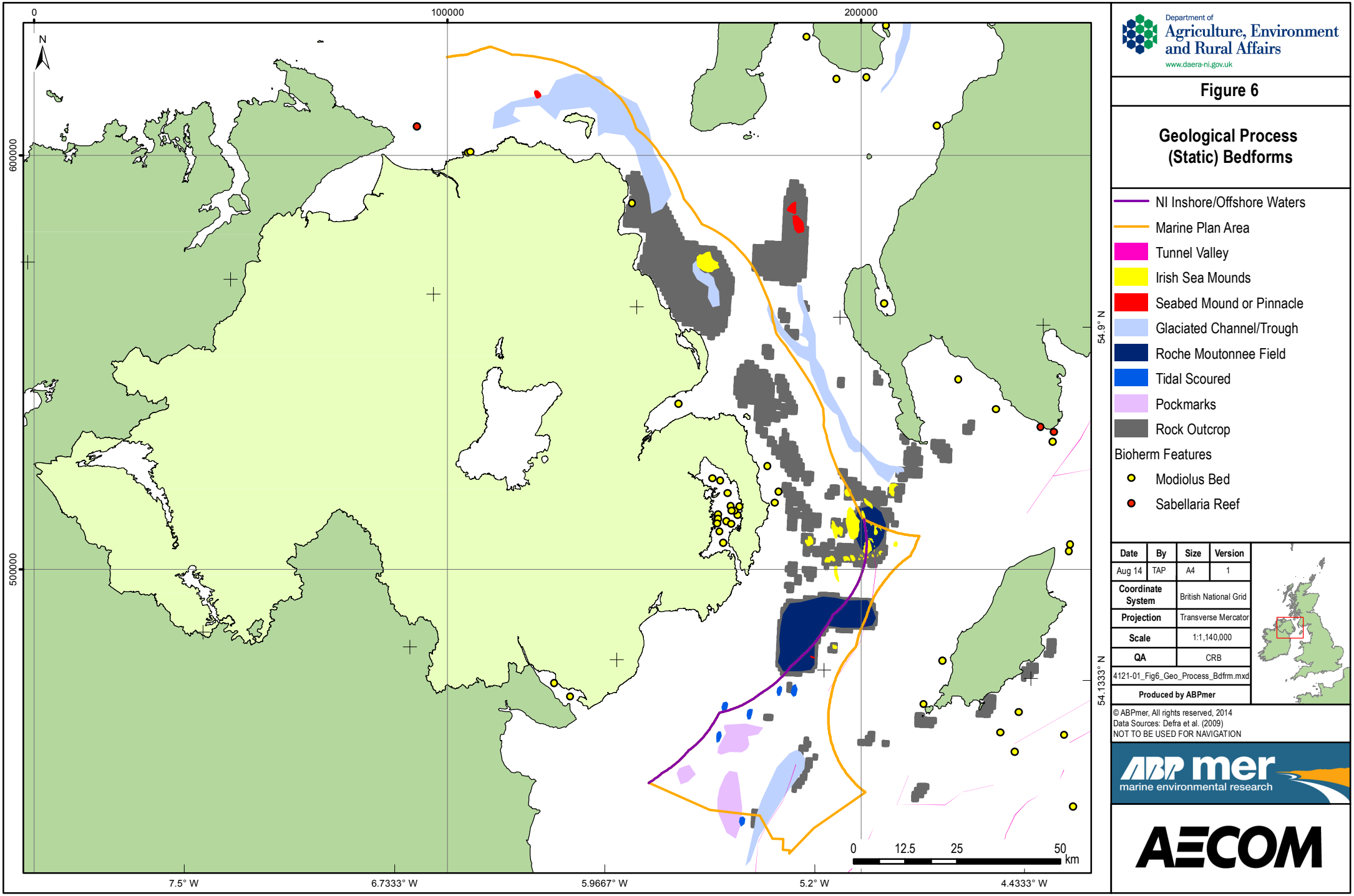

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Figure 6

Geological Process (Static) Bedforms

- NI Inshore/Offshore Waters
- Marine Plan Area
- Tunnel Valley
- Irish Sea Mounds
- Seabed Mound or Pinnacle
- Glaciated Channel/Trough
- Roche Moutonnee Field
- Tidal Scoured
- Pockmarks
- Rock Outcrop

Bioherm Features

- Modiolus Bed
- Sabellaria Reef

Date	By	Size	Version
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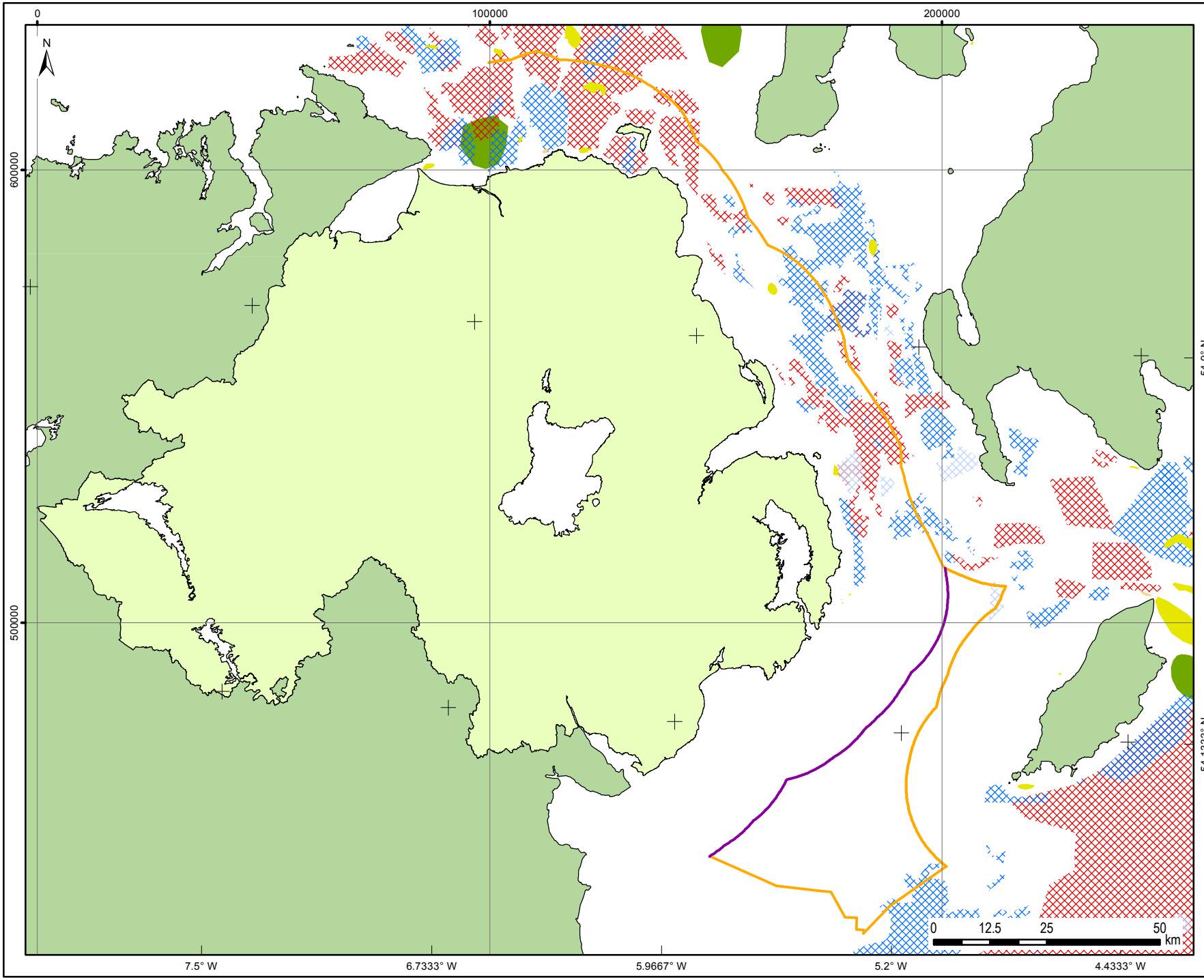

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Figure 7

Marine Process (mobile) Bedforms

- NI Inshore/Offshore Waters
- Marine Plan Area

Tidal Bank Features
- Gravel Bank
- Sand Bank

Transverse Bedform Features
- Gravel Wave Field
- Sand Wave Field

Longitudinal Bedform Features
- Sand Ribbon Field

Other Bedform Features
- Sharp Edged Sand Patches

Date	By	Size	Version
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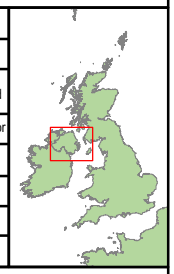

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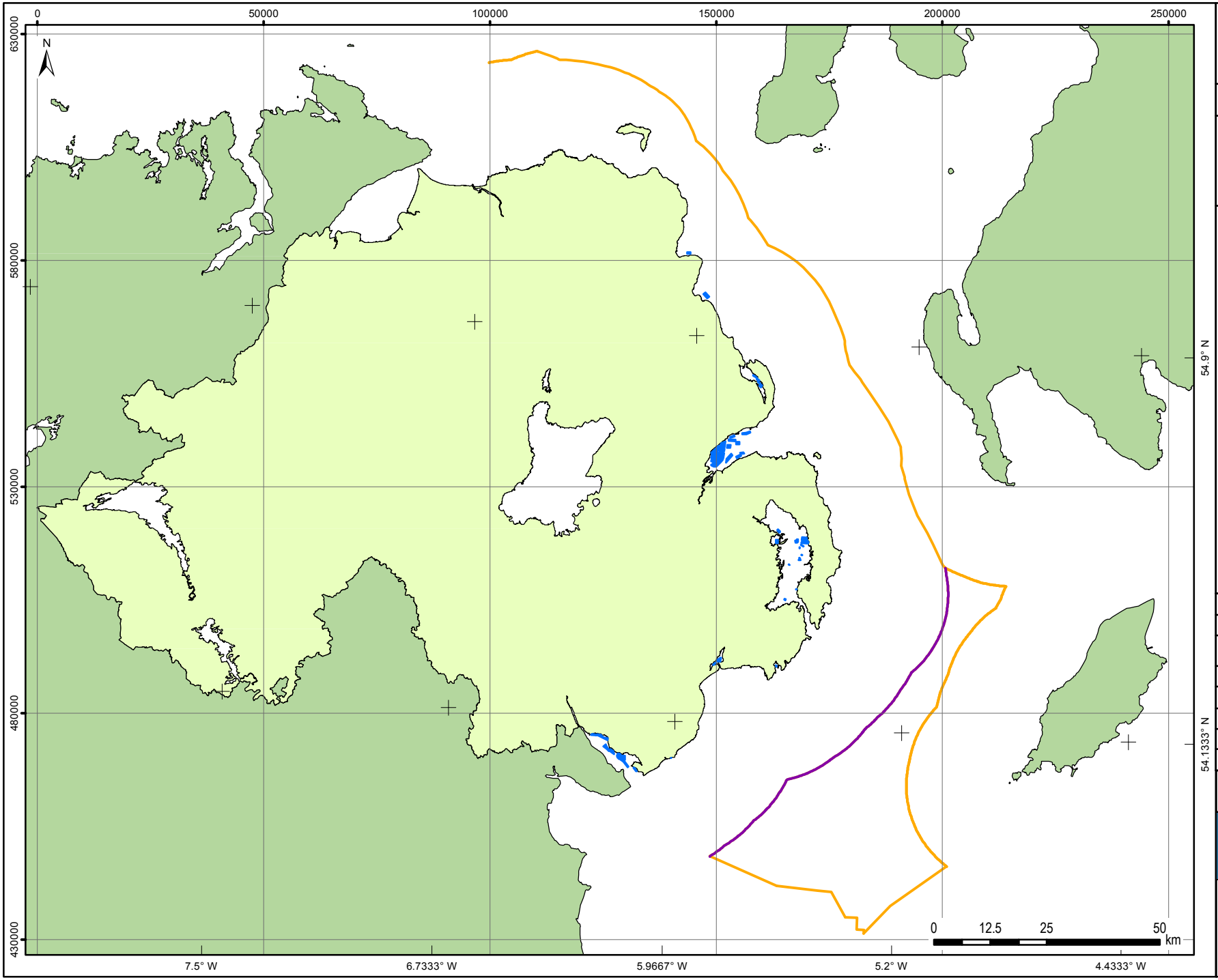

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Figure 8

Licensed Aquaculture Areas

- NI Inshore/Offshore Waters
- Marine Plan Area
- Licensed Aquaculture Area

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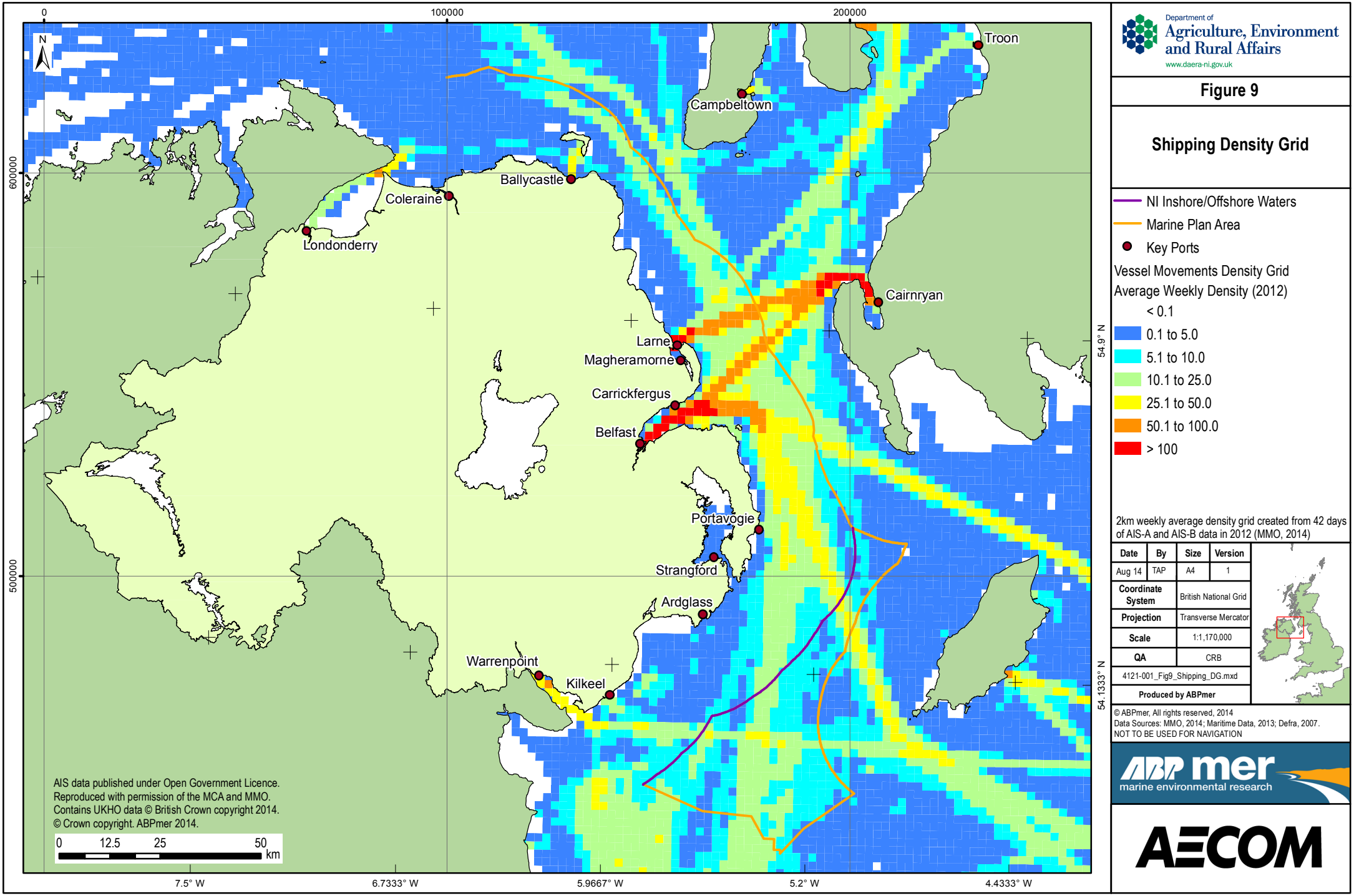

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Figure 9

Shipping Density Grid

- NI Inshore/Offshore Waters
- Marine Plan Area
- Key Ports

Vessel Movements Density Grid
Average Weekly Density (2012)

- < 0.1
- 0.1 to 5.0
- 5.1 to 10.0
- 10.1 to 25.0
- 25.1 to 50.0
- 50.1 to 100.0
- > 100

2km weekly average density grid created from 42 days of AIS-A and AIS-B data in 2012 (MMO, 2014)

Date	By	Size	Version
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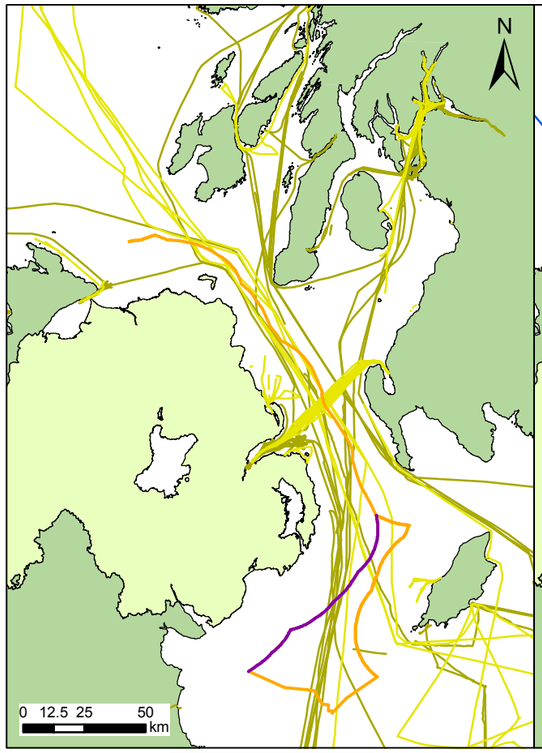
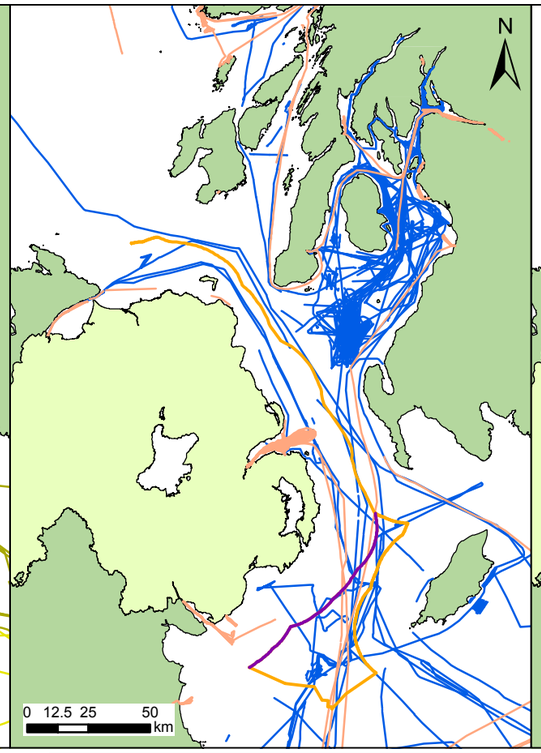
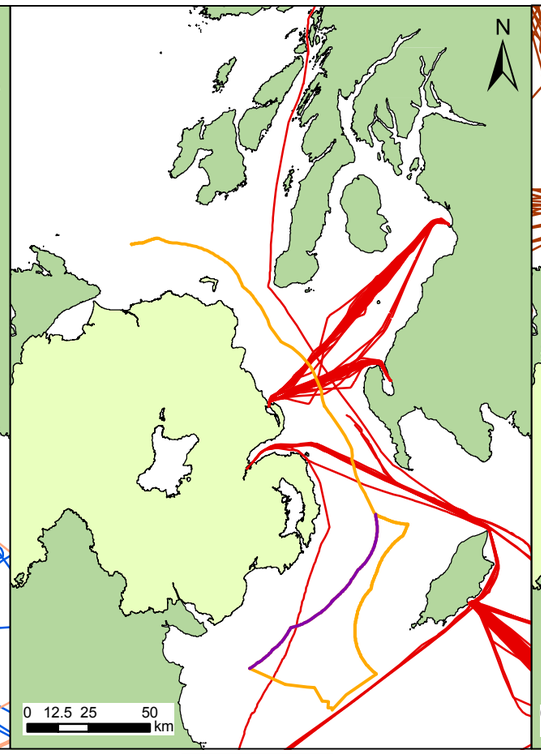


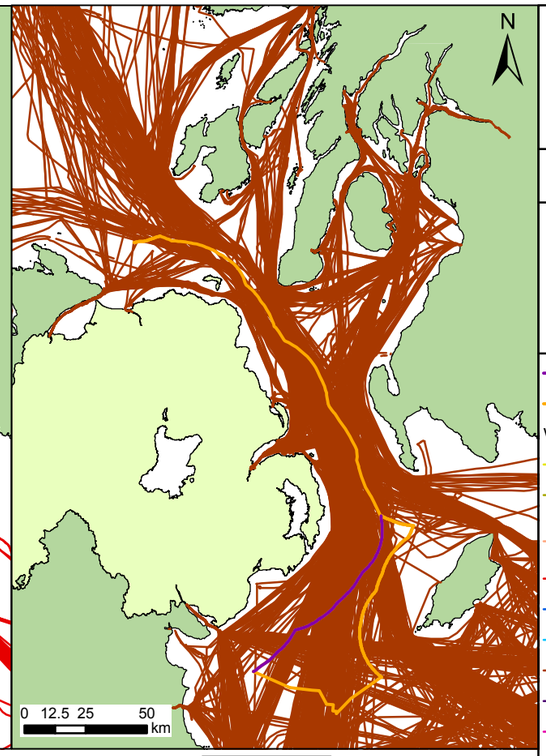
Non-Port Service Craft & Port Service Craft



Vessels engaged in Dredging or Underwater Operations (including diving) & Military or Law Enforcement Vessels

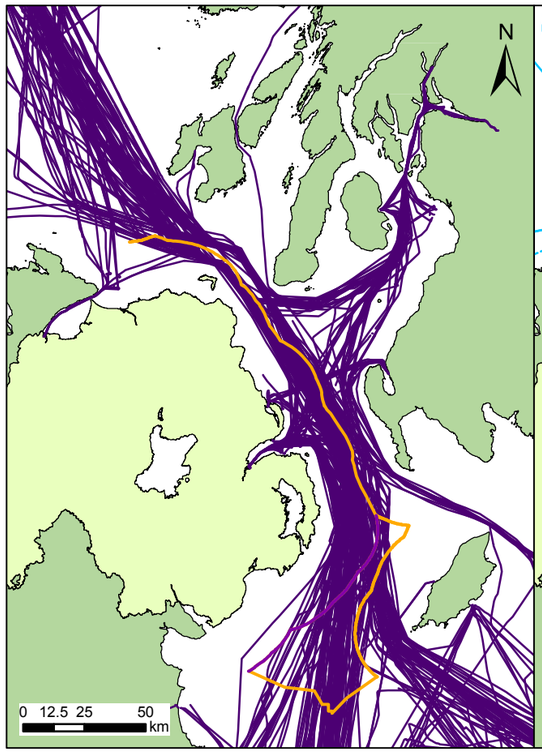


High Speed Craft

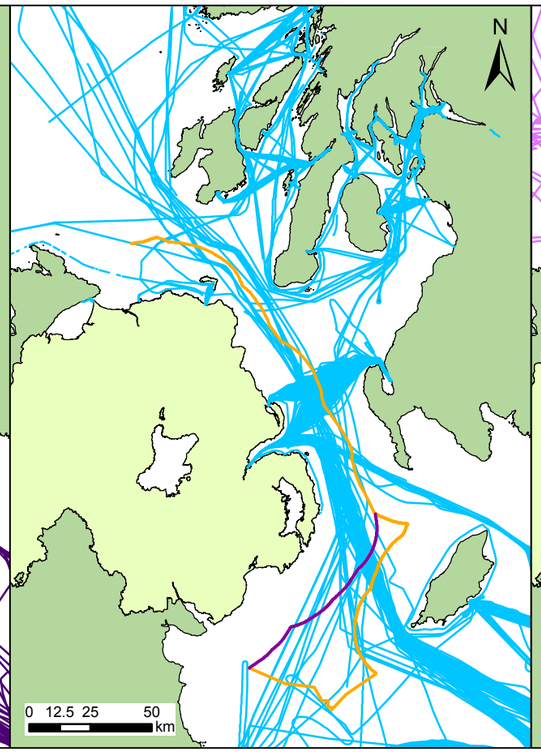


Cargo Vessels

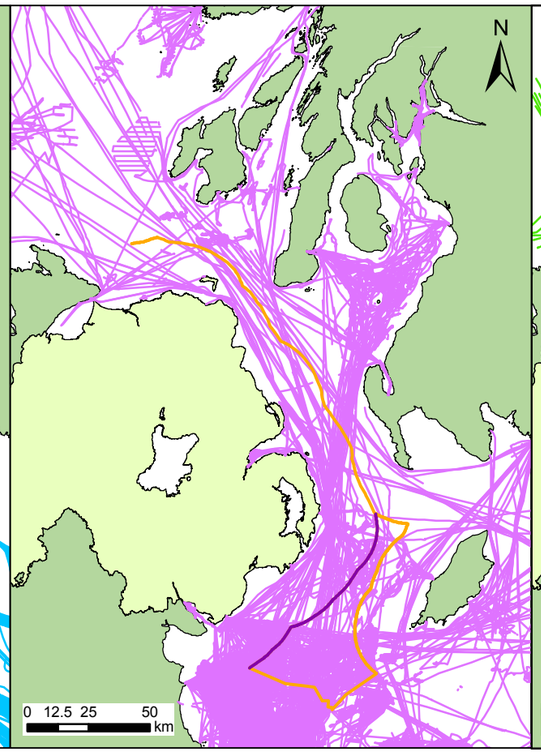
Tankers



Passenger Vessels



Fishing Vessels



Recreational Vessels

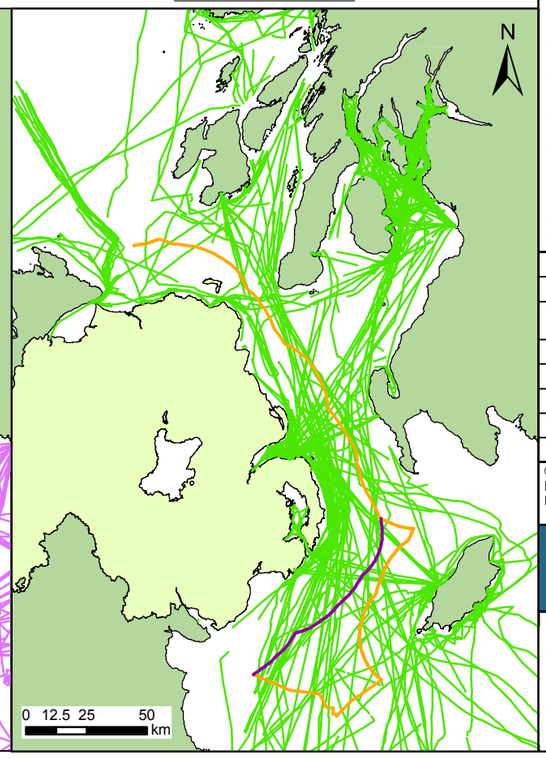


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Figure 10

Shipping Transit Lines

- NI Inshore/Offshore Waters
- Marine Plan Area

Vessel Transits by Ship Type Group (2012)

- Non-Port Service Craft
- Port Service Craft
- Dredging or underwater operations (incl. diving)
- High Speed Craft
- Military or Law Enforcement Vessels
- Passenger Vessels
- Cargo
- Tankers
- Fishing Vessels
- Recreational Vessels

Composite plot of 42 days of of AIS-A and AIS-B data in 2012 for the following periods: 3rd to 9th Jan and1st to 7th Mar, May, Jul, Sep, Nov 2012 (MMO, 2014)

Date	By	Size	Version
Aug 14	TAP	A3	1
Coordinate System		British National Grid	
Projection		Transverse Mercator	
Scale		1:2,500,000	
QA		CRB	
4121_001_Fig10_Shipping_Transits			
Produced by ABPmer			

Data Sources: MMO, 2014, Defra, 2007.
NOT TO BE USED FOR NAVIGATION

ABPmer marine environmental research

AECOM

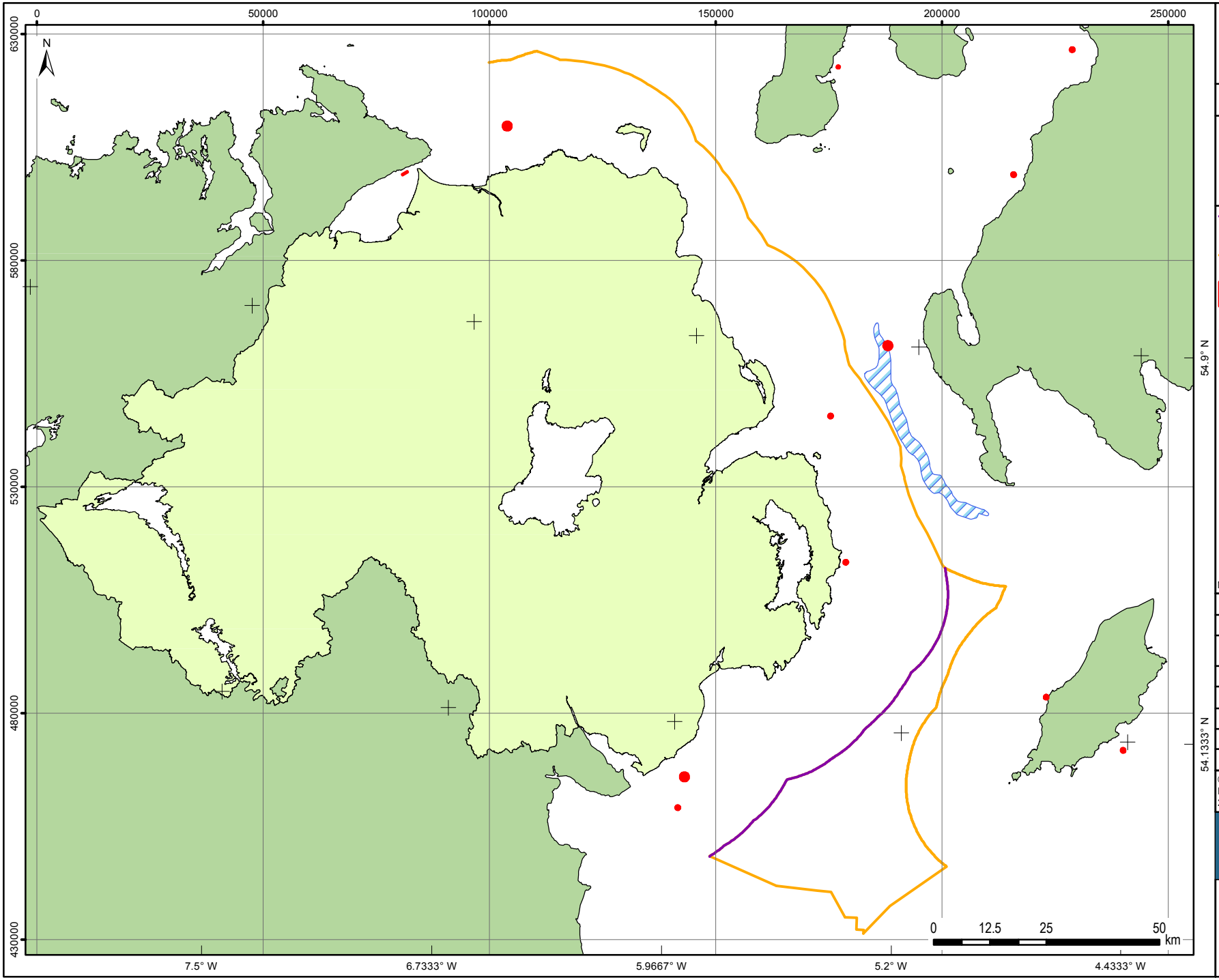

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Figure 11

Disposal Sites

- NI Inshore/Offshore Waters
- Marine Plan Area
- Open Disposal Sites
- Beaufort's Dyke Munitions Disposal Site

NOT TO BE USED FOR NAVIGATION

Date	By	Size	Version
Aug 14	TAP	A4	1
Coordinate System		British National Grid	
Projection		Transverse Mercator	
Scale		1:1,140,000	
QA		CRB	
4121-001_Fig11_Disposal_Sites.mxd			
Produced by ABPmer			

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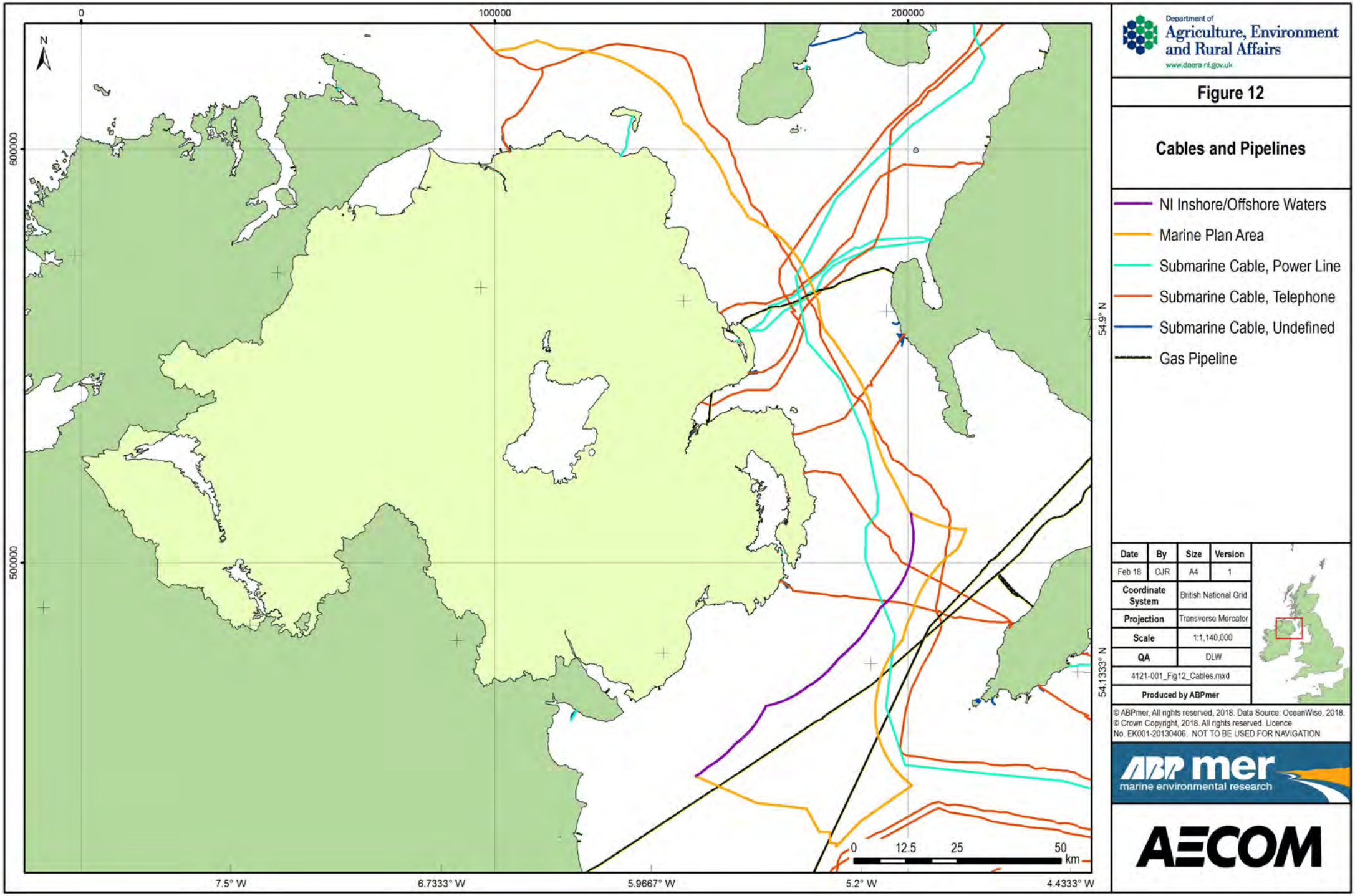

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Figure 12

Cables and Pipelines

- NI Inshore/Offshore Waters
- Marine Plan Area
- Submarine Cable, Power Line
- Submarine Cable, Telephone
- Submarine Cable, Undefined
- Gas Pipeline

Date	By	Size	Version
Feb 18	OJR	A4	1
Coordinate System		British National Grid	
Projection		Transverse Mercator	
Scale		1:1,140,000	
QA		DLW	
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Produced by ABPmer			

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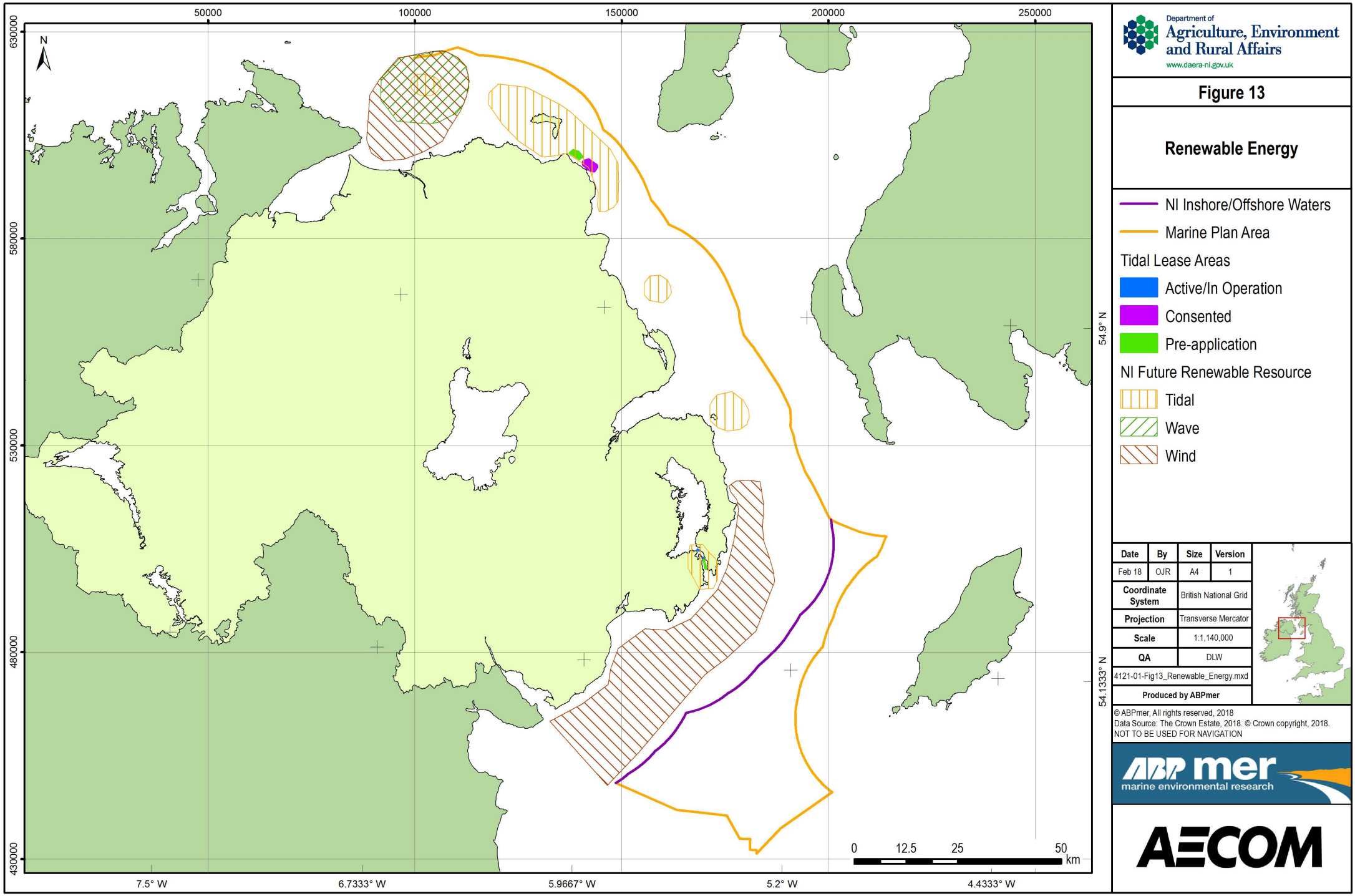

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Figure 13

Renewable Energy

- NI Inshore/Offshore Waters
- Marine Plan Area

Tidal Lease Areas
- Active/In Operation
- Consented
- Pre-application

NI Future Renewable Resource
- Tidal
- Wave
- Wind

Date	By	Size	Version
Feb 18	OJR	A4	1
Coordinate System		British National Grid	
Projection		Transverse Mercator	
Scale		1:1,140,000	
QA		DLW	
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Produced by ABPmer			

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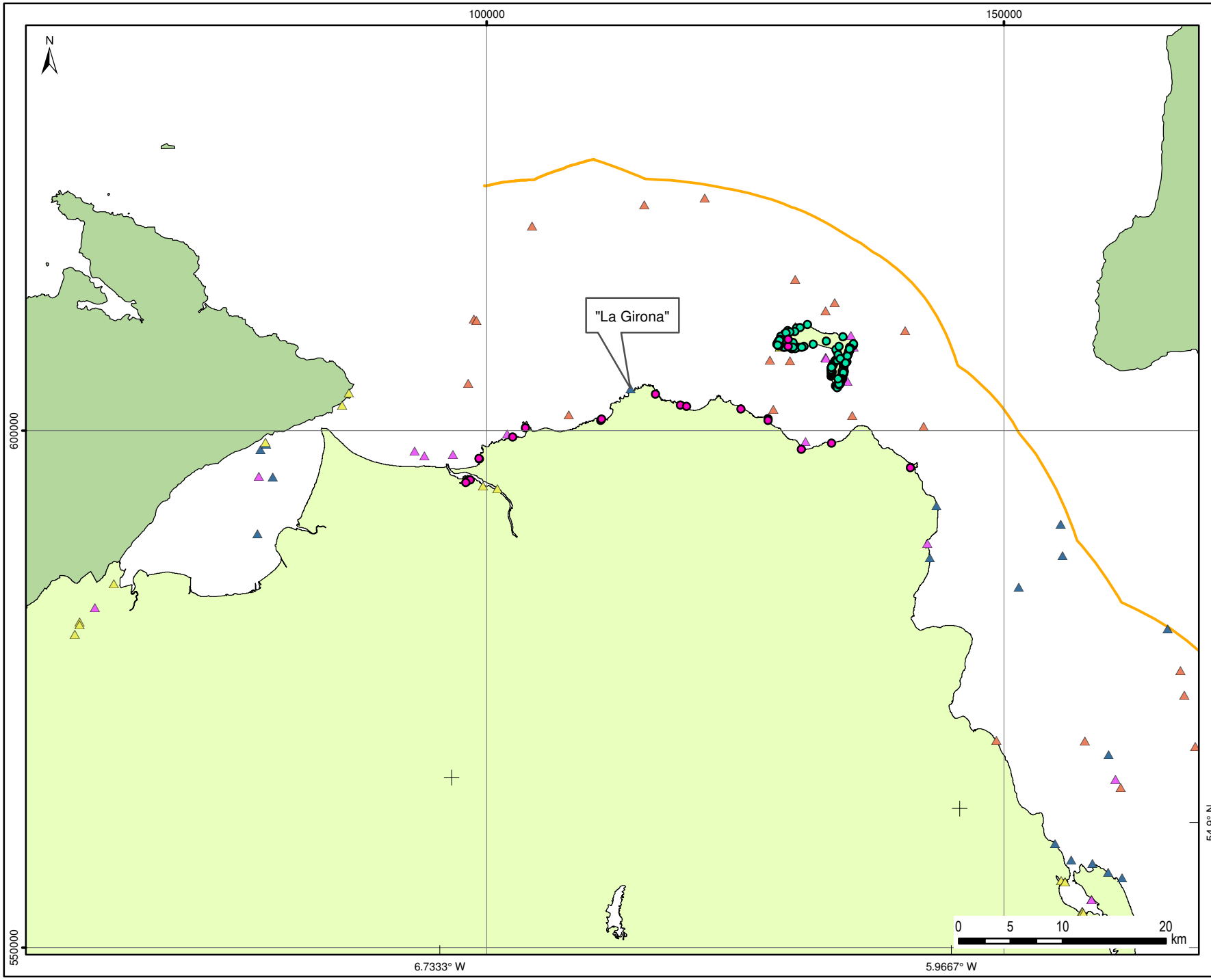

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Figure 14a - 1 of 3

Intertidal and Marine Heritage

Marine Plan Area

Marine Sites & Monuments Record

- Scheduled
- Unscheduled

Recorded Wrecks

- Dangerous Wreck
- Non-Dangerous Wreck
- Undefined Wreck
- Wreck Showing Any Portion of Hull or Superstructure

Northern Ireland

Date	By	Size	Version
Aug 14	GB	A4	03
Coordinate System		British National Grid	
Projection		Transverse Mercator	
Scale		1:500,000	
QA		MM	
Produced by AECOM			

ABP mer marine environmental research

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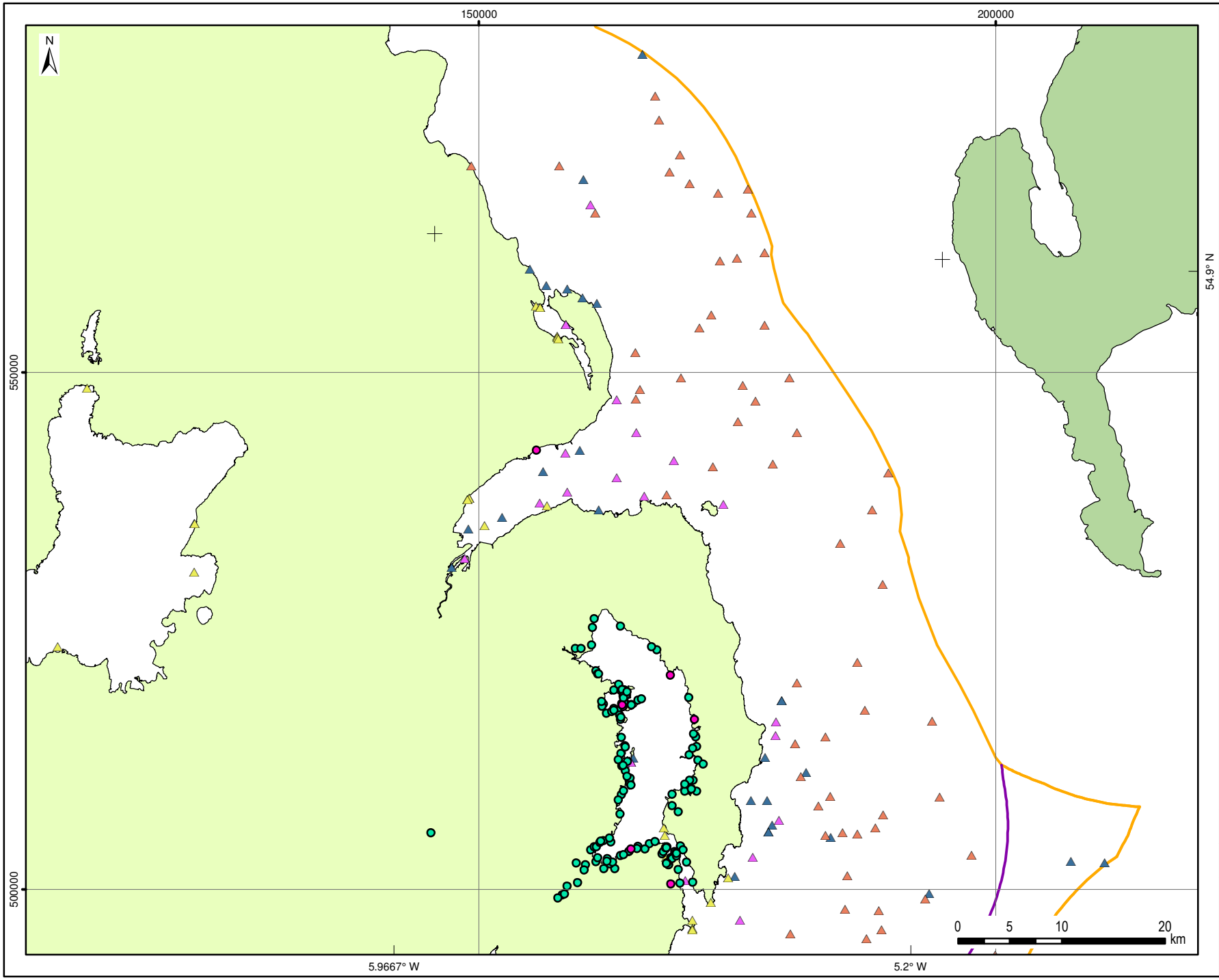

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Figure 14b - 2 of 3

Intertidal and Marine Heritage

NI Inshore/Offshore Waters Boundary
Marine Plan Area

Marine Sites & Monuments Record

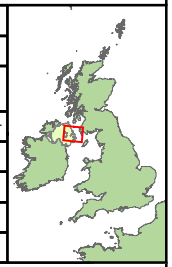
Scheduled
Unscheduled

Recorded Wrecks

Dangerous Wreck
Non-Dangerous Wreck
Undefined Wreck
Wreck Showing Any Portion of Hull or Superstructure

Northern Ireland

Date	By	Size	Version
Aug 14	GB	A4	03
Coordinate System		British National Grid	
Projection		Transverse Mercator	
Scale		1:500,000	
QA		MM	
Produced by AECOM			



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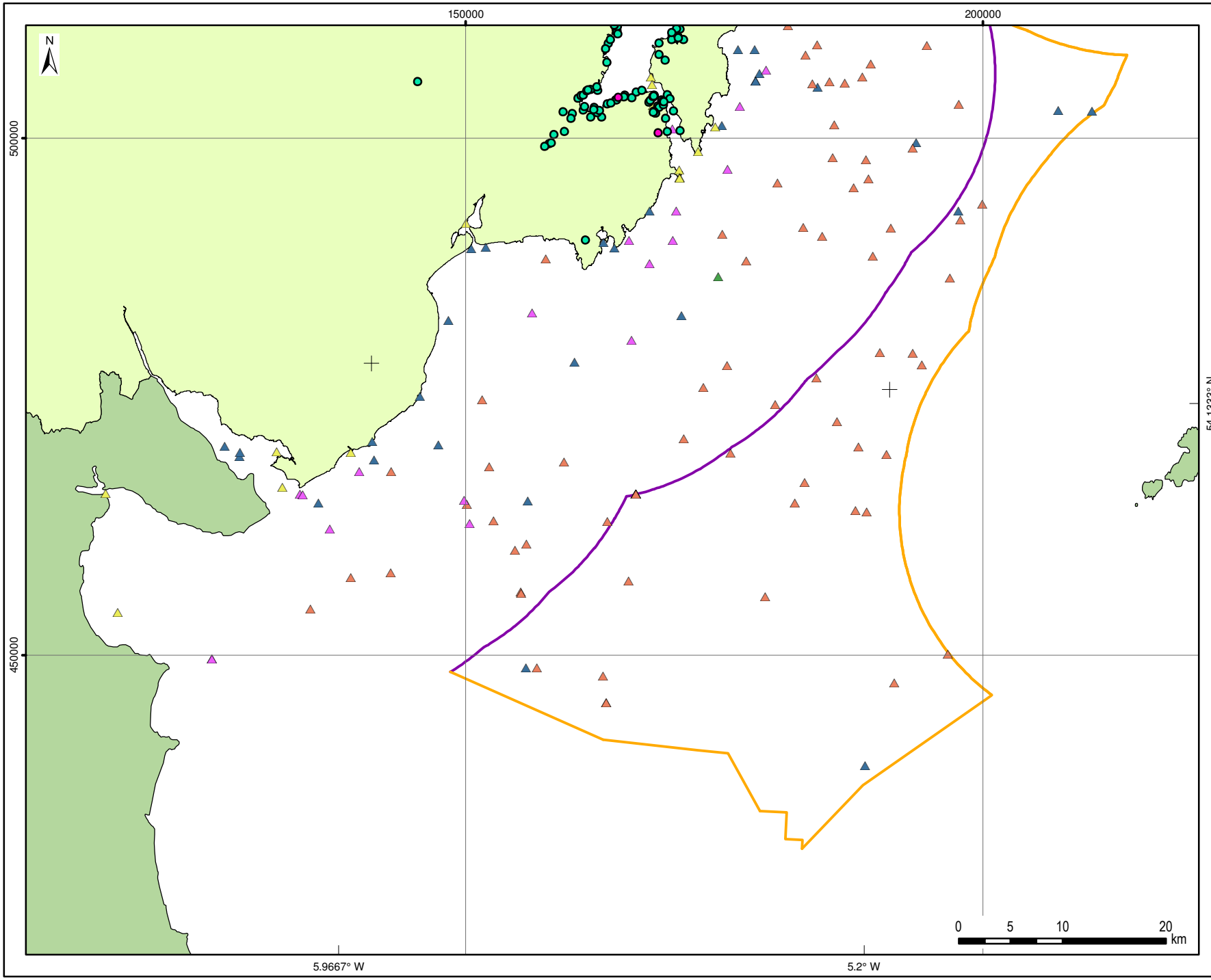

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Figure 14c - 3 of 3

Intertidal and Marine Heritage

NI Inshore/Offshore Waters Boundary

Marine Plan Area

Marine Sites & Monuments Record

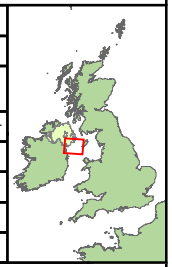
- Scheduled
- Unscheduled

Recorded Wrecks

- Dangerous Wreck
- Distributed Remains of Wreck
- Non-Dangerous Wreck
- Undefined Wreck
- Wreck Showing Any Portion of Hull or Superstructure

Northern Ireland

Date	By	Size	Version
Aug 14	GB	A4	03
Coordinate System		British National Grid	
Projection		Transverse Mercator	
Scale		1:500,000	
QA		MM	
Produced by AECOM			



ABP mer marine environmental research

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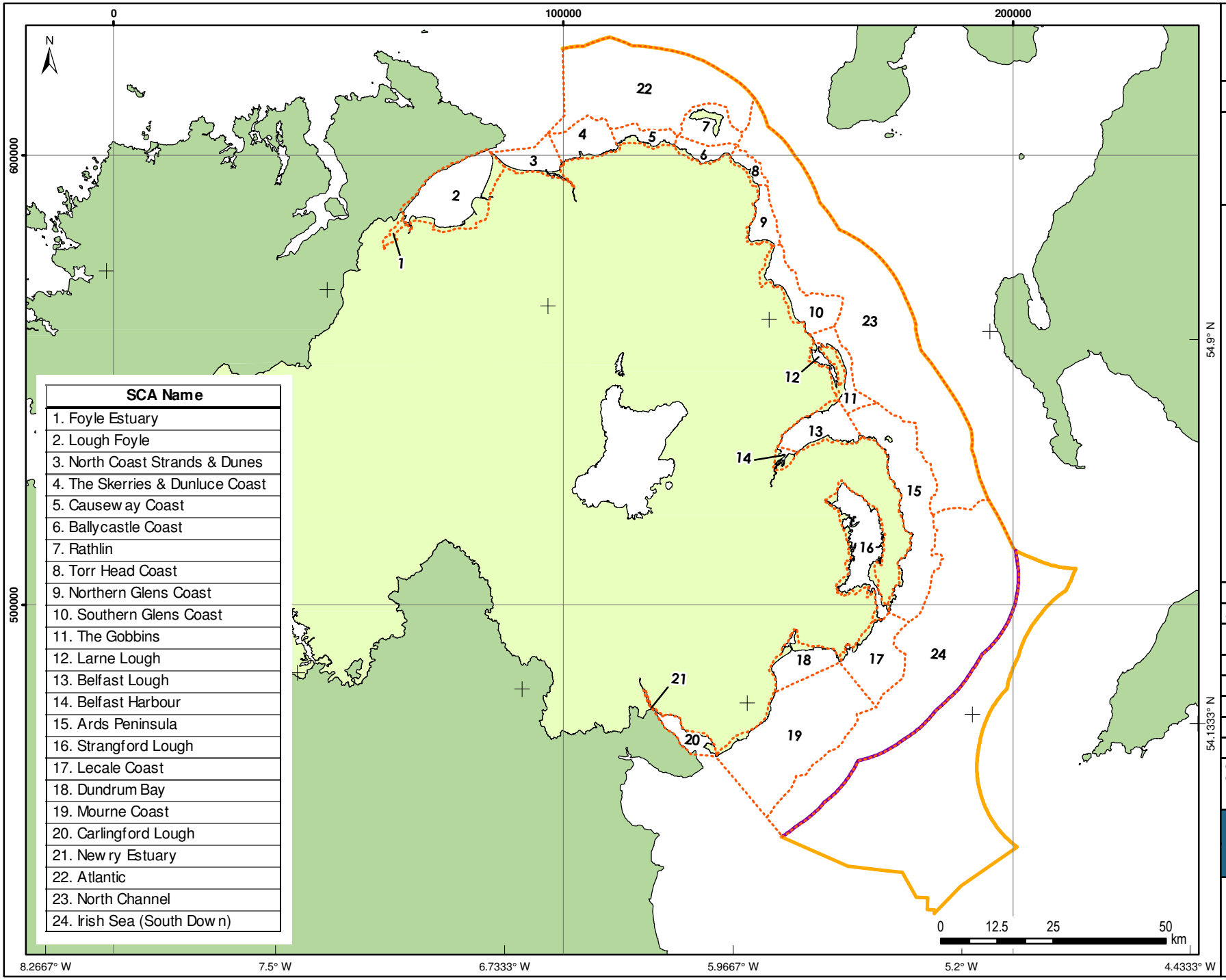

SCA Name
1. Foyle Estuary
2. Lough Foyle
3. North Coast Strands & Dunes
4. The Skerries & Dunluce Coast
5. Causeway Coast
6. Ballycastle Coast
7. Rathlin
8. Torr Head Coast
9. Northern Glens Coast
10. Southern Glens Coast
11. The Gobbins
12. Larne Lough
13. Belfast Lough
14. Belfast Harbour
15. Ards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

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Figure 15

Northern Ireland Seascape Character Areas

- NI Inshore/Offshore Waters Boundary
- Marine Plan Area
- Seascape Character Area (SCA)
- Northern Ireland

Date	By	Size	Version
Aug 14	GB	A4	03
Coordinate System		British National Grid	
Projection		Transverse Mercator	
Scale		1:1,150,000	
QA		MM	
Produced by AECOM			

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Appendix D – Assessment Tables

Appendix D1 – Policy Screening Review

Table D1: Screening Review of Individual Marine Plan Policies against Existing Policy

Plan Policy	Review against existing policy	Outcome of review
Presumption in favour of sustainable development	The UK MPS states that there is a presumption in favour of sustainable development in the marine planning system. The Marine Plan applies this existing policy provision.	No change
Stakeholder Engagement	The EU Public Participation Directive requires consideration of stakeholder engagement in respect of the drawing up of certain plans and programmes. Provisions exist for stakeholder engagement within existing processes, such as for marine licensing, aquaculture licensing, terrestrial planning, Sustainability Appraisal (SA), Strategic Environmental Assessment (SEA), Environmental Impact Assessment (EIA) and/or Habitat Regulations Assessment (HRA). Notwithstanding these existing commitments, the stakeholder engagement policy may lead to a minor increase in stakeholder engagement commitments for proposals that fall below the EIA threshold; however proportionality is central to the policy and it outlines that minor proposals may not require extensive stakeholder engagement. Although stakeholder engagement is established within existing practice and policy, this is the first time it is presented in a written form for some marine sectors. This minor change is not significant.	Minor
Air Quality	EU Directives (including the Air Quality Directive 2008/50/EC), international obligations and national legislation require consideration of impacts on air quality. This includes consideration of the contribution from marine (ships) and coastal sources. The UK MPS also requires consideration of air quality impacts. Provisions exist for the assessment of impacts of proposals on air quality through existing processes, such as a SA, SEA, EIA, and terrestrial planning permission in the vicinity of an Air Quality Management Area (AQMA), HRA or other reports/assessments requested or produced by public authorities. The air quality policy is in line with these existing commitments.	No change
Climate Change	The UK Climate Change Act set targets on reducing greenhouse gases and provides a framework for adaptation. This is reflected in the Northern Ireland draft Programme for Government (PfG).The UK MPS requires consideration of the impact of proposals on greenhouse gas emissions and climate change resilience. Provisions exist for the assessment of the impact from proposals on climate factors through existing processes, such as SA, SEA, EIA, HRA or other reports/assessments requested or produced by public authorities. The climate change policy is in line with these existing commitments.	No change

Plan Policy	Review against existing policy	Outcome of review
Climate Change *Climate Change Mitigation*	The UK Climate Change Act sets targets on reducing greenhouse gases. This is reflected in the PfG. The UK MPS and terrestrial planning policy require consideration of climate change mitigation. The climate change policy is in line with these existing commitments.	No change
Climate Change *Climate Change Adaptation*	The UK Climate Change Act provides a framework for adaptation. The UK MPS and terrestrial planning policy require consideration of climate change adaptation. At a regional level, the policy may require proposers to consider the Northern Ireland Climate Change Adaption Programme where appropriate. The climate change policy is in line with these existing commitments.	No change
Coastal Processes	At a European level, the Water Framework Directive (WFD) requires consideration of impacts on hydromorphology, comprising both hydrological and morphological attributes, both of which are linked to coastal processes. The Marine Strategy Framework Directive (MSFD) also requires the consideration of sea floor integrity and hydrographical conditions, both of which are linked to coastal processes. At a regional level, terrestrial planning policy sets out policies to minimise flood risk to people, property and the environment and states development will not be permitted in areas of the coast known to be at risk from coastal erosion, or land instability. Living with Rivers and the Sea is the Government's response to the independent Flood Risk Management Policy Review of Rivers Agency, setting out a flexible framework for the delivery of flood risk management. In addition, the UK MPS requires consideration of coastal change in terms of physical changes to the shoreline (e.g. coastal erosion and accretion). Provision exists for the assessment of the impact from proposals on coastal processes through existing processes such as SA, SEA, EIA, HRA or other reports/assessments requested or produced by public authorities. The coastal processes policy is in line with these existing commitments.	No change
Coastal Processes *Resilience to Coastal Processes*	The WFD, MSFD and UK MPS and terrestrial planning policy already require the consideration of coastal processes (see above) and on proposals over their lifetime. The coastal processes policy is in line with these existing commitments.	No change
Co-existence	MSFD promotes the consideration of co-existence of relevant activities and uses. The UK MPS encourages the co-existence of compatible activities wherever possible. Provision may already exists for the consideration of potential impacts of proposals on other users and activities within existing processes such as SA, SEA, EIA, HRA or other reports/assessments requested or produced by public authorities. Notwithstanding these existing commitments, the co-existence policy may help to provide greater focus on the co-existence of marine activities. This minor change is not considered to be significant.	Minor
Cumulative	The UK MPS, terrestrial planning policy, and environmental policy and legislation (such as the Habitats Directive) require the cumulative	No change

Plan Policy	Review against existing policy	Outcome of review
Impacts	impacts of proposals to be taken into account. Provision exists for the assessment of cumulative impacts of proposals through existing processes such as SA, SEA, EIA and HRA or other reports/assessments requested or produced by public authorities. The cumulative impacts policy is in line with these existing commitments.	
Heritage Assets	Best practice guidance concerning the assessment of impacts on heritage assets (e.g. 2001 UNESCO Convention on the Protection of Underwater Cultural Heritage) and standards for archaeological protection, conservation and recording already exist (e.g. European Convention on the Protection of Archaeological Heritage (Valletta)). In addition terrestrial planning policy sets out the assessment requirements in the terrestrial planning regime. The UK MPS also includes consideration of cultural heritage. Provision exists for the assessment of potential impacts of proposals on heritage assets through existing processes such as SA, SEA, EIA, HRA or other reports/assessments requested or produced by public authorities. The heritage assets policy is in line with these existing commitments.	No change
Heritage Assets *Designated Heritage Assets*	Best practice guidance, national legislation (e.g. Protection of Wrecks Act 1973, Historic Monuments and Archaeological Objects (NI) Order 1995 and Planning (Northern Ireland) Order 2011) and the UK MPS require the protection and regulation of designated heritage assets. In addition terrestrial planning policy sets out the requirements for the assessment of proposals that potentially affect designated heritage assets. Provision exists for the assessment of the potential impacts of proposals on designated heritage assets through existing processes such as SA, SEA, EIA, HRA or other report/assessments requested or produced by public authorities. The designated heritage assets policy is in line with these existing commitments.	No change
Heritage Assets *Undesignated Heritage Assets*	National legislation (e.g. Merchant Shipping Act 1995), standards and protocols for the recording of new finds and undesignated heritage assets already exist. The UK MPS states that the absence of designation does not necessarily indicate lower significance and these assets should be subject to the same policy principles as designated heritage assets. Terrestrial planning policy also requires that the impacts of proposals on undesignated heritage assets are assessed. Provision exists for the assessment of potential impacts of proposals on undesignated heritage assets through existing processes such as SA, SEA, EIA or other reports/assessments requested or produced by public authorities. The undesignated heritage assets policy is in line with these existing commitments.	No change
Invasive Alien Species	International obligations (Convention on Biological Diversity 1992), European Directives (WFD, MSFD) and the Invasive Alien Species Strategy for Northern Ireland recognise the need to address invasive alien species and provide measures to manage this issue. For some sectors such as, shipping and aquaculture, policy and procedures relating to the risks from invasive alien species are well established. The UK MPS also requires the consideration of assessing the risk of introducing alien species for aquaculture. Provision exists for the	Minor

Plan Policy	Review against existing policy	Outcome of review
	assessment of the potential risk of introducing and/or spreading invasive alien species as a result of proposals through existing processes such as SA, SEA, EIA, HRA or other reports/assessments requested or produced by public authorities. The invasive alien species policy is in line with these existing commitments; however this is the first time it has been presented in a written form for some marine sectors. The will raise awareness of this issue across all sectors and may help an improved awareness of the risks from invasive alien species. This minor change is not considered to be significant.	
Land and Sea Interaction	The Maritime Spatial Planning Directive requires that land and sea interactions are considered as part of the marine planning process. The UK MPS also highlights that the Marine Planning system will sit alongside existing planning regimes on land. The policy is cognisant of River Basin Management Plans associated with the WFD and Planning in the Coastal Area. The approach will support the principles of integrated coastal zone management. Provisions exist for the consideration of land and sea interaction of proposals within existing processes such as SA, SEA, EIA, HRA or other reports/assessments requested or produced by public authorities. This policy is in line with existing commitments; however, this is the first time it is presented in a written form for most marine sectors. The policy potentially provides a stronger focus on the requirement for integrated planning, design and decision making as it relates to the interactions of land and sea. This minor change is not considered to be significant.	Minor
Marine Litter	The MSFD requires the consideration of marine litter in the coastal and marine environment. The UK MPS also highlights the need to take account of marine litter and highlights that tourism is a key pressure. The Northern Ireland Marine Litter Strategy also seeks to reduce the levels of litter entering the sea and remove litter which is already there. Provisions exist for the assessment of the risk of litter entering the marine area as a result of proposals through existing processes such as SA, SEA, EIA, HRA or other reports/assessments requested or produced by public authorities. This policy is therefore in line with existing commitments; however this is the first time it has been presented in a written form for some marine sectors. The policy will also ensure that greater consideration is given to the potential risk from land-based proposals to generate marine litter. This minor change is not considered to be significant.	Minor
Marine Noise	The MSFD requires the consideration of underwater noise and its effects on the marine environment. Under the MSFD's Programme of Measures a Noise Register has been established in the UK as a first step to assist regulatory authorities to determine licensed noise events/noisy activities. Marine noise would also form part of any assessment for protected species which may be adversely affected by noise (such as cetaceans). The UK MPS also recognises the potential effects of man-#made noise and highlights the issues for consideration. Provisions exist for the assessment of marine noise from proposals through existing processes such as SA, SEA, EIA, HRA or other reports/assessments requested or produced by public	Minor

Plan Policy	Review against existing policy	Outcome of review
	authorities. This policy is therefore in line with existing commitments; however this is the first time it has been presented in a written form for some marine sectors. This provides greater clarity and a stronger focus on the requirement to consider marine noise. This minor change is not considered to be significant.	
Natural Heritage *International and National Designated Sites and Protected Species*	EU Directives (MSFD, Birds & Habitats Directives), international agreements and commitments (Ramsar Convention, OSPAR Convention etc.), national and regional legislation (Marine and Coastal Access Act, Marine Act (Northern Ireland), Wildlife and Natural Environment Act (Northern Ireland) 2011, Wildlife (Northern Ireland) Order 1985 and the Conservation (Natural Habitats, etc) Regulations (Northern Ireland) 1995) recognise the importance of designated sites and protected species and provide for their protection. In addition terrestrial planning policy integrates the requirements of the legislation into the terrestrial planning regime. The UK MPS also requires that appropriate weight should be attached to designated sites and protected species. Provision exists for the assessment of the potential impacts of proposals on designated sites and protected species through existing mechanisms such as SA, SEA, EIA, HRA or other reports/assessments requested or produced by public authorities. The policy is in line with these existing commitments.	No change
Natural Heritage *Other Habitats, Species or Features of Importance*	The MSFD includes several key objectives in relation to marine ecology and biodiversity, and requires measures for achieving good environmental status (GES) to include spatial measures for the maintenance of biodiversity. This is in addition to WFD requirements for the consideration of biological quality elements (e.g. fish, invertebrates, macrophytes) that are used to assess the ecological status of a water body. The Wildlife and Natural Environment Act (Northern Ireland) and Wildlife (Northern Ireland) Order recognises the importance of other habitats, species and features of importance and identifies species of flora and fauna and types of habitat which are of principal importance for the purpose of conserving biodiversity. In addition terrestrial planning policy integrates the requirements of this legislation into the terrestrial planning regime. The UK MPS requires consideration of other species of principal importance for the conservation of biodiversity and to geological interests within the wider environment. Provision exists for the assessment of the impacts of proposals on other habitats, species or features of importance through existing processes such as SA, SEA, EIA or other reports/assessments requested or produced by public authorities. The policy is in line with these existing commitments.	No change
Seascape	The Nature Conservation and Amenity Lands (Northern Ireland) Order 1985 provides for the designation of Areas of Outstanding Natural Beauty (AONB) which recognise the quality of Northern Ireland's coastal landscapes. The UK MPS also requires, the marine plan authority to consider potential impacts on seascape, taking account of existing character and quality, how highly it is valued and its capacity to accommodate change specific to any development. Terrestrial planning policy requires that the potential impacts of proposals on	Minor

Plan Policy	Review against existing policy	Outcome of review
	visual amenity, designated landscapes, buildings and monuments are considered. Terrestrial planning also provides for the designation of areas due to their visual amenity. In addition, the Northern Ireland Regional Seascape Character Assessment 2014 defines distinct Seascape Character Areas around the coastline and provides information on their principle features of importance and supportive landscape character areas. Provisions exist for the assessment of the impact of proposals on seascape through existing processes such as SA, SEA, EIA or other reports/assessments requested or produced by public authorities. The seascape policy is in line with these existing commitments; however this is the first time it has been presented in a written form for some marine sectors. This may help ensure that the consideration is given to seascape in planning, design and decision making processes. This change is not considered to be significant.	
Use of Evidence	The UK MPS directs the Marine Plan Authority and decision makers in the use of evidence. Proportionate use of best available evidence is already part of existing decision making processes, such as for SA, SEA, EIA, HRA and other reports/assessments requested or produced by public authorities. The public access Marine Mapviewer which supplements the Marine Plan will improve proposers and decision maker's access to up-to-date evidence. This minor change is not considered to be significant.	Minor
Water Quality	EU Directives (including the WFD, MSFD, Urban Waste Water Treatment Directive (UWWTD), Nitrates Directive, Bathing Waters Directive) and regional legislation (including The Water (Northern Ireland) Order, Abstraction and Impoundment (Licensing) Regulations (Northern Ireland)) require consideration of impacts on water quality. The UK MPS recognises that development and other activities at the coast and at sea can have adverse effects on ecological and chemical water quality and resources. There are also existing and emerging strategies and guidance that take account of water quality, including the Regional Development Strategy, Social and Environmental Guidance for Water and Sewerage Services, the Water and Sewerage Services Act (Northern Ireland) 2016, and the Long-Term Water Strategy (2015-2040). Provisions exist for the assessment of the impact from proposals on water quality through existing processes such as, SA, SEA, EIA, HRA or other reports/assessments requested or produced by public authorities. The water quality policy is in line with these existing commitments.	No change
Aquaculture	At a European level the Reformed Common Fisheries Policy, the European Maritime and Fisheries Fund, the Blue Growth Initiative and the Strategic Guidelines for the sustainable development of EU aquaculture already promote sustainable growth of this sector. The WFD provides for the designation of Protected Areas to protect and improve the quality of shellfish waters, support shellfish production and contribute to high quality products for human consumption. At a regional level the Northern Ireland Executive in response to The Agri-Food Strategy Board's document 'Going for Growth' has set out actions to support the aquaculture industry. The UK MPS recognises	Minor

Plan Policy	Review against existing policy	Outcome of review
	the importance of aquaculture production in helping to contribute to increased food security and local production as a means of securing future supply in a way which is carbon efficient and fits local economies. The UK MPS also recognises the impacts of aquaculture, the issues for consideration and the importance of embracing any opportunities for co-existence. Provisions exist for the assessment of potential impacts from aquaculture proposals through existing processes, such as, Sustainable Mariculture in Northern Irish Lough Ecosystems (SMILE) models, SA, SEA, EIA, HRA or other reports/assessments requested or produced by public authorities. The policy applies the co-existence policy and is in line with existing commitments. The policy does encourage that new marine shellfish aquaculture activities locate within existing shellfish water protected areas. The spatial aspects of this policy, supported by the Marine Mapviewer introduce new guidance however; this change is not considered significant.	
Commercial Fishing ***Proposals with the potential to impact on fisheries***	At a European level the Reformed Common Fisheries Policy (CFP) provides the management framework for commercial fisheries and promotes sustainability. Decision makers must therefore have regard to the provisions of the CFP in developing any plans or proposals affecting fisheries. Under MSFD, GES requires populations of fish stocks to be exploited within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock. Existing regional policy, including the Northern Ireland Inshore Fisheries Strategy: Delivering a Sustainable Future already requires consideration of commercial fishing. The UK MPS highlights the value of commercial fishing to local communities and recognises that this activity can be radically affected by other marine activities and the issues which should be considered. It also recognises that many fishing activities are compatible with other sea users and opportunities for co-existence between fishing and other activities and uses should be encouraged wherever possible. Provisions exist for the assessment of the impacts of proposals on commercial fishing through existing processes such as SA, SEA, EIA or other reports/assessments requested or produced by public authorities. The commercial fishing policy applies the co-existence policy and is in line with a number of existing commitments. Although the commercial fishing policy is established within existing practice and policy, this is the first time it is presented in a written form for other marine sectors. The policy is supported by the information on commercial fishing activities in the Marine Mapviewer which will help resolve potential conflicts and minimise impacts on commercial fishing interests in Northern Ireland waters. This minor change is not considered to be significant.	Minor
Defence and National Security	Existing advice and guidance on defence and national security issues are available from the Ministry of Defence (MOD) and other relevant authorities, including the Maritime and Coast Guard Agency, HM Revenue and Customs, UK Border Force, National Crime Agency, Police Service of Northern Ireland and Belfast Harbour Police. The UK	No change

Plan Policy	Review against existing policy	Outcome of review
	MPS states that marine activities should not prejudice the interest of defence and national security and that the MOD should be consulted accordingly. It also recognises that individual and cumulative effects of marine infrastructure on both marine and land based MOD interests should be taken account of in decision making. The UK MPS also encourages the consideration of co-existing compatible activities and uses wherever possible. The defence and national security policy effectively applies the co-existence policy and is in line with existing commitments.	
Dredging	International obligations (e.g. OSPAR Convention 1992 and London Convention 1996) require the management of waste from dredged material. The UK MPS requires consideration of the potential adverse effects of any dredging activity or deposit on the marine ecosystem and others using the sea, as well as the internationally agreed hierarchy of waste management options for sea disposal. The UK MPS also encourages the consideration of co-existing compatible activities and uses wherever possible. Provisions exist for the assessment of the potential impacts from dredging activities and associated disposal of material through existing processes, such as SA, SEA, EIA, HRA or other reports/assessments requested or produced by public authorities. The policy applies the co-existence policy and is in line with existing commitments. Spatial direction on the disposal of dredged wastes at sea, states that preference is given to existing registered disposal sites. This spatial direction, supported by the Marine Mapviewer provides new guidance however; this change is not significant.	Minor
Energy	National Policy Statements for energy infrastructure (i.e. EN-1, EN-3, and EN-4) provide specific measures and actions to avoid or minimise adverse impacts in the offshore region. At a regional level, the Strategic Energy Framework sets out the key energy goals of building competitive markets, ensuring security of energy supply, enhancing sustainability and developing energy infrastructure to 2020. The UK MPS already requires that the national level of need for energy infrastructure as set out in the Strategic Energy Framework should be taken into account in decision making. In addition, the UK MPS recognises policy objectives to maximise economic development of the UK's oil and gas resources, and to develop the UK's low carbon manufacturing capability. It also recognises the importance of taking account of positive wider benefits of renewable and low carbon electricity generation, and that energy projects can only be developed where the resource exists and where economically feasible. In addition to the consideration of energy infrastructure, the UK MPS also encourages the consideration of co-existing compatible activities and uses wherever possible. Provision exists for the consideration of the potential impacts from energy proposals through existing processes, such as SA, SEA, EIA, HRA or other reports/assessments requested or produced by public authorities. The policy effectively applies the co-existence policy to energy proposals and is in line with existing commitments.	No change

Plan Policy	Review against existing policy	Outcome of review
Marine Aggregates	The UK MPS recognises the strategically important role of marine aggregates in securing an adequate and continuing supply to the UK market for various uses and requires consideration of impacts from marine aggregate proposals. In addition, the UK MPS encourages the consideration of co-existing compatible activities and uses wherever possible. The potential impacts from any marine aggregate activities can be assessed through existing processes, such as SA, SEA, EIA, HRA, or other reports/assessments including Coastal Impact Studies requested or produced by public authorities. The policy effectively applies the co-existence policy to marine aggregates projects and is in line with existing commitments.	No change
Ports, Harbours and Shipping ***Proposals with the potential to impact on navigational safety***	Under international law, freedom of navigation is a principle that, apart from the exceptions provided, ships flying the flag of any sovereign state shall not suffer interference from other states. This right is codified as article 87(1)a of the 1982 United Nations Convention of the Law of the Sea (UNCLOS). The UK MPS requires that any impacts on shipping activity, freedom of navigation and navigational safety are taken account of and minimised and that decisions are in compliance with international maritime law. The Port Marine Safety Code established a national standard for every aspect of port marine safety and applies to all harbour authorities in the UK that have statutory powers and duties. Provision already exists for the assessment of the potential impacts from proposals on navigational safety through existing mechanisms, namely a Navigation Risk Assessment in line with best practice. The policy is in line with these existing requirements and responsibilities of decision makers.	No change
Ports, Harbours and Shipping ***Proposals with the potential to impact on shipping***	Under international law, freedom of navigation is a principle that, apart from the exceptions provided for in international law, ships flying the flag of any sovereign state shall not suffer interference from other states. This right is codified as article 87(1)a of the 1982 United Nations Convention of the Law of the Sea (UNCLOS). The UK MPS requires that any impacts on shipping activity and freedom of navigation are taken account of and minimised and that decisions are in compliance with international maritime law. The UK MPS also encourages the consideration of co-existing compatible activities and uses wherever possible. The policy requires that other factors such as disruption to shipping activity with associated travelling time and fuel costs are considered. This reflects the UK MPS, which requires the consideration of environmental, social and economic effects associated with shipping. Provision already exists for the assessment of potential impacts from proposals on shipping activity and freedom of navigation through existing processes, such as SA, SEA, EIA or other reports/assessments requested or produced by public authorities. The consideration of these issues will also be supported by the information on shipping activity (including seasonal variations) in the Marine Mapviewer. The policy effectively applies the co-existence policy to shipping and is in line with existing commitments. However it is first time specific issues, such as disruption, travel time and fuel costs have been presented in a written policy. This change is not considered	Minor

Plan Policy	Review against existing policy	Outcome of review
	significant.	
Ports, Harbours and Shipping ***Ports and Harbours***	The Regional Development Strategy indicates the overall national level of need for port development in Northern Ireland based on port forecasts in the context of a market-led sector. The UK MPS requires the consideration of the impacts from port development. In addition, the UK MPS encourages the consideration of co-existing compatible activities and uses wherever possible. Provision exists for the assessment of the impacts from port and harbour proposals through existing processes, such as SA, SEA, EIA, HRA or other reports/assessments requested or produced by public authorities. The policy effectively applies the co-existence policy to ports and harbours proposals and is in line with existing commitments.	No change
Tele-communications Cabling	The UK MPS recognises the importance of telecommunication cabling as vital infrastructure for the domestic and global economy and requires the consideration of the impacts from cable installations. The UK MPS also encourages the consideration of co-existing compatible activities and uses wherever possible. Provision already exists for the assessment of the potential impacts from telecommunication proposals through existing processes, such as SA, SEA, EIA, HRA or other reports/assessments requested or produced by public authorities. The policy effectively applies the co-existence policy to telecommunications proposals and is in line with existing commitments. While the policy reflects existing high level policy and processes this is the first time, in the Northern Ireland marine area, a written policy is presented. This should provide greater clarity; however this change is not considered to be significant.	Minor
Tourism and Recreation	At a European level, Europe's Blue Growth Initiative reflects the desire to promote the sustainable growth of the coastal tourism sector, including the recreational opportunities. At a national level, the Executive's draft Programme for Government sets out the aims to increase tourism's contribution to delivering economic opportunities and to grow internationally. This is supported by the Regional Development Strategy that promotes a sustainable approach to the provision of tourism infrastructure. The UK MPS requires the consideration of the impacts from tourism and recreation and the importance of considering the links between marine and terrestrial plans in this regard. The UK MPS also encourages the consideration of co-existing compatible activities and uses wherever possible. Provision exists for the assessment of the potential impacts from tourism and recreation proposals through existing processes, such as a SA, SEA, EIA, HRA or other reports/assessments requested or produced by public authorities. The policy effectively applies the co-existence policy to tourism and recreation proposals and is in line with existing commitments.	No change

Appendix D2 – Individual Policy Assessment

Assessments were completed for the following policies:

Core Policies:
- Stakeholder Engagement;
- Co-existence;
- Invasive Alien Species;
- Land and Sea Interaction;
- Marine Litter;
- Marine Noise;
- Seascape; and,
- Use of Evidence.

Key Activity Policies:
- Aquaculture;
- Potential to impact on Commercial Fishing;
- Dredging;
- Potential to Impact on Shipping; and,
- Telecommunications Cabling.

Core Policy: Stakeholder Engagement

Description of proposal associated with policy		
Description of main types of proposal	This policy applies to all marine proposals and land-based proposals that have the potential to affect the Northern Ireland marine area.	
Locations where proposals are likely to occur	Anywhere a proposal affects or might affect the Northern Ireland marine area.	
Indication of numbers of proposals	The policy can apply to a wide range of decisions that affect or might affect the marine area, including terrestrial decisions, such as planning permissions. Given the scope of the policy, the numbers of proposals are unknown but could be large.	
SA Topics	**Description of Effect**	**Significance of Effect**
Biodiversity, Flora and Fauna	Stakeholder engagement can help ensure that relevant baseline information and stakeholder involvement in identifying concerns and/or solutions regarding biodiversity, flora and fauna are taken into account by proposers and decision makers. This is the first time for many sectors that a Stakeholder Engagement policy is presented in a written form. The policy clarifies that engagement should be proportionate to the scale and impact of the proposal. By identifying relevant issues and stakeholders, assisted by the Marine Mapviewer, at the earliest opportunity and prior to entering regulatory processes; the policy may improve the likelihood of reaching a broad consensus. The policy may also improve the evidence base and enhance the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on biodiversity, flora and fauna. Presenting the policy in written form also clarifies the evidence requirements relating to stakeholder engagement in 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. The policy supports the Co-existence, Use of Evidence and Natural Heritage policies of the Marine Plan. Although there could potentially be a large number of proposals required to take account of this policy, stakeholder engagement is already established within existing practice and regulatory processes. Therefore the change in baseline conditions for biodiversity, flora and fauna as a result of the policy,	Negligible

	will be negligible.	
Water and Soils	Stakeholder engagement can help ensure that relevant baseline information and stakeholder involvement in identifying concerns and/or solutions regarding water and soils are taken into account by proposers and decision makers. This is the first time for many sectors that a Stakeholder Engagement policy is presented in a written form. The policy clarifies that engagement should be proportionate to the scale and impact of the proposal. By identifying relevant issues and stakeholders, assisted by the Marine Mapviewer at the earliest opportunity and prior to entering regulatory processes; the policy may improve the likelihood of reaching a broad consensus. The policy may also improve the evidence base and enhance the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on water and soils. Presenting the policy in written form also clarifies the evidence requirements relating to stakeholder engagement in 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. The policy supports the Co-existence, Use of Evidence, and Water Quality policies of the Marine Plan. Although there could potentially be a large number of proposals required to take account of this policy, stakeholder engagement is already established within existing practice and regulatory processes. Therefore the change in baseline conditions for water and soils as a result of the policy, will be negligible.	Negligible
Air Quality	Stakeholder engagement can help ensure that relevant baseline information and stakeholder involvement in identifying concerns regarding air quality are taken into account by proposers and decision makers. This is the first time for many sectors that a Stakeholder Engagement policy is presented in a written form. The policy clarifies that engagement should be proportionate to the scale and impact of the proposal. By identifying relevant issues and stakeholders, assisted by the Marine Mapviewer at the earliest opportunity and prior to entering regulatory processes; the policy may improve the likelihood of reaching a broad consensus. The policy may also improve the evidence base and enhance the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on air quality. The policy supports the Co-existence, Use of Evidence and Air Quality policies of the Marine Plan. Although there could potentially be a large number of proposals required to take account of this policy, stakeholder engagement is already established within existing practice and regulatory processes.	Negligible

	Therefore the change in baseline conditions for air quality as a result of the policy, will be negligible.	
Climate Factors	Stakeholder engagement can help ensure that relevant baseline information and stakeholder involvement in identifying concerns and/or solutions regarding climate factors are taken into account by proposers and decision makers. This is the first time for many sectors that a Stakeholder Engagement policy is presented in a written form. The policy clarifies that engagement should be proportionate to the scale and impact of the proposal. By identifying relevant issues and stakeholders, assisted by the Marine Mapviewer, at the earliest opportunity and prior to entering regulatory processes; the policy may improve the likelihood of reaching broad a consensus. The policy may also improve the evidence base and enhance the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and decision making processes. This may have slight benefits in reducing greenhouse gas emissions. The policy supports the Co-existence, Use of Evidence and Climate Change policies of the Marine Plan. Although there could potentially be a large number of proposals required to take account of this policy, stakeholder engagement is already established within existing practice and regulatory processes. Therefore the change in baseline conditions for climate factors as a result of the policy will be negligible.	Negligible
Socio-Demographics	Stakeholder engagement can help ensure that relevant baseline information and stakeholder involvement in identifying concerns and/or solutions regarding socio-demographics are taken into account by proposers and decision makers. This is the first time for many sectors that a Stakeholder Engagement policy is presented in a written form. The policy clarifies that engagement should be proportionate to the scale and impact of the proposal. By identifying relevant issues and stakeholders, assisted by the Marine Mapviewer at the earliest opportunity and prior to entering regulatory processes; the policy may improve the likelihood of reaching a broad consensus. The policy may also improve the evidence base and enhance the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on socio-demographics. The policy supports the Co-existence and Use of Evidence policies of the Marine Plan. Although there could potentially be a large number of proposals required to take account of this policy, stakeholder engagement is already established within existing practice and regulatory processes. Therefore the change in baseline conditions for socio-demographics as a result of the policy, will be negligible.	Negligible

Uses and Activities (excluding noise, lighting and marine litter)	Stakeholder engagement can help ensure that relevant baseline information and stakeholder involvement in identifying concerns and/or solutions regarding uses and activities are taken into account by proposers and decision makers. This is the first time for many sectors that a Stakeholder Engagement policy is presented in a written form. The policy clarifies that engagement should be proportionate to the scale and impact of the proposal. By identifying relevant issues and stakeholders, assisted by the Marine Mapviewer, at the earliest opportunity and prior to entering regulatory processes; the policy may improve the likelihood of reaching a broad consensus. The policy may also improve the evidence base and enhance the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on these subtopics. Presenting the policy in written form also clarifies the evidence requirements relating to stakeholder engagement in 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. The policy supports the Co-existence, Use of Evidence and relevant Key Activity policies of the Marine Plan. Although there could potentially be a large number of proposals required to take account of this policy, stakeholder engagement is already established within existing practice and regulatory processes. Therefore the change in baseline conditions for these subtopics as a result of the policy, will be negligible.	Negligible
Uses and Activities (noise, lighting and marine litter)	Stakeholder engagement can help ensure that relevant baseline information and stakeholder involvement in identifying concerns and/or solutions regarding noise, litter and light are taken into account by proposers and decision makers. This is the first time for many sectors that a Stakeholder Engagement policy is presented in a written form. The policy clarifies that engagement should be proportionate to the scale and impact of the proposal. By identifying relevant issues and stakeholders, assisted by the Marine Mapviewer, at the earliest opportunity and prior to entering regulatory processes, the policy may improve the likelihood of reaching a broad consensus. The policy may also improve the evidence base and enhance the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals from noise, marine litter and lighting. The policy supports the Co-existence, Use of Evidence, Marine Litter and Marine Noise policies of the Marine Plan. Although there could potentially be a large number of proposals required to take account of this policy, stakeholder engagement is already established within existing practice and regulatory processes.	Negligible

	Therefore the change in baseline conditions for these subtopics as a result of the policy will be negligible.	
Material Assets	Stakeholder engagement can help ensure that relevant baseline information and stakeholder involvement in identifying concerns and/or solutions regarding material assets are taken into account by proposers and decision makers. This is the first time for many sectors that a Stakeholder Engagement policy is presented in a written form. The policy clarifies that engagement should be proportionate to the scale and impact of the proposal. By identifying relevant issues and stakeholders, assisted by the Marine Mapviewer at the earliest opportunity and prior to entering regulatory processes; the policy may improve the likelihood of reaching a broad consensus. The policy may also improve the evidence base and enhance the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on material assets. Presenting the policy in written form also clarifies the evidence requirements relating to stakeholder engagement in 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. The policy supports the Co-existence, Use of Evidence and relevant Key Activity policies of the Marine Plan. Although there could potentially be a large number of proposals required to take account of this policy, stakeholder engagement is already established within existing practice and regulatory processes. Therefore the change in baseline conditions for material assets as a result of the policy, will be negligible.	Negligible
Cultural Heritage	Stakeholder engagement can help ensure that relevant baseline information and stakeholder involvement in identifying concerns and/or solutions regarding cultural heritage are taken into account by proposers and decision makers. This is the first time for many sectors that a Stakeholder Engagement policy is presented in a written form. The policy clarifies that engagement should be proportionate to the scale and impact of the proposal. By identifying relevant issues and stakeholders, assisted by the Marine Mapviewer at the earliest opportunity and prior to entering regulatory processes; the policy may improve the likelihood of reaching a broad consensus. The policy may also improve the evidence base and enhance the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on cultural heritage. Presenting the policy in written form also clarifies the evidence requirements relating to stakeholder engagement in decision making processes. This may lead to more effective and efficient decision	Negligible

	making, thus reducing the risk of uncertainty and increasing the potential for a positive outcome. The policy supports the Co-existence, Use of Evidence and Heritage Assets policies of the Marine Plan. Although there could potentially be a large number of proposals required to take account of this policy, stakeholder engagement is already established within existing practice and regulatory processes. Therefore the change in baseline conditions for cultural heritage as a result of the policy will be negligible.	
Landscape and Seascape	Stakeholder engagement can help ensure that relevant baseline information and stakeholder involvement in identifying concerns and/or solutions regarding landscape and seascape are taken into account by proposers and decision makers. This is the first time for many sectors that a Stakeholder Engagement policy is presented in a written form. The policy clarifies that engagement should be proportionate to the scale and impact of the proposal. By identifying relevant issues and stakeholders, assisted by the Marine Mapviewer at the earliest opportunity and prior to entering regulatory processes; the policy may improve the likelihood of reaching a broad consensus. The policy may also improve the evidence base and enhance the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on landscape and seascape. The policy supports the Co-existence, Use of Evidence and Seascape policies of the Marine Plan. Although there could potentially be a large number of proposals required to take account of this policy, stakeholder engagement is already established within existing practice and regulatory processes. Therefore the change in baseline conditions for landscape and seascape as a result of the policy, will be negligible.	Negligible

Core Policy: Co-Existence

Description of proposal associated with policy		
Description of main types of proposal	**This policy applies to all marine proposals and land-based proposals that have the potential to affect the Northern Ireland marine area.**	
Locations where proposals are likely to occur	Anywhere a proposal affects or might affect the Northern Ireland marine area.	
Indication of numbers of proposals	The policy can apply to a wide range of decisions that affect or might affect the marine area. Given the scope of the policy, the number of proposals is unknown, but could be large.	
SA Topics	**Description of Effect**	**Significance of Effect**
Biodiversity, Flora and Fauna	Co-existence both maximises the efficient use of the marine area and helps ensure that potential conflicts between different uses and activities are avoided. This is the first time for many sectors that a Co-existence policy is presented in a written form. The policy may help to ensure that the concept, planning and design of proposals and decision making processes consider co-existence alongside other uses and activities, including those related to, or dependent on, biodiversity flora and fauna. This may have slight benefits in preventing or reducing any adverse impacts of proposals on biodiversity, flora and fauna. Presenting the policy in written form also clarifies the evidence requirements relating to co-existence in 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. The policy supports all of the other policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for biodiversity, flora and fauna as a result of the policy, will be negligible.	Negligible
Water and Soils	Co-existence both maximises the efficient use of the marine area and helps ensure that potential conflicts between different uses are avoided. This is the first time for many sectors that a Co-existence policy is presented in a written form. The policy may help to ensure that the concept, planning and design of proposals and decision making processes consider co-existence alongside other uses and activities, including those related to, or dependent on,	Negligible

	water and soils. This may have slight benefits in preventing or reducing any adverse impacts of proposals on water and soils. Presenting the policy in written form also clarifies the evidence requirements relating to co-existence in 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. The policy supports all of the other policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for water and soils as a result of the policy, will be negligible.	
Air Quality	Co-existence both maximises the efficient use of the marine area and helps ensure that potential conflicts between different uses and activities are avoided. This is the first time for many sectors that a Co-existence policy is presented in a written form. The policy may help to ensure that the concept, planning and design of proposals and decision making processes consider co-existence alongside other uses and activities, including those related to, or dependent on, air quality. This may have slight benefits in preventing or reducing any adverse impacts of proposals on air quality. The policy supports all of the other policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for air quality as a result of the policy will be negligible.	Negligible
Climate Factors	The Co-existence policy is unlikely to influence the baseline conditions for climate factors.	No effect
Socio-Demographics	Co-existence both maximises the efficient use of the marine area and helps ensure that potential conflicts between different uses (and their socio-demographics outcomes) are avoided. This is the first time for many sectors that a Co-existence policy is presented in a written form. The policy may help to ensure that the concept, planning and design of proposals and decision making processes consider co-existence alongside other uses and activities and their socio-demographic outcomes. This may have slight benefits in preventing or reducing any adverse impacts of proposals on socio-demographics. The policy supports all of the other policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline	Negligible

	conditions for socio-demographics as a result of the policy, will be negligible.	
Uses and Activities (excluding, lighting, noise and marine litter).	Co-existence both maximises the efficient use of the marine area and helps ensure that potential conflicts between different uses and activities are avoided. This is the first time for many sectors that a Co-existence policy is presented in a written form. The policy may help to ensure that the concept, planning and design of proposals and decision making processes consider co-existence alongside other uses and activities. This may have slight benefits in preventing or reducing any adverse impacts of proposals on these subtopics. The policy may also provide opportunities for synergies between uses and activities. Presenting the policy in written form also clarifies the evidence requirements relating to co-existence in 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. The policy supports all of the other policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for these subtopics as a result of the policy, will be negligible.	Negligible
Uses and Activities – Lighting, noise and marine litter	Co-existence both maximises the efficient use of the marine area and helps ensure that potential conflicts between different uses and activities are avoided. This is the first time for many sectors that a Co-existence policy is presented in a written form. The policy may help to ensure that the concept, planning and design of proposals and decision making processes consider co-existence alongside other uses and activities, including those which can be affected by lighting, noise and marine litter. This may have slight benefits in preventing or reducing any adverse impacts of lighting, noise and/or marine litter from proposals that might affect the marine area. The policy supports all of the other policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for these subtopics as a result of the policy, will be negligible.	Negligible
Material Assets	Co-existence both maximises the efficient use of the marine area and helps ensure that potential conflicts between different uses and activities, including material assets, are avoided. This is the first time for many sectors that a Co-existence policy is presented in a written form. The policy may help to ensure that the concept, planning and design of proposals and decision making processes consider co-existence alongside other uses, activities and material assets. This may have slight benefits	Negligible

	in preventing or reducing any adverse impacts of proposals on material assets. The policy may also provide opportunities for synergies between uses and activities, including material assets. Presenting the policy in written form also clarifies the evidence requirements relating to co-existence in 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. The policy supports all of the other policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for material assets as a result of the policy, will be negligible.	
Cultural Heritage	Co-existence both maximises the efficient use of the marine area and helps ensure that potential conflicts between different uses and activities, including cultural heritage, are avoided. This is the first time for many sectors that a Co-existence policy is presented in a written form. The policy may help to ensure that the concept, planning and design of proposals and decision making processes consider co-existence alongside other uses and activities, including those related to cultural heritage. This may have slight benefits in preventing or reducing any adverse impacts of proposals on cultural heritage. Presenting the policy in written form also clarifies the evidence requirements relating to co-existence in decision making processes. This may lead to more effective and efficient decision making processes, thus reducing the risk of uncertainty and increasing the potential for a positive outcome. The policy supports all of the other policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for cultural heritage as a result of the policy, will be negligible.	Negligible
Landscape and Seascape	Co-existence both maximises the efficient use of the marine area and helps ensure that potential conflicts between different uses and activities are avoided. This is the first time for many sectors that a Co-existence policy is presented in a written form. The policy may help to ensure that the concept, planning and design of proposals and decision making processes consider co-existence alongside other uses and activities, including those related to, or dependent on, landscape and seascape. This may have slight benefits in preventing or reducing any adverse impacts of proposals on landscape and seascape. The policy supports all of the other policies of the Marine Plan.	Negligible

	There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for landscape and seascape as a result of the policy, will be negligible.	

Core Policy: Invasive Alien Species

Description of proposal associated with policy		
Description of main types of proposal	This policy applies to all marine proposals and land-based proposals that have the potential to introduce and/or spread invasive alien species in the Northern Ireland marine area. These include proposals that involve the use of vessels, due to the risk of introduction via ballast water and/or hull fouling; aquaculture proposals whereby introduced species breed and establish in the wild; as well as proposals involving the introduction of a new surface in the aquatic environment e.g. coastal defences, port development and recreational or tourism developments in coastal areas, which could provide a colonisation surface for invasive alien species.	
Locations where proposals are likely to occur	Anywhere a proposal affects or might affect the Northern Ireland marine area.	
Indication of numbers of proposals	The policy can apply to a wide range of decisions that affect or might affect the marine area. Given the scope of the policy, the numbers of proposals are unknown but could be large.	
SA Topics	**Description of Effect**	**Significance of Effect**
Biodiversity, Flora and Fauna	Invasive alien species may result in a negative impact on biodiversity through a range of mechanisms such as through competition, herbivory, predation, alteration of habitats and food webs, introduction of parasites and pathogens and the dilution of native gene pools. Once introduced the impacts of invasive alien species can be serious and can have long term consequences. This is the first time for many sectors that a policy on invasive alien species is presented in a written form. The policy may help to ensure that consideration is given to invasive alien species, including any potential impact on biodiversity, flora and fauna, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits for biodiversity, flora and fauna; by preventing or reducing any adverse impact from the introduction of and/or spread of invasive alien species. Presenting the policy in written form also clarifies the evidence requirements relating to invasive alien species in 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. The policy supports the Stakeholder Engagement, Use of Evidence and Natural Heritage policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline	Negligible

	conditions for biodiversity, flora and fauna as a result of the policy, will be negligible.	
Water and Soils – geomorphology and sediment processes, water and sediment quality	Some invasive alien species could have the potential to affect geomorphology and sediment processes through changes in bioturbation, sedimentation and erosion. Invasive alien species can also affect water and sediment quality (e.g. nutrients, dissolved oxygen) through changes in biological processes (e.g. decomposition, excretion). Once introduced, the impacts of invasive alien species can be serious and have long term consequences. This is the first time for many sectors that a policy on invasive alien species is presented in a written form. The policy may help to ensure that consideration is given to invasive alien species, including any potential impact on these subtopics, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits for these subtopics by preventing or reducing any adverse impact from the introduction of and/or spread of invasive alien species. Presenting the policy in written form also clarifies the evidence requirements relating to invasive alien species in 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. The policy supports the Stakeholder Engagement, Use of Evidence and Water Quality policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for these subtopics as a result of the policy, will be negligible.	Negligible
Water and Soils – bathymetry and hydrography, geology	The Invasive Alien Species policy is unlikely to influence the baseline conditions for these subtopics.	No effect
Air Quality	The Invasive Alien Species policy is unlikely to influence the baseline conditions for air quality.	No effect
Climate Factors	The Invasive Alien Species policy is unlikely to influence the baseline conditions for climate factors.	No effect
Socio-Demographics	Invasive alien species can affect marine uses and activities including fisheries, aquaculture, tourism and recreation; which in turn can result in socio-economic impacts. Invasive alien species can also be carriers of human disease and pose risks to human health. Once introduced, the impacts of invasive alien species can be serious and have long term consequences. There can be very significant and long term costs, for both private and public sectors, associated with the eradication and/or management of invasive alien species. This is the first time for many sectors that a policy on invasive alien species is presented in a written form. The policy may help to ensure that consideration is given to the potential introduction and/or	Negligible

	spread of invasive alien species, including any potential impact on socio-demographics, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes This may have slight benefits for socio-demographics by preventing or reducing any adverse impact from the introduction of and/or spread of invasive alien species. The policy supports the Stakeholder Engagement, Use of Evidence and relevant Key Activity policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for socio-demographics as a result of the policy will be negligible.	
Uses and Activities – aquaculture and commercial fisheries	Invasive alien species can affect native stocks of finfish and shellfish via competitive exclusion, niche displacement, or hybridisation with related native species. Invasive alien species can also affect aquaculture and commercial fisheries, if their proliferation affects the effective use of fishing equipment, infrastructure and vessels. Aquaculture activities can result in the introduction of invasive alien species; however the industry in Northern Ireland has management measures to minimise these risks. Once introduced the impacts of invasive alien species can be serious and have long term consequences. This is the first time for many sectors that a policy on invasive alien species is presented in a written form. The policy may help to ensure that consideration is given to the potential introduction and/or spread of invasive alien species, including any potential impact on aquaculture and commercial fisheries, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits for aquaculture and commercial fisheries, by preventing or reducing any adverse impact from the introduction of and/or spread of invasive alien species. Presenting the policy in written form also clarifies the evidence requirements relating to invasive alien species in 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. The policy supports the Stakeholder Engagement, Use of Evidence, Aquaculture and Commercial Fisheries policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for aquaculture and commercial fisheries as a result of the policy, will be negligible.	Negligible
Uses and Activities - ports, shipping, navigation, dredging and disposal, military activity,	Invasive alien species can be transferred via ballast water and ship's hulls, or be introduced as a result of the presence of new structures. Activities such as dredging or construction can also potentially spread invasive alien species. Once introduced the impacts of invasive alien species can be serious and have long term consequences. For ports and harbours there can be significant eradication and/or	Negligible

coastal defence	management costs. The shipping industry has well established measures to manage the risks relating to invasive alien species. This is the first time for many sectors that a policy on invasive alien species is presented in a written form. The policy may help to ensure that consideration is given to the potential introduction and/or spread of invasive alien species, including any potential impact on these sub-topics, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits for these sub-topics by preventing or reducing any adverse impact from the introduction of and/or spread of invasive alien species. Presenting the policy in written form also clarifies the evidence requirements relating to invasive alien species in 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. The policy supports the Stakeholder Engagement, Use of Evidence and relevant Key Activity policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for these sub-topics as a result of the policy, will be negligible.	
Uses and Activities – tourism and recreation	The ecological impacts of invasive alien species can affect tourism and recreation activities such as angling and wildlife watching. Tourism and recreational activities, such as boating can also potentially introduce and/or spread invasive alien species. For the tourism and recreation industry there can be significant eradication and/or management costs. Once introduced the impacts of invasive alien species can be serious and have long term consequences. This is the first time for many sectors that a policy on invasive alien species is presented in a written form. The policy may help to ensure that consideration is given to the potential introduction and/or spread of invasive alien species, including any potential impact on tourism and recreation, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits for tourism and recreation by preventing or reducing any adverse impact from the introduction of and/or spread of invasive alien species. Presenting the policy in written form also clarifies the evidence requirements relating to invasive alien species in 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. The policy supports the Stakeholder Engagement, Use of Evidence and Tourism and Recreation policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However,	Negligible

	as the policy reflects existing commitments and decision making processes, the change in baseline conditions for tourism and recreation as a result of the policy will be negligible.	
Uses and Activities – aviation, noise, lighting, marine litter	The Invasive Alien Species policy is unlikely to influence the baseline conditions for these subtopics.	No effect
Material Assets	Invasive alien species can be transferred via ballast water and ships' hulls or be introduced as a result of the presence of new structures. Once introduced, the impacts of invasive alien species can be serious and have long term consequences. For material assets there can significant eradication and/or management costs. This is the first time for many sectors that a policy on invasive alien species is presented in a written form. The policy may help to ensure that consideration is given to the potential introduction and/or spread of invasive alien species, including any potential impact on these sub-topics, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits for material assets by preventing or reducing any adverse impact from the introduction of and/or spread of invasive alien species. Presenting the policy in written form also clarifies the evidence requirements relating to invasive alien species in 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. The policy supports the Stakeholder Engagement, Use of Evidence and relevant Key Activity policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. As the policy reflects existing commitments and decision making processes, the change in baseline conditions for material assets as a result of the policy, will be negligible.	Negligible
Cultural Heritage	The Invasive Alien Species policy is unlikely to influence the baseline conditions for cultural heritage.	No effect
Landscape and Seascape	The Invasive Alien Species policy is unlikely to influence the baseline conditions for landscape and seascape.	No effect

Core Policy: Land and Sea Interaction

Description of proposal associated with policy		
Description of main types of proposal	This policy applies to all marine proposals and land-based proposals that have the potential to affect the Northern Ireland marine area. These include proposals in the marine area that have some level of reliance and/or impact on land and proposals on land which have some level of reliance and/or impact on the marine area.	
Locations where proposals are likely to occur	Anywhere a proposal affects or might affect the Northern Ireland marine area.	
Indication of numbers of proposals	The policy can apply to a wide range of decisions that affect or might affect the marine area, including terrestrial decisions, such as planning permissions. Given the scope of the policy, the numbers of proposals are unknown but could be large.	
SA Topics	**Description of Effect**	**Significance of Effect**
Biodiversity, Flora and Fauna	Proposals on land, even those far from the coast, can have some level of reliance on and/or can affect the marine area, for example by discharging into rivers. Similarly marine proposals can have some level of reliance on and/or can impact on land, for example the need for supporting infrastructure, such as roads or services. Dependent on the nature of the proposal, impacts can be temporary, long term, permanent and/or intermittent, (e.g. associated with construction or decommissioning activities or during the operational phase of the proposal). The land and sea interaction of proposals is an important consideration which will ensure that relevant baseline information and impacts on biodiversity, flora and fauna are taken into account in an integrated and holistic manner. This is the first time for many sectors that a policy on land and sea interaction is presented in a written form. The policy may help to ensure that consideration is given to land and sea interactions, including any potential impact on biodiversity, flora and fauna, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on biodiversity, flora and fauna in the marine and terrestrial environment. Presenting the policy in written form also clarifies the evidence requirements relating to land and sea interactions in 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. The policy supports the Co-existence, Use of Evidence, Natural Heritage and Coastal Processes policies of the Marine Plan.	Negligible

	There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for biodiversity, flora and fauna as a result of the policy, will be negligible.	
Water and Soils	Proposals on land, even those far from the coast, can have some level of reliance on and/or can affect the marine area, for example by disturbing sediment transport/circulation processes. Similarly marine proposals can have some level of reliance on and/or can impact on land, for example the need for supporting infrastructure, such as coastal engineering. Dependent on the nature of the proposal, impacts can be temporary, long term, permanent and/or intermittent (e.g. associated with construction or decommissioning activities or during the operation phase of the proposal). The land and sea interaction of proposals is an important consideration which will ensure that relevant baseline information and impacts on water and soils are taken into account in an integrated and holistic manner. This is the first time for many sectors that a policy on land and sea interaction is presented in a written form. The policy may help to ensure that consideration is given to land and sea interactions, including any potential impact on water and soils, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on the water and soils of the marine and terrestrial environment. Presenting the policy in written form also clarifies the evidence requirements relating to land and sea interactions in 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. The policy supports the Co-existence, Use of Evidence, Water Quality and Coastal Processes policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions of water and soils as a result of the policy, will be negligible.	Negligible
Air Quality	Marine proposals can have some level of reliance on and/or can affect land, for example through the need for supporting infrastructure, such as roads with associated traffic and air quality issues. Dependent on the nature of the proposal, impacts can be temporary, long term, permanent and/or intermittent (e.g. associated with construction or decommissioning activities or during the operation phase of the proposal). The land and sea interaction of proposals is an important consideration which will ensure that relevant baseline information and impacts on air quality are taken into account in an integrated and holistic mannerThis is the first time for many sectors that a policy on land and sea interaction is presented in a written form. The policy may help to ensure that consideration is given to land and sea interactions,	Negligible

	including any potential impact on air quality, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on the air quality of the marine and terrestrial environment. The policy supports the Co-existence, Use of Evidence and Air Quality policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions of air quality as a result of the policy, will be negligible.	
Climate Factors	Proposals can contribute to greenhouse emissions, or can be susceptible to changes in climatic conditions. These impacts tend to be long term. The land and sea interaction of proposals is an important consideration which will ensure that relevant baseline information and impacts on climate factors are taken into account in an integrated and holistic manner. This is the first time for many sectors that a policy on land and sea interaction is presented in a written form. The policy may help to ensure that consideration is given to land and sea interactions, including climate factors, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making. This may have slight benefits in preventing or reducing any adverse impact of proposals on the climate. The policy supports the Co-existence, Use of Evidence and Climate Change policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions of climate factors as a result of the policy, will be negligible.	Negligible
Socio-Demographics	Proposals on land, even those far from the coast, can have some level of reliance on and/or can affect the marine area or marine uses and activities, for example by discharging into rivers and potentially affecting water quality. Similarly marine proposals can have some level of reliance on and/or impact on land, for example by increased use of terrestrial transport networks. Dependent on the nature of the proposal, impacts can be temporary, long term, permanent and/or intermittent (e.g. associated with construction or decommissioning activities or during the operation phase of the proposal). The land and sea interaction of proposals is an important consideration which will ensure that relevant baseline information and impacts on socio-demographic factors are taken into account in an integrated and holistic manner. This is the first time for many sectors that a policy on land and sea interaction is presented in a written form. The policy may help to ensure that consideration is given to land and sea interactions, including those related to socio-demographics, in the concept, planning and design of proposals (during all phases	Negligible

	i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on socio-demographics. The policy supports the Co-existence, Use of Evidence, Stakeholder Engagement and relevant Key Activity policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions of socio-demographics as a result of the policy, will be negligible.	
Uses and Activities – aquaculture, commercial fisheries, ports, shipping, navigation, dredging and disposal, military activity, coastal defence, tourism and recreation.	Proposals on land, even those far from the coast, can have some level of reliance on and/or can affect the marine area or marine uses and activities, for example by discharging into rivers and potentially affecting water quality. Similarly marine proposals can have some level of reliance on and/or impact on land, for example through the need for supporting infrastructure. Dependent on the nature of the proposal, impacts can be temporary, long term, permanent and/or intermittent (e.g. associated with construction or decommissioning activities or during the operational phase of the proposal). The land and sea interaction of proposals is an important consideration which will ensure that relevant baseline information and impacts on uses and activities are taken into account in an integrated and holistic manner. This is the first time for many sectors that a policy on land and sea interaction is presented in a written form. The policy may help to ensure that consideration is given to land and sea interactions, including how uses and activities may affect or be affected by other uses and activities, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on these subtopics. Presenting the policy in written form also clarifies the evidence requirements relating to land and sea interactions in 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. The policy supports the Co-existence, Use of Evidence, Stakeholder Engagement and relevant Key Activity policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions of these uses and activities as a result of the policy, will be negligible.	Negligible
Uses and Activities – marine litter, noise, lighting	Proposals on land, even those far from the coast, can have some level of reliance on and/or can affect the marine area, for example litter entering rivers can become marine litter. Similarly marine proposals can have some level of reliance on and/or impact on land, for example through the need for supporting infrastructure. Dependent on the nature of the proposal, impacts can be temporary, long term, permanent	Negligible

	and/or intermittent (e.g. associated with construction or decommissioning activities or during the operation phase of the proposal). The land and sea interaction of proposals is an important consideration which will ensure that relevant baseline information and impacts on these subtopics are taken into account in an integrated and holistic manner. This is the first time for many sectors that a policy on land and sea interaction is presented in a written form. The policy may help to ensure that consideration is given to land and sea interactions, including those related to marine litter, noise and lighting in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on these subtopics. Presenting the policy in written form also clarifies the evidence requirements relating to land and sea interactions in 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. The policy supports the Co-existence, Use of Evidence, Marine Litter and Marine Noise policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions of these subtopics as a result of the policy, will be negligible.	
Uses and Activities - aviation	Marine proposals through land and sea interaction can affect the land, for example tall structures near airports can impact on radar and safety. Dependent on the nature of the proposal, impacts can be temporary, long term, permanent and/or intermittent, for example permanent structures, or the temporary docking/anchoring of tall vessels/structures. The land and sea interaction of proposals is an important consideration which will ensure that relevant baseline information and impacts on aviation are taken into account in an integrated and holistic manner. This is the first time for many sectors that a policy on land and sea interaction is presented in a written form. The policy may help to ensure that consideration is given to land and sea interactions, including those related to aviation, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on aviation. Presenting the policy in written form also clarifies the evidence requirements relating to land and sea interactions in 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. The policy supports the Co-existence, Use of Evidence and Stakeholder Engagement policies of the	Negligible

	Marine Plan. The numbers of proposals that could interact with aviation is small. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions of aviation as a result of the policy, will be negligible.	
Material Assets	Proposals on land, even those far from the coast, can have some level of reliance on and/or can affect the marine area and material assets, for example through industrial discharges. Similarly marine proposals can have some level of reliance on and/or impact on land, for example terrestrial landing stations, offloading facilities or other services. Dependent on the nature of the proposal, impacts can be temporary, long term, permanent and/or intermittent (e.g. associated with construction or decommissioning activities or during the operational phase of the proposal). The land and sea interaction of proposals is an important consideration which will ensure that relevant baseline information and impacts on material assets are taken into account in an integrated and holistic manner. This is the first time for many sectors that a policy on land and sea interaction is presented in a written form. The policy may help to ensure that consideration is given to land and sea interactions in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on Material Assets. Presenting the policy in written form also clarifies the evidence requirements relating to land and sea interactions in 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. The policy supports the Co-existence, Use of Evidence, Stakeholder Engagement and relevant Key Activity policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for material assets as a result of the policy, will be negligible.	Negligible
Cultural Heritage	Cultural Heritage can interact with both the land and the sea, such as historic harbours, tidal mills and bridges. Impacts on either the land or marine area can affect the overall integrity of the cultural heritage asset. Often impacts can be permanent given the irreplaceable nature of in situ cultural heritage. However impacts can also be temporary, long term and/or intermittent (dependent on the nature of the proposal, e.g. associated with survey, construction or operation phase). The land and sea interaction of proposals is an important consideration which will ensure that relevant baseline information and impacts on cultural heritage are taken into account in an integrated and holistic manner.	Negligible

	This is the first time for many sectors that a policy on land and sea interaction is presented in a written form. The policy may help to ensure that consideration is given to land and sea interactions, including those related to cultural heritage, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on cultural heritage. Presenting the policy in written form also clarifies the evidence requirements relating to land and sea interactions in 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. The policy supports the Co-existence, Use of Evidence, Stakeholder Engagement and Heritage Assets policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions of cultural heritage as a result of the policy, will be negligible.	
Landscape and Seascape	The land and sea characteristics of landscape and seascape can be affected by marine and terrestrial proposals. Dependent on the nature of the proposal, impacts can be temporary, long term, permanent and/or intermittent (e.g. associated with construction or decommissioning activities or during the operational phase of the proposal). The land and sea interaction of proposals is an important consideration which will ensure that relevant baseline information and impacts on landscape and seascape are taken into account in an integrated and holistic manner. This is the first time for many sectors that a policy on land and sea interaction is presented in a written form. The policy may help to ensure that consideration is given to land and sea interactions, including those related to landscape and seascape, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on landscape and seascape. The policy supports the Co-existence, Use of Evidence, Stakeholder Engagement and Seascape policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions of landscape and seascape as a result of the policy, will be negligible.	Negligible

Core Policy: Marine Litter

Description of proposal associated with policy		
Description of main types of proposal	This policy applies to all marine proposals and land-based proposals that have the potential to generate marine litter in the Northern Ireland marine area, particularly in coastal areas and some river catchments, e.g. fast food outlets, events, urban development and recreational or tourism developments.	
Locations where proposals are likely to occur	Anywhere a proposal affects or might affect the Northern Ireland marine area. Once litter enters the marine area it can be transported over considerable distances. Marine litter is not necessarily specific to the area in which a proposal occurs but extends to the marine area more generally.	
Indication of numbers of proposals	The policy can apply to a wide range of decisions that affect or might affect the marine area, including terrestrial decisions, such as planning permissions. Given the scope of the policy, the numbers of proposals are unknown but could be large.	
SA Topics	**Description of Effect**	**Significance of Effect**
Biodiversity, Flora and Fauna	Marine litter can affect fauna through entanglement, entrapment and ingestion, which in turn can interfere with biological production and marine food webs, and impact on coastal and marine habitats. These impacts are often long term. This is the first time for many sectors that a Marine Litter policy is presented in a written form. The policy may help to ensure that consideration is given to marine litter, including any potential impact on biodiversity, flora and fauna, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on biodiversity, flora and fauna. Presenting the policy in written form also clarifies the evidence requirements relating to marine litter in 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. The policy supports the Co-existence, Stakeholder Engagement, Natural Heritage, Use of Evidence and Land and Sea Interaction policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for biodiversity, flora and fauna as a result of the policy, will be negligible.	Negligible
Water and Soils – water and	Marine litter can affect water and sediment quality. Contaminants can leach out of marine litter, disperse	Negligible

sediment quality	in the water column and accumulate in sediments, which can reduce water and sediment quality. Contaminants may also preferentially adhere to microplastics creating a new impact pathway for contaminants to affect ecological or human receptors. These impacts are often long term. This is the first time for many sectors that a Marine Litter policy is presented in a written form. The policy may help to ensure that consideration is given to marine litter, including any potential impact on this sub-topic, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on this subtopic. Presenting the policy in written form also clarifies the evidence requirements relating to marine litter in 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. The policy supports the Co-existence, Water Quality, Stakeholder Engagement, Use of Evidence, Land and Sea Interaction, and relevant Key Activity policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for these subtopics of water and soils as a result of the policy, will be negligible.	
Water and Soils – bathymetry and hydrography, geology, geomorphology and sediment processes	The Marine Litter policy is unlikely to influence the baseline conditions for these subtopics.	No effect
Air Quality	The Marine Litter policy is unlikely to influence the baseline conditions for air quality.	No effect
Climate Factors	The Marine Litter policy is unlikely to influence the baseline conditions for climate factors.	No effect
Socio-Demographics	The Marine Litter policy is unlikely to influence the baseline conditions for socio-demographics.	No effect
Uses and Activities – marine litter	This is the first time for many sectors that a Marine Litter policy is presented in a written form. The policy may help to ensure that consideration is given to marine litter in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of marine litter. The policy supports the Co-existence, Stakeholder Engagement, Use of Evidence, Land and Sea Interaction and relevant Key Activity policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However,	Negligible

	as the policy reflects existing commitments and decision making processes, the change in baseline conditions for marine litter as a result of the policy, will be negligible.	
Uses and Activities – commercial fisheries and aquaculture	Marine litter can damage finfish through entanglement, entrapment and ingestion. Shellfish can also be affected through the ingestion of leached chemicals from marine debris and ingested contaminants adhered to microplastics. Marine litter can also affect commercial fisheries if it becomes snagged, entangled or damages fishing equipment. These impacts are often long term. This is the first time for many sectors that a Marine Litter policy is presented in a written form. The policy may help to ensure that consideration is given to marine litter, including any potential impact on these subtopics, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on these subtopics. Presenting the policy in written form also clarifies the evidence requirements relating to marine litter in 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. The policy supports the Co-existence, Stakeholder Engagement, Land and Sea Interaction, Use of Evidence and relevant Key Activity policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for these subtopics as a result of the policy, will be negligible.	Negligible
Uses and Activities – ports, shipping, navigation, dredging and disposal.	Marine litter can result in a safety issue for ports, shipping, navigation, dredging and disposal, such as collision risks. Dependent on the nature of the proposal marine litter impacts can be temporary, long term, permanent and/or intermittent. This is the first time for many sectors that a Marine Litter policy is presented in a written form. The policy may help to ensure that consideration is given to marine litter, including any potential impact on these subtopics, in the concept, planning and design of proposals (during all phases, survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on these subtopics. Presenting the policy in written form also clarifies the evidence requirements relating to marine litter in 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. The policy supports the Co-existence, Stakeholder Engagement, Land and Sea Interaction, Use of Evidence and relevant Key Activity policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline	Negligible

	conditions for these subtopics as a result of the policy, will be negligible.	
Uses and Activities – military activity, coastal defences.	Marine litter is unlikely to have significant effects on military activities and coastal defences, however these subtopics are potential sources of marine litter (e.g. from construction operations or when coastal defences are also used as recreational assets i.e. walking trails). This is the first time for these subtopics that a Marine Litter policy is presented in a written form and it clarifies the evidence requirements relating to marine litter in 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. The policy supports the Co-existence, Stakeholder Engagement, Land and Sea Interaction, Use of Evidence and relevant Key Activity policies of the Marine Plan. There would only be a limited number of military activity and coastal defence proposals per year. In addition, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for these subtopics as a result of the policy, will be negligible.	Negligible
Uses and Activities - recreation and tourism	Marine litter can affect human health, and tourism and recreational assets, such as beaches, harbours and coastal waters by detracting from their enjoyment and/or visual setting. The presence of litter on blue flag beaches can affect award status. Landowners (e.g. district councils) can also incur costs from removing marine litter. These impacts are often long term but may be subject to seasonal fluctuations. This is the first time for many sectors that a Marine Litter policy is presented in a written form. The policy may help to ensure that consideration is given to marine litter, including any potential impact on tourism and recreation, in the concept, planning and design of proposals (during all phases, survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on recreation and tourism. Presenting the policy in written form also clarifies the evidence requirements relating to marine litter in 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. The policy supports the Co-existence, Stakeholder Engagement, Land and Sea Interaction, Use of Evidence and Tourism and Recreation policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for tourism and recreation as a result of the policy, will be negligible.	Negligible
Uses and Activities – aviation, noise and lighting	The Marine Litter policy is unlikely to influence the baseline conditions of aviation, noise and lighting.	No effect

Material Assets	Marine litter is unlikely to have significant effects on material assets. However, material assets are potential sources of marine litter. This is the first time for many marine sectors that a Marine Litter policy is presented in a written form and it clarifies the evidence requirements relating to marine litter in decision making processes. For material assets this may lead to more effective and efficient decision making, thus reducing the risk of uncertainty and increasing the potential for a positive outcome. The policy supports the Co-existence, Stakeholder Engagement, Land and Sea Interaction, Use of Evidence and relevant Key Activity policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for material assets as a result of the policy, will be negligible.	Negligible
Cultural Heritage	Marine litter could affect the appearance, integrity and public enjoyment of cultural heritage features and their setting. Dependent on the nature of the proposal marine litter impacts can be temporary, long term, permanent and/or intermittent. This is the first time for many sectors that a Marine Litter policy is presented in a written form. The policy may help to ensure that consideration is given to marine litter, including any potential impact on cultural heritage, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on cultural heritage. Presenting the policy in written form also clarifies the evidence requirements relating to marine litter in 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. The policy supports the Co-existence, Heritage Assets, Stakeholder Engagement, Use of Evidence and Land and Sea Interaction policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for cultural heritage as a result of the policy, will be negligible.	Negligible
Landscape and Seascape	Marine litter deposited in coastal areas can affect the character of some coastal localities such as beaches. Dependent on the nature of the proposal marine litter impacts can be temporary, long term, permanent and/or intermittent and may be subject to seasonal fluctuations. This is the first time for many sectors that a Marine Litter policy is presented in a written form. The policy may help to ensure that consideration is given to marine litter, including any potential impact on landscape and seascape, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight	Negligible

	benefits in preventing or reducing any adverse impact of proposals on landscape and seascape. The policy supports the Co-existence, Seascape, Stakeholder Engagement, Use of Evidence, and Land and Sea Interaction policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for landscape and seascape as a result of the policy, will be negligible.	

Core Policy: Marine Noise

Description of proposal associated with policy		
Description of main types of proposal	This policy applies to all marine proposals and land-based proposals that have the potential to generate noise in the Northern Ireland marine area.	
Locations where proposals are likely to occur	Anywhere a proposal affects or might affect the Northern Ireland marine area.	
Indication of numbers of proposals	The policy can apply to a wide range of decisions that affect or might affect the marine area, including terrestrial decisions, such as planning permissions. Given the scope of the policy, the numbers of proposals are unknown but could be large.	
SA Topics	**Description of Effect**	**Significance of Effect**
Biodiversity, Flora and Fauna	Man-made noise has the potential to affect marine and coastal ecosystems, particularly marine mammals, fish and seabirds. Noise can mask biologically relevant signals, result in behavioural responses and potentially damage or kill marine life, all of which could have population consequences. Dependent on the nature of the proposal, noise impacts can be temporary, long term, permanent and/or intermittent (e.g. associated with survey, construction or decommissioning activities or during the operational phase of the proposal). This is the first time for many sectors that a Marine Noise policy is presented in a written form. The policy may help to ensure that consideration is given to marine noise, including any potential impact on biodiversity, flora and fauna, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on biodiversity, flora and fauna. Presenting the policy in written form also clarifies the evidence requirements relating to marine noise in 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. The policy supports the Co-existence, Use of Evidence, Natural Heritage and Land and Sea Interaction policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for biodiversity, flora and fauna as a result of the policy, will be negligible.	Negligible

Water and Soils	The Marine Noise policy is unlikely to influence the baseline conditions of water and soils.	No effect
Air Quality	The Marine Noise policy is unlikely to influence the baseline conditions of air quality.	No effect
Climate Factors	The Marine Noise policy is unlikely to influence the baseline conditions of climate factors.	No effect
Socio-Demographics	Man-made noise has the potential to affect coastal communities; excessive noise can impact on quality of life, health and use or enjoyment of marine and coastal areas. Man-made noise can also impact on other uses and activities sensitive to noise pollution, such as tourism. Dependent on the nature of the proposal, noise impacts can be temporary, long term, permanent and/or intermittent (e.g. associated with survey, construction or decommissioning activities or during the operational phase of the proposal). This is the first time for many sectors that a Marine Noise policy is presented in a written form. The policy may help to ensure that consideration is given to marine noise, including any potential impact on socio-demographic factors, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on socio-demographics. The policy supports the Co-existence, Use of Evidence, Stakeholder Engagement and Land and Sea Interaction policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions of socio-demographics as a result of the policy, will be negligible.	Negligible
Uses and Activities – aquaculture, commercial fisheries	Man-made noise can affect fish by masking biologically relevant signals and has the potential to result in changes to behaviour and/or to harm, injure or kill. This could have consequences on fishing, spawning and nursery grounds, as well as migratory fish and cultivated finfish. Some invertebrates (e.g. crabs) are also potentially sensitive to noise. Dependent on the nature of the proposal, noise impacts can be temporary, long term, permanent and/or intermittent (e.g. associated with survey, construction or decommissioning activities or during the operational phase of the proposal). This is the first time for many sectors that a Marine Noise policy is presented in a written form. The policy may help to ensure that consideration is given to marine noise, including any potential impact on aquaculture and commercial fisheries, in the concept, planning and design of proposals (during all phases, survey i.e. construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on aquaculture and commercial fisheries. Presenting the policy in written form also clarifies the evidence requirements relating to marine noise in 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.	Negligible

	The policy supports the Co-existence, Use of Evidence, Stakeholder Engagement, Land and Sea Interaction, Aquaculture and Commercial Fishing policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for aquaculture and commercial fisheries as a result of the policy, will be negligible.	
Use and Activities – military activity	Man-made noise has the potential to affect military sonar reception which could have consequences for submarine navigation, communication and detection of other vessels. Military activities can generate man-made noise in the Northern Ireland marine area. Land based military activities such as practice firing ranges (danger areas) can generate noise intermittently over long periods of time. Marine military activities such as vessel sonar tend to be time-limited and associated with military exercises or vessels transiting the marine area. The policy reflects existing commitments and processes. In addition, the Ministry of Defence has well established systems to manage the risks arising from its activities, therefore the change in baseline conditions of military activities as a result of the policy will be negligible.	Negligible
Uses and Activities – tourism and recreation	Excessive noise could potentially affect the quality/attractiveness of marine and coastal areas for tourism and recreation activities. In addition, man-made noise has the potential to affect marine and coastal ecosystems, particularly marine mammals and birds, and in turn could have implications for wildlife watching. Dependent on the nature of the proposal, noise impacts can be temporary, long term, permanent and/or intermittent (e.g. associated with survey, construction or decommissioning activities or during the operational phase of the proposal). This is the first time for many sectors that a Marine Noise policy is presented in a written form. The policy may help to ensure that consideration is given to marine noise, including any potential impact on tourism and recreation, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on tourism and recreation. Presenting the policy in written form also clarifies the evidence requirements relating to marine noise in 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. The policy supports the Co-existence, Stakeholder Engagement, Use of Evidence, Land and Sea Interaction and Tourism and Recreation policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions of tourism and recreation as a result of the policy, will be negligible.	Negligible

Uses and Activities – noise	This is the first time for many sectors that a Marine Noise policy is presented in a written form. The policy may help to ensure that consideration is given to marine noise in the concept, planning and design of proposals (during all the phases of a proposal i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on this topic. The policy supports the Co-existence, Use of Evidence, Stakeholder Engagement, Land and Sea Interaction and relevant Key Activity policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline noise as a result of the policy, will be negligible.	Negligible
Uses and Activities - ports, shipping, navigation, dredging and disposal and coastal defence.	Marine noise is unlikely to have significant effects on these subtopics, however these subtopics are potential sources of marine noise. The main source of noise related to coastal defence is from the construction phase and is time limited. The main source of noise from shipping is related to the transit of vessels through the marine area, the frequency of which increases in intensively used shipping routes. Ports and harbours also generate marine noise which may be temporary, intermittent, long term and/or permanent dependent on the activity, for example temporary construction activities or permanent operations such as the running of plant and machinery. Noise from dredging and disposal activities is time limited and associated with operations such as suction pumps or the transit of vessels. This is the first time for many sectors that a Marine Noise policy is presented in a written form and it clarifies the evidence requirements relating to marine noise in 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. The policy supports the Co-existence, Stakeholder Engagement, Land and Sea Interaction, Use of Evidence and relevant Key Activity policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline for these subtopics as a result of the policy, will be negligible.	Negligible
Uses and Activities - aviation, marine litter, lighting	The Marine Noise policy is unlikely to influence the baseline conditions of aviation, marine litter and lighting.	No effect
Material Assets	Material Assets are unlikely to be significantly affected by marine noise, although material assets have the potential to generate noise. Dependent on the nature of the proposal, noise impacts can be temporary, long term, permanent and/or intermittent (e.g. associated with survey, construction or	Negligible

	decommissioning activities or during the operation phase of the proposal). This is the first time for many sectors that a Marine Noise policy is presented in a written form and it clarifies the evidence requirements relating to marine noise in 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. The policy supports the Co-existence, Stakeholder Engagement, Use of Evidence, Land and Sea Interaction, and relevant Key Activity policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline for material assets as a result of the policy, will be negligible.	
Cultural Heritage	The Marine Noise policy is unlikely to influence the baseline conditions of cultural heritage.	No effect
Landscape and Seascape	Landscape and seascape character can be influenced by non-visible factors such as noise. Areas which experience low levels of man-made noise could be particularly susceptible to change. Dependent on the nature of the proposal, noise impacts can be temporary, permanent, long term and/or intermittent (e.g. associated with survey, construction or decommissioning activities or during the operational phase of the proposal). This is the first time for many sectors that a Marine Noise policy is presented in a written form. The policy may help to ensure that consideration is given to marine noise, including any potential impact on landscape and seascape, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on landscape and seascape. The policy supports the Co-existence, Natural Heritage, Seascape, Use of Evidence and Land and Sea Interaction policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for landscape and seascape as a result of the policy, will be negligible.	Negligible

Core Policy: Seascape

Description of proposal associated with policy		
Description of main types of proposal	This policy applies to all marine proposals and land-based proposals that have the potential to affect the seascape of the Northern Ireland marine area.	
Locations where proposals are likely to occur	Anywhere a proposal affects or might affect the Northern Ireland marine area. Seascape is defined as landscapes with views of the coast or seas, and coasts and the adjacent marine environment with cultural, historical, and archaeological links with each other.	
Indication of numbers of proposals	The policy can apply to a wide range of decisions that affect or might affect the Northern Ireland marine area, including terrestrial decisions, such as planning permissions. Given the scope of the policy, the numbers of proposals are unknown but could be large.	
SA Topics	**Description of Effect**	**Significance of Effect**
Biodiversity, Flora and Fauna	Changes to the constituent parts that contribute to seascape character, can affect biodiversity, flora and fauna. Dependent on the nature of the proposal, impacts can be temporary, long term, permanent and/or intermittent. This is the first time for many sectors that a Seascape policy is presented in a written form. The policy, assisted by the Marine Mapviewer, may help to ensure that consideration is given to seascape, including features relating to biodiversity, flora and fauna, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on biodiversity, flora and fauna. Presenting the policy in written form also clarifies the evidence requirements relating to seascape in 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 The policy supports the Co-existence, Natural Heritage, Use of Evidence, Land and Sea Interaction and Coastal Processes policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for biodiversity, flora and fauna as a result of the policy, will be negligible.	Negligible
Water and Soils	Changes to the constituent parts that contribute to seascape character, can affect water and soils	Negligible

	(particularly as they relate to coastal geomorphology). Dependent on the nature of the proposal, impacts can be temporary, long term, permanent and/or intermittent. This is the first time for many sectors that a Seascape policy is presented in a written form. The policy, assisted by the Marine Mapviewer, may help to ensure that consideration is given to seascape character, including features relating to water and soils, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on water and soils. Presenting the policy in written form also clarifies the evidence requirements relating to seascape in 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. The policy supports the Co-existence, Use of Evidence, Stakeholder Engagement, Water Quality, Land and Interaction and Coastal Processes policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for water and soils as a result of the policy, will be negligible.	
Air Quality	The Seascape policy is unlikely to influence the baseline conditions for air quality.	No effect
Climate Factors	The Seascape policy is unlikely to influence the baseline conditions for climate factors.	No effect
Socio-Demographics	Seascape has a fundamental role in supporting the tourism industry with many of the region's most important attractions directly linked to their seascape setting. Seascapes also play an important role in Northern Ireland's creative industries providing a backdrop for film and television productions which reach large international audiences. Communities and industries (such as fisheries, and the associated infrastructure) are intrinsically linked to seascape. Changes to the constituent parts that contribute to seascape character can affect socio-demographics Dependent on the nature of the proposal, impacts can be temporary, long term, permanent and/or intermittent. This is the first time for many sectors that a Seascape policy is presented in a written form. The policy, assisted by the Marine Mapviewer, may help to ensure that consideration is given to seascape character, including features relating to socio-demographics, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on socio-demographics. The policy supports the Co-existence, Use of Evidence, Stakeholder Engagement, Land and Sea Interaction and relevant Key Activity policies of the Marine Plan.	Negligible

	There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for socio-demographics as a result of the policy, will be negligible.	
Uses and Activities – tourism and recreation	Seascape is an important element of people's enjoyment of the marine area, and contributes to a sense of place, livelihoods and quality of life. As such, seascape quality has a fundamental role in the tourism industry with many important attractions directly linked to their seascape setting. Changes to the constituent parts that contribute to seascape character can affect tourism and recreation. Dependent on the nature of the proposal, impacts can be temporary, long term, permanent and/or intermittent. This is the first time for many sectors that a Seascape policy is presented in a written form. The policy, assisted by the Marine Mapviewer, may help to ensure that consideration is given to seascape character, including features relating to tourism and recreation, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on tourism and recreation. Presenting the policy in written form also clarifies the evidence requirements relating to seascape in 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. The policy supports the Co-existence, Use of Evidence, Stakeholder Engagement, Land and Sea Interaction, and relevant Key Activity policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for tourism and recreation as a result of the policy, will be negligible.	Negligible
Uses and Activities - marine litter and noise	The Seascape policy is unlikely to influence the baseline conditions for theses uses and activities.	No effect
Uses and Activities - lighting	Lighting is intrinsically linked to seascape by being a part of it and having the potential to affect it. Dependent on the nature of the proposal, impacts can be temporary, long term, permanent and/or intermittent. This is the first time for many sectors that a Seascape policy is presented in a written form. The policy, assisted by the Marine Mapviewer, may help to ensure that consideration is given to seascape character, including the impacts of light, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse light impacts of proposals.	Negligible

	The policy supports the Co-existence, Use of Evidence, Stakeholder Engagement and Land and Sea Interaction policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for lighting as a result of the policy, will be negligible.	
Uses and Activities - aquaculture, commercial fisheries, ports, shipping, navigation, dredging and disposal, military activity, coastal defence	These Uses and Activities are intrinsically linked to seascape by being a part of it and having the potential to affect it. Changes to the constituent parts that contribute to seascape character can affect these uses and activities. Dependent on the nature of the proposal, impacts can be temporary, long term, permanent and/or intermittent. This is the first time for many sectors that a Seascape policy is presented in a written form. The policy, assisted by the Marine Mapviewer, may help to ensure that consideration is given to seascape character, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impacts of proposals on these subtopics. Presenting the policy in written form also clarifies the evidence requirements relating to seascape in 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. The policy supports the Co-existence, Use of Evidence, Stakeholder Engagement, Land and Sea Interaction, and relevant Key Activity policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions, for these uses and activities, as a result of the policy, will be negligible.	Negligible
Uses and Activities – aviation	The Seascape policy is unlikely to influence the baseline conditions for aviation.	No effect
Material Assets – terrestrial transport network, petroleum, offshore renewable energy	Terrestrial transport networks, petroleum operations and offshore renewable energy are intrinsically linked to seascape by being a part of it and having the potential to affect it. Dependent on the nature of the proposal, impacts can be temporary, long term, permanent and/or intermittent. Terrestrial transport networks can also provide access to viewpoints from which seascape can be appreciated. This is the first time for many sectors that a Seascape policy is presented in a written form. The policy, assisted by the Marine Mapviewer, may help to ensure that consideration is given to seascape character, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on these subtopics. Presenting the policy in written form also clarifies the evidence requirements relating to seascape in	Negligible

	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. The policy supports the Co-existence, Use of Evidence, Stakeholder Engagement, Land and Sea Interaction and relevant Key Activity policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for these material assets as a result of the policy, will be negligible.	
Material Assets – cables and pipelines, aggregates, underground offshore energy storage, carbon capture and storage, compressed air energy storage and waste water treatment and industrial discharge	The majority of these material assets are located in the sub-surface or sub-seabed, therefore the visual impact on seascape may be limited to isolated surface infrastructure and/or land-based elements. These visual elements can form a part of seascape character and also have the potential to affect it. Dependent on the nature of the proposal, impacts can be temporary, long term, permanent and/or intermittent. This is the first time for many sectors that a Seascape policy is presented in a written form. The policy, assisted by the Marine Mapviewer, may help to ensure that consideration is given to seascape character, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on these subtopics. Presenting the policy in written form also clarifies the evidence requirements relating to seascape in 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. The policy supports the Co-existence, Use of Evidence, Stakeholder Engagement, Land and Sea Interaction, and relevant Key Activity policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions of these material assets as a result of the policy, will be negligible.	Negligible
Cultural Heritage	Changes to the constituent parts that contribute to seascape character, can affect cultural heritage and its setting. Dependent on the nature of the proposal, impacts can be temporary, long term, permanent and/or intermittent. This is the first time for many sectors that a Seascape policy is presented in a written form. The policy, assisted by the Marine Mapviewer, may help to ensure that consideration is given to cultural heritage aspects of seascape character, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on cultural heritage. Presenting the policy in written form also clarifies the evidence requirements relating to seascape in	Negligible

	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. The policy supports the Co-existence, Use of Evidence, Stakeholder Engagement, Land and Sea Interaction and Heritage Assets policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions of cultural heritage as a result of the policy, will be negligible.	
Landscape and Seascape	This is the first time for many sectors that a Seascape policy is presented in a written form. The policy, assisted by the Marine Mapviewer, may help to ensure that consideration is given to landscape and seascape, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on landscape and seascape. The policy supports the Co-existence, Use of Evidence, Stakeholder Engagement, Land and Sea Interaction, Natural Heritage and Heritage Assets policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions of landscape and seascape as a result of the policy, will be negligible.	Negligible

Core Policy: Use of Evidence

Description of proposal associated with policy		
Description of main types of proposal	This policy applies to all marine proposals and land-based proposals that have the potential to affect the Northern Ireland marine area.	
Locations where proposals are likely to occur	Anywhere a proposal affects or might affect the Northern Ireland marine area.	
Indication of numbers of proposals	The policy can apply to a wide range of decisions that affect or might affect the marine area, including terrestrial decisions, such as planning permissions. Given the scope of the policy, the numbers of proposals are unknown but could be large.	
SA Topics	**Description of Effect**	**Significance of Effect**
Biodiversity, Flora and Fauna	The use of best available evidence will help to ensure that relevant baseline information (or evidence gaps), as well as pressures and impacts exerted on biodiversity, flora and fauna are identified and taken into account. The Marine Plan is supplemented by a Marine Mapviewer. This is the first time that marine related data, covering a wide range of topics, uses and activities, is presented in a publicly accessible web-based form for the Northern Ireland marine area. The Marine Mapviewer improves access to up-to-date evidence relating to biodiversity flora and fauna, such as designated sites, and may improve the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on biodiversity, flora and fauna. The policy and Marine Mapviewer support the other policies of the Marine Plan. Although there could potentially be a large number of proposals required to take account of this policy, the proportionate use of best available evidence, is already established within existing practice and decision making processes. Therefore, the change in baseline conditions for biodiversity, flora and fauna as a result of the policy and Marine Mapviewer, will be negligible.	Negligible
Water and Soils	The use of best available evidence will help to ensure that relevant baseline information (or evidence gaps), as well as pressures and impacts exerted on water and soils, are identified and taken into account.	Negligible

	The Marine Plan is supplementedby a Marine Mapviewer. This is the first time that marine related data, covering a wide range of topics, uses and activities, is presented in a publicly accessible web-based form for the Northern Ireland marine area. The Marine Mapviewer improves access to up-to-date evidence relating to water and soils, such as WFD protected areas, and may improve the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and decision making processes. This may have slight benefits in preventing or reducing any adverse impacts of proposals on water and soils. The policy and Marine Mapviewer support the other policies of the Marine Plan. Although there could potentially be a large number of proposals required to take account of this policy, the proportionate use of best available evidence, is already established within existing practice and decision making processes. Therefore, the change in baseline conditions for water and soils as a result of the policy and Marine Mapviewer, will be negligible.	
Air Quality	The use of best available evidence will help to ensure that relevant baseline information (or evidence gaps), as well as pressures and impacts exerted on air quality are identified and taken into account. The Marine Plan is supplementedby a Marine Mapviewer. This is the first time that marine related data, covering a wide range of topics, uses and activities, is presented in a publicly accessible web-based form for the Northern Ireland marine area. The Marine Mapviewer improves access to up-to-date evidence relating to air quality, such as Air Quality Management Areas, and may improve the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on air quality. The policy and Marine Mapviewer support the other policies of the Marine Plan. Although there could potentially be a large number of proposals required to take account of this policy, the proportionate use of best available evidence, is already established within existing practice and decision making processes. Therefore, the change in baseline conditions for air quality as a result of the policy and Marine Mapviewer, will be negligible.	Negligible
Climate Factors	The use of best available evidence will help to ensure that relevant baseline information (or evidence gaps), as well as pressures and impacts exerted on climate factors are identified and taken into account. The Marine Plan is supplementedby a Marine Mapviewer. This is the first time that marine related data, covering a wide range of topics, uses and activities, is presented in a publicly accessible web-based form for the Northern Ireland marine area. The Marine Mapviewer improves access to up-to-date evidence relating to climate factors, such as vessel movements, and may improve the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and decision making processes. This may have slight benefits in preventing or reducing any adverse impact	Negligible

	of proposals on climate factors. The policy and Marine Mapviewer support the other policies of the Marine Plan. Although there could potentially be a large number of proposals required to take account of this policy, the proportionate use of best available evidence, is already established within existing practice and decision making processes. Therefore, the change in baseline conditions for climate factors as a result of the policy and Marine Mapviewer, will be negligible.	
Socio-Demographics	The use of best available evidence will help to ensure that relevant baseline information (or evidence gaps), as well as pressures and impacts exerted on socio-demographics are identified and taken into account. The Marine Plan is supplementedby a Marine Mapviewer. This is the first time that marine related data, covering a wide range of topics, uses and activities, is presented in a publicly accessible web-based form for the Northern Ireland marine area. The Marine Mapviewer improves access to up-to-date evidence relating to socio-demographics, such as economic uses and activities, and may improve the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and decision making processes. This may have slight benefits in preventing or reducing impacts of proposals on socio-demographics. The policy and Marine Mapviewer support the other policies of the Marine Plan. Although there could potentially be a large number of proposals required to take account of this policy, the proportionate use of best available evidence, is already established within existing practice and decision making processes. Therefore, the change in baseline conditions for socio-demographics as a result of the policy and Marine Mapviewer, will be negligible.	Negligible
Uses and Activities (excluding marine litter, noise and lighting)	The use of best available evidence will help to ensure that relevant baseline information (or evidence gaps), as well as pressures and impacts exerted on uses and activities are identified and taken into account. The Marine Plan is supplementedby a Marine Mapviewer. This is the first time that marine related data, covering a wide range of topics, uses and activities, is presented in a publicly accessible web-based form for the Northern Ireland marine area. This improves access to up-to-date evidence relating to multiple uses and activities and may improve concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on uses and activities. The incorporation of the improved evidence base into proposals may lead to more effective and efficient decision making, thus reducing the risk of uncertainty and increasing the potential for a positive outcome. The policy and Marine Mapviewer support the policies of the Marine Plan.	Negligible

	Although there could potentially be a large number of proposals required to take account of this policy, the proportionate use of best available evidence, is established within existing practice and decision making processes. Therefore, the change in baseline conditions for these subtopics as a result of the policy and Marine Mapviewer, will be negligible.	
Uses and Activities (marine litter, noise and lighting)	The use of best available evidence will help to ensure that relevant baseline information (or evidence gaps), as well as pressures and impacts exerted on uses and activities are identified and taken into account. The Marine Plan is supplementedby a Marine Mapviewer. This is the first time that marine related data, covering a wide range of topics, uses and activities, is presented in a publicly accessible web-based form for the Northern Ireland marine area. The Marine Mapviewer improves access to up-to-date evidence relating to these subtopics, such as areas sensitive to marine litter and noise (such as beaches/protected areas), and may improve the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on these subtopics. The policy and Marine Mapviewer support the other policies of the Marine Plan. Although there could potentially be a large number of proposals required to take account of this policy, the proportionate use of best available evidence, is already established within existing practice and decision making processes. Therefore, the change in baseline conditions for marine litter, noise and lighting as a result of the policy and Marine Mapviewer, will be negligible.	Negligible
Material Assets	The use of best available evidence will help to ensure that relevant baseline information (or evidence gaps), as well as pressures and impacts exerted on material assets are identified and taken into account. The Marine Plan is supplementedby a Marine Mapviewer. This is the first time that marine related data, covering a wide range of topics, uses and activities, is presented in a publicly accessible web-based form for the Northern Ireland marine area. This improves access to up-to-date evidence relating to multiple material assets and may improve the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on material assets. The incorporation of the improved evidence base into proposals may lead to more effective and efficient decision making, thus reducing the risk of uncertainty and increasing the potential for a positive outcome. The policy and Marine Mapviewer support the policies of the Marine Plan. Although there could potentially be a large number of proposals required to take account of this policy, the proportionate use of best available evidence, is established within existing practice and decision making processes. Therefore, the change in baseline conditions for material assets as a result of the policy and Marine Mapviewer, will be negligible.	Negligible

Cultural Heritage	The use of best available evidence will help to ensure that relevant baseline information (or evidence gaps), as well as pressures and impacts exerted on cultural heritage are identified and taken into account. The Marine Plan is supplementedby a Marine Mapviewer. This is the first time that marine related data, covering a wide range of topics, uses and activities, is presented in a publicly accessible web-based form for the Northern Ireland marine area. The Marine Mapviewer improves access to up-to-date evidence relating to cultural heritage, such as designated and undesignated heritage assets, and may improve the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on cultural heritage. The policy and Marine Mapviewer support the other policies of the Marine Plan. Although there could potentially be a large number of proposals required to take account of this policy, the proportionate use of best available evidence, is already established within existing practice and decision making processes. Therefore, the change in baseline conditions for cultural heritage as a result of the policy and Marine Mapviewer, will be negligible.	Negligible
Landscape and Seascape	The use of best available evidence will help to ensure that relevant baseline information (or evidence gaps), as well as pressures and impacts exerted on landscape and seascape are identified and taken into account. The Marine Plan is supplementedby a Marine Mapviewer. This is the first time that marine related data, covering a wide range of topics, uses and activities, is presented in a publicly accessible web-based form for the Northern Ireland marine area. The Marine Mapviewer improves access to up-to-date evidence relating to landscape and seascape, such as Landscape and Seascape Character Areas, and may improve the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and decision making processes. This may have slight benefits in preventing or reducing any adverse impact of proposals on landscape and seascape. The policy and Marine Mapviewer support the other policies of the Marine Plan. Although there could potentially be a large number of proposals required to take account of this policy, the proportionate use of best available evidence, is already established within existing practice and decision making processes. Therefore, the change in baseline conditions for landscape and seascape as a result of the policy and Marine Mapviewer, will be negligible.	Negligible

Key Activity Policy: Aquaculture

Description of proposal associated with policy		
Description of main types of proposal	This policy applies to all proposals for marine finfish, shellfish and algae farms as well as public authority plans for aquaculture that have the potential to affect the Northern Ireland marine area.	
Locations where proposals are likely to occur	Finfish and shellfish cultivation depends on the farms being located in areas of good water quality and where the current flow allows the growth of healthy fish and shellfish. New aquaculture sites are also likely to occur close to existing sites where supporting coastal infrastructure already exists. Similarly, new shellfish aquaculture developments are likely to be located in areas that have already been designated as shellfish water protected areas. Existing shellfish aquaculture sites are principally concentrated in the five sea loughs with some operations at Dundrum Bay and Killough Harbour. There is also a marine salmon farm with sites in Glenarm Bay and Red Bay. Algae farms are located at Rathlin Island and Strangford Lough.	
Indication of numbers of proposals	The policy applies to all new aquaculture proposals, which are likely to amount to no more than 5 per year.	
SA Topics	**Description of Effect**	**Significance of Effect**
Biodiversity, Flora and Fauna	New aquaculture sites/activities and operations can affect biodiversity, flora and fauna, in particular benthic habitats and species, fish, marine mammals and diving birds. There are a number of pathways for impacts, for example changes in water and sediment quality and impacts associated with the introduction of non-native species. Impacts can be temporary, long term, permanent and/or intermittent. The policy encourages new marine shellfish aquaculture proposals to locate within existing shellfish water protected areas, which are shown in the Marine Mapviewer. However, the policy does not preclude new shellfish proposals outside these areas. Encouraging new shellfish proposals to locate within existing protected areas will help to limit any potential adverse impact on biodiversity, flora and fauna to those areas where shellfish aquaculture is already established. The policy supports the Co-existence, Stakeholder Engagement, Use of Evidence, Land and Sea Interaction and Natural Heritage policies of the Marine Plan. As the number of new aquaculture proposals will be very small and the spatial footprint of any new sites in the marine area will also be very small, the change in baseline conditions for biodiversity, flora and fauna, as a result of the policy, will be negligible.	Negligible
Water and Soils	New aquaculture sites/activities and operations can affect water and soils through a number of pathways, for example, changes in water and sediment quality and physical impacts associated with farming	Negligible

	structures and farm operations. Impacts can be temporary, long term, permanent and/or intermittent. The policy encourages new marine shellfish aquaculture proposals to locate within existing shellfish water protected areas, which are shown in the Marine Mapviewer. However, the policy does not preclude new shellfish sites outside these areas. Encouraging new shellfish proposals to locate within existing protected areas will help to limit any potential adverse impact on water and soils, to those areas where shellfish aquaculture is already established. The policy supports the Co-existence, Stakeholder Engagement, Use of Evidence, Land and Sea Interaction and Water Quality policies of the Marine Plan. As the number of new aquaculture proposals will be very small and the spatial footprint of any new sites in the marine area will also be very small the change in baseline conditions for water and soils, as a result of the policy, will be negligible.	
Air Quality	The Aquaculture policy is unlikely to influence the baseline conditions for air quality.	No effect
Climate Factors	The Aquaculture policy is unlikely to influence the baseline conditions for climate factors.	No effect
Socio-Demographics	New aquaculture sites/activities and operations could result in additional employment and generate income that will benefit local economies and communities. The policy encourages new marine shellfish aquaculture proposals to locate within existing shellfish water protected areas, which are shown in the Marine Mapviewer. However, the policy does not preclude new shellfish sites outside these areas. Encouraging new shellfish proposals to locate within existing protected areas may concentrate employment opportunities from new shellfish aquaculture proposals to those areas where shellfish aquaculture is already established. The policy supports the Co-existence, Stakeholder Engagement, Use of Evidence, Land and Sea Interaction and relevant Key Activity policies of the Marine Plan. The number of new shellfish aquaculture proposals will be small as will be any potential new employment opportunities. The policy could therefore result in slight social and economic benefits in local areas, but the overall change in baseline conditions for socio-demographics, will be negligible.	Negligible
Uses and Activities – aquaculture	New aquaculture sites/activities and operations can interact with existing aquaculture operations and result in potential conflict, for example, through competition for nutrients or an increased risk of disease. Impacts can be temporary, long term, permanent and/or intermittent. The policy encourages new marine shellfish aquaculture proposals to locate within existing shellfish water protected areas, which are shown in the Marine Mapviewer. This may lead to more effective and efficient decision making for aquaculture proposals, thus reducing the risk of uncertainty and increasing the potential for a positive outcome. Encouraging new shellfish proposals to locate within existing	Negligible

	protected areas has the potential to concentrate any adverse impact within those areas where shellfish aquaculture is already established. However, the policy does not preclude new shellfish sites outside these areas. The policy supports the Co-existence, Stakeholder Engagement, Use of Evidence, Land and Sea Interaction and Water Quality policies of the Marine Plan. As the number of aquaculture proposals will be very small and the spatial footprint of any new sites in the marine area will also be very small, the change in baseline conditions for existing aquaculture operations, as a result of the policy, will be negligible.	
Uses and Activities – commercial fisheries, ports, shipping, navigation, dredging and disposal, military activity, recreation and tourism	New aquaculture sites/activities and operations can potentially constrain the operation of other marine activities and uses, by reducing the available marine space and/or interacting with other uses and activities. Impacts can be temporary, long term, permanent and/or intermittent. The policy encourages new marine shellfish aquaculture proposals to locate within existing shellfish water protected areas, which are shown in the Marine Mapviewer. However, the policy does not preclude new shellfish sites outside these areas. Encouraging new shellfish proposals to locate within existing protected areas will help to limit any potential adverse impact on these subtopics to those areas where shellfish aquaculture is already established. The policy supports the Co-existence, Stakeholder Engagement, Use of Evidence, Land and Sea Interaction and relevant Key Activity policies of the Marine Plan. As the number of aquaculture proposals will be very small and the spatial footprint of any new sites in the marine area will also be very small, the change in the baseline conditions for these subtopics, as a result of the policy, will be negligible.	Negligible
Uses and Activities – noise, lighting, marine litter	New aquaculture sites/activities and operations could result in an increase in noise, lighting and/or marine litter. Impacts can be temporary, long term, permanent and/or intermittent. The policy encourages new marine shellfish aquaculture proposals to locate within existing shellfish water protected areas, which are shown in the Marine Mapviewer. However, the policy does not preclude new shellfish sites outside these areas. Encouraging new shellfish proposals to locate within existing protected areas will help to limit any potential adverse impact from noise, lighting and marine litter to those areas where shellfish aquaculture is already established. The policy supports the Co-existence, Stakeholder Engagement, Use of Evidence, Land and Sea Interaction, Marine Noise and Marine Litter policies of the Marine Plan. As the number of aquaculture proposals will be very small and the spatial footprint of any new sites in the marine area will also be very small, the change in the baseline conditions for these subtopics, as a result of the policy, will be negligible.	Negligible

Uses and Activities – aviation, coastal defence	The Aquaculture policy is unlikely to influence the baseline conditions for aviation or coastal defence.	No effect
Material Assets – cables and pipelines, aggregates, underground offshore energy storage; petroleum exploration licensing, offshore renewable energy, carbon capture and storage, compressed air energy Storage	New aquaculture sites/activities and operations may constrain these material assets by reducing available marine space and/or interacting with construction and operational activities. Impacts can be temporary, long term, permanent and/or intermittent. The policy encourages new marine shellfish aquaculture proposals to locate within existing shellfish water protected areas, which are shown in the Marine Mapviewer. However, the policy does not preclude new shellfish sites outside these areas. Encouraging new shellfish proposals to locate within existing protected areas will help limit any potential adverse impact on these subtopics to those areas where shellfish aquaculture is already established. The policy supports the Co-existence, Stakeholder Engagement, Use of Evidence, Land and Sea Interaction and relevant Key Activity policies of the Marine Plan. As the number of aquaculture proposals will be very small and the spatial footprint of any new sites in the marine area will also be very small, the change in the baseline conditions for these subtopics, as a result of the policy, will be negligible.	Negligible
Material Assets – terrestrial transport network	New aquaculture sites/activities and operations may result in an intermittent increase in the use of the terrestrial transport network, as a result of increased production. The policy encourages new marine shellfish aquaculture proposals to locate within existing shellfish water protected areas, which are shown in the Marine Mapviewer. However, the policy does not preclude new shellfish sites outside these areas. This may increase the use of transport infrastructure close to localities that have existing shellfish water protected areas. The policy supports the Co-existence, Stakeholder Engagement and Land and Sea Interaction policies of the Marine Plan. As the number of aquaculture proposals will be very small, the change in the baseline conditions for the terrestrial transport network, as a result of the policy, will be negligible.	Negligible
Material Assets – waste water treatment, industrial discharges	New aquaculture sites/activities and operations depend on good water quality and where current flow allows the growth of healthy fish and shellfish. Aquaculture proposals are particularly vulnerable to pollution, especially bacterial or chemical contamination. These impacts can be temporary, long term, permanent and/or intermittent. The policy encourages new marine shellfish aquaculture proposals to locate within existing shellfish water protected areas, which are shown in the Marine Mapviewer. However, the policy does not preclude new shellfish sites outside these areas. Encouraging new shellfish proposals to locate within existing protected areas will help to limit any potential adverse impact (such as upgrade costs of infrastructure) on	Negligible

	these subtopics to those areas where shellfish aquaculture is already established. The policy supports the Co-existence, Use of Evidence, Stakeholder Engagement, Water Quality and Land and Sea Interaction policies of the Marine Plan. As the number of aquaculture proposals will be very small and the spatial footprint of any new sites in the marine area will also be very small, the change in the baseline conditions for these subtopics, as a result of the policy, will be negligible.	
Cultural Heritage	New aquaculture sites/activities and operations could affect cultural heritage assets. Impacts can be temporary, long term, permanent and/or intermittent. The policy encourages new marine shellfish aquaculture proposals to locate within existing shellfish water protected areas, which are shown in the Marine Mapviewer. However, the policy does not preclude new shellfish sites outside these areas. Encouraging new shellfish proposals to locate within existing protected areas will help to limit any potential adverse impact on cultural heritage to those areas where shellfish aquaculture is already established. The policy supports the Co-existence, Stakeholder Engagement, Heritage Assets, Use of Evidence and Land and Sea Interaction policies of the Marine Plan. As the number of aquaculture proposals will be very small and the spatial footprint of any new sites in the marine area will also be very small, the change in the baseline conditions for cultural heritage, as a result of the policy, will be negligible.	Negligible
Landscape and Seascape	New aquaculture sites/activities and operations can affect landscapes and seascapes. The impact can vary significantly depending on the type of aquaculture, for example, if it requires surface infrastructure. Impacts can be temporary, long term, permanent and/or intermittent. The policy encourages new marine shellfish aquaculture proposals to locate within existing shellfish water protected areas, which are shown in the Marine Mapviewer. However, the policy does not preclude new shellfish sites outside these areas. Encouraging new shellfish proposals to locate within existing protected areas will help limit any potential adverse impact on landscape and seascape to those areas where shellfish aquaculture is already established. The policy supports the Co-existence, Stakeholder Engagement, Use of Evidence, Land and Sea Interaction and Seascape policies of the Marine Plan. As the number of aquaculture proposals will be very small and the spatial footprint of any new sites in the marine area will also be very small, the change in the baseline conditions for landscape and seascape, as a result of the policy, will be negligible.	Negligible

Key Activity Policy: Proposals with the Potential to Impact on Commercial Fishing

Description of proposal associated with policy		
Description of main types of proposal	The policy applies to all marine proposals and land-based proposals and decision making that has the potential to affect commercial fishing activities. This includes land-based elements such as harbours, markets and processing plants; and the ecosystems that support them, within the Northern Ireland marine area.	
Locations where proposals are likely to occur	On land where proposals affect or might affect commercial fishing activities; the marine area and other areas used by migratory marine fish species (such as river catchments) or the ecosystem services which support them. The Northern Ireland fishing fleet is concentrated at the Co. Down ports of Kilkeel, Portavogie and Ardglass, with many small vessels operating out of other ports and harbours along the whole coastline. The Northern Ireland fleet is highly dependent on fishing opportunities in the eastern Irish Sea where Nephrops are concentrated. There is also frequent activity by local trawlers in the North Channel, Clyde, western Irish Sea, and North Sea, while pelagic activity occurs in the Irish Sea, west of Scotland, the Northern Isles and the west of Ireland. Potting is popular in inshore waters and in all of the sea loughs. The coast from Rathlin to Larne is the main lobster fishing area, whilst brown crab tends to be mainly taken off the County Down coast. Some collection of wild cockles, mussels and winkles takes place, particularly in Strangford Lough, Carlingford Lough and Dundrum Inner Bay. Small scale bait-digging takes place all round the coast in muddy areas, but commercial digging is prevalent only in Inner Belfast Lough. Native oysters are harvested within Lough Foyle.	
Indication of numbers of proposals	The policy can apply to a wide range of proposals that affect or might affect the commercial fishing sector or the ecosystem services on which it depends. Given the scope of the policy, the numbers of proposals are unknown but could be large.	
SA Topics	**Description of Effect**	**Significance of Effect**
Biodiversity, Flora and Fauna	Commercial fishing is dependent on wild populations of fish (finfish, shellfish and crustaceans) and a healthy functioning marine environment (e.g. existence of essential fish habitats such as spawning and nursery area). Both short and long term anthropogenic disturbance and/or damage to biodiversity, flora and fauna could potentially affect fish stocks and/or impact on the capacity of the marine environment to support wild fisheries. This is the first time for many sectors that a safeguarding Commercial Fishing policy is presented in a written form. The policy and Marine Mapviewer, may have the benefit of increasing the consideration given to, biodiversity, flora and fauna, and its role in supporting commercial fishing, in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This policy will help to limit any potential adverse impact on biodiversity, flora and fauna, such as, key fish spawning and nursery areas. Presenting the policy in written form also clarifies the evidence requirements relating to commercial	Negligible

	fishing in 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. This policy supports the Co-existence, Use of Evidence, Stakeholder Engagement and Natural Heritage policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for biodiversity, flora and fauna as a result of the policy, will be negligible.	
Water and Soils	Commercial fishing is dependent on wild populations of fish (finfish, shellfish and crustaceans-and a healthy functioning marine environment (e.g. clean water and sediments). A change in the quality of water and soils (for example, brought about by discharges to the aquatic environment or disturbance of benthic habitats) could potentially impact on the capacity of the environment to support commercial fisheries. These impacts could be temporary, long term, permanent and/or intermittent. This is the first time for many sectors that a safeguarding Commercial Fishing policy is presented in a written form. The policy and Marine Mapviewer, may have the benefit of ensuring consideration of commercial fishing and its supporting ecosystem, including those related to water and soils in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This will help to limit any potential adverse impact on water and soils, in particular impacts on water quality and sediment quality. Presenting the policy in written form also clarifies the evidence requirements relating to commercial fishing in 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. This policy supports the Stakeholder Engagement, Use of Evidence and Water Quality policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for water and soils as a result of the policy, will be negligible.	Negligible
Air Quality	The Potential to Impact on Commercial Fishing policy is unlikely to influence the baseline conditions for air quality.	No effect
Climate Factors	The Potential to Impact on Commercial Fishing policy is unlikely to influence the baseline conditions for climate factors.	No effect
Socio-Demographics	The commercial fishing industry is a major employer in coastal communities and this policy seeks to safeguard commercial fishing and its related socio-economic benefits. In addition, Northern Ireland	Negligible

	commercial fishing contributes to UK food security. This is the first time for many sectors that a safeguarding Commercial Fishing policy is presented in a written form. The policy and Marine Mapviewer, may have the benefit of ensuring consideration of commercial fishing and related associated socio-demographic factors (such as employment and community issues), in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This will help to limit any potential adverse impact on socio-demographic outcomes. This policy supports the Stakeholder Engagement, Co-existence and Use of Evidence policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However as the policy reflects existing commitments and decision making processes, the change in baseline conditions for socio-demographics as a result of the policy, will be negligible.	
Uses and Activities – commercial fisheries	This is the first time for many sectors that a safeguarding Commercial Fishing policy is presented in a written form. The policy and Marine Mapviewer, may have the benefit of ensuring consideration of commercial fishing (including land based elements) and its supporting ecosystem in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This will help to limit any potential adverse impact on commercial fishing. This policy supports the Co-existence, Stakeholder Engagement and Use of Evidence policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for commercial fishing as a result of the policy, will be negligible.	Negligible
Uses and Activities –ports, shipping, navigation, dredging and disposal	Commercial fishing is dependent on navigation, ports, dredging and disposal. There is also potential for commercial fishing to be affected by these uses and activities, for example, if such activities have adverse effects on stock recruitment and/or result in displacement from fishing grounds. These impacts can be short term, intermittent or long term. This is the first time for many sectors that a safeguarding Commercial Fishing policy is presented in a written form. The policy and Marine Mapviewer, may have the benefit of ensuring consideration of commercial fishing and its supporting ecosystem (including safe navigation and the functioning of ports and harbours that support commercial fishing activities) in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. The policy will also help to limit any potential adverse impact on these uses and activities. Presenting the policy in written form also clarifies the evidence requirements relating to commercial	Negligible

	fishing in 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. The policy supports the Co-existence, Stakeholder Engagement, Use of Evidence policies and relevant Key Activity policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However as the policy reflects existing commitments and decision making processes, the change in baseline conditions for these subtopics as a result of the policy, will be negligible.	
Uses and Activities – aquaculture, military activity, recreation and tourism, coastal defence	There is potential for commercial fishing to be affected by aquaculture, military activity, coastal defence, tourism and recreation, for example, if activities have adverse effects on stock recruitment and/or result in displacement from fishing grounds. These impacts can be temporary, intermittent or long term. This is the first time for many sectors that a safeguarding Commercial Fishing policy is presented in a written form. The policy and Marine Mapviewer, may have the benefit of ensuring consideration of commercial fishing (including land based elements) and its supporting ecosystem are considered in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. Presenting the policy in written form also clarifies the evidence requirements relating to commercial fishing in 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. This policy supports the Co-existence, Use of Evidence, Stakeholder Engagement policies and relevant Key Activity policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for these subtopics as a result of the policy, will be negligible.	Negligible
Uses and Activities – noise, lighting and marine litter	The Potential to Impact on Commercial Fishing policy is unlikely to influence the baseline conditions for noise, lighting and marine litter.	No effect
Uses and Activities – aviation	The Potential to Impact on Commercial Fishing policy is unlikely to influence the baseline conditions for aviation.	No effect
Material Assets	Commercial fishing has the potential to be affected by material assets, for example, maintenance, construction and/or operation of these assets can have adverse effects on stock recruitment and/or result in displacement from fishing grounds. These impacts can be temporary, long term, permanent and/or intermittent. This is the first time for many sectors that a safeguarding Commercial Fishing policy is presented in a	Negligible

	written form. The policy and Marine Mapviewer, may have the benefit of ensuring consideration of commercial fishing (including land based elements) and its supporting ecosystem in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. Presenting the policy in written form also clarifies the evidence requirements relating to commercial fishing in 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. This policy supports the Co-existence, Use of Evidence, Stakeholder Engagement policies and Key Activity policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for material assets as a result of the policy, will be negligible.	
Cultural Heritage	The Potential to Impact on Commercial Fishing policy is unlikely to influence the baseline conditions for cultural heritage.	No effect
Landscape and Seascape	The Potential to Impact on Commercial Fishing policy is unlikely to influence the baseline conditions for landscape and seascape.	No effect

Key Activity Policy: Dredging

Description of proposal associated with policy		
Description of main types of proposal	This policy applies to all proposals for maintenance and capital dredging (and associated disposal) that have the potential to affect the Northern Ireland marine area. Maintenance dredging involves the periodic removal of material that has accumulated over time (e.g. through sedimentation) and is principally conducted within ports and navigable channels to allow safe and continued operation for shipping. Capital dredging involves creating a greater depth or channel width than had previously existed, for example for new port developments or creating a new seabed profile to provide foundations for infrastructure.	
Locations where proposals are likely to occur	Dredging proposals tend to be concentrated around ports, harbours and marinas, both large and small and associated navigable channels such as the Bann River, Belfast Lough, Carlingford Lough and Lough Foyle. Dredging is an enabling activity for other marine sector activities, for example, facilitating future port development, accommodating larger vessels in shipping, the construction of pipelines and outfalls, and the preparation of sites for proposals such as renewable energy projects. Dredging may, therefore, occur anywhere in the marine area where such developments are proposed/required.	
Indication of numbers of proposals	Maintenance dredging is an ongoing (continuous) activity. The requirement for capital dredging is driven by development and there are likely to be a very small number of capital dredging proposals per year.	
SA Topics	**Description of Effect**	**Significance of Effect**
Biodiversity, Flora and Fauna	Dredging (and associated disposal) activities and operations can affect biodiversity, flora and fauna through a number of pathways. These pathways could be through the loss of benthic habitat, the potential risk to fish and other marine life from the release of sediments and sediment bound contaminants; increases in turbidity, morphological changes including burial of seabed flora and fauna, and increases in marine noise. These impacts can be temporary, long term, permanent and/or intermittent. The policy states that there will be a presumption in favour of dredging when, in addition to other requirements, the disposal of dredged waste at sea is directed to existing registered disposal sites, which are shown in the Marine Mapviewer. However, the policy does not preclude the opening of new disposal sites. Directing disposal to existing registered sites will help to limit any potential adverse impact on, biodiversity, flora and fauna, to those areas where disposal activities are already established. The policy supports the Natural Heritage, Stakeholder Engagement, Use of Evidence, Land and Sea Interaction and Co-Existence policies of the Marine Plan. The number of capital and maintenance dredging proposals (and any associated waste disposal) will be very small. Furthermore, existing maintenance dredging activities will continue within the current spatial footprint. As such, the change in baseline conditions for, biodiversity, flora and fauna, as a result of the	Negligible

	policy, will be negligible.	
Water and Soils	Dredging (and associated disposal) activities and operations can affect, water and soils, through a number of pathways, such as changes in natural sedimentary systems, coastal processes, hydrology and water quality through the release of sediment-bound contaminants. These impacts can be temporary, long term, permanent and/or intermittent. The policy states that there will be a presumption in favour of dredging when, in addition to other requirements, the disposal of dredged waste at sea is directed to existing registered disposal sites, which are shown in the Marine Mapviewer. However, the policy does not preclude the opening of new disposal sites. Directing disposal to existing registered sites will help to limit any potential adverse impact on water and soils to those areas where disposal activities are already established. The policy supports the Water Quality, Stakeholder Engagement, Use of Evidence, Land and Sea Interaction and Co-existence policies of the Marine Plan. The number of capital and maintenance dredging proposals (and any associated waste disposal) will be very small. Furthermore, existing maintenance dredging activities will continue within the current spatial footprint. As such, the change in baseline conditions for, water and soils, as a result of the policy, will be negligible.	Negligible
Air Quality	The Dredging policy is unlikely to influence the baseline conditions for air quality.	No effect
Climate Factors	Dredging (and associated disposal) activities and operations can affect climate factors, through emissions from dredging operations and any vessels/equipment/vehicles used for the transportation/disposal of dredged material at sea or on land. The scale of these emissions will relate to the location, frequency and duration of dredging and disposal activities and the type of vessels/equipment/vehicles used and travel distances involved. The policy states that there will be a presumption in favour of dredging when, in addition to other requirements, the disposal of dredged waste at sea is directed to existing registered disposal sites, which are shown in the Marine Mapviewer. However, the policy does not preclude the opening of new disposal sites. Curtailing new sea disposal sites close to dredging operations could reduce the potential for proposers to limit the travel distance to disposal sites and impact on the associated greenhouse gas emissions. The policy supports the Use of Evidence and Climate Change policies of the Marine Plan. The number of future capital or maintenance dredging proposals will be very small, therefore the contribution of this sector to overall emissions will also be very small. As such the change in baseline conditions for, climate factors, as a result of the policy, will be negligible.	Negligible

Socio-Demographics	The Dredging policy is unlikely to influence the baseline conditions for socio-demographics.	No effect
Uses and Activities – dredging and disposal	The policy states that there will be a presumption in favour of dredging when, in addition to other requirements, the disposal of dredged waste at sea is directed to existing registered disposal sites, which are shown in the Marine Mapviewer. This may lead to more effective and efficient decision making for dredging proposals, thus reducing the risk of uncertainty and increasing the potential for a positive outcome. In addition, whilst the policy could limit the potential for dredging proposers to reduce travel distances to disposal sites, the policy does not preclude the opening of new disposal sites. This policy supports the Stakeholder Engagement, Co-existence, Use of Evidence, Land and Sea Interaction policies of the Marine Plan. As this policy reflects existing commitments and decision making processes, and the spatial guidance does not preclude the opening of new sites, the change in baseline conditions for these dredging and disposal subtopics, as a result of the policy, will be negligible	Negligible
Uses and Activities – ports, shipping, navigation, military activity, commercial fisheries, aquaculture, tourism and recreation	Dredging (and associated disposal) activities and operations are essential for the safe navigation and functioning of ports, harbours and marinas. Dredging activities are also closely linked to evolving industry needs, such as the trend for shipping to use larger vessels. Maintenance dredging will be a continual requirement to ensure safe navigation and functioning of ports, shipping and navigation. Dredging and disposal activities and operations can have temporary and intermittent impacts on ports, shipping and navigation (including recreational) through the movement of dredging vessels. Dredging and disposal activities can have short and long term impacts on commercial fisheries and aquaculture and the ecosystems that support them. The policy states that there will be a presumption in favour of dredging when, in addition to other requirements, the disposal of dredged waste at sea is directed to existing registered disposal sites, which are shown in the Marine Mapviewer. However, the policy does not preclude the opening of new disposal sites. Directing disposal wastes to existing registered sites will help to limit any potential adverse impact on these, uses and activities, to those areas where disposal activities are already established (including established transit routes). This policy supports the Co-existence, Stakeholder Engagement, Use of Evidence, Land and Sea Interaction policies, and relevant Key Activity policies of the Marine Plan. The number of capital and maintenance dredging proposals (and associated waste disposal) will be very small. Furthermore, existing maintenance dredging activities will continue within the current spatial footprint. As such, the change in baseline conditions for these uses and activities subtopics, as a result of the policy, will be negligible.	Negligible
Uses and Activities – coastal defence	The Dredging policy is unlikely to influence the baseline conditions for coastal defence.	No effect

Uses and Activities – noise, lighting, litter	The Dredging policy is unlikely to influence the baseline conditions for these subtopics.	No effect
Uses and Activities - aviation	The Dredging policy is unlikely to influence the baseline conditions for aviation.	No effect
Material Assets – cables and pipelines, underground offshore energy storage; petroleum exploration licensing, offshore renewable energy, carbon capture and storage, compressed air energy Storage, aggregates	Dredging (and associated disposal) activities and operations are an enabling activity for other marine sectors, for example, the laying of subsea cables and pipelines, and the preparation of sites for other proposals such as renewable energy projects. However, dredging (and associated disposal) activities and operations may also constrain some of these material assets subtopics by reducing the available marine space (e.g. through vessel movements) and/or interacting with operational activities. These impacts can be temporary, long term, permanent and/or intermittent. The policy states that there will be a presumption in favour of dredging when, in addition to other requirements, the disposal of dredged waste at sea is directed to existing registered disposal sites, which are shown in the Marine Mapviewer. However, the policy does not preclude the opening of new disposal sites. Directing disposal of dredged wastes to existing registered disposal sites will help to limit any potential adverse impact, on these material assets, to those areas where disposal activities are already established (including established transit routes). This policy supports the Co-existence, Stakeholder Engagement, Use of Evidence, Land and Sea Interaction policies, and relevant Key Activity policies of the Marine Plan. The number of capital and maintenance dredging proposals will be very small. Furthermore, existing maintenance dredging activities will continue within the current spatial footprint. As such, the change in the baseline conditions for these, material assets subtopics, as a result of the policy, will be negligible.	Negligible
Material Assets – terrestrial transport network	The Dredging policy is unlikely to influence the baseline conditions for the terrestrial transport network.	No effect
Material Assets – waste water treatment, industrial discharges	The Dredging policy is unlikely to influence the baseline conditions for waste water treatment or industrial discharges.	No effect
Cultural Heritage	Dredging (and associated disposal) activities have the potential for short and long term impacts on cultural heritage assets through disturbance or smothering. The policy states that there will be a presumption in favour of dredging when, in addition to other requirements, the disposal of dredged waste at sea is directed to existing registered disposal sites, which are shown in the Marine Mapviewer. However, the policy does not preclude the opening of new disposal	Negligible

	sites. Directing disposal to existing registered sites will help to limit any potential adverse impact on cultural heritage to those areas where disposal activities are already established. This policy supports the Co-existence, Stakeholder Engagement, Use of Evidence, Heritage Assets, and Land and Sea Interaction policies of the Marine Plan. The number of capital and maintenance dredging proposals will be very small. Furthermore, existing maintenance dredging activities will continue within the current spatial footprint. As such, the change in baseline conditions for cultural heritage as a result of the policy, will be negligible.	
Landscape and Seascape	The Dredging policy is unlikely to influence the baseline conditions for landscape and seascape.	No effect

Key Activity Policy: Ports, Harbours and Shipping - Proposals with the Potential to Impact on Shipping

Description of proposal associated with policy		
Description of main types of proposal	This policy applies to all marine proposals and land-based proposals that have the potential to interfere with, or impede, shipping activity and/or freedom of navigation in the Northern Ireland marine area.	
Locations where proposals are likely to occur	Anywhere within the Northern Ireland marine area, but not tidal rivers beyond the upstream limits of a harbour authority. Interference with the operation or functioning of the following is likely to be unacceptable: the IMO Traffic Separation Scheme, maintained channels, areas of intensive shipping activity (in relation to interference with safe navigation), aids to navigation, such as, lighthouses, buoys and telecommunications equipment (the latter may include land-based proposals).	
Indication of numbers of proposals	The policy can apply to a wide range of decisions that affect or might affect the marine area. Given the scope of the policy, the numbers of proposals are unknown but could be large.	
SA Topics	**Description of Effect**	**Significance of Effect**
Biodiversity, Flora and Fauna	Shipping activity and the freedom of navigation can affect biodiversity, flora and fauna through a number of pathways, for example, from the risk of spillages, noise and visual disturbance, and ship wash. Impacts can be temporary, long term, permanent and/or intermittent. This is the first time for many sectors that specific issues with the potential to impact on shipping, such as, disruption to shipping activity through increased travel time, fuel consumption and associated greenhouse gas emissions, have been presented in a written form. The policy and supporting Marine Mapviewer may help to ensure that consideration is given to these aspects of shipping in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may reduce any potential disruption to areas of intensive shipping activity and limit any potential adverse impact on biodiversity, flora and fauna. The policy supports the Co-existence, Stakeholder Engagement, Use of Evidence and Natural Heritage policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for biodiversity, flora and fauna, as a result of the policy, will be negligible.	Negligible
Water and Soils	Shipping activity and the freedom of navigation can affect water and soils through a number of pathways, for example through the risk of spillages, ship wash and dredging activities that are required to maintain approaches and channels. Impacts can be temporary, long term, permanent and/or	Negligible

	intermittent. This is the first time for many sectors that specific issues with the potential to impact on shipping, such as, disruption to shipping activity through increased travel time, fuel consumption and associated greenhouse gas emissions have been presented in a written form. The policy and supporting Marine Mapviewer may help to ensure that consideration is given to these aspects of shipping in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may reduce any potential disruption to areas of intensive shipping activity and limit any potential adverse impact on water and soils. The policy supports the Co-existence, Stakeholder Engagement, Use of Evidence and Water Quality policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for water and soils, as a result of the policy, will be negligible.	
Air Quality	The Potential to Impact on Shipping policy is unlikely to influence the baseline conditions for air quality.	No effect
Climate Factors	Shipping activity and the freedom of navigation can affect climate factors through the emission of greenhouse gases by vessels. This is the first time for many sectors that specific issues with the potential to impact on shipping, such as, disruption to shipping activity through increased travel time, fuel consumption and associated greenhouse gas emissions have been presented in a written form. The policy and supporting Marine Mapviewer may help to ensure that consideration is given to these aspects of shipping in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may reduce any potential disruption to areas of intensive shipping activity and limit potential increases in vessel emissions arising from increased travelling times. The policy supports the Climate Change, Stakeholder Engagement and Use of Evidence policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for climate factors, as a result of the policy, will be negligible.	Negligible
Socio-Demographics	Shipping activity and the freedom of navigation is essential for trade and tourism and is a significant contributor to the national/regional economy. For some communities it is an essential transport link, providing access to services and employment thereby reducing social and economic isolation. This is the first time for many sectors that specific issues with the potential to impact on shipping, such	Negligible

	as disruption to shipping activity through increased travel time, fuel consumption and associated greenhouse gas emissions have been presented in a written form. The policy and supporting Marine Mapviewer may help to ensure that consideration is given to these aspects of shipping in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may reduce any potential disruption to areas of intensive shipping activity and ensure the continued viability of routes and services on which communities rely. This policy may also limit any potential adverse impact on uses and activities and their associated employment/economic benefits. The policy supports the Co-existence, Stakeholder Engagement, Use of Evidence and relevant Key Activity policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for socio-demographics as a result of the policy, will be negligible.	
Uses and Activities – ports, shipping, navigation, dredging and disposal	This is the first time for many sectors that specific issues with the potential to impact on shipping, such as disruption to shipping activity through increased travel time, fuel consumption and associated greenhouse gas emissions have been presented in a written form. The policy and supporting Marine Mapviewer may help to ensure that consideration is given to these aspects of shipping in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making process. This may reduce any potential disruption to areas of intensive shipping activity and limit any associated impacts, such as increased travel time and costs. The policy supports the Co-existence, Stakeholder Engagement, Use of Evidence and relevant Key Activity policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However, as the policy reflects existing commitments and decision making processes, the change in baseline conditions for these subtopics as a result of the policy, will be negligible.	Negligible
Uses and Activities – aquaculture, commercial fisheries, military activities, recreation and tourism	Shipping activity and the freedom of navigation is essential for a number of uses and activities, namely aquaculture, commercial fisheries, military activities and recreation and tourism. Uses and activities can impact on shipping and vice-versa, for example through spatial competition. Impacts can be temporary, long term, permanent and/or intermittent. This is the first time for many sectors that specific issues with the potential to impact on shipping, such as disruption to shipping activity through increased travel time, fuel consumption and associated greenhouse gas emissions have been presented in a written form. The policy and supporting Marine Mapviewer may help to ensure that consideration is given to these aspects of shipping in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may reduce any potential disruption to areas	Negligible

	of intensive shipping activity and limit any potential adverse impact on these uses and activities. Presenting the policy in written form also clarifies the evidence requirements relating to shipping in 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. The policy supports the Co-existence, Stakeholder Engagement, Use of Evidence and relevant Key Activity policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However as the policy reflects existing commitments and decision making processes, the change in baseline conditions for these subtopics, as a result of the policy, will be negligible.	
Uses and Activities – noise	Shipping activity is a significant source of marine noise. Noise impacts are related to the transit of vessels through the marine area and as such are temporary and intermittent. Noise impacts increase within or close to intensively used shipping routes and around ports and harbours to produce long term/permanent impacts. This is the first time for many sectors that specific issues with the potential to impact on shipping, such as disruption to shipping activity through increased travel time, fuel consumption and associated greenhouse gas emissions have been presented in a written form. The policy and supporting Marine Mapviewer may help to ensure that consideration is given to these aspects of shipping in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may reduce any potential disruption to areas of intensive shipping activity and limit any potential adverse noise impacts. The policy supports the Co-existence, Stakeholder Engagement, Use of Evidence and Marine Noise policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However as the policy reflects existing commitments and decision making processes, the change in baseline conditions for noise, as a result of the policy, will be negligible.	Negligible
Uses and Activities- aviation, lighting and marine litter	The Potential to Impact on Shipping policy is unlikely to influence the baseline conditions for aviation, lighting and marine litter.	No effect
Material Assets - cables and pipelines, aggregates, underground offshore energy storage; petroleum exploration licensing, offshore renewable energy, carbon capture and	Shipping activity and freedom of navigation are essential for the maintenance, construction and/or operation of these material assets. These material assets can impact on shipping and vice-versa, for example through spatial competition. Impacts can be temporary, long term, permanent and/or intermittent. This is the first time for many sectors that specific issues with the potential to impact on shipping, such as disruption to shipping activity through increased travel time, fuel consumption and associated	Negligible

storage, compressed air energy storage, terrestrial transport network	greenhouse gas emissions have been presented in a written form. The policy and supporting Marine Mapviewer may help to ensure that consideration is given to these aspects of shipping in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may reduce any potential disruption to areas of intensive shipping activity and limit any potential adverse impact on these material assets. Presenting the policy in written form also clarifies the evidence requirements relating to shipping in 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. The policy supports the Co-existence, Stakeholder Engagement, Use of Evidence and relevant Key Activity policies of the Marine Plan. There could potentially be a large number of proposals required to take account of this policy. However as the policy reflects existing commitments and decision making processes, the change in baseline conditions for these material assets subtopics as a result of the policy, will be negligible.	
Material Assets - waste water treatment and industrial discharges	The Potential to Impact on Shipping policy is unlikely to influence the baseline conditions for waste water treatment and industrial discharges.	No effect
Cultural Heritage	The Potential to Impact on Shipping policy is unlikely to influence the baseline conditions for cultural heritage.	No effect
Landscape and Seascape	The Potential to Impact on Shipping policy is unlikely to influence the baseline conditions for landscape and seascape.	No effect

Key Activity Policy: Telecommunications Cabling

Description of proposal associated with policy		
Description of main types of proposal	This policy applies to all proposals for subsea telecommunication cable installation and maintenance that have the potential to affect the Northern Ireland marine area.	
Locations where proposals are likely to occur	There are seven subsea telecommunication cables in the Northern Ireland marine area. The majority of the telecommunication cables make landfall on the east coast. Four cables connect Northern Ireland to Scotland, two cables connect to the Isle of Man and one cable connects to the north of England. At Portrush on the north coast, the Northern Ireland branch of the Hibernia North fibre optic cable joins the main Hibernia North cable, which traverses between the north of England, Canada and the United States of America. Future proposals for this sector are likely to focus on upgrading and/or increasing the capacity of existing cables along existing routes.	
Indication of numbers of proposals	The annual number of proposals required to maintain the existing network of telecommunication cables is likely to be small (less than 5 proposals per year). The annual number of proposals to install new subsea telecommunication cables, along new routes, is likely to be very small (less than 1 proposal per year).	
SA Topics	**Description of Effect**	**Significance of Effect**
Biodiversity, Flora and Fauna	Subsea telecommunications cabling activities can affect biodiversity, flora and fauna through a number of pathways. These pathways could be through the abrasion/disturbance of benthic community, smothering, changes in suspended sediment concentrations (turbidity), release of sediment bound contaminants, and introduction and/or facilitation of the spread of non-native species. However, the scale of impacts from subsea cable installations is generally considered to be low, spatially limited and temporary. The main impacts are associated with the use of cable protection, for example, rock armour or concrete mattresses where cable burial is not feasible; and potentially in the intertidal area, where the cable makes landfall. Such affects can be long term or permanent. This is the first time that a Telecommunication Cabling policy has been presented in a written form. The policy states that there will be a presumption in favour of subsea telecommunication proposals when, in addition to other requirements, consideration is given to the burial of cables as a preferred option. The policy may help to ensure that biodiversity, flora and fauna are considered in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes, including the means and method of cable laying (e.g. burial). This may have slight benefits in preventing or reducing any potential adverse impact from proposals on biodiversity, flora and fauna. The policy supports the Co-existence, Use of Evidence, Stakeholder Engagement, Natural Heritage,	Negligible

	Land and Sea Interaction and Coastal Processes policies of the Marine Plan. The number of telecommunication cable proposals is expected to be small. In addition, the policy does not restrict the method of cable laying and it reflects existing commitments and decision making processes. Therefore, the change in baseline conditions for biodiversity, flora and fauna as a result of the policy, will be negligible.	
Water and Soils	Subsea telecommunications cabling activities can affect water and soils through a number of pathways. These pathways could be through changes in suspended sediment concentration, release of sediment bound contaminants, abrasion/disturbance of the seabed sediment, penetration of the seabed sediment and physical changes to another seabed type (e.g. through addition of rock armour or concrete mattresses). However, the scale of impacts from subsea cable installations is generally considered to be low, spatially limited and temporary. The main impacts are associated with the use of cable protection and can be long term, for example, rock armour or concrete mattresses where cable burial is not feasible; and potentially in the intertidal area where the cable makes landfall. Such effects can be long term or permanent. This is the first time that a Telecommunication Cabling policy has been presented in a written form. The policy states that there will be a presumption in favour of subsea telecommunication proposals when, in addition to other requirements, consideration is given to the burial of cables, as a preferred option. The policy may help to ensure that water and soils are considered in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes, including the means and method of cable laying (e.g. burial). This may have slight benefits in preventing or reducing any potential adverse impact from proposals on water and soils. The policy supports the Co-existence, Use of Evidence, Water Quality, Stakeholder Engagement, Land and Sea Interaction and Coastal Processes policies of the Marine Plan. The number of telecommunication cable proposals is expected to be small. In addition, the policy does not restrict the method of cable laying and it reflects existing commitments and decision making processes. Therefore, the change in baseline conditions for water and soils as a result of the policy, will be negligible.	Negligible
Air Quality	The Telecommunications Cabling policy is unlikely to influence the baseline conditions for air quality.	No effect
Climate Factors	The Telecommunications Cabling policy is unlikely to influence the baseline conditions for climate factors.	No effect
Socio-Demographics	Subsea telecommunication cables are critical infrastructure, providing vital links for society and businesses to access national and international telecommunications services. This sector is important for the development of a knowledge-based economy and essential for the continued economic and social well-being of Northern Ireland. Subsea telecommunications cabling operations can also potentially affect	Negligible

	other marine uses and activities (with associated socio-demographic outcomes), for example, through spatial competition. However, the scale of impacts from subsea cable installations is generally considered to be low, spatially limited and temporary. This is the first time that a Telecommunication Cabling policy has been presented in a written form. The policy states that there will be a presumption in favour of subsea telecommunication proposals when, in addition to other requirements, consideration is given to the burial of cables as a preferred option. The policy may help to ensure that socio-demographic outcomes are considered in the concept, planning and design of telecommunication cable proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes, including the means and method of cable laying (e.g. burial). This may result in the prevention or reduction of any potential adverse impact from proposals on other uses and activities and their associated socio-demographic outcomes. The policy supports the Co-existence, Use of Evidence, Stakeholder Engagement, Land and Sea Interaction policies and relevant Key Activity policies of the Marine Plan. The number of telecommunication cable proposals is expected to be small. In addition, the policy does not restrict the method of cable laying and it reflects existing commitments and decision making processes. Therefore, the change in baseline conditions for socio-demographics as a result of the policy, will be negligible.	
Uses and Activities – Commercial fisheries, recreation, shipping, aquaculture, navigation, dredging, military activities, ports, coastal defence.	Subsea telecommunications cabling operations can potentially affect other marine uses and activities through vessel movements (for example to maintenance/installation areas and/or during maintenance/installation activities). Furthermore, the presence of subsea telecommunication cables may potentially constrain the operation of other marine uses and activities, by reducing available marine space for, or excluding other uses and activities. However, the scale of the impacts from subsea cable installations is generally considered to be low, spatially limited and temporary. This is the first time that a Telecommunication Cabling policy has been presented in a written form. The policy states that there will be a presumption in favour of subsea telecommunication proposals when, in addition to other requirements, consideration is given to the burial of cables as a preferred option. The policy may help to ensure that these subtopics are considered in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes, including the means and method of cable laying (e.g. burial). This may have slight benefits in preventing or reducing any potential adverse impact from proposals on these subtopics. The policy supports the Co-existence, Water Quality, Land and Sea Interaction, Stakeholder Engagement, Use of Evidence and relevant Key Activity policies of the Marine Plan. The number of telecommunication cable proposals is expected to be small. In addition, the policy does not restrict the method of cable laying and it reflects existing commitments and decision making processes. Therefore, the change in baseline conditions for these subtopics as a result of the policy, will	Negligible

	be negligible.	
Uses and Activities – noise, lighting and marine litter	Subsea telecommunication cabling maintenance and installation operations could result in an increase in the pollution generated by these subtopics. However, the scale of impacts from these activities is generally considered to be low, spatially limited and temporary. This is the first time that a Telecommunication Cabling policy has been presented in a written form. The policy states that there will be a presumption in favour of subsea telecommunication proposals when, in addition to other requirements, consideration is given to the burial of cables as a preferred option. The policy may help to ensure that these subtopics are considered in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes including the means and method of cable laying (e.g. burial). This may have slight benefits in preventing or reducing any potential adverse impact from noise, lighting and marine litter on proposals. The policy supports the Co-existence, Use of Evidence, Land and Sea Interaction, Marine Litter and Marine Noise policies of the Marine Plan. The number of telecommunication cable proposals is expected to be small. In addition, the policy does not restrict the method of cable laying and it reflects existing commitments and decision making processes. Therefore, the change in baseline conditions for these subtopics as a result of the policy, will be negligible.	Negligible
Uses and Activities - aviation	The Telecommunications Cabling policy is unlikely to influence the baseline conditions for aviation.	No effect
Material Assets – telecommunication cables	This is the first time that a Telecommunication Cabling policy has been presented in a written form. The policy states that there will be a presumption in favour of subsea telecommunication proposals when, in addition to other requirements consideration is given to the burial of cables as a preferred option. The policy may help to ensure that other material assets, such as other telecommunication cables, are considered in the concept, planning and design of telecommunication cable proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes, including the means and method of cable laying (e.g. burial). This may have slight benefits in preventing or reducing any potential adverse impact from new telecommunication proposals on existing telecommunication cables. Presenting the policy in written form also clarifies the evidence requirements for 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. The policy supports the Co-existence, Stakeholder Engagement, Use of Evidence and Land and Sea Interaction policies of the Marine Plan. The number of telecommunication cable proposals is expected to be small. In addition, the policy does	Negligible

	not restrict the method of cable laying and it reflects existing commitments and decision making processes. Therefore, the change in baseline conditions for this subtopic as a result of the policy, will be negligible.	
Material Assets –underground offshore energy storage; petroleum exploration licensing, offshore renewable energy, carbon capture and storage, compressed air energy storage, aggregates, cables and pipelines – other than telecommunications.	Subsea telecommunications cabling operations can potentially affect these material assets through increasing vessel traffic (for example to maintenance/installation areas and/or during maintenance/installation activities). Furthermore, the presence of subsea telecommunication cables may potentially constrain other material assets by reducing available marine space or excluding other assets. However, the scale of impacts from subsea cable installations is generally considered to be low, spatially limited and temporary. This is the first time that a Telecommunication Cabling policy has been presented in a written form. The policy states that there will be a presumption in favour of subsea telecommunication proposals when, in addition to other requirements consideration is given to the burial of cables as a preferred option. The policy may help to ensure that these subtopics are considered in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes, including the means and method of cable laying (e.g. burial). This may have slight benefits in preventing or reducing any potential adverse impact from proposals on these subtopics. The policy supports the Co-existence, Land and Sea Interaction, Use of Evidence, Stakeholder Engagement and relevant Key Activity policies of the Marine Plan. The number of telecommunication cable proposals is expected to be small. In addition, the policy does not restrict the method of cable laying and it reflects existing commitments and decision making processes. Therefore, the change in baseline conditions for these subtopics as a result of the policy, will be negligible.	Negligible
Material Assets – terrestrial transport network	The Telecommunication Cabling policy is unlikely to influence the baseline conditions for the terrestrial transport network.	No effect
Material Assets – waste water treatment, industrial discharges	The Telecommunication Cabling policy is unlikely to have an influence on the baseline conditions for waste water treatment or industrial discharges.	No effect
Cultural Heritage	The installation of subsea telecommunication cables has the potential to adversely affect cultural heritage sites including marine archaeology principally through the disturbance of the seabed when laying and burying cables or cable protection using rock armour or concrete mattresses. Dependent on the activity and the level of disturbance, impacts can be temporary, long term and/or permanent. This is the first time that a Telecommunication Cabling policy has been presented in a written form. The policy states that there will be a presumption in favour of subsea telecommunication proposals when, in addition to other requirements, consideration is given to the burial of cables as a preferred option. The policy may help to ensure that cultural heritage is considered in the concept, planning and design of	Negligible

	proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes, including the means and method of cable laying (e.g. burial). This may have slight benefits in preventing or reducing any potential adverse impact from proposals on cultural heritage. The policy supports the Co-existence, Heritage Assets, Stakeholder Engagement, Use of Evidence and Land and Sea Interaction policies of the Marine Plan. The number of telecommunication cable proposals is expected to be small. In addition, the policy does not restrict the method of cable laying and it reflects existing commitments and decision making processes. Therefore, the change in baseline conditions for cultural heritage as a result of the policy, will be negligible.	
Landscape and Seascape	Telecommunications cables in Northern Ireland are located subsurface, including at the point where they make landfall. The only visual element of subsea telecommunication infrastructure may be terrestrial landing stations, which can be located some distance from the coast in relatively modest sized buildings. There could be long term or permanent potential impacts on landscape and seascape from the landing station and temporary and/or intermittent impacts arising from the maintenance and installation operations. This is the first time a Telecommunication Cabling policy has been presented in a written form. The policy states that there will be a presumption in favour of subsea telecommunication proposals when, in addition to other requirements consideration is given to the burial of cables as a preferred option. This may help to ensure that landscape and seascape are considered in the concept, planning and design of proposals (during all phases i.e. survey, construction, operation and decommissioning) and in decision making processes. This may have slight benefits in preventing or reducing any potential adverse impact from proposals on landscape and seascape. The policy supports the Co-existence, Land and Sea Interaction, Use of Evidence, Stakeholder Engagement and Seascape policies of the Marine Plan. The number of telecommunication cable proposals is expected to be small. In addition, the policy does not restrict the method of cable laying and it reflects existing commitments and decision making processes. Therefore, the change in baseline conditions for landscape and seascape as a result of the policy, will be negligible.	Negligible